138

THE IRON AGE

UNIVERSITY OF TORONTO

VOL. LXXXVIII.

JULY—DECEMBER, 1911

730
4/3/30

NEW YORK:
DAVID WILLIAMS COMPANY,
239 West 39th Street.

CANCELLED

T.
1
I7
V.88

640357
14.8.56

INDEX.

Illustrated articles indicated by *.

A.

Academy of Political Science:
To Discuss Relation of Government to Business, Oct 26 p 900
Accidents:
American Ironmasters Safeguard Men. Nov 16 p 1082
Coming Meeting of American Association for Labor Legislation on Prevention, Sept 7 p 507
Compulsory Safety Devices, Oct 5 p 719
Increasing Liability for Fatal, Aug 24 p 402
In German Iron and Steel Works, Dec 14 p 1413
Laws for Prevention, Aug 24 p 421
Molders' Safeguards, Nov 23 p 1108
Proposed Federal Compensation Bill, Dec 14 p 1316
Safeguarding Workmen in Small Plants, July 13 p 74
Safety as Applied to Grinding Wheels, July 20 p 140
Safety Devices for Grinding Wheels, Aug 17 p 349
Safety Measures May Be Too Thorough, Aug 3 p 277
Standards of Safety in Relation to Machinery,* July 13 p 88; July 20 p 160
With the Metal Press, Aug 3 p 279
Acklin Stamping Company:
Toledo Metal Stamping Plant,* Sept 14 p 594
Acme Automatic Engine, Sterling,* Sept 7 p 531
Adamson, N. E., Jr.:
Time Study Observations,* Nov 16 p 1090
Addy, Matthew, & Co.:
Cost of Producing Alabama Pig Iron, Sept 7 p 545
Adulteration of Oils, Detecting, July 13 p 91; Aug 17 p 386
Aerial Camera, Woodbury & Co.'s,* Oct 19 p 869
Aero Motor, Frontier Eight-Cylinder,* Dec 7 p 1259
Aeroplane Propeller Testing Plant, Worcester Polytechnic,* July 20 p 152
Africa, New Industry for South, Sept. 28 p 676
Air Compressor Installation, Interesting Chicago,* Dec 7 p 1258
Air Compressor Installation, Notable,* Sept 7 p 536
Air Cylinders for Pyramid Pumps, Goulds,* Aug 3 p 276
Air Economizer, Sterling,* Oct 12 p 808
Alabama Consolidated Coal & Iron Company:
Consolidation with Southern Iron & Steel Company, Aug 24 p 421; Oct 12 p 795
Alabama Iron & Steel Company, Aug 24 p 421
Alabama Pig Iron, Cost of Producing, Sept 7 p 545
Alabama's Governor Pleases Railroad Interests, Nov 30 p 1204
Albree, Chester B., Iron Works Company, July 13 p 123
Alexander, W. W.:
Safety Measures May Be Too Thorough, Aug 3 p 277
Aligning of Shafting,* Oct 12 p 814
Allen-Bradley Company:
Motor Starters,* Sept 21 p 646
Allen, Irving C.:
Specifications for Purchase of Fuel Oil for Government, Aug 3 p 261
Allen, John F., Company:
New Riveter Hammer,* Oct 26 p 917
Alliance Machine Company:
Crane Contracts, Nov 16 p 1073
Allis-Chalmers Company:
To Reorganize, Dec 14 p 1315; Dec 21 p 1333
Alloyed Steel in 1910, Production of, Oct 5 p 743
Alloys, Titanium, with and Without Aluminum, Nov 16 p 1056
Alloys Used for Die-Castings, Sept 7 p 532
Aluminum:
No International Syndicate, Oct 5 p 767
Pulleys for American Planers, Aug 3 p 271
Titanium Alloys with and Without, Nov 16 p 1056
World's Production of, Sept 7 p 507
Amalgamated Scale Signers, July 20 p 143
American Association for Labor Legislation:
Programme of Coming Meeting, Sept 7 p 507; Dec 21 p 1359
American Blower Company:
Detroit Return Trap,* Nov 16 p 1088
Forced Blast Unit, 500-hp.,* Nov 30 p 1200
Monthly Informant, July 6 p 34
American Bridge Company:
Monumental Bridge Contract, Nov 9 p 1024
New Pittsburgh Bridge, Aug 24 p 417
Yard Installation of Cleveland Cranes,* Oct 5 p 762
American Car & Foundry Company:
Annual Report, July 6 p 5
American District Steam Company:
New Plant,* Dec 14 p 1300
American Engineers for the New Steel Works in India, Sept 21 p 623
American Foundry Foremen's Association, Nov 9 p 1042
American Grondal Company:
To Concentrate Moose Mountain Ores, Nov 30 p 1183
American-Hawaiian Steamship Company:
New Vessels for Panama and Pacific Trade, Oct 19 p 852
American Institute of Mining Engineers:
Excursion Features of San Francisco Meeting, Sept 28 p 677
Meeting, Sept 21 p 639
Meeting of New York Section, Sept 28 p 682
American Iron and Steel Association:
Iron Trade Statistics for 1910, Aug 3 p 249
American Iron and Steel Institute:
Directors, Nov 2 p 956
Directory, Aug 31 p 449
Special Meeting, Oct 19 p 861
Use of Intoxicants by Steel Workers, Dec 14 p 1277
American Iron Trade Statistics for 1910, Aug 3 p 249
American Locomotive Company:
Annual Report, Sept 7 p 537
American Manufacturers' Export Association:
Convention, Sept 28 p 678
American Metal Hose Company:
Flexible Metal Hose and Tubing, Dec 28 p 1415
American Museum of Safety:
Molders' Safeguards, Nov 23 p 1108
American Opportunity in Europe, Sept 21 p 627
American Oxhydric Company:
Electrolytic Generation of Oxygen and Hydrogen, Aug 31 p 491
American Rolling Mill Company:
Banquet of Salesmen, Sept 21 p 623
Entertains Culvert Manufacturers, Dec 21 p 1367
New Works at Middletown, Ohio,* Aug 31 p 478
Sheet and Pair Furnaces, Sept 14 p 578
American Shipbuilding Company:
Annual Report, Oct 19 p 858
Two New Orders for Lake Vessels, Nov 9 p 1020
American Society for Testing Materials:
Action on Various Matters, Nov 9 p 1016
Convention Proceedings, July 6 p 20
Specifications for Spelter, Aug 17 p 387
Specifications for Steel Axles and Shafts, Aug 24 p 425
Steel Reinforcement Bar Specifications, Aug 17 p 379
Year Book, Oct 19 p 869
American Society of Mechanical Engineers:
Annual Meeting Announcement, Nov 16, p 1089
Convention Preliminaries, Dec 7 p 1219
Convention Proceedings, Dec 14 p 1290
Programme of Meeting, Nov 30 p 1171
Standard Boiler Rules, Sept 7 p 521
American Specialty Company:
Twentieth Century Loose Pulley Oil Cup,* July 27 p 214
American Steel & Wire Company:
Steel Wire Gauge, Nov 16 p 1069
American Steel Foundries:
Earnings, Oct 19 p 860; Nov 9 p 1016
American Supply and Machinery Manufacturers' Association:
Campaign to Increase Membership, Oct 19 p 865
American Tool Works Company:
Aluminum Pulleys for Planers, Aug 3 p 271
Analyses:
Improvement in Sulphur Tests, Aug 17 p 363
Andresen-Evans Company:
Type B Grab Buckets,* Sept 7 p 549
Annealing Steel Castings,* Sept 7 p 542
Ansaldo, G., Armstrong & Co.:
Case Hardening of Steel,* Nov 2 p 978
Appalachian Exposition, Aug 3 p 284
Armor Plate Decision, Oct 19 p 837
Arsenals, Scientific Management at, Nov 9 p 1022
Ashland Steel Company:
New Officers, Oct 19 p 849
Atikokan Iron Company:
By-Product Coke Plant, Dec 28 p 1401
Atkins, E. C., & Co.:
Hack Saw Machine,* Sept 28 p 694
Atlantic & Pacific Transport Company:
Proposed Panama Steamship Line, Sept 7 p 522
Atlas Car & Mfg Company:
New Ore Car,* Sept 14 p 590
Ore Transfer Car,* Oct 5 p 751
Atlas Dryer Company:
Ore Dryer, Sept 28 p 682
Atlas Engine Works:
Crude-Oil Engine,* Sept 14 p 584
Auchy, George:
Improvement in Sulphur Tests, Aug 17 p 363
Works Chemist's Protest Against Paternalism, Oct 26 p 886

Autogenous Welding Not for the Weakened Structure, Oct 5 p 720
Automatic Pittsburgh Air Pump Company:
Air Compressors for Light Work, July 20 p 143
Automobiles:
MacLeod & Co., Oil-Fired Furnaces for Parts,* Nov 9 p 1036
Outlook for 1912, Aug 24 p 403
Rolling of Rims, Aug 31 p 488
Avery No 3 Drill Press, Cincinnati,* Sept 7 p 546
Avery Scale Company:
Automatic Scale,* Aug 31 p 490
Axles and Shafts, Specifications for Steel, Aug 24 p 425
Axles, Heat-Treated Steel, Nov 9 p 1005

B.

Bagley, D.:
Benzol from Coke-Oven Gases,* Oct 5 p 756
Baird Machine Company:
Spring-Making Machines,* Sept 7 p 527
Baker Brothers:
Cylinder-Boring Machine,* Dec 7 p 1247
Baker, David:
Thin-Lined Blast Furnace Construction,* Dec 28 p 1400
Baldwin Locomotive Works:
To Have a Western Plant, Dec 21 p 1347
Baltimore & Ohio Railroad:
Chrome Steel Rails in Tunnels, Aug 31 p 463
Baltimore Business Organization, New, July 13 p 95
Baltimore Industrial Notes, Aug 3 p 283; Sept 14 p 592; Oct 12 p 831; Nov 2 p 981; Dec 14 p 1327
Bankruptcy Act, Safeguarding the, Sept 21 p 609
Baraduc-Muller, Dr. L.:
Carborundum for Special Steels, Nov 16 p 1086
Barb Wire Machine, Blashill & Gray Improved,* Aug 3 p 272
Barge Canal and Iron Ore Freights, New York's, Aug 24 p 417
Bar Iron Combination, Scotch, Sept 7 p 507
Barnes & McWilliam:
Nickel Steel, 3 Per Cent., Aug 10 p 326
Bars, Twisting of Reinforcing,* Sept 21 p 641
Bartlett, C. O., & Snow Company:
New Fueling Lighter,* Dec 14 p 1308
Basic Steel, Titanium and Low Carbon,* Dec 14 p 1306
Bates Machine Company:
Improved Corliss Valve Gear,* Aug 24 p 432
Battery, Storage, for the Steel Mill, Oct 19 p 859
Beaumont Iron Works:
Black Revolving Steam Feed,* Nov 9 p 1033
Belnap, Hiram W.:
Broken Lehigh Valley Rail, Nov 23 p 1126
Belting at the Turin Exposition, Schieren,* Oct 26 p 918
Belt, New Features of the Gandy, Sept 28 p 705
Bench, Sand-Mixing, Portable, Molder's,* Dec 21 p 1367
Benzol from Coke-Oven Gases,* Oct 5 p 756
Berger Mfg. Company:
Steel Racks for Pattern Storage,* Dec 7 p 1255
Steel Storage Bins, Oct 19 p 865
Berlin Chemical Laboratory:
Langrehr Safety Can for Gasoline,* Oct 19 p 866
Bernhardt, F.:
New Open-Hearth Furnace Construction,* Oct 12 p 816
Besly, Charles H., & Co.:
Disk Grinder,* Oct 19 p 862
Ring-Grinding Wheel Chuck,* July 20 p 165
Bessemer Gas Engine Company:
Gas Engines, Nov 9 p 1038
Bethlehem Steel Company:
New Blast Furnace Almost Completed, July 6 p 33
Seller of Pig Iron, Nov 23 p 1121
Betz-Pierce Company:
New Iron and Steel Jobbing House in Cleveland, July 27 p 199
Beyer, David S.:
Standards of Safety in Relation to Machinery,* July 13 p 88; July 20 p 160
Bierer and Fay:
Heat Treatment of Low-Carbon Nickel Steels, July 27 p 195
Bingham, W., Company:
Changes Ownership, Dec 28 p 1396
Birkinbine, John:
New York's Barge Canal and Iron Ore Freights, Aug 24 p 417
Birmingham Notes, July 13 p 96
Black, L. J.:
Revolving Steam Feed,* Nov 9 p 1033
Blake Specialty Company, Dec 21 p 1301
Blashill & Gray:
Improved Barb Wire Machine,* Aug 3 p 272
Blast Furnaces:
(See Furnaces, Blast)
Blatchley, Chas. A.:
Sewage Disposal for a Hardware Works,* July 13 p 112
Block-Pollak Company:
Interests, Oct 5 p 736
Blowers:
American 500-hp. Forced Blast Unit,* Nov 30 p 1200
Terry High-Pressure Set,* Nov 9 p 1040
Terry Turbo-Cupola,* Dec 28 p 1410
Boiler Plant Operation, Efficiency in, Aug 17 p 368
Boiler Rules, Standard, Sept 7 p 521
Boiler Tools, Heely,* Aug 24 p 432
Bone, Prof. William A.:
Remarkable Discovery in Gas Combustion,* Dec 7 p 1248
Bonuses and the Location of Industries, Aug 10 p 297
Bonus System Man and His Foreman, Oct 26 p 885
Book Reviews:
Copper Handbook, Oct 5 p 720
Cost Keeping and Scientific Management, July 27 p 192
General Foundry Practice, Aug 3 p 266
Handbuch der Mineralchemie (Manual of Mineral Chemistry), Part 1, Aug 3 p 266; Part 2, Dec 21 p 1348
Hendricks' Commercial Register of the United States, Sept 7 p 509
Iron and Steel: Their Production and Manufacture, July 27 p 192
Metallurgy of Tin, July 27 p 192
Principles of Industrial Engineering, Aug 3 p 266
Quelques Mots sur L'Industrie Metallurgique Russe (Some Words on the Russian Metallurgical Industry), July 13 p 97
Bope, H. P.:
Future Development of the Middle West, Nov 30 p 1186
Boring Machines:
Baker Cylinder,* Dec 7 p 1247
Kidder,* Dec 7 p 1257
Newton Combination, Portable, Drilling, Milling and,* Aug 10 p 331
Boston Chamber of Commerce:
Credit Unions for Employees, July 27 p 215
Bounty on Canadian Pig Iron, Proposed, Nov 30 p 1170
Bourne-Fuller Company:
Buys the Upson Nut Company, Nov 30 p 1182; Dec 7 p 1218
Bowser, S. F., & Co., Inc.:
Oil Pump House at Gary,* July 27 p 203
Bradford Machine Tool Company:
Lathe Relieving Attachment,* Aug 31 p 474
Brady, F. W.:
Patents and the Public Welfare, Nov 2 p 950
Brass Manufacturers, National Association of: Meetings, July 6 p 34; Dec 28 p 1414
Bretaud, J. V.:
Steel Converter Installations, Oct 19 p 857
Bridgeport Safety Emery Wheel Company:
Combination Grinding Machine,* July 6 p 59
Bridges:
Chicago-Milwaukee Rapid Repair,* Dec 28 p 1399
Monumental Contract Let, Nov 9 p 1024
New Pittsburgh, Aug 24 p 417
Briquetting Flue Dust, General Briquetting Company, Dec 14 p 1295
Briquetting Process for Ores and Flue Dust, Weiss, Nov 30 p 1185
Bristol Company:
Recorder with Frictionless Inking Device,* Nov 30 p 1201
British and American Export Trade, Nov 2 p 935
British-Columbian Mining in 1910, Aug 3 p 293
British Handbook for Iron Founders, July 13 p 96
British Iron and Steel Exports and Imports, Aug 24 p 421
British Iron and Steel Exports Stationary, Aug 3 p 235
British Iron and Steel Market, Aug 3 p 266; Sept 21 p 624; Nov 23 p 1121
British Steel Imports, Move to Reduce, Oct 12 p 794
British Steel Trade, Rebate Plan in, Dec 14 p 1277
British Wage Earners, Nov 2 p 951
Bronn and Schemann:
Molten Ferromanganese for Deoxidation, Oct 12 p 801
Brown & Sharpe Mfg. Company:
Castellating Attachment,* Aug 31 p 491
New Fine Measurement Tools,* Dec 7 p 1246
Brown Hoisting Machinery Company:
Coal-Handling Plant at Duluth,* Dec 7 p 1240
Improved Slag Bucket,* Dec 7 p 1257
Browning Engineering Company:
New Crane,* Sept 7 p 541
Wrecking Crane with Steam Shovel Attachment,* Dec 7 p 1260
Brown Instrument Company:
Expansion, Aug 17 p 387
New Electric Recording Instrument,* Nov 9 p 1042
Brown Iron Ores, Preparation of, Sept 7 p 528
Brown-Ketcham Iron Works:
Failure, Sept 21 p 643
Bruce-Macbeth Engine Company:
Gas Engine Orders, Nov 23 p 1109
Brush, F. & M., New Wire,* Nov 2 p 981
Brussels, Belgium:
International Steel Conference, July 13 p 74; July 20 p 144; Aug 3 p 252
Buck, D. M.:
Iron and Steel Roofing Sheets, Nov 23 p 1145
Buckets:
Andresen-Evans Type B Grab,* Sept 7 p 549
Improved Brown Slag,* Dec 7 p 1257
Buck, Rudolf:
Users of Blast Furnace Gas, Oct 26 p 902
Bucyrus Company:
Hand Book of Steam Shovel Work, Sept 28 p 695; Oct 12 p 799
Buffalo:
Freight Rate Reductions from, Aug 24 p 414
Industrial Week in, Nov 23 p 1121

Ship Canal Lock at, Dec 28 p 1385
Buffalo Forge Company:
Conoidal Fan,* Dec 28 p 1414
Buffalo Union Furnace Company:
Industrial Railroad Case, Dec 28 p 1397
Building Code, Ohio's State, Sept 7 p 526
Bullard Machine Tool Company:
To Prevent Leaks in Overhead Costs,* Nov 23 p 1139
Bunnell, Sterling H.:
Making Machines Earn Their Living, July 27 p 194
Standardizing Factory Expense and Cost, Nov 16 p 1072
Bureau of Mines:
Demonstrations, Sept 28 p 705
Producer Gas Investigations, Nov 30
Burt Mfg. Company:
Automatic Oiling System,* July 13 p 111
New Oil Filter,* Oct 12 p 819
Ventilator,* Sept 28 p 693
Business, What Is the Matter with, Sept 14 p 565

C.

Cableways, Panama Canal,* Oct 12 p 812
Calder, John:
Organizer of Men in Management, Nov 2 p 958
Caldwell, E. R., & Co.:
Air Compressor,* Oct 19 p 871
California, Sunshine in, Oct 12 p 794
Cambria Steel Company:
Axles and Forgings, Nov 2 p 981
Briquetting Flue Dust, Dec 14 p 1295
First Steel Rails Rolled at Johnstown, Nov 9 p 1002
Visited by Engineers, Nov 30 p 1185
Wire and Nail Catalogue, July 6 p 5
Workers' Reunion,* Oct 5 p 740
Camera, Aerial, Woodbury & Co.'s,* Oct 19 p 869
Canada:
Blashill & Gray Improved Barb Wire Machine,* Aug 3 p 272
British-Columbian Mining in 1910, Aug 3 p 203
Duty on Wrought Pipes or Tubes, Nov 16 p 1076
Electro Steel Company of Canada, Ltd., at Judicial Sale, July 20 p 153
Iron and Steel Output, Nov 9 p 1016
National Bridge Company, Aug 31 p 463
New Mills for Steel Company of Canada, Dec 14 p 1298
Proposed Bounty on Pig Iron, Nov 30 p 1170
Titaniferous Ores Used in the United States, Oct 19 p 865
To Concentrate Moose Mountain Iron Ores, Nov 30 p 1183
Canadian Sirocco Company, Ltd., Nov 16 p 1076
Canal Commission Bids, Isthmian, Nov 16 p 1060; Nov 23 p 1146
Canal Equipment Contract, Panama Hydraulic, Dec 21 p 1347
Canal Gates, Engineers Inspect Panama, July 20 p 129
Canal Lock at Buffalo, Ship, Dec 28 p 1385
Canal, Locomotives to Tow Ships Through Panama, Oct 26 p 903
Can for Gasoline, Langrehr Safety,* Oct 19 p 866
Canton Foundry & Machine Company:
New Geared Ratchet Lifting Jack,* July 6 p 43
Canton Industrial Notes, Nov 2 p 984
Carborundum for Special Steels, Nov 16 p 1080
Carden, Capt. Godfrey L.:
American Opportunity in Europe, Sept 21 p 627
Cargo Transference at Steamship Terminals, Nov 23 p 1151
Carnahan Tin Plate & Sheet Company:
Genuine Charcoal Iron Tin Plate, Sept 7 p 546
Carnegie Steel Company:
Furnace Slags in Concrete, July 13 p 90
Heat-Treated Steel Axles, Nov 9 p 1005
New Shape Book, Nov 16 p 1076
Steel Derricks and Drilling Rigs, July 27 p 202
Carnegie Veterans' Association:
Dinner, Dec 14 p 1298
Carpenter, A. W.:
Metal Corrosion in Gaseous Atmosphere, Aug 31 p 461
Cars:
All-Steel Passenger, Oct 26 p 898
Atlas Ore Transfer,* Oct 5 p 751
Buying Movement, Nov 23 p 1106
Chicago Exceptionally Large Tank, Nov 16 p 1085
Hamfelt Blast Furnace Charging,* Nov 9 p 1039
New Atlas Ore,* Sept 14 p 590
Pennsylvania 52-Ft. Steel, Dec 7 p 1255
Superiority of Steel, Nov 23 p 1138
Westinghouse Steel Transformer,* Aug 3 p 278
Cartwright & Eaton, Ltd.:
New Industry for South Africa, Sept 28 p 676
Case Hardening, Observations on,* July 27 p 213
Case Hardening of Steel,* Nov 2 p 978
Castellating Attachment, Brown & Sharpe,* Aug 31 p 491
Cast Iron, Physical Properties of, Nov 16 p 1077
Castings:
Alloys Used for Die, Sept 7 p 532
Annealing Steel,* Sept 7 p 542
Steel from Electric Furnace,* July 20 p 148
Stock Process for Steel,* Sept 7 p 524
Treadwell Electric Steel, Dec 21 p 1333
William Sellers Machine Molding for Large, Dec 28 p 1412
Caterpillar Traction Engine, Holt,* Aug 10 p 334
Cement:
Production in 1910, Nov 23 p 1104
Use of Portland, July 6 p 3
Census Bureau's Report on Iron and Steel, Aug 31 p 470
Centering Machine, New Fay & Scott,* July 20 p 150
Chain, Taylor Tisco Manganese Steel,* Oct 19 p 868
Challenge Machine Company, Inc.:
New Combination Grinder,* July 27 p 212
Changes and Better Business, Economic, Sept 21 p 610
Chaplet, McCarroll Ideal,* July 27 p 221
Chapman, Clovd M.
Sulphuric Acid Corrosion Test,* July 13 p 99
Charging Car, Hamfelt Blast Furnace,* Nov 9 p 1039
Chatillon, Commentry & Neuves-Maisons Steel Corporation
Highly Reputable French Steel, Dec 14 p 1305
Chattanooga Manufacturers' Association, July 27 p 192
Chemistry, International Congress in 1912, Oct 26 p 904
Chemist's Protest Against Paternalism, Works, Oct 26 p 886
Cheney, Edward J.:
Flywheels for Motor-Driven Rolling Mills, Sept 28 p 700
Chester, Pa.:
Steel Castings Trade, July 27 p 204
Chicago Business Men's Pluck, Sept 7 p 505
Chicago Engineers' Club:
New Building, July 6 p 50
Chicago, Milwaukee & St. Paul Railroad
Rapid Bridge Repair,* Dec 28 p 1399
Chicago Pneumatic Tool Company:
Interesting Air Compressor Installation,* Dec 7 p 1258
Chicago Steel Car Company:
Exceptionally Large Tank Car, Nov 16 p 1085
Chilled Roll Process, New National,* Oct 5 p 766
Chimney Gases, Diffusing Noxious, Dec 21 p 1367
Chimney, Wiederholt,* Sept 28 p 689
Chinese Exports of Pig Iron and Iron Ore, Sept 28 p 700
Chrome Steel Rails in Tunnels, Aug 31 p 463
Chronograph, Stromberg Electric,* Nov 16, p 1084
Chucks:
Besly Ring Grinding Wheel,* July 20 p 165
Gardner Ring Wheel,* Nov 16 p 1087
Keystone Insert Jaws,* Oct 5 p 750
Machine & Tool Quick Change Drill,* Dec 7 p 1255
Schuchardt & Schutte Columbia,* Aug 3 p 282
Cincinnati and Its Manufacturing Suburbs, Sept 28 p 681
Cincinnati Bickford Tool Company:
New Plant,* July 6 p 26
Cincinnati Meeting for Promotion of Industrial Education, Oct 26 p 887
Cincinnati Metal Trades Dinner, Dec 14 p 1305
Cincinnati Planer Company:
Special Planer Drive,* Nov 23 p 1152
Cincinnati Pullev Machinery Company:
Avey No. 3 Drill Press,* Sept 7 p 546
Cino Iron Body Gate Valve, Williams,* Oct 19 p 871
Cleveland Crane & Engineering Company:
Economical Sand and Stone Handling,* July 27 p 204
Handling Freight with a Gantry Crane,* Aug 31 p 467
Installation at American Bridge Company's Plant* Oct 5 p 762
New Crane Trolley,* Nov 30 p 1203
Cleveland Pneumatic Tool Company:
Air Drill for Close Quarters,* Sept 14 p 599
New Four Piston Air Drills,* Aug 31 p 476
Cleveland Twist Drill Company:
Some Recent Drilling Records,* July 27 p 215
Coal
Production in 1910, Sept 7 p 523
Handling Plant at Duluth,* Dec 7 p 1240
World's Production of, Nov 30 p 1185
Coke:
Benzol from Oven Gases,* Oct 5 p 756
By-Product Plant for Atikokan Furnace, Dec 28 p 1401
Connellsville Producers Demand Lower Freight Rates, Sept 21 p 623
Connellsville Trade, Oct 5 p 736; Oct 12 p 813; Oct 19 p 851; Oct 26 p 900; Nov 9 p 1020; Nov 23 p 1109
Indiana Electrical Equipment of Gary Plant,* Dec 28 p 1400
Largest By-Product Plant in the World, Dec 14 p 1311
New Flat Rate, July 6 p 7
Oven Gas as an Open-Hearth Fuel, Sept 7 p 538
Oven Gas Engine Plant, 15,000-hp,* Dec 21 p 1354
Production and By-Products Saved, July 27 p 198
Colburn Machine Tool Company:
New Heavy-Duty Drill Press,* July 27 p 210
Colorado Fuel & Iron Company:
Annual Report, Nov 16 p 1088
Columbia Chuck, Schuchardt & Schutte,* Aug 3 p 282
Columbia Motor Car Company:
Knight Gasoline Engine,* Aug 10 p 328

Combustion:
Flameless Surface, Dec 7 p 1217
Remarkable Discovery in Gas,* Dec 7 p 1248
Combustion Utilities Corporation:
Decision on Gas-Producer Operation, Oct 12 p 818
Compensation Bill, Proposed Federal, Dec 14 p 1316
Compressors:
Caldwell Air,* Oct 19 p 871
Chicago Interesting Air Installation,* Dec 7 p 1258
Notable Air Installation,* Sept 7 p 536
Sargent Two-Stage Gas-Driven Air, July 27 p 221
Vilter Ammonia,* Sept 14 p 596
Comptometer, New Felt & Tarrant,* Sept 14 p 583
Concrete Engineering, Album on, Nov 9 p 1021
Conference, International Steel, July 13 p 74; July 20 p 144
Congress on Chemistry in 1912, International, Oct 26 p 904
Connellsville Coke Producers Demand Lower Freight Rates, Sept 21 p 623
Conservation Congress, Sept 7 p 521
Consolidated Expanded Metal Companies:
Album on Concrete Engineering, Nov 9 p 1021
Consolidations, Southern Iron, Aug 24 p 421
Contracts in the Iron Trade, Scale, Dec 14 p 1274
Controllers:
Cutler-Hammer Automatic Oil Pump,* Dec 7 p 1258
Electric Automatic Motor,* Nov 30 p 1199
Control of Large Business, Federal, Nov 9 p 1016
Conventions:
American Manufacturers' Export Association, Sept 28 p 678
American Society for Testing Materials, July 6 p 20
American Society of Mechanical Engineers, Dec 7 p 1219; Dec 14 p 1290
Association of Iron and Steel Electrical Engineers, Sept 28 p 678; Oct 5 p 737
Foundrymen's at Buffalo in June, 1912, Dec 7 p 1250
International Railway General Foremen's Association, Aug 3 p 284
Lake Superior Mining Institute, Aug 31 p 462
National Founders' Association, Nov 16 p 1068; Nov 23 p 1130*
National Gas and Gasoline Engine Trades Association, Dec 7 p 1233; Dec 14 p 1280
National Implement and Vehicle Association, Oct 19 p 851
National Machine Tool Builders' Association, Oct 12 p 796; Oct 19 p 857
National Supply and Machinery Dealers' Association, Oct 12 p 798; Oct 19 p 857
Society for the Promotion of Industrial Education Nov 9 p 1020
Converter Installations, Bretaud Steel, Oct 19 p 857
Cooler New Power Specialty Water,* Nov 9 p 1034
Co-operation in the Steel Trade, After Effects of, Sept 14 p 562
Co-operation in the Steel Trade, International, Aug 3 p 234
Copper:
And Brass Specifications, Old, July 27 p 200
Production and Stocks, June, July 13 p 96; July, Aug 10 p 318; August, Sept 14 p 589; September, Oct 12 p 795; October, Nov 16 p 1068; November, Dec 14 p 1295
Why the European Market Advances, Dec 28 p 1385
Core Room Conveyor System, Symington,* July 27 p 217
Corona Mfg. & Supply Company:
Flexible Metallic Hose,* July 27 p 221
Drill Socket,* Aug 10 p 233
Corporation Commission, Dec 14 p 1297
Corporations, Government Control of Large, Dec 7 p 1236
Corrigan, McKinney & Co.:
New Steel Plant at Cleveland, Nov 23 p 1108; Dec 14 p 1298
Corrosion in Gaseous Atmosphere, Metal, Aug 31 p 461
Corrosion Test, Sulphuric Acid,* July 13 p 99
Costs:
Bullard System to Prevent Leaks in Overhead,* Nov 23 p 1139
Correct Distribution of, July 27 p 194
Electric Power, July 27 p 199
Getting Steel Costs Down, Dec 14 p 1274
Interest Charges and Profit,* Aug 24 p 426
Overhead Expense and Cost Systems, Oct 19 p 835
Producing Alabama Pig Iron, Sept 7 p 545
Southern Pig Iron, Sept 21 p 642
Standardizing Factory Expense and, Nov 16 p 1072
Cotton Planters Combine to Maintain Prices, Aug 31 p 446
Cox, Jennings S., Jr.:
Ore Loading at El Cuero Mines,* Oct 5 p 752
Cranes:
Browning Wrecking with Steam Shovel Attachment,* Dec 7 p 1260
Cleveland Economical Sand and Stone Handling,* July 27 p 204
General Electric Battery Truck,* Nov 30 p 1200
Handling Freight with a Cleveland Gantry,* Aug 31 p 467
Interesting Pawling & Harnischfeger Installation,* July 6 p 35
McMyler 35-Ton Shipbuilding,* Nov 16 p 1092
New Browning,* Sept 7 p 541
New Cleveland Trolley,* Nov 30 p 1203
New Cutler-Hammer Panel,* Nov 16 p 1081
Northern Engineering Coal Handling,* Dec 21 p 1350
Special Reading,* Sept 28 p 704
Toledo Special Coal Handling,* Aug 10 p 321
Yard Installation at American Bridge Company's Plant,* Oct 5 p 762
Crank Motion, Stockbridge,* Oct 5 p 760
Credit Unions for Employees, July 27 p 215
Cross Creek Coal Company, Dec 14 p 1317
Croton Magnetic Iron Mines Suit, Aug 24 p 418
Crozier, General William:
Scientific Management at United States Arsenals, Nov 9 p 1022
Crucible Steel Company of America:
Annual Report, Oct 19 p 870
Crusher, Jeffrey Single Roll Coal,* Dec 7 p 1251
Crusher Litigation, Nov 16 p 1092
Cuba:
Ore Loading at El Cuero Mines,* Oct 5 p 752
Sintering of Mayari Iron Ores in,* Sept 14 p 586
Cupola and Air Furnace Combined, Holland,* Sept 21 p 644
Cushman, Dr. Allerton S.:
Pure Irons from the Open-Hearth Furnace, July 13 p 94
Custer Sandless Casting Company:
Permanent Mold Rights, Dec 28 p 1409
Customs Decisions:
Alcohol Smoothing Irons, July 13 p 75
Automobile Tire Bolts, Nov 2 p 986
Book Sewing Machines, Dec 21 p 1346
Cotton Belting, Nov 2 p 986
Earthenware and Metal Steam Exhausters, Aug 31 p 460
Ecclesiastical Cast Iron Statuary, July 27 p 191
Forged and Turned Steel Shafts, Dec 21 p 1346
Hydraulic Motors and Pumps, Nov 2 p 986
Iron Sand, Dec 21 p 1346
Japanned Sheets, Dec 21 p 1346
Knitting Machines, Nov 2 p 986
Locomotives, Dec 7 p 1235
Manganese Metal, Dec 21 p 1346
Metal Blocks, Dec 7 p 1235
Needles for Embroidery Machines, July 27 p 191
Nut Washers, Sept 21 p 642
Old Sugar Mill Shafts, Dec 21 p 1346
Railroad Supplies, Dec 7 p 1235
Scrap Iron or Steel, Aug 17 p 369
Sewing Machines, July 27 p 191; Nov 2 p 986
Sheet Iron Drums or Containers, July 27 p 191; Aug 18 p 369; Aug 31 p 460; Sept 21 p 642; Nov 2 p 986
Sheet Steel Cask Linings, Nov 2 p 986
Sheet Steel Stampings, Dec 7 p 1235
Steel Rods, Sept 21 p 642
Steel Rolls for Calico Printing, Nov 2 p 986
Steel Shapes, Aug 17 p 369
Steel Strips in Coils, Dec 21 p 1346
Steel Window Sash, Dec 7 p 1235
Tin Cans, Nov 2 p 986
Toy Sewing Machines, Nov 2 p 986
Wire-Bound Hose, July 13 p 75
Wire Drawing Plates, July 13 p 75; Aug 17 p 369
Wolfram Ore, Nov 2 p 986
Cutler-Hammer Mfg. Company:
Automatic Oil Pump Controller,* Dec 7 p 1258
New Crane Panel,* Nov 16 p 1081
Two Thomas Meter Installations, Aug 31 p 464
Cutting and Welding Machine, Davis-Bournonville,* Aug 31 p 472

D.

Dahlstrom Metallic Door Company:
Superiority of Steel Cars, Nov 23 p 1138
Darlington Forge Company, Ltd.:
Stock Process for Steel Castings,* Sept 7 p 524
Davis-Bournonville Company:
Increased Facilities, July 6 p 25
Welding and Cutting Machine,* Aug 31 p 472
Day, Percy C.:
Herringbone Gears,* Dec 21 p 1364
Dean Bros. Steam Pump Works:
Special Air Pump and Jet Condenser,* July 6 p 58
DeBats Crucible Steel Company, Dec 14 p 1288
Decision, Armor Plate, Oct 19 p 837
Decision, Molding Machine Patent, Dec 14 p 1276
Decision on Gas-Producer Operation, Oct 12 p 818
Decisions of Interest to Manufacturers, Judicial, July 27 p 201; Aug 10 p 345; Aug 17 p 397; Aug 31 p 466; Sept 21 p 647; Oct 19 p 872; Nov 16 p 1093; Dec 21 p 1348
Dennison Mfg. Company:
Tags for Factory Operating Systems, Sept 7 p 522
Department of Commerce and Labor:
Sailing Dates in Foreign Commerce, Aug 17 p 363
Derricks and Drilling Rigs, Steel, July 27 p 202
Detroit Return Trap, American,* Nov 16 p 1088
Detroit Steel Products Company:
Example of Good Machine Shop Lighting,* July 20 p 164

Deutscher Eisenhuettenleute's Meeting, Oct 12 p 802
Devlin, Thomas, Mfg. Company:
Sewage Disposal for a Hardware Works,* July 13 p 112
Diamond Saw & Stamping Works:
New Sterling Power Hack-Saw Machine,* Sept 7 p 547
Die-Castings, Alloys Used for, Sept 7 p 532
Die, Improved National-Acme Spring,* Nov 30 p 1204
Diemer, Hugo:
Shop System of Ferracute Machine Company,* July 13 p 106
Direct Metal Stimulates Construction, Dec 28 p 1383
Dock, New Concrete-Steel Ore,* Nov 9 p 1041
Dodge Mfg. Company:
Bearings in Long Service, Oct 19 p 858
Iron-Center Wood-Rim Pulley Test, Nov 2 p 956
Shop Erection and Testing of All Important Work, Dec 21 p 1367
Dog, Hill Face Plate,* Aug 17 p 383
Dreses Machine Tool Company:
Drill, Radial, 6-ft.,* Oct 26 p 920
Improved Simplex Radial Drill,* Nov 30 p 1195
Drilling Machines:
Cincinnati Avey No. 3 Drill Press,* Sept 7 p 546
Cleveland Air for Close Quarters,* Sept 14 p 590
Corona Drill Socket,* Aug 10 p 333
Dreses Improved Simplex,* Nov 30 p 1195
Dreses 6-Ft. Radial,* Oct 26 p 920
Foote-Burt Multiple-Spindle Stay Bolt,* Nov 23 p 1153
Foster Hydro-Pneumatic Radial,* July 27 p 206
Hisey-Wolf Converting Attachment,* Nov 2 p 985
Hisey-Wolf Portable Electric Bench,* Oct 19 p 866
Langelier Combination Saw and,* Dec 7 p 1254
Langelier Semi-Automatic Rivet,* July 20 p 155
New Cleveland Four-Piston Air,* Aug 31 p 476
New Colburn Heavy-Duty Press,* July 27 p 210
New Foote-Burt High-Duty,* July 20 p 163
New Prentice Radial,* Oct 26 p 916
New Sibley Motor-Driven,* Aug 31 p 473
New Silver,* Nov 30 p 1202
New Snyder Heavy-Duty,* Oct 12 p 821
New Van Dorn & Dutton Portable Electric,* July 20 p 158
Sibley Box Column,* Nov 2 p 968
Special Langelier,* Aug 17 p 382
Washburn 15-In.,* Dec 28 p 1410
Washburn Motor-Driven,* Sept 28 p 701
Washburn Multiple-Spindle,* Oct 26 p 915
Willey Motor-Driven Bench,* Sept 21 p 645
Drilling Records, Some Recent,* July 27 p 215
Driver, C. H.:
Drill Rack,* Sept 7 p 550
Dudley, P. H.:
Ductility in Rail Steel, July 13 p 97
Duff Mfg. Company:
Ball-Bearing Journal Jack,* Sept 14 p 597
Duluth:
Coal-Handling Plant at,* Dec 7 p 1240
New Minnesota Steel Plant at,* Nov 30 p 1196
President Farrell on the Steel Corporation's Plans for, Sept 21 p 626
Duty on Wrought Pipes or Tubes, Canadian, Nov 16 p 1076
Dwight-Lloyd System of Sintering Fine Iron-Bearing Materials, Aug 24 p 422; Dec 21 p 1349
Dwyer, W. A.:
Proposed Michigan Corporate Excess Tax, Dec 21 p 1333

E.

Eastern Steel Company:
To Lease Warwick Iron & Steel Company, Dec 21 p 1333; Dec 28 p 1398
East Texas Brown Ore Mining & Development Company:
New Plant, July 27 p 197
Easton, Pa., Sunday Call:
What Is the Matter With Business? Sept 14 p 595
Ebbw Vale Steel, Iron & Coal Company, Ltd.:
American and German Steel Displace Welsh Workers, Aug 31 p 471
Eclipse Pipe Hangers, Morgan,* Dec 7 p 1256
Economic Changes and Better Business, Sept 21 p 610
Economies, Iron Industry's, Oct 5 p 718
Economizer, Sterling Air,* Oct 12 p 808
Economy Welding Machine Company:
Welding Machine,* Nov 9 p 1037
Edenborn, William:
Suit Over a Southern Iron Company Promotion, Oct 26 p 911
Editorials:
After Effects of Co-operation in the Steel Trade, Sept 14 p 562
American Steel Prices Below Foreign, Dec 21 p 1330
Any Readjustment Will Include Labor, Aug 24 p 401
Appeal to Prejudice, Nov 30 p 1169
Autogenous Welding Not for the Weakened Structure, Oct 5 p 720
Basing Prices on a Normal Business, Sept 28 p 663
Bonus System Man and His Foreman, Oct 26 p 885
British and American Blast Furnace Activity, Aug 17 p 348
British and American Export Trade, Nov 2 p 935
British Iron and Steel Exports Stationary, Aug 3 p 235
Buying of Replacement Parts, Oct 12 p 782
Campaign Against Factory Fires, July 20 p 128
Cancellation of the Hill Ore Lease, Oct 26 p 884
Car Buying Movement, Nov 23 p 1106
Chicago Business Men's Pluck, Sept 7 p 505
Close Time Study of Factory Operations, Nov 9 p 1000
Coming Demand for Machine Tools, Dec 14 p 1275
Coming Machinery Meeting, Sept 21 p 609
Commercialized Engineering, Nov 16 p 1055
Compulsory Safety Devices, Oct 5 p 719
Congressman Underwood's Boast of Cheap Iron, Sept 7 p 505
Cotton Planters Combine to Maintain Prices, Aug 31 p 446
Curve of Pig Iron Production,* Oct 12 p 780
Demand for Second-Hand Machinery, Dec 21 p 1332
Direct Metal Stimulates Construction, Dec 28 p 1383
Do Congressmen Enjoy Ruinous Steel Prices? Nov 30 p 1170
Educational Value of an Export Trade, Oct 12 p 781
Electrification at Lake Superior Mines, Sept 14 p 562
Excluding Private Liability Insurance, Oct 26 p 885
Flameless Surface Combustion, Dec 7 p 1217
Germany's Industrial Policy as a Model, Aug 31 p 446
Getting Steel Costs Down, Dec 14 p 1274
Health of Employees, Oct 5 p 719
Human Obstacle to Evolution, July 6 p 3
Idle Hours in Machine Shops, Dec 28 p 1384
Important Discovery Regarding Oil Adulteration, July 13 p 72
Improvement in the Steel Trade, Dec 21 p 1330
Increasing Cost of Workmen's Compensation, Nov 23 p 1107
Increasing Liability for Fatal Accidents, Aug 24 p 402
Increasing Railroad Traffic, July 27 p 178
Industrial Campaign Against Sickness, Aug 10 p 297
Inspecting Fire Equipment, Nov 16 p 1056
Insurance Against Strikes, Oct 5 p 719
Intermountain Railroad Rate Decision, Aug 3 p 235
International Co-operation in the Steel Trade, Aug 3 p 234
Iron and Steel Works Improvements, Nov 16 p 1054
Iron Industry's Economics, Oct 5 p 718
Is Government Interference with Business Culminating? Sept 21 p 608
Keeping Down Idle Labor, Nov 2 p 935
Labor Agitation and Railroad Machinery Purchases, Oct 5 p 720
Labor and Lower Prices for Commodities, Sept 7 p 504
Labor and the Efficiency System, Aug 31 p 447
Lake Shipbuilding at Low Ebb, Aug 31 p 448
Latent Service of Scientific Management, Aug 17 p 348
Lime Light on Factory Lighting, Oct 12 p 781
Los Angeles Confessions, Dec 7 p 1216
Mammoth in Steam Power Generators, Nov 9 p 1001
Misrepresenting Machinery Deliveries, Sept 28 p 663
Model Navy Repair Ship, July 20 p 127
No Potential Monopoly in Steel, Nov 23 p 1107
Our Improved Foreign Trade Balance, July 27 p 179
Overhead Expense and Cost Systems, Oct 19 p 835
Oxy-Acetylene Welding Menaced, Nov 9 p 1001
Permanency in Shop Buildings, Aug 24 p 401
Piece-Rate Cutting, Sept 14 p 563
Place of 1911 in the Pig Iron Record, Nov 30 p 1170
Problem in Steel Tempering, July 20 p 126
Proposed Bounty on Canadian Pig Iron, Nov 30 p 1170
Prosperous Conditions in Germany, Nov 16 p 1107
Railroad Earnings Fairly Good, July 6 p 2
Relative Tonnages of Finished Products, Aug 10 p 296
Safeguarding the Bankruptcy Act, Sept 21 p 609
Safeguarding Workmen in Small Plants, July 13 p 74
Safety Devices for Grinding Wheels, Aug 17 p 349
Scale Contracts in the Iron Trade, Dec 14 p 1274
September's Record Merchandise Exports, Oct 26 p 885
Sick Benefits and Society Physicians, Dec 7 p 1217
Small Unit Producer Gas Engines, Nov 9 p 1001
Some Iron Ore Fallacies, Nov 9 p 1000

Spheres of Wrought Iron and Rerolled Steel, Nov 30 p 1168
Statistics of Blast Furnace Flux, Aug 17 p 349
Steel and Commodity Prices, Aug 24 p 400
Steel Corporation and Disintegration, Sept 28 p 662
Steel Makers Move for Lower Freights, Oct 19 p 834
Steel Mill Labor and Hot Weather, July 20 p 126
Suit to Dissolve the Steel Corporation, Nov 2 p 934
Suiting Processes to Conditions, July 13 p 72
Tin Plate Imports and Exports, Oct 12 p 782
To-day's and Other Price Levels, Sept 21 p 608
Trade Statistics, Dec 28 p 1382
Trend of Railroad Revenues, Oct 19 p 834
Trust Prosecutions, Nov 16 p 1055
Turbo-Electric Hoisting Engines in Lake Mines, Sept 28 p 664
Two Problems of Factory Building, Aug 3 p 236
Undeveloped Asset, July 20 p 127
Unfit Blast Furnaces, July 13 p 72
United States Steel Corporation Helps Its Competitors, Aug 24 p 402
Use of Portland Cement, July 6 p 3
Ventilation in Factory Heating, Aug 10 p 297
Wage Scale Settlements, July 6 p 2
Workmen's Foolish Investments, July 13 p 73
Education Convention, Industrial, Nov 9 p 1020
Efficiency in Government Shops, Dec 28 p 1384
Efficiency System and Labor, Aug 31 p 447
Eight-hour Bill, House Passes an, Dec 21 p 1348
El Cuero Mines, Ore Loading at,* Oct 5 p 752
Electrical Engineers, Association of Iron and Steel:
Convention, Sept 28 p 678; Oct 5 p 737
Electrical Equipment of Gary Coke Plant, Indiana,* Dec 28 p 1406
Electrical Exposition, New York, Oct 10 p 852
Electrical Iron Smelting in Sweden,* Oct 12 p 804
Electrical Storage Battery Company:
Storage Battery for the Steel Mill, Oct 19 p 859
Electric Controller & Mfg. Company:
Automatic Motor Controllers,* Nov 30 p 1199
Electric Induction Furnace Linings, Improvement in, Nov 30 p 1171
Electric Lamp Trade, Sept 14 p 597
Electric Loads, Minimizing Peak,* Aug 24, p 430
Electric Power Charters in Pennsylvania, Many, Aug 17 p 350
Electric Power Cost, July 27 p 199
Electro Steel Company of Canada, Ltd.:
At Judicial Sale, July 20 p 153
Elevators, Modern Types of,* Aug 17 p 376
Ellwood City, Pa.:
Gets a New Industry, Oct 19 p 865
Empire Steel & Iron Company:
Record at a Crane Furnace, Oct 26 p 887
Engineering, Commercialized, Nov 16 p 1055
Engineering Societies, Growth of the, Aug 10 p 332
Engines:
Atlas Crude-Oil,* Sept 14 p 584
Foos Kerosene Economy, July 6 p 5
Holt Caterpillar Traction,* Aug 10 p 334
Knight Gasoline,* Aug 10 p 328
Late Features of the Vilter Corliss,* Dec 7 p 1261
Mackintosh-Hemphill Interesting Order, Nov 30 p 1184
Mesta Large Corliss Built in 16 Days,* Dec 7 p 1257
Operation of Blast Furnace Gas, July 6 p 36
Poppet Valve,* July 6 p 54
Small Unit Producer, Nov 9 p 1001
Sterling Acme Automatic,* Sept 7 p 531
Turbo-Electric Hoisting in Lake Mines, Sept 28 p 664
Worthington High-Duty Pumping,* Oct 5 p 764
Wastes for Factory Heating,* July 27 p 208
Webster & Perks New Internal Combustion,* Oct 12 p 820
Equipment Orders, Railroad, July 13 p 97; July 20 p 142; Aug 3 p 282; Aug 24 p 402; Aug 31 p 464; Sept 21 p 629; Oct 26 p 901; Nov 23 p 1128; Nov 30 p 1183
Ericsson Memorial Dinner, Nov 30 p 1170
Erie City Iron Works:
Poppet Valve Engine,* July 6 p 54
Eschweiler Mining Company:
Coke Oven Gas Engine Plant, 15,000-hp.,* Dec 21 p 1354
Espen-Lucas Machine Works, Inc.:
Foundry Cold Saw,* Dec 14 p 1312
Europe:
American Opportunity in, Sept 21 p 627
Iron Trade Active, Dec 28 p 1384
Selling American Machine Tools in, July 6 p 40
Selling American Machinery in, Aug 3 p 262
Evolution, Human Obstacle to, July 6 p 3
Ewald Iron Company:
Historic Kentucky Mill Dismantled, July 27 p 199
Expense, Overhead, Nov 30 p 1190
Export Association, American Manufacturers':
Convention, Sept 28 p 678
Exporters Should Fully Describe Merchandise, Oct 12 p 820
Exports and Imports of Iron and Steel:
May, July 6 p 34; June, Aug 10 p 317; July, Sept 7 p 506; August, Oct 12 p 809; September, Nov 9 p 1021; October, Dec 7 p 1219
Exports of Manufacturers Approaching Billion-Dollar Line, Nov 9 p 1035
Exports, September's Record Merchandise, Oct 26 p 885
Export Trade:
American, Oct 5 p 744
British and American, Nov 2 p 935
Educational Value of an, Oct 12 p 781
Expositions:
Appalachian, Aug 3 p 284
International, of Inventions, Aug 3 p 251
Milwaukee Industrial, Sept 14 p 579
New York Electrical, Oct 19 p 852
Railroad Appliance, Oct 26 p 921

F.

F & M. Company:
New Wire Brush,* Nov 2 p 981
Facing Machine, Rochester Duplex,* Dec 14 p 1299
Factories, Fire Protection in, Aug 31 p 465
Factory Building, Two Problems of, Aug 3 p 236
Factory Expense and Cost, Standardizing, Nov 16 p 1072
Factory Floors, Oct 12 p 799
Factory Heating, Gas Engine Wastes for, July 27 p 208
Factory Illumination, Oct 19 p 861
Factory Operations, Close Time Study of, Nov 9 p 1000
Factory Work, Analysis of, Nov 16 p 1074
Fan, Buffalo Conoidal,* Dec 28 p 1414
Farrar & Trefts:
Combines with the East Buffalo Iron Works, Dec 28 p 1397
Farrell, James A.:
Steel Corporation's Plans for Duluth, Sept 21 p 626
Fay & Bierer:
Heat Treatment of Low-Carbon Nickel Steels, July 27 p 195
Fay & Scott:
New Centering Machine and Lathe,* July 20 p 150
Fay, Henry:
Heat Treatment on Acid and Basic Open-Hearth Steel of Similar Composition, July 6 p 25
Federal Control of Large Business, Nov 9 p 1016
Federal Heater Company, July 13 p 110
Feed:
Black Revolving Steam,* Nov 9 p 1033
Williams Warrior Sight,* Nov 9 p 1040
Felt & Tarrant Mfg. Company:
New Comptometer,* Sept 14 p 583
Ferracute Machine Company:
New Toggle Drawing Press,* July 20 p 164
Shop System,* July 13, p 106
Ferroalloys, Imports of Ferrosilicon and Other, Sept 7 p 523
Ferromanganese, Molten, for Deoxidation, Oct 12 p 801
Ferromanganese, Why It is Rising, Nov 30 p 1202
Ferrosilicon and Other Ferroalloys, Imports of, Sept 7 p 523
Ferrotitanium and Its Use, July 27 p 180; Oct 12 p 782
File Trade, Sept 14 p 583
Filter, New Burt Oil,* Oct 12 p 819
Finished Products, Relative Tonnages of, Aug 10 p 296
Finlay, Prof. J. R.:
Michigan's Iron and Copper Mines, Aug 24 p 417
Fire Equipment, Inspecting, Nov 16 p 1056
Fire-Fighting System, Norton Factory,* Dec 21 p 1360
Fire Protection in Factories, Aug 31 p 465
Fires, Campaign Against Factory, July 20 p 128
Firth, Arthur E.:
Powder for Ready Plating of Metals,* July 20 p 165
Fitch, John A.:
Steel Works Labor Conditions, Oct 19 p 853
Flameless Surface Combustion, Dec 7 p 1217
Flask, New Kreutzberg Molder's,* Oct 5 p 707
Flask, Thompson New Molding,* Dec 28 p 1415
Flat-Top Fuel Company, Dec 14 p 1308
Floors, Factory, Oct 12 p 799
Flux, New Foundry, Sept 7 p 550
Flywheel for Motor-Driven Rolling Mills, Sept 28 p 700
Follansbee Brothers Company:
Electrical Steel Sheets, Dec 21 p 1359
Foos Gas Engine Company:
Kerosene Engine Economy, July 6 p 5
Foote-Burt Company:
Multiple-Spindle Stay Bolt Drill,* Nov 23 p 1153
New High-Duty Drill, July 20 p 163*; July 27 p 204
Foreign Trade Balance:
Our Improved, July 27 p 179
Another Great, Nov 23 p 1121
Forge, Hauck Changeable,* Nov 30 p 1189
Foster, Walter H., Company:
Hydro-Pneumatic Radial Drill,* July 27 p 206
Founders' Association, National:
Announcement of Meeting, Oct 12 p 783
Convention Opening, Nov 16 p 1068
Convention Proceedings,* Nov 23 p 1130
Founders, British Handbook for Iron, July 13 p 96

Foundry:
And Mechanical School at Boston, New, Sept 28 p 699
Drying Oven, Oct 19 p 864
French & Hecht Mechanically Operacted,* Oct 26 p 912
Lifting Magnets in, July 13 p 92
M. Rumely Company's,* Oct 26 p 906
New Flux, Sept 7 p 550
Pattern Handling in a Steel,* Aug 10 p 330
Sly, W. W., Mfg. Company Equipment, Sept 7 p 546
What It Thinks of the Machine Shop, Dec 21 p 1350
Foundry Foremen, Philadelphia:
Outing, Sept 21 p 611
Meetings, Oct 19 p 864; Nov 23 p 1109
Foundry Foremen's Association, American, Nov 9 p 1042
Foundrymen, Prize Contest of Society of German, Nov 16 p 1094
Foundrymen's Associations:
Newark, Oct 12 p 819; Dec 21 p 1349
Philadelphia, Sept 14 p 579; Oct 12 p 797; Nov 9 p 1042; Dec 14 p 1295
Pittsburgh, Sept 21 p 625; Oct 26 p 898; Dec 7 p 1256
Foundrymen's Convention at Buffalo in June, 1912, Dec 7 p 1259
Fox 15-In. Lathe, Springfield,* Oct 5 p 747
Freight Handling in Small Shipments, Nov 2 p 984
Freight Handling with a Cleveland Gantry Crane,* Aug 31 p 467
Freight Rates:
Connellsville Coke Producers Demand Lower Rates, Sept 21 p 623
Discrimination Alleged on Eastern Iron Ores, Sept 21 p 611
Important Reductions, July 27 p 197
Intermountain Railroad Rate Decision, Aug 3 p 235
Iron Ore Rates from Lower Lake Ports, Nov 9 p 1033
Lake Superior Ore Railroad Hearing, July 20 p 147
Mahoning and Shenango Valley for Lower Rates, Nov 23 p 1124; Dec 21 p 1333
Manufacturers Contest Advances, Nov 9 p 1003
New Flat Rate on Coke, July 6 p 7
New York's Barge Canal and Iron Ore, Aug 24 p 417
Reductions from Buffalo, Aug 24 p 414
Revolution in Claims, July 27 p 192
Steel Makers Move for Lower Freights, Oct 19 p 834
Steel Works Cases Before the Commerce Commission, Oct 5 p 736
French & Hecht:
Mechanically Operated Foundry,* Oct 26 p 912
French Blast Furnace Consolidation, Sept 28 p 697
French Iron Ore Production in 1910, Oct 26 p 904
Friedrich Changeable Open-Hearth Furnace Port,* July 20 p 152
Fritz Medal Presented to Sir W. H. White, Nov 23 p 1147
Frontier Iron Works:
Adds New Lines, Oct 19 p 853
Eight-Cylinder Aero Motor,* Dec 7 p 1250
Fueling Lighter, New,* Dec 14 p 1308
Fuel Oil, Papers on, Aug 10 p 323
Fuel Oil Specifications, Aug 3 p 261
Furnace, Air, and Cupola Combined, Holland,* Sept 21 p 644
Furnace, Jones Process for "Metallizing" Ore, Dec 14 p 1305
Furnace, Tate-Jones New Oil Fired Flanging,* Dec 7 p 1243
Furnaces, Blast:
British and American Activity, Aug 17 p 348
Development of Size, Sept 28 p 683
First Tata Blown in in India, Dec 7 p 1261
French Consolidation, Sept 28 p 697
Hamfelt Charging Car,* Nov 9 p 1030
Minnesota Steel Company, Aug 10 p 331
Monthly Statement,* July 6 p 6; Aug 10 p 300; Sept 7 p 508; Oct 5 p 722; Nov 9 p 1004; Dec 7 p 1234
New Bethlehem Almost Completed, July 7 p 33
New Iroquois Iron Company,* July 6 p 30
New Virginia Oriskany, Nov 23 p 1144
Operation of Gas Engines, July 6 p 36
Pittsburgh Steel Company's New, Dec 7 p 1239; Dec 21 p 1348
Record at a Crane, Oct 26 p 887
Republic No. 4 at Haselton, Ohio,* Dec 28 p 1402
Slags in Concrete, July 13 p 90
Statistics of Flux, Aug 17 p 349
Thin-Lined Construction,* Dec 28 p 1400
Unfit, July 13 p 72
Uses of Gas, Oct 26 p 902
Furnaces, Electric:
Improvement in Induction Linings, Nov 30 p 1171
Molybdenum Steel from the, Sept 21 p 641
Multiple Replaceable Unit,* Aug 10 p 332
Steel Castings from,* July 20 p 148
Treadwell Steel Castings, Dec 21 p 1333
Furnaces, Oil-Fired, MacLeod & Co., for Automobile Parts,* Nov 9 p 1036
Furnaces, Open Hearth:
Coke Oven Gas as a Fuel, Sept 7 p 538
Friedrich Changeable Port,* July 20 p 152
New Construction,* Oct 12 p 816
Pure Irons from the, July 13 p 94
Small, Sept 7 p 544
Steel, In Great Britain, Aug 31 p 465
Three Phoenix Notable, Nov 30 p 1203
Two New Lackawanna, Dec 14 p 1295

G.

Gaco Specialties, Pittsburgh,* Sept 28 p 703
Gandy Belting Company:
New Feature of Belt, Sept 28 p 705
Gardner Machine Company:
Motor-Driven Disk Grinder,* Dec 14 p 1316
Pattern Maker's Disk Grinder,* Aug 17 p 378
Plant,* Dec 21 p 1357
Ring Wheel Chuck,* Nov 16 p 1087
Sample Book of Abrasive Disks, Aug 24 p 425
Garrison, A., Foundry Company:
Double-Crank Forging Press,* Sept 21 p 644
Garvin Machine Company:
Automatic Tappers,* Aug 24 p 431
Plain Milling Machine,* July 13 p 105
Two-Head Automatic Tapper,* Nov 23 p 1151
Two Motor-Driven Grinders,* Aug 3 p 267
Gary, Ind.:
Largest By-Product Coke Oven Plant in the World, Dec 14 p 1311
Oil Pump House,* July 27 p 203
Sheet-Bar Mill,* July 13 p 102
Gas and Gasoline Engine Trades Association, National:
Convention, Dec 7 p 1233; Dec 14 p 1289
Gas:
Benzol from Coke-Oven,* Oct 5 p 756
Coke Oven, as an Open-Hearth Fuel, Sept 7 p 538
Coke Oven Engine Plant, 15,000-hp, Dec 21 p 1354
Decision on Producer Operation, Oct 12 p 818
Diffusing Noxious Chimney, Dec 21 p 1367
Engine Wastes for Factory Heating,* July 27 p 208
High Pressure Distribution,* Oct 26 p 910
International-Amet Oil Producer,* July 13 p 100
New Standard Bituminous Producer,* Dec 14 p 1310
Operation of Blast Furnace Engines, July 6 p 36
Peine Revolving Grate Producer, Nov 9 p 1017
Producer Investigations, Nov 30 p 1194
Remarkable Discovery in Combustion,* Dec 7 p 1248
Sampling and Analyzing, July 6 p 34
Small Unit Producer Gas Engines, Nov 9 p 1001
Uses of Blast Furnace, Oct 26 p 902
Gasoline Engines, Knight,* Aug 10 p 328
Gauge, American Steel Wire, Nov 16 p 1069
Gayley, James:
Sintering of Fine Iron-Bearing Materials,* Aug 24 p 422
Gealy Wrench & Mfg. Company:
New Pipe Wrench,* Dec 28 p 1411
Gear:
Gould & Eberhardt Hobber,* Nov 23 p 1147
Herringbone,* Dec 21 p 1364
Jenckes Valve,* Oct 12 p 810
New James Model of O'Kelly Speed-Reducing, Aug 10 p 333
New Standard Cutters,* Nov 2 p 983
Gear Grinding Machine Company:
Example of Good Machine Shop Lighting,* July 20 p 164
Geismer, H. S.:
Preparation of Brown Iron Ores, Sept 7 p 528
General Briquetting Company:
Briquetting, Flue Dust, Dec 14 p 1295
General Electric Company:
Air Compressor Sales, Nov 30 p 1194
Battery Truck Crane,* Nov 30 p 1200
Electric Generator of 30,000 hp, Nov 9 p 1021
Electric Lamp Combination Dissolved, Oct 19 p 860
General Refractories Company, Aug 10 p 323
Generators, A Mammoth in Steam Power, Nov 9 p 1001
Georgian Mfg. Company:
Proposed Enlargements, July 20 p 143
Germany:
Accidents in Iron and Steel Works, Dec 14 p 1313
Coke Oven Gas Engine Plant, 15,000-hp,* Dec 21 p 1354
Deutscher Eisenhuettenleute's Meeting, Oct 12 p 802
Friedrich Changeable Open-Hearth Furnace Port,* July 20 p 152
Heavy Tools for Turbine Building,* Nov. 9 p 1030
Industrial Policy as a Model, Aug 31 p 446
Iron Market, July 6 p 17; July 20, p 139; July 27, p 189; Aug 10 p 309; Aug 17 p 360; Aug 24 p 409; Sept 7 p 518; Sept 14 p 573; Sept 21 p 620; Sept 28 p 673; Oct 5 p 733; Oct 12 p 791; Oct 19 p 846; Oct 26 p 895; Nov 2 p 949; Nov 9 p 1012; Nov 16 p 1065; Nov 23 p 1118; Nov 30 p 1180; Dec 7 p 1231; Dec 14 p 1285; Dec 21 p 1342; Dec 28 p 1393
Kölner Bergwerks-Verein New Scheme for Storing Exhaust Steam, Aug 10 p 326
Krupp Research and Chemical Laboratories, Aug 31 p 448
Molten Ferromanganese for Deoxidation, Oct 12 p 801
Open-Hearth Steel Works, Nov 9 p 1003
Patent Law Practice, July 27 p 198
Peine Steel Works Revolving Grate Gas Producer, Nov 9 p 1017
Pig Iron Production First Half 1911, Aug 3 p 266

Prosperous Conditions, Nov 23 p 1107
Prize Contest of Society of German Foundrymen, Nov 16 p 1094
Schmitz, August, Wire Flattening Mill, Dec 12 p 1362
Softening Water on a Large Scale, July 27 p 202
Steel Plant Construction, Nov 9 p 1002
Globe Iron Works:
To Remove Its Plant, Sept 28 p 699
Goedman, Maurice:
Chatillon, Commentry & Neuves-Maisons French Steel, Dec 14 p 1305
Golden-Anderson Valve Specialty Company:
Electrically Operated Stop Valve,* Aug 10 p 335
Gould & Eberhardt:
Bevel Gear Roughing Shaper,* July 27 p 205
Gear Hobber with New Drive,* Nov 23 p 1147
New Hobbing Attachment,* Aug 31 p 477
Goulds Mfg. Company:
Air Cylinders for the Pyramid Pumps,* Aug 3 p 270
Motor-Driven Mine Pump,* Oct 12 p 811
New Centrifugal Pumps,* Aug 24 p 427
Pumps of Exceptional Capacity, Dec 7 p 1261
Triplex Pump,* Sept 7 p 546
Government Control of Large Corporations, Dec 7 p 1230
Government Interference with Business, Is It Culminating? Sept 21 p 608
Government to Business, To Discuss Relation of, Oct 26 p 900
Grab Buckets, Andresen-Evans Type B,* Sept 7 p 549
Graham, Walter:
Southwestern Virginia Ore Development, Sept 28 p 681
Grant Mfg. & Machine Company:
Motor-Driven Ceiling Riveter,* Nov 2 p 983
Graphite, Production of, in 1910, Aug 31 p 477
Great Britain:
American and German Steel Displaces Welsh Workers, Aug 31 p 471
Frodair Iron & Steel Company's Handbook for Iron Founders, July 13 p 96
Increasing Cost of Workmen's Compensation, Nov 23 p 1107
Iron and Steel Exports and Imports, Aug 24 p 421
Iron and Steel Exports Stationary, Aug 3 p 235
Iron and Steel Market, Aug 3 p 266; Sept 21 p 624; Nov 23 p 1121
Move to Reduce Steel Imports, Oct 12 p 794
Open-Hearth Steel Furnaces, Aug 31 p 465
Rebate Plan in the Steel Trade, Dec 14 p 1277
Scotch Bar Iron Combination, Sept 7 p 507
Scottish Tube Works Consolidation, Aug 10 p 317
Stock Process for Steel Castings,* Sept 7 p 524
Wage Earners, Nov 2 p 951
Great Northern Iron Ore Lease:
All the Details, Oct 19 p 854
Cancellation of, Oct 26 p 884 and p 901
Greaves, Klusman & Co.:
Heavy 15-In. Engine Lathe,* Aug 31 p 488
Green Fuel Economizer Company:
Temperature Pendants, Nov 9 p 1042
Grinding Machines:
Besly Disk,* Oct 19 p 862
Besly Ring Grinding Wheel Chuck,* July 20 p 165
Bridgeport Combination,* July 6 p 59
Gardner Motor-Driven Disk,* Dec 14 p 1316
Gardner Pattern Maker's Disk,* Aug 17 p 378
Garvin Motor-Driven Hole,* July 27 p 214
Ingersoll Cutter,* Aug 31 p 468
Landis Integral Cam Grinding Attachment,* July 20 p 150
Miami Improved Tool and Cutter,* July 13 p 105
New Challenge Combination,* July 27 p 212
New Hisey-Wolf Parallel,* July 13 p 110
Newton, for Planer Cutters,* Aug 10 p 327
Norton Axle,* Nov 23 p 1148
Ransom Guard,* Nov 2 p 982
Ransom Portable,* Nov 9 p 1038
Safety as Applied to, July 20 p 140
Safety Devices for, Aug 17 p 349
Two Motor Driven Garvin,* Aug 3 p 267
Willey Motor-Driven Lathe Center, Nov 2 p 960
Guy Clamp, Matthews Boltless,* Aug 10 p 760

H.

Hadfield, Sir Robert A.:
Progress of Metallurgy, Sept 14 p 580
Hagan, George J.:
Sheet and Pair Furnace Contracts, Oct 19 p 857
Hamfelt, George K.:
Blast Furnace Charging Car,* Nov 9 p 1039
Hamilton Machine Tool Company:
Relieving Device Integral with Lathe,* Nov 23 p 1154
Hammers:
Langelier, Sept 28 p 692
New Allen Riveter,* Oct 26 p 917
Oldham Riveting,* Nov 2 p 985
Hancock, E. L.:
Strength of Steel from Structural Shapes,* July 20 p 156
Hanford & Barkley:
Correction, Sept 14 p 593
Hanger, Thompson Automatic Cut-Out,* Aug 17 p 388
Hanna Engineering Works:
Electric Riddle Oscillator,* Sept 21 p 638
Hanna, Leonard C.:
Testimony at Steel Investigation, Aug 3 p 250
Hanna, M. A., & Co.:
Atlas Ore Dryer, Sept 28 p 682
Harbison-Walker Refractories Company:
Annual Report, Nov 30 p 1188
Harding, H. McL.:
Cargo Transference at Steamship Terminals, Nov 23 p 1151
Harriman Lines:
Employees Demand Control of Shops, Aug 31 p 466
Harrison Safety Boiler Works:
Notable Departure in Relief Valves,* Nov 16 p 1085
Hartness, James:
Turret Equatorial Telescope,* Dec 21 p 1368
Hatch, Leonard W.:
Laws for Accident Prevention, Aug 24 p 421
Hauck Mfg. Company:
Changeable Forge,* Nov 16 p 1089
Heald Machine Company:
Good Business, Sept 14 p 596
Health of Employees, Oct 5 p 719
Heating, Gas Engine Wastes for Factory, July 27 p 208
Heat Treatment:
Acid and Basic Steel of Similar Composition, July 6 p 25
Low-Carbon Nickel Steels, July 27 p 193
Paper by James H. Herron,* Nov 23 p 1140
Steel Axles, Nov 9 p 1005
Heckscher, August:
Suit Over a Southern Iron Company Promotion, Oct 26 p 911
Heely Tube Spreader Company:
Boiler Tools,* Aug 24 p 432
Heppenstall Forge & Knife Company:
Improvements, July 20 p 129
Herringbone Gears, Dec 21 p 1364
Herron, James H.:
Heat Treatment of Steel,* Nov 23 p 1140
Hersey & Job:
Study of Steel Tires,* July 20 p 154
High-Voltage Apparatus, Reaction from, Oct 26 p 886
Hill Iron Ore Lease, Full Details of, Oct 19 p 854
Cancellation of, Oct 26 p 884 and p 901
Hill, M. B., Mfg. Company:
Face Plate Dog,* Aug 17 p 383
Hisey-Wolf Machine Company:
Drill Converting Attachment,* Nov 2 p 985
Gas Engine Wastes for Factory Heating,* July 27 p 208
New Parallel Grinder,* July 13 p 110
Portable Electric Bench Drill,* Oct 19 p 866
Hobber with New Drive, Gould & Eberhardt Gear,* Nov 23 p 1147
Hobbing Attachment, New Gould & Eberhardt,* Aug 31 p 477
Holder, Text Book and Blue Print,* Sept 14 p 591
Holland-Domschke Foundry Company:
Cupola and Air Furnace Combined,* Sept 21 p 644
Holt Mfg. Company:
Caterpillar Traction Engine,* Aug 10 p 334
Holzhüter, E.:
Weiss Briquetting Process for Ores and Flue Dust, Nov 30 p 1185
Hooper, George K.:
Core Room Conveyor System,* July 27 p 217
Hopkins & Allen Arms Company, Aug 24 p 421; Aug 31 p 448
Horseshoe and Wire Pool Cases, Aug 10 p 323
Hose and Tubing, American Flexible Metal, Dec 28 p 1415
Hose, Corona Flexible Metallic,* July 27 p 221
Hours and Wages in the Iron Industry, Aug 10 p 336
Howard, James E.:
Broken Lehigh Valley Rail, Nov 23 p 1126
Hoyme, C. R.:
Motor Trucks, Dec 14 p 1314
Hudson & Manhattan Railroad Company:
Forced Blast Unit, 500-hp., Nov 30 p 1200
Hughes, Charles H.:
Forced Blast Unit, 500-hp.,* Nov 30 p 1200
Mechanical Equipment of the New York Central Terminal, Sept 14 p 593
Hulbert, William R.:
Ferrotitanium and Its Use, Oct 12 p 782
Hunter, John A.:
Efficiency in Boiler Plant Operation, Aug 17 p 368
Hunt, Robert W.:
First Steel Rails Rolled at Johnstown, Nov 9 p 1002
Hunt, Robert W., & Co.:
Rail Branding and Heat Number Stamping, Oct 19 p 840
Hupp Motor Car Company:
New Plant for Windsor, Canada, Oct 12 p 802
Hyatt Roller Bearing Company:
Engineering Data, Dec 21 p 1353
Hydrogen and Oxygen, Generating Electrolytically,* Aug 17 p 386; Aug 31 p 491

I.

Ideal Chaplet Works:
McCarroll Ideal Chaplet,* July 27 p 221

Illinois Steel Company:
Operations, Aug 3 p 261
Screw Spikes, Sept 14 p 578
South Chicago Rail Mill Not Closed, Dec 14 p 1277

Illumination:
Factory, Oct 19 p 861
Steel Mill, Oct 5 p 737

Implement and Vehicle Association, National:
Convention, Oct 19 p 851

Imports and Exports of Iron and Steel, May, July 6 p 34; June, Aug 10 p 317; July, Sept 7 p 506; August, Oct 12 p 809; September, Nov 9 p 1021; October, Dec 7 p 1219

Imports of Ferrosilicon and Other Ferroalloys, Sept 7 p 523

India:
American Engineers for the New Steel Works in, Sept 21 p 623
First Tata Furnace Blown in, Dec 7 p 1201
Iron and Steel Industry in, Sept 28 p 682

Indiana Steel Company:
Electrical Equipment of Gary Coke Plant,* Dec 28 p 1406
Largest By-Product Coke Oven Plant in the World, Dec 14 p 1311
Sheet-Bar Mill,* July 13 p 102
Oil Pump House,* July 27 p 203

Indictments of Business Men, Wholesale, July 6 p 4

Industrial Education, Cincinnati Meeting for Promotion of, Oct 26 p 887

Industrial Education Convention, Nov 9 p 1020

Industrial Lighting, Aug 3 p 281

Ingersoll Milling Machine Company:
Cutter Grinder,* Aug 31 p 468

Ingot Molds of Steel, Oct 26 p 904

Ingram-Richardson Mfg. Company:
Improvements, July 20 p 142

Inland Steel Company:
Annual Report, Aug 3 p 251
Bolt and Rivet Works,* Sept 28 p 684
Handbook on Steel Products, Nov 23 p 1125
Twisting of Reinforcing Bars,* Sept 21 p 641
Vismera Steel Sheets, Aug 3 p 248

Insurance Against Strikes, Oct 5 p 719

Insurance, Excluding Private Liability, Oct 26 p 885

Interest Charges and Profit,* Aug 24 p 426

International-Amet Gas Power Company:
Oil Gas Producer,* July 13 p 100

International Association for Testing Materials:
Sixth Congress Committees, Sept 28 p 665

International Congress on Chemistry in 1912, Oct 26 p 904

International Exposition of Inventions, Aug 3 p 251

International Motor Company, Oct 26 p 915

International Oxygen Company:
Generating Oxygen and Hydrogen Electrolytically, Aug 17 p 386*; Aug 31 p 491

International Railway General Foremen's Associations:
Convention, Aug 3 p 284

International, Schedule of the, July 27 p 218

International Steel Conference, July 13 p 74; July 20 p 144; Aug 3 p 252

Interstate Commerce Commission, Steel Works Cases Before, Oct 5 p 736

Inventions, International Exposition of, Aug 3 p 251

Iron and Steel, Census Bureau's Report on, Aug 31 p 470

Iron and Steel Institute:
Programme for Turin Meeting, July 27 p 202
Turin Meeting Abandoned, Oct 5 p 751

Iron and Steel Institute, American:
Special Meeting, Oct 19 p 861

Iron-Bearing Materials, Sintering of Fine,* Aug 24 p 422

Iron-Making Nations, Great, Dec 14 p 1296

Iron Mines Suit, Croton Magnetic, Aug 24 p 418

Iron Mines, Taxable Valuation of Michigan, Nov 9 p 1028

Iron Ore:
(Also see Lake Superior Ore)
Chinese Exports of Pig Iron and, Sept 28 p 700
Eastern Rate Discrimination Alleged on, Sept 21 p 611
East Texas Developments, July 27 p 197
French Production in 1910, Oct 26 p 904
Great Northern Lease, Oct 19 p 854
Imports of Swedish, Oct 26 p 887
Minnesota Valuations, Nov 2 p 937
New 24-Hour Record in Unloading, Aug 24 p 416
Preparation of Brown, Sept 7 p 528
Production in 1910, Aug 24 p 420
Sintering of Mayari Ores in Cuba,* Sept 14 p 586
Some Fallacies, Nov 9 p 1000
To Concentrate Moose Mountain, Nov 30 p 1183

Iron Sands, Titaniferous, Sept 7 p 537

Irons from the Open-Hearth Furnace, Pure, July 13 p 94

Iron, Wrought, and Rerolled Steel, Spheres of, Nov 30 p 1168

Iron, Wrought, Production of, Dec 7 p 1218

Iron, Wrought, Versus Steel Pipe, Nov 30 p 1188

Iroquois Iron Company:
New Blast Furnaces,* July 6 p 30
Notable Air Compressor Installation,* Sept 7 p 536

Isthmian Canal Commission Bids, Nov 17 p 1060; Nov 23 p 1146

Italy:
Another Steel Combination, Aug 10 p 323
Iron and Steel Production in 1910, Oct 5 p 763
Iron and Steel Trust in, Sept 28 p 701

Irvington Mfg. Company:
High-Grade Small Tools in Demand, Dec 14 p 1289

J.

Jacks:
Duff Ball-Bearing Journal,* Sept 14 p 597
New Canton Geared Ratchet Lifting,* July 6 p 43

James, D. O., Mfg. Company:
New Model of O'Kelly Speed-Reducing Gear,* Aug 10 p 333

Janney, Steinmetz & Co.:
Business, Sept 28 p 699

Japan:
Nippon Steel Works, July 27 p 181
Pig Iron Production, Nov 2 p 982

Jeanesville Iron Works Company:
Pumps Used in Uncovering the Maine,* Aug 17 p 374

Jefferson Union Company:
New Union Tee,* July 2 p 206

Jeffrey Mfg. Company:
Single Roll Coal Crusher,* Dec 7 p 1251

Jenckes, J. M.:
Valve Gear,* Oct 12 p 810

Job & Hersey:
Study of Steel Tires,* July 20 p 154

Job Handling System, Triumph,* Sept 21 p 638

Job, Robert:
Broken Lehigh Valley Rail,* Oct 12 p 800

Jones, John I.
Process for "Metallizing" Ore, Dec 14 p 1305

Jones & Laughlin Steel Company:
Increased Operations at Aliquippa, Dec 14 p 1288

Judicial Decisions of Interest to Manufacturers, July 27 p 201; Aug 10 p 345; Aug 17 p 397; Aug 31 p 466; Sept 21 p 647; Oct 19 p 872; Nov 16 p 1093; Dec 21 p 1348

K.

Keen, William H.:
Acid and Basic Open-Hearth Steel, Aug 10 p 324

Kentucky Iron History, Sept 7 p 543

Kentucky Mill Dismantled, Historic, July 27 p 199

Kerr Turbine Company:
Sales, Nov 30 p 1184

Keystone Mfg. Company:
Insert Chuck Jaws,* Oct 5 p 750

Kidder, R. E.:
Boring Machine,* Dec 7 p 1257

Kirchhoff, C.:
American Ironmasters Safeguarding Their Men, Nov 16 p 1082

Kirner, Dr. J.:
Observations on Case Hardening,* July 27 p 213

Knight Gasoline Engine,* Aug 10 p 328

Knox Pressed & Welded Steel Company:
Announcement, Nov 16 p 1087
Steel Men Inspect Devices, Sept 28 p 683

Koppers, H.:
Largest By-Product Coke Oven Plant in the World, Dec 14 p 1311

Kreutzberg, L. J.:
New Molder's Flask,* Oct 5 p 767

Krupp, Fried.:
Armor Plate Decision, Oct 19 p 837
Research and Chemical Laboratories, Aug 31 p 493

L.

La Belle Iron Works:
Annual Report, Sept 21 p 643

Labor:
Accidents in German Iron and Steel Works, Dec 14 p 1313
American Association for Labor Legislation, Sept 7 p 507; Dec 21 p 1359
Analysis of Factory Work, Nov 16 p 1074
And Lower Prices for Commodities, Sept 7 p 504; Sept 14 p 564
And the Efficiency System, Aug 31 p 447
Another Plan for Stock-Owning by Employees, Aug 17 p 388
Any Readjustment Will Include, Aug 24 p 401
Bonus System Man and His Foreman, Oct 26 p 885
British Wage Earners, Nov 2 p 951
Close Time Study of Factory Operations, Nov 9 p 1000
Coming Meeting of American Association for Labor Legislation, Sept 7 p 507
Credit Unions for Employees, July 27 p 215
Efficiency in Government Shops, Dec 28 p 1384
Employees Demand Control of Harriman Lines Shops, Aug 31 p 466
Excluding Private Liability Insurance, Oct 26 p 885
Health of Employees, Oct 5 p 719
Hours and Wages in the Iron Industry, Aug 10 p 336
House Passes an Eight-Hour Bill, Dec 21 p 1348
Idle Hours in Machine Shops, Dec 28 p 1384
Increasing Cost of Workmen's Compensation, Nov 23 p 1167
Industrial Campaign Against Sickness, Aug 10 p 297

Insurance Against Strikes, Oct 5 p 719
In the Iron and Steel Industry, Nov 23 p 1138
Investigation by Steel Corporation, Oct 26 p 914
Keeping Down Idle, Nov 2 p 935
Laws for Accident Prevention, Aug 24 p 421
Los Angeles Confessions, Dec 7 p 1216
Machinists' Strike Benefits, Oct 26 p 898
Norton Company's Medical Department,* Dec 7 p 1244
Piece-Rate Cutting, Sept 14 p 563
Proposed Federal Compensation Bill, Dec 14 p 1316
Safeguarding Workmen in Small Plants, July 13 p 74
Safety Devices for Grinding Wheels, Aug 17 p 349
Scientific Management in Government Shops, Dec 14 p 1276
Sheet and Tin Plate Scale, July 6 p 42
Sherman Act and the Labor Trust, Nov 2 p 950
Sick Benefits and Society Physicians, Dec 7 p 1217
Steel Corporation Bonuses to Employees, Dec 28 p 1385
Steel Mill and Hot Weather, July 20 p 126
Steel Works Conditions, Oct 19 p 853
Time Study Observations,* Nov 16 p 1090
Union View of Lifting Magnets, Aug 31 p 466
Unusual Service Records in Spencer Wire Works, Sept 28 p 693
Use of Intoxicants by Steel Workers, Dec 14 p 1277
Wage Scale Settlements, July 6 p 2
Women in the Metal Trades, Nov 30 p 1189
Workmen's Foolish Investments, July 13 p 73

Labor Notes, Aug 10 p 318; Sept 14 p 577; Oct 5 p 723; Nov 23 p 1125; Dec 7 p 1237
  Chemical, Aug 31 p 493

Lackawanna Steel Company:
  Earnings, Oct 19 p 851
  New Merchant Mill,* Sept 28 p 690
  Two New Open-Hearth Furnaces, Dec 14 p 1295

Lagonda Mfg. Company:
  Automatic Cut-Off Valve,* Sept 21 p 640
  Large Strainers,* Sept 14 p 592

Laidlaw-Dunn-Gordon Company:
  High-Pressure Gas Distribution,* Oct 26 p 919

Lake, E. F.:
  Alloys Used for Die-Castings, Sept 7 p 532

Lake Shore & Michigan Southern Railroad:
  Handling Freight with a Gantry Crane,* Aug 31 p 467

Lake Superior & Ishpeming Railway Company:
  New Concrete-Steel Ore Dock,* Nov 9 p 1041

Lake Superior Iron & Chemical Company, Oct 19 p 858

Lake Superior Mining Institute:
  Convention Programme, Aug 10 p 301
  Proceedings, Aug 31 p 462

Lake Superior Ore:
  Electrification at Mines, Sept 14 p 562
  First Mesaba Range Steam Shovel, Sept 28 p 697
Mining News, July 13 p 68; Aug 3 p 264
Minnesota Iron Ore Valuations, Nov 2 p 937
New 24 Hour Record in Unloading, Aug 24 p 416
New Concrete-Steel Ore Dock,* Nov 9 p 1041
New Finds of Lake Iron Ores, Sept 28 p 702
Property Values Keep Up, Aug 31 p 492
Railroad Hearing, July 20 p 147
Rates from Lower Lake Ports, Nov 9 p 1033
Shipments in May, July 13 p 85
Shipments in July, Aug 10 p 312
Shipments in August, Sept 14 p 578
Shipments in September, Oct 12 p 803
Shipments in October, Nov 16 p 1073
Shipments in 1911, Dec 7 p 1221
Taxable Valuation of Michigan Iron Mines, Nov 9 p 1028
Turbo-Electric Hoisting Engines in Lake Mines, Sept 28 p 664

Lamps:
  Book on Arc Operation, July 6 p 42
  Electric Combination Dissolved, Oct 19 p 860
  Hangers for Mill Lights, Oct 19 p 860

Landis Machine Company:
  New Threading Machine,* Aug 3 p 280

Landis Tool Company:
  Integral Cam Grinding Attachment,* July 20 p 150

Langelier Mfg. Company:
  Combination Saw and Drill,* Dec 7 p 1254
  Hammering Machine,* Sept 28 p 692
  Semi-Automatic Rivet Drilling Machine,* July 20 p 155
  Special Drill,* Aug 17 p 382

Langrehr Safety Can for Gasoline,* Oct 19 p 866

Lathes:
  Bradford Relieving Attachment,* Aug 31 p 474
  Greaves-Klusman Heavy 15-In. Engine,* Aug 31 p 488
  Hamilton Relieving Device Integral with,* Nov 23 p 1154
  Hill Face Plate Dog,* Aug 17 p 383
  Miami 14-In.,* Nov 2 p 982
  Morris 16-In.,* Nov 2 p 976
  New Fay & Scott,* July 20 p 150
  Seneca Falls Relieving Attachment,* Nov 30 p 1204
  Springfield Fox 15-In.,* Oct 5 p 747
  Willey Motor-Driven Center Grinder,* Nov 2 p 960

Law, Merrett and Pollard:
  Welds by Different Methods, July 27 p 200

Lead in 1910, Production of, Dec 7 p 1256

Lea Recorder, Yarnall-Waring,* Dec 28 p 1404

Lebanon Valley Iron & Steel Company, July 28 p 181

Le Blond, R. K., Machine Tool Company:
  Combination Miller,* Nov 16 p 1094

Ledyard, Lewis C.:
  Testimony at Steel Investigation, Aug 3 p 259

Lees, G. E.:
  Production of Alloyed Steels in 1910, Oct 19 p 836

Lehigh Valley Railroad:
  Broken Rail,* Oct 12 p 800
  Interstate Commerce Commission's Report on Broken Rail, Nov 23 p 1126

Lentz, Hugo:
  Poppet Valve Engine,* July 6 p 54

Lewis Foundry & Machine Company
  Contracts, July 6 p 4

Lidgerwood Mfg. Company:
  Panama Canal Cableways, Oct 12 p 812

Lighter, New Fueling,* Dec 14 p 1308

Lighting:
  Example of Good Machine Shop,* July 20 p 164
  Improved Pyle-National Contractor's, Dec 14 p 1300
  Industrial, Aug 3 p 281
  Lamp Hangers for Mill, Oct 19 p 860
  Lime Light on Factory, Oct 12 p 781

Lignites and the Use of Producer Gas in Texas, Sept 28 p 676

Lilienberg, N.
  Labor and Lower Prices for Commodities, Sept 14 p 564

Littlefield, F. H.:
  Great Trade School at St. Louis, Dec 7 p 1232

Little Giant Serial Taps,* Oct 19 p 868

Little, James E.:
  Sintering of Mayari Iron Ores in Cuba,* Sept 14 p 586

Locomotives:
  Huge Pennsylvania, Dec 28 p 1397
  On Ore Railroads, Mallet Articulated, July 13 p 97
  Terre Haute Electric Switching,* Sept 28 p 694
  To Tow Ships Through Panama Canal, Oct 26 p 903

Lodge & Shipley Machine Tool Company:
  Office Lunching Plan, Nov 23 p 1109
  Shop System for Greater Output,* Aug 3 p 268

Loggie, George W.:
  Aligning of Shafting,* Oct 12 p 814

Long Island Railroad Company:
  All-Steel Passenger Cars, Oct 26 p 898

Loss to Profit, Transmission from, July 27 p 218

Louisville Steel & Iron Company, Oct 19 p 869

Lovejoy, A. H.:
  Toncan Metal, July 6 p 59

Lubrication of Queen City Shaper,* Oct 26 p 918

Lubrication, Richardson-Phenix Engine,* Dec 14 p 1317

Lumen Bearing Company:
  Expands, Dec 14 p 1297

Lunching Plan, Office, Nov 23 p 1109

M.

Macgregor, Walter:
  Small Open Hearth Furnaces, Sept 7 p 544

MacLeod & Co.:
  Oil Fired Furnaces for Automobile Parts,* Nov 9 p 1036

McClintic-Marshall Construction Company:
  Engineers Inspect Panama Canal Gates, July 20 p 129

McClintock, A. E.:
  Machine Molding for Large Castings,* Dec 28 p 1412

McDougall, John, Caledonian Iron Works Company, Ltd.:
  Minimizing Peak Electric Loads,* Aug 24 p 430

McGlynn, William P.:
  New Wire and Rod Machines,* Nov 16 p 1082

McGowan Company, John H.:
  Duplex Pump,* Oct 19 p 867

McMyler Interstate Company:
  Shipbuilding Crane,* 35-Ton, Nov 16 p 1092

McNamara Brothers' Confessions, Dec 7 p 1216

McWilliam & Barnes:
  Experiments on 0.2 Per Cent. Vanadium Steel, July 27 p 205
  Nickel Steel, 3 Per Cent., Aug. 10 p 326

Machinery:
  Demand for Second-Hand, Dec 21 p 1332
  Labor Agitation and Railroad Purchases, Oct 5 p 720
  Misrepresenting Deliveries, Sept 28 p 663
  Motion Pictures for Selling, Aug 31 p 464
  Selling American in Europe, Aug 3 p 262
  Standards of Safety in Relation to, July 13 p 88; July 20 p 160

Machines Earn Their Living, Making, July 27 p 104

Machine Shops, Idle Hours in, Dec 28 p 1384

Machine Shops of Rumely Tractor Works,* Nov 2 p 970

Machine Shop, What the Foundry Thinks of the, Dec 21 p 1350

Machine Tool Builders
  Convention Programme, Sept 28 p 701
  Official List of, Aug 10 p 335
  Proceedings, Oct 12 p 796

Machine Tool Dealers' Meeting, Oct 19 p 857
Machine Tools:
Coming Demand for, Dec 14 p 1275
Selling American in Europe, July 6 p 40
Machinists' Strike Benefits, Oct 26 p 898
Mackintosh, Hemphill & Co.:
Interesting Engine Order, Nov 30 p 1184
Magnets:
In Foundries, July 13 p 92
Labor Union View of, Aug 31 p 466
Mahoning and Shenango Valley Manufacturers for Lower Freight Rates, Nov 23 p 1124
Maine, Uncovering the,* Aug 17 p 374
Mallet Articulated Locomotives on Ore Railroads, July 13 p 97
Management in Government Shops, Scientific, Dec 14 p 1276
Management, Organizer of Men in, Nov 2 p 958
Manganese Ores, Production of, Nov 30 p 1187
Manila Times, July 13 p 97
Manning, Maxwell & Moore, Inc.:
Changes, July 27 p 180
Manufacturers Contest Freight Advances, Nov 9 p 1003
Manufacturers, National Association of:
Sherman Act and the Labor Trust, Nov 2 p 950
Marking Machine, Remington,* Aug 17 p 383
Massillon Bridge & Structural Company:
New Structural Shop, Dec 14 p 1311
Matthews Gravity Carrier Company:
Will Move to Ellwood City, Pa., Oct 19 p 865
Matthews, H. A., Mfg. Company:
Waterbury Large Double-Acting Cam Press,* Oct 12 p 807
Matthews, W. N., & Bro.:
Boltless Guy Clamp,* Oct 5 p 760
Mayari Iron Ores in Cuba, Sintering of,* Sept 14 p 586
Maynard, George W.:
Dwight & Lloyd Ore Sintering Process, Dec 21 p 1349
Measurement Tools, New Brown & Sharpe,* Dec 7 p 1246
Mechanical Engineers, American Society of:
Annual Meeting, Nov 16 p 1089
Convention Programme, Nov 30 p 1171
Proceedings, Dec 7 p 1219; Dec 14 p 1290
Standard Boiler Rules, Sept 7 p 521
Mechanical Plant Auxiliaries on Fourth Floor of Lofty Building, Aug 3 p 261
Medal Presented to Sir W. H. White, Fritz, Nov 23 p 1147
Medical Department of the Norton Company,* Dec 7 p 1244
Meek, Charles E.:
Fire Protection in Factories, Aug 31 p 465
Merrell Mfg. Company:
Portable Pipe Machine,* July 6 p 50
Merton, Henry R., & Co., Ltd.:
Why the European Copper Market Advances, Dec 28 p 1385
Mesaba Range Steam Shovel, First, Sept 28 p 697
Mesta Machine Company:
Large Corliss Engine Built in Sixteen Days,* Dec 7 p 1257
Record in Building Rolling Mill Equipment, Oct 5 p 761
Shipments, July 13 p 123
Metal Corrosion in Gaseous Atmosphere, Aug 31 p 461
Metallurgy, Progress of, Sept 14 p 580
Metal Manufacturers' Association, Philadelphia:
Annual Meeting, Dec 28 p 1401
Metal Trades Dinner, Cincinnati, Dec 14 p 1295
Meter Installations, Two Thomas, Aug 31 p 464
Mexico:
Mammoth Potrero Gusher, Aug 3 p 258
Miami Valley Machine Tool Company:
Improved Tool and Cutter Grinder,* July 13, p 105
Lathe, 14-in.,* Nov 2 p 982
Michigan Corporate Excess Tax, Proposed, Dec 21 p 1333
Michigan's Iron and Copper Mines, Aug 24 p 417
Michigan Iron Mines, Taxable Valuation of, Nov 9 p 1028
Michigan Steel Company, Oct 19 p 860
Micrometers, New Brown & Sharpe, Dec 7 p 1246
Middle West, Future Development of the, Nov 30 p 1186
Midvale Steel Company:
Armor Plate Decision, Oct 19 p 837
Mill Illumination, Steel, Oct 5 p 737
Milling Machines:
Garvin Plain,* July 13 p 105
Le Blond Combination,* Nov 16 p 1094
New Newton Brace,* Aug 10 p 336
Newton Combination Portable Boring, Drilling and,* Aug 10 p 331
New Waltham Thread,* Nov 30 p 1194
Milwaukee Industrial Exposition, Sept 14 p 579
Mines, Bureau of:
Demonstrations, Sept 28 p 705
Producer Gas Investigations, Nov 30 p 1194
Mines:
Croton Suit, Aug 24 p 418
Michigan's Iron and Copper, Aug 24 p 417
Ore Loading at El Cuero,* Oct 5 p 752
Taxable Valuation of Michigan Iron, Nov 9 p 1028
Minimizing Peak Electric Loads,* Aug 24 p 430
Mining Engineers, American Institute of:
Announcement of Meeting, Sept 21 p 639
Excursion Features of San Francisco Meeting, Sept 28 p 677
Meeting of New York Section, Sept 28, p 682
Mining Institute, Lake Superior:
Convention, Aug 31 p 462
Minnesota Iron Ore Valuations, Nov 2 p 937
Minnesota Steel Company:
Blast Furnaces, Aug 10 p 331
New Steel Plant at Duluth,* Nov 30 p 1196
Steel Corporation's Plans for, Sept 21 p 626
Mitchell, R. C.:
New Internal Combustion Engine,* Oct 12 p 820
Mixers, Pig Iron, Aug 3 p 265
Molder's Bench, Sand Mixing Portable,* Dec 21 p 1367
Molder's Flask, New Kreutzberg,* Oct 5 p 767
Molder's Flask, Thompson New,* Dec 28 p 1415
Molders' Safeguards, Nov 23 p 1108
Molding Machines:
Murphy Duplex Jarring Machine,* Dec 7 p 1259
Osborn Drop Plate Squeezer,* Oct 12, p 803
Patent Decision, Dec 14 p 1276
Pridmore Power Squeezing Attachment, Nov 9 p 1035
William Sellers, for Large Castings,* Dec 28 p 1412
Molds of Steel, Ingot, Oct 26 p 904
Mold Sprayer, Murphy,* Dec 14 p 1316
Moll, William
Steam Trap for Heating Plants,* July 6 p 53
Molybdenum Steel from the Electric Furnace, Sept 21 p 641
Monterey Iron & Steel Company:
Annual Report, Oct 5 p 721
Moose Mountain, Ltd.:
To Concentrate Ores, Nov 30 p 1183
Morgan Construction Company:
New Mills for Steel Company of Canada, Dec 14 p 1298
Morgan Engineering Company:
To Drain an Arkansas Swamp, Dec 28 p 1403
Morgan Spring Company:
Eclipse Pipe Hangers,* Dec 7 p 1256
Morgantown, W. Va., Seeks Additional Industries, Nov. 2 p 957
Morris, John B., Machine Tool Company:
Lathe,* 16-in., Nov 2 p 976
Motionscope Company
Motion Pictures for Selling Machinery, Aug 31 p 464
Motor Driving for Planers,* Oct 26 p 914
Motors:
Frontier Eight-Cylinder Aero,* Dec 7 p 1259
New Westinghouse Direct Current,* Aug 17 p 375
Wagner New Single Phase Electric,* Nov 16 p 1080
Motor Trucks, Dec 14 p 1314
Motor Wagon Display in New York, Nov 23 p 1153
Mount Union Refractories Company:
New Fire Brick Enterprise, Oct 12 p 820
Multiple Unit Electric Company:
Replaceable Unit Electric Furnace,* Aug 10 p 332
Mumford, E. H., Company:
Molding Machine Patent Decision, Dec 14 p 1276
Municipal Building, Mechanical Plant Auxiliaries on Fourth Floor, Aug 3 p 261
Munzel, K.:
Revolving Grate Gas Producer, Nov 9 p 1017
Murphy, James A.:
Duplex Jarring Machine,* Dec 7 p 1259
Mold Sprayer,* Dec 14 p 1316
Museum of Safety, American:
Molders' Safeguards, Nov 23 p 1108

N.

National-Acme Mfg. Company:
Effective Advertising Device, Dec 21 p 1353
Improved Spring Die,* Nov 30 p 1204
National Association of Brass Manufacturers:
Meeting, July 6 p 34
National Brake & Electric Company:
Notable Air Compressor Installation,* Sept 7 p 536
Routing Material Through Shop Departments,* Nov 30 p 1192
National Bridge Company of Canada, Aug 31 p 463
National Carbon Company:
Practical Operation of Arc Lamps, July 6 p 42
National Electric Lamp Association:
Electric Lamp Trade, Sept 14 p 597
National Enameling & Stamping Company:
Annual Report, Sept 7 p 545
National Founders' Association:
Announcement of Meeting, Oct 12 p 783
Opening Features, Nov 16 p 1068
Proceedings, Nov 23 p 1130
National Gas and Gasoline Engine Trades Association:
Convention, Dec 7 p 1233; Dec 14 p 1289
National Implement and Vehicle Association:
Convention, Oct 19 p 851
National Machine Tool Builders' Association
Announcement, Aug 24 p 403
Convention Programme, Sept 28 p 700
Official List, Aug 10 p 335
Proceedings, Oct 12 p 796; Oct 19 p 857

National Roll & Foundry Company:
New Chilled Roll Process,* Oct 5 p 766
National Society for the Promotion of Industrial Education:
Coming Convention, Oct 26 p 887
National Supply and Machinery Dealers' Association:
Announcement of Papers, Oct 5 p 755
Convention, Oct 12 p 798; Oct 19 p 857
Navigation, International Congress of, Dec 14 p 1299
Navy Repair Ship, Model, July 20 p 127
Nelson Valve Company:
Annual Dinner, Sept 7 p 522
Newark Foundrymen's Association, Oct 12 p 819; Dec 21 p 1349
New Departure Mfg. Company:
Machine for Close Measuring Available Free, Nov 2 p 937
New Era Mfg. Company:
New Foundry Flux, Sept 7 p 550
New York & Queens Gas Company:
High Pressure Gas Distribution,* Oct 26 p 919
New York Central Railroad:
Mechanical Equipment of the New York Terminal, Sept 14 p 593
New York Connecting Railroad:
Monumental Bridge Contract Let, Nov 9 p 1024
New York Edison Company:
Electric Generator of 30,000 hp., Nov 9 p 1021
New York Electrical Exposition, Oct 19 p 852
New York, Motor Wagon Display in, Nov 23 p 1153
New York Shipbuilding Company:
McMyler 35-Ton Crane,* Nov 16 p 1092
New York's Barge Canal and Iron Ore Freights, Aug 24 p 417
New Zealand, Iron Industry in, Dec 7 p 1247
Newton Machine Tool Works, Inc.:
Combination Portable Boring, Drilling and Milling Machine,* Aug 10 p 331
Grinder for Planer Cutters,* Aug 10 p 327
Internal Cold Metal Saw,* Nov 16 p 1083
New Brace Miller,* Aug 10 p 336
Niagara Falls, Plan to Restore Original Natural Beauty, Nov 30 p 1195
Niagara Falls Power Development, Additional, Nov 30 p 1171
Nicholson, W. H., & Co.:
Wyoming Steam Trap,* Nov 9 p 1041
Nickel Steel, Properties of 3 Per Cent., Aug 10 p 326
Nicoll, B., & Co.:
Rate Discrimination Alleged on Eastern Iron Ores, Sept 21 p 611
Niles-Bement-Pond Company:
Le Blond Combination Miller,* Nov 16 p 1094
Northern Engineering Works:
Coal-Handling Crane,* Dec 21 p 1359
Northern Iron Company:
Unusual Casts of Low Phosphorus Iron, Aug 17 p 385
Norton Company:
Factory Fire-Fighting System,* Dec 21 p 1360
Health of Employees, Oct 5 p 719
Medical Department,* Dec 7 p 1244
Safety as Applied to Grinding Wheels, July 20 p 140
Norton Grinding Company:
Axle-Grinding Machine,* Nov 23 p 1148

O.

Obituary:
Avery, George C., Aug 3 p 237
Beale, Oscar J.,* July 20 p 141
Boyts, B. F., Dec 7 p 1220
Bradley, Henry L., Oct 12 p 799
Brooks Byron A., Oct 5 p 721
Brooks, Major James C., July 20 p 141
Brunner, Christian O., Sept 14 p 577
Bryant, Orrin, Aug 31 p 461
Carlin, William J., Dec 21 p 1346
Chambers, Cyrus, Jr., July 13 p 75
Christie, James, Aug 31 p 461
Christie, Robert, Dec 28 p 1397
Colles, Edward G. T., Sept 14 p 577
Drawbaugh, Daniel F., Nov 9 p 1018
Dwyer, James, Sept 28 p 677
Eaton, Charles S., July 20 p 141
Eaton, John, Sept 21 p 625
Fennerty, Harry A., July 20 p 141
Eldredge, Barnabas, Dec 7 p 1220
Field, Henry P., July 6 p 7
Flinn, Elisha H., Dec 7 p 1220
Forbes, Harry F., Nov 30 p 1183
Frohman, Harry F., July 13 p 75
Garrison, Daniel E., Jr., Sept 7 p 521
Gates, John W.,* Aug 10 p 298
Gaulbert, William R., July 27 p 193
Gobeille, Joseph L., Oct 5 p 721
Green, Col. W. C., Aug 10 p 299
Greening, S. O., Sept 7 p 521
Grubb, Charles B., Nov 23 p 1123
Hall, Harry R., Dec 14 p 1298
Hall, Zachary T., Oct 19 p 851
Harden, Edward W., Sept 14 p 577
Harris, William E., Nov 30 p 1183
Haselton, Hyatt S., Aug 3 p 237
Hastings, Washington, Oct 19 p 851
Hebard, George W., Nov 23 p 1123
Hegewald, Charles, Sept 21 p 625
Hillman, J. H., Sr.,* Oct 19 p 850
Hubbard, Walter, Aug 31 p 461
Hughson, George A. F., July 27 p 193
Humphryes, Robert B.,* July 20 p 141
Ingraham, Irving E., Aug 10 p 299
Ives, H. R., Oct 12 p 799
Jewell, Pliny, Nov 9 p 1018
Jones, W. M., Oct 12 p 799
Keefer, Samuel H., July 27 p 193
Kelly, Ironton A., Aug 10 p 299
Kelly, Thomas P., Oct 12 p 799
Kemp, Clarence M., July 27 p 193
Kerr, William H., Nov 2 p 951
King, John H., Aug 31 p 461
Klein, Frederick C., Dec 28 p 1397
Koegel, Charles, Aug 17 p 351
Ladd, Sherman W., Sept 14 p 577
Lanman, Joseph K., July 27 p 193
Larrabee, Henry C., Aug 3 p 237
Latshaw, W. H., Aug 31 p 461
Lewis, John L., Nov 9 p 1018
Long, Frank R., Sept 7 p 521
Love, William H., Nov 23 p 1123
Mackay, James, July 20 p 141
McLaren, John, Oct 19 p 851
Marwedel, C. F., Nov 23 p 1123
Marx, August, Nov 16 p 1070
Mather, Robert, Oct 26 p 900
Mitchell, John R., Aug 10 p 299
Morrison, Robert C., Dec 7 p 1220
Mott, Augustus W., July 6 p 7
Neely, Thomas, Oct 19 p 851
Oldershaw, Hiram, Aug 24 p 416
Osborne, John H., Aug 24 p 416
Pancoast, Henry B., July 13 p 75
Parmelee, Arthur W., Dec 28 p 1307
Peck, Edward W., Nov 2 p 951
Phillips, Charles H., Nov 9 p 1018
Pohl, Edward, Nov 16 p 1070
Rea, Charles, Nov 16 p 1070
Reeves, Albert B., Nov 16 p 1070
Rhoads, John B., Sept 28 p 677
Rice, C. L., Nov 16 p 1070
Richards, Thomas C., Aug 24 p 416
Robbins, Francis L., Sept 14 p 577
Salter, T. F., Nov 9 p 1019
Schumann, Francis, July 13 p 75
Shuster, Franklin B.,* Aug 24 p 416
Simonds, Edwin F., Sept 14 p 577
Sims, Joseph W., Oct 19 p 851
Souther, John, Sept 21 p 625
Steele, Omar N., Aug 24 p 416
Stowe, Aaron F., Nov 9 p 1019
Stower, James N., Dec 7 p 1220
Stranahan, Olin A., Sept 14 p 577
Tanzer, Arnold, Dec 28 p 1307
Thomas, David J., Dec 28 p 1307
Thompson, A. P., Nov 30 p 1183
Treadway, A. R.,* Oct 26 p 899
Trout, Henry G., Aug 10 p 299
Tucker, Hugh, Dec 7 p 1220
Viall, Richmond,* Nov 23 p 1123
Waener, Frederick L., Aug 31 p 461
Warner, John McM., Nov 16 p 1070
Webber, George, Oct 12 p 799
Weed, Walter I., Aug 24 p 416
Weiler, C. Franklin, Sept 28 p 677
Wilson, Francis B., Nov 9 p 1019
Wood, Howard, July 6 p 7
Oglebay, Earl W.:
Testimony at Steel Investigation, Aug 3 p 261
Ohio Machine Tool Company:
Standard versus Heavy Duty Shapers, Sept 7 p 523
Ohio Steel & Wire Company:
New Wire Mill, Aug 17 p 368
Ohio's State Building Code, Sept 7 p 526
Oil:
Adulteration, Important Discovery Regarding, July 13 p 72 and p 91; Aug 17 p 386
American Twentieth-Century Loose Pulley Cup,* July 27 p 214
Fuel Specifications, Aug 3 p 261
Furnaces for Automobile Parts, MacLeod & Co.,* Nov 9 p 1036
International-Amet Gas Producer,* July 13 p 100
Mammoth Potrero Gusher, Aug 3 p 258
New Burt Filter,* Oct 12 p 819
Papers on Fuel, Aug 10 p 323
Production in 1910, Dec 21 p 1349
Pump House at Gary,* July 27 p 203
Oiling System, Burt Automatic,* July 13 p 111
O'Kelly Speed-Reducing Gear, New Model of,* Aug 10 p 333
Oldham, George, & Son Company:
Riveting Hammer,* Nov 2 p 985
Olney, Richard:
Problem of the Trusts, Nov 9 p 1026
Olsen, Tinius, & Co.:
Autographic Transverse Testing Machine,* Aug 3 p 277
Open-Hearth Steel, Heat Treatment on Acid and Basic, of Similar Composition, July 6 p 25
Ore:
(Also see Lake Superior Ore)
Canada's Titaniferous, Used in the United States, Oct 19 p 865
Chinese Exports of, Sept 28 p 700
East Texas Developments, July 27 p 197
French Production in 1910, Oct 26 p 904
Great Northern Lease, Oct 19 p 854; Oct 26 p 901
Imports of Swedish, Oct 26 p 887
Jones Process for "Metallizing," Dec 14 p 1305
Loading at El Cuero Mines,* Oct 5 p 752
Minnesota Valuations, Nov 2 p 937
Preparation of Brown, Sept 7 p 528
Production in 1910, Aug 24 p 420
Rate Discrimination Alleged on Eastern, Sept 21 p 611
Sintering of Mayari Ore in Cuba,* Sept 14 p 586
Sintering Process, Dwight & Lloyd,* Aug 24 p 422; Dec 21 p 1349
Some Fallacies, Nov 9 p 1000
Southwestern Virginia Development, Sept 28 p 681
To Concentrate Moose Mountain, Nov 30 p 1183
Weiss Briquetting Process, Nov 30 p 1185
Ore Dryer, Atlas, Sept 28 p 682
Organizer of Men in Management, Nov 2 p 958
Oriskany Ore & Iron Corporation:
New Virginia Blast Furnace, Nov 23 p 1144
Osann, Prof. B.:
Foundry Drying Oven, Oct 19 p 864
Osborn Mfg. Company:
Drop-Plate Squeezer,* Oct 12 p 803
Otis Steel Company, Ltd.:
Plans, Nov 30 p 1184
Outerbridge, Alexander E., Jr.:
Detecting Adulteration of Oils, July 13 p 91; Aug 17 p 386
Oven, Foundry Drying, Oct 19 p 864
Overhead Expense, Nov 30 p 1190
Oxy-Acetylene Welding Menaced, Nov 9 p 1001

Oxy-Carbi Company:
New Portable Welding Machine,* Sept 21 p 628
Oxygen and Hydrogen, Generating Electrolytically,* Aug 17 p 386; Aug 31 p 491

P.

Packing, Need of Stronger, Sept 21 p 627
Packing Tool, Strode,* Sept 7 p 547
Panama:
Canal Cableways,* Oct 12 p 812
Canal Hydraulic Equipment Contract, Dec 21 p 1347
Engineers Inspect Canal Gates, July 20 p 129
Locomotives to Tow Ships Through, Oct 26 p 903
Lower Prices on Rails, Aug 17 p 379
Proposed Steamship Line, Sept 7 p 522
Sale of French Scrap Material, Oct 13 p 813
Scrap Sale, Sept 7 p 520
Park Drop Forge Company:
Improvements, Oct 5 p 736
Patents:
And the Public Welfare, Nov 2 p 950
German Law Practice, July 27 p 198
Molding Machine Decision, Dec 14 p 1276
Pattern Handling in a Steel Foundry,* Aug 10 p 330
Pattern Storage, Berger Steel Racks for,* Dec 7 p 1255
Pawling & Harnischfeger Company:
Interesting Crane Installation,* July 6 p 35
Peck, E. C.:
Systematic versus Scientific Management, Aug 17 p 364
Peine Steel Works:
Revolving Grate Gas Producer, Nov 9 p 1017
Pelton Water Wheel Company:
Panama Canal Hydraulic Equipment Contract, Dec 21 p 1347
Pennsylvania Crusher Company:
Crusher Litigation, Nov 16 p 1092
Pennsylvania Engineering Works:
Minnesota Steel Company Blast Furnaces, Aug 10 p 331
Pennsylvania:
Industrial Legislation in, Aug 17 p 350
Many Electric Power Charters in, Aug 17 p 350
Pennsylvania Railroad:
Freight Handling in Small Shipments, Nov 2 p 984
Huge Locomotive, Dec 28 p 1397
Need of Stronger Packing, Sept 21 p 627
Notable Tunnel Ventilating Plant,* Aug 31 p 493
Steel Cars, 52-Ft., Dec 7 p 1255
Pennsylvania Steel Company:
Interesting Rail Transaction, Dec 7 p 1243
Perin, Charles P.:
Iron and Steel Industry in India, Sept 28 p 682
Testimony at Steel Investigation, Aug 10 p 313
Perkins, George W.:
Constructive Programme on the Trust Question, Dec 7 p 1233
Testimony at Steel Investigation, Aug 17 p 366
Philadelphia Foundry Foremen:
Outing, Sept 21 p 611
Meetings, Oct 19 p 864; Nov 23 p 1160
Philadelphia Foundrymen's Association, Sept 14 p 579; Oct 12 p 797; Nov 9 p 1042; Dec 14 p 1295
Philadelphia Metal Manufacturers' Association:
Annual Meeting, Dec 28 p 1401
Philadelphia Roll & Machine Company:
Motor-Driven Sheet and Strip Mill,* Sept 28 p 696
New Wire and Rod Machines,* Nov 16 p 1082
Phoenix Iron Company:
Three Notable Open-Hearth Furnaces, Nov 30 p 1203
Physical Properties of Cast Iron, Nov 16 p 1077
Piece-Rate Cutting, Sept 14 p 563
Pig Iron:
Chinese Exports of Iron Ore and, Sept 28 p 700
Congressman Underwood's Boast of Cheap Iron, Sept 7 p 505
Cost at One Southern Plant, Aug 10 p 319
Cost of Producing Alabama, Sept 7 p 545
Cost of Southern, Sept 21 p 642
Curve of Production,* Oct 12 p 780
German Production First Half 1911, Aug 3 p 266
Half-Yearly Statistics, Aug 3 p 237
Mixers, Aug 3 p 265
Monthly Statement,* July 6 p 6; Aug 10 p 300; Sept 7 p 508; Oct 5 p 722; Nov 9 p 1004; Dec 7 p 1234
Place of 1911 in the Record, Nov 30 p 1170
Production in United States, First Six Months of 1911, Aug 10 p 320
Production of Japan, Nov 2 p 982
Russian Duty, July 20 p 129
Suiting Processes to Conditions, July 13 p 72
Superior Special Charcoal, Sept 7 p 509
United States Production First Half of 1911, Aug 3 p 237
Unusual Casts of Low Phosphorus, Aug 17 p 385
World's Production of, Aug 3 p 282
Pipe Hangers, Morgan Eclipse,* Dec 7 p 1256
Pipe Industry, Wrought, Dec 21 p 1332
Pipe Line Carrying Superheated Steam, Efficiency of, Aug 3 p 278
Pipe Machine, Merrell Portable,* July 6 p 59
Pittsburgh:
And the Steel Corporation, Aug 17 p 381
More Factories Wanted in, Sept 21 p 624
Pittsburgh and Vicinity Business Notes, Sept 7 p 506; Sept 14 p 595; Sept 21 p 626; Sept 28 p 679; Oct 5 p 723; Oct 19 p 848; Oct 26 p 905; Nov 2 p 957; Nov 9 p 1019; Nov 16 p 1071; Nov 23 p 1129; Nov 30 p 1184; Dec 7 p 1220; Dec 14 p 1268; Dec 21 p 1347; Dec 28 p 1397
Pittsburgh Coal-Dock Company:
Coal-Handling Plant at Duluth,* Dec 7 p 1240
Pittsburgh Foundrymen's Association, Sept 21 p 625; Oct 26 p 898; Dec 7 p 1256
Pittsburgh Gage & Supply Company:
Gaco Specialties,* Sept 28 p 703
Pittsburgh Steel Company:
Annual Report, Oct 12 p 821
New Blast Furnaces, Dec 7 p 1239; Dec 21 p 1348
Pittsburgh Valve, Foundry & Construction Company:
Aiken Hydraulic Valves, July 20 p 165
Planers:
Aluminum Pulleys for the American, Aug 3 p 271
Cincinnati Special Drive,* Nov 23 p 1152
Motor Driving for,* Oct 26 p 914
Newton Grinder for Planer Cutters,* Aug 10 p 327
Plating of Metals, Powder for Ready, July 20 p 165
Platt Iron Works Company:
Readjustment, Aug 3 p 273
Poetter, G. m. b. H.:
Friedrich Changeable Open-Hearth Furnace Port,* July 20 p 152
Political Science, Academy of:
To Discuss Relation of Government to Business, Oct 26 p 900
Pollock, Wm. B., Company:
Latest Development in Slag Pots,* Aug 17 p 369
Poor's Manual for 1910, July 27 p 217
Porceliron Stove Company, July 20 p 140
Porter, John Jermain:
Physical Properties of Cast Iron, Nov 16 p 1077
Potrero Gusher, Mammoth, Aug 3 p 258
Power Specialty Company:
New Water Cooler,* Nov 9 p 1034
Pratt & Cady Company:
Sales Offices, Nov 23 p 1108
Pratt & Whitney Company:
New Vise,* Aug 24 p 430
Prejudice, Appeal to, Nov 30 p 1169
Prentice Brothers Company:
New Radial Drill,* Oct 26 p 916
Prescott, Fred M., Steam Pump Company:
Herringbone Gears,* Dec 21 p 1364
Presses:
Accidents With Metal, Aug 3 p 279
Garrison Double-Crank Forging,* Sept 21 p 644
New Ferracute Toggle Drawing,* July 20 p 164
New Standard Double-Acting Cam,* Dec 21 p 1356
Waterbury Large Double-Acting Cam,* Oct 12 p 807
Prices:
American Steel Below Foreign, Dec 21 p 1330
Basing on a Normal Business, Sept 28 p 663
Do Congressmen Enjoy Ruinous Steel Prices? Nov 30 p 1171
Lowness of Steel, Nov 23 p 1108
Steel and Commodity, Aug 24 p 400
To-day's and Other Levels, Sept 21 p 608
Pridmore, Henry E.:
Power Squeezing with Molding Machine,* Nov 9 p 1035
Primos Chemical Company:
Alloys for Steel, Oct 26 p 887
Producer Gas Engines, Small Unit, Nov 9 p 1001
Producer Gas in Texas, Lignites and the Use of, Sept 28 p 676
Producer Gas Investigations, Nov 30 p 1194
Production Statistics:
Alloyed Steel in 1910, Oct 5 p 743
Canadian Iron and Steel, Nov 9 p 1016
Cement in 1910, Nov 23 p 1164
Census Bureau's Report on Iron and Steel, Aug 31 p 470
Coal in 1910, Sept 7 p 523
Coke and By-Products Saved, July 27 p 198
Copper, June, July 13 p 96; July, Aug 10 p 318; Aug, Sept 14 p 589; Sept, Oct 12 p 795; Oct, Nov 16 p 1068; Nov, Dec 14 p 1295
French Iron Ore in 1910, Oct 26 p 904
Graphite in 1910, Aug 31 p 477
Iron Ore in 1910, Aug 24 p 420
Italy's Iron and Steel in 1910, Oct 5 p 763
Lead in 1910, Dec 7 p 1256
Manganese Ores, Nov 30 p 1187
Oil in 1910, Dec 21 p 1349
Pig Iron, United States, First Six Months 1911, Aug 10 p 320
Pig Iron of Japan, Nov 2 p 982
Russian Iron and Steel Output 1910, Oct 5 p 763
Spelter in First Half 1911, July 27 p 197
Swedish Iron and Steel, Nov 2 p 980
United States, First Half 1911, Aug 3 p 237
United States Iron and Steel, 1910, Aug 3 p 249
World's Production of Aluminum, Sept 7 p 507
World's Production of Coal, Nov 30 p 1185
World's Production of Pig Iron, Aug 3 p 282
Profit Sharing Plan of Youngstown Sheet & Tube Company, Aug 17 p 383
Pulleys for the American Planers, Aluminum, Aug 3 p 271
Pulleys, Tests of, Oct 26 p 920

Pulsometer Steam Pump Company:
Pulsometer as Power Plant Pump,* Sept 7 p 548
Pumping Plant, Solar,* Sept 28 p 698
Pumps:
Cutler-Hammer Automatic Oil Controller,* Dec 7 p 1258
Dean Bros. Special Air Pump and Jet Condenser,* July 6 p 58
Goulds Air Cylinders for the Pyramid,* Aug 3 p 276
Goulds Motor-Driven Mine,* Oct 12 p 811
Goulds, of Exceptional Capacity, Dec 7 p 1261
Goulds Triplex,* Sept 7 p 546
John McDougall Caledonian Iron Works Company, Ltd.,* Aug 24 p 430
McGowan Duplex,* Oct 19 p 867
New Goulds Cenrtifugal,* Aug 24 p 427
New Queen City,* Aug 31 p 475
New Standard,* Aug 17 p 384
Pulsometer as Power Plant,* Sept 7 p 548
Vaile-Kimes Motor-Driven House,* Sept 14 p 597
Pyle-National Electric Headlight Company:
Improved Contractor's Light,* Dec 14 p 1309

Q.

Queen City Machine Tool Company:
Lubrication of Shaper,* Oct 26 p 918
New Crank Shaper,* July 6 p 43
Queen City Punch & Shear Company:
New Punch,* Aug 31 p 475
Quick Change Drill Chuck, Machine & Tool,* Dec 7 p 1255

R.

Rack, Driver Drill,* Sept 7 p 550
Racks for Pattern Storage, Berger Steel,* Dec 7 p 1255
Railroads:
Appliance Exhibition, Oct 26 p 921
Better Feeling Toward, Nov 9 p 1029
Buffalo Union Furnace Company's Industrial Case, Dec 28 p 1397
Earnings Fairly Good, July 6 p 2
Equipment Orders, July 13 p 97; July 20 p 142; Aug 3 p 282; Aug 10 p 298; Aug 17 p 368; Aug 24 p 402; Aug 31 p 464; Sept 21 p 629; Oct 26 p 901; Nov 23 p 1128; Nov 30 p 1183
General Foremen's Association, International, Convention, Aug 3 p 284
Increasing Traffic, July 27 p 178
Intermountain Rate Decision, Aug 3 p 235
Labor Agitation and Machinery Purchases, Oct 5 p 720
Lake Superior Ore Hearing, July 20 p 147
Mallet Articulated Locomotives on Ore, July 13 p 97
Trend of Revenues, Oct 19 p 834
Rails:
Branding and Heat Number Stamping, Oct 19 p 849
Broken Lehigh Valley, Oct 12 p 800*; Nov 23 p 1126
Chrome Steel in Tunnels, Aug 31 p 463
Ductility in Steel, July 13 p 97
First Steel Rolled at Johnstown, Nov 9 p 1002
Foreign Trade, July 13 p 93
Interesting Transaction, Dec 7 p 1243
Lower Prices on Panama, Aug 17 p 379
Recent Experience with Titanium, Sept 7 p 507
Railway Business Association:
Alabama's Governor Pleases Railroad Interests, Nov 30 p 1204
Revolution in Freight Claims, July 27 p 102
Ramp, H. M.:
What the Foundry Thinks of the Machine Shop, Dec 21 p 1350
Ranken, David, Jr., School of Mechanical Trades, Dec 7 p 1252
Ransom Mfg. Company:
Emery Wheel Guard,* Nov 2 p 982
Portable Grinder,* Nov 9 p 1038
Reaction from High-Voltage Apparatus, Oct 26 p 886
Reading-Bayonne Steel Casting Company, Nov 30 p 1199
Reading Crane & Hoist Works:
Special Cranes,* Sept 28 p 704
Reading Iron Company:
Improvements, Oct 26 p 917
Wrought Iron Versus Steel Pipe, Nov 30 p 1188
Recorder, Yarnall-Waring Lea,* Dec 28 p 1404
Records:
At a Crane Furnace, Oct 26 p 887
In Building Rolling Mill Equipment, Mesta, Oct 5 p 761
In Unloading Iron Ore, New 24-Hour, Aug 24 p 416
Some Recent Drilling,* July 27 p 215
Recorders:
For Vehicles, Travel, Nov 23 p 1154
New Brown Electric,* Nov 9 p 1042
Stromberg Electric,* Nov 16 p 1084
With Frictionless Inking Device, Bristol,* Nov 30 p 1201
Redfield, William C.:
American Export Trade, Oct 5 p 744
Rees, James, & Son Company:
Pittsburgh Steel Steamboats for Export, Dec 7 p 1243
Reinforcing Bars, Twisting of,* Sept 21 p 641
Remington Machine & Tool Company:
Marking Machine,* Aug 17 p 383
Replacement Parts, Buying of, Oct 12 p 782
Republic Iron & Steel Company
Annual Report, Aug 17 p 380
Haselton Plant,* Aug 17 p 370
No. 1 Blast Furnace at Haselton, Ohio,* Dec 28 p 1402
Rhodes, L. E.:
Vertical Shaper Attachment,* Dec 28 p 1411
Richardson, George W
Motor Driving for Planers,* Oct 26 p 914
Richardson-Phenix Company:
Engine Lubrication, Dec 14 p 1317
Riddle Oscillator, Hanna Electric,* Sept 21 p 638
Rims, Rolling of Automobile, Aug 31 p 488
Riter-Conley Mfg. Company:
Large Contracts, Dec 14 p 1277
Riveter, Grant Motor-Driven Ceiling,* Nov 2 p 983
Riveting Machine:
New Shuster, Oct 19 p 859
Robesonia Iron Company:
Good Record on Sulphurs, Nov 23 p 1151
Roberts, E. P.:
Design of a Factory System,* Aug 24 p 420
Robertson, Thomas D.:
Electrical Iron Smelting in Sweden,* Oct 12 p 804
Robertshaw Mfg. Company, July 20 p 143
Rochester Boring Machine Company:
Duplex Facing Machine,* Dec 14 p 1300
Rockford Machine Tool Company:
New Plant, Aug 31 p 460
Rockwood Sprinkler Company:
Sprinklers in Knock-Down Form,* Aug 24 p 428
Roll Process, National New Chilled,* Oct 5 p 766
Rolling Mills, Flywheels for Motor-Driven, Sept 28 p 700
Roofing, Selling Arguments for Tin, July 6 p 33
Roofing Sheets, Iron and Steel, Nov 23 p 1145
Roosevelt, Theodore:
Testimony at Steel Investigation, Aug 10 p 316
Root & Van Dervoort Engineering Company:
Factory Expansion, Sept 21 p 641
Routing Material Through Shop Departments,* Nov 30 p 1192
Rowe, Ernest H.:
Bonuses and the Location of Industries, Aug 10 p 297
Roy, A. R.:
Swedish Steels, Nov 9 p 1025
Rules, New Brown & Sharpe,* Dec 7 p 1246
Rumely, M., Company:
Enlarged Operations, Nov 30 p 1202; Dec 21 p 1366
Foundry of Tractor Works,* Oct 26 p 906
Machine Shops of Tractor Works,* Nov 2 p 970
Russia:
Duty on Pig Iron, July 20 p 129
Iron and Steel Output in 1910, Oct 5 p 763

S.

Safeguarding Their Men, American Ironmasters, Nov 16 p 1082
Safety Can for Gasoline, Langrehr,* Oct 19 p 866
Safety Devices, Compulsory, Oct 5 p 719
Safety Devices for Grinding Wheels, Aug 17 p 349
Safety in Relation to Machinery, Standards of,* July 13 p 88; July 20 p 160
Safety Measures May Be Too Thorough, Aug 3 p 277
Sailing Dates in Foreign Commerce, Aug 17 p 393
Sampierdarena Engineering Works:
Case Hardening of Steel,* Nov 2 p 978
Sand-Blast Machinery, Vogel & Schemmann Self-Contained, Nov 2 p 985
Sand Mixing Machine Company:
Portable Molder's Bench,* Dec 21 p 1367
Sargent, C. E.:
Two-Stage Gas-Driven Air Compressor, July 27 p 221
Sauer Power Generating Company:
Transmission Gear,* Nov 16 p 1081
Sawdon, Prof. Will M.:
Tests of Pulleys, Oct 26 p 920
Saws
Atkins Hack Machine,* Sept 28, p 694
Diamond New Sterling Power Hack Machine, Sept 7 p 547
Espen Lucas Foundry Cold,* Dec 14 p 1302
Langelier Combination Drill and,* Dec 7 p 1254
New Silver Table,* Nov 2 p 977
Newton Internal Cold Metal,* Nov 16 p 1083
Scale, Avery Automatic,* Aug 31 p 490
Schemann & Bronn:
Molten Ferromanganese for Deoxidation, Oct 12 p 801
Schieren, Charles A., Company:
Belting at the Turin Exposition,* Oct 26 p 918
Schley, Grant B.:
Testimony at Steel Investigation, Aug 10 p 313
Schlieper-Daae Company:
Announcement, July 27 p 181
New Soaking Pit Cover,* Dec 14 p 1311
Pittsburgh Universal Straightener,* Dec 28 p 1404
Schmitz, August:
Wire Flattening Mills,* Dec 21 p 1362
Schneider, Dean Herman:
Analysis of Work, Nov 16 p 1074
Schuchardt & Schutte:
Columbia Chuck,* Aug 3 p 282
Schulz, F. A.
Tilting Vise,* Aug 24 p 433
Schwab, Charles M.
Testimony at Steel Investigation, Aug 10 p 315

Schwanhausser, William:
Worthington High-Duty Pumping Engine,* Oct 5 p 764
Scientific Management at United States Arsenals, Nov 9 p 1022
Scientific Management, Latent Service of, Aug 17 p 348
Scientific Versus Systematic Management, Aug 17 p 364
Scotch Bar Iron Combination, Sept 7 p 507
Scott, Arthur P.:
Coke Oven Gas as an Open-Hearth Fuel, Sept 7 p 538
Scottish Tube Company, Ltd., Aug 10 p 317
Scrap Material, Sale of French Panama, Oct 12 p 813
Scrap Sale, Panama, Sept 7 p 520
Scrap, Speculation by Makers of, Oct 19 p 837
Scullin-Gallagher Iron & Steel Company:
Steel Foundry Extensions, Nov 2 p 937
Scully Steel & Iron Company:
Storle Brass Globe Valve,* Oct 5 p 763
Second-Hand Machinery, Demand for, Dec 21 p 1332
Sellers, William, & Co.:
Machine Molding for Large Castings,* Dec 28 p 1413
Selling American Machinery in Europe, Aug 3 p 262
Selling American Machine Tools in Europe, July 6 p 40
Seneca Falls Mfg. Company:
Lathe Relieving Attachment,* Nov 30 p 1204
Service Recorder Company:
Travel Recorder for Vehicles, Nov 23 p 1154
Sewage Disposal for a Hardware Works,* July 13 p 112
Shafting, Aligning of,* Oct 12 p 814
Shafts and Axles, Specifications for Steel, Aug 24 p 425
Shapers:
Gould & Eberhardt Bevel Gear Roughing, July 27 p 205
Lubrication of Queen City,* Oct 26 p 918
New Queen City Crank,* July 6 p 43
Rhodes Vertical Attachment,* Dec 28 p 1411
Standard Versus Heavy-Duty, Sept 7 p 523
Sheet and Tin Plate Association, Dec 28 p 1308
Sheet and Tin Plate Scale, July 6 p 42
Sheets, Iron and Steel Roofing, Nov 23 p 1145
Shelby Iron Company:
Sixty-seven Years of Charcoal Iron Production, Nov 30 p 1180
Sherman Law:
As It Works, Oct 5 p 720
Text of, Nov 9 p 1025
What It Forbids, Oct 10 p 837
Shimer, McGlynn & Co.:
Motor-Driven Sheet and Strip Mill,* Sept 28 p 696
Shipbuilding in 1911, Lake, Dec. 28 p 1403
Shipbuilding, Lake, at Low Ebb, Aug 31 p 448
Shop Buildings, Permanency in, Aug 24 p 401
Shop System for Greater Output,* Aug 3 p 268
Shop System of Ferracute Machine Company,* July 13 p 106
Shovel, First Mesaba Range Steam, Sept 28 p 697
Shovel Work, Steam, Sept 28 p 695
Shuster, F. B., Company:
New Riveting Machine,* Oct 19 p 850
Sibley Machine Tool Company:
Box Column Drilling Machine,* Nov 2 p 968
New Motor-Driven Drills,* Aug 31 p 473
Sight Feed, Williams Warrior,* Nov 9 p 1040
Silver Mfg. Company:
New Drills,* Nov 30 p 1202
New Saw Table,* Nov 2 p 977
Simmersbach, O.:
Pig Iron Mixers, Aug 3 p 265
Simonds Mfg. Company
Lockport Steel Mill,* Aug 3 p 274
Simplex Radial Drill, Improved Dreses,* Nov 30 p 1195
Sintering:
Dwight & Lloyd Process,* Aug 24 p 422; Dec 21 p 1349
Mayari Iron Ores in Cuba,* Sept 14 p 586
Slag Bucket, Improved Brown,* Dec 7 p 1257
Slag Pots, Pollock Latest Development in,* Aug 17 p 369
Slags, Furnace, in Concrete, July 13 p 90
Slatington Rolling Mills:
Again in Operation, Sept 28 p 705
Slocomb, J. T., Company:
Tool Store in New York, Sept 21 p 643
Slocum, Charles V.:
Views on Titanium in Iron and Steel Oct 26 p 903
Sly, W. W., Mfg. Company:
Foundry Equipment, Sept 7 p 546
Smith, Herbert K.:
Government Report on the Steel Corporation, July 6 p 57
Smith, J. M.:
Factory Illumination, Oct 19 p 861
Smith, Oberlin:
Accidents with the Metal Press, Aug 3 p 279
Smith, Robert H.:
Textbook and Blue Print Holder, Sept 14 p 591
Smith, Senex
Plan to Restore Original Natural Beauty of Niagara Falls, Nov 30 p 1195
Snyder, J. E., & Son:
New Heavy-Duty Drills,* Oct 12 p 821
Soaking Pit Cover, New Schlieper-Daae,* Dec 14 p 1311
Socket, Corona Drill,* Aug 10 p 333
Softening Water on a Large Scale, July 27 p 202
Solar Pumping Plant,* Sept 28 p 698
Southern Iron & Steel Company:
Consolidation with Alabama Consolidated, Aug 24 p 421
Reorganization, Oct 12 p 795
Southern Iron Company Promotion, Suit Over a, Oct 26 p 911
Southern Iron Consolidations, Aug 24 p 421
Southern Pig Iron, Cost of, Sept 21 p 642
Specifications:
For Spelter, Aug 17 p 387
Fuel Oil, Aug 3 p 261
Old Copper and Brass, July 27 p 200
Reinforcement Bars, Aug 17 p 370
Steel Axles and Shafts, Aug 24 p 425
Steel Reinforcement Bar, Aug 17 p 370
Spelter:
Production in First Half of 1911, July 27 p 197
Specifications for, Aug 17 p 387
Spencer Wire Company:
Unusual Service Records, Sept 28 p 693
Sprayer, Murphy Mold,* Dec 14 p 1316
Spring Making Machines, Baird,* Sept 7 p 527
Springer, J. F.:
Welding and Cutting Machine,* Aug 31 p 472
Springfield Machine Tool Company:
Fox 15-In. Lathe,* Oct 5 p 747
Sprinkler Efficiency, Automatic, Aug 24 p 431
Sprinklers in Knock-Down Form,* Aug 24 p 428
Squeezer, Osborn Drop Plate,* Oct 12 p 803
St. Louis Blast Furnace Company:
Litigation, Oct 26 p 918
St. Louis, Rankin Great Trade School at, Dec 7 p 1253
Stamping Plant, Acklin Toledo Metal,* Sept 14 p 594
Standard Bridge Tool Company:
Equipment Sold, Dec 14 p 1304
Standard Cast Iron Pipe & Foundry Company:
Interesting Crane Installation,* July 6 p 35
Standard Chain Company:
Makes Hardware Saddlery, July 27 p 200
Standard Gas Power Company:
New Bituminous Gas Producer,* Dec 14 p 1310
Standard Machinery Company:
New Double-Acting Cam Press,* Dec 21 p 1356
Standard Mfg. Company:
New Gear Cutters,* Nov 2 p 983
Standard Oil Company:
Dissolution Plan, Aug 3 p 237
Standard Pump & Engine Company:
New Pumps,* Aug 17 p 384
Standard Scale & Supply Company:
Scale and Truck Orders, Sept 28 p 691
Standard Welding Company:
New Addition,* July 27 p 216
Standardizing Factory Expense and Cost, Nov 16 p 1072
Stanley Investigating Committee, Nov 16 p 1057; Nov 23 p 1122
Stark Rolling Mill Company:
Toncan Metal, July 6 p 59
Unique Advertising Device Made of Toncan Metal, Nov 2 p 959
Starrett, L. S., Company:
Declares "Open Shop," Oct 5 p 739
Starters, Allen-Bradley Motor,* Sept 21 p 646
Statistics, Trade, Dec 28 p 1382
Steam
Efficiency of Pipe Line Carrying Superheated, Aug 3 p 278
Mammoth in Power Generators, Nov 9 p 1001
New Scheme for Storing Exhaust, Aug 10 p 319
Steamboats for Export, Pittsburgh Steel, Dec 7 p 1243
Steam Company, American District:
New Plant, Dec 14 p 1300
Steamship Line, Proposed Panama, Sept 7 p 522
Steamship Terminals, Cargo Transference at, Nov 23 p 1151
Steel:
Acid and Basic Open-Hearth, Aug 10 p 324
Annealing Castings,* Sept 7 p 542
Carborundum for Special, Nov 16 p 1086
Case Hardening,* Nov 2 p 978
Castings from Electric Furnace,* July 20 p 148
Derricks and Drilling Rigs, July 27 p 202
Ductility in Rail, July 13 p 97
Experiments on 0.2 Per Cent. Vanadium, July 27 p 205
Heat Treatment of,* Nov 23 p 1140
Heat Treatment of Low-Carbon Nickel, July 27 p 195
Heat Treatment on Acid and Basic Open-Hearth of Similar Composition, July 6 p 25
Ingot Molds of, Oct 26 p 904
International Conference, July 13 p 74; July 20 p 144; Aug 3 p 252
Manufacture and Treatment of Tool, Dec 7 p 1238
Molybdenum, from the Electric Furnace, Sept 21 p 631
Nickel, 3 Per Cent., Aug 10 p 326
Production of Alloyed in 1910, Oct 5 p 713
Strength of, from Structural Shapes,* July 20 p 156

Study of Tires,* July 20 p 154
Swedish, Nov 9 p 1025
Titanium and Low-Carbon Basic,* Dec 14 p 1306
Stein, C. M.:
Case Hardening of Steel,* Nov 2 p 978
Sterling Equipment Company:
Air Economizer,* Oct 12 p 808
Sterling Machine Company:
Acme Automatic Engine,* Sept 7 p 531
Sterling Power Hack Saw Machine, Diamond New,* Sept 7 p 547
Stockbridge Machine Company:
Crank Motion,* Oct 5 p 760
Stock, Guy J.:
Process for Steel Castings,* Sept 7 p 524
Stoever-Treadwell Consolidation, Sept 28 p 664
Storage Battery for the Steel Mill, Oct 19 p 859
Storle Brass Globe Valve, Scully,* Oct 5 p 763
Stoughton, Bradley:
Annealing Steel Castings,* Sept 7 p 542
Straightener, Schlieper-Daae Universal,* Dec 28 p 1404
Strainers, Large Lagonda,* Sept 14 p 592
Stratton, H. F.:
Lifting Magnets in Foundries, July 13 p 92
Street, A. L. H.:
Judicial Decisions of Interest to Manufacturers, 'July 27 p 201; Aug 10 p 345; Aug 17 p 397; Aug 31 p 466; Sept 21 p 647; Oct 19 p 872; Nov 16 p 1093; Dec 21 p 1348
Strike Benefits, Machinists', Oct 26 p 898
Strikes, Insurance Against, Oct 5 p 710
Strode, Edward P.:
Packing Tool,* Sept 7 p 547
Stromberg Electric Company:
Chronograph,* Nov 16 p 1084
Structural Shapes, Strength of Steel from,* July 20 p 156
Sullivan, W. B.:
Tool Steel, Dec 7 p 1238
Sulphuric Acid Corrosion Test,* July 13 p 99
Sulphurs, Good Record in, Nov 23 p 1151
Sulphur Tests, Improvement in, Aug 17 p 363
Sun Power Company:
Solar Pumping Plant,* Sept 28 p 608
Superior Charcoal Iron Company:
Charcoal Pig Iron, Nov 2 p 983
Special Charcoal Pig Iron, Sept 7 p 509
Supply and Machinery Dealers' Meeting:
Papers to be Read, Oct 5 p 755
Proceedings, Oct 12 p 798
Supply and Machinery Manufacturers' Association, American:
Campaign to Increase Membership, Oct 19 p 865
Swank, James M.:
Production of Vanadium Steel in 1910, Oct 19 p 836
Sweden, Electrical Iron Smelting in,* Oct 12 p 804
Swedish Iron and Steel Statistics, Nov 2 p 980
Swedish Iron & Steel Corporation:
Hunts Swindlers, Aug 3 p 265; Sept 7 p 523
Swedish Iron Institute, July 27 p 198
Swedish Iron Ore, Imports of, Oct 26 p 887
Swedish Steels, Nov 9 p 1025
Sweetser, R. H.:
Great Iron-Making Nations, Dec 14 p 1296
Swiss Metal Industries, Lessons from the,* Oct 5 p 748
Switchboard, New Cutler-Hammer Crane,* Nov 16 p 1081
Symington, T. H., Company:
Core Room Conveyor System,* July 27 p 217
Systematic Versus Scientific Management, Aug 17 p 364

T.

Tabor Mfg. Company:
Molding Machine Patent Decision, Dec 14 p 1276
Tags for Factory Operating Systems, Sept 7 p 522
Tappers:
Garvin Automatic,* Aug 24 p 431
Garvin Two-Head Automatic,* Nov 23 p 1151
Taps, Little Giant Serial,* Oct 19 p 868
Tariff: Proposed Iron and Steel Changes, Aug 24 p 416
Tata Iron & Steel Company:
American Engineers for, Sept 21 p 623
First Furnace Blown in, Dec 7 p 1261
Tate, Jones & Co., Inc.:
Heat-Testing Furnaces, July 27, p 213
New Oil-Fired Flanging Furnace,* Dec 7, p 1243
Taxable Valuation of Michigan Iron Mines, Nov 9 p 1028
Taxation, New York City, Nov 30 p 1191
Tax, Proposed Michigan Corporate Excess, Dec 21 p 1333
Taylor Iron & Steel Company:
Tisco Manganese Steel Chain,* Oct 19 p 868
Taylor, N. & G., Company:
Improvements, Dec 14 p 1317
Selling Arguments for Tin Roofing, July 6 p 33
Telescope, Turret Equatorial,* Dec 21 p 1368
Temperature Pendants, Green, Nov 9 p 1042
Tempering, Problem in Steel, July 20 p 126
Temple, W. C.:
Testimony at Steel Investigation, Aug 17 p 366
Tennessee Coal, Iron & Railroad Company:
Convict Coal Miners, Dec 14 p 1277
Tennessee Rolling Works:
Dismantled, July 27 p 199
Kentucky Iron History, Sept 7 p 543
Terminals, Cargo Transference at Steamship, Nov 23 p 1151
Terre Haute, Indianapolis & Eastern Traction Company:
Electric Switching Locomotive,* Sept 28 p 694
Terry Steam Turbine Company:
High-Pressure Blower Set,* Nov 9 p 1040
Turbo-Cupola Blower,* Dec 28 p 1410
Testing Machine, Olsen Autographic Transverse,* Aug 3 p 277
Testing Materials, American Society for:
Action on Various Matters, Nov 9 p 1010
Convention Proceedings, July 6 p 20
Specifications for Steel Axles and Shafts, Aug 24 p 425
Year Book, Oct 19 p 869
Testing Materials, International Association for:
Sixth Congress Committee, Sept 28 p 665
Tests for Metals, 1909, July 13 p 90
Tests of Pulleys, Oct 26 p 920
Texas Lignites and the Use of Producer Gas in, Sept 28 p 676
Thiele, A.:
Ingot Molds of Steel, Oct 26 p 904
Thin-Lined Blast Furnace Construction, Dec 28 p 1400
Thomas Iron Company:
Annual Meeting, Sept 21 p 611
Thomas Meter Installations, Two, Aug 31 p 464
Thompson Electric Company:
Lamp Hangers for Mill Lights, Oct 19 p 860
Thompson Hanger Works:
Automatic Cut-Out Hanger,* Aug 17 p 388
Thompson, Henry E.:
New Molding Flask,* Dec 28 p 1415
Thomson Electric Welding Company:
New Electric Welder,* Aug 10 p 329
Thornton, George Q.:
Labor and Lower Prices for Commodities, Sept 7 p 504
Threading Machines:
New Landis,* Aug 3 p 280
Thyssen, Fritz:
Remarks at the Brussels Conference, Aug 31 p 448
Time Recorder, Stromberg Electric,* Nov 16 p 1084
Time Study Observations,* Nov 16 p 1090
Tin Plate:
And Sheet Association, Dec 28 p 1398
And Sheet Scale, July 6 p 42
Carnahan Genuine Charcoal Iron, Sept 7 p 549
Imports and Exports, Oct 12 p 782; Dec 14 p 1327
Tin Roofing, Selling Arguments for, July 6 p 33
Tires, Study of Steel,* July 20 p 154
Tisco Manganese Steel Chain, Taylor,* Oct 19 p 868
Titaniferous Iron Sands, Sept 7 p 537
Titaniferous Ores Used in the United States, Canada's, Oct 19 p 865
Titanium Alloy Mfg. Company:
Product of Titanium Steels This Year, Nov 2 p 982
Recent Experience with Titanium Rails, Sept 7 p 507; Oct 26 p 900
Titanium Alloys with and Without Aluminum, Nov 16 p 1056
Titanium and Low-Carbon Basic Steel,* Dec 14 p 1306
Titanium in Iron and Steel, Views on, Oct 26 p 903
Tobacco Trust Decision, Nov 16 p 1057
Toledo Bridge & Crane Company:
Special Coal Handling Crane,* Aug 10 p 321
Toledo Metal Stamping Plant, Acklin,* Sept 14 p 594
Toncan Metal:
Qualities, July 6 p 59
Unique Advertising Device Made of, Nov 2 p 959
Tool Steel, Manufacture and Treatment of, Dec 7 p 1238
Tools and Appliances, New, July 27 p 220; Aug 17 p 373; Aug 24 p 434; Aug 31 p 460; Sept 21 p 648; Oct 19 p 881; Nov 2 p 949; Nov 16 p 1103; Nov 23 p 1165; Dec 7 p 1271; Dec 21 p 1370
Topping, John A.:
Testimony at Steel Investigation, Aug 10 p 314
Town, F. E.:
Modern Types of Elevators,* Aug 17 p 376
Traction Engine, Holt Caterpillar,* Aug 10 p 334
Tractor Works at La Porte, Runnely Foundry,* Oct 26 p 906
Trademark Treaties, World, Sept 7 p 535
Trade Publications, July 13 p 86; Aug 17 p 397; Aug 24 p 445; Aug 31 p 459; Sept 7 p 520; Sept 21 p 640; Oct 5 p 735; Oct 19 p 873; Oct 26 p 931; Nov 2 p 987; Nov 9 p 1017; Nov 23 p 1125; Nov 30 p 1213; Dec 21 p 1371; Dec 28 p 1423
Trade School at St. Louis, Rankin Great, Dec 7 p 1252
Transformer, Westinghouse Improved, Sept 21 p 645
Transmission Gear, Sauer,* Nov 16 p 1081

Traps:
American Detroit Return,* Nov 10 p 1088
Moll, for Heating Plants, July 6 p 53
Nicholson Wyoming,* Nov 9 p 1041
Travel Recorder for Vehicles, Nov 23 p 1154
Treadwell Engineering Company:
Electric Steel Castings, Dec 21 p 1333
Treadwell-Stoever Consolidation, Sept 28 p 664
Trench, C. S., & Co.:
Hopeful Forecast, Sept 14 p 595
Triumph Electric Company:
Job Handling System,* Sept 21 p 638
Trucks, Motor, Dec 14 p 1314
Trust Prosecutions, Nov 16 p 1055
Trust Question, Constructive Programme on the, Dec 7 p 1233
Trusts, Problems of the, Nov 9 p 1026
Tube Works Consolidation, Scottish, Aug 10 p 317
Tuechter, August H.:
European Conditions, Oct 19 p 861
Tunnel Ventilating Plant, Notable,* Aug 31 p 493
Tupper, C. A.:
Economic Changes and Better Business, Sept 21 p 610
Heavy German Tools for Turbine Building,* Nov 9 p 1030
Lessons from the Swiss Metal Industries,* Oct 5 p 748
Pattern Handling in a Steel Foundry,* Aug 10 p 330
Selling American Machinery in Europe, Aug 3 p 262
Selling American Machine Tools in Europe, July 6 p 40
Turbine Building, Heavy German Tools for,* Nov 9 p 1030
Turret Equatorial Telescope,* Dec 21 p 1368
Twentieth Century Loose Pulley Oil Cup, American,* July 27 p 214
Twisting of Reinforcing Bars,* Sept 21 p 641

U.

Union Switch & Signal Company:
Another Plan for Stock-Owning by Employees, Aug 17 p 388
Union Tee, New Jefferson,* July 27 p 206
United States Arsenals, Scientific Management at, Nov 9 p 1022
United States Cast Iron Pipe & Foundry Company:
Annual Report, July 6 p 4
United States Motor Company:
Output, Aug 31 p 490
United States Steel Corporation:
And "Independent" Output, Nov 23 p 1127
Attitude of Buyers of Steel and Independent Manufacturers Toward Suit, Nov 9 p 1002
And Pittsburgh, Aug 17 p 381
Bonuses to Employees, Dec 28 p 1385
Cancellation of the Hill Ore Lease, Oct 26 p 884
Committee on Steel Works Labor Conditions, Nov 9 p 1026
Current Business, Aug 31 p 449
Disintegration, Sept 28 p 662
Electrical Equipment of Gary Coke Plant,* Dec 28 p 1406
Gary Sheet-Bar Mill,* July 13 p 102
Government Report on the, July 6 p 57
Great Northern Iron Ore Lease, Oct 19 p 854
Helps Its Competitors, Aug 24 p 402
Investigation, July 27 p 196; Aug 3 p 250; Aug 10 p 313; Aug 17 p 366
Labor Investigation, Oct 26 p 914
Largest By-Product Coke Oven Plant in the World, Dec 14 p 1311
Minnesota Steel Plant at Duluth,* Nov 30 p 1106
No Potential Monopoly, Nov 23 p 1107
Oil Pump House at Gary,* July 27 p 203
One Investigation Ended, Sept 14 p 585
Pacific Coast Selling Department, Sept 28 p 683
Percentage of Production for 1910, Aug 3 p 281
Plans for Duluth, Sept 21 p 626
Quarterly Statement, July 27 p 197; Nov 2 p 937
Sampling and Analyzing Cases, July 6 p 34
Stands on Its Record, Sept 28 p 665
Stanley Appeal to Prejudice, Nov 30 p 1160
Suit to Dissolve, Nov 2 p 934 and p 952
To Cancel the Hill Ore Lease, Oct 26 p 901
Unfilled Orders, July 13 p 96; Aug 17 p 350; Sept 14 p 578; Oct 12 p 797; Nov 16 p 1069; Dec 14 p 1277
Vast Growth of Assets, Sept 28 p 680
Upson Nut Company:
Sold to Bourne-Fuller Company, Nov 30 p 1182; Dec 7 p 1218
Steel Plant,* Nov 2 p 960

V.

Vaile-Kimes Company:
Motor-Driven House Pump,* Sept 14 p 597
Valves:
Bates Improved Corliss Gear,* Aug 24 p 432
Golden-Anderson Electrically Operated Stop,* Aug 10 p 335
Harrison Notable Departure in Relief,* Nov 16 p 1085
Jenckes Valve Gear,* Oct 12 p 810
Lagonda Automatic Cut-Off,* Sept 21 p 640
New List Prices for Iron Body Gate, Nov 2 p 977
Scully Storle Brass Globe,* Oct 5 p 763
Williams Cino Iron Body Gate,* Oct 19 p 871
Vanadium Steel, Experiments on 0.2 Per Cent., July 27 p 205
Van Dorn & Dutton Company:
New Portable Electric Drills,* July 20 p 158
Venezuela, Imataca Iron Deposit in, Aug 24 p 414
Ventilating Plant, Notable Tunnel,* Aug 31 p 493
Ventilation in Factory Heating, Aug 10 p 297
Ventilator, Burt,* Sept 28 p 693
Vessels for Panama and Pacific Trade, New, Oct 19 p 852
Vilter Mfg. Company:
Ammonia Compressor,* Sept 14 p 596
Late Features of the Corliss Engine,* Dec 7 p 1261
Virginia Iron, Coal & Coke Company.
Annual Report, Sept 28 p 681
Virginia Ore Development, Southwestern, Sept 28 p 681
Vises:
New Pratt & Whitney,* Aug 24 p 430
Schulz Tilting,* Aug 24 p 433
Vismera Steel Sheets, Aug 3 p 248
Vom Baur, C. H.:
Steel Castings from Electric Furnace,* July 20 p 148
Vulcan Crucible Steel Company:
High-Grade Steel, Oct 12 p 821

W.

Wages:
Amalgamated Scale Signers, July 20 p 143
And Hours in the Iron Industry, Aug 10 p 336
Sheet and Tin Plate Scale, July 6 p 42
Wagner Electric Mfg. Company:
New Single-Phase Electric Motors,* Nov 16 p 1080
Walker, Albert H.:
What the Sherman Law Forbids, Oct 19 p 837
Waltham Machine Works:
New Thread Miller,* Nov 30 p 1194
Ward Nail Company, July 6 p 5
Warrior Sight Feed, William,* Nov 9 p 1040
Warwick Iron & Steel Company:
To Be Leased by Eastern Steel Company, Dec 21 p 1333; Dec 28 p 1398
Washburn 15 In. Drill,* Dec 28 p 1410
Washburn Motor-Driven Drill,* Sept 28 p 701
Washburn Multiple Spindle Drill,* Oct 26 p 915
Waterbury Farrel Foundry & Machine Company:
Large Double-Acting Cam Press,* Oct 12 p 807
Water Cooler, New Power Specialty,* Nov 9 p 1034
Waterhouse, G. B.:
Ferrotitanium and Its Use, July 27 p 180
Titanium Alloys with and Without Aluminum, Nov 16 p 1056
Titanium and Low-Carbon Basic Steel,* Dec 14 p 1306
Water Softening, on a Large Scale, July 27 p 202
Watson, James, & Co.:
World's Production of Pig Iron, Aug 3 p 282
Webster & Perks Tool Company:
New Internal Combustion Engine,* Oct 12 p 820
Weiss Briquetting Process for Ores and Flue Dust, Nov 30 p 1185
Welder, New Thomson Electric,* Aug 10 p 329
Welding and Cutting Machine, Davis-Bournonville,* Aug 31 p 472
Welding, Autogenous, Not for the Weakened Structure, Oct 5 p 720
Welding Machine, Economy,* Nov 9 p 1037
Welding Machine, Oxy-Carbi New Portable,* Sept 21 p 628
Welds by Different Methods, July 27 p 200
Wells Bros. Company:
Little Giant Serial Taps,* Oct 19 p 868
Welsh Workers, American and German Steel Displaces, Aug 31 p 471
Wentworth Institute, Boston:
New Foundry and Mechanical School, Sept 28 p 699
Western Conduit & Mfg. Company, Dec 21 p 1366
Western Steel Corporation:
Bankruptcy, Nov 2 p 982
Bond Issue, Aug 17 p 351
Meeting of Creditors, Dec 14 p 1298
Receivership, Oct 19 p 852
Western Wheel Barrow & Mfg. Company:
New Plant, Sept 28 p 700
Westinghouse Air Brake Company:
Business, Sept 14 p 591
Westinghouse Electric & Mfg. Company:
Electric Switching Locomotive,* Sept 28 p 694
Important Electric Contracts, Sept 21 p 646
Improved Transformer,* Sept 21 p 645
Meeting, Aug 3 p 283
New Direct-Current Motor,* Aug 17 p 375
New Officers,* Aug 10 p 318
Steel Transformer Car,* Aug 3 p 278
West Penn Steel Company:
Improvements, Dec 14 p 1298
Wheel Guard, Ransom Emery,* Nov 2 p 982
Wheeling Corrugating Company:
Catalogue, July 13 p 96
Wheelwright, Thomas S:
Production of Wrought Iron, Dec 7 p 1218
White, Sir W. H.:
Fritz Medal Presented to, Nov 23 p 1147
Wiederholdt Construction Company:
Chimney,* Sept 28 p 689

Wiener Machinery Company:
Vogel & Scheinmann Self-Contained Sand-Blast Machinery, Nov 2 p 985
Willey Machine Company:
Motor-Driven Bench Drill, Sept 21 p 645
Motor-Driven Lathe Center Grinder,* Nov 2 p 969
Williams, D. T., Valve Company:
Cino Iron Body Gate Valve,* Oct 19 p 871
Warrior Sight Feed,* Nov 9 p 1040
Windsor Machine Company:
New Shops,* July 6 p 44
Winona Technical Institute, Sept 28 p 704; Dec 21 p 1360
Wire and Horseshoe Pool Cases, Aug 10 p 323
Wire and Rod Machines, New Philadelphia,* Nov 10 p 1082
Wire Brush, F. & M., New,* Nov 2 p 981
Wire Flattening Mill, August Schmitz,* Dec 21 p 1362
Wire Manufacturers Fined, July 27 p 181
Wire Specialty & Machine Works:
New Plant,* Oct 5 p 755
Wire Twisting Machine,* Oct 19 p 867
Wisconsin Bridge & Iron Company:
New Concrete-Steel Ore Dock, Nov 9 p 1041
Women in the Metal Trades, Nov 30 p 1189
Wood, Alan, Iron & Steel Company:
Charges Discrimination, Sept 14 p 578
Wood, Henry M.:
Shop System for Greater Output,* Aug 3 p 268
Woodbridge, Dwight E.:
Mining News, July 13 p 98
Mining Notes, Aug 3 p 264
Ore Railroad Hearing, July 20 p 147
Taxable Valuation of Michigan Iron Mines, Nov 9 p 1028
Woodbury & Co.:
Aerial Camera, Oct 19 p 880
Woodward Iron Company:
Buys Vanderbilt Furnaces, Nov 9 p 1021
Pig Iron Cost, Aug 10 p 319
Purchase of Birmingham Coal & Iron Company, Nov 16 p 1057
Worcester Gas Light Company:
Decision on Gas Producer Operation, Oct 12 p 818
Worcester Polytechnic Institute:
Aeroplane Propeller Testing Plant,* July 20 p 152
Improved Hydraulic Testing Plant, July 20 p 140
Washburn 15-In. Drill,* Dec 28 p 1410
Washburn Motor-Driven Drill,* Sept 28 p 701
Washburn Multiple Spindle Drill,* Oct 26 p 915
Works Improvements, Iron and Steel, Nov 16 p 1054
Works Management: Triumph Job Handling System, Sept 21 p 638
World's Production of Aluminum, Sept 7 p 567
World's Production of Coal, Nov 30 p 1158
World's Production of Pig Iron, Aug 3 p 282
World Trademark Treaties, Sept 7 p 535
Worth Brothers Company:
New Railroad, Nov 30 p 1201
Worthington, Henry R.:
High-Duty Pumping Engine,* Oct 5 p 704
Wrench, Gealy New Pipe,* Dec 28 p 1401
Wrought Iron and Rerolled Steel, Spheres of, Nov 30 p 1168
Wrought Iron, Production of, Dec 7 p 1218
Wrought Iron Versus Steel Pipe, Nov 30 p 1188
Wyoming Steam Trap, Nicholson,* Nov 9 p 1041

Y.

Yarnall-Waring Company:
Lea Recorder,* Dec 28 p 1404
Youngstown Industries More Active, Dec 7 p 1210
Youngstown Sheet & Tube Company:
Annual Meeting, Aug 3 p 267
Extensions in Recent Years,* Sept 21 p 630
Officers, Sept 14 p 578
Profit Sharing Plan, Aug 17 p 385; Aug 24 p 417

THE IRON AGE

Established 1855 — New York, July 6, 1911 — Vol. 88: No. 1

Published Every Thursday by the
DAVID WILLIAMS COMPANY
239 West 39th Street, New York

Entered at the New York Post Office as Second-Class Mail Matter

Subscription Price, United States and Mexico, $5.00 per Annum; to Canada, $7.50 per Annum; to Other Foreign Countries, $10.00 per Annum
Single Copies, 20 Cents.

W. H. Taylor, - - - - - - President and Treasurer
I. A. Mekeel, - - - - - - - First Vice-President
Harold S. Buttenheim, - - - - Second Vice-President and Secretary

Geo. W. Cope, - - - -
A. I. Findley, - } Editors
W. W. Macon, - -

Branch Offices

Philadelphia, Real Estate Trust Building
Pittsburgh, Park Building
Boston, Compton Building
Chicago, Fisher Building
Cleveland, American Trust Building
Cincinnati, 807 Andrews Building

CONTENTS

Pig Iron Production Declines 1
The Wage Scale Settlements 2
Railroad Earnings Fairly Good 2
The Use of Portland Cement 3
The Human Obstacle to Evolution 3
Wholesale Indictments of Business Men 4
United States Cast Iron Pipe & Foundry Company 4
Lewis Foundry & Machine Company Contracts 4
Foos Kerosene Engine Economy 5
The Ward Nail Company 5
Cambria Wire & Nail Catalogue 5
The American Car & Foundry Company's Year 5
June Pig Iron Production 6
Obituary 7
The Iron and Metal Markets ..... 8 to 18
Notes on Prices 19
Personal 19
The American Society for Testing Materials 20
The Davis-Bournonville Company's Increased Facilities 25
Heat Treatment on Acid and Basic Open Hearth Steel of Similar Composition 25
The Cincinnati Bickford Shops 26
The New Iroquois Blast Furnaces 30
Selling Arguments for Tin Roofing 33
New Bethlehem Blast Furnace Almost Completed 33
May Iron and Steel Exports and Imports 34
The American Blower Company's Monthly 34
The Brass Manufacturers' Meeting 34
Sampling and Analyzing Gases 34
An Interesting Crane Installation 35
Operation of Blast-Furnace Gas Engines 36
Selling American Machine Tools in Europe 40
A Book on Arc Lamp Operation 42
The Sheet and Tin Plate Scale 42
The New Queen City Crank Shaper 43
A New Geared Ratchet Lifting Jack 43
The Windsor Machine Company's New Shops 44
The Moll Steam Trap for Heating Plants 53
A Poppet Valve Engine 54
Chicago Engineers' Club New Quarters 56
The Government Report on the Steel Corporation 57
A Special Air Pump and Jet Condenser 58
A Combination Grinding Machine 59
Toncan Metal 59
A Portable Pipe Machine 59
The Machinery Markets ..... 60 to 69
Government Purchases 69

Pig Iron Production Declines

But Pig Iron Buyers Show More Interest

Improving Outlook for Last Half of the Year

Very complete reports from blast furnace operators to *The Iron Age* show an output in June of 1,787,566 gross tons of coke and anthracite pig iron in the United States, against 1,893,456 tons in May. The falling off was but 105,890 tons, although the month was a day shorter. The daily output in June was 59,585 tons, which is 1494 tons under the daily rate in May. This is the lowest production of any month since January, when the daily output was 56,752 tons. The furnaces in blast July 1 numbered 197, against 203 in blast June 1, and their estimated daily capacity was 59,979 tons, against 61,844 tons June 1. The decline in the June output was confined to the merchant furnaces. Those connected with steel plants maintained a daily rate of 42,708 tons against 42,270 tons in May. These figures substantiate the reports of an improvement in the steel trade in June, and it is expected that the July figures will show this tendency more strongly. The June figures added to those for previous months make an aggregate of 11,470,054 tons of coke and anthracite pig iron produced in the first half of the year. Adding an estimate of 160,000 tons for the charcoal pig iron made, the total for the half year is 11,630,054 tons, against 12,319,807 tons produced in the last half of 1910, according to the authentic statistics of the American Iron and Steel Association. The decline was thus a little over 5 per cent.

The indications for the coming half year are much more cheerful than were those of last January. While the production of pig iron has been declining, the volume of business in finished products as well as in pig iron has been increasing. The United States Steel Corporation worked up to 73 per cent. of its total steel ingot capacity last week, which represents about what is expected to be realized after the passage of the dullness of the first half of July due to stoppages for repairs and inventories. The past week witnessed the closing of another large contract for steel bars by a Western agricultural implement manufacturer. Several smaller contracts of the same character were placed in Ohio. The steel bar market seems firmly anchored on the 1.25c. Pittsburgh basis. The closing of the New York Subway agreement with the Brooklyn Rapid Transit Company means the early placing of contracts which will eventually require over 200,000 tons of steel. While deliveries will be spread over several years, the amount required each year will be of much importance to the steel trade. The city of Detroit will open bids July 11 on 11,000 tons of cast iron pipe.

The railroad consumption of iron and steel is likely to be much heavier in the coming quarter. Specifications for rails are coming in more freely, while good orders are being placed for locomotives and cars, with a much more active demand indicated for the latter in the near future. All interests connected with furnish-

ing railroad equipment or supplies are now talking more hopefully and confidently.

Reports from the various pig iron markets are becoming much brighter. In the Chicago market melters are inquiring generally for last half delivery with the demand for malleable iron prominent. In Cincinnati inquiries for pig iron are remarkably good. Cleveland reports that the demand for pig iron there shows more life than for months, and an inquiry is out for 6000 tons of basic. Pittsburgh reports that inquiries for basic iron there total 30,000 tons, while an inquiry is also in the market for 3000 tons of Bessemer. Basic pig iron is now firmer as the stocks held by scrap dealers have been sold and those middlemen are therefore out of the market. It is now quoted at $13.25 at Valley furnace, with some makers refusing to shade $13,50. Interest among consumers is reported to be broadening at Buffalo with a considerable increase in the number of inquiries. The Eastern markets also show a somewhat larger demand.

In connection with pig iron matters the fact must be noted that the independent blast furnaces of the Middle West increased their stocks of pig iron last month by 33,000 tons. This was due to a considerable extent to the increasing make of furnaces connected with some steel plants.

The improved condition of the iron trade is making itself felt in coke, for which the demand is much more active both from blast furnaces and foundries, and prices are therefore a little firmer.

Lake Superior iron ore shipments in June were 4,826,525 tons. Shipments up to July 1 were 8,810,354 tons. This is a falling off of slightly over 6,000,000 tons, as compared with the movement to July 1 last year.

The Wage Scale Settlements

Worthy of more than passing mention is the amicable settlement of certain mill wage scales for the twelve months beginning July 1. Sheet and tin plate scales were agreed to June 22 and the Republic bar iron scale June 28. The scales for the sheet and tin plate mills only apply to the works of such companies as recognize the Amalgamated Association, while the bar iron scale signed by the Republic Iron & Steel Company only relates to its mills working on iron. Quite a number of bar iron makers organized as the Western Bar Iron Association will be represented in conference with the Amalgamated Association at a meeting arranged for July 6, but it appears settled that those manufacturers will follow the example of the Republic Iron & Steel Company.

While these wage settlements affect a very small part of the capacity of the country's iron and steel finishing mills, they constitute that part of the trade in which wage scales are agreed upon at this time of the year. The fact that a harmonious adjustment has been reached is gratifying, as labor troubles are always unpleasant and involve both loss and inconvenience, but the further fact that the terms agreed upon continue the rates paid for the past year is highly interesting. It had been expected that the depression in trade and the decline in prices would so warrant a demand by manufacturers for a reduction in the rate of wages for the coming year that such a claim would not only be presented, but be emphatically insisted upon. Unquestionably the reduced prices for sheets and bar iron have seriously cut into the profits of manufacturers. In the case of tin plates prices have not been reduced, it is true, but if the depression in business should continue far into the last half of the year it might be necessary to make a cut in that branch also. The continuance of old rates of wages, however, appears to represent a belief among manufacturers that the slight turn for the better which has recently been apparent presages a more favorable state of trade in the near future.

Another fact stands out very clearly. Wage scales are no longer attacked when a depression in trade makes its appearance as was the case not so many years ago. In those days the pay roll was one of the first points to be considered when the necessity for retrenchment or a reduction in costs made itself felt. It might provoke difficulty and precipitate labor troubles, but chances were taken of such a result, as, if a reduction was effected, it was an easier and simpler way to cut down the cost of production than to study where economies could be secured in other directions. Managers have become more enlightened, more efficient and perhaps more sympathetic than was formerly the case, notwithstanding the impression that the corporate form of doing business leads to the elimination of personality.

Whatever may be the influences or considerations which have brought about this settlement of the wage scales for 1911-1912, the result attained must be a serious disappointment to those who have so persistently claimed that the liquidation imposed by the panic of 1907 must run its course until it included labor. If these wage scales had been cut down, that would have been claimed as an indication that the liquidation in labor was progressing. The movement downward, however, has evidently not acquired a sufficient impetus to carry every element of cost with it.

Railroad Earnings Fairly Good

The Bureau of Railway Economics, Washington, which is maintained by the railroads and makes a monthly presentation from statistics of railroad earnings identical with those which the Interstate Commerce Commission summarizes somewhat more slowly, has just issued its April chart, reducing railroad earnings to a per mile basis, which, of course, is the only fair method of comparison, because railroad mileage increases each year. The showing for the first four months of this year is not, on the whole, unsatisfactory. It is true that revenues, after January, have been slightly lower than a year earlier, but expenses have decreased almost as much, so that the decrease in net revenue, particularly for April, is not proportionately as great as the decrease in gross. The bureau's comparison is made only with the months of the preceding year. If we go back to earlier years we shall find the comparison quite favorable, for the first four months of this year, if they do not make an altogether pleasant showing with the same months of 1910, do make a distinctly favorable showing as compared with either 1909 or 1908. It is not possible to go back farther than July 1, 1907, when the uniform accounting system of the Interstate Commerce Commission went into effect.

We find that the gross revenue per mile of line in the first four months of this year averaged well above $900 per month, with the exception of February, a short month. This, as observed, was slightly below 1910, but above 1909 and far above 1908, when the average was not much above $750. Net revenue this year ranged from about $225 in January and February to between $275 and $300 in March and April, somewhat less than in 1910, practically identical with 1909 and much above 1908, which showed about $175 in

January and February and about $235 in March and April.

The argument of the railroads that they must have large surplus earnings in order that extensions may be made is not being taken altogether as much to heart by the public at large as formerly. The trend in current thought is rather directly toward economizing, and there is room for questioning the ultimate advantage of finding earnings in one place to invest in another place which cannot support itself. Of course a new line cannot be expected to be made to pay from the start, but it ought to be able to become a paying proposition at an early date; otherwise it is not in accordance with present day ideas of economy to build it.

Improvements upon existing lines have never been seriously in jeopardy. They are called for by increase in the traffic, and that increase in traffic is sure to produce the funds, irrespective of the curious doctrine offered last year in the advanced rate cases, that as traffic increased the cost per unit for conducting it increased. That the total freight traffic of the country is bound to increase apace, with few and slight backsets, is indubitable, and it is not conceivable that this should not, year by year, place the railroads in better and better position.

For handling the growing traffic, the railroads will from time to time require more cars and locomotives, and will wear out their rails faster. Those are the orders, rather than occasional large expenditures for extensions of lines, which in the long run will be most profitable to the iron and steel industry.

The Use of Portland Cement

Statistics of the production of Portland cement in 1910, just made public by the United States Geological Survey, show that in two years our production has increased by almost 50 per cent. As cement and iron have much in common commercially, it is interesting to study the production statistics. While last year's production was 75,699,485 barrels, it was only fifteen years ago that the output reached the dignity of seven figures. In 1880 the total made in the United States was estimated at 42,000 barrels, and in 1890 at 335,500 barrels, accurate returns showing the 1895 production to have been 990,324 barrels. The production since then is shown below, and we have computed the percentage of gain in each year over the preceding year in order to develop whether any uniformity in the rate of increase can be discerned:

Years.	Production, barrels.	Annual increase, per cent.	Years.	Production, barrels.	Annual increase, per cent.
1896....	1,543,023	56.0	1904....26,505,881		18.8
1897....	2,677,775	73.5	1905....35,246,812		33.1
1898....	3,692,284	37.9	1906....46,463,424		31.6
1899....	5,652,266	57.5	1907....48,785,390		5.0
1900....	8,482,020	50.2	1908....51,072,612		4.9
1901....12,711,225		50.0	1909....64,991,431		27.1
1902....17,230,644		35.7	1910....75,699,485		16.5
1903....22,342,973		29.5			

It is at once apparent that there has been a great decline in the rate of increase, comparing the early years in the table with the later years. This, however, was due to the special circumstance that Portland cement did not have the field to itself in the early years. What is known as natural cement was produced in large quantities for a while, the maximum production being reached in 1899, when the output was almost 10,000,000 barrels, or considerably more than the output of Portland cement. In the early nineties the production of Portland cement was negligible, the production of natural cement being fairly large. From about 1895 to about 1902 Portland cement was engaged largely in replacing natural cement, at the same time taking care of the increase in cement demand. The percentages from 1902 to date are therefore the only ones that need be considered, and here we see clearly a decline in the rate of increase, but even the most conservative view of the table indicates that the rate of increase must be described as very rapid. We all regard the rule of increase in pig iron production, a doubling every ten years, as showing a very rapid rate, yet that rate is maintained by each year's output being 7.2 per cent., not 10 per cent., in excess of that of the previous year. An increase of 7.2 per cent. would look small in the foregoing table, for the years 1907 and 1908 showed relatively insignificant gains, yet those gains were 5 per cent. The evidence of the table is that the rate of increase in the next few years is not likely to be less than from 10 to 15 per cent. per year, which annual rates of increase are equivalent to a doubling of production in from five to seven years.

A few years ago fears were entertained that the rapidly increasing use of concrete would seriously cut into the demand for steel. As for the increased use of cement having measurable effect on the steel industry as a whole, those fears were entirely unfounded. Take the year 1907, for instance. Its production of 48,785,390 barrels was equivalent to about 8,300,000 gross tons, which, with the most common proportions of sand and stone in structural work, would involve a total weight of concrete of perhaps 50,000,000 tons, only double the total production of pig iron in 1907, whereas it was clear that a great deal of concrete is not a remote competitor of steel. The remainder in 1907 was not an impressive tonnage proposition.

Experience of late has shown that the influence of concrete is to increase rather than decrease the consumption of iron and steel, for the reason that the availability of concrete at low cost tends to increase industrial activity along a number of lines, whereby reinforcing bars, sheet piling and various other forms of steel are in greater demand. Even last year's output of cement, 76,699,485 barrels, weighed only 12,800,000 gross tons, equal to the production of perhaps 75,000,000 tons of concrete, while pig iron production in the year was 27,300,000 tons. The proportion of cement to pig iron bids fair to increase year by year, but the growing use of cement will increase rather than decrease the use of iron and steel.

The Human Obstacle to Evolution

Since time was human frailty typified by selfishness has been a stone in the path of human progress. Opposition has sometimes been excusable. It was not to be expected that the gas works laborers of England could be made to foresee what the introduction of the electric light was going to do for mankind in general and even for them in particular. It was not to be expected that they could imagine the tremendous growth of the artificial illuminating gas business itself. It is charitable to acknowledge that he whose immediate well-being is threatened by the introduction of labor-saving machinery has justification for a pugnacious attitude in view of his limited horizon. But when selfishness arises among those in places of large responsibility and presumably in a position to apprehend large movements, palliation for their economic crime is hard to grant. This slavery to alleged fear of the other man's advantage once he knows our secret may long be with us, but as Kipling says: "They copied all they could follow, but they couldn't copy my mind."

This recurrence to an oft expressed theme is impelled by two notable presidential addresses, one by Henry Souther before the Society of Automobile Engineers, and the other by Dr. Henry M. Howe before the American Society for Testing Materials. Mr. Souther emphasized truly that only those standards can survive which are believed in. He agrees that it is not fair and indeed is rarely necessary to ask that all trade secrets be laid bare, but that sufficient knowledge may be imparted to allow for intelligent procedure —that all personal feeling and trade jealousy should be laid aside for the benefit of all concerned. Then true progress will proceed with less friction. Dr. Howe delivered an address of considerable length offering an outline of the high plane of operation which his society must follow to accomplish its own desires and prove of maximum usefulness to mankind. He dwelt at length on the unwillingness of men as a class to adopt any new thing, each fearing that some unforeseen result of the change may work him harm. One who really believes in himself and his goods, he emphasized, should welcome standards as a measure by which their superiority may be the more readily verified. "He is not really the one to dread the letting in of light, and the education of the public." The trend of the century, Dr. Howe adds, is away from the old piratical idea that the buyer is the seller's reasonable prey to the new idea that he is the seller's employer, but, to get a full measure of the responsibilities and duties which the manufacturer owes to the public, one ought really get a full copy of the address, which may shortly be obtainable in printed form from the society, Prof. Edgar Marburg, University of Pennsylvania, secretary. This has accomplished its mission if it has excited a desire to peruse Dr. Howe's study of the economic side of engineering progress.

Wholesale Indictments of Business Men

The sensation of the week was the announcement, June 29, that nine indictments had been found by a federal grand jury in New York City against officers of a large number of corporations and members of firms who are charged with participating in pools formed in June, 1908, and continued until November 1, 1909. Each pool formed the basis of an indictment, and the total number of individuals named in the indictment is 83. The pools or associations against which the proceedings are directed comprise the Horseshoe Manufacturers' Association, Bare Copper Wire Association, Rubber Covered Wire Association, Underground Power and Cable Association, Telephone Cable Association, Wire Rope Manufacturers' Association, Weatherproof and Magnet Wire Association, Lead Encased Cable Association and Fine Wire Magnet Association. In addition to the officers of manufacturing companies and members of firms, the supervisor of the several pools, Edwin F. Jackson, Jr., New York City, has also been indicted. The indictments set forth various meetings of the pool members in 1908, 1909 and 1910 as overt acts in the alleged conspiracy.

Among the persons indicted are officers and sales agents of the American Steel & Wire Company, subsidiary of the United States Steel Corporation and officers of other companies as follows: Old Dominion Iron & Nail Works Company, Bryden Horseshoe Company, Phœnix Horseshoe Company, Rhode Island Perkins Horseshoe Company, American Electrical Works, Ansonia Brass & Copper Company, Benedict & Burnham Mfg. Company, Coe Brass Mfg. Company, National Conduit & Cable Company, John A. Roebling's Sons Company, Standard Underground Cable Company, Crescent Belting & Packing Company, Habirshaw Wire Company, Hazard Mfg. Company, Phillips Insulated Wire Company, Broderick & Bascom Rope Company, A. Leschen & Sons Rope Company, Trenton Iron Company, etc.

A peculiarity of the indictments is that the corporations and firms interested have not been proceeded against, but the individuals who apparently have at one time or another represented them in the various pools. These pools or associations, it is alleged, did not proceed by verbal agreements but reduced to writing the rules which should govern them. It is charged that the regulation of prices and output was the purpose of the several associations. An intimation is further given through Washington news bureaus that the activities of the Department of Justice will not end with the evidence placed before the New York federal grand jury, but an effort will be made to ascertain if any officials of the United States Steel Corporation had guilty knowledge of any of the pooling agreements.

It is a most serious matter that so many individuals of great prominence in manufacturing and business circles, men of unquestioned high character and personal integrity, should have their reputations blemished by indictments. It is of course a long step from an indictment to a conviction. The Bache Review caustically characterizes these indictments as "merely a border skirmish in the contest which is being carried on against business by politics."

United States Cast Iron Pipe & Foundry Company

In the report of the United States Cast Iron Pipe & Foundry Company, for the year ending May 31, the income account is given as follows:

	1911	1910
Gross income from operations	$536,711	$636,711
Other income	93,798	66,580
Total income	$630,509	$703,291
Interest on P. & F. bonds	90,000	90,000
Net earnings	$540,509	$613,291
Reserve for improvements	41,140	54,900
Reserve for doubtful accounts	12,000	12,000
Balance	$484,369	$546,392
Amount transferred from reserve for additional working capital	250,000	200,000
Previous surplus	35,511	164,120
Total surplus	$769,880	$910,511
Preferred dividend	625,000	875,000
P. & L. surplus	$144,880	$35,511

The balance of $484,369 above given is equal to 3.38 per cent. on the $12,500,000 preferred stock as against 4.37 per cent. earned on the same stock last year. The general balance sheet, with a comparison with 1910, is as follows:

ASSETS.

	1911	1910
Cost of property	$24,984,860	$24,106,731
Treasury stock at cost	347,555	347,555
Bonds American Pipe & Foundry Company	611,913	611,543
Raw and unmanufactured materials	2,500,092	2,730,633
Accounts and bills receivable	3,020,324	3,349,557
Cash	382,790	363,109
Total	$31,047,559	$31,509,128

LIABILITIES.

Preferred stock	$12,500,000	$12,500,000
Common stock	12,500,000	12,500,000
A. P. & F. Co. bonds	1,500,000	1,500,000
Dividends declared	.....	.....
Accounts and bills payable	2,469,402	2,794,257
Reserve for additional working capital	1,800,000	2,050,000
Reserve for insurance fund	100,000	100,000
Reserve for doubtful accounts	33,276	21,360
Surplus	144,881	35,511
Total	$31,047,559	$31,509,128

At the annual meeting of the company, Colgate Hoyt, Jr., was elected a director to succeed David Giles, deceased.

Lewis Foundry & Machine Company Contracts.—The Lewis Foundry & Machine Company, Groveton, Pa., near Pittsburgh, has recently made shipments as follows: Pacific Coast Steel Company, San Francisco, Cal., one No. 3 roll lathe: Sweet Steel Company, Williamsport, Pa., one 9-in. mill with five stands, one No. 1 roll lathe, one 14-in. train with seven stands of rolls and two stands of pinions, and has contracts from the same company for two mill tables and drives and three cropping shears. Among other contracts under way is one from the Whitaker-Glessner Company, Wheeling, W. Va., for six 24-in. cold mills and gear drive and another from the Reeves Mfg. Company, Canal Dover, Ohio, for seven of finishing mills, three stands of cold mills, 56-in. squaring shear, roll lathe, 26-in. squaring shear, 48-in. steam doubler, four 36-in. doubling shears, etc. Operations in full over the next three months are insured, while the company is also figuring on considerable other work.

Foos Kerosene Engine Economy.—In an article now in preparation the Foos Gas Engine Company, Springfield, Ohio, will give data collected from actual power-plant experience with its engines operating on petroleum and distillates, showing remarkable reliability and economy. Comparison is made between the Foos engine using kerosene at 5 cents a gallon and a gasoline engine using 12 cent fuel. A 10-hour day with a 25 hp. oil engine at full load shows a fuel cost of but $1.55. A gasoline engine under the most favorable conditions, it is stated, would use 31¼ gal. of fuel, which, at 12 cents, would cost $3.75. A total saving for 300 working days would thus give the oil engine a lead of $660 a year. As a matter of fact, the advantage in favor of the oil engine is shown to be even greater. Kerosene can be bought as low as 4 cents and in many fields oils are available at 2¼ cents.

The Ward Nail Company.—It is the intention of the Ward Nail Company, which recently started its new plant at Struthers, Ohio, to limit its production for the present to large head roofing nails, and for a time its capacity will not be over 10 tons per day. The initial equipment will be five of the Ward pneumatic nail machines. In this type of machine compressed air is used for driving, and it promises to give very successful results. It is stated that all kinds of wire nails can be made on a Ward machine at a very high rate of speed, and large head nails can also be made successfully and quickly, while with the ordinary types of nail machines more or less trouble has been encountered in making large head nails.

The Linde Air Products Company, Buffalo, N. Y., has shipped a complete oxy-acetylene cutting plant, arranged for six operators, to the War Department for use in conjunction with the salvage of the Maine in Havana harbor. Much of the work involved is the cutting of 9-in. armor plate, in addition to the usual structural shapes. It is interesting to note that similar apparatus to this was used with signal success in connection with the removal of the debris of the Quebec bridge.

The Youngstown Vindicator, Youngstown, Ohio, publishes a special issue which contains a large number of exceedingly interesting articles relating to the great importance of the industries of that city. It gives a list of 735 separate and distinct articles which are made there by 92 incorporated companies and individual manufacturers, of which 28 are directly concerned in the iron and steel industry. Illustrated descriptions are presented of several of the most important manufacturing plants. Among the leading articles is one on the prevention of accidents in the large mills, showing the extent to which Youngstown manufacturers are adopting appliances for safeguarding their workmen. Additions which are now being made to the city's manufacturing industries are described, and its continued growth in manufacturing importance and population is confidently predicted.

Cambria Wire & Nail Catalogue.—The Cambria Steel Company, Johnstown, Pa., has just issued its new 1911 wire and nail catalogue. The publication is 3½ x 6½ in., 44 pages, with tables and illustrations covering fence wire, coil spring steel wire, Cambria barb wire, Cambria fence staples, bale ties, common nails, common and flooring brads, tin shing and casing nails, smooth and barbed box nails, etc. A copy may be had by addressing the Wire Sales Department.

The new lake freighter, the Col. J. M. Schoonmaker, the largest vessel on the lakes and said to be the largest bulk freighter in the world, was launched at the Ecorse yards of the Great Lakes Engineering Works July 1. This boat is one of two of similar size being built for the William P. Snyder interests of Pittsburgh. It is 617 ft. long, 64-ft. beam, and will have an ore-carrying capacity of 14,000 tons. The boat is named in honor of the vice-president of the Pittsburgh & Lake Erie Railroad.

The Tennessee Coal, Iron & Railroad Company has placed an order with the General Electric Company for four 18-ton a.c. locomotives. These will be 220-volt, three-phase, 25-cycle locomotives, and their service will consist chiefly of switching and placing cars in and about the company's plants at Ensley and Corey, Ala.

The American Car & Foundry Company's Year

The annual report of the American Car & Foundry Company for the fiscal year ended April 30, shows net earnings of $6,240,324, an increase of $515,226. After allowing for the preferred dividend the company had a balance of $2,134,789, equal to 7.01 per cent. on the $30,000,000 common stock, as against 6.63 per cent. earned on the same stock last year.

The income account of the year, compared with 1910, is as follows:

	1911	1910
Net earnings	$6,240,324	$5,725,098
Renewals, replacements, repairs, etc.	2,005,536	1,635,620
Balance applicable for dividends	$4,234,788	$4,089,478
Preferred dividend (7%)	2,100,000	2,100,000
Balance	$2,134,789	$1,989,478
Common dividend	600,000	600,000
Surplus	$1,534,789	$1,389,478
Maintenance and improvements	750,000	.....
Surplus	$784,789	$1,389,478
Previous surplus	23,952,556	22,563,078
P. & L. surplus	$24,737,345	$23,952,556

The general balance sheet as of April 30, 1911, compares with 1910 as follows:

ASSETS.	1911	1910
Cost property	$66,422,532	$66,156,522
Stocks, bonds other companies	1,098,785	701,869
Material on hand	3,196,577	1,867,238
Accounts and notes receivable	21,244,187	24,253,760
Cash	6,485,429	2,941,561
Bank certificates on deposit	1,000,000	.....
Total	$93,242,357	$100,867,967
LIABILITIES.		
Preferred stock	$30,000,000	$30,000,000
Common stock	30,000,000	30,000,000
Audited vouchers and payroll	3,923,611	12,050,224
Insurance reserve	1,000,000	1,000,000
Reserve for improvements, maintenance, etc.	1,028,606	628,167
Reserve for payment Wilmington plant	.....	500,000
Reserve for steel car plant	1,277,795	1,462,021
Surplus account	24,737,345	23,952,556
Dividends payable July	675,000	675,000
Reserve for common	600,000	600,000
Total	$93,242,357	$100,867,967

President Eaton reviewed the condition of the company's affairs, in part as follows: "Your company begins the fiscal year 1911-1912 with fewer cars on its books than it had at the beginning of the year 1910-1911. At the close of the fiscal year the railroads were not in the market for the purchase of new equipment in any considerable quantity. It is not to be assumed that this condition will continue without change.

"During the past year an additional shop at St. Charles has been finished and our all-steel passenger car plant at St. Charles is now practically complete. For this work and for additions to our plants at Berwick, Detroit, Chicago and Milton there was expended of our reserve for construction of and additions to steel car plants the sum of $434,225.

"During the year $500,000, representing the price agreed to be paid for the purchase of the real estate and buildings at Wilmington, has been expended for that purpose, and your company now owns that property in fee and free of all encumbrances. As an incident of this purchase your company acquired the entire outstanding capital stock of the Jackson & Sharp Company, the former owner of the Wilmington plant.

"A great deal of attention has been given to the building up of the export business. Due to various causes this field is one difficult of entry, but the company has had a fair measure of success in it in the past which, with proper effort, may be continued in the future. Several contracts for passenger cars for export were entered during the year, shipments under which have been commenced."

The McInnes-McCleary Foundry Company, composed of Colin McInnes and J. P. McCleary, succeeds the Wellsburg Foundry & Machine Company, Wellsburg, W. Va., making a specialty of glass house furnaces, lehrs, vanadium mold castings, etc.

Solomon Brothers, Knox street, North Side, Pittsburgh, dealers in iron and steel products, scrap, etc., recently purchased the equipment in the plants of the Crystal Glass Company, Bridgeport, Ohio, and Riverside Glass Works, Wellsburg, W. Va., and are dismantling the plants and selling the machinery.

June Pig Iron Production

Falls 1494 Tons a Day Under May Output

The Decline Confined to Merchant Furnaces

June, a 30-day month, shows an output of 1,787,566 gross tons of coke and anthracite pig iron in the United States, against 1,893,456 tons in the 31 days of May. The falling off was 105,800 tons, as compared with a decline in production of 171,630 tons in May. The daily output in June was 59,585 tons, which is 1494 tons under the daily rate of production in May. This is the lowest rate of any month of this year since January, when the daily output was 56,752 tons.

It is interesting to note that the decline in the June output was confined to the merchant furnaces. The furnaces connected with steel plants maintained a daily rate of production of 42,708 tons, against 42,270 tons in May. These figures substantiate the reports of an improvement in the steel trade in June. The July pig iron figures will doubtless show this tendency more strongly.

The collection of the June figures enables an estimate to be made of the total production of pig iron in the first six months of 1911. Our figures by months show an aggregate of 11,470,054 tons of coke and anthracite pig iron, to which an estimated production of 160,000 tons of charcoal pig iron is to be added, making a total of 11,630,054 tons, against 12,319,807 tons produced in the last half of 1910, according to the authentic statistics of the American Iron and Steel Association. This would make the falling off in the first half of this year a little over 5 per cent., as compared with the last half of last year.

Daily Rate of Production

The daily rate of production of coke and anthracite pig iron by months, beginning with June, 1910, is as follows:

Daily Rate of Pig Iron Production by Months--Gross Tons

	Steel works.	Merchant.	Total.
June, 1910	51,637	23,879	75,516
July	47,183	22,122	69,305
August	46,534	21,429	67,963
September	47,007	21,536	68,542
October	45,794	21,726	67,520
November	41,427	22,232	63,659
December	35,909	21,440	57,349
January, 1911	36,401	20,351	56,752
February	42,349	21,741	64,090
March	48,970	21,066	70,036
April	47,805	21,031	68,836
May	42,270	18,809	61,079
June	42,708	16,877	59,585

Capacity in Blast July 1 and June 1

The following table shows the daily capacity of furnaces in blast July 1 and June 1:

Coke and Anthracite Furnaces in Blast.

Location of furnaces.	Total number of stacks.	July 1. Number in blast.	July 1. Capacity per day.	June 1. Number in blast.	June 1. Capacity per day.
New York:					
Buffalo	17	12	4,056	12	4,049
Other New York	7	3	495	1	164
New Jersey	7	1	183	1	183
Spiegel	2	..	...	..	...
Pennsylvania:					
Lehigh Valley	24	11	1,976	13	2,497
Spiegel	3	2	145	1	75
Schuylkill Valley	16	6	1,468	6	1,429
Low. Susquehanna	7	3	611	3	616
Lebanon Valley	10	5	780	5	831
Pittsburgh district	80	35	14,367	35	14,717
Spiegel	3	2	340	1	158
Shenango Valley	20	7	2,368	8	2,618
West. Penn.	27	8	2,520	9	2,700
Maryland	4	3	706	3	728
Wheeling district	14	9	3,120	10	3,547
Ohio:					
Mahoning Valley	23	17	6,615	15	5,685
Central and North.	22	9	3,350	13	4,932
Hocking Val., Hanging Rock and S.W. Ohio	15	3	407	6	865
Illinois and Indiana	34	22	8,735	20	7,935
Mich., Wis. and Minn.	10	4	752	5	1,029
Colo., Mo. and Wash.	7	4	1,117	4	1,102
The South:					
Virginia	23	5	650	6	745
Kentucky	5	2	245	1	81
Alabama	46	16	4,148	17	4,335
Tenn. and Georgia	20	8	825	8	831
Total	416	197	59,979	203	61,844



Diagram of Daily Average Production by Months of Coke and Anthracite Pig Iron in the United States from January 1, 1907, to July 1, 1911; Also of Monthly Average Prices of Southern No. 2 Foundry Iron at Cincinnati and Local No. 2 Foundry Iron at Chicago District Furnace.

Chart of Pig Iron Production and Prices

The fluctuations in pig iron production from January, 1907, to the present time are shown in the accompanying chart. The figures represented by the heavy line are those of daily average production, by months, of coke and anthracite iron. The two other curves on the chart represent monthly average prices of Southern No. 2 foundry pig iron at Cincinnati and of local No. 2 foundry iron at furnace at Chicago. They are based on the weekly market quotations of *The Iron Age*. The two sets of figures are as follows:

Daily Average Production of Coke and Anthracite Pig Iron in the United States by Months Since January 1, 1907.—Gross Tons.

	1907.	1908.	1909.	1910.	1911.
January	71,149	33,518	57,975	84,148	56,753
February	73,088	37,163	60,976	85,616	64,000
March	71,821	39,619	59,232	84,459	70,036
April	73,885	38,289	57,962	82,792	68,836
May	74,048	37,603	60,753	77,302	61,079
June	74,486	36,444	64,656	75,516	59,585
July	72,763	39,287	65,763	66,305	.....
August	72,594	43,851	72,545	67,963	.....
September	73,783	47,300	79,507	68,426	.....
October	75,386	50,384	83,856	67,520	.....
November	60,937	52,595	84,917	63,659	.....
December	39,815	56,158	85,022	57,349	.....

Monthly Average Prices of Bessemer No. 2 Foundry Iron at Cincinnati and Local No. 2 Foundry at Chicago, Tidewater Furnace, Since January, 1907.

	1907.		1908.		1909.		1910.		1911.	
	Sou. No. 2, Cin.	Loc. No. 2, Chi.	Sou. No. 2, Cin.	Loc. No. 2, Chi.	Sou. No. 2, Cin.	Loc. No. 2, Chi.	Sou. No. 2, Cin.	Loc. No. 2, Chi.	Sou. No. 2, Cin.	Loc. No. 2, Chi.
Jan.	26.00	25.50	16.15	18.10	16.26	17.00	17.25	18.50	14.25	15.00
Feb.	26.00	25.50	15.75	17.81	16.13	16.40	17.06	18.50	14.25	15.00
Mar.	26.00	25.75	15.50	17.50	15.05	16.15	16.30	17.80	14.25	15.00
Apr.	25.76	26.00	15.20	17.38	14.25	16.15	15.37	17.00	14.25	15.00
May	24.25	26.50	14.75	17.28	14.50	16.15	15.00	16.56	14.00	13.00
June	24.10	26.25	15.25	17.38	14.70	16.15	14.85	16.25	13.50	15.00
July	23.85	25.20	15.00	17.20	15.75	16.65	14.75	16.06	.....	.....
Aug.	23.00	24.50	15.25	17.00	16.38	16.78	14.31	16.00	.....	.....
Sept.	21.50	23.75	15.65	16.70	17.35	18.35	14.25	15.90	.....	.....
Oct.	20.95	22.10	15.75	16.50	17.88	18.50	14.25	15.56	.....	.....
Nov.	19.50	20.31	16.00	16.75	17.75	18.50	14.25	15.50	.....	.....
Dec	17.00	18.55	16.25	17.00	17.45	18.50	14.25	15.50	.....	.....

The Record of Production

Production of Coke and Anthracite Pig Iron in the United States by Months Since January 1, 1907. Gross Tons.

	1907	1908	1909	1910	1911
Jan.	2,205,497	1,043,250	1,797,560	2,608,605	1,759,326
Feb.	2,045,068	1,077,740	1,707,340	2,397,254	1,794,509
Mar.	2,226,457	1,228,204	1,832,194	2,617,949	2,171,111
Apr.	2,216,558	1,149,602	1,738,877	2,483,763	2,064,086
May	2,295,505	1,165,688	1,883,330	2,390,180	1,893,456
June	2,234,575	1,092,131	1,930,866	2,265,478	1,787,566
July	2,255,660	1,218,129	2,103,431	2,148,442	.....
Aug.	2,250,410	1,359,831	2,248,930	2,106,847	.....
Sept.	2,183,487	1,418,998	2,385,196	2,056,275	.....
Oct.	2,336,972	1,567,198	2,599,541	2,093,121	.....
Nov.	1,828,125	1,577,854	2,547,508	1,909,780	.....
Dec.	1,234,279	1,740,912	2,635,680	1,777,817	.....

June Output by Districts

The table below gives the production of all coke and anthracite furnaces in June and the four months preceding:

Monthly Pig Iron Production—Gross Tons.

	February. (28 days)	March. (31 days)	April. (30 days)	May. (31 days)	June. (30 days)
New York	131,238	157,624	139,674	130,927	130,395
New Jersey	6,006	5,869	5,150	9,788	3,600
Lehigh Valley	56,367	69,263	78,182	79,731	72,787
Schuylkill Valley	57,321	67,634	55,305	46,827	44,039
Lower Susquehanna and Lebanon Val.	42,729	46,980	44,537	44,179	41,754
Pittsburgh district	424,517	531,521	488,447	422,000	415,519
Shenango Valley	86,908	109,799	109,239	88,170	78,196
West Penn	96,616	120,464	100,593	61,892	55,047
Maryland, Virginia and Kentucky	57,759	61,628	60,978	53,271	48,969
Wheeling district	95,571	135,775	119,489	115,213	93,617
Mahoning Valley	201,624	203,006	189,822	187,748	190,187
Central and North. Ohio	144,806	170,914	161,742	152,909	141,973
Hocking Valley, Hanging Rock and S.W. Ohio	32,396	35,173	27,084	27,185	20,245
Mich., Minn., Mo., Wis., Col., Wash.	61,406	69,741	76,379	71,938	54,391
Chicago district	155,498	213,638	236,550	238,424	249,666
Alabama	118,594	143,751	149,737	134,386	122,015
Tenn., Georgia and Texas	25,153	28,331	22,178	28,868	27,169
Total	1,794,509	2,171,111	2,065,086	1,893,456	1,787,566

The furnaces blown out in June or on July 1 included Carbon and one Bethlehem in the Lehigh Valley; one Steelton in the Lower Susquehanna district; Clinton and one Monongahela in the Pittsburgh district; one Shenango in the Shenango Valley; Rebecca and Perry in western Pennsylvania; Mattie in the Mahoning Valley; Emma, Upson and one Lorain in northern Ohio; one La Belle in the Wheeling district; Globe, Milton and the second Columbus in central Ohio; Belfont and Marting (banked) in southern Ohio; Citico in Tennessee; one Sloss in Alabama; and one Zug Island at Detroit, Mich.

Among the furnaces blown in in June were Standish and Genesee in New York; one Palmerton (spiegel) in the Lehigh Valley; one Steelton in the Lower Susquehanna district; one Cambria in western Pennsylvania; one Lucy (spiegel) at Pittsburgh; West End in Virginia; one Republic, one Ohio and one Youngstown in the Mahoning Valley; Norton in Kentucky, and two Illinois at South Chicago.

Production of Steel Companies

Returns from all plants of the United States Steel Corporation and the various independent steel companies show the following totals of product month by month. Only steel making iron is included in these figures, together with ferromanganese, spiegeleisen and ferrosilicon. These last, while stated separately, are also included in the columns of "total production":

Production of Steel Companies—Gross Tons.

	Pig.—Total production.—			Spiegeleisen and ferromanganese.	
	1909.	1910.	1911.	1910.	1911.
January	1,117,823	1,775,201	1,148,448	16,338	8,360
February	1,073,363	1,626,539	1,185,782	21,396	12,821
March	1,144,553	1,749,212	1,351,964	25,591	11,784
April	1,093,092	1,669,898	1,434,142	22,304	10,657
May	1,256,448	1,619,283	1,310,378	26,529	13,641
June	1,365,527	1,549,112	1,281,241	27,680	22,611
July	1,508,762	1,462,669	.....	22,924	.....
August	1,561,961	1,442,572	.....	25,756	.....
September	1,660,836	1,410,221	.....	15,151	.....
October	1,766,904	1,419,624	.....	8,500	.....
November	1,685,094	1,342,804	.....	9,083	.....
December	1,768,799	1,113,174	.....	12,178	.....

Obituary

HOWARD WOOD, president of the Alan Wood Iron & Steel Company, Philadelphia, Pa., died in the Bryn Mawr Hospital July 1, aged 66 years, following an operation. He had been in poor health for several months. He was connected with the company, which was founded by Alan Wood, Sr., from his boyhood. For a number of years he was manager of the Conshohocken Mills, and in 1886, when the company was incorporated, he was made its president. He was also interested in financial and other commercial concerns. He graduated from the University of Pennsylvania in 1864, and was a member of the Union League, Art and University clubs. He leaves three daughters and four sons.

AUGUSTUS WRIGHT MOTT, second vice-president of the J. L. Mott Iron Works, New York, died July 2, aged 50 years. He was the son of Jordan Lawrence Mott, president of the company which bears his name. The deceased was president of the Mott Haven Company, and was a member of the New York Athletic Club and the Larchmont Yacht Club.

HENRY PHILIP FIELD, former secretary and treasurer of the Celfor Tool Company, Chicago, died June 25 at the house of his son, William A. Field, general superintendent of the South Works, Illinois Steel Company.

The Standard Steel Company, Bedford, Ohio, has increased its capitalization from $40,000 to $100,000 to provide funds to increase its equipment and to increase its output of blue and polished sheets.

Effective July 1, the new flat rate on coke from the Upper and Lower Connellsville regions and from West Virginia to Chicago will be $2.50 per ton instead of $2.35 per ton for furnace coke and $2.65 per ton on foundry coke. The flat rate to Toledo will be $1.95 per ton, instead of $1.85 per ton on furnace coke and $2.25 per ton on commercial coke. The flat rate to Detroit will be $2.10 per ton, instead of $2 per ton on furnace coke and $2.25 on commercial coke. The freight rate of $1.05 per ton to Cleveland will not be changed.

The Morris County Traction Company, Morristown, N. J., has placed an order with the Westinghouse Electric & Mfg. Company, East Pittsburgh, Pa., for ten quadruple railroad motor equipments. The company has also received an order from the Marshall Traction Company, Marshall, Texas, for two double motor equipments. Foreign railroad motor business recently secured includes an order from Walter Brothers & Co., Rio de Janeiro, Brazil, for 15 double motor equipments.

The Iron and Metal Markets

A Comparison of Prices

Advances Over the Previous Week in Heavy Type. Declines in Italics.

At late, one week, one month and one year previous.

	July 5 1911.	June 28 1911.	June 7 1911.	July 6 1910.
PIG IRON, Per Gross Ton:				
Foundry No. 2, standard, Philadelphia	$15.00	$15.00	$15.00	$16.25
Foundry No. 2, Valley furnace	13.50	13.50	13.75	14.50
Foundry No. 2, Southern, Cincinnati	13.25	13.25	13.75	14.75
Foundry No. 2, Birmingham, Ala.	10.00	10.00	10.50	11.50
Foundry No. 2 local, at furnace, Chicago	15.00	15.00	15.00	16.75
Basic, delivered, eastern Pa.	14.50	14.50	14.50	15.75
Basic, Valley furnace	**13.25**	13.00	13.10	14.50
Bessemer, Pittsburgh	15.90	15.90	15.90	16.40
Gray forge, Pittsburgh	13.90	13.90	14.15	14.90
Lake Superior charcoal, Chicago	16.50	16.50	17.00	18.50
COKE, CONNELLSVILLE, Per Net Ton, at oven:				
Furnace coke, prompt shipment	**1.45**	1.40	1.45	1.60
Furnace coke, future delivery	1.60	1.60	1.70	1.80
Foundry coke, prompt shipment	**1.85**	1.80	1.75	2.15
Foundry coke, future delivery	2.10	2.10	2.00	2.25
BILLETS, &c., Per Gross Ton:				
Bessemer billets, Pittsburgh	21.00	21.00	21.00	25.00
Forging billets, Pittsburgh	26.00	26.00	26.00	30.00
Open hearth billets, Philadelphia	23.40	23.40	23.40	28.50
Wire rods, Pittsburgh	27.00	27.00	29.00	30.00
OLD MATERIAL, Per Gross Ton:				
Iron rails, Chicago	14.00	14.00	14.00	17.00
Iron rails, Philadelphia	16.50	16.50	16.75	19.00
Car wheels, Chicago	12.50	12.50	12.50	15.00
Car wheels, Philadelphia	13.00	13.00	13.00	14.50
Heavy steel scrap, Pittsburgh	13.00	13.00	13.00	15.00
Heavy steel scrap, Chicago	10.25	10.25	10.25	12.75
Heavy steel scrap, Philadelphia	13.00	13.00	13.00	14.25

FINISHED IRON AND STEEL, Per Pound:	Cents.	Cents.	Cents.	Cents.
Bessemer rails, heavy, at mill	1.25	1.25	1.25	1.25
Rolled iron rails, Philadelphia	1.27½	1.27½	1.27½	1.47½
Common iron bars, Pittsburgh	1.25	1.25	1.25	1.50
Common iron bars, Chicago	1.20	1.20	1.20	1.40
Steel bars, Pittsburgh	1.25	1.25	1.25	1.45
Steel bars, tidewater, New York	1.41	1.41	1.41	1.61
Tank plates, Pittsburgh	1.35	1.35	1.35	1.45
Tank plates, tidewater, New York	1.51	1.51	1.51	1.61
Beams, Pittsburgh	1.35	1.35	1.35	1.45
Beams, tidewater, New York	1.51	1.51	1.51	1.61
Angles, Pittsburgh	1.35	1.35	1.35	1.45
Angles, tidewater, New York	1.51	1.51	1.51	1.61
Skelp, grooved steel, Pittsburgh	1.25	1.25	1.30	1.50
Skelp, sheared steel, Pittsburgh	1.35	1.35	1.35	1.60

SHEETS, NAILS AND WIRE, Per Pound:	Cents.	Cents.	Cents.	Cents.
Sheets, black, No. 28, Pittsburgh	2.00	2.00	2.00	2.30
Wire nails, Pittsburgh	1.70	1.70	1.80	1.80
Cut nails, Pittsburgh†	1.60	1.60	1.60	1.75
Barb wire, galvanized, Pittsburgh†	2.00	2.00	2.10	2.10

METALS, Per Pound:	Cents.	Cents.	Cents.	Cents.
Lake copper, New York	12.87½	12.87½	12.75	12.75
Electrolytic copper, New York	12.62½	12.62½	12.50	12.50
Spelter, St. Louis	**5.60**	5.45	5.25	5.05
Spelter, New York	**5.80**	5.65	5.55	5.20
Lead, St. Louis	4.35	4.35	4.22½	4.25
Lead, New York	4.50	4.50	4.37½	4.40
Tin, New York	**45.40**	45.00	48.25	32.80
Antimony, Hallett, New York	8.75	8.25	8.75	8.12½
Tin plate, 100-lb. box, New York	$3.94	$3.94	$3.94	$3.84

† Two cents per 100 lb. delivery to purchasers in the Chicago district is also paid here.
‡ These prices are for largest lots of sheets.

Prices of Finished Iron and Steel f.o.b. Pittsburgh

Freight rates from Pittsburgh in carloads, per 100 lb.: New York, 16c.; Philadelphia, 15c.; Boston, 18c.; Buffalo, 11c.; Cleveland, 10c.; Cincinnati, 15c.; Indianapolis, 17c.; Chicago, 18c.; St. Paul, 32c.; St. Louis, 22½c.; New Orleans, 30c.; Birmingham, Ala., 45c. Rates to the Pacific Coast are 80c. on plates, structural shapes and sheets, No. 11 and heavier; 85c. on sheets, No. 12 to 16; 95c. on sheets, No. 16 and lighter; 65c. on wrought boiler tubes.

Structural Material.—I-beams and channels, 3 to 15 in., inclusive, 1.35c. to 1.40c., net; I-beams over 15-in., 1.45c. to 1.50c., net; H-beams over 8 in., 1.50c. to 1.55c.; angles, 3 to 6 in., inclusive, ¼ in. and up, 1.35c. to 1.40c. net; angles over 6 in., 1.45c. to 1.50c., net; angles, 3 in. on one or both legs, less than ¼ in. thick, 1.40c., plus full extras as per steel bar card effective September 1, 1909; tees, 3 in. and up, 1.40c., net; zees, 3 in. and up, 1.35c. to 1.40c., net; angles, channels and tees under 3 in., 1.40c., base, plus full extras as per steel bar card of September 1, 1909; deck beams and bulb angles, 1.65c. to 1.70c., net; hand rail tees, 2.45c.; checkered and corrugated plates, 2.45c., net.

Plates.—Tank plates, ¼ in. thick, 6¼ in. up to 100 in. wide, 1.35c. to 1.40c., base. Following are stipulations prescribed by manufacturers, with extras to be added to base price (per pound) of plates:

Rectangular plates, tank steel or conforming to manufacturers' standard specifications for structural steel dated February 6, 1903, or equivalent, ¼ in. thick and over on thinnest edge, 100 in. wide and under, down to but not including 6 in. wide, are 1.65c.

Plates up to 72 in. wide, inclusive, ordered 10.2 lb. per square foot, are considered sheet plates. Plates over 72 in. wide must be ordered 11 lb. thick on edge, or not less than 11 lb. per square foot, to take base price. Plates over 72 in. wide ordered less than 11 lb. per square foot down to the weight of 3/16 in. take the price of 3/16 in.

Allowable overweight, whether plates are ordered to gauge or weight, to be governed by the standard specifications of the Association of American Steel Manufacturers.

Gauges under ¼-in. to and including 3-16-in. on thinnest edge, extra	$0.10
Gauges under 3 16-in. to and including No. 8	.15
Gauges under No. 8 to and including No. 9	.25
Gauges under No. 9 to and including No. 10	.30
Gauges under No. 10 to and including No. 12	.40
Sketches (including all straight taper plates) 3 ft. and over in length	.10
Complete circles 3 ft. in diameter and over	.20
Boiler and flange steel	.10
Wrought iron and ordinary firebox steel	.20
Still bottom steel	.30
Marine steel	.40
Locomotive firebox steel	.50
Widths over 100 in. up to 110 in., inclusive	.05
Widths over 110 in. up to 115 in., inclusive	.10
Widths over 115 in. up to 120 in., inclusive	.15
Widths over 120 in. up to 125 in. inclusive	.25
Widths over 125 in. up to 130 in., inclusive	.50
Widths over 130 in.	1.00
Cutting to lengths or diameters under 3 ft. to 2 ft., inclusive	.25
Cutting to lengths or diameters under 2 ft. to 1 ft., inclusive	.50
Cutting to lengths or diameters under 1 ft.	1.55

No charge for cutting rectangular plates to lengths 3 ft and over.
Terms Net cash 30 days.

Sheets.—Makers' prices for mill shipments on sheets in carload and larger lots, on which jobbers charge the usual discounts for small lots from store, are as follows: Blue annealed sheets, Nos. 3 to 8, U. S. standard gauge, 1.40c.; Nos. 9 and 10, 1.50c.; Nos. 11 and 12, 1.55c.; Nos. 13 and 14, 1.60c.; Nos. 15 and 16, 1.70c. One pass, cold rolled, box annealed sheets, Nos. 10 to 12, 1.65c.; Nos. 13 and 14, 1.70c.; Nos. 15 and 16, 1.75c.; Nos. 17 to 21, 1.80c.; Nos. 22, 23 and 24, 1.85c.; Nos. 25 and 26, 1.90c.; No. 27, 1.95c.; No. 28, 2c.; Nos. 29, 2.05c.; No. 30, 2.15c. Three pass, cold rolled sheets, box annealed, are as follows: Nos. 15 and 16, 1.85c.; Nos. 17 to 21, 1.90c.; Nos. 22 to 24, 1.95c.; Nos. 25 and 26, 2c.; No. 27, 2.05c.; No. 28, 2.10c.; No. 29, 2.15c.; No. 30, 2.25c. Galvanized sheets, Nos. 10 and 11, black sheet gauge, 2c.; Nos. 12, 13 and 14, 2.10c.; Nos. 15, 16 and 17, 2.25c.; Nos. 18 to 22, 2.40c.; Nos. 23 and 24, 2.50c.; Nos. 25 and 26, 2.70c.; No. 27, 2.85c.; No. 28, 3c.; No. 29, 3.10c.; No. 30, 3.30c. All above prices are f.o.b. Pittsburgh, terms 30 days net, or 2 per cent. cash discount 10 days from date of invoice, as also are the following basic prices per square for painted and galvanized roofing sheets, with 2½-in. corrugations:

Gauge.	Painted.	Galvanized.	Gauge.	Painted.	Galvanized.
[illegible]	[illegible]	$2.40	23	$2.50	$3.50
28	$1.40	2.55	22	2.60	3.70
27	1.55	2.70	21	2.80	4.05
26	1.65	2.85	20	3.05	4.35
25	1.85	3.05	18	4.05	5.70
24	2.10	3.15	16	4.90	6.50

Wrought Pipe.—The following are the jobbers' carload discounts on the Pittsburgh basing card on wrought pipe, in effect from October 1:

Butt Weld.	Steel		Iron	
	Black.	Galv.	Black.	Galv.
1 to 1½ in.	73	61	40	43
½ in.	75	63	71	59
¾ to 1½ in.	79	69	74	65
2 to 3 in.	80	70	76	66
Lap Weld.				
2 in.	76	66	72	62
2½ to 4 in.	78	67	74	64
4½ to 6 in.	77	67	73	63
7 to 12 in.	75	59	71	55
13 to 18 in.	51½	..	..	..
Lap Weld, extra strong, plain ends, card weight.				
2 in.	75	69	71	65
2½ to 4 in.	77	71	73	67
4½ to 6 in.	76	70	72	66
7 to 8 in.	69	59	65	55
9 to 12 in.	64	54	60	50

THE IRON AND METAL MARKETS

Butt Weld, double extra strong, plain ends, card weight.				
⅛ in.	64	58	60	54
¼ to 1½ in.	67	61	63	57
2 to 3 in.	69	63	65	59
Lap Weld, double extra strong, plain ends, card weight.				
2 in.	65	59	61	55
2½ to 4 in.	67	61	63	57
4½ to 6 in.	66	60	62	56
7 to 8 in.	54	49	51	45
Plugged and Reamed.				
1 to 1½, 2 to 3 in. Butt Weld	Will be sold at two (2) points lower basing (higher price) than merchants' or card weight pipe. Butt or lap weld, as specified.			
2, 2½ to 4 in. Lap Weld				

The above discounts are for "card weight," subject to the usual variation of 5 per cent. Prices for less than carloads are three (3) points lower basing (higher price) than the above discounts.

Boiler Tubes.—Discounts on lap welded steel boiler tubes to jobbers in carloads are now as follows:

	Steel.
1¼ to 2 in.	65
2½ in.	67½
2¾ to 3 in.	70
3½ to 4½ in.	72½
5 to 9 in.	75
10 to 13 in.	62½

Less than carloads to destinations east of the Mississippi River will be sold at delivered discounts 1 to 2 points lower than for lengths 22 feet and under; longer lengths f.o.b. Pittsburgh. Usual extras to jobbers and boiler manufacturers.

Wire Rods and Wire.—Bessemer, open hearth and chain rods, $27. Fence wire, Nos. 0 to 9, per 100 lb., terms 60 days, or 2 per cent. discount in 10 days, carload lots, to jobbers, annealed, $1.50, galvanized $1.80; carload lots, to retailers, annealed, $1.55, galvanized $1.85. Galvanized barb wire, to jobbers, $2; painted, $1.70. Wire nails, to jobbers, $1.70.

The following table gives the prices to retail merchants on wire in less than carloads, including the extras on Nos. 10 to 16, which are added to the base price:

Fence Wire, Per 100 Lb.

No.	0 to 9	10	11	12 & 12 ½	13	14	15	16
Annealed	$1.65	1.70	1.75	1.80	1.90	2.00	2.10	2.20
Galvanized	1.95	2.00	2.05	2.10	2.20	2.30	2.70	2.80

Market and Store Wire in Bundles, Discount from Standard List.

Bright and Annealed:	
9 and coarser	80
10 to 18	80 and 10
19 to 26	80 and 10 and 5
27 to 36	80 and 5
Galvanized:	
9 and coarser	75 and 10
10 to 16	75 and 10
17 to 26	75 and 10
27 to 36	72½
Coppered or Liquor Finished:	
7 and coarser	75 and 10
10 to 26	75 and 10
27 to 36	70 and 10 and 5
Tinned:	
6 to 18	75 and 10 and 10

Iron and Industrial Stocks

NEW YORK, July 5, 1911.

Summer relaxation and government investigations are causing restriction in stock market transactions. While dullness thus prevails, stocks continue to show firmness. The range of prices on active iron and industrial stocks from Wednesday of last week to Monday of this week was as follows:

Allis-Chalmers, pref.	29	29		Railway Spring, com.	35	35
Beth. Steel com.	32¾	33¾		Republic, com.	30	30½
Beth. Steel, pref.	62	63		Republic, pref.	88	88
Can. com	10¾	10¾		Sloss, com.	48	50
Can. pref	84	85		Pipe, com.	16	17
Car & Fdry. pref.	116			Pipe, pref.	57	
Steel Foundries	41½			U. S. Steel, com.	73¾	
Steel Foundries, pref.	41½			U. S. Steel, pref.	117	118
Colorado Fuel	34½	34¾		Westg. Elec.	73	73½
General Electric	160	162		W. J. & C.	73	73½
Gr. N. Ore Cert.	60	60¼		Am. Ship. com.	48	48½
Int. Harvester, com.	112½	113¼		Chic. Pneu. Tool	50	51
Int. Pump, com.	41	43		Cruc. Steel	44	45
Int. Pump, pref.	84			Lake Sup. Corp.	25	26
Locomotive, com.	40½	41		Warwick		10
Nat. E. & St. com.	18	20¼		Cramp's Steel, com.		10
Nat. E. & St. pref.	96¾	97		Crucible Steel, pref.	81½	82
Pressed Steel, com.	36			Harb. Walk Ref., pr.	98	

Dividends

The Reece Buttonhole Machine Company, quarterly, 2 per cent., payable July 15.

The Reece Folding Machine Company, quarterly, 1 per cent., payable July 15.

The International Buttonhole Sewing Machine Company, quarterly 1 per cent., payable July 15.

The American Rolling Mill Company, quarterly, 3 per cent. on the common and 1¾ per cent on the preferred, payable June 30.

The Chicago Pneumatic Tool Company, regular quarterly, 1 per cent., payable July 25.

The National Fire Proofing Company, regular quarterly, 1 per cent. payable July 15.

Pittsburgh

PARK BUILDING, July 4, 1911.

The iron trade enters the month of July under much more favorable conditions than have existed for a long time. Indications are that the long-hoped-for improvement in trade has actually started. The heads of selling departments of a number of steel companies state that in the second half of June new orders and specifications showed a very material increase, and inquiries on nearly all kinds of material were much better. In June the rail and billet sales department of the Carnegie Steel Company showed an increase of more than 60,000 tons over May in actual orders and specifications sent to the mills. The structural steel and plate departments of the same company report an increase in June business over May of over 20 per cent. A very large amount of structural work and plates is now in the market. The new demand and specifications for sheets showed a large increase in June over May, and on two or three other lines increases in actual orders are reported. There is decided improvement in inquiries for pig iron and prices are firmer on basic. It is claimed that on present prices of ore and coke basic iron cannot be made and sold at a profit at $13 a ton, and in the past week several Valley furnaces have quoted $13.50 at furnace on inquiries and refuse to shade this business. The basic iron obtained by several scrap dealers in exchange for scrap has all been disposed of, and this has strengthened the market. New inquiries for foundry iron are quite active and several fairly large lots have been closed. The scrap trade is showing more life with prices ruling firm. The market on prompt furnace coke is also stronger, due to continued heavy purchases by a local consumer, which are now running upward of 2000 tons a day. This consumer makes its own coke, but owing to labor troubles at its mines up the Monongahela River it has not been able to mine any coal and is compelled to buy its supply of furnace coke.

Pig Iron.—More actual tonnage of pig iron has been sold in the past week than in any one week for some months and new inquiries are better and for larger tonnages. A radiator company at Johnstown, Pa., closed late last week for about 3000 tons of Northern No. 2 foundry iron for delivery over remainder of this year and another local consumer has closed for about 1500 tons of Northern No. 2 foundry for same delivery on the basis of about $13.50 at Valley furnace. An inquiry is in the market for 3000 tons of Bessemer iron for third quarter delivery and this is expected to be closed at slightly under $15 at Valley furnace. A sale is reported of 500 tons of forge iron for July and August at $13 Valley. Heavy inquiries for basic pig iron are in the market, and it is believed these amount to fully 30,000 tons or more. The Shenango Furnace Company will blow out its No. 1 stack at Sharpsville, Pa., for relining and improvements, while Tod furnace, of the Youngstown Steel Company, will probably go out this week. A sale of 200 tons of Bessemer pig iron is reported to have been made by a Valley furnace at $15 at furnace for July shipment. The average price of Bessemer iron in June was nominally $15 at Valley furnace, but half a dozen small sales were made by dealers at prices ranging from $14.75 to $14.85 at furnace. The average price of basic iron for June was $13.06 at Valley furnace, but actual sales were made below that figure last month. We quote as follows: Bessemer pig iron, nominally, $15; malleable Bessemer, $13.50; basic, $13.25; No. 2 foundry, $13.50 to $13.75; gray forge, $13, all at Valley furnace, the freight rate to Pittsburgh being 90c. per ton.

Steel.—Several of the large steel mills report that regular prices on Bessemer and open hearth billets, sheet bars and forging billets are being firmly maintained. A local interest reports a sale of 1000 tons of open hearth sheet bars for July and August at $22, Pittsburgh. We quote Bessemer and open hearth billets, 4 x 4 in., and up to but not including 10 x 10 in., $21, base, and sheet and tin bars in 30-ft. lengths, $22; 1½-in. billets, $22; forging billets, $26, base, usual extras for sizes and carbons—all prices being f.o.b. Pittsburgh or Youngstown district, with freight to destination added.

Ferromanganese.—Inquiries are reported for several fair sized lots of ferromanganese for delivery in third quarter, but most consumers are covered over remainder of the year. The increase in operations of the steel companies will mean an increased consumption of ferromanganese, and shipments to consumers are expected to be heavier in the near future than they have been for some time. A sale of three cars, or about 90 tons, is reported to a local consumer at $36.50, Baltimore. We quote foreign 80 per cent. at $36.50 with a

THE IRON AND METAL MARKETS

freight rate of $1.95 a ton for delivery in the Pittsburgh district.

Ferrosilicon.—There have been no sales in the past week and no new inquiries are reported, most consumers being covered for remainder of the year. We quote 50 per cent. at $51.50 to $52, Pittsburgh, for delivery over second half of the year; 10 per cent. blast furnace silicon, $22; 11 per cent., $24, and 12 per cent., $25, f.o.b. cars Ashland and Jisco furnaces.

Muck Bar.—A sale of 500 tons of standard grade muck bar to a local consumer for July delivery is reported on the basis of about $28.50 delivered. We quote best grades of muck bar made from all pig iron, at $28.50 to $29, Pittsburgh, one or two makers refusing to quote less than the latter price.

Skelp.—A little more new inquiry is noted, but several consumers will close down their plants for the next two weeks to take inventory and repairs and are holding up shipments until these have been completed. A sale of 1000 to 1200 tons of wide sheared iron plates for July and August delivery is reported at about 1.70c. delivered. We quote grooved steel skelp at 1.25c.; sheared steel skelp, 1.35c.; grooved iron skelp, 1.50c. to 1.60c., and sheared iron skelp, 1.70c. to 1.75c., usual terms, all for delivery at consumers' mills in the Pittsburgh district.

Wire Rods.—The recent reduction in prices of wire rods has brought out some new inquiry, and specifications against contracts are reported as being heavier. We note a sale of 500 tons of Bessemer rods and one of 750 tons of open hearth rods for delivery over the next four months on the basis of $27, Pittsburgh. We quote Bessemer, open hearth and chain rods at $27, Pittsburgh.

Steel Rails.—A Southern railroad is in the market for 25,000 tons and the Texas Pacific is expected to close this week for 16,000 tons. In the past week the Carnegie Steel Company received new orders and specifications for 2500 tons of light rails and also sold a sufficient quantity of Duquesne rail joints to lay about 25,000 tons of rails for a leading Eastern trunk line. The Cambria Steel Company has taken an order for 7,000 tons of standard sections for the Baltimore & Ohio Railroad. Prices on light rails are as follows: 12-lb. rails, 1.25c.; 16, 20 and 25-lb., 1.21c. to 1.25c.; 30 and 35-lb., 1.20c., and 40 and 45-lb., 1.16c. The prices are f.o.b. at mill, plus freight, and are the minimum of the market in carload lots, small lots being sold at a little higher price. Standard sections are held at 1.25c per pound.

Structural Material.—A good deal of new work has been closed and a very large tonnage is pending. The McClintic-Marshall Construction Company has received 1700 tons additional steel for bridges for the Western Maryland Railroad and 500 tons of bridge work for a southern road. This company has also taken 1800 tons of steel for new buildings for the American Sugar Refining Company of Brooklyn, N. Y. Bids on the Kansas City Terminal requiring 14,000 tons of steel have been postponed until July 12. It is estimated that 150,000 tons of steel will be required for new work coming up in Cincinnati. This includes a new Union Station, elevated tracks and other work, and is expected to come out before long. Bids will be asked for in July on the steel for the Point Bridge in this city about 1500 tons. The Henry Shenk Company is the lowest bidder on a large new hotel at Erie, Pa., which will take 1200 to 1500 tons of steel. Prices on fabricated work are reported firmer and several leading concerns report they are asking higher figures. We quote beams and channels up to 15-inch at 1.35c., Pittsburgh.

Plates.—The Pressed Steel Car Company has an order from the Louisville & Nashville Railroad for 500 steel underframes, the Bettendorf Steel Axle Company an order for 250 steel underframes and the Mount Vernon Car Mfg. Company, Mt. Vernon, Ill., an order for 250 steel underframes, all for the Louisville & Nashville Railroad for 1000 box cars which this road will build at its own shops at Louisville, Ky. The Cambria Steel Company has received an order for 200 steel hopper cars of 100,000 lbs. capacity for the Cambria & Indiana Railroad, and the Western Steel Car & Foundry Company has an order for 1000 steel underframes to be used in building 1000 box cars for the Northern Pacific Railroad, which that road will build in its own shops. The Canadian Car & Foundry Company has an order for 1000 box cars for the Grand Trunk Railway. The Erie Railroad is in the market for about 4000 cars of six different types and the steel car companies are now figuring on this inquiry. The Boston Elevated has an inquiry out for 50 steel car bodies, the Montreal Street Railway Company for 25 and the Frisco system is in the market for 35 steel passenger cars. The 4000 tons of plates for the Los Angeles aqueduct, for which the Treadwell Construction Company, Midland, Pa., has the contract, will be rolled by a local mill. Leading plate mills are now operating to larger capacity than for some time. We quote ¼-in. and heavier plates at 1.35c., Pittsburgh.

Sheets.—In the last two weeks in June more new orders and specifications against contracts for black, galvanized and roofing sheets were placed than in any similar period for a long time. The leading sheet makers report that new orders are steadily increasing and specifications against contracts are coming in more freely. The American Sheet & Tin Plate Company is now operating to about 65 per cent. of capacity and expects to put on more sheet mills in the near future The independent sheet mills are also operating to larger capacity and the whole sheet trade is in more satisfactory condition than for some time. The settlement of the sheet and tin plate scales with the Amalgamated Association precludes any labor troubles this year. On a previous page is given the full schedule of prices now in effect on black, galvanized and roofing sheets.

Tin Plate.—Very few new contracts for tin plate are being made, as this is the dull season, but specifications against contracts received in the last two weeks in June were heavier than in the first half. Some of the independent tin plate mills are running to nearly full capacity and as the independent tin plate mills have made a settlement of the tin plate scale with the Amalgamated Association there will not be any labor troubles in the tin plate mills this year. A few mills have closed down for inventory and repairs, but will start again as soon as these have been finished. It is estimated that about 65 per cent. of the tin plate capacity is active at present. We quote 100-lb. cokes, 14 x 20, at $3.70 per base box f.o.b. Pittsburgh.

Bars.—Makers of steel bars state that during this month they expect to secure a number of large contracts for steel bars from implement makers that have not as yet covered their requirements for the year beginning July 1. A fair amount of new tonnage has been placed in contracts, but it is very much less than usual at this time of the year. Makers of iron bars report a slight increase in new orders, but specifications are unsatisfactory. We quote steel bars at 1.25c. and common iron bars at 1.25c. to 1.30c., Pittsburgh.

Rivets.—New orders and specifications for rivets in the last two weeks in June were heavier than the first half of that month. There is a good deal of new inquiry and makers anticipate that considerable tonnage will be placed this month. We quote structural rivets at 1.70c. to 1.75c. and boiler rivets at 1.80c. to 1.85c., these prices being shaded only on most desirable orders.

Wire Products.—New orders for wire nails and wire continue to be confined to small lots to cover actual needs and specifications against contracts are dull and unsatisfactory. It is believed that July and August will be very quiet months in the wire trade, but an increase in new demand is expected early in September. We quote galvanized barb wire at $2 per 100 lb.; painted, $1.70; annealed fence wire, $1.50; galvanized, $1.80; wire nails, $1.70, and cut nails, about $1.60, f.o.b. Pittsburgh, full weight added to point of delivery. The quotation of $1.60 on cut nails might be shaded on a desirable order.

Spikes.—Spike makers report that new orders from the railroads are mostly for small lots for repair work. We quote railroad spikes at $1.50 base per keg for standard sizes f.o.b. Pittsburgh, the usual extras being charged over this price for odd sizes.

Shafting.—New orders and specifications for shafting continue to be confined to small lots to cover actual needs, and shipments by the makers in June were only fairly heavy. The implement makers are expected to commence to specify more liberally against their contracts about August 1, and it is believed that within a short time regular demand will be better. Stocks in the hands of jobbers and consumers are reported as unusually low. Regular discounts on shafting remain at 60 per cent. off in carloads and 55 per cent. in less than carloads, but on desirable orders these discounts are still being shaded.

Spelter.—Prices have shown a further decline during the week. We quote prime grades of Western spelter at 5.50c. East St. Louis, equal to 5.62½c. Pittsburgh.

Hoops and Bands.—Specifications against contracts for hoops and bands in the last two weeks in June are reported as having been slightly better than in the first

THE IRON AND METAL MARKETS

half, but the new demand continues to be confined to small lots to cover actual needs. We quote hoops at 1.40c. and bands at 1.25c., extras on the latter as per the steel bar card.

Merchant Steel.—A leading mill reports that its shipments against orders and specifications in June exceeded May by nearly 25 per cent. New orders are reported a little better and specifications are said to be coming in more freely. Quotations, which, however, are being shaded, are as follows: Iron finished tire, ½ x 1½ in. and heavier, 1.40c., base; under these sizes, 1.55c.; planished tire, 1.60c.; channel tire, 1.80c., base; toe calk, 1.90c.; flat sleigh shoe, 1.55c.; concave or convex, 1.75c.; cutter shoes, tapered or bent, 2.25c.; spring steel, 2c.; machinery steel, smooth finish, 1.90c.

Merchant Pipe.—New orders for merchant pipe are only fairly satisfactory, the actual tonnage entered by a number of the leading pipe mills in June having been less than in May. No large gas or oil lines are in the market, with the exception of one project for taking natural gas from the western Virginia fields to Detroit, Mich., and which if it goes through will require upward of 300 miles of large pipe. Regular discounts in effect on iron and steel pipe are given on a previous page.

Boiler Tubes.—The market on boiler tubes continues in very unsatisfactory condition, both from the standpoint of new demand and prices. Regular discounts continue to be more or less shaded.

Iron and Steel Scrap.—A number of finishing mills that are fairly large users of scrap closed down their plants June 30 for inventory and repairs and this will restrict consumption of scrap for the time being. An embargo has also been placed on scrap destined for Monessen, Pa., but this is expected to be lifted this week. The tone of the scrap market is firmer, but consumers have fairly large stocks and are inclined to hold off buying until these have been materially reduced. We note sales of about 1000 tons of heavy steel scrap for July shipment at $13 to $13.25 delivered in the Pittsburgh district; a sale of 500 tons of cast iron borings at $8.85 delivered, and a sale of 1000 tons of machine shop turnings at $9.15 delivered. Dealers are now quoting per gross ton, f.o.b. Pittsburgh, as follows:

Heavy steel scrap Steubenville, Follansbee, Sharon, Monessen and Pittsburgh delivery	$13.00 to $13.25
No. 1 foundry cast	13.25 to 13.50
No. 2 foundry cast	12.75 to 13.00
Bundled sheet scrap, f.o.b. consumers' mill, Pittsburgh district	10.75 to 11.00
Rerolling rails, Newark and Cambridge, Ohio, Cumberland, Md., and Franklin, Pa.	13.50 to 13.75
No. 1 railroad malleable stock	12.00 to 12.25
Grate bars	10.50 to 10.75
Low phosphorus melting stock	16.00 to 16.25
Iron car axles	23.75 to 24.00
Steel car axles	18.50 to 18.75
Locomotive axles	23.00
No. 1 busheling scrap	12.00 to 12.25
No. 2 busheling scrap	8.50 to 8.75
Old car wheels	13.50 to 13.75
Sheet bar crop ends	15.50 to 15.75
*Cast from borings	8.75 to 9.00
*Machine shop turnings	9.00 to 9.25
Old iron rails	15.00 to 15.25
No. 1 wrought scrap	14.25 to 14.50
Heavy steel axle turnings	10.00 to 10.25
Stove plate	10.50 to 10.75

*These prices are f.o.b. cars at consumers' mill in the Pittsburgh district.

Coke.—The demand for spot furnace coke has been very active in the past two or three weeks, due to the fact that a local blast furnace interest that mines its own coal up the Monongahela River, and makes it into coke in the Pittsburgh district, has had serious labor troubles at its coal mines, which have been shut down for several weeks. This concern started out by buying from 800 to 1000 tons of spot furnace coke per day, and has lately run its purchases up to 2000 tons a day. The company will not buy any furnace coke that is not guaranteed running under 1 per cent. in sulphur, and as a consequence it has been paying from $1.50 to $1.55 per ton at oven for all the coke it has bought. Some large inquiries are in the market for foundry coke, but they are slow in being closed. The Westinghouse Electric & Mfg. Company has inquiries out for about 5000 tons of foundry coke, shipments July 1 to April 1, for its East Pittsburgh, Allegheny and Cleveland, Ohio, foundries. We note a sale of 800 tons of standard foundry coke for delivery over July and August at $2.15 per net ton at oven to the consumer, and another sale of 1200 tons for delivery over remainder of the year at the same price. The output of coke last week in the Upper and Lower Connellsville regions was 273,422 tons, an increase over the previous week of nearly 2500 tons. It is believed that the worst of the depression in the coke trade is over. We quote best grades of furnace coke for prompt shipment at $1.45 to $1.50; for July and August, $1.55 to $1.60, and for last half of the year, $1.60 to $1.65, all per net ton at oven. We quote standard makes of 72-hour foundry coke for spot shipment at $1.85 to $2 and for last half of the year at prices ranging from $2.10 up to $2.40 per net ton at oven. Some grades of furnace and foundry coke lower in quality than the above are offered at lower prices.

Cleveland

CLEVELAND, OHIO, July 4, 1911.

Iron Ore.—The market continues lifeless. Furnacemen who will need some additional ore to make their supply sufficient to the opening of navigation next year are in no hurry to buy, as they expect to be able to get all the ore they want by coming into the market quite late in the season. Few buyers who will need a small tonnage have as yet placed contracts for their requirements. Ore stocks in furnace yards are still generally quite large and many consumers will be able to get along without any additional tonnage, unless the demand for pig iron improves very materially during the next few weeks. More vessels were placed in commission this week, but the condition of the lake trade is still quite unsatisfactory. We quote prices as follows: Old range Bessemer, $4.50; Mesaba Bessemer, $4.25; old range non-Bessemer, $3.70; Mesaba non-Bessemer, $3.50.

Pig Iron.—The market shows more life than for several months. Inquiries for foundry grades have become quite active during the past few days and a moderate buying movement is expected from foundries in this territory. These inquiries are mostly for lots of 500 to 600 tons and under for the last half delivery, although some are for the third quarter only. The demand is for both Northern and Southern grades. Local furnaces have submitted bids on an inquiry from the United Steel Company, Canton, Ohio, for 6000 tons of basic for delivery, 1000 tons a month, during the last half. A heating boiler manufacturer in Canton has purchased 400 tons of Northern and 500 tons of Southern iron for the last half, and the sale of two other 600-ton lots of Southern iron for the same delivery are noted. The Southern sales were made on the basis of $10.25, Birmingham, for the last half. A Cleveland foundry is in the market for 1500 tons of No. 1 Southern for the last half. An inquiry from a Lansing, Mich., automobile manufacturer is for 2500 tons of Northern and Southern analysis iron for the last half, and a Michigan implement manufacturer wants 1000 tons of Southern for the same delivery. While prices on foundry grades are unchanged at $13.50 to $13.75 Valley furnace, for No. 2 some producers are adhering to a $14 quotation. For prompt shipment and for the last half we quote, delivered Cleveland, as follows:

Bessemer	$15.90
Basic	14.00
Northern foundry, No. 2	14.25
Gray forge	13.25
Southern foundry, No. 2	$14.35 to 14.85
Jackson Co. silvery, 8 per cent. silicon	17.50 to 17.75

Coke.—The demand for foundry grades has become quite active. Many consumers who had contracts that expired July 1 waited until these contracts were on the verge of expiring before coming into the market. This resulted in the placing of considerable tonnage for the last half in the past few days. Furnace coke is quiet. We quote standard Connellsville furnace coke at $1.45 to $1.50, per net ton at oven for spot shipment, and $1.60 to $1.70 for the last half. Connellsville 72-hr. foundry coke is held at $1.85 to $2.15 for spot shipment and $2.15 to $2.40 for the remainder of the year.

Finished Iron and Steel.—Reports from sellers are all very encouraging. Prices on steel bars have become firmer and some buyers who have been holding off in the hope of getting concessions are closing contracts on the 1.25c. basis. The demand for plates has improved and that for structural material is quite active. Contracts for a considerable tonnage of plates and structural shapes for delivery until January 1 have been placed the past few days by structural shops, which, in this territory, are now comfortably filled with work. While the leading producers are maintaining plate prices some of the smaller mills making the narrow sizes are continuing their former policy of selling at $1 a ton below the regular market price. Current orders and specifications on steel bar, plate and shape contracts are fairly good. While they are generally for small lots they average a larger tonnage than for

THE IRON AND METAL MARKETS

some time. In structural lines considerable new work is being figured, but no new contracts of any size are reported. The demand for sheets is only moderate, although quite a few contracts are being placed for the last half. Several of the mills are taking contracts at the regular price, but with their mill instead of Pittsburgh as the basic point, which amounts to a maximum price concession of $1 a ton in this territory. There is a fair demand for shafting, but prices are weak, regular quotations being shaded considerably. The demand is moderate for forging billets in car lots, on which regular prices are maintained. The demand for iron bars is light. Prices are unchanged at 1.25c. to 1.30c. at mill.

Old Material.—The market has improved slightly and has a firmer tone than for some time. Two local consumers are in the market for steel making scrap for future delivery, and one of them has contracted for considerable tonnage in the week. Local mills are paying about $11.75 for heavy steel, which is an advance of about 50 cents a ton over what they have been paying recently. Some small lots on cars that dealers were anxious to move went at about $11.50. While sellers do not look for much demand the next few weeks they expect more activity at the end of the month and firmer prices. The railroad lists this week include indefinite tonnages offered by the Erie Railroad, to close July 5, and by the Pennsylvania Lines West, to close July 6. Dealers' prices per gross ton, f.o.b. Cleveland, are as follows:

Old steel rails, rerolling	$13.00 to $13.50
Old iron rails	15.00 to 15.50
Steel car axles	17.50 to 18.00
Heavy melting steel	11.50 to 12.00
Old car wheels	11.50 to 12.00
Relaying rails, 50 lb. and over	22.50 to 23.50
Agricultural malleable	10.75 to 11.00
Railroad malleable	11.00 to 11.50
Light bundled sheet stock	8.00 to 8.50

The following prices are per net ton, f.o.b. Cleveland:

Iron car axles	$21.00 to $21.50
Cast borings	6.25 to 6.50
Iron and steel turnings and drillings	6.50 to 6.75
Steel axle turnings	8.00 to 8.50
No. 1 machinery	9.50 to 10.00
No. 1 railroad wrought	11.50 to 12.00
No. 1 cast	11.25 to 11.50
Stove plate	9.50 to 10.00
Bundled tin scrap	11.00 to 11.50

Cincinnati

CINCINNATI, OHIO, July 3. 1911.

Coke.—There is no activity in this territory in furnace coke, although the Eastern inquiries reported last week are still open. Some foundry contracting is going on, and there is considerable foundry coke business yet to be placed, although the majority of foundrymen have covered for a last half supply. Prices remain the same as previously quoted, but foundry coke shows more firmness in all three fields, and is quotable, for prompt shipment, around $2 to $2.15, with the future contract price on several brands running as high as $2.35 per net ton at oven. Furnace coke remains weak at $1.40 to $1.55 for prompt shipment, but extended delivery contracts call for an advance of about 15c. per ton over the last-named figure.

Finished Material.—One bright spot in the general business situation is the demand for a number of finished material products, notably among which is the relatively heavy buying of steel bars and sheets. Specifications have been coming in at a moderately satisfactory rate, and both local warehouse and mill agencies report a steady improvement. Warehouse prices remain at 1.70c. per lb. on steel bars and at 1.80c. for structural material.

Pig Iron.—The first part of July is usually a dull period and the present week opens up with no exception to the general rule, although the inquiry is remarkably good as compared with last month at this time. Consumers who have not covered for their entire last half requirements seem disposed to take hold now, and a number are asking for deliveries extending into the second quarter of next year. So far no reasonable prices have been made for any shipment beyond December of this year. From Michigan there is an inquiry for 1500 to 2000 tons of foundry iron for a stove maker; the same territory furnishes requests for prices on 1000 tons of foundry and 500 tons of high silicon iron, as well as a miscellaneous lot of small tonnage inquiries, all for last half shipment. Indiana manufacturers are in the market for lots ranging from 100 to 1000-ton lots of foundry iron and two or three of the larger ones are expected to be closed this week. Sales include 1000 tons to a local melter, divided equally between Northern and Southern foundry. An Indiana firm bought 1000 tons of Northern No. 2 foundry at $13, Ironton, for last half shipment. A lot of Southern No. 3 foundry, for the same shipment, went to a Michigan concern at $9.75, Birmingham. For the remainder of the year $10 Birmingham and $13 Ironton on No. 2 foundry are easily obtainable quotations, but it is rumored that the furnace interests expect an advance, and are not now making any great effort to fill up orderbooks at these figures. Malleable continues quiet, although there are a few inquiries out. It is quotable around $13.25 to $13.50 Ironton. Although there are reported to be comparatively large stocks of Jackson County silvery iron being held, it remains firm at $16 furnace, based on 8 per cent. silicon. Interest in basic is not very much in the foreground, but it is quite possible that more than one concern has been doing some quiet figuring for a future supply. Based on freight rates of $3.25 from Birmingham and $1.20 from Ironton we quote, f.o.b. Cincinnati, as follows:

Southern coke, No. 1 foundry and 1 soft	$13.75 to $14.25
Southern coke, No. 2 foundry and 2 soft	13.25 to 13.75
Southern coke, No. 3 foundry	13.00 to 13.25
Southern coke, No. 4 foundry	12.50 to 12.75
Southern gray forge	12.00 to 12.50
Ohio silvery, 8 per cent. silicon	16.95 to 17.20
Lake Superior coke, No. 1	14.70 to 14.95
Lake Superior coke, No. 2	14.20 to 14.45
Lake Superior coke, No. 3	13.70 to 13.95
Basic, Northern	14.45 to 14.70
Standard Southern car wheel	25.25 to 25.75
Lake Superior car wheel	19.00

Old Material.—It is said that the 30,000 tons of steel scrap that a Western railroad system has been holding for several months is still on the market. The buyers are not diposed to meet sellers' views, and this fairly represents the situation in this territory, both as to the larger and smaller dealers and sellers. Prices for delivery in buyers' yards, southern Ohio and Cincinnati, are as follows:

No. 1 railroad wrought, net ton	$11.50 to $12.00
Casting borings, net ton	4.50 to 5.00
Steel turnings, net ton	5.50 to 6.00
No. 1 cast scrap, net ton	9.50 to 10.00
Burnt scrap, net ton	6.50 to 7.00
Old iron axles, net ton	16.50 to 17.00
Bundled sheet scrap, gross ton	7.25 to 8.25
Old iron rails, gross ton	13.50 to 14.00
Relaying rails, 50 lb. and up, gross ton	21.00 to 22.00
Old car wheels, gross ton	10.75 to 11.75
Heavy melting steel scrap, gross ton	10.00 to 10.50

Chicago

CHICAGO, July 3, 1911.

Except as it may be somewhat retarded by the midsummer season the market situation in iron and steel continues to show favorable progress. Both because a year of dullness has permitted keeping mills in good repair and because of the improved volume of orders on the books the shutdowns usual at this time are to be shorter than might have been expected. The local mills of the United States Steel Corporation at South Chicago and Gary and the Indiana Harbor plant of the Inland Steel Company were closed on Monday and Tuesday only. The East Chicago bar mills are off for this week only. The steel bar situation appears to have been well cleared up with the closing of its contracts by the large implement interest at Moline. The signing of last year's wage scale by the Republic Iron & Steel Company may be taken to indicate that it now has its bar tonnage practically placed. Structural and plate tonnage continues satisfactory and a volume of rail business is considered imminent. Structural contracts aggregating 3500 tons are reported for the week. The pig iron market has changed little during the week, but it is understood a round tonnage of Southern iron for delivery in the last half was placed, the price being on the basis of $10 Birmingham for No. 2.

Pig Iron.—Melters of iron in this market are inquiring very generally for iron to be delivered in the last half and in one or two instances over into the first quarter. The volume of inquiry is still rather out of proportion to the orders placed, but the aggregate tonnage of the week, particularly of Southern iron, was very good. A large Milwaukee melter has been in the market for 2000 tons, and it is understood that the iron will be furnished by the Bay View furnaces. A Laporte, Ind., implement manufacturer bought 1000 tons of Southern iron at $10, Birmingham, for last half delivery and is in the market for the remainder of a 2000-tons inquiry. Inquiry for malleable iron has been prominent, but it is reported that only a few thousand tons

THE IRON AND METAL MARKETS

have been bought. Indications are that prices now prevailing are so low as to tempt buyers who at the same time hesitate to buy beyond their immediate needs in the belief that prices will remain as they are for some time to come. We continue to quote for Chicago delivery, with the exception of local irons, which are f.o.b. furnace, the following prices:

Lake Superior charcoal	$16.50 to $17.00
Northern coke foundry, No. 1	15.50
Northern coke foundry, No. 2	15.00
Northern coke foundry, No. 3	14.75
Northern Scotch, No. 1	16.00
Southern coke, No. 1 foundry and No. 1 soft	14.85 to 15.10
Southern coke, No. 2 foundry and No. 2 soft	14.35 to 14.60
Southern coke, No. 3	14.10 to 14.35
Southern coke, No. 4	13.85 to 14.10
Southern gray forge	13.60 to 13.85
Southern mottled	13.60 to 13.85
Malleable Bessemer	15.00
Standard Bessemer	17.40
Basic	15.50
Jackson Co. and Kentucky silvery, 6 per cent	17.90
Jackson Co. and Kentucky silvery, 8 per cent	18.90
Jackson Co. and Kentucky silvery, 10 per cent	19.90

Rails and Track Supplies.—The week past has not been important in the placing of rail orders. It is stated, however, that a very satisfactory volume of business is pending. In bridge and car work the railroads continue to be interesting factors. We quote standard railroad spikes at 1.65c. to 1.75c., base; track bolts with square nuts, 2.10c. to 2.20c., base, all in carload lots, Chicago. Standard section Bessemer rails, 1.28c.; open hearth, 1.34c.; light rails, 40 to 45 lb., 1.16c. to 1.20½c.; 30 to 35 lb., 1.19½c. to 1.24c.; 16, 20 and 25 lb., 1.20½c. to 1.25c.; 12 lb., 1.25c. to 1.30½c.; angle bars, 1.50c. to 1.60c., Chicago.

Structural Material.—The more important lettings of building structural contracts during the week were the Federal Life Insurance Building, this city, for which 1368 tons will be furnished by the Worden-Allen Company, and 1065 tons for a reinforced concrete building for the Corn Products Refining Company, Argo, Ill. The American Bridge Company will fabricate 194 tons for a court house at Danville, Ill.,; 140 tons for the Cox Ferry bridge, California; 191 tons for subway construction for the Elgin, Joliet & Eastern Railway, and 129 tons for the Wolvin Building, Duluth. The Illinois Steel Company will roll 3000 tons of car building structural shapes for the Mexican Northwestern Railway. We quote plain material from mill at 1.53c. and from jobbers' stocks, 1.75c., Chicago.

Plates.—Plates for car building and bridge work, augmented by a growing volume of tank plate orders, have accumulated into very satisfactory rolling schedules for the local mills. Chicago quotations for mill shipment are 1.53c.; from store, 1.75c.

Sheets.—While for a long time the sheet business has been so sparse as to make the mill rollings very unsatisfactory it is now believed that sufficient business is in sight to greatly improve this situation. Mills are beginning to be restless under the low prices. Jobbers, while carrying sufficient stocks to protect themselves, are not yet buying for the future. Some slight irregularities in price are noted, but nothing of marked significance is reported. Chicago prices are as follows: Carload lots, from mill: No. 28 black sheets, 2.18c.; No. 28 galvanized, 3.08c.; No. 10 blue annealed, 1.68c. Prices from store, Chicago, are: No. 10, 1.95c. to 2.05c.; No. 12, 2.00c. to 2.10c.; No. 28 black, 2.60c. to 2.70c.; No. 28 galvanized, 3.35c. to 3.45c.

Bars.—With the closing of its bar contracts by the leading manufacturer at Moline, it becomes apparent that the Republic Iron & Steel Company has contracts covering probably 90 per cent. of its available tonnage. Steel bar prices are not decidedly strong, although generally well maintained. The impression prevails with reference to bar iron, in view of the tonnage recently placed, that a firmer attitude on the part of the mills is imminent. We quote as follows, f.o.b. Chicago: Soft steel bars, 1.43c.; bar iron, 1.20c. to 1.25c.; hard steel bars, rolled from old rails, 1.20c. to 1.25c. From store, soft steel bars, 1.70c. to 1.80c., Chicago.

Wire Products.—The dull midsummer market has developed little out of the routine in the wire trade during the week. Jobbers' carload prices, which are quoted to manufacturing buyers. are as follows: Plain wire, No. 9 and coarser, base, 1.68c.; wire nails, 1.78c.; painted barb wire, 1.78c.; galvanized, 2.18c.; polished staples, 1.88c.; galvanized, 2.18c., all Chicago.

Cast Iron Pipe.—The contract for 2000 tons of pipe for Hammond, Ind., will be placed with the United States Cast Iron Pipe & Foundry Company, as was the Columbus, Ohio, lot of about 1000 tons also. At Mandan, N. D., 500 tons was awarded to a Fargo contractor, the order for the pipe not having been placed with a manufacturer as yet. At Detroit 11,000 tons will be awarded July 11. We continue to quote as follows, per net ton, Chicago: Water pipe, 4 in., $25.50; 6 to 12 in., $24.50; 16 in. and up, $24, with $1 extra for gas pipe.

Old Materials.—From the standpoint of the scrap market the week has been very quiet. The local mills have sought to take as little as possible owing to the light operations of the current week. Railroad offerings were very light. We quote below for delivery to buyers' works, all freight and transfer charges paid, per gross ton:

Old iron rails	$14.00 to $14.50
Old steel rails, rerolling	12.25 to 12.50
Old steel rails, less than 3 ft.	11.00 to 11.50
Relaying rails, standard sections, subject to inspection	24.00
Old car wheels	12.50 to 13.00
Heavy melting steel scrap	10.25 to 10.75
Frogs, switches and guards, cut apart	10.25 to 10.75
Shoveling steel	9.75 to 10.25
Steel axle turnings	8.50 to 9.00

The following quotations are per net ton:

Iron angles and splice bars	$12.50 to $13.00
Iron arch bars and transoms	13.75 to 14.25
Steel angle bars	10.25 to 10.75
Iron car axles	18.00 to 18.50
Steel car axles	16.00 to 16.50
No. 1 railroad wrought	11.00 to 11.25
No. 2 railroad wrought	10.00 to 10.50
Steel knuckles and couplers	9.00 to 9.50
Locomotive tires, smooth	16.00 to 16.50
Machine shop turnings	6.25 to 6.75
Cast and mixed borings	5.25 to 5.75
No. 1 busheling	8.75 to 9.25
No. 2 busheling	6.75 to 7.25
No. 1 railroad cast, shoveling	10.00 to 10.50
Boiler punchings	12.00 to 12.50
No. 1 cast scrap	10.25 to 10.75
Stove plate and light cast scrap	7.00 to 7.50
Railroad malleable	10.00 to 10.50
Agricultural malleable	9.25 to 9.75
Pipes and flues	8.00 to 8.50

Philadelphia

PHILADELPHIA, July 3, 1911.

The usual midsummer idleness of finishing mills is expected to be of short duration. In fact, the trade generally looks forward to even more active conditions in the latter half of July. The pig iron movement has been on a fairly even basis, with prices practically unchanged. Structural material continues the most active of the finished material lines, but contracts close slowly. Old material is sentimentally stronger, but business drags. Both furnace and foundry coke still show considerable activity.

Iron Ore.—While negotiations are pending for at least one large block of foreign ore no sales of importance are reported. Importations at this port in the week ending July 1 include 7579 tons of Swedish and 6100 tons of Cuban ore.

Ferromanganese.—No fresh demand has developed in this territory. Quotations remain unchanged at $36.50, Baltimore, for 80 per cent.

Billets.—Buying has been on a fairly even basis, but orders are still confined to small lots for near future delivery. Forging steel continues in better demand than rolling steel. Prices are well maintained at $23.40 for rolling billets, and $28.40 for forging billets, delivered in buyers' yards in this vicinity.

Plates.—Orders during the week are reported by Eastern producers to have been fully up to the preceding few weeks. Quantities also show an increase, in several instances lots of several hundred tons being placed. Bridge plates have been in active demand and several fair orders for tank, boiler and ship plates are noted. While immediate business is lighter, due to the holiday, more activity is looked for in the immediate future. Quotations are firm at 1.50c. for ordinary plates, delivered in this district.

Pig Iron.—There has been a moderate inquiry for foundry grades but quantities openly before the trade are usually confined to small and moderate lots. Interest on the part of consumers, however, is somewhat broader and buying for more extended delivery would, no doubt, result if producers were generally willing to sell ahead at to-day's quotations. For delivery in this immediate vicinity producers of standard brands of No. 2 X foundry adhere pretty firmly to $15 minimum, although, in sharp competition with furnaces in other producing districts, prices which represent a slightly lower figure for delivery here have no doubt been made. In such cases the matter of freight rates dominates the situation. Orders placed during the week have been slightly larger in the aggregate. The Pennsylvania Railroad Company has placed orders for a good part of the foundry iron recently inquired for, and more substantial orders, running up to several

THE IRON AND METAL MARKETS

hundred tons, as well as a good number of small orders have been received from the general trade. The cast iron pipe foundries are still in the market for low grade iron, for third quarter and more extended delivery. There has been little movement in Virginia foundry grades, small lots constitute the bulk of the sales in this territory, with prices unchanged. Small sales of Southern foundry iron are reported at $10.50, Birmingham, base for No. 2. Business in this grade has not been sufficiently interesting to producers to bring out the minimum quotation. While some business has been done in forge iron there is no general interest shown by consumers and that grade shows little activity. Although $14.50, delivered, is considered about the market, that price could no doubt be shaded if a desirable quantity was inquired for. There has been little doing in the steel making grades; several inquiries for basic are still before the trade, while small sales of low phosphorus iron, together with an occasional moderate lot, are reported. The following range of prices is named for standard brands, delivered in buyers' yards, in this district during the third quarter:

Eastern Pennsylvania No. 2 X foundry	$15.00 to $15.25
Eastern Pennsylvania No. 2 plain	14.75 to 15.00
Virginia foundry	15.05 to 15.50
Gray forge	14.50
Basic	14.50 to 14.75
Standard low phosphorus	20.50 to 20.75

Old Material.—Although the actual amount of business transacted has not been large, the market has a somewhat better tone. Heavy melting steel is still rather inactive, although some business between brokers to fill expiring contracts has been done around $13. Borings and turnings have been a trifle more active and prices are slightly better. Wrought iron scrap is in better demand and some sales of yard wrought are reported. Car wheels have also been sold in moderate quantities. The month's offerings from the railroads have not come out, but will no doubt command the attention of the trade before the week end. A lot of 1000 tons of Panama scrap, which will come to this port, is offered by the Panama Railroad, bids on which will be received July 10. The following quotations, while largely nominal, represent sellers' ideas for moderate lots for prompt delivery in buyers' yards, eastern Pennsylvania and nearby points, carrying a freight rate from Philadelphia varying from 35c. to $1.35 per gross ton:

No. 1 heavy melting steel scrap	$13.00 to $13.25
Old steel rails, rerolling (nominal)	13.75 to 14.25
Low phosphorus heavy melting steel scrap	16.75 to 17.25
Old steel axles (nominal)	19.25 to 19.75
Old iron axles	24.00 to 24.50
Old iron rails	16.50 to 17.00
Old car wheels	13.00 to 13.50
No. 1 railroad wrought	15.00 to 15.50
Wrought iron pipe	12.00 to 12.50
No. 1 forge fire	10.50 to 11.00
No. 2 light iron (nominal)	6.75 to 7.25
Wrought turnings	8.75 to 9.25
Cast borings	8.25 to 8.75
Machinery cast	13.00 to 13.50
Railroad malleable	11.50 to 12.00
Grate bars, railroad	10.00 to 10.50
Stove plate	9.75 to 10.25

Coke.—Considerable business in both furnace and foundry coke is under negotiation. At least one large block of furnace coke for last half delivery has been closed, while several 1000-ton lots of foundry coke have been contracted for. A fair volume of business in prompt coke is also reported. Quotations are unchanged, the following range being named per net ton for delivery in buyers' yards in this vicinity:

Connellsville furnace coke	$3.65 to $4.00
Foundry coke	4.10 to 4.55
Mountain furnace coke	3.25 to 3.60
Foundry coke	3.70 to 4.15

Structural Material.—Projects under consideration close, as a rule, rather slowly, although there is quite a good volume of business under negotiation. Smaller fabricators still contend that they are unable to meet quotations named by the larger fabricators and that a large share of the business therefore goes to the latter interests. The several hotel projects in this district are still unclosed. More bridge work is pending and the trade looks forward to continued active conditions. Prices are maintained at 1.50c. minimum for plain shapes, delivered in this territory.

Sheets.—While mills are closed for the usual midsummer repairs, orders are reported as coming in quite freely, for the greater part in small lots, and mills expect to have order books in pretty good shape when operations are resumed. In several instances mills will resume partial operations next week. Quotations are unchanged, the following range of prices being named f.o.b. Eastern maker's mill: Nos. 18 to 20, 2.30c.; Nos. 22 to 24, 2.40c.; Nos. 25 to 26, 2.50c; No 27, 2.60c.; No. 28, 2.80c.

Bars.—A moderate volume of business is being placed, but the market lacks snap. Refined iron bars come out in odd lots, for which prices are unchanged at 1.27½c. to 1.32½c., delivered, but are not considered particularly strong. A fair business in steel bars at 1.40c., delivered, is reported, with specifications on contracts coming in fairly satisfactory.

St. Louis

ST. LOUIS, Mo., July 3, 1911.

The general situation continues to develop improved characteristics. Reports of inquiries as well as of specifications on contracts justify the better feeling. The demand is keeping well up on ordinary business and in some instances anticipation of contract requirements is reported on both pig iron and coke. About the only weak spot noticeable is in the requirements for the agricultural machinery plants which are waiting, seemingly, upon the crop reports as affected by the drought situation.

Pig Iron.—The interesting feature of the pig iron market the past week was the appearance of the Missouri Malleable Iron Company in the field with an inquiry for 2000 tons of malleable for car castings, etc. Some confusion resulted because the same inquiry was sent out by the company for which the castings are to be made, and the impression gained ground that the sale, when finally made, was for double the actual amount. The taking was, however, 2000 tons at the last quotation. Aside from this one order for 750 tons and other small ones aggregating about 250 tons more constituted the total of new business for the week. On contracts the specifications generally are keeping up well and in a few cases are even anticipating requirements. An inquiry for 500 tons of Virginia high manganese appeared in the market late in the week and a deal for closing is well under way at this writing. Quotations for No. 2 Birmingham may be regarded as at $10 to $10.25, the latter figure being held firm for exclusively last quarter delivery. In Northern No. 2 there has been nothing of consequence doing and no change from last figures, nor has there been anything new in basic. Generally, however, the situation is regarded as better than for some time, the market clean and prices not so indifferently held as recently. If there is any shading now it is in analysis iron better than No. 2 at the No. 2 price.

Coke.—Inquiries are increasing in coke and although prices are unchanged the situation is regarded as firmer. Requisitions on contracts are kept up with some in anticipation of the standing orders. Inquiries for last half delivery and also for delivery to July of next year are increasing in number. The quotations remain unchanged from the figures last given, $2 to $2.25 at oven for best 72-hr. selected, Connellsville or Stonega. As far as can be learned very few consumers are behind their contracts in requisitions, indicating that they are keeping up well in their business.

Finished Iron and Steel.—In the finished material market there is a generally better feeling with expectations of early increases in the movement. In structural material the orders have been very good, most of the tonnage being on special work, but buyers are also ordering small tonnage for stock, the price being on the basis of $1.35 Pittsburgh and firm. No jobs of any size came out during the past week, the movement generally being on existing work and its requirements. Shipments were asked for promptly, and the mills have proved able to meet the requests. In bars the specifications were fair, although buyers, for the most part, are content to wait rather than contract on the present basis. Iron is still so low that most of the tonnage is going in that direction to the exclusion of steel. In standard rails an inquiry is made by a Kansas City road for 700 tons. A Kansas road is looking for about 900 tons, while an Arkansas road closed for 500 tons for September delivery. In track fastenings business has been fair, the railroads requisitioning general materials rather freely. In light rails an improvement in the inquiry from the coal mines is noted, but the lumber companies are doing practically nothing. Agricultural and wagon requirements are apparently held down by some of the crop stories afloat until better determination is to be had as to country needs. Considerable indirect interest in railroad needs has been aroused by the placing by the Missouri Pacific with the American Locomotive Company of an order for 50 freight locomotives of the Mikado type, delivery to commence within 50 days, and orders from the Frisco for 28 Pacific type passenger locomotives and 51 steel passenger cars.

Old Material.—In scrap the situation shows a distinctly better tone. Dealers are buying at the present

THE IRON AND METAL MARKETS

prices rather than selling and are holding for the advances and the more active demand that is expected by September 1 if not sooner. During the past week the Missouri Pacific list came out with about 400 tons, the Frisco with 450 tons and the Wabash with 600 tons. While the situation is a bit speculative, nevertheless it is on a rather safe foundation. The better tone to the market for new material is very largely responsible for the improved condition in scrap, though the dealers believe that consumers will have to make their appearance soon in order to care for the natural developments of fall business. Dealers' prices per gross ton, f.o.b. St. Louis, are as follows:

Old iron rails	$12.50	to	$13.00
Old steel rails, re-rolling	11.25	to	11.75
Old steel rails, less than 3 feet	10.25	to	10.75
Relaying rails, standard section subject to inspection	23.00	to	23.50
Old car wheels	13.00	to	13.50
Heavy melting steel scrap	10.25	to	10.75
Frogs, switches and guards cut apart	10.25	to	10.75

The following quotations are per net ton

Iron fish plates	11.00	to	11.50
Iron car axles	18.50	to	19.00
Steel car axles	17.50	to	18.00
No. 1 railroad wrought	10.75	to	11.25
No. 2 railroad wrought	9.75	to	10.25
Railway springs	9.00	to	9.50
Locomotive tires, smooth	14.50	to	15.00
No. 1 dealers' forge	8.50	to	9.00
Mixed borings	5.00	to	5.50
No. 1 busheling	9.00	to	9.50
No. 1 boilers, cut to sheets and rings	8.00	to	8.50
No. 1 cast scrap	10.00	to	10.50
Stove plate and light cast scrap	8.00	to	8.50
Railroad malleable	8.00	to	8.50
Agricultural malleable	7.00	to	7.50
Pipes and flues	8.00	to	8.50
Railroad sheet and tank scrap	7.25	to	7.75
Railroad grate bars	8.00	to	8.50
Machine shop turnings	6.50	to	7.00

Buffalo

BUFFALO, N. Y., July 3, 1911.

Pig Iron.—Interest in pig iron is steadily broadening and an increasing number of inquiries are coming in from users of foundry grades—pipe and radiator works, manufacturers of railroad and general machinery lines—and more iron was sold in this district last week than in any like period for six weeks. Consumers are interested principally in last quarter and first half of next year, but furnacemen are disinclined to consider deliveries very far into first half and some are refusing to take any first half business at present prices. Orders include a large tonnage of high silicon iron from a Troy manufacturer for shipment over the fourth quarter and running into the first quarter of next year; one of 2000 tons foundry grades for fourth quarter, and several of 600 to 1000 tons, aggregating 7000 to 8000 tons besides the large tonnage order mentioned. Some sales were also made in Canada to manufacturers of agricultural implements. Shipments on contracts are going forward rapidly from furnaces and in excess of the rate of production. Prices for current and fourth quarter delivery remain about the same as last week's schedule, but furnaces are becoming more reluctant to apply current prices to extended deliveries and there is a strong tendency toward firmer prices in that direction. We quote as follows for delivery over last half f.o.b. Buffalo:

No. 1 X foundry	$13.75	to	$14.25
No. 2 X foundry	13.25	to	14.00
No. 2 plain	13.25	to	13.75
No. 3 foundry	13.00	to	13.25
Gray forge	13.00	to	13.25
Malleable	13.75	to	14.25
Basic	14.00	to	14.75
Charcoal	16.50	to	17.25

Finished Iron and Steel.—Inquiries and orders in finished lines continue to show improvement in volume. In bars and plates particularly considerable contracting has been completed for third and fourth quarter delivery. The leading interest reports a number of good contracts closed in the week for material required by agricultural implement and other manufacturing interests. Good inquiries are received for concrete reinforcing bars, and the Canadian export trade continues to show active demand in all lines. Sustained activity is noted in fabricated structural material and a large amount of business is in sight for the summer and fall months. Figures are soon to be taken for a 14-story office building for the Eastman Kodak Company, Rochester, N. Y., involving a large tonnage of steel, bids to be closed the latter part of the month. Cornell University is receiving bids to July 15 for steel required in the erection of three additional buildings at Ithaca requiring about 500 tons and bids are to be received this week for steel for the Hamot Hospital Nurses' Home, Erie, Pa., about 250 tons. The Lackawanna Bridge Company, Buffalo, has been awarded the contract for the fabrication and erection of steel for the Seitz Building, Syracuse, N. Y., 200 tons. The Charles E. Ernst Iron Works, Buffalo, was the lowest on bids opened this week for the 800 tons steel for the Hutchinson High School, Buffalo, but the contract has not yet been awarded.

Old Material.—The betterment in the demand for scrap continues. Very little material is coming out at present prices, owing to the fact that dealers are inclined to hold their stocks for a higher market and that only a limited tonnage is being offered by scrap producers. Prices have shown an advance for the week. We quote as follows per gross ton f.o.b. Buffalo:

Heavy melting steel	$12.25	to	$12.75
Low phosphorus steel	15.50	to	16.00
No. 1 railroad wrought	13.50	to	14.00
No. 1 railroad and machinery cast scrap	13.25	to	13.75
Old steel axles	18.00	to	18.50
Old iron axles	22.00	to	22.50
Old car wheels	12.75	to	13.25
Railroad malleable	11.50	to	12.00
Boiler plate	10.50	to	11.00
Locomotive grate bars	11.00	to	11.50
Pipe	9.50	to	9.75
Wrought iron and soft steel turnings	7.00	to	7.25
Clean cast borings	6.50	to	6.75

San Francisco

SAN FRANCISCO, June 27, 1911.

The tonnage of sales for June has been augmented by a number of very fair structural contracts, this being about the most active department at present. The total of cast-iron pipe sales has also been very satisfactory. While in other lines little or no improvement is noted, the aggregate has been at least up to the average of recent months, and general indications seem more encouraging. Outside of the building trades the principal buying is for public utilities and development projects, and requirements in this line are likely to be quite large for the remainder of the season. The demand from established consuming industries is limited.

Bars.—Little change is noted in the market for soft steel bars, the demand in the distributive trade being held down very closely to immediate requirements. The only business of much consequence is on reinforcing material, which is now in fairly active demand. The city of Los Angeles received bids last week for 72,000 round bars for reinforcement. Bars from store, San Francisco, are quoted at 2c. for steel and 1.90c. for iron.

Structural Material.—The American Bridge Company has taken an order for 300 tons for the Pacific Portland Cement Company's plant, near Suisun, Cal., and a contract for about 250 tons for Gladding, McBean & Co.'s large clay shed at Lincoln, Cal., has been let to the McClintic-Marshall Construction Company. The Palm Iron Works, Sacramento, Cal., has taken the D. O. Mills bank contract in that city, 200 tons. Figures are being taken on the general contract for a hotel there, which is expected to take about 600 tons. The principal local jobs are the Bankers' Investment Company's building, Market street, about 700 tons, and the San Francisco Investment Company's building at Sutter and Montgomery streets, about 300 tons, both of which have been taken by the Pacific Rolling Mill Company. This company also has the contract for Pantage's Theater, 300 tons. The Ralston Iron Works has taken a small job for the Welch estate building, and Dyer Bros. are the low bidders on cells for the county jail, about a $50,000 job. The Masonic Temple in this city is still pending. Figures are to be taken shortly for a five-story steel frame warehouse at Sacramento, Cal., and bids have been taken on a small municipal job at Fresno, Cal. The Masonic organizations at Seattle, Wash., are considering plans for a large temple. The Liberty Coal & Ice Company, Portland, Ore., is planning to erect a steel coal shed. Bids will be opened July 27 for a new building for the Idaho State capitol. An inquiry is expected shortly for a heavy tonnage for the naval station at Pearl Harbor, T. H. The Knights of Columbus building in San Francisco is again up for figures.

Rails.—Orders are coming in freely from small roads all over the coast. Aside from several proposed lines, on which business may be closed at any time, extensions to existing street and interurban roads are taking a considerable tonnage. Light rails are still rather quiet. The Northern Electric Railway is planning extensions from Marysville to Colusa and from

THE IRON AND METAL MARKETS

Sacramento to Woodland, Cal., on which work will probably be started this year, and plans for next year include a line from Chico to Red Bluff, Cal. There is apparently some likelihood of the construction of a road connecting Lakeport, Cal., with lines in the Sacramento Valley. Gladding, McBean & Co. have about completed arrangements for a tramway between their plant and clay beds at Lincoln, Cal.

Sheets.—The recent revision of prices has caused no distinct change in local market conditions. After a temporary interruption distributive business has been resumed on about the former scale, but there is no real activity. There are indications of a good consuming demand, however, and a heavier movement is expected within the next month.

Plates.—A fair tonnage has been booked, and while new inquiries of importance are slow to materialize an increasing demand is expected later in the summer. There is little steel-tank work in the oil fields at present, but a large tonnage will be required for refineries and distributing plants at other points. It is reported that the Copper River Railroad in Alaska will erect tanks with a capacity of 150,000 bbl. In addition to its improvements in California, the Standard Oil Company is planning large storage stations on Puget Sound and in the Hawaiian Islands. The California-Fresno Oil Company will rebuild its refinery recently destroyed by fire at Fresno, Cal. The Great Western Power Company is preparing improvements to its hydro-electric plants in northern California, which will require considerable pipework.

Merchant Pipe.—The demand for casing and oil pipe, while perhaps better than a few months ago, is still quiet, and merchants report continued dullness in the small trade. Some business is coming from water and gas companies, however, the largest recent order being for 65,000 ft. of 12-in. pipe, placed by the Western Water Company, Bakersfield, Cal., with a Los Angeles merchant. The Bard Oil & Asphalt Company has let a contract for an 8-mile line of 4-in. pipe near Santa Paula, Cal. The Santa Maria, Cal., Gas Company is preparing to extend its system to a number of nearby towns. The city of Los Angeles has just received bids for 1000 ft. of 8-in. casing and 723 ft. of 24-in. pipe. A better oil field business is expected in the fall, but the outlook is very uncertain.

Cast-Iron Pipe.—The June tonnage in this territory has been very satisfactory, including 8000 tons for the city of San Diego, taken by the United States Pipe Company. Deliveries are to be completed on this order by the end of the year. The city of San Francisco is about ready for delivery of the last of the pipe for the high-pressure system. The town of San Mateo, Cal., has just received figures on a complete water system. The Union Water Company of Oakland, Cal., is still holding off, and there is apparently some uncertainty regarding its future course. The Pacific Gas & Electric Company is in the market for a very large tonnage of gas pipe, for delivery to Sacramento, Stockton, Chico, Marysville and numerous other points, and the San Francisco Gas & Electric has ordered about 700 tons. The city of Los Angeles has ordered 420 tons of 30-in. pipe, and is in the market for 450 tons more. A large order for high-pressure water pipe is also expected shortly from Los Angeles harbor. The town of Santa Barbara, Cal., is taking bids on a small lot, and the Santa Barbara Gas & Electric Company is planning a 6-mile extension of its mains. The Spring Valley Water Company has acquired a 22-mile right of way from Niles, Cal., to Oakland, but it is unlikely that any pipe will be laid in the near future. It is reported that the Sisquoc Investment Company, Santa Barbara, Cal., will lay a lot of large cast-iron pipe for irrigation purposes.

Pig Iron.—The first arrival of foreign iron in several weeks was a shipment of 650 tons for Girvin & Eyre, of this city. Supplies, however, have been ample for all current needs, and it is difficult to sell except in very small lots. No. 2 Southern foundry iron is nominally valued at about $20.50, but finds little demand in this market.

Old Material.—Some business in rerolling rails was booked about the middle of the month, the principal sale being 4000 tons purchased by the Rudgear-Merle Company from the San Francisco Iron & Metal Company. The Rudgear-Merle rolling mill will probably start in August or September. At present everything on the list is dull, owing partly to the approach of the midsummer inventory. It is almost impossible to sell cast scrap, and accumulations in the hands of dealers are larger than for some time. A better demand for steel melting scrap is expected in August, as it is believed that stocks held by melters will be about cleaned up by that time, and the new plant at South San Francisco is expected to start up in September. Prices are quoted as follows: Cast-iron scrap, per net ton, $16; steel melting scrap, per gross ton, $10.50 to $11; wrought scrap, per net ton, $11 to $15; rerolling rails, per net ton, $11.

Birmingham

BIRMINGHAM, ALA., July 2, 1911.

Pig Iron.—The sales effected the past week were very scattering and the aggregate of tonnage sold comparatively small. About 1000 tons for shipment during the third quarter was sold by one producer; 500 tons for spot shipment by another; 200 tons of analysis iron for delivery during the last half by another, and 300 tons of gray forge for spot shipment by a fourth. The lot of 200 tons of analysis iron brought a premium of $1 per ton over the No. 2 foundry schedule, while the lot of 300 tons of forge was sold at $9.25 Birmingham. With these exceptions the transactions reported involved a basis of $10, Birmingham, for No. 2 foundry. The market quotation for last half deliveries is understood to be a basis of $10.50 without any figures whatever having yet been submitted on deliveries further advanced. In the absence of a transaction involving the figures just named, the quotation is of course considered nominal, but it is quite likely that the terms for delivery on a $10 basis are not now so liberal as could be had one week ago. The inquiry for last half shipments has improved perceptibly; in fact, to such an extent that the theory of a very limited provision by the trade for its second half requirement is more generally accepted. At this time two lots of 2000 tons each for shipment during the last half are pending and the smaller lots are attractive in the aggregate. An increase has been made in the output of basic iron, but without any indications of an addition to the number of stacks being operated on foundry grades. It will be noted that the production of foundry grades on July 1 was even smaller than that of June 1, a total of only 13 stacks being in operation on the first date named. The present condition of furnace stocks cannot be arrived at with accuracy without the necessary stock reports and those figures will probably not be available before July 5. Recent additions have been made to the tonnage on charcoal iron orderbooks and quotations have been fully maintained. We quote the local market for prompt shipments as below per gross ton f.o.b. cars here:

No. 1 foundry, soft	$10 50
No. 1 foundry and No. 2 soft	10 00
No. 2 foundry	9 50
No. 3 foundry	9 25
Gray forge	9 00
Mottled	8 75
Southern basic, delivered at Cincinnati	10 25
Charcoal iron, f.o.b. Birmingham	9 75
Charcoal iron, delivered Pittsburgh district	22 50

Cast Iron Pipe.—The principal order placed in this market the past week was for 700 tons of water pipe for requirement at St. Louis, Mo. A number of smaller lots for maintenance work were placed, however, and the tonnage disposed of in the aggregate was fairly satisfactory. All local plants are now closed down on account of the approaching holiday, but operations will be resumed promptly and the business on orderbooks will warrant a steady output for some months. The prices for this material are probably weaker as a result of the continued dullness in the pig iron market. It is understood that the shading of quotations on round tonnages recently placed was very extensive owing to the figures at which raw material could be had, although the present condition is such that quotations can hardly be revised with accuracy. The figures published are being quoted on such small lots as are being offered and for those lots are being maintained. The result of the proposed increase in production will be watched with considerable interest inasmuch as this particular industry has so far this year been comparatively free of competition from two large factors. We continue to quote water pipe as follows per net ton f.o.b. cars here: 4 to 6-in., $22; 8 to 12-in., $21; over 12-in., average, $20, with $1 per ton extra for gas pipe.

Old Material.—The improvement in the demand for finished steel products has not yet been reflected in this market and the aggregate movement continues very light. The consumption locally will be considerably less for some weeks owing to the suspension of operations at the Alabama City mills, but dealers will in the meantime replenish their stocks when practicable at the prices prevailing. Their most encouraging prospects

THE IRON AND METAL MARKETS

are for the steel grades, but with the continued scarcity of low grade pig iron it is probable that a stronger demand will be found for light cast and machinery grades. Quotations are all nominal and we continue to quote without revision as follows, per gross ton, f.o.b. cars:

Old iron axles (light)	$13.50 to $14.00
Old steel axles (light)	12.50 to 13.50
Old iron rails	12.50 to 8.00
No. 1 railroad wrought	11.00 to 11.50
No. 2 railroad wrought	9.50 to 10.00
No. 1 country wrought	7.50 to 8.00
No. 2 country wrought	7.00 to 7.50
No. 1 machinery	9.50 to 10.50
No. 1 steel	8.50 to 9.00
Tram car wheels	8.00 to 8.50
Standard car wheels	9.50 to 10.50
Light cast and stove plate	7.00 to 7.50

Coal and Coke.—This market is considerably stronger as a result of the increase in active furnace capacity and the indications of an early season for cotton oil mills and compresses. It is noted that the purchases of those concerns have been unusually large this time by reason of the large crops predicted, and for the same reason the railroad companies in this section have provided for their coal requirements more extensively. Dealers in domestic coal are now manifesting interest in prices and some deliveries of such grades have already been arranged. The prices for domestic grades will probably be higher this season than formerly, notwithstanding the general decline in prices for steam coal. Standard 72-hour coke for prompt shipment is weaker, but contract prices are so far unaffected.

The German Iron Market

BERLIN, June 23, 1911.—Uncertainties regarding several trade combinations still exert a depressing influence, and prices continue to give way slowly, where not rigidly fixed by organizations. On the Düsseldorf Exchange the last fortnightly trading brought out lower prices for certain steel products. Band iron was quoted at 127.50 to 132.50 marks, against the last previous quotation of 130 to 135 marks, and wire rods 122.50 marks, against 130. The heavy break in the latter was of course due to the dissolution of the trade combination. On the other hand, pig iron prices were partly higher, in view of the expectation that the Essen Syndicate would be extended and prolonged. A strong effort has just been made by the band iron and wire rod makers to induce the Steel Works Union to reduce the prices of steel billets, which is now 100 marks the ton. The rod manufacturers asked for a cut of 5 to 7.50 marks, and the band mills for 7.50. The big mixed establishments, however, opposed these reductions, and at a meeting of the union yesterday it was decided to postpone a decision of the matter, in view of the fact that better news has come in from the foreign market. This evidently refers to the more active buying in the American market reported by *The Iron Age* this week.

The Steel Situation

The union's monthly report on the state of business given out yesterday is comparatively satisfactory, but it must be borne in mind that it covers only the fully syndicated goods—half-rolled material, structural forms and rails. In respect to steel material, the report says that the course of the market remains satisfactory, although it has been unfavorably affected by the dissolution of the wire convention, and the foreign market continues quiet owing to the uncertainties in the American situation.

The Prussian railway authorities have at length placed their orders for heavy rails and other track-building supplies for next year's delivery, but the amount is even less than for the current year. The foreign market for heavy rails is good and is expected to continue so, inasmuch as several large railway projects are under negotiation. In grooved rails sufficient work is on hand, and specifications are coming in satisfactorily. Home orders this year have been considerably greater than last year, and foreign sales are of pretty large volume, though prices have been sharply contested by American and Belgian makers. Light rails for mines continue in good demand, but Belgian works are cutting prices in foreign business.

Trade in structural forms for the September quarter has been very active since the end of May, and calls for delivery on order are brisk, which latter also applies to foreign business. English buying is slower owing to price reductions in the United States, but the demand from some other countries is quite good.

So much for the union's report on the goods in question. Other sections of the market are distinctly growing weaker. The wire trade is completely demoralized by the dissolution of the price convention. As anticipated, prices have dropped heavily. The new quotation for wire nails sent in yesterday was 14.50 marks per metric cwt., as compared with the convention's price of 16.50 to 16.75 marks. The export price is 12 marks f.o.b. seaport.

The band-iron trade also continues in a demoralized condition, with prices still tending lower. In heavy plates there is plenty of work on hand, and both home and foreign buyers are calling for goods rapidly, but one market review complains that the convention prices are being cut in some instances. The export trade remains active, but price concessions must be made in competition with English and Belgian goods. The foreign market for wire rods also continues very active. During the past few months about 35 per cent. of the total product was exported.

The Essen Pig Iron Syndicate

The outlook for the perfection of the Essen Pig Iron Syndicate is much less hopeful. It is understood that the demand of the Gutehoffnungs Hütte for an increase of its allotment, mentioned last week, has now taken on the character of an ultimatum. Decision was postponed to July 9, but as the time for giving notice of withdrawal from the syndicate lapses at the end of this month it is expected that this great establishment will serve notice of withdrawal next week. In that case the syndicate's existence would terminate at the end of July, unless the Gutehoffnung's increase of allotment should be granted. The company attributed its attitude to the fact that its producing facilities have been steadily increasing, an explanation that might be put forth by nearly every one of the great works in the West.

Meanwhile the Siegerland furnaces are showing that they are willing to do everything in their power to help the organization to its completion. They have now agreed to take no orders for 1911 delivery prior to July 15, in order to give the syndicate people time to complete the negotiations. No definite action, however, has yet been taken in treating with the Luxemburg-Lorraine furnaces, and everything in that quarter seems to be at a standstill.

The pig iron market continues to show a quiet, waiting tendency, buyings for 1911 delivery being only for supplementary requirements. Calls for delivery of goods on order are of normal volume. The market for old and scrap iron is quiet. The amount of goods offering is relatively heavy, and prices are weak. The demand for home ores is slightly restricted and supplies are accumulating to some extent at the mines.

The exports of iron and steel in May showed a big recovery from the reduced figures for April, the outgo having been about 65,000 tons greater than for that month, and also about 13,500 tons more than for May, 1910. Imports also registered a further gain.

The latest reports from the Belgian market are again unsatisfactory. Prices are still falling, except where fixed by trade combinations, as in the case of steel rails and beams. Pig iron is severely depressed in price and but little business is doing. The latest news from the French market indicates that it still continues to enjoy an exceptional position among the great producing countries. The recent decision of the French mills to withdraw from the arrangement with the German and Belgian organizations respecting half-rolled steel is understood here to have been due to the strong business position in the northern district of France. In Austria prices are falling, and further reductions are looked for.

New York

NEW YORK, July 5, 1911.

Pig Iron.—Transactions have been more numerous. A larger number of orders have been placed for early shipment by small consumers and some buying has been done by the larger interests. A horse-shoe manufacturer has purchased about 30,000 tons of gray forge for delivery running into next year. Other large consumers are making inquiries and are more freely disposed to contract for future delivery. The interests connected with railroads are purchasing more freely than they have done for some time. Northern iron at tidewater is quoted as follows: No. 1 foundry, $15.50 to $15.75; No. 2 X, $15 to $15.50; No. 2 plain, $14.50 to $15. Southern No. 1 foundry is quoted at $14.75 to $15.25; No. 2, $14.25 to $14.75.

THE IRON AND METAL MARKETS

Cast Iron Pipe.—The city of New York will open bids for 2000 tons of water pipe to-day. The general demand continues quiet. Carload lots of 6-in. are quoted at $21 to $22 per net ton, tidewater.

Finished Iron and Steel.—A week of hot weather and a national holiday has not been prolific of much business, and it may be that the continued dullness is not necessarily indicative of present fundamental conditions. One plate mill seems to roll special orders about as soon as received, a fact which, if general, shows slackening in demand. A few specific orders of considerable size have been placed during the week for both sheets and steel bars, and it needs only a greater volume in these lines to substantiate the conclusion that buyers are generally convinced that the bottom price has been reached. None of the spectacular structural contracts has yet been placed, but there is still a fair volume represented in new projects. Supplementing the lists given in late issues of work on which bids have been taken or on which there are inquiries may be added the Glen Onoco bridge for the Central Railroad of New Jersey, amounting to about 550 tons. The building at West Point Military Academy will, it is estimated, require 700 tons. The American Bridge Company is reported to have a 1200-ton contract for the Weil warehouse at Greenwich and Laight streets, New York, and the 1400-ton Rotterdam bridge for the Boston & Maine, and the Phoenix Bridge Company is credited 700 tons for a drawbridge for same railroad. It is probable that the Bethlehem Steel Company will roll the 6000 tons for the Bamberger store, Newark, but the fabricating contract has not yet been let. Quotations are: Plain structural material and plates, 1.51c. to 1.56c.; steel bars, 1.41c. to 1.46c.; bar iron, 1.30c. to 1.37½c., all New York. Plain material and plates from store, New York, 1.80c. to 1.90c.

Old Material.—The Panama Railroad Company, 24 State street, New York, will receive bids until 12 noon, July 10, on 1000 tons of Panama scrap which will arrive in the meantime and be unloaded on cars at Port Richmond, Philadelphia. The general demand shows a little improvement in transactions in heavy steel melting scrap, but not much is doing in other lines. Cast scrap has been less active, while borings and turnings have been particularly quiet. Holders are stubbornly maintaining prices in the expectation of an early improvement in the demand. Quotations are as follows, per gross ton New York and vicinity:

Old girder and T rails for melting	$10.50 to $11.00
Heavy melting steel scrap	10.50 to 11.00
Relaying rails	20.00 to 21.00
Rerolling rails	(nominal) 12.00 to 12.25
Standard hammered iron car axles	21.00 to 21.50
Old steel car axles	16.75 to 17.25
No. 1 railroad wrought	12.75 to 13.25
Wrought iron track scrap	12.00 to 12.50
No. 1 yard wrought, long	11.50 to 12.00
No. 1 yard wrought, short	10.00 to 10.50
Light iron	4.25 to 4.75
Cast borings	5.25 to 5.75
Wrought turning	6.25 to 6.75
Wrought pipe	9.50 to 10.00
Old car wheels	11.00 to 11.50
No. 1 heavy cast, broken up	11.00 to 11.50
Stove plate	8.50 to 9.00
Locomotive grate bars	8.50 to 9.00
Malleable cast	10.00 to 10.50

Metal Market

NEW YORK, July 5, 1911.

The Week's Prices

Cents Per Pound for Early Delivery.

	Copper, New York.			Lead.		Spelter.	
June.	Lake.	Electrolytic.	Tin. New York.	New York.	St. Louis.	New York.	St. Louis.
29	12.87½	12.62½	45.10	4.50	4.35	5.75	5.50
30	12.87½	12.62½	45.00	4.50	4.35	5.80	5.60
July							
1	12.87½	12.62½	.....	4.50	4.35	5.80	5.60
3	12.87½	12.62½	45.00	4.50	4.35	5.80	5.60
5	12.87½	12.62½	45.40	4.50	4.35	5.80	5.60

Copper continues firm and in good demand. Pig tin is very quiet. Lead is dull. Spelter is somewhat stronger.

Copper.—Some fairly good sales of copper have been noted during the week and although the speculative element has been in evidence and has caused some irregularity in prices the market has not receded to any great extent. Consumers who are familiar with the market conditions have been able to buy lake all week at 12.87½c. and electrolytic at 12.62½c. Some sellers have been demanding higher prices while others who offered resale lots were making concessions. The exports of copper during the month of June were very large, amounting approximately to 30,074 tons. There is some difference of opinion as to deliveries into domestic consumption, but it is generally conceded that they were large. In London this morning the market was rather easier with spot copper selling at £56 13s. 3d. and futures at £57 2s. 6d. Exports of copper for the first three business days of the month amounted to 2010 tons. L. Vogelstein & Co. give the following figures of German consumption of foreign copper for the months January-May, 1911: Imports, 74,313 tons; exports, 3211 tons; consumption, 71,102 tons, as compared with consumption during the same period in 1910 of 66,388 tons. Of this quantity 64,555 tons was imported from the United States.

Pig Tin.—Pig tin has been very quiet all week and it is a fortunate thing for the consumer that they are fairly well supplied as spot stocks of tin are decidedly scarce. Figures compiled by C. Mayer, secretary of the New York Metal Exchange, show that deliveries into consumption during the month were quite large, amounting to 2900 tons, while the total deliveries for the first six months of the year showed a decrease of 2100 tons compared with the same period of last year. The total visible supplies on June 30 were 905 tons above that of June 30, 1910, but this country is short on spot stocks. Very little business was done during the week as Monday was made a holiday by many and tin could be bought this morning in New York for about 45.40c. In London this morning the market opened with spot tin at £196 10s. and futures at £190.

Tin Plates.—Quotations on foreign tin plates were lowered during the week in keeping with the reduction of pig tin prices in the London market and this morning the price for plates at Swansea, Wales, was 13s. 9d. The demand for domestic tin plates continues fairly active and quotations are unchanged at $3.94 for 100 lb. coke plates.

Lead.—Lead continues decidedly firm, but there is very little demand for the metal. Outside sellers are meeting the price made by the leading interest which is 4.50c. New York and 4.35c. St. Louis.

Spelter.—The spelter market has stiffened somewhat but consumers are inquiring for less stocks. This morning the price for spelter in New York was 5.80c. and in St. Louis it was around 5.60c.

Antimony.—Antimony is considerably weaker and Hallett's can be purchased for 8.12½c. Chinese and Hungarian grades are down to 7.20c. to 7.25c. and Cookson's is 8.50c. It is apparent that people who bought Hallett's two or three months ago for speculative purposes are now offering their stocks at resale at a decided sacrifice.

Old Metals.—Business is quiet, but dealers' selling prices, New York, are unchanged as follows:

	Cents.
Copper, heavy cut and crucible	12.00 to 12.25
Copper, heavy and wire	11.50 to 11.75
Copper, light and bottoms	10.75 to 11.00
Brass, heavy	8.00 to 8.25
Brass, light	6.75 to 7.00
Heavy machine composition	10.50 to 10.75
Composition turnings	8.75 to 9.00
Clean brass turnings	8.00 to 8.25
Lead, heavy	4.20 to 4.25
Lead, tea	3.95 to 4.00
Zinc, scrap	4.25 to 4.30

Chicago

JULY 3.—The movement of metals this week has been more or less sluggish. Fluctuations in the price of tin, both above and below the current quotation, marked the only activity. We quote Chicago prices as follows: Casting copper, 12.75c.; lake, 13.00c., in carloads, for prompt shipment; small lots, ¼c. to ⅜c. higher; pig tin, carloads, 45½c.; small lots, 42c.; lead, desilverized, 4.45c. to 4.50c. for 50-ton lots; corroding, 4.70c. to 4.75c. for 50-ton lots; in carloads, 2½c. per 100 lb. higher; spelter, 5.65c. to 5.70c.; Cookson's antimony, 9½c., and other grades, 8½c. to 9c., in small lots; sheet zinc is $7.50 f.o.b. La Salle, in carloads of 600-lb. casks. On old metals we quote for less than carload lots: Copper wire, crucible shapes, 12½c.; copper bottoms, 10¼c.; copper clips, 12c.; red brass, 10½c.; yellow brass, 9¼c.; lead pipe, 4⅜c.; zinc, 4¼c.; pewter, No. 1, 27c.; tin foil, 35c.; block tin pipe, 39c.

St. Louis

JULY 3.—In. metals, aside from Lake copper, there has been very little change the past week. The tone is distinctly firm and the reports from the Joplin zinc district are of strong prices there. Tin is quotable at 45.35c.; Lake copper at 13.15c., electrolytic copper 13c. and Cookson's antimony 8.85c. The demand is rather moderate. In old material the prices per 100 lb. are: Light brass, $5; heavy brass and light copper, $8: heavy copper and copper wire, $9: zinc, $3; lead, $3.25; pewter, $20: tin foil, $29; tea lead, $3.

Notes on Prices

Rope.—Business in rope continues moderate, buyers only providing for immediate or nearby requirements, and the market shows corresponding lack of strength on mixed grades of cordage. The following quotations represent regular prices to the retail trade in the Eastern market for rope, 7/16 in. in diameter and larger, with card advances for smaller sizes: Pure manila of the highest grade, 8½ to 9 cents per pound; second grade manila, 7½ to 8 cents per pound; hardware grade manila, 7 to 7½ cents per pound; pure sisal of the highest grade, 6¼ cents per pound; second grade, 6 cents per pound; rove jute rope, ¼ in. and up, No. 1, 6½ to 7 cents per pound; No. 2, 6 cents per pound.

Linseed Oil.—There has been improvement in buying of five and ten barrel lots, but business in carload lots has been quiet. The tone of the market is easy, oil generally being obtainable in various quantities below card prices. In 100-barrel lots the price asked is about 84 cents for raw. It has been learned that manufacturing consumers who have used substitutes for linseed oil are having trouble with customers on this account, and it is thought probable that fewer substitutes will be used next year. No change has been made in card prices, but the following prices, in New York, are general for five-barrel lots:

	Cents.
State, raw	87
City, raw	88

Oil, in lots of less than 5 bbl., 1 cent advance per gallon.
Boiled oil, 1 cent advance per gallon over raw.

Naval Stores.—The demand for turpentine is confined to a considerable extent to jobbing lots, as large consumers are expecting lower prices. New York quotations are as follows:

	Cents.
In oil barrels	56½
In machine barrels	57

Less than 5-bbl. lots, ½ cent advance per gallon.

Demand for the lower grades of rosins has been fair, although the size of orders have been moderate. On the basis of 280 lb. to the barrel, common to good is quoted at $6.40 and grade D, $7.05 in the New York market.

Personal

E. M. S. Young has resigned as general sales manager of the Allegheny Steel Company, Pittsburgh, Pa. W. Lester Walker, who has been appointed general sales manager of that company and also of the Pittsburgh Metal Products Company, was formerly connected with the Hyde Park Iron & Steel Company, Hyde Park, Pa.; later with the Muskingum Valley Rolling Mill Company, operating sheet mills at Zanesville, Ohio, now owned by the American Rolling Mill Company; then with the American Sheet & Tin Plate Company, and finally became connected with the Pittsburgh Metal Products Company. His headquarters will be at the works at Brackenridge, Pa.

W. B. Simpson, president of A. M. Castle & Co., is making an extended automobile trip, having left Chicago June 28 for San Francisco and southern California, accompanied by C. R. Stephens of the Moline Plow Company and G. O. Gunderson, manager of the Acme Steel Company.

Theodore N. Ely, chief of motive power of the Pennsylvania Railroad, retired from active service June 30 in accordance with the pension rules of the company. He had been with that railroad since 1868, and in March, 1893, was appointed chief of motive power. With his retirement the position of chief of motive power will be abolished and the office of chief mechanical engineer has been established to take its place. A. W. Gibbs, general superintendent of motive power of the Pennsylvania lines east of Pittsburgh, was appointed to fill that position. He has been with the company since 1879.

William F. McKenzie, sales manager of the Upson Nut Company, Cleveland, Ohio, severed his connection with that company July 1 to become vice-president of the Gary Bolt & Screw Company, Gary, Ind., and of the Pittsburgh Screw & Bolt Company, Pittsburgh, Pa. He will reside in Chicago. Mr. McKenzie had been connected with the Upson Nut Company 25 years. A farewell dinner was tendered him June 27 at the Hollenden Hotel, Cleveland, which was attended by about 30 representatives of the bolt and nut and general iron and steel industries in Cleveland and other cities. At this dinner he was presented with a handsome loving cup.

H. G. Prout, vice-president and general manager of the Union Switch & Signal Company, Pittsburgh, has had conferred upon him the degree of doctor of laws by the University of Michigan. He was made a master of arts by Yale in 1902.

F. H. Evans, manufacturer of Crescent expansion bolts, 31 to 35 Hewes street, Brooklyn, N. Y., sailed June 27 for a tour through Finland and Russia. He expects to return late in September.

William H. Grady has resigned his position as superintendent of the Seaboard Coal & Coke Company, Coal City, Ala., and has accepted the position of chief engineer of coal mines of the Tennessee Coal, Iron & Railroad Company, Birmingham, Ala.

A. H. Diehl, formerly in charge of the blast-furnace gas engines of the Duquesne Works of the Carnegie Steel Company, has become identified with the Allis-Chalmers Company.

The University of Pennsylvania has conferred the degree of doctor of science on W. L. Saunders, president of the Ingersoll-Rand Company.

McClernan & Co., Peoples Gas Building, Chicago, Ill., who formerly represented the Brightman Mfg. Company, Columbus, Ohio, for the sale of shafting, screw stock, etc., are no longer representing that company, and for the present the territory which they covered will be taken care of directly from the general office of the company at Columbus.

W. E. Manning, assistant general manager of sales of the Youngstown Sheet & Tube Company, Youngstown, Ohio, sailed for Europe last week.

W. O. Duntley, president Chicago Pneumatic Tool Company, sailed for Europe June 27 and will visit the company's plants in England, Germany and Russia for the purpose of inspection.

J. C. Manternach, sales manager of the tube department of the Standard Welding Company, Cleveland, Ohio, has been appointed general manager of sales. W. H. Pirrong, sales manager of the rim department, has resigned.

E. A. Wurster, secretary of the Falk Company, Milwaukee, Wis., arrived home a week ago from an extensive trip in Europe.

D. R. Day, formerly general manager of the Union Malleable Iron Company, Moline, Ill., has been made sales manager of the Prescott Malleable Iron Company, Milwaukee, Wis.

The United States Cast Iron Pipe & Foundry Company, 71 Broadway, New York, announces that at a meeting of the directors held June 29 the office of chairman of the board was created, and George B. Hayes, formerly president of the company, was elected thereto. At the same meeting L. R. Lemoine, formerly second vice-president of the company, was elected president; George J. Long was re-elected vice-president; B. F. Haughton was re-elected secretary and treasurer; Charles R. Rauth was re-elected assistant secretary and assistant treasurer; Ralph M. Shaw was re-elected assistant secretary.

A. E. Croft has been appointed general manager for E. G. T. Colles & Co., Chicago. He was with the Featherstone Foundry & Machine Company for eight years and for two years past has been sales manager for the Modern Steel Structural Company.

Frank W. Hall, manager of the Philadelphia office of the Sprague Electric Works, has been appointed manager of hoist sales and after July 15 will be located at the New York office, 527 to 531 West Thirty-fourth street. James A. Clifford, manager of the Baltimore office, has been appointed manager of the Philadelphia office. The Baltimore office will be continued as in the past under Mr. Clifford's direction, but as subsidiary to the Philadelphia office and with Henry S. Patterson in charge.

W. C. Mitchell, who for several years has been general superintendent of the Dominion Iron & Steel Company, Sydney, N. S., has been appointed general superintendent of the Algoma Steel Company, Sault Ste. Marie, Ont.

The Valley Mold & Iron Company, Sharpsville, Pa., manufacturer of ingot molds, states that its June tonnage was the heaviest of any month this year. This is taken to indicate fuller operations in the steel works using its ingot molds.

The American Society for Testing Materials

Fourteenth Annual Meeting, June 27 to July 1, Atlantic City, N. J.

The first of the nine professional sessions which were to comprise the fourteenth annual meeting of the American Society for Testing Materials opened Tuesday afternoon, June 27, at the Hotel Traymore, Atlantic City, N. J. The work began in the usual energetic style which has characterized the activities of this influential organization, with President Dr. Henry M. Howe in the chair and Secretary Prof. Edgar Marburg at his right. The programme provided for a session to be given over to the consideration of preservative coatings for iron and steel, two sessions on steel, one on cement and concrete, one on bitumens, covering road making materials, and one on testing apparatus and methods.

At the Tuesday afternoon session was presented a report of committee A-3, Walter Wood chairman and Dr. Richard Moldenke secretary, on standard specifications for cast iron and finished castings, giving at this time specifications for locomotive cylinders. At the request of the committee chairman no action was taken. Reports were also made of committees on specifications for hard-drawn copper wire, J. A. Capp chairman, and specifications for clay and cement sewer pipes, Rudolph Hering, chairman.

The tellers of election, Richard L. Humphrey and J. A. Capp, announced the unanimous election as members of the executive committee of: W. A. Bostwick, metallurgical engineer, Carnegie Steel Company, Pittsburgh (re-elected); Robert W. Hunt, Chicago; Dr. Richard Moldenke, Watchung, N. J.; William R. Webster, Philadelphia (re-elected).

The society now has a total membership of 1382, 274 applications having been approved since the last meeting, and the total loss from all causes being 172. Another indication of the high estimate in which the society is held is reflected in the sale of its publications. The total receipts from this source for the year 1908-1909 was about $875; for the year 1909-1910, $1,376, and for the past year, $2,540. For the first time in its history the society is on a sound financial footing. Instead of a deficit of $2,200 which existed a year ago, there is a cash balance in the treasury of $6,792, with no outstanding liabilities.

Ingot Iron

A leading feature of Tuesday night's session was an extended paper by Dr. Allerton S. Cushman, entitled, "The Manufacture of Pure Irons in Open-Hearth Furnaces." A metal which contains 3 per cent. or more of a foreign body such as slag, falls, he said, just that far short of being pure iron, and from a perfectly reasonable standpoint it would appear that after the carbon-iron alloy field has been eliminated, the nearer the metal approaches to the theoretical constitution of that element itself the more it justifies the name of iron. This pure iron made in an open-hearth furnace has become generally known in this country and to a certain extent in Europe as "ingot iron."

The manufacture of pure iron in open-hearth furnaces in its entirety is, he continued, undoubtedly a distinctly new development, in spite of the fact that the process has a great many points in common with the open-hearth production of mild steel. In the case of the iron the oxidizing operation under highly basic conditions is carried forward to an abnormal extent. It is not too much to say that the effort is made to do what has generally been conceded to be bad practice in an open-hearth furnace; that is to say, the metal is deliberately over-burned. This treatment yields a bath of metal and slag heavily charged with gas and in a highly super-oxidized condition. The elimination of the carbon and manganese to such low percentages that they amount to no more than traces makes this super-oxidation a necessary step in the process. Having obtained the desired purity with respect to these elements the bath is given a heroic treatment, whereby a thorough deoxidation takes place, the gas being at the same time satisfactorily eliminated.

In tensile strength it closely approximates high-grade well-rolled charcoal iron, and in elongation and reduction of area it not only equals but in many cases surpasses the finest soft steel. It is a well-known fact that iron is usually inferior to steel in elongation and reduction of area. Owing to its more steel-like qualities in this respect, therefore, pure open-hearth iron becomes available for deep drawing and stamping purposes where very often ordinary wrought iron is unavailable and steel must usually be employed. After reviewing all the evidence available, both favorable and unfavorable, Dr. Cushman affirmed his belief in pure iron as a valuable article of commerce to be stronger than it ever was before.

In discussion there was considerable sentiment expressed against the suggested disturbance of present-day iron and steel nomenclature and it was brought out that the heroic treatment referred to involved the addition of pig iron to bring about the necessary deoxidation. It was mentioned also that the ingot iron is highly weldable and is used as a solder in connection with the high-temperature flame.

President's Address

President Howe, in his address which opened the Tuesday evening session, paid a tribute to the late Gustavus C. Henning and the audience rose for a moment as a testimonial to his memory. Dr. Howe discussed at some length the inertia or unwillingness of the average individual to accept a change of condition. The friction met in attempting to bring about a change is in part due to the harm one feels may be done him. Those who are in favor of the efforts are the small number of manufacturers who are attempting to serve the public well, the larger number who are those immediately served and the rest the multitude which are benefited.

The buyer is no longer the seller's prey but his employer. The trend of the change is indicated in the newer relations between employer and employee. He mentioned the active part taken in bringing about present-day changes by John Fritz, Judge Gary, Charles Kirchhoff and others. Universal education is uplifting the world's peoples beyond the Aryan race. He mentioned how one of the difficulties to be overcome in the march of progress is the differences among countries regarding such detail as specifications for rails. He outlined a scheme to bring about a single international specification. The problem he emphasized was not an engineering one but psychological.

Specifications for Steel Wheels and Axles

Considerable attention was paid at the Wednesday morning session, given over to steel, to the question of specifications for steel wheels. A report of Committee A-1, W. R. Webster chairman, was presented, dealing in part with specifications for forged and rolled solid steel wheels for passenger and freight car service, with specifications for heat-treated carbon-steel axles and shafts and with specifications for steel reinforced bars.

Charles S. Churchill, chief engineer, Norfolk & Western Railway, regarded the specifications for steel passenger car wheels as too liberal with regard to the limits of the chemical composition, the carbon being 0.6 to 0.85. He felt it was likely to be difficult later to narrow the limits. Mr. Stevenson of the committee mentioned that the specifications covered both acid and basic steel and that the committee had been working several years on the subject. He emphasized also that the specifications were the first covering rolled solid steel wheels.

R. W. Hunt, Chicago, thought it was better to have no specification than one of some doubtful basis. The rolled solid steel wheel he regarded as too new for the society to take the step of adoption but that the makers should fight their own battles.

R. W. Mahon, chemist, New York Central lines, West Albany, said that wheels used on the same axle only differed by 0.05 carbon and the question of range in carbon was no special argument against the specification. He said wheels used on the New York Central lines came within the specification. The percentage of carbon is stamped on the wheels, and there is no difficulty in properly mating the wheels. One member said that he was buying wheels under a less elastic specification.

Mr. Hunt regarded it as a unique proposition that the manufacturer was not asking for the relatively wide

limits allowed. Professor Marburg emphasized that as the specifications covered a new line they should be liberal rather than exacting, that the society's Year Book carried specifications which are in particulars not so exacting as some in regular use.

The specifications were referred to Committee A, which is to receive and consider specific objections to the specifications.

It was voted to submit the specifications for steel reinforcement bars to a letter ballot of the society.

With regard to the specifications for heat-treated carbon-steel axles considerable discussion arose over an allowed limit of not over 0.6 per cent. carbon. The consensus of opinion was that the carbon limit was protected by the general requirements of the physical tests demanded. It was explained that the limit was put in as a protection and that what was important was the capability of the steel to meet the physical tests. It was voted also to submit the specifications to a letter ballot of the society.

Heat Treatment of Iron and Steel

Dr. Howe presented a report on the heat treatment of iron and steel. It was styled as recommended practice for annealing miscellaneous rolled and forged carbon steel products, no attempt being made to draw up specifications on the subject because no single set of rules could be applied vigorously to such widely varying classes of objects and purposes. The report covered suggestions on annealing to remove existing coarse grain, mentioning, for example, that an exposure of 1 hr. should be long enough for pieces 12 in. thick. The trained eye was regarded as better than the use of the unchecked pyrometer, and emphasis was placed on keeping the surrounding light at the same intensity or always dull so that the eye does not have to accustom itself to changing contrasts.

Temperatures for Annealing.

Carbon per cent.	Range of Annealing Temperature deg.
Less than 0.12	875 to 925 C. (1607-1697F)
0.12 to 0.29	840 to 870 C. (1544-1598F)
0.3 to 0.49	815 to 840 (1499-1544Fq
0.50 and over	790 to 815 C. (1454-1499F)

Figures were given, as reproduced in the accompanying table, for the annealing temperatures for different carbon contents. The higher the carbon the slower the cooling should be, it was emphasized, and the slower the cooling the more ductile the metal will be and the lower will be its tensile strength, elastic limit and yield point; the greatest softness and ductility being had at a certain sacrifice of strength

To give an unusually high combination of ductility with tensile strength and elastic limit, the quenching in oil is recommended and the removal of the metal when the temperature has fallen, say, to 160 deg. C. (320 deg. F.). The annealing should begin within a very few hours of the quenching, and the quenching may be done in water if the carbon content is so low and the shape so simple that there is no danger of the piece cracking or receiving permanent harmful stress. The steel hardened should then be annealed to a temperature suited for giving the properties needed. For very high elastic limit and tensile strength annealing at 500 to 650 deg. C. (932 to 1032 deg. F.) is mentioned; in this case the ductility will be low. For greatest ductility, with good strength and elastic limit, anneal at 725 to 750 deg. C. (1337 to 1382 deg. F.).

To get moderate increase of strength and elastic limit, the cooling from the annealing temperature is hastened until the object is at a dull red, say 650 deg. C. (1207 deg. F.), and then the cooling is slow. The hastening of the cooling may be done by withdrawing the object from the furnace, returning at the proper time.

Prof. Mansfield Merriman regarded the report as covering a method of manufacturing, whereas all other matters the society heretofore has dealt with referred to materials after they are made, but the fact that the committee was appointed at a former time was mentioned as answering the point. It was voted to send a copy of the recommended practice to the members for a letter ballot and to print it in the proceedings and in the Year Book.

Heat Treatment of Nickel Steel

A paper by Prof. William Campbell, Columbia University, and H. B. Allen covered a research of a heat treatment of an open-hearth steel of 0.27 per cent. carbon, 3.15 nickel and 0.65 manganese, cold drawn, 5/8 in. round. It was found that the refining temperature was complete at 750 deg. C or 75 deg. lower than for ordinary carbon steel.

In the case of bars heated and then cooled in the air it was found that reheating to 700 deg. decreased the elastic limit, which was 66,630 lb. per square inch, against 83,170 lb., the elastic limit of the steel as received. The elongation was very marked, as was to be expected, being 33.5 per cent. against 22 per cent. for the steel as received. Heating to 750 deg. gave the maximum ductility, or 37.5 per cent. elongation. Heating to 1200 deg. gave a yield point of 71,740 lb., but an elongation of 25 per cent., and beyond that point there was a marked falling off in ductility.

For bars cooled in the furnace heating to 610 deg. C. lowered the elastic limit and increased the ductility because heat treatment even below the critical points has marked effects on the properties of material that has been worked cold. As before, heating to 750 deg. gave greater ductility, but the 1200-deg. heat showed little difference, indicating that slow cooling may mask overheating. The yield points for the steel as rolled for cooling from 610 deg., cooling from 750 deg. and for cooling from 1200 deg. were 83,170, 71,650, 61,400 and 51,390 lb. The elongation in 2 in. was for the four cases 27, 32, 39.5 and 35 per cent. respectively.

Bars were quenched in water and the maximum tensile strength was 275,800 lb. per square inch, occurring with the bar heated to 870 deg. C. The tensile strength remained high at 1200 deg. It was noted that the strength of quenched bars was liable to vary.

With bars quenched in oil the tensile strength was high, but somewhat below that of water-quenched bars.

Bars quenched in water were reheated and cooled in air. The original quenching gave a low ductility, elongation 2 per cent. and reduction of area about 8 per cent.; reheating to 200 deg. lowered the strength but increased elongation to 12 per cent, and reduction of area to 54 per cent. Later it was found with oil-quenched bars and reheating to 150 deg. a high tensile strength was maintained and ductility enormously increased.

The structure of the steel showed the same variation of ferrite and pearlite as normal low carbon steel. The conclusions covered the refining temperature of 750 deg. already mentioned and that hardening is complete when the steel is quenched from this temperature, but higher tensile strength is obtained by quenching around 900 deg. C. It was also found that overheating becomes marked above 1200 deg., and tempering bars quenched in water or oil gives very uniform increase in ductility and decreases in strength until at 650 deg. the properties are very nearly those of the original steel, having a slightly lower elastic limit and greater reduction of area.

Arrangements for Next Year's Congress

Prof. Marburg mentioned on Wednesday evening the necessity of considering general matters concerning the next annual meeting of the society on account of the International Congress to be held in America in September next year. It was decided to hold the annual meeting at the usual time, but to receive only committee reports, the papers which may be presented to be contributed to the International Congress meeting. It was suggested that in order to make amends to the American members for the lack of proceedings, so to speak, suitable financial arrangements could be made so that the members may get the English edition of the proceedings of the congress, which in the case of the English rendition last year yielded 1000 pages. Members of the American Society also members of the international body will get advance copies of the international meeting. It was also suggested that junior members for a payment of $2.50 could be given the English international proceedings.

Metal Preservative Coatings

Wednesday evening's session was styled the session "On Preservative Coatings" and was occupied in part with the reading of the report of committee D-1 having to do with the findings of the conditions of painted panels and structure of the Havre-de-Grace bridge and in part with a paper by Cloyd M. Chapman, of Westinghouse, Church, Kerr & Co., having to do with the observations of paint behavior on small plates exposed to the weather on the roof of a building in lower New York.

Paint Tests on Maritime Building, New York

Mr. Chapman's paper gave a table which showed the comparative degree of protection afforded by different classes or groups of paints. These tests have been continued since last year, and other paints added, until now

over 1000 coatings have been exposed to the weather, spread on approximately 3000 steel plates. The paints reported on last year consisted chiefly of ready-mixed products, sold ready for application, but a considerable number of those which are included in this report, and which had not been exposed long enough to be included last year, were made up in the laboratory, from standard pigments and vehicles, while others were supplied by the makers in the paste form and thinned for use with raw linseed oil and dryer.

He emphasized two points in regard to details of the method of testing. The first is the desirability of pickling the plates in dilute sulphuric acid to remove the mill scale before painting. The other point is the desirability of giving the plate an opportunity to rust at some well-defined point, so as to be able to note the effectiveness of the paint film in preventing the spread of rust from that point. This was accomplished in these tests by deeply scratching the corners of each plate through the paint film with a sharp-pointed tool on the day that the plates were exposed.

The table shows the average percentage ratings of these groups of points after one, two and three years' exposure to the weather. These ratings are based solely upon the amount of visible rust which had formed on the steel plates.

An examination of this table brings prominently forward several points.

1. For short time protection, in such cases as the protection of steel for a few months by the application of a single coat, a red lead, white lead or one of the chromate group would be satisfactory.

2. The early and complete failure of the gilsonite and elaterite paints, indicating the unsuitability of these materials for this particular kind of exposure.

3. The close agreement between the groups comprising the two forms of carbon, namely, the carbon and the graphite groups. At the same time it should be noted that combinations of these two pigments have been much less effective.

4. The close agreement between the two carbon groups just mentioned and the iron oxide group is noteworthy. The only distinct advantage possessed by any of them

Comparative Average Percentage Ratings of Structural-Steel Coatings

Class.	One year exposure. One coat. No. of tests.	One year exposure. One coat. Average rating, per cent.	One year exposure. Two coats. No. of tests.	One year exposure. Two coats. Average rating, per cent.	Two years' exposure. One coat. No. of tests.	Two years' exposure. One coat. Average rating, per cent.	Two years' exposure. Two coats. No. of tests.	Two years' exposure. Two coats. Average rating, per cent.	Three years' exposure. One coat. No. of tests.	Three years' exposure. One coat. Average rating, per cent.	Three years' exposure. Two coats. No. of tests.	Three years' exposure. Two coats. Average rating, per cent.
Carbon	82	33	67	72	65	3	53	49	61	0	35	25
Carbon and graphite ..	5	13	5	38	5	9	5	24	5	0	5	18
Graphite ...	78	22	67	71	67	4	56	48	30	2½	43	23
Graphite and iron oxide	5	49	5	81	5	15	5	65	4	0	3	35
Iron oxide..	101	48	98	77	74	8½	71	48	34	3	52	24
Iron oxide and red lead	5	34	5	60	5	11	5	37	5	0	5	3
Red lead...	61	65	50	81	50	24	39	54	19	4	20	37
Red lead primers ..	..	..	45	76	..	..	43	54	..	..	14	37
White lead.	40	62	28	88	24	17	12	49	16	0	3	0
Lead compounds (except red and white)	11	45	12	84	8	10	4	64	8	7	8	36
Zinc oxide..	9	31	9	69	6	0	5	50	4	0	5	23
Mineral hydrocarbon (no pigment) ...	62	32	58	58	48	8	55	24	20	4	24	28
Elaterite ..	12	8	12	24	12	0	12	13	12	0	8	0
Gilsonite ..	6	0	6	18	6	0	6	8	6	6	6	0
Mineral hydrocarbons (with pigment) ...	10	16	11	53	10	0	11	27	10	6	7	9
Vegetable hydrocarbons (no pigment) ...	4	4	4	52	4	0	4	0	4	0	4	0
Vegetable hydrocarbons (with pigment) ...	9	26	9	60	9	0	9	20	9	0	6	0
Cement ...	8	31	8	40	8	13	8	27	0	..	0	..
Chromate ..	20	50	30	76	14	8	24	33	12	0	9	30
Vehicle	30	6	15	35	30	0	7	0	30	0	7	0
Miscellaneous ..	103	41	121	67	68	7	86	38	63	0	63	19

appears to be in favor of the iron oxide for short-time single-coat work, while carbon appears to be somewhat better than graphite for the same purpose. It seems that a mixture of graphite and iron oxide has some advantage over either used alone. Were it not for the small number of tests of this graphite and iron oxide group the showing made would command attention.

It should also be noted that zinc oxide compares favorably with carbon, graphite and iron oxide.

White lead appears somewhat superior to any other pigment except red lead for one-coat work, after either one year's or two years' exposure. For two-coat work, while it holds the honors for the first year, it has dropped down to the level of many others at the end of two years. The group marked "Lead compounds, except red lead and white lead," which includes such pigments as basic sulphate, sublimed blue lead, zinc lead, etc., is making a remarkably good showing throughout the test.

There is one other point which stands out prominently in the table, and that is the durability of the group of red lead primers. Very inferior paints were used for the second coat on many of the plates in this group and yet the average is well up with the best.

Ten samples of paints were tested which the makers claimed were rendered inhibitive by the use of chromates or chromic acid in some form. With these were tested a number of pigments and pastes containing chromium which were received from or through the laboratory of the Paint Manufacturers' Association. The averages of the results obtained with the chromates from the laboratory of the Paint Manufacturers' Association were much higher than those shown by the ready-mixed paints from the makers, especially for one-coat work. A comparison of the results obtained with ready-mixed and laboratory-mixed paints is shown in the table. The wide difference in favor of the laboratory-mixed samples would seem to indicate the use of inferior materials in the factory-made paints.

Comparative Results Obtained with Paints Received Ready-Mixed and Paints Mixed in the Laboratory; One Year Exposure

Class.	One coat. No. of tests.	One coat. rating, per cent. Average	Two coats. No. of tests.	Two coats. rating, per cent. Average
Chromate paints received ready mixed	10	28	10	61.5
Chromate paints mixed in the laboratory	10	72.5	16	86
Carbon paints received ready mixed	70	26	56	69
Carbon paints mixed in the laboratory	12	74	11	90
Red lead paints received ready mixed	48	62	41	80
Red lead paints mixed in the laboratory	13	77	9	86
Iron oxide paints received ready mixed	72	42	69	74
Iron oxide paints mixed in the laboratory	19	88	19	93

In the case of red lead paints the difference does not appear to be so great, especially for two years' exposure. One interpretation of these results might be that, just as a small proportion of the proper chromate will render a paint inhibitive, so something less than 100 per cent. red lead will make a good protector for steel.

In the discussion Dr. Cushman thought Mr. Chapman's methods of rating novel and that if larger samples were used the results would be more valuable. He argued that caution should be taken in drawing sweeping conclusions, particularly in view of the large commercial bearing of the subject. A tribute was paid to the author for the great scope of the efforts made by him. It was noted that the pieces of metal painted were only 8½ per cent. of 1 sq. ft. in area.

Attention was called to the better performance of the laboratory tests. Mr. Chapman explained that pigments were submitted dry and ground in raw linseed oil and then thinned with linseed oil and 6 per cent. turpentine dryer. He felt with regard to his small size plates that they were generally consistent with the showing of larger samples. One member felt it should be understood the results of the experiments were submitted for such interest as they may have.

In this connection mention may be made of a paper by Henry A. Gardner, director, Scientific Section, Paint Manufacturers' Association of the United States, describing how paint oils are now under observation on a fence supporting 48 testing panels 22 x 1 x 9 in. on the grounds of the Institute of Industrial Research at Washington, D. C.

The Acid Corrosion Test

Another notable feature of the Wednesday evening session, if not of the entire meeting, was the extended reference to the acid corrosion test. It was mentioned by Dr. Cushman in his report of committee A-5; it formed the basis of a paper by Prof. W. H. Walker of the Massachusetts Institute of Technology and the subject of a paper

by Cloyd M. Chapman. No action was taken, however, in respect to the society's attitude on the subject.

Dr. Cushman briefly mentioned the preference for the lead acetate test in connection with the determination of the weight of zinc coatings of galvanized wire, but took the occasion to emphasize in closing that "the name of the American Society for Testing Materials continues to be used as having recommended the acid corrosion test and by inference as having indorsed the same. For this reason your committee desires at this time to again disclaim any recommendation or indorsement of the acid test as a measure of natural corrosion and to point out that any use of the name or authority of the American Society for Testing Materials in this connection is unwarranted."

Copper in Iron and the Acid Test

Prof. Walker's paper described an investigation of the effect of copper in iron on the acid corrosion test. He submitted a table, reproduced herewith, covering the analysis of four open-hearth steels and four irons. Where copper was absent the destruction of the metal in the sulphuric acid was relatively very great, being 40 times greater in the case of the irons. He referred to the fact that copper in contact with iron hastens destruction, but when it is in iron it retards it.

Dr. Cushman did not regard the presence of copper as the retarding agent, but it was a question of oxygen, involving a phenomenon not yet explained. He inferred that when the question of the presence of copper is considered one is entering the alloy field.

One member gave results of tests to controvert Prof. Walker's investigation. He gave the composition of elec-

Relative Solution in Acid of Different Metals.

	Steels.					
	Copper.	Manganese.	Sulphur.	Phosphorus.	Copper.	Loss, per cent., in sulphuric acid.
A	0.08	0.5	0.018	0.017	0.21	8.7
A2	0.08	0.5	0.018	0.017	0.21	0.12
B	0.16	0.41	0.027	0.026	0.19	0.12
C	0.09	0.31	0.021	0.063	0.19	0.14
	Irons.					
E	0.02	0.06	0.035	0.006	trace	18.83
F	0.02	0.02	0.022	0.005	0.16	0.44
G	0.02	0.25	0.041	0.009	0.20	0.50
H	0.02	0.06	0.04	0.003	0.19	0.44

trolytic iron, American ingot iron and Swedish iron, each of which was subjected to a 4-hr. 60 deg. C. acid test with losses, of 7, 24 and 46 per cent. respectively. Among other constituents the electrolytic had carbon, 0.006; oxygen, 0.032, and copper, 0. The American ingot had 0.01 carbon, 0.027 oxygen and 0.5 copper. The Swedish iron 0.05 carbon, 0.058 oxygen and 0.43 copper. A 100 per cent. loss was reported for a case where the copper was 0.03.

It was remarked that copper in one case may be in solid solution and in another in an alloyed condition, and then the material could not be admitted as a pure iron.

Actual Versus Accelerated Corrosion

Mr. Chapman's paper illustrated the behavior of two plates, one of iron and the other of steel, subjected to weather exposure for 18 mo. They exhibited little difference unless the iron were slightly more corroded. In a 12-hr. acid test, however, the steel suffered badly in comparison.

One member thought it wise for the members to give careful consideration to the acid test before it is discredited. There is one marked difference. With a number of grades of iron there is a great range in the acid test results, but in actual weather exposure there is a much less range.

Dr. Cushman here took the occasion to explain that individually his ideas had not changed, and the committee's statement referred to earlier in this report of the discussion marked the majority's views. He had decided it wise not to introduce a minority report.

Practical Testing of Oil Adulteration

Easily the spectacular feature of the meeting and unquestionably popular from the practical and far-reaching importance of its bearing was the paper of Alexander E. Outerbridge, Jr., entitled "A Novel Method of Detecting Resin Oil and Mineral Oil in Other Oils." The advance copies shared in the demand for them with Dr. Cushman's paper on the manufacture of pure irons in the open-hearth furnace, copies of both papers being early exhausted. Extended reference is to be in these pages to Mr. Outerbridge's contribution, the full extent of the influence of which it is hard to forecast. It amounts to the discovery that the slightest addition of a rosin or mineral oil to a vegetable oil, like linseed, makes the mixture fluorescent in the utlra-violet rays, such as are obtainable with an inclosed arc light, and, moreover, an ordinary employee can make a close quantitative estimation of the degree of adulteration. The phenomenon is true even with so-called de-bloomed oils which are marketed as linseed, for example.

Heat Treatment of Spring Steel

A report to committee A-7, Henry Souther chairman, covering an investigation of heat treatment of steels for springs, was received on Thursday afternoon from the sub-committee: A. A. Stevenson, A. N. Lukens, J. E. Howard, F. D. Carney and E. D. Nelson, chairman. The report also covered an analysis of transverse, hardness and bending tests. It was found that at a quenching temperature of 1500 deg. F. the maximum elastic limit was obtained with a drawing temperature of about 600 deg., while where the quenching temperature was 1650 deg. the maximum elastic limit was found when the drawing temperature was about 800 deg. In the former case it was noted that the angle of bend at rupture was an average of slightly over 59 deg., there being considerable variation in the specimens, while with the following group the average angle at rupture was slightly over 103 deg. It was not conclusively proved that there is a definite relationship between hardness numbers and elastic limits.

Hardness Tests and Machines

A leading feature of the steel section of Thursday afternoon was the consideration of the following papers: "Hardness Tests," by Prof. Bradley Stoughton and J. S. Macgregor; "Comparison of Five Methods of Hardness Measurement," by R. P. Devries; "Hardness in Relation to Other Physical Properties," also by Mr. Devries, and "The Property of Hardness in Metals and Materials," by Albert F. Shore, president Shore Instrument Company, New York.

Mr. Macgregor described a machine for ascertaining the resistance of materials to abrasion, like the wear that occurs in the bottom of an engine cylinder. It involved whetstones running dry at 400 to 500 r.p.m. and exerting a pressure of 1 lb. each on the specimens tested. With six specimens tested each was moved to a new position after 700,000 r.p.m. and after the six changes of position had been consummated the loss of diameter and loss in weight was determined.

Mr. Devries described five hardness machines and explained at length the interesting experiences and results of measuring the depth of indentation of a hard sphere into the metal under investigation when pressure was applied by a hydraulic ram. By means of a micrometer-microscope the movement of a line on the ram piston was measured with a definite loading or pressure developed by the ram and then the degree of return of the line when the load or pressure was removed gave a measure of the depth of indentation. For example, with a certain loading the line moves parallel to itself a measured distance, but on unloading it does not recover the distance, the recovery measuring the temporary deformation of the machine and the lack of recovery the permanent indentation. It was suggested to refer hardness to the load necessary to produce 1 millimeter of indentation depth.

Mr. Shore's paper announced a semi-automatic scleroscope capable of giving 5000 hardness readings per day and described a hardness machine for testing rubber and similar materials.

Dr. Howe opened the discussion and emphasized how important it would be commercially to develop a hardness test which could if possible replace the tensile test in regular manufacturing operations, leaving the tensile test for the more exact information that will be necessary.

Dr. Leonard Waldo paid a tribute to the papers of Mr. Devries and described an instrument he used which was about the size of a drawing instruments' case and highly portable. It involved a standard carrying a plummet suspended from a silken cord with a 60-deg.-angle cone-striking point at the bottom of the plummet. This was held about 12 in. above the metal to be tested and given a free vertical fall by a trigger releasing of the cord. With the apparatus was a microscope which was provided with a scale in the plane of vision so direct measurement could be made of the diameter of the depression or indentation made in the metal. He regards the way to measure hardness is by the displacement of the metal.

Overstrained Structural Material After a Period of Rest

An interesting paper on the effect of gagging or overstraining of structural material in straightening it was read by Prof. E. L. Hancock of the Worcester Polytechnic Institute. It explained the different physical characteristics of the web, flange and root of beams and indicated that there was increase in desirable characteristics after a period of rest. Arrangements have been made for printing the paper substantially in full in these columns.

Sulphur in Boiler Tubes

F. N. Speller, metallurgical engineer of the National Tube Company, described the method of flattening and flanging the crop ends of tubes as a means of testing their thoroughness of manufacture and justification for commercial use. This has already been illustrated in *The Iron Age*. He emphasized that low sulphur does not always mean higher weldability. In a test of 1200 pieces of tubing of 0.045 per cent. sulphur the loss was 14 per cent. against a 20 per cent. loss with 0.027 sulphur. In another case there were 20 per cent. more bad welds when the sulphur was below 0.03 per cent. than when it was over 0.04 per cent. He considered that the rigorous specification in this respect had been overdone and that 0.05 per cent. sulphur would be altogether satisfactory.

He exhibited a chart covering records of the additional sulphur absorbed by locomotive tubes in practice. There was an indication that the tubes with the less amount of sulphur initially absorbed the greater amount in use.

It was voted to refer to a letter ballot a committee report on proposed standard methods for transverse tests.

Testing Apparatus and Methods

Friday afternoon's session was given over to methods and apparatus for testing. A report of committee A-6 was received relating to proposed magnetic tests of iron and steel. It was voted to submit it to the membership for a letter ballot.

An ingenious method of subjecting teeth of a gear to shock which could be measured was described by Prof. Bradley Stoughton, who together with Prof. J. S. Macgregor submitted a paper on the subject. The point was that fracture of the teeth of a pinion in practice occurs as a result of suddenly applied load rather than of a static load, and such a test was essential. The investigation covered a test of a case hardened gear and one of a uniform carbon content.

Two papers were read by T. Y. Olsen, one describing a new type of impact testing machine for determining fragility of metals and the other describing a new type of autographic transverse testing machine for research or regular foundry practice. The author said the deviation from the average of the results obtained from the impact machine was not essentially different from that true of tensile tests.

Mr. Outerbridge mentioned how about 20 years ago he had discovered the possibility of getting 25 to 30 per cent. better transverse test results after tumbling the specimens. He also told of his early experiments with impact tests in which by subjecting the specimens to successively increased falls of the hammer the iron acquires an increased strength. These phenomenon he had explained as due to rapid readjustment of the molecules involving the overcoming of cooling stresses.

Fritz Engineering Laboratory

The Fritz Engineering Laboratory given to Lehigh University by John Fritz was described in a paper by Prof. F. P. McKibben of Lehigh University at the Saturday morning session. There are four sections in the Laboratory, as follows:

(1) A general testing section including the testing machinery and a small machine shop; (2) a room for testing cement; (3) a room for making and storing concrete specimens, such as beams and cylinders; and (4) a hydraulic section.

One of the machines is a 800,000-lb. machine, capable of testing a column of 24 ft., a tension specimen of corresponding length, or a transverse specimen 10 ft. long or less. It is possible to test beams up to 25 or 30 ft. in length by using extension girders on the weighing table.

Elastic Properties of Iron Carbon Alloys

An interesting paper was read at the Saturday morning session by Prof. C. R. Jones of West Virginia University, Morgantown, W. Va. The object was to determine whether any relation existed between the variation of the tensile properties and certain known magnetic properties of a series of steels. The steels were made by the crucible process and after being rolled were allowed to cool in air. There was a small variation of all the elements in the series proper except carbon, and microscopic study showed the steels to be quite homogeneous. The carbon varied from 0.60 to 1.37 per cent., while the phosphorus varied from 0.01 to 0.013 per cent., the silicon from 0.14 to 0.19 per cent., the manganese from 0.14 to 0.17 per cent., and the sulphur from 0.012 to 0.014 per cent.

The results of the tests made by the writers would indicate that pure iron should have a tensile strength of about 40,000 lb. per square inch, and that the tensile strength of the series of annealed crucible steels tested increased about 630 lb. for each 0.01 per cent. of carbon up to 0.80 per cent., after which the strength gradually decreased.

The variation of the modulus of elasticity with the carbon content in the series of steels tested by the authors followed the same general law as the maximum strength and elastic limit and the values ranged between 22,000,000 and 40,000,000. The curves for total elongation and reduction of area were similar, and indicate that there is a critical point in each corresponding to the percentage of carbon which gives maximum strength. A comparison of the curves between the tensile strength and carbon, and those for the magnetic hysteresis loss, showed a striking similarity as to shape

D. E. Douty was glad to see the attempt made to couple the magnetic and tensile properties. He volunteered to measure the hardness of the specimens to discover the relations of this feature and the remainder of the characteristics. There was considerable discussion over the variation shown by the authors in the modulus of elasticity. H. C. Boynton, Trenton, N. J., said that in some tests he had made with low-carbon annealed wire of 0.10 carbon and 0.12 manganese, moduli of elasticity of 22,000,000 to 23,000,000 were obtained until he had some 50 tests of utmost accuracy when the values ranged between 29,000,000 and 30,000,000. He mentioned, however, his results might not be comparable with those on the pure iron tested by the author.

Government Fuel Investigations

A report of the committee on coke was, in the absence of the chairman, read by A. W. Belden of the Bureau of Mines of the United States Government, Pittsburgh.

He also reported on the progress of fuel investigations being made by the Bureau of Mines. This work includes investigation of combustion and of the conditions transpiring in the cupola. The work, for example, has shown that it is possible easily to burn 52½ per cent. of the iron. A later report promises much valuable information in this particular.

The Bureau has this year analyzed and reported on over 1,000,000 tons of coal of all kinds, the value of which is worth $5,000,000; and the work of the laboratories is represented by more than 7,000 samples. The cost of this work, per sample, is about $1.54, equivalent to 1.33 cents per ton or 0.48 per cent. of the cost of the coal.

Miscellaneous Business

It was voted that the executive committee appoint a committee to formulate a standard specification as regards form but not substance.

Secretary Marburg discussed the probability of the papers' being distributed earlier in advance, and of closer censorship being exercised in respect to the papers.

The executive committee, it was announced by the secretary, had decided to declare a dividend in the shape of an index to the proceedings up to date.

Entertainment

A record for attendance marked the meeting. There was a total registration of over 450, of which 98 or 100 were ladies. There were a third more members than were present last year. The entertainment committee, of which Anderson Polk was an energetic member, arranged for the use by ladies of Atlantic City's rolling chairs on the Board Walk on exhibition of the ladies' badges and provided for a vaudeville entertainment and also a smoker on one of the evenings and entertained at the Atlantic City Country Club, the journey to which was made in autos.

The Davis-Bournonville Company's Increased Facilities

The Davis-Bournonville Acetylene Development Company has united with the National Pneumatic Company, of Chicago, in making the Davis-Bournonville Company their exclusive agent for welding and cutting apparatus, and have added largely to its working capital and executive ability. The National Pneumatic Company has been handling the Davis-Bournonville Company's apparatus almost since its introduction, through its Chicago Welding Company department. Many ideas of importance have been developed, and a wide and valuable experience acquired, so that high-class ability, as well as additional financial strength, has been added to the selling company.

J. B. Burdett and Harold Rowntree, of the National Pneumatic Company, and also widely known as the principals in the Burdett-Rowntree Mfg. Company, will participate actively in the management of the Davis-Bournonville Company; Mr. Burdett as treasurer, and Mr. Rowntree as vice-president. Hugh L. Adams, who has achieved a high reputation in the industry, as manager of the Chicago Welding Company, will be the manager of the Western department. Augustine Davis will be president, and C. B. Wortham will be secretary and assistant treasurer of the company.

The business will be divided into the Eastern department, with offices in its present quarters at 90 West street, New York, and the Western department, with offices at 515 Laflin street, Chicago. The consolidation thus effected places the combined resources and experience of these companies at the service of all prospective users of autogenous apparatus.

Heat Treatment on Acid and Basic Open Hearth Steel of Similar Composition*

BY HENRY FAY†

It is generally conceded from the results of the work of Campbell and of Webster that acid open hearth is superior in quality to a basic steel of similar composition, but so far as the author knows no attempt has ever been made to see whether or not the superiority holds for variously heat-treated specimens. To test this, two steels were selected of the following composition:

	Acid Open Hearth. Per cent.	Basic Open Hearth Per Cent.
Carbon	0.43	0.42
Manganese	0.6	0.6
Phosphorus	0.027	0.009
Silicon	0.067	0.033
Sulphur	0.05	0.055

These two steels were made under the same conditions for similar purposes. The chief differences in composition are in phosphorus and silicon, as would be expected. The steel was received in the form of bars, 0.24 x 2 x ⅜ in., and was used in this form for heat treatment. The heating was accomplished in an electrically heated muffle furnace, and temperatures were determined by means of thermo-couples of platinum and platinum rhodium.

Each steel was subjected to the following heat treatment: 1.—Heated to a definite temperature and immediately cooled in the air. 2.—Heated to definite temperature, held constant for 2 hr. and then cooled in air. 3.—Heated to definite temperature and cooled in the furnace. 4.—Heated to a definite temperature, held constant for 2 hr. and then cooled in the furnace. The results of the physical tests on each series are shown in the accompanying table, in which A represents acid steel and B stands for basic steel.

The bars after heating were machined into 18-in. test bars with a parallel section 1½ in. wide x 9 in. in length between shoulders. The section in the jaws of the testing machine was 2 in. in width.

Tests on the original bars were made and gave results as follows:

	Tensile Strength, lb. per sq. in.	Elastic Limit, lb. per sq. in.	Elongation, per cent. in 8 in.	Contraction of area, per cent
Acid	85,400	43,700	20.3	43.2
Basic	73,500	37,700	25.	39.6

*Paper read before the American Society for Testing Materials, Atlantic City, N. J., June 28.

†Professor of Analytical Chemistry, Massachusetts Institute of Technology.

The results obtained on the heat treated specimens are given in the accompanying tables.

Physical Tests of Heat Treated Acid and Basic Steels.

Specimen.	Temperature.	Tensile Strength, lb. per sq. in.	Elastic Limit, lb. per sq. in.	Elongation, in 8 in.	Contraction of Area.
Series 1 –					
A	700	78,300	35,300	21.1	.....
B	700	72,600	33,500	22.6	.....
A	750	77,500	34,200	22.2	.....
B	750	70,300	32,200	21.5	.....
A	800	79,800	33,700	18.8	.....
B	800	73,500	30,500	18.8	.....
A	900	81,700	44,000	20.4	.....
B	900	74,200	38,500	24.2	.....
A	1,000	81,700	40,200	18.8	.....
B	1,000	73,000	36,000	25.	.....
Series 2 –					
A	700	75,100	37,200	21.1	.....
B	700	67,800	29,600	27.	.....
A	750	75,700	35,400	14.5	.....
B	750	68,200	33,400	14.	.....
A	800	79,700	35,800	22.3	.....
B	800	68,300	32,800	22.3	.....
A	900	77,200	34,400	21.2	.....
B	900	68,100	32,500	20.8	.....
A	1,000	79,700	34,200	20.8	.....
B	1,000	68,900	32,400	20.4	.....
Series 3 –					
A	700	67,000	33,500	14.8	44.2
B	700	70,800	26,100	18.7	44.8
A	750	80,100	38,700	21.0	45.6
B	750	66,900	30,000	23.4	48.7
A	800	80,200	37,500	21.8	42.7
B	800	72,200	38,200	22.7	44.5
A	900	73,500	39,800	21.8	41.1
B	900	65,700	33,800	28.9	41.3
A	1,000	73,100	33,700	22.6	37.9
B	1,000	68,100	26,100	25.7	38.0
Series 4 –					
A	700	77,030	37,990	14.0	51.3
B	700	66,670	33,200	24.2	44.6
A	750	74,680	38,200	23.4	51.4
B	750	67,400	34,200	25.0	45.6
A	800	71,300	37,600	25.0	47.4
B	800	63,600	31,800	26.5	48.4
A	900	72,500	37,900	23.4	37.8
B	900	72,300	34,400	22.6	46.4
A	1,000	71,200	37,000	22.2	36.8
B	1,000	64,600	34,200	21.3	37.3

The results are very incomplete and are to be considered qualitative rather than quantitative, but they seem to show superiority not only of the acid steel as originally received from the mill but also when subjected to heat treatment. These differences cannot be accounted for by the carbon as the results were checked by two independent workers and these in turn checked against the mill analysis. The maximum variation in percentage of carbon can hardly be more than 0.03 per cent., and if it were so considered it could not account for the variations in tensile strength of 6000 to 10,000 lb. per square inch. Whether or not these differences can be accounted for by the phosphorus and silicon, both of which are higher in the acid than in the basic steel, only more extended investigation will show. To a person not connected with a mill it would be difficult to follow these results to the logical conclusion, and they are now offered with the hope they may be of some value to others who may wish to carry the investigation further.

The microstructure of the various bars was studied with the hope that some difference might be found, but there was a marked similarity throughout the series. In the original specimens as received from the mill the basic steel seemed to show the effect of work slightly more than the acid steel.

The heat treatments, however, did not have the usual effect. In the specimens heated to the higher temperature beginning at 900 deg. there was a very considerable tendency for the pearlite areas to become more dense in appearance and to segregate along lines parallel to the direction of forging. There was very little tendency toward the usual enlargement of the grain size except in limited areas.

The Scottdale Foundry & Machine Company, Scottdale, Pa., builder of rolling mill machinery, complete mine equipments, etc., has recently installed in its foundry an Adams molding machine for handling its smaller specialties, such as bearings, etc. It is furnishing for the Pittsburgh filtration plant a large runner shaft for a 35,000,000 gal. centrifugal pump. A recent shipment comprised six complete mine cages and six extra platforms for the Cerro de Pasco Mining Company, Peru, while a recent contract from the Leach Collieries Company, Alberta, Canada, covers an electrically operated pusher and coke leveler.

The Cincinnati Bickford Shops

The New Plant at Oakley Is a Striking Exposition of Modern Manufacturing Arrangement—Interesting Space and Labor Saving Ideas

The Cincinnati Bickford Tool Company, Cincinnati, Ohio, has occupied its new plant at Oakley. The works are essentially modern and demonstrate in a myriad of ways the results of careful planning. The lighting, ventilation, heating and most important of all, the arrangement to secure economical manufacturing facilities, must each have been given a great deal of thought in all of their details. Oakley, forty minutes out by trolley from the business center of Cincinnati, is the home of a colony of manufacturing establishments and is rapidly becoming one of the most important machinery centers of the country.

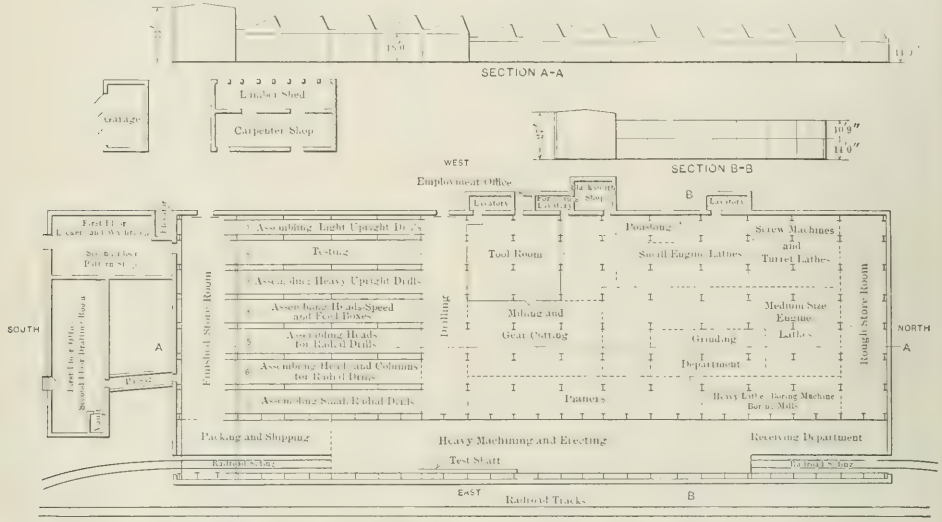


Fig. 1.—Plan of the New Plant of the Cincinnati Bickford Machine Tool Company, Oakley, Ohio.

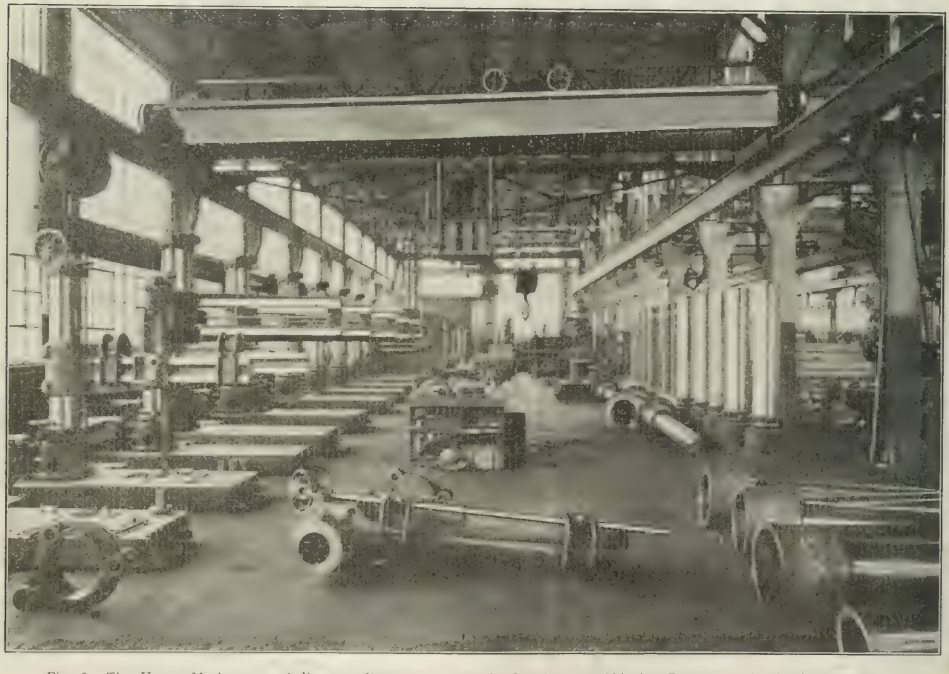


Fig. 2.—The Heavy Machinery and Erecting Department with the Packing and Shipping Department in the Background.

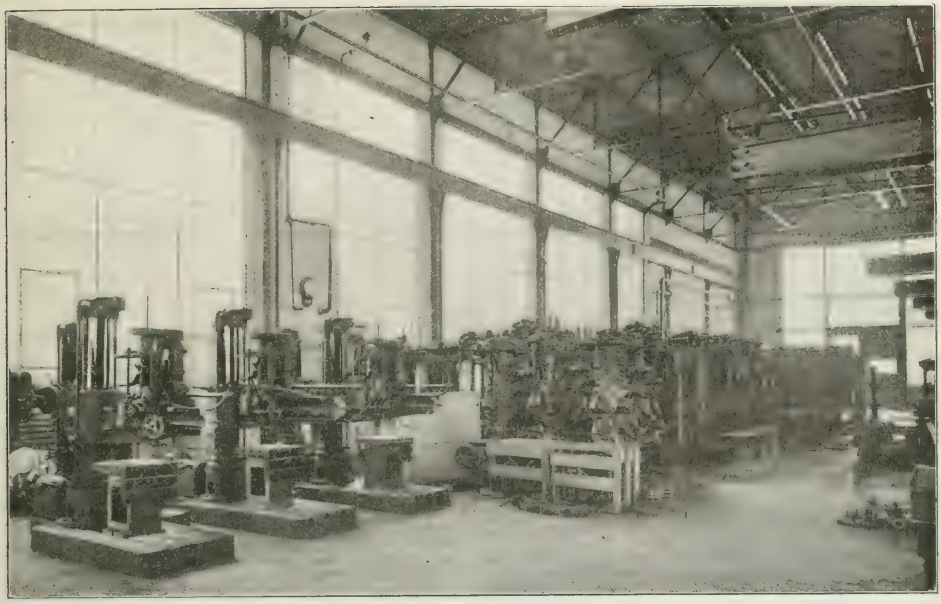


Fig. 3.—The Finished Storeroom, Showing the Ends of the Crane Runways of the Assembling Bays.

The general layout of the Cincinnati Bickford shops is seen in Fig. 1. The main building is a one-story structure 165 x 430 ft., with saw-tooth roof. Only the office in the adjoining ell, containing also the washroom, has two stories. A depressed siding from the railroad which passes the plant enters the shop at each end. The reason for this rather novel arrangement is that a large amount of floor space is saved as compared with the situation did the track pass completely through the shop. Each spur enters to a distance of 90 ft., giving ample room for two cars, a sufficient accommodation at any one time. The rails are 4 ft. below the level of the shop floor, which is level with the car floor, an arrangement facilitating loading and unloading. The track at the north end, seen in Fig. 2, takes incoming freight, such as rough castings and bar stock, while that at the other end is used for the shipping of finished machines. This is in harmony with the general scheme of the routing; the product passes in the various steps of manufacture from north to south without unnecessary handling.

The Heavy Machinery Department

The tracks run lengthwise of the building, and enter a long bay, 35 ft. wide, which contains the largest and heaviest machines that take care of such heavy castings as require to pass through this room only. Here are a

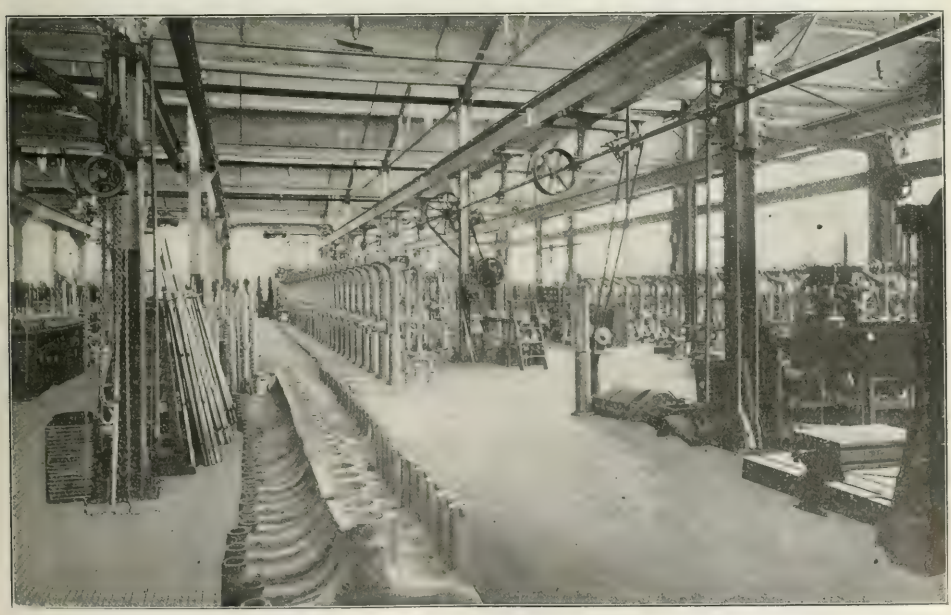


Fig. 4.—A View Showing Departments for Assembling and Testing Light and Heavy Upright Drilling Machines.

lathe for turning heavy drills, columns and sleeves; a boring machine for large castings, two planing machines and large radial drilling machines. The remainder of the floor space is devoted to the assembling and testing of the large sizes of machines. The bay is served by a 15-ton Pawling & Harnischfeger cage-operated crane, which handles heavy parts about the machines and moves them from, or places them upon the cars.

The most northerly bay is occupied as a stock room for rough materials and for small parts made in the shop or purchased from outside. The material used in the manufacture of small or medium-sized parts is issued directly from this room, a long counter separating it from the remainder of the shop. Immediately outside are the cutting-off machines, the turret lathes for castings and the screw machines for bar stock. Close by the turret lathes is the bench for hand reaming, the tools being kept on the bench so as always to be accessible. Each reamed hole is tested with a steel plug to insure its accuracy, and should the reamers be found under size they are returned at once to the tool room for readjustment and grinding. Fixtures, tools and jigs are stored in several places in the shop, the purpose being to keep each set close to the machines in which it is used.

In natural sequence the engine lathes are grouped immediately adjoining the turret lathes, and here, too, are two turret lathes that are used exclusively for the making of bronze bushings. It should be borne in mind that no partitions separate the departments, the dotted lines of the drawing merely indicating the limits of space devoted to each. Leaving the lathes the parts go immediately to the neighboring grinding department, and those which are not ground to the polishing department, which are next in order in the machine arrangement. In the space adjoining are the gear cutting and milling machines, together with the key-seating and broaching machines.

In the bay which adjoins that containing the railroad tracks, are machines suitable for medium-sized work, including heavy lathes, large grinding machine, boring machines, boring mills and medium and small-sized planers This bay is served by several small cranes. From these several departments the work goes to the drilling machines, which are located in a space crossways of the shop, and thence on to the several erecting and assembling departments.

An Interesting Crane System

Occupying the extreme south end of the shop is a large bay, Fig. 3, 35 ft. wide and served by a 10-ton Toledo cage operated crane, which is set apart as a store room for machines which have been assembled and tested and are awaiting shipment. This section is higher than the remainder of the building in order that the crane may run at such a height that all the cranes from the assembling floors, each of which is served, may pass under and deliver work directly beneath the large crane, the tracks of the small cranes, each projecting 7 or 8 ft. into the bay. The crane places the finished machine in position in the store room and later loads it directly on to the railroad cars, lifting it, if desired, over its neighbors. The space in the store room is divided between the upright and the radial drilling machines. Near the track are scales and a space devoted to crating for shipment. The entrance of the railroad tracks into the shop is closed by vertical rolling steel shutters.

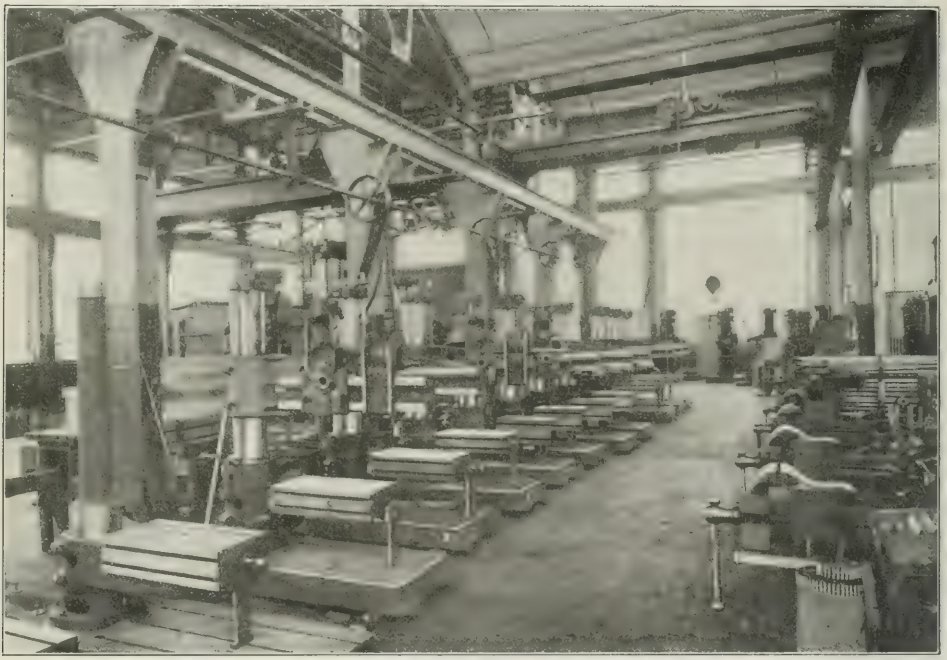


Fig. 5.—The Assembling of Small Radial Drilling Machines.

From this bay extend seven longitudinal bays, as seen in the ground plan, and the first three of them in Fig. 4. These are devoted to assembling. In the first are erected the lightest upright drills built by the company, in the third and larger sizes. In the second are tested the machines after they have been assembled in the first and third bays, from which, upon completion, they are immediately moved that room may be made for new work. The fourth bay is devoted to the assembling of heads and feed boxes for upright drills and speed boxes for upright and radial drills, everything in the works being built strictly on the unit system. In the fifth bay the heads of both universal and plain radial drilling machines are assembled, and in the sixth small radial drill heads, as well as back gear brackets for the large radials. The seventh bay, Fig. 5, is given up to small radials, and the tables for the large radials are fitted up there. The small radials are tested in the space where they are assembled, being driven from the shafts which run lengthwise from the bay.

The Tool Room and Employment Office

The tool room, located at about the center of the shop on the west side, covers a space of 48 x 50 ft. It has a counter at the front and sides, the space underneath being utilized for racks or drawers containing the small tools. The room is equipped with grinding machines, lathes, drill presses, an arbor press, a shaper and a milling machine. Two benches are provided, one for the making and adjustment of small tools and one for the making of jigs and fixtures, boring bars, etc.

Adjoining the tool room is an employment office from which the applicant may be quickly taken to the department in which he desires to work. Usually the foreman of that department personally interviews the man and recommends him to the general foreman if he is found suitable for the work on which he would be employed. The sanitary arrangements are also centrally located, and a separate wash-room with lockers is provided for the foreman. The blacksmith shop at the west side of the shop takes care of tool dressing, light forging and case-hardening. The carpenter shop is located a short distance from the main shop, near the south end, so that lumber for crating machinery, etc., may be brought directly through the stock room to the shipping floor.

cables carry the electric current to the northwest corner of the machine shop, where the switchboard is located. The wiring to the motors is carried in conduits beneath the floor.

The shop is excellently lighted by 61 Cooper-Hewitt lights, as is well illustrated in Fig. 6, which is reproduced from a photograph taken at night with no other means of illumination than that of the regular lamps. The Evans-Almirall system of hot-water heating is installed, wall and overhead coils being provided. The hot water is obtained from the power house and brought to the shop in pipes laid in a concrete duct. Drinking water is from six "bubbling" fountains distributed throughout the building.

The machine shop and assembling departments have a saw-tooth roof, the bays running east to west. These, however, extend only to the south and east bays, which are built independently of the regular construction. The distance from the floor to the trusses supporting the roof over the assembling floor is 18 ft., and over the tool room and machine department, 14 ft. Cast-iron hangers let down the stringers for the shaft hangers to a distance 12 ft. from the floor, a height which has been found best as to length of belts for the machines. The reason for hav-

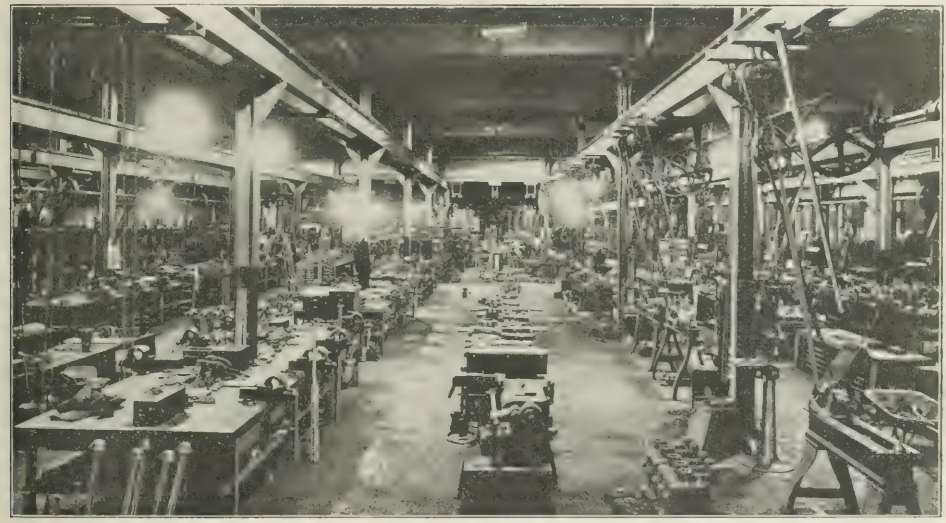


Fig. 6.—The Main Bay, with the Cooper-Hewitt Lighting System.

The main office and the wash room and lockers for the employees are on the first floor of a two-story building at the south end of the machine shop. The floor over the wash room is utilized for the pattern shop, and on the second floor of the office building is the drafting room. In this building is a two-story vault, the lower part for the main office, the upper for the drafting room.

The shop has a capacity for from 400 to 500 men, although at the present time only about 300 are employed. A comparatively small floor space is required for the efficient working of a relatively large force when a shop is laid out for systematic manufacturing. The quantity of the product, which can be turned out for an equal floor space, is also greatly enhanced by a wise planning of the shop.

The Power and Transmission

Six line shafts furnish power for the machine tools, running north and south, each with its own motor placed at a height of about 6 ft. above the floor. The assembling floors are provided with motors for the line shafts from which the machines are driven when tested, and from it power is derived for small machines used for fitting purposes. In all there is about 1800 ft. of line shafting. Practically all the bearings in the line shafts are of the Hyatt roller type. Power is obtained from a central power station, located 500 ft. north of the factory, in which the company owns an interest. Underground lead-covered

ing the trusses in the machine shop 2 ft. higher than the shafting is to provide better ventilation. The roof windows face north, the total length of the sash being 126 ft. The upper section of the sash swings out and is operated by a chain from the floor, the entire length of each sash being opened from one point. All window sashes are of metal and the roof is of reinforced concrete construction. The shop floor consists of 3-in. pine boards nailed into sleepers laid into a 5-in. layer of tarred concrete. The top of the floor is ⅞-in. maple. Automatic sprinklers are located everywhere.

The building was designed by Dodge & Day, Philadelphia, Pa., in conjunction with S. C. Schauer, vice-president and general manager of the Cincinnati Bickford Tool Company, and the machinery layout was taken care of by Mr. Schauer and Mr. Schafer, the superintendent of the shop.

The Davis-Bournonville Company, oxy-acetylene cutting and welding, 90 West street, New York, cut out a ventilator hole and two gangways on the new steamship Olympic while she was at the dock in the harbor of New York

---

The plant of the Damascus Nickel Steel Company, Carnegie, Pa., was sold last week by the Trust Company of North America, trustee, at public auction to the bondholders for $6,000.

The New Iroquois Blast Furnaces

The Iroquois Iron Company's Improvements at South Chicago

At South Chicago, Ill., about one-half mile from its present plant, two 400-ton blast furnaces are being built for the Iroquois Iron Company. They are so far completed that it is hoped they can be blown in before the end of the year. The project for building this additional capacity had its inception several years ago. At that time, and even now, the occasion simply for increased capacity to supply the growing consumption of pig iron in the Chicago district, although apparent to the far-sighted, was not the important consideration. Lower cost of production had become a fundamental necessity.

Why These Furnaces Are Being Built

There are within the immediate environs of Chicago and Milwaukee six separate blast-furnace interests, operating 11 stacks, with a maximum output of foundry and malleable pig iron aggregating over 800,000 tons. Yet under market conditions in which low prices prevail, as at present, Detroit and Toledo furnaces can deliver iron to northern Indiana points and even to Chicago on a freight rate of $1.70 and undersell Chicago iron. While Chicago iron is at present handicapped by local switching charges that, on long hauls, are absorbed, the inability to compete on the basis of producing cost has been in itself responsible for the loss of the sale of no small tonnage naturally within Chicago territory. The plans for a new furnace making of its blast furnace site, this larger opportunity has not been lost from view.

This furnace installation will also be unique in the West in the character of its power equipment. Blast for the furnaces will be furnished by three General Electric turbo-blowers of the type installed at the Oxford furnaces in New Jersey and at the Port Henry furnaces in New York. The South Chicago installation, somewhat modified in design, is the third of its kind. In economy of power house space, efficiency and continuity of wind pressure the turbine blower is expected to establish new precedents in blowing practice. These blowers are driven by Curtis steam turbines and are rated to develop 2900 hp. They are also expected to deliver 44,000 cu. ft. of air per minute each and supply a maximum pressure of 30 lb. per square inch at a speed of 3600 r.p.m. What the actual tests of these units will show can only be determined after they are connected up under the operating conditions of this plant. The wind pressure from the blower is automatically controlled by means of a regulator in the air suction which controls the quantity of air admitted to the blower vanes.

For the new plant a total area of 78 acres is included within a frontage of 1700 ft. on the lake and 2000 ft. on the river. Along this entire frontage a close-driven rock-filled pier, built of two rows of oak piles, driven through



Fig. 1.—Ore Yard of the New Blast Furnace Plant of the Iroquois Iron Company, South Chicago, Ill.

must include cost sheets that compare favorably with other lake port furnaces.

Aside from proper general equipment, two advantages in particular were essential to the economical production desired: ownership by the furnace of the ore it used so that, if necessary, it could be charged into the pig iron cost on the basis of mining and transportation charges only, and facilities for the direct mechanical handling of raw materials into the furnace. The first consideration has been solved through the development of this company's Cuyuna range properties, thus augmenting previous holdings and securing an adequate supply for the future. The second has been made possible by gaining title through legislative action to many acres of submerged land along the shore of Lake Michigan, beginning at and extending south from the Calumet River. Here, by filling in and driving piles, a plant site has been wrested from the lake, presenting natural advantages in strict accordance with engineer's specifications.

In addition to the question of cost, the growth of Chicago as a consuming center for chilled basic pig and malleable as well is obviously important. At present the Chicago furnaces have little or no basic to sell. The new plant is therefore equipped for ladle pouring and for casting in a pig machine. To thus create a plant that would meet the above requirements was to create also the possibility for every expansion for which such a blast-furnace installation might be the nucleus. In what has already been accomplished by the Iroquois Iron Company in the from 10 to 14 ft. of water to a total depth of 40 ft., has been extended. Under date of April 22, 1911, an interesting account of the filling in of the site and the building of the concrete foundations was presented in the Engineering Record. The rapidity with which the Great Lakes Dredge & Dock Company proceeded with this work is of especial interest.

The Ore Dock and Ore Yard

The plant is laid out on lines parallel to the Calumet River, along which the ore dock is built. The sequence of arrangement in a direction away from the river shows the ore yard, ore, coke and stone bins, stacks and cast houses, dust catchers and cleaners, stoves, boiler house, power house and pig machine. The future expansion of the blast-furnace plant will be along these parallel lines, to the east, which is in the direction of the lake.

The concrete ore dock is 1200 ft. long and is set back 52 ft. from the line of the former government pier so that boats may lie at the dock without obstructing the river channel. Before the old government dock was removed the piles and sheeting for the concrete construction were driven. The outer shear legs of the ore bridges run on two tracks 32 ft. apart, between which two additional standard gauge tracks are laid for the direct loading and unloading from boat to cars and to the storage yard or vice versa. The two piers supporting the traveler tracks are tied together by 2-in. rods, spaced 5 ft. centers, which run back 142 ft. to a deadman. The storage yard is 1200 ft. long and 284 ft. wide with an effective height under

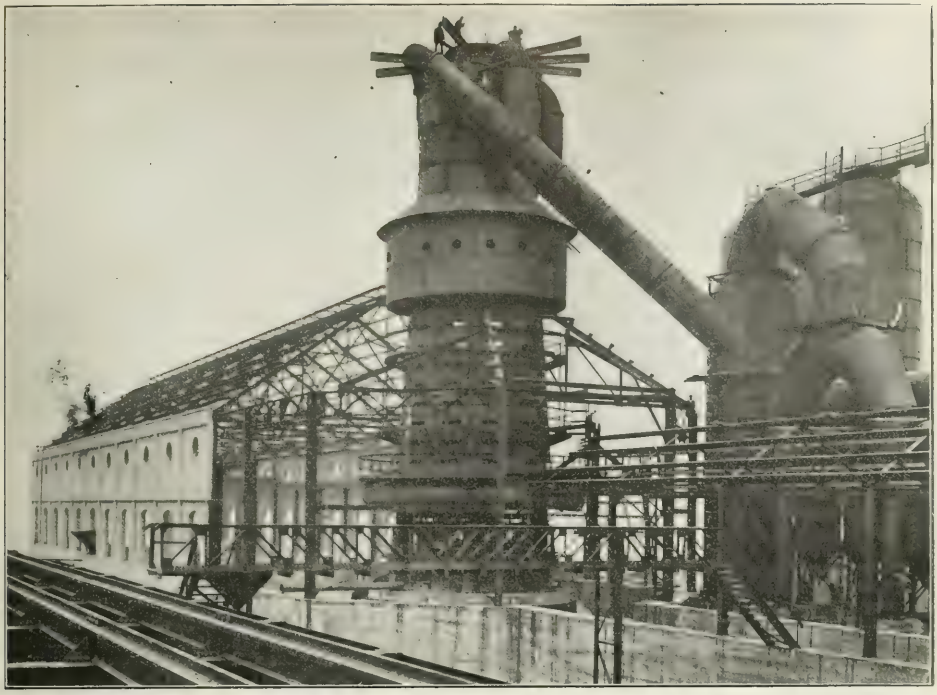


Fig. 2.—View of One of the Iroquois Iron Company's New Blast Furnaces.

the ore bridges of 72 ft., affording estimated storage capacity for 500,000 tons.

The ore yard, Fig. 1, is spanned by two 7½-ton Brown electric "man trolley" bridge tramways. These bridges have one span of 300 ft. between shear legs, a cantilever projection of 51 ft. 9 in. over the ore bins and an apron extension at the water end of 84 ft. The trolley travel over the entire length is approximately 400 ft. The bridge is designed to carry the man trolley and a maximum load suspended from it of about 15 tons. The trolley is arranged to travel along the tramway at a speed of 900 ft. per minute and to hoist the full load in the grab bucket at the rate of 225 ft. per minute. The travel of the bridge along its track is rated from 50 to 75 ft. per minute. The bucket is of the recently improved Brown two-rope type with a capacity of 110 cu. ft. and an over-all spread of approximately 17 ft. 6 in.

The ore bin, transfer car and charging larry installations are generally similar to the equipment at the Gary plant of the Indiana Steel Company except in the extent of the plant. There are two sets of ore, coke and limestone bins of the Brown parabolic type, each set consisting of eight panels about 14 ft. long, making the total length of each set 112 ft. The bins have capacity sufficient for 24 hours' run of the stacks. Two parallel standard gauge tracks are carried on the bins, the approach being over a steel trestle built on a 420-ft. radius curve and with a grade of 1¾ deg. At each panel point of the bins cross beams are provided, designed to carry the track stringers and so spaced as to carry a 60-ton ore carload. For the distribution of material along the bins a transfer car is installed, also built by the Brown Hoisting Machinery Company. This has a four-compartment hopper with bottom doors, mounted on a structural steel frame. It is electrically driven and controlled completely from the operator's cage at one end.

Attached to the bottom of each panel of the ore and limestone bins are two spouts and gates, or 32 in all. The 16 panels of coke bins are each equipped with one spout and gate, or 16 in all. Each of these gates is connected up so that it may be operated from the larry cars. Three 120-cu. ft. electrically operated larries run on a track suspended under the bins. Each larry is equipped for operating one 120-cu. ft. bucket which is carried on a special weighing mechanism supported on the steel framework of the larry. The speed of these larries with full load is from 600 to 900 ft. per minute. A more complete description of this type of installation may be found in the description of the Gary plant in *The Iron Age* of January 6, 1909.

Blast-Furnace Stacks and Stoves

The engineering work of this plant is in charge of the office of Julian Kennedy, Pittsburgh, and the stacks and



Fig. 3.—The Rust Vertical Boilers in the Iroquois Iron Company's Power Plant.

stoves will be recognized as his design. The stacks have an approximate capacity of 300 tons daily and are 21 ft. by 85 ft. 4½ in. The hearth is 14 ft. in diameter at the cinder notch and 14 ft. 5 in. at the iron notch, with a height of 10 ft. The hearth is carried in the usual firebrick and concrete foundation, Fig. 2. The mantle rests on 6 cast iron

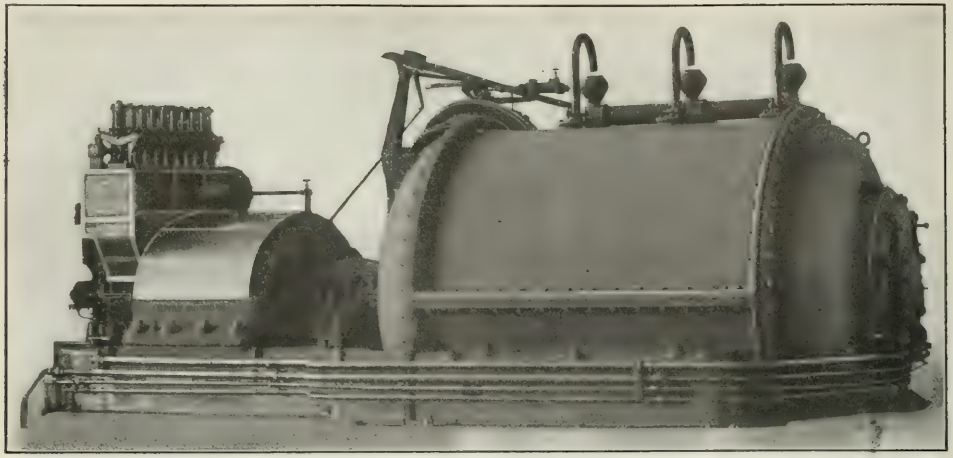


Fig. 4.—General Electric Turbine Blowing Engine in the Iroquois Iron Company's Power House.

columns imbedded in concrete to a depth of 5 ft. 3 in. and tied together with steel rods in a circle 25 ft. 3 in. in diameter. From hearth to sidewall the height of the boshes is 11 ft. 3 in. There is no external cooling of the hearth or shell. The hearth is inclosed in 4½-in. steel plates, into which cooling pipes are cast. In the boshes are eight rows of cooling plates—in the first row 22, in the second 12, in the third 12 and in the balance 18. In the side walls for a height of 27 ft. above the boshes are 9 rows of cooling plates. Above this the walls are not water cooled. The sidewall lining just above the mantle is 16½ in. thick; above the cooling plates 19½ in., and at the top 24 in. Openings are cut in the shell and the brick lining is arched for each cooling plate so that it may be easily removed. Galleries are built around the sidewalls as shown in the illustrations, for handling these cooling plates, and these galleries are covered with steel canopies which serve as a weather protection. Hot air pipes for the prevention of freezing are carried under the canopies.

The furnace has a closed top with no explosion doors. The top casting into which the hopper fits, in addition to being carried on the shell, is inclosed in concrete. The inside diameter of this casting is 10 ft. 4 in. The hopper diameter at the bottom is 9 ft. 3 in. and the bell at the bottom has a diameter of 10 ft. 2 in., and is operated hydraulically. The lining of the furnace just below the bell, where the charge strikes, is protected by heavy plates cast in segments to make a throat 14 ft. in inside diameter for a depth of 6 ft. 6 in. The two downcomers are taken off from four openings from the top, each opening 3 ft. in

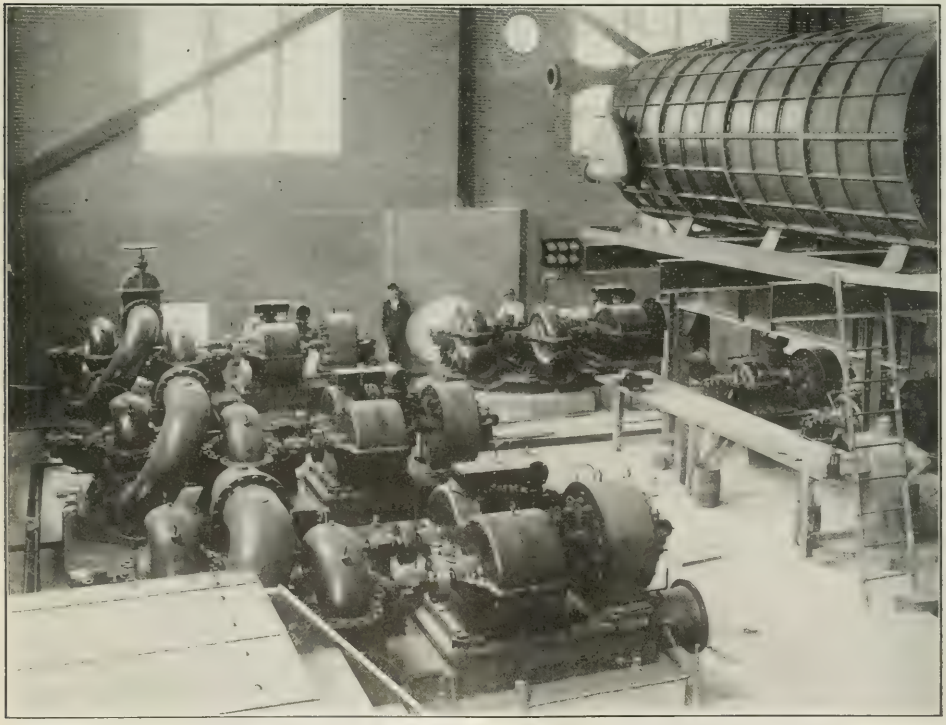


Fig. 5—The Pump Installation in the Iroquois Iron Company's Power House.

diameter, enlarging at the second elbow to 3 ft. 6 in. There are six tuyeres and the inside diameter of the bustle pipe is 24 in.

The furnace skips are operated in balance from the larry pit by hydraulic control. The hoist houses are located between the furnaces and the stoves, and ordinarily they are not entered except for oiling. The hoist was built by the Otis Elevator Company. Provision has been made so that, if the control of the hoist from the larry pit should fail connection can be cut off and the hoist operated by means of a hand lever in the hoist house.

The gas cleaning equipment consists of a dust catcher and four centrifugal gas cleaners for each stack. The dust catcher is of the baffle plate type, the diameter inside of the shell being 12 ft. 6 in. and height over all 55 ft. The foot valve is 10 ft. 3 in. above the surface level and the dirt can be spouted directly into cars. The gas is then carried through a 7-ft. main and distributed to a set of four gas cleaners of novel design. These are spaced 9 ft. center to center, and 13 ft. 6 in. on either side of the center line between the furnaces. The gas on entering the cleaner through a nozzle in the side near the top impinges against an internal circular throat concentric with the outside shell. The gas is given a circular motion in driving around the outside of this throat and is broken up in its passage downward by the many ribs with which the throat casting is joined to the outside shell. Below the throat casting is a circular ribbed baffle, which again deflects the gases. The centrifugal action throws the dust to the outside and the gases pass up through the center and out through the top into a manifold for delivery to the stoves and boilers.

There are eight stoves, four for each furnace, with a self-supporting steel stack for each set of four stoves. The stoves are of the two-pass type, 22 ft. by 96 ft. 4½ in. They are somewhat unique in having two chimney valves, the intention being to avoid shutting down the stove when a chimney valve requires repairing. In the erection work, two stack derricks were used mounted on rollers, so that they can swing in a complete circle around the stack, covering an area including the engine house on one side and the furnaces on the other. The convenience of this overhead handling is apparent.

The Power Plant

Steam for the power plant is generated in a battery of 13 Rust vertical boilers developing an aggregate of 7,000 h.p., Fig. 3. The boilers are equipped to burn blast-furnace gas regularly, but they may also be hand fired with coal. A separate gas header is brought down for each pair of furnaces and is carried on a dust leg. These headers divide so that each boiler may be independently controlled and without removing the gas burner from the firebox.

The power house is a steel-frame brick building, 54 x 220 ft. In addition to the turbine blowing engines mentioned above, one of which is shown in Fig. 4, there are installed here two Epping-Carpenter Company 19 x 34 x 4½ x 24 in. hydraulic pumps for operating the pig breaker located in the cast house of furnace D. These pumps yield a pressure of 40 lb. per sq. in. and have been tested up to 5000 lb. As illustrated, Fig. 5, the lift against which the service pumps must operate is reduced by placing them in a large pit at the west end of the power house. Water is brought to the power house from the intake in the Calumet River through a 60-in. cast iron pipe and the outgoing return is through a 60-in. brick conduit. The slope of these pipes is 2 in. in 100 ft. in the direction of the flow. The service and cooling water pumps as well as the condenser and feed water pumps are of the De Laval steam-turbine-driven centrifugal type. Three sets are used for general service. Two of these are connected in series, and they are rated to deliver 7000 gal. per min. against a head of 110 ft., operating at a speed of 885 ft. per min. The turbines operate on steam at 80 to 150 lb. pressure. The third set is used as a spare set and is connected up with a gate valve so arranged that it can be operated in either series or parallel and be cut in on either the service or condenser line. Its rating in series is the same as the other two and in parallel it is limited to a head of 55 ft. The fourth set is connected in parallel and will deliver 8050 gal. per min. at a speed of 900 r.p.m. against a head of 35 ft. It is used as a condenser pump for the barometric condenser, which stands just outside the power house.

The boiler feed pumps consist of two sets of centrifugal pumps, turbine driven, rated to deliver 635 gal. per min. at a speed of 2850 r.p.m. against a pressure equivalent to a head of 465 ft. or approximately 200 lb. The hydraulic pumps and accumulator for operating the furnace bells are also placed in this pit. The pumps are two Smith-Vaile type built by the Platt Iron Works, 10 x 2½ x 12 in., and the accumulator was furnished by R. D. Wood & Co., Philadelphia. A Cochrane feed-water heater is installed and the dry air pumps for the condenser are two in number, with 18 x 36 steam ends and 34 x 36-in. air suction cylinders, built by the Mesta Machine Company, Pittsburgh. The electric plant consists of two 600-kw. turbo-generators for the ore bridge and larry operation, and for the direct-current cranes a motor generator set consisting of a Westinghouse 40-h.p. 220-volt 3-phase 60-cycle motor and a 225-kw., 220-volt Crocker-Wheeler generator. A 10-ton Whiting crane traverses the power house. The water system includes a Kennicott water softening plant and standpipe.

Particularly for the making of chilled basic iron, a pig casting plant has been included in the installation, and one of the cast houses, that for furnace C, has been arranged exclusively for pouring in ladles. The west stack is known as C and the east furnace as D, the two stacks at the old plant being known as A and B. Cast house C is 69 x 132 ft., measuring from the center of the furnace and from center to center of columns. For the easier approach of the ladle tracks on each side, this cast house stands at an angle of 3½ deg. from the line of the furnaces. Cast house D is 69 x 249 ft. Iron can be poured in ladles here also, but for the most part the iron will be cast in the sand. In this connection a Brown pig-breaking machine is installed at the east end of the cast house and a 10-ton crane traverses the building.

The pig-casting ladle house is 65 x 138 ft. and carries a 100-ton crane. The pig-casting machine was furnished by Heyl & Patterson, Pittsburgh, is electrically operated and has a ladle-tilting cradle of recent type. The distance from the center line of the ladle house to the center of the pig loading tracks at the discharge end of the casting machine is 163 ft. 8 in.

From the face of the concrete dock to the center line of the blast furnaces the distance is 437 ft. From the furnaces to the center line of the pig casting house the distance is 472 ft. 6 in. From center to center of furnaces is 165 ft. The stoves are 106 ft. from the furnaces and the power house is 113 ft. south of the stoves.

Selling Arguments for Tin Roofing

Under the above title the N. & G. Taylor Company, Philadelphia, has issued a publication of 78 pages which is practically a treatise on the subject of tin roofs. It gives numerous arguments in compact form for use in pushing the sale of tin roofing. These arguments are presented under several heads as follows: Durability, time tried and long established, easily applied, adaptability to any service, moderate first cost, low cost of maintenance, re-use or second hand value, easily and quickly repaired, neat appearance, loses nothing in appearance with age, not affected by heat or cold, gives protection against lightning, incombustible or preventing the spread of fire, and weather proof. Under each of these headings numerous illustrations are given of structures roofed with tin, and pertinent testimonials are presented for the purpose of making the application of the idea a practical one. Instructions are given in laying a tin roof and numerous tables are included which are of practical value to the tin roofer and others engaged in supplying tin plates for this purpose.

New Bethlehem Blast Furnace Almost Completed.—At the east end of the blast-furnace department of the Bethlehem Steel Company, South Bethlehem, Pa., one modern blast furnace is being erected and almost completed. It is 22 ft. in diameter in the bosh and 90 ft. high, with a capacity of 450 tons of pig iron per day. This furnace is equipped with an electric skip hoist and supplied with five hot-blast stoves of the McClure type, each 22 ft. in diameter and 100 ft. high. It will be ready to be put in blast in a week or two. After it shall have been put in operation the company's blast furnace plant will comprise a total of seven furnaces with a capacity of 900,000 tons of pig iron per year. Practically all of the hot metal from the blast-furnace department is taken directly in 40-ton ladles to open-hearth department No. 2 (Saucon plant).

May Iron and Steel Exports and Imports

The report of the Bureau of Statistics of the Department of Commerce and Labor for May shows a material decrease in our iron and steel exports and a slight increase in imports as compared with the April figures. The total value of the exports of iron and steel and manufactures thereof, not including iron ore, was $20,616,795 in May against $24,917,056 in April, while the value of similar imports in May was $2,736,149 against $2,439,885 in April.

The exports of commodities for which quantities are given totaled 173,920 gross tons in May against 227,832 tons in April and 134,703 tons in May, 1910. The details of the exports of such commodities for May and for 11 months of the fiscal year ended with May, compared with corresponding periods of the previous year, are as follows:

Exports of Iron and Steel.

	May		11 months ended May	
Commodities.	1911 Gross tons.	1910 Gross tons.	1911 Gross tons.	1910 Gross tons.
Pig iron	6,274	7,814	145,064	1,207,410
Scrap	10,351	3,667	53,764	14,508
Bar iron	1,457	2,057	16,675	14,644
Wire rods	2,224	1,834	17,029	22,443
Steel bars	11,244	8,201	111,347	81,062
Billets, ingots and blooms	21,520	180	167,718	49,313
Steel rails	36,900	35,516	359,157	344,186
Iron sheets and plates	8,453	8,834	92,610	87,893
Steel sheets and plates	14,304	13,271	182,441	128,924
Tin and terne plates	4,695	1,461	27,182	10,918
Structural iron and steel	18,480	15,750	156,331	104,472
Barb wire	7,975	7,349	75,459	67,853
All other wire	10,073	8,236	100,067	73,013
Wire nails	3,214	4,996	46,851	34,093
Cut nails	1,047	1,031	9,504	8,449
All other nails, including tacks	1,236	1,185	11,289	7,666
Pipe and fittings	14,503	13,301	164,010	150,779
Totals	173,920	134,703	1,736,498	2,407,626

The imports of commodities for which quantities are given totaled 23,375 gross tons in May as compared with 22,390 tons in April and 42,537 tons in May, 1910. The details of such imports for May and for 11 months of the fiscal year ended with May, as compared with the corresponding periods of the previous year, are as follows:

Imports of Iron and Steel.

	May		11 months ended May	
Commodities.	1911 Gross tons.	1910 Gross tons.	1911 Gross tons.	1910 Gross tons.
Pig iron	12,273	21,405	187,095	223,606
Scrap	2,601	3,253	24,196	116,370
Bar iron	2,850	4,304	27,500	29,963
Billets, bars and steel forms n.e.s.	2,029	3,885	36,188	34,797
Sheets and plates	196	460	3,454	6,424
Tin and terne plates	2,199	7,086	40,874	63,553
Wire rods	1,227	2,174	16,627	14,040
Totals	23,375	42,567	335,934	488,753

The imports of iron ore in May were 217,467 gross tons against 133, 900 tons in April and 240,833 tons in the month of May, 1910. The total importations of iron ore for 11 months of the fiscal year ended with May were 2,015,337 gross tons, against 2,188,261 tons in the corresponding period of 1910. Of the May imports of iron ore 124,025 tons came from Cuba, 35,899 tons from Sweden, 28,131 tons from Spain, 21,980 tons from Newfoundland and 7432 tons from Canada.

The total value of the exports of iron and steel and manufactures thereof, not including ore, for 11 months of the fiscal year ended with May was $210,415,298 against $162,629,982 in the corresponding period of 1910. The total value of the imports of iron and steel and manufactures thereof, exclusive of ore, for 11 months of the fiscal year ended with May was $31,427,331 against $35,434,273 in the similar period of 1910.

The Pittsburgh Drafting Company has been formed by George K. Smith, formerly mechanical engineer of the Bell Telephone Company, Pittsburgh, and also with the Western Electric Company, New York City. Its location is at 1216 Fulton Building, Pittsburgh, its specialty being the development of new mechanical propositions, machine design, patent drawings, sketches, shop drawings, etc.

The Clarion Water Company, Clarion, Pa., has awarded the contract for a steel settling tank to the Hammond Iron Works, Warren, Pa. Chester & Fleming, Union Bank Building, Pittsburgh, are the consulting engineers.

The American Blower Company's Monthly

To keep in closer touch with and to improve the efficiency of its selling organization the American Blower Company, Detroit, Mich., has commenced the publication of a monthly that will be issued for confidential circulation among its branch managers, about 50 in number. Each of these managers will contribute a news letter for each issue, in which he will give information about business conditions in his territory, prospects, unclosed contracts, and other matters of interest. The publication will also include technical information about fan performances, records of tests, detailed descriptions of installations that are out of the ordinary, information relating to the new use of blowers and other matters of interest to the selling force. Up to this time much of this information has been disseminated among the branch managers only once a year at their annual meeting. The company has adopted the policy of refusing to countenance a complaint without a suggestion for a betterment. To keep this firmly before the minds of the branch managers, the following precept is to appear in large type on the back inside cover of each issue of the pamphlet: "He who criticises, be he ever so honest, must suggest a practical remedy or he soon descends from the hight of a critic to the level of a common growler." The publication is very neatly gotten up, in form quite similar to a small house organ. It has been named the "Informant."

The Brass Manufacturers' Meeting

The National Association of Brass Manufacturers held a very successful meeting at the Hotel Ponchartrain, Detroit, Mich., June 27. Among the topics discussed were the standardization of measures and openings; the eradicating of old and obsolete threads, and legislation recently enacted by the several States, and especially the recent law passed in Ohio, Senate Bill No. 479, which will materially alter existing conditions and tend to bar the use of certain types of goods. Other topics were shipping classifications, freight rates, labor conditions and modern methods of producing goods. The association will next meet in Cleveland, Ohio, September 20.

Sampling and Analyzing Gases.—The methods of sampling and analyzing gases as practiced by the United States Steel Corporation are described in a 36-page pamphlet prepared by the Chemists' Committee, J. M. Camp, Carnegie Steel Company, Duquesne, Pa., chairman. Aside from the economic value of the suggestions and information given, the appearance of such a publication is a commentary on the importance placed on accurate knowledge of the composition of gases, which, with the rapid increase in the use of the internal combustion engine, using blast furnace or producer gas as a fuel, has rendered expedient close watchfulness on the efficiency of the different parts of the modern plant. Views of the sampling and analyzing apparatus and a description of its construction are given, as are also the determinations made in connection with both blast furnace gas and producer gas, and a useful table of factors for correcting volumes of gas to standard conditions.

The Helwig Mfg. Company, St. Paul, Minn., is making a pneumatic staybolt clipper which is steadily increasing in popularity for the rapid, efficient and economical manner in which it cuts off staybolts. It not only cuts bolts of any length, but crown stays as well, and of the proper length for riveting without injury to the thread or sheet. It cuts off the bolt with a smooth, soft straight cut, leaving it as tight in the sheet as when first put in. The machine is made in two sizes, the larger weighing 210 lbs. and cutting off staybolts up to 1½ in., while the smaller weighs 170 lbs. and cuts off 1¼ in. and smaller. It is claimed that the device is convenient to handle, easy to operate and cheap to maintain.

The McDermott Tool Works, Martin's Ferry, Ohio, manufacturer of iron and steel forgings, oil well supplies, etc., is placing on the market a machine for galvanizing sheets of standard widths, or will build special sizes to suit. The McDermott machine possesses some features which add to its life; for instance, the working parts of the machine are located above the metal line. Machines already installed are giving excellent satisfaction.

An Interesting Crane Installation

Standard Pipe Foundry Equipment

The six 10-ton electric traveling cranes and a special electric hoist, herewith illustrated, in the plant of the Standard Cast Iron Pipe & Foundry Company, Bristol, Pa., were installed by the Pawling & Harnischfeger Company, Milwaukee, Wis.

The traveling cranes, Fig. 1, have a lift of 40 ft. and a span of 51 ft. 10 in. The bridges are composed of riveted box-section fish-belly girders, tied at the ends with structural frames and riveted to form a one-piece construction in which the bridge is supported on four cast truck brackets closely fitted to each corner and having substantial through-bolts outside to outside of the brackets. The oil waste bearings with bronze boxes on each side of the steel-tired wheels are easily removable when the corner of the bridge is slightly wedged up. Extending the full length of the bridge on one side is a latticed auxiliary truss supported at each end on channel beams. Horizontal angle bars fastened to the bridge girder and truss carry the motor, gear case and cross-shaft boxes as well as the walk platform.



Fig. 1.—An Installation of Six Pawling & Harnischfeger 10-ton Electric Traveling Cranes in a Pipe Foundry.

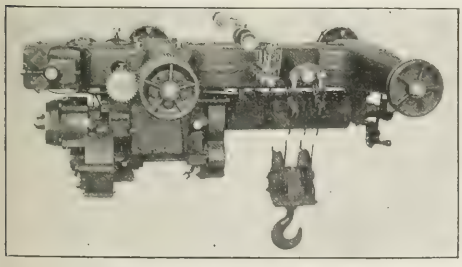


Fig. 2.—A Special Electric Hoist for Handling Cores and Pipes.

The operating cage, with controllers, marble switchboard and foot brake lever and connections, is suspended partly from the truss, usually at the end and clear of the inside of the girder, in order to allow the hook and cables to pass to their full travel. In this type of crane the cage may be located at any part of the span. Connection from the bridge motor brake to the foot lever enables the operator to stop the bridge travel without reversing the motor, a control so complete that much time is saved. The builder in designing these cranes has sought to accommodate motors of different sizes for either direct or alternating current and to have each shaft accessible without disturbance to the other. The motors are designed with special reference to crane service and have a great overload capacity. The frames are of cast steel, and they are fitted with laminated poles. All field coils are energized with bronze bushed bearings for ring oiling lubrication. Each armature is removable from the spider on which the punchings are mounted. Armature coils are form-wound and provided with ventilation to assure low temperature.

The controllers, located in the operator's cage, have the rheostat resistances banked in frames on which are mounted the circular heads that retain the reversing switches and connections. The operating levers have a forward and return movement which corresponds with the several directions of travel of the load hook, bridge and trolley. All connections are made with metal bars, securely bolted, yet easily disconnected for making repairs. The levers have an easy movement and short throw, the resistance being so arranged as to provide for the accurate motor regulation essential in good crane practice.

A limit or safety switch cutout device, attached to the drum shaft bearing box cap; has its trip nut traveling on a screw stud in a cap fastened to the end of drum shaft. The function of this device is to open the hoisting circuit when the bottom block reaches the safe limit of up-travel. In this operation the connections are so made that the lowering circuit is not broken, which allows of lowering the hook but makes it necessary that the operator throw in the safety switch in order to hoist. Machine cut steel spur gearing, all inclosed, is used throughout. Split bronze bushings set and doweled in bored pockets with bolted caps are accurately fitted for each shaft bearing.

Fig. 2 shows one of several special electric hoists of 3 and 6-ton capacity built by the Pawling & Harnischfeber Company for the Standard Company. It is operated with a double I-beam truck and is used for handling cores and pipe into and out of a tar bath. It is controlled from a pulpit and has a lift of 20 ft. and a spread of 4 ft. 2 in.

The Allegheny Steel Company, Pittsburgh, Pa., is doubling the capacity of its steel casting department, as well as making other less important additions to its plant at Brackenridge, Pa.

Operation of Blast-Furnace Gas Engines

The Experiences with Gas Engine Performance and Gas Cleaning Voiced at the Mechanical Engineers' Meeting

Valuable suggestions and interesting figures having to do with the application of the gas engine for utilizing blast furnace gas were given at the recent meeting in Pittsburgh of the American Society of Mechanical Engineers. They were made more or less informally at the time, and reference to them other than given in the report of the meeting in *The Iron Age* has been withheld until the figures and observations could have the stamp of authority which is now obtained through the secretary of the Gas Power Section of the society, George A. Orrok, of the New York Edison Company. One whole session of the Pittsburgh meeting was given over to gas power, and it was very largely occupied with the discussion of the large size gas engine and co-ordinate problems of blast furnace operation. Generous extracts from the discussion are as follows:

Satisfactory Results at Carrie Furnaces

R. H. Stevens said: At the Carrie furnaces we have four gas blowers of the Allis-Chalmers make. We have five electric engines, three of the Allis-Chambers and two of the Bethlehem, all in operation. We have got quite a cleaning plant in this connection. The gas first goes through a Babbit impinging washer; from there through a fan into a screen, from the screen into the Theisen, and from there to the engine house. We get a total efficiency in the cleaning of over 99 per cent. We get down as low as 0.003 grain per cubic foot. Our engines are running along about 110 to 120 cu. ft. of gas per indicated horsepower, and they have the gas running from 85 to 90 B. t. u. per cubic foot.

We have operated from the time the engines were in shape to operate, at least from 95 to 98 per cent. of the time. This, however, was not required, as the demand was such that we only ran approximately about 90 per cent.

Amount and Condition of Gas Obtained

A. N. Diehl, of the Duquesne Works, of the Carnegie Steel Company, gave the following interesting information: We consume a pound of coke for about every 60 cu. ft. of air blown, and produce approximately 150,000 cu. ft. of gas per ton of pig iron produced, of which a loss of ten per cent. may be allowed for leaks. About 50,000 cu. ft. is used to heat the blast, and the remaining 85,000 can be used to produce steam or drive the blowing engines; any excess is available for other facilities.

The gas from the top of the furnace varies considerably in thermal value, as well as in temperature, moisture and dust content. The normal hydrogen is about 2 to 5 per cent., and carbon monoxide from 18 to 27 per cent. These figures are only normal; very often we have higher hydrogen and either higher or lower carbon monoxide. The dust will vary from one gr. per cu. ft. to 25 or 30 gr. in gas from a slipping furnace, and the moisture from 15 gr. to 35 or 40 gr. per cu. ft. The temperature of the top gas will vary from 250 deg. F., in a good working furnace, to 1000 deg. F., in a furnace working irregularly. The normal top temperature is about 500 deg. F.

Cleaning the Gas

The gas, after leaving the furnace, first passes through the dust catcher, where the heavy particles are deposited by their own weight, and also by the reason of the chamber being large enough to slow down the gas, thereby allowing some dirt to fall out.

A number of systems of gas cleaning have been proposed from this point. The gas may be caused to enter a chamber so designed that the velocity is greatly increased, and the gas and dust whirled rapidly to the circumference, where vertical Z bars are located to catch the dust and keep it from getting back into the gas. The dust falls into a pocket below, where it can be drawn off. The system referred to is the Brassert-Whitting type, as is used in the South Chicago plant of the Illinois Steel Company. It is desirable to get the dust out dry if possible, as it saves it for other purposes, as well as removing just that much material and heat from the scrubbers through which the gas will have to go.

There are different systems of preliminary or partial wet washing. In some cases the gas is passed through impinging washers, where it is rapidly thrown on surfaces of water; in others the gas is sprayed, etc. None of these systems are very efficient unless used as an auxiliary to a cooling apparatus for the removal of the moisture, because even though the gas should be more or less purified regarding dust, the temperature is so great as to pick up moisture, and the good effect of the clean gas is destroyed by the excessive moisture absorbed.

In case the gas is to be cleaned, the scrubbers will do all that these cleaners will do, and a lot more in the almost complete removal of dust, as well as the removal of considerable moisture. In some installations, the gas is passed through baffle towers. The gas enters at the bottom of the tower and finds a tortuous way to the top. Water is run over these baffles and drawn off below. From the baffles the gas is passed through Zschocke tower washers, which have stationary sprays, located at the top of the tower, and having a succession of wooden grids over which the water flows, falling from one to the other. A number of installations use baffles and one or two Zschockes in series, then pass to Theisen horizontal washers for final cleaning.

Gas Scrubbing at Duquesne

At Duquesne, we have departed somewhat from this system and have got the best results by positive and repeated spraying, with a tower 76 ft. high, 12 ft. in diameter, having two main supplies for the water, one about 10 ft. from the bottom of the scrubber, the other about 40 ft. from the bottom. The water is fed, in each case, into a valve having a motor driven revolving core. One 5 hp. motor is required to drive four valves, that is, the valves for two scrubbers. The valves are located outside the scrubber, and have 12 openings which can be used. At present we are only using six, each having a 1¼-in. pipe connected to the discharge opening in the valve. These pipes run into the scrubber and are located in such a position as to spray the entire area. The nozzles on the end of the pipes are turned vertically and a screen is placed about 6 ft. above the nozzles. This screen breaks up the water into a fine rain or mist, thus exposing an enormous surface to the gas, allowing better contact and cooling.

The revolving core is designed to blank one opening, allowing the water to flow through the remaining five. It is evident that, by its revolution, each hole will be blanked in succession, causing a momentary suspension in the flow of water from this nozzle; the other five delivering their usual flow. The result is that momentarily an area of less resistance to the gas is offered, approximately equal to one-sixth of the area of the scrubber, and the gas will surge naturally toward this point. After the gas has surged over the dead nozzle, and is traveling upward through the scrubber at the rate of 4 ft. per second, the core passes the opening, allowing the water to flow once more at a velocity of about 60 ft. per second. The gas, being under control of this spraying and continually rising toward the top of the scrubber, is tending toward a spiral or helical course, which is effective. We have found that 15 r.p.m. is about the proper speed for the core.

The upper and lower valves, which operate on the same principle, are driven from one shaft, and so arranged that the sprays overlap. This scheme of washing gas was adopted on the basis of results obtained in scrubbers as originally operated with revolving spraying device located at the top. The water after leaving the top of the

scrubber, was deflected by the different velocities of the gas, so that a continuous varying regulation of the quantity of water, and speed of rotation, was required to maintain a uniform rain. In spite of the most careful regulation the column of gas surged from one side of the scrubber to the other, the column practically deflecting the drops of water. The water distribution was verified by numerous distribution tests, at different points in the scrubbers, 4 in. apart, covering the entire diameter, by means of a movable funnel.

Drain pipes from the bottom of the funnel were brought to the outside of the scrubber, where the water was collected in a standard measuring vessel, and the time taken for the water to fill the same. The channeling of the currents was determined by putting powerful incandescent lights and reflectors inside the scrubbers to note the action. The lights were so arranged that the inside of the scrubber could be seen through a corresponding door placed over one of the manholes. This channeling would tend to keep the gas and water from coming in close contact, which is further borne out by the accompanying tabular results of a test showing the difference of temperature of 18.3 deg. between the inlet water and the outlet gas, against 4.2 deg. on positive spraying under the same conditions, except that 3000 cu. ft. more gas per minute passed through the latter scrubber. The No. 4 scrubber was equipped with the motor driven positive spraying valve, and the No. 8 scrubber with spray pipe and screens at top.

Test No.		Grains per cubic ft. No. 4.	No. 8.
121	Dust at 60 deg. F and 30 in. Mercury	0.21716	.....
122		0.19695	.....
123		0.26964	.....
124		0.26312	.....
116-A		.....	0.34640
117-A		.....	0.33208
118-A		.....	0.27540
119-A		.....	0.35895
	Average..	0.2367	

Temperatures No. 4 scrubber. Inlet water.	Outlet gas.	Temperatures No. 8 scrubber. Inlet water.	Outlet gas.
76.0	78.6	79.0	98.7
76.0	81.4	78.5	99.0
77.4	79.4	79.0	96.4
74.0	78.5	78.9	97.8
74.0	77.1	79.0	93.4
Aver. 74.8	79.0	78.8	99.1

Aver. difference, 4.2.....18.3
Average gas per min. through scrubber No. 4.....25,704 cu. ft.
Average gas per min. through scrubber No. 8.....22,701 cu. ft.

Average Performance of the Scrubbers

Our object was to establish a condition of intimate contact between the water and gas, and this is shown by the temperature of the gas entering 350 to 400 deg. and coming out at the top, at about 4 to 5 deg. above the temperature of the cooling water. The upper part of the scrubber is sufficiently large to allow any mechanically carried water to fall out before going farther. Moisture tests, taken on the connecting line, from the scrubbers to the clean gas main, show the moisture in the gas to be on an average of ½ grain per cubic foot above the saturation point at the temperature of the gas. Each scrubber will handle 25,000 cu. ft. of gas per minute with a water consumption of about 815 gal.

This will give 36.8 cu. ft. of gas per gallon water used. The gas enters, from an average of a large number of tests, with 3 gr. of dust per cubic foot, at an average temperature of 350 to 400 deg. The gas in the main delivering to the stoves and also to the Theisens, contains 0.19708 gr. per cu. ft. This figure covers an average of 150 tests during the past year. We have noticed that the gas delivered to the stoves will show traces of moisture when the temperature of the air is less than 5 deg. higher than the temperature of the gas. If the temperature rise is greater, we have no deposition, showing that the gas is comparatively dry.

The gas after leaving the Theisen, contains an average dust content of 0.00902. This is an average of about the same number of tests mentioned before. The capacity of a Theisen is 14,000 cu. ft., although more can be put through. The engine builder's specification, as regards dust in the gas, is 0.025. The Theisens consume 1 gal. of water per 56.1 cu. ft. of gas cleaned

The gas cleaning plant consists of nine tower washers for the rough cleaning. This makes a scrubbing capacity of from 250,000 to 275,000 cu. ft. of gas per minute, when the entire plant is in operation. The gas is delivered to the scrubbers in a brick lined gas main 8 ft. 6 in. in diameter, and afterward goes through a 10 ft. 6 in. unlined, riveted and calked main, extending to the fans. The gas is passed only through one scrubber, then taken through a fan which had been provided, but is not in use at present. From the fan it is passed through a spiral dryer, or separator, which will tend to remove the mechanically carried moisture picked up in the fan, and any dirt which might be thrown out in its path through this spiral.

Handling the Gas

There are four fans rated at 84,000 cu. ft. of gas per minute capacity, which are driven by a 200 hp. motor. The reason for not using the fans is that we found by backing up the pressure in the dirty gas main we can obtain sufficient pressure to drive the gas to the point of combustion.

The gas is taken from the clean gas main, which is 8 ft. in diameter, by the Theisens, each running 375 r.p.m. and driven by 150 hp. motor. It then passes through another spiral dryer into a 7 ft. 6 in. refined gas main, leading to the gas engines.

The water for the scrubbers is taken from the main pressure system and increased 10 lb. by means of two De Laval centrifugal lifting pumps. The dirt and water from the scrubbers is collected in a central sewer, and run into a settling basin, provided with baffles which will allow the dirt to settle so that it can be recovered and also so that the water will be sufficiently clean to go into the river. We catch an average of 65 per cent. of a car load of dirt in the settling basin per day. The settling basin is divided into two parts, so that when one side is filled the water can be diverted to the other, allowing the first compartment to be cleaned.

The gas, after leaving the Theisens, passes into the engines through a small gasometer. The object of this gasometer is to reduce the pressure to about 2 in. before delivering it to the mixing chambers of the engines. The gasometers are about 4 ft. in diameter and about 4 to 5 ft. high. We do not have a large gasometer such as has been used in a number of the plants.

Performance of the Gas Engines

The gas engine equipment consists of two power engines and four blowers. The engines drive 2000 kw. Crocker-Wheeler generators, delivering alternating current at 6600 volts. The blowing engines operate Slick blowing tubs and are guaranteed to deliver 33,000 cu. ft. of air at 62 r.p.m., against 22½ lb. pressure. The cylinders are 42 x 60 in. with inlet and outlet valves on the side, the total horsepower of the engine being given by the builders as 3600, using furnace gas containing 80 B. t. u. per cu. ft., and calculated on a mean effective pressure of from 55 to 60 lb. This mean effective pressure is far lower than what we have got in some tests, but in most tests the thermal value of our gas has been between 90 and 100 B. t. u. The outlet and inlet valves are operated by noiseless cams, the inlet valve being closed by a heavy spring, the outlet valve being closed by compressed air at about 25 to 30 lb. pressure. The engines are of constant mixture and variable-compression, twin-tandem, four-cycle type.

We have a forced feed lubricating system operated by means of Richardson oil pumps. The oil is forced into the cylinder and packing cases. The packing requires a feed of one drop of oil for every other revolution of the cam shaft, while the feed of the cylinder requires one drop every four or five revolutions of the cam shaft. The engines require about from 6 to 8 gal. of oil every 24 hr. They are cooled by means of water circulation, and require about 6 to 7 gal. of water per horsepower hour. The temperature of the ingoing water is from 50 to 75 deg.; the outgoing from 120 to 160 deg. About 20,000 gal. of water per hour is being used.

The average thermal efficiency for the last six months of 1910 was 24.15 per cent. on an average load of 1372 kw., and gave an average B. t. u. per indicated horsepower of 10,529. This was only 55 per cent. of the rated full load. At a nearer rated full load the gas power engine showed the following as an average: Average load 3030 b.h.p.; percentage of rated full load 84 per cent.; B. t. u. per i.h.p. 8244, or a thermal efficiency per i.h.p. of 30.9. Rated full load 3600 b.h.p. The maximum load noted on the engine, lasting continuously for a period of three minutes, was 3300 kw., no drop in speed being noted at this load. This load would correspond to 4807 b.h.p. or 5741 i.h.p. giving an apparent overload of 33 per cent.

above the builders rating and a mechanical efficiency of 83.7 per cent. at this total load. This, however, was all due to the increase in B. t. u. value of the gas, but shows the engine to be capable of more power if the conditions are favorable.

Deposits in Gas Engines

The engines are only cleaned about once every two months, and about 4 or 5 lb. of dirt scraped off the cylinder and piston heads. We have not as yet had to stop an engine, especially to clean the cylinders and pistons, but do so when we stop to clean the cooling jackets, which become clogged up with mud and leaves, due to the poor condition of our river water. The dirt removed from the cylinders and piston heads is a whitish deposit which seems to be held in position by carbonized oil. The cylinders are blown off about once every 6 hr., allowing two exhaust charges to pass through a blowing off port located at the bottom of the cylinder.

An analysis of the whitish deposit formed on the cylinder and piston heads is as follows: SiO_2, 18.40; Mn_3O_4, 2.40; Al_2O_3, 15.55; CaO, 12.20; Mgo, 1.68; Fe_2O_3, 4.71; ignition loss, 2.17 and alkalies, 42.89.

The dust coming from the scrubbers and collecting on the sampling pipe is generally of a steel gray color, shading to red. The weight of dust per cubic foot seems higher in the gray than it does in the red samples. The deposit seems to carry through the entire system and is seen at the top of the stoves and at the top of the boiler stacks. A determination was made to find what quantity passed through the system without being deposited, and was found to be 25 per cent. of the dust recorded at the gas cleaning plant. In the bottoms of the stoves and in the combustion chambers of the boilers, this white deposit, which appears as an impalpable powder, collects, and has the following analysis: SiO_2, 22.80; Fe, 6.00 (= Fe_2O_3 — 8.57 per cent. Mn, 1.50) (= Mn_3O_4 — 2.09 per cent.); Al_2O_3, 15.73; CaO, 21.42; MgO, 2.50; KO, 20.90; ignition loss, 6.08.

Experience at McKeesport

Alex. L. Hoehr, steam and hydraulic engineer of the National Tube Company, discussed some details of the gas cleaning and gas engine plant of the National Tube Company at McKeesport, Pa. The plant contains two Allis-Chalmers twin-tandem, four-cycle gas-engines, with cylinders 32 in. in diameter and 42 in. stroke. Each engine drives a 1000 kw. Crocker-Wheeler direct current generator of 250 volts at 110 r.p.m. The first engine was started with the load on October 27, 1907, and the second on September 23, 1908. They operate in parallel with four Allis-Chalmers steam units driving 624 kw. generators. Many difficulties were encountered in starting the plant, but to-day and for many months past the gas engines have operated as regularly as any other unit on the plant.

The load factor for seven months of this year beginning with June, averaged 81.6 per cent. The maximum was 86.06 per cent. in November and the minimum was 77.23 per cent. in July. The No. 2 engine ran 8014.5 hrs. out of a possible 8760.91 per cent. The maximum was 86.06 per cent. in November and the minimum 67.89 per cent. in August. There were six months when no delays were charged to the engine. The gas engines are operated on Sunday in preference to the steam units which are supplied by coal fired boilers, and this helps to hold up the load factor.

The two engines use about 15,000,000 gal. of water per month, which amounts to 12.4 gal. per kilowatt hour or 61.0 gal. per 1000 cu. ft. of gas used. The jacket water is discharged at temperatures ranging from 120 to 140 deg. F., and no use is made of it at present except in winter when a part is further heated by passing through a coil in the exhaust muffler and is used to heat the shops.

Gas Cleaning at McKeesport

The blast furnace plant at McKeesport consists of four 500-ton furnaces producing Bessemer pig iron for the manufacture of tubular goods. The gas mains from these furnaces are all connected into one system. To this system is connected the main leading to the gas cleaning plant so that the surplus from any or all of the furnaces can pass to the gas engines. The arrangement of the dust catchers is different at each of the four furnaces, but includes in all cases a large dry dust catcher into the top of which the downcomer passes and from the sides of which, at various angles, pass gas mains to the stoves, boilers, etc. These branches are equipped with water seal valves so that they can be cut off from the system for repairs or other purposes.

Dry dust catcher No. 1 on the gas cleaning system, is 35 ft. diameter inside the plates, and about 32 ft. total height. It has a 4½ in. brick lining throughout. Two 5 ft. diameter gas flues, which form the connection between the general gas system and the gas cleaning system, enter the dust catcher tangentially near the top, giving to the entering gas a rotary motion which lengthens the distance to be traveled between the inlet and outlet and also causes some centrifugal effect which aids in separating out the dust, which falls to the conical bottom and is kept out of the outgoing gas current by a series of baffle plates. A short distance above the tops of these plates and at the center of the dust catcher is the lower end of the 8 ft. diameter outlet flue which is supported by a series of diagonal rods running to the upper edge of the dust catcher. This flue passes up and out at the top where it makes a 90 deg. bend and crosses the mill yard to dry dust catcher No. 2, which it enters tangentially near the top, being reduced to 6 ft. diameter at the point of attachment for convenience of construction. This flue is not lined.

Dust catcher No. 2 is the same size and construction as No. 1 except that it is not lined and has but one inlet connection. These two 35 ft. diameter dry dust catchers and the connecting flue, 8 ft. diameter, were made large not only to reduce velocities so that the dust would settle out, but also to provide large radiating surfaces for the dissipation of heat which otherwise would have to be carried off by additional water supplied to the Zschocke washers. As the temperature of the gas leaving dust catcher No. 2 will run about 365 deg. F. it is evident that this dissipation has been accomplished. With two engines at full load the velocity of the gas in the 8 ft. connecting flue will not exceed 135 ft. per minute. It should be explained here that this connection was designed for twice the engine capacity now in use, but even with this increase the velocity would be very low.

From the top of dust catcher No. 2 the gas passes into a horizontal overhead flue 8 ft. diameter, from which two vertical branches are taken, which act as supports and also as downcomers to deliver the gas into the lower portion of two Zschocke spray towers. These towers are each 14 ft. in diameter, 42 ft. high and are water sealed at the base. They consist of a cylindrical steel shell with circumferential angles at intervals which support a series of wooden baffles the function of which is to break up into small streams and thoroughly mix, the gas which is rising from the bottom and the water which is falling from the top. The water is supplied to each tower through 30 stationary spray nozzles so arranged as to deliver a fairly uniform rain over the entire area of the top baffle. These two towers were designed to work in parallel, but it has been found possible to operate with only one in service.

The gas enters the base of the tower at a temperature of about 365 deg. F., and with a dust content of 33.5 milligrammes per cu. ft. (0.517 gr. per cu. ft.), and leaves the top at a temperature of 75 deg. F., with a dust content of 4 milligrammes per cu. ft. (0.062 gr. per cu. ft.). The downcomers from the tops of the towers connect at ground level with a water sealed U tube which conducts the gas to a third Zschocke tower or, through a by-pass direct to the Theisen rotary washer. The plant is operating at present through this by-pass with the third spray tower not in use.

The rotary washer is of the usual Theisen construction, the rotating part being about 8 ft. mean diameter and 10 ft. long. It is driven by a 150 hp. Crocker-Wheeler motor at 300 r.p.m. By measurement when washing gas for two engines, the power required was found to be 300 amperes at 220 volts.

Efficacy of the Gas Cleaning Operation

The gas leaving the Theisen washer is practically free from dust, a 100 cu. ft. sample containing 0.15 milligrammes (0.0023 gr. per cu. ft.).

From the Theisen washer the gas passes through a water separator, 4 ft. 6 in., and 13 ft. 1 in. high, to a

50 ft. diameter gas holder, of 50,000 cu. ft. capacity. The gas holder is by-passed so that the engines can be operated with holder out of commission for painting or repairs. From the holder the gas enters the 42 in. diameter clean gas main which conveys the gas a distance of about 1100 ft. to the gas engines.

The water for the gas cleaning plant averages 105.7 gal. per 1000 cu. ft. of gas washed. This includes the water used in all parts of the cleaning plant.

Promise of Low Pressure Steam Turbine

Without being able to present figures at this time to support his position, the writer believes that under existing conditions in the Pittsburgh District as to prices for coal, turbines, gas engines and labor, a complete steam plant from gas fired boilers to low pressure turbines can be installed and operated to produce a given amount of power for less money than would be required through a gas engine plant. This would be due to lower first cost, lower attendance charges and lower repair charges on the steam plant. It is assumed that proper interest and depreciation charges are made to both plants.

H. J. K. Freyn, of the Illinois Steel Company, explained that at the Gary plant, which is entirely gas and gas engines, only 25 per cent. of the delays were charged against the gas engines. The gas engines in Gary were run on an average use factor of 33 per cent. That is about the same use factor of any of the large power plants in New York or Boston or Chicago, or anywhere else.

Europe and the Gas Engine

The gas engine, he continued, was started in Europe about 1899, and I had the pleasure of being connected with the birth of the gas engine, if you please. Five or six years ago, in an assembly like this, those people were also talking about cylinders cracking and piston rods breaking, and about all kinds of troubles, but if you go over there to-day you will not hear anything of the sort, for they have worked out the problems in the meantime. The gas engine in America is not to-day as far advanced as the gas engine in Europe, and cannot be, for the simple reason that only four or five years have elapsed since the first large gas engine was turned out, installed and operated.

Abroad gas engines are in operation of 48 in. diameter cylinders and 55-in. stroke, running at anywhere from 80 to 90 r.p.m. I have myself seen a twin tandem, double-acting, four-cycle gas engine, of 4000 kw., in operation on blast furnace gas.

The last installation of gas engines, those magnificent Snow engines at South Chicago or Duquesne, or the Allis-Chalmers and Westinghouse engines at Gary, are operating without any big repairs, and you will agree with me when I say that we are coming down in the cost of repairs and the cost of operation of these engines just as the Europeans have done

The Cast Steel Engine Cylinder

The cast steel cylinder has not met with great success abroad, because people very rightly point out the fact that while the modulus of elasticity of cast steel is much higher than that of cast iron, about three times as high, or two and one-half times as high, the co-efficient of elongation by temperature is, on the other hand, very much higher again. The product of the two factors, which is called the co-efficient of quality, of cast steel as compared with cast iron, is about the same. In other words, you get from a cast steel cylinder greater elongation due to changes in temperature, than in the iron cylinder, which offsets the difference in the modulus of elasticity. I was surprised to see 48-in. cast-iron pistons in use abroad without cracking.

Dust in Making Ferrosilicon

Recently one of our furnaces has been making ferrosilicon. That means an awful amount of dust in the gas, and of a quality which is almost impossible to remove by a water process. The efficiency of our wet scrubbers dropped from 85 to about 50 per cent, while the efficiency of the Theisen or Zschocke washer is kept at approximately 98 or 99 per cent. Everybody having gas engine plants in operation in connection with steel companies in this country knows that there is no trouble at all with dirt in gas. Our engines are not being cleaned even once a year. As a matter of fact we have not got time to clean the engines and we do not need to. The other day I pulled out a cylinder head on one of our old Chalmers gas-blowing engines and I called everybody in the plant that I could get to look at that cylinder. It was absolutely polished like a piece of glass, and the amount of dirt in the cylinder head and on the piston and in the counter-bore was not enough to make a handful, almost no carbon to be seen.

Tribute to an Oiling System

I was surprised to see that in one plant, the Carrie Furnace plant, the oil consumption was about one-half of what it ran in other plants, one-third in some instances. This was due, in my opinion, exclusively to the application of the Horton oiler. Mr. Horton, engineer of plant efficiency at Homestead, has designed an oiler which operates by compressed air and squirts the oil on to the piston and into the cylinder by means of compressed air. The saving of oil is perfectly remarkable. The cost of oil is an amazingly low figure.

Material for Gas Engine Piston Rods

A. E. Maccoun, superintendent of the Edgar Thomson furnaces of the Carnegie Steel Company, said that the material the piston rods were first made of was nickel steel as this was thought to be the best material to use, but it was found very unreliable for this particular class of work and numerous failures developed. Open-hearth steel, of the following composition, was found more satisfactory: Carbon, 0.45 to 0.60 per cent.; manganese, 0.45 to 0.60; phosphorus, under 0.04; sulphur, under 0.04; silicon, 0.10 to 0.20; to be heat treated to get 50,000 lb. per square inch elastic limit, 95,000 lb. per square inch ultimate strength and 12 per cent. elongation in 2 in. He added that no trouble has been experienced by the wearing of piston rods made from this material on account of softness.

At the Edgar Thomson Works he said they were compelled to line the inside of piston rods with brass tubing on account of the acid in the river water, and that they had to abandon all holes for the entry or outlet of water through the walls of piston rods, the water being now brought into and taken out of the ends of the piston rods, as the holes through the sides were found to be very convenient places for cracks to start.

A large rolling mill engine rated to develop about 1000 hp. is receiving the finishing touches at the plant of the Hooven, Owens & Rentschler Company, Hamilton, Ohio, for installation in the addition to the works of the Portsmouth Steel Company, Portsmouth, Ohio. The cylinder is 32 x 54 in. and is cast in one piece with the bed of the engine. The bed measures over 27 ft. in length and the total weight of the engine, without the flywheel, is about 225,000 lb. The flywheel, built in halves, is 22 ft. in diameter and weighs complete 80,000 lb. The engine is equipped with the maker's improved gravity valve gear.

Tom S. Wotkyns & Co., Fulton and Front streets, Troy, N. Y., who conduct the largest retail coal business in the vicinity, have perfected a new removable horseshoe calk for heavy horses, and desire to arrange for its manufacture and sale. Several years of experimenting have been made under their own supervision, with their own teams, on all grades and kinds of pavement and in all sorts of weather through winter and summer, and the calk appears to have met every requirement. They state that a driver can easily replace a calk at any time, no tapping being necessary, as no threads are used.

The Busch-Sulzer Bros.-Diesel Engine Company, South Side Bank Building, St. Louis, Mo., reports quite a number of recent sales and installations of the American Diesel oil engine. The orders received represent buyers in various States, from Texas to Minnesota and from Florida to Massachusetts. The most important equipment mentioned consists of five 225-hp. engines for the General Phosphate Company, Pembroke, Florida. Some of the companies named in the list of buyers have sent in their orders for a third engine. An electric works orders an engine to be used as an auxiliary to water power. It is interesting to note that the United States naval torpedo station, Newport, R. I., recently installed a 225-hp. engine.

Selling American Machine Tools in Europe

The Use and Support of Continental Agencies

BY C. A. TUPPER, MILWAUKEE

In marketing American machinery abroad, is it best to sell directly to users or through agencies?

The answer to that question depends almost wholly upon the extent and character of the campaign which the manufacturer, after a careful survey of conditions, decides to undertake. If he has a product which can be sold in considerable quantity, so as to justify the establishment of branch offices, each with its own corps of resident and traveling salesmen, he will undoubtedly get the best results from that method; provided, of course, that he has gauged the requirements of the trade correctly and that his employees abroad are competent for their tasks. Ordinarily, however, neither of those conditions has been adequately met, and the result is that the manufacturer desirous of doing an export business has either abandoned the field in disgust or has fallen back upon representation through agencies.

Agencies Most Economical at the Start

For the beginning, in most cases, practical experience points to agencies as the surest and at the same time the most economical means of introducing American metal-working machines or appliances in Europe. It therefore remains, first, to choose those agencies wisely and then to utilize their services intelligently. There is much of experience bound up in the first part of that sentence; a great deal more is comprised in the second.

It is not difficult to learn the names of good European agents. The Bureau of Manufactures, at Washington, has a list, selections from which will be furnished on application; American consuls are glad to give information on the subject; and American manufacturers now selling abroad will usually state to other companies, when asked to do so, what agencies they have found reliable. In making a choice it is, in any event, desirable to secure American references and to be governed largely by the advice contained in the latter.

Foreign representation, exclusive of branch houses, can be roughly divided into three classes. Large central agencies having branches in the principal countries of Europe and a well organized selling staff; smaller agencies covering a single section, industrial district or city, and firms or individuals intensively cultivating a limited field. There are also innumerable sub-agencies, to whose work no separate reference need be made in the present article.

Central Agencies

The tendency of the larger manufacturers on this side of the Atlantic is to place their interests almost wholly in the hands of the central agencies, particularly where they have a varied line of specialties to offer. For them this method has its advantages. Wherever there is to be a large installation, such as the complete equipment of a new plant or the remodeling of a shop, these agencies almost invariably have the list to bid on, and they are able to keep a fairly steady stream of orders coming in, owing to the extent of the territory from which their custom is drawn.

For the principal countries of Europe, the offices of these agencies are located in the largest cities, which are also the political capitals. Most of the headquarters are in London, Berlin and Paris. In Russia selling effort is concentrated in St. Petersburg and Riga. For Italy one of the cities of the north, such as Milan or Turin, will be chosen; in Switzerland, Zurich and Geneva; in Austro-Hungary, Prague and Buda-Pesth rather more than Vienna; in Spain, Bilbao; and in the other countries a main or branch office is apt to be located in any one of a number of the larger centers of population. Frequently these agencies will have offices and salesrooms also in other cities of the countries above mentioned, where the extent of the trade justifies additional district managers.

Smaller Agencies

Many of the most successful selling campaigns abroad have been carried on through the class of agencies second above referred to, as, for example, one covering the large industrial district of which Düsseldorf, Germany, is the center. The activities of such agencies, not being so widely diffused, can be concentrated upon the particular requirements of a carefully cultivated trade, and the personal element in selling enters more largely into their methods. When manufacturing flourishes, as at present, the representation secured through such agencies is likely to be very effective. On the other hand, if business in the district happens to be generally dull, or orders for equipment have been pretty well filled for a time, their returns may be discouraging. To some extent this deficiency, however, may be and is commonly offset by correspondence or by sending traveling men into other territory.

Individual Agents or Firms

The class of representation third above mentioned, through firms or individuals soliciting such trade as they can personally look after, has also been made to yield good results; and to the discriminating selection of agents of this character has been due the phenomenal success abroad of a number of American machine tool builders. It is best adapted to companies having only a moderate annual output, which they wish to distribute around through Europe in such a manner that the location of the tools in service will count heavily as a means of pushing sales when a greater volume of business can be handled. By that time there has been built up an organization closely identified with the American manufacturer's own interests, which he can utilize with increasing effectiveness as his facilities at home develop. For my own part, I would prefer this method to any other under the conditions cited.

The above division can, as I have stated, be only "roughly" made, for the reason that the elements of all three are intermingled in the work of some of the best agencies; and in entering upon or sustaining an extended sales campaign where a large volume of business can be offered for export, it is practically essential to have all three. To illustrate this by reverting to the subject of the large central agencies:

In Europe the metropolis of a country is ordinarily its political capital. Activity of every description radiates from it; buying and selling in all phases of commercial life are concentrated in it. The large central agency, prominently placed on a busy street, with showrooms where machines can be displayed and demonstrated, is, therefore, in a position to bring its wares before large numbers of visitors from the provinces, as well as from the industrial suburbs that usually surround a large city. Travelers from distant countries are also attracted to these agencies and not infrequently leave orders of considerable size. This is particularly true of London and has recently become a factor in the trade at Berlin.

Germany, like America and England, is getting to be the stamping ground for all foreigners bent on acquiring industrial knowledge, at first hand, from the latest developments in the various fields of manufacturing. The Japanese, of course, are now omnipresent. I seldom visited a large plant without running into at least one, or finding his name on the visitors' register immediately preceding my own; but investigators from other countries of Asia, from Australasia, South and Central America, South Africa and Mediterranean lands, as well as North America, are now common. These are, to a very considerable extent, the managers—perhaps the sons or other relatives—of wealthy proprietors of similar plants in their home countries; and not infrequently they have authority to buy new machines of the models that impress them the most favorably. Sooner or later nearly all such visitors "do" the large capitals of Europe, and they are very apt to complete their investigations by a round of the agencies where the types of machinery in which they may be interested are displayed. Here, if anywhere, orders are the most likely to be left.

The London or Berlin Agency

And I will say this: If I were a metal-worker of Buenos Ayres or Durban, I would much rather order an American machine tool from the stock of a London or Berlin agency (which for the latter's export trade would be in store at the free harbor of Hamburg, thereby avoiding payment of any extra duty) than from the manufacturer in this country or his New York representatives. I could depend upon getting it at the date of delivery specified, with no parts missing and with no disagreeable complications regarding drafts or other forms of payment. Also, I would have the assurance, at Berlin, after a tour of German shops and German salesrooms, that I had seen the pick of American machine tools. Said an expert from this country (Captain Carden) in an article written for Harper's Weekly, some years ago: "If one would know which are the best American machine tools, go to Germany. The Germans know." This is literally true; and he might have said the same of the French, the Belgians, the Swiss or almost any European nationality except the English. Perhaps I do the latter an injustice; but, with the exception of such concerns as Alfred Herbert, Ltd., whose representative, William Hill, recently delivered a very interesting address in this country, I was not very favorably impressed with their ideas of shop equipment.

To return specifically to the subject of agencies: I think I have said enough to indicate the advisability of being represented in the large political and trading centers; but the benefits accruing from proper sales effort in manufacturing districts, such as those in which Chemnitz, Leipsic or Nuremberg are located, should not be overlooked.

Agents Must Be Conversant with Apparatus

The proper selection of representatives is, however, but the initial step in any campaign from which results are to be expected. Having made his choice of agents, the American manufacturer should see, first of all, that they are thoroughly conversant with the advantages and full uses of the apparatus which he has to offer. Then he must give them proper backing and support.

To explain with any degree of fullness what is meant by both or either of these propositions will require a separate treatise. Let any American sales manager, however, put himself in the place of his European agent, which is not a difficult feat of the imagination. What information would he, himself, need as the basis of a successful selling campaign? What co-operation from his principal in this country would he require? It does not call for a knowledge of European conditions any more than domestic to reply to these questions in his own mind; for their answers are embodied in fundamental business principles. Common sense will teach any successful business man, who gives the subject adequate thought, what his representative in the foreign field, be it in France, Brazil or China, needs as the basis of conducting the business.

In correspondence with an agent the manufacturer should be very careful not to have any loose statements creep into his letters, nor to lead the agent in any way to make claims for the apparatus that will not stand the most rigorous service tests. The foreign customer who considers himself deceived in any particular seldom comes back. On this account, also, it is important, before making arrangements with any agency, to ascertain whether it is considered among users to be absolutely reliable in its statements and dealings. As a general thing, European salesmen who expect to sell regularly to a certain trade are very careful in the claims that they make; but men with loose, irresponsible tongues are found the world over, and they break into the machinery trade abroad as well as in this country. Naturally, agents of that character are continually looking for new connections, and some American manufacturers get hooked up with them, seriously to their detriment.

At this point it may be well to inquire whether exclusive representation should be required of an agent. If he is selling some specialty for which a large trade can be worked up, and the American manufacturer is willing to subsidize him until such time as the sales are sufficient in volume to yield a fair return for his efforts, I should say "Yes"; but it can hardly be looked for under any other conditions. With respect to the large central agencies it is less practicable, for obvious reasons. This, however, is a phase of the agency question in which general statements are apt to be misleading; and each case needs to be considered strictly in the light of its particular conditions.

A further complication arises from the fact that most agencies handle both European and American tools, and that a number of the leading manufacturers abroad of metal working machinery fill out their own lines with sales of American apparatus, thereby putting them in a position to offer complete shop equipments. In probably the majority of cases, either of these arrangements has worked out satisfactorily to all concerned; but both are liable to misunderstandings, and all of the circumstances likely to arise should be carefully gone into in advance of any agency contract.

Printed Matter

No really efficient representative should be expected to get along without the assistance of proper printed matter. This should be expressed in terms comprehensible to European users and prepared with the aid and approval of the agencies concerned. For the Continent it ought to be provided in two languages, French and German. With these, 75 to 80 per cent. of all the metal working establishments of Europe outside of Great Britain (namely, in France, Belgium, Germany, Switzerland Austria proper and the Baltic provinces of Russia) can be reached directly in the tongues spoken by their personnel; and of the remainder, including other parts of Russia, Bohemia, Moravia, Hungary, Italy, Spain, Portugal, Holland, Finland and the Scandinavian countries, there are few indeed where the men in control of the work do not speak one or the other of the two leading languages of the Continent.

It is preferable to print the description of each machine separately on a single or two-page sheet of light tough paper—having, however, a smooth surface that will take a satisfactory imprint from half-one plates. Good illustrations go a long way toward introducing American machines abroad, when the favorable impression created by them is followed by proper sales effort. While there is not the discrepancy in this respect that there once was between American and foreign work, our catalogue cuts and printing are considerably better than the run of European specimens, and this is an advantage of which American tool builders, or other manufacturers of metal-working machinery, should not fail to avail themselves.

Demonstrating

No article on the subject of agencies would be complete without a reference to the value of demonstrating. It stands to reason that a machine properly demonstrated by one who is expert in its operation has a much better show of being purchased abroad than apparatus equally as efficient the good points of which are not clear. That so many American tools were sold for a good many years in the leading industrial centers of Europe, without adequate explanation of their merits, speaks more for the perception of foreign users than for the business instincts of our manufacturers. Recently, however, it has come to be the practice of the more enterprising firms of this country to send men to Europe precisely for that purpose. The most successful method of making their work count is to have them accompany the salesmen of the various agencies in their rounds of the trade, spending each week or fortnight with a different one and teaching the latter how to demonstrate the good points of the machines by doing this in the presence of the prospective customers. The details, including the very important one of getting a heavy machine in a position to be shown to possible users, have to be worked out in different ways, according to circumstances.

To give in conclusion, however, a couple of examples of what demonstrating will do in the way of introducing new machines, I cite the following incidents:

A large manufacturer of bridge and structural steel, whose works are in Rhenish Prussia, stated that a line of cutting, drilling and riveting machinery of American make which he had in operation had been bought on the basis of a series of successful demonstrations made under the supervision of an expert salesman from one of the agencies in Köln. Competitive apparatus had been offered at a lower price; but his choice had narrowed down to the latest American types; and, having only catalogues (in English) of the other machines offered from this country, he had preferred to depend upon the witness of his own eyes, thereby taking no chances. Similarly, with respect to

good-sized installations of machine tools and other shop or mill apparatus at various places, I found that their purchase had been practically decided by the same circumstance; that is, the presence of a demonstrator.

In accord with these facts is the account given me by an American salesman of the first sale of a line of screw machines made by his house in France. Learning, while in London, that there was an opportunity of furnishing the equipment for a new shop near Paris, he braved the terrors of the English Channel and sought the proprietors. They understood no English and he could not speak French; but, using one of their old machines in illustration, he showed by appropriate gestures the advantages of his new type, of which he had a photograph, and finally secured their order for a complete installation. Acceptance and payment were to be contingent upon the machines doing what he represented. In drawing up the contract he secured the services of a well-known Paris machine tool agency, the members of which were so impressed by his success that they hastened to close with him an arrangement very favorable to his house for the future sale of the machines in that territory.

It seems incredible that such a sale could have been made merely by the use of sign language and a few words of tourist French, like "oui, oui;" but it merely goes to show the influence of personal salesmanship and the enthusiasm resulting from a thorough knowledge of a product. When this can be instilled into a European agent—and it is quite possible to do so—the last touch has been added to preparations for a successful campaign, aside from the ordinary details of banking arrangements, collections, credits, etc., which business prudence dictates.

A Book on Arc Lamp Operation

A book on the "Practical Operation of Arc Lamps" has been edited and published by the National Carbon Company, Cleveland, Ohio. It contains 76 pages of practical and helpful points regarding every phase of arc lamp construction and operation. Numerous illustrations marked in such a way that they closely hook up with the article make it easy for the lamp man to understand the points brought out in the text.

A number of practical tables are given and an index at the close of the book makes it possible to locate quickly any article in it. No advertisements are scattered through its pages, and the general editorial policy carried out is seemingly that of thorough and practical information which the company and its lamp engineers and salesmen have found lamp owners and operators want.

A copy of the book will be sent free on request to any one connected with the construction, operation or maintenance of arc lamps of any form.

The West Virginia Fire Clay Mfg. Company, with main plant at New Cumberland, W. Va., and others in Ohio and Pennsylvania, has recently improved the first-named property by a brick addition, 75 x 120 ft., which has been equipped with two 300 hp. Coatesville boilers, a 300 hp. Hamilton-Corliss engine, two new Stevenson dry grinding pans, etc. The company manufactures fire brick and shapes and fire clays and has a growing trade with iron, steel and general manufacturing companies. It also furnishes fire clays to the United States Government for use in furnace work along the Panama Canal. The clay is carefully shipped in specially constructed barrels to Norfolk, being thence conveyed by government ships to Panama. N. W. Ballantyne, secretary and treasurer, handles the company's sales from offices in the Diamond Bank Building, Pittsburgh, while Elmer E. Melick, Philadelphia, handles the Eastern sales.

The blast furnace of the Clinton Iron & Steel Company at Pittsburgh, which was blown out recently, will be relined and considerable new equipment will be added. This is the oldest stack in the Pittsburgh district, having originally been built in 1859, but it has been remodeled and enlarged a number of times. It has a daily capacity of about 200 tons, but this will probably be increased to 250 tons, when the proposed improvements and additions to the furnace have been completed.

The Sheet and Tin Plate Scale

Below is given a copy of the scale agreement reached at Pittsburgh recently between the independent sheet and tin plate manufacturers and the Amalgamated Association for the scale year beginning July 1:

We, the undersigned sheet and tin plate manufacturers and the Amalgamated Association of Iron, Steel and Tin Workers, agree that the scale of 1910-1911 shall be the scale for 1911-1912, subject to the following amendments and additions:

Sheet Mill

1 That the schedule of minimum and maximum weights be changed to read as follows:

Gauge.	Maximum.	Base.	Minimum.
7	7.81	7.5	7.19
8	7.18	6.875	6.56
9	6.55	6.25	5.94
10	5.93	5.625	5.31
11	5.30	5.	4.69
12	4.68	4.375	4.06
13	4.05	3.75	3.44
14	3.43	3.125	2.97
15	2.96	2.8125	2.66
16	2.65	2.5	2.38
17	2.37	2.25	2.13
18	2.12	2.	1.88
19	1.875	1.75	1.63
20	1.635	1.5	1.44
21	1.4375	1.375	1.313
22	1.3125	1.25	1.188
23	1.1875	1.125	1.063
24	1.0625	1.	0.94
25	0.9375	0.875	0.8126
26	0.8125	0.75	0.719
27	0.71875	0.6875	0.6563
28	0.65625	0.625	0.594
29	0.59375	0.5625	0.5313
30	0.53125	0.5	0.469
31	0.46875	0.4375	0.4219
32	0.42188	0.4062.5	0.3906

Clause 20 as changed in convention, mutually agreed, and now reads:

Payment of all regular employees called for in the scale shall be made by the company, and rollers shall be furnished with pay statements of all tonnage men prior to pay day. Such statements to be accessible to each member of the crew interested.

Clause 24 changed to read:

Company to furnish extra help not to exceed two men on sheets 36 in. wide or over, containing 22 sq. ft. or more, and on all bars of any width weighing 55 lb. or over.

New footnote 33. All bars scaled in the pair furnace shall be swept by the pair heater.

Tin Mill

Clause 5 was agreed to with the addition of the following paragraph:

But it is understood that if the sheets or tin plate are cut to smaller sizes and tinned at plant where made, the tin mill scale shall be paid.

Footnote 6 was changed to read:

Where improved squaring shears are used, the company shall pay for opening packs and grinding the knives, and in mills where plates are cut to smaller sizes than 14x20 in., additional pay shall be arranged, etc.

Footnote 8 was changed to read:

It is agreed that no more than four changes in the classification of sheet and tin plate mills can be made during the scale year, and due notice shall be given before such changes. Each member of the crew to mantain a position on each change or classification.

Clause 23 of scale of 1910—1911 to be eliminated.

The following clause was agreed to:

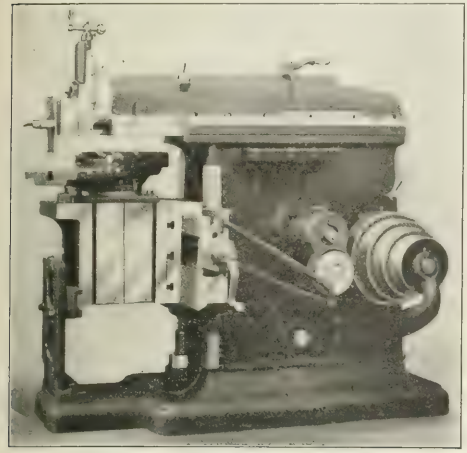
All bars shall be swept by doubler or doubler's helper, when in the judgment of the roller such action is necessary to insure perfect plates.

The signers of the sheet and tin plate scales of the Amalgamated Association agreed upon as above are as follows: American Rolling Mill Company, Middletown, Ohio; Atlanta Tin Plate & Sheet Mill Company, Atlanta, Ind.; Carnahan Tin Plate & Sheet Company, Canton, Ohio; De Forest Sheet & Tin Plate Company, Niles, Ohio; Empire Iron & Steel Company, Niles, Ohio; Follansbee Bros. Company, Follansbee, W. Va.; W. H. Griffiths, Washington, Pa.; National Enameling & Stamping Company, Granite City, Ill., and St. Louis, Mo.; Newport Rolling Mill Company, Newport, Ky.; Pope Tin Plate Company, Steubenville, Ohio.; Thomas Steel Company, Niles, Ohio; N. & G. Taylor Company, Cumberland, Md.; Whitaker-Glessner Company, Wheeling, W. Va., and Martins Ferry, Ohio; Youngstown Iron & Steel Roofing Company, Youngstown, Ohio; Zug Iron & Steel Company, Pittsburgh, Pa.

The Allegheny County Light Company, Pittsburgh, has placed an order with the Westinghouse Electric & Mfg. Company for ten 250-kva. and two 200-kva. transformers of the oil-insulated, self-cooling type. Other recent orders for transformers and other electric station equipment received by the Westinghouse Company include the following: New York Edison Company, 1000-kva. oil-insulated, self-cooling transformer, tubular type; Great Western Power Company, San Francisco, Cal., six 300-kva. oil-insulated, self-cooling transformers.

The New Queen City Crank Shaper

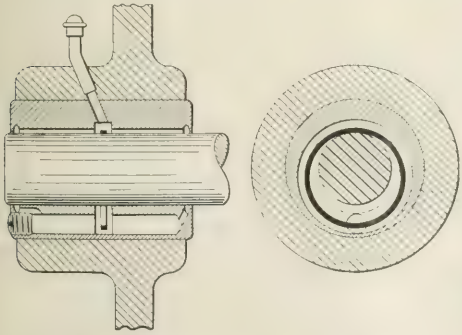
The 16-in. back-geared crank shaper, shown in the illustration, is an improved type brought out by the Queen City Machine Tool Company, Cincinnati, Ohio, containing



The New Queen City Crank Shaper

a number of improvements, which also are about to be incorporated in the three larger sizes of the machine. Very particular attention has been paid to the lubrication and the bearings. Those that have to do with delivering the driving power to the ram have heat treated and ground journals running in cast iron. These comprise the crank pin, bull wheel, the driving and the driven shafts, and the lower rocker arm shaft, and also those that connect the link with the rocker arm and ram. The crank pin, which has the heaviest duty to perform in proportion to its size, is a crucible steel casting over which is pressed a heat-treated sleeve, ground to be a running fit in the cast-iron crank block. This block has an oil reservoir with channels cut to insure thorough distribution of the lubricant, which is lifted from the reservoir on to the crank pin by a chain, the oil always falling back to the reservoir. Consequently a continuous flow is assured. Means are provided for drawing off the oil and replacing it with a fresh supply. The bull wheel hub is similarly provided with a hardened sleeve and the same oiling device is applied.

The cone pulley shaft has a 3-point bearing, which eliminates the overhang at the drive. The five journals of the driving and driven shaft are heat treated and ground and run in removable cast-iron bushings. They are constantly flooded with oil by means of ring oilers. The chain is used where a ring will not lift sufficient oil when the shaper is running at slow speeds. Care has been taken in providing lubrication for the rocker arm and link shaft where neither ring nor chain can be used, the motion not being fully rotary.



The Oiling Device of the Queen City Crank Shaper.

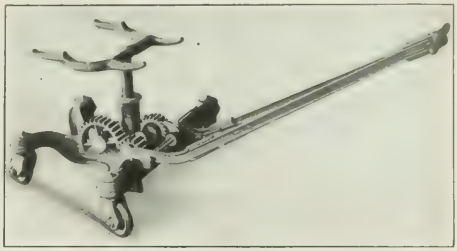
The belt pull of this machine is below the average, yet it will take very heavy cuts. The countershaft should run at 270 r.p.m. The four cone steps take a 2-in. double belt. The single gear ratio is 4 to 1; the back gear ratio 19 to 1. This combination gives the following cutting strokes per minute to the ram: 7.98, 11.78, 17.15, 25.31, 37.9, 55.95, 81.45, 120.24—a geometric progression. Twelve changes of feed are instantaneously obtainable without danger to the operators' fingers. Combined with the eight speeds, the range of the machine is complete.

As to accuracy, the machine is designed to produce work to within .0005 in. for the full 16-in. stroke. The arch ram is an important factor in securing the required rigidity of the cutting tool to accomplish this result, and the general design of the machine combines to enable work to be held solidly while being machined. The shaper is low, which lends convenience to its operation, and the ram is proportionately unusually long. All flat bearing surfaces are of large area and are gibbed for taking up wear. The feed screws have micrometer adjustments, and the swivels are graduated.

A New Geared Ratchet Lifting Jack

A new geared ratchet automobile jack designed for use in repair work on automobiles, shown herewith, is manufactured by the Canton Foundry & Machine Company, Canton, Ohio. The working mechanism is simple, and the jack is quick in action and easy to operate. A pinion meshes the large gear wheel, the motion being imparted from the gear wheel shaft to a pinion engaging a rack on a tube which slides up and down in the frame. The tube is threaded on the inside, and into it screws the stem of the arms or antlers, so named from their peculiar shape. On the end of the pinion shaft is a double ratchet wheel.

The jack is controlled by two rods that extend from the handle bar down the inside of the lever to the working mechanism. One rod, operated by the left hand, controls both the lifting and lowering pawl, which are connected. The retaining pawl, working into the same ratchet wheel, is controlled by the rod operated by the right hand. The raising capacity is 5-in., and the screw stem furnishes an additional range of 7-in. The form of the antlers was adopted after much time spent in designing as one which would fit the rear axle of any make of automobile. The short horns are for lifting front axles, but the others may also be used for that purpose. The jack is regularly mounted on four rubber tired casters, with both ball and roller bearings, making it practically noiseless and easy to move around the floor of a garage, and is also built with three casters. When not in use the handle can be raised to a perpendicular position, so that a small space is occupied.



The Canton Foundry & Machine Company's Ratchet Automobile Jack.

The E. W. Bliss Company has declared its regular 2 per cent. quarterly dividend on the preferred stock, payable July 1, but has passed the quarterly dividend on the common stock, which for a number of years has paid at the rate of 10 per cent. annually. In a circular to stockholders the explanation is made that since the International Brotherhood of Machinists called out the men only about one-third of the vacancies have been filled. The directors have indorsed the action of the officers in refusing the strikers' demands and have ordered the continuance of an open shop.

The Windsor Machine Company's New Shops

The Model Plant in Which Gridley Automatics Are Built—Many Original and Interesting Features—Problems Which Had to Be Solved

The new plant of the Windsor Machine Company, Windsor, Vt., affords a striking example of the advances which have been made in machine shop construction and arrangement in the last decade. The design embodies a great many features which, although not all of them are essentially new, have been brought together in an original adaptation to the particular purposes for which these shops will be used. The mill engineers and the general manager of the company, George O. Gridley, have worked together to accomplish this desired end, the latter having given much study to the details as they might affect production and the peculiarities of the business. The company manufactures Gridley automatics, precision machines requiring the best of workmanship. The shops are planned with the purpose of building the machinery under the very best of manufacturing conditions as to the excellence of workmanship and rapidity of production. The result is one of the finest manufacturing plants in the country.

The Location and the Layout

The works are most advantageously located. The building lies close to the main line of the Boston & Maine Railroad, and between it and the Connecticut River. The land is flat to the edge of the sharp decline which descends to the water. The elevation is above high-water mark, so that no provision had to be made to avoid inundation. The tract is a large one, which will permit of extension of the works from time to time as the growth of the business may require. The location is one of great natural beauty, and the atmosphere is unpolluted. Incidentally it may be mentioned that Windsor, although a small town, possesses advantages in the way of labor supply, the Vermont country furnishing some of the best of raw material for workmen, and a large percentage of the skilled men being home owners and therefore located permanently.

A view of the exterior of the plant is given in Fig. 1, showing its peculiar constructon. The office end of the building is in the foreground, together with the shipping platform on the spur track. Well to the rear is the unloading platform, with three cars on the siding delivering their contents. In the background, at the far corner of the company's land, can be seen the pumping station, where a general service and a fire pump, both motor driven, take water from the river. Fig. 2 is the general plan of the property. Fig. 3 gives the details of construction, including the saw-tooth roof and the windows, and suggests their relation to the ventilating system in conjunction with the swinging cowls. In Fig. 4 are interesting details of the sash construction with its double glass.



Fig. 1.—The Windsor Machine Company's New Works.

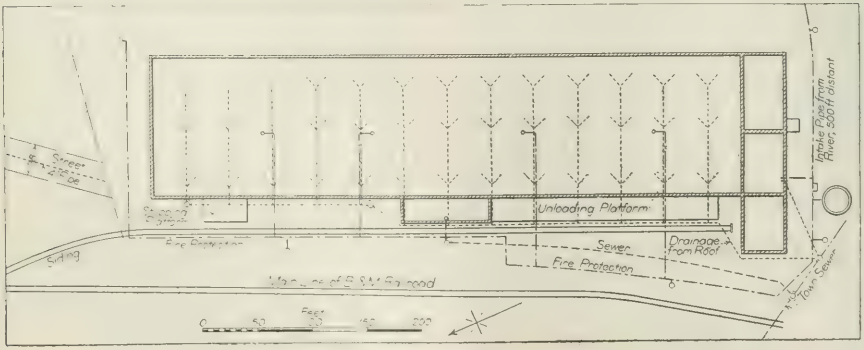


Fig. 2.—A General Plan of the Works.

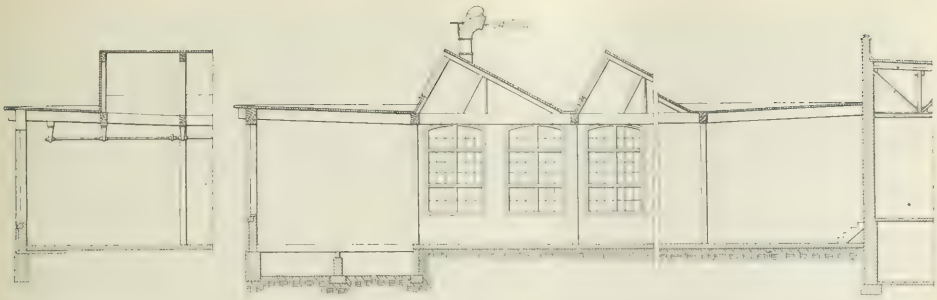


Fig. 3.—Construction Details, Including the Saw Tooth and the Side Windows.

The plant is under a single roof. The brick building is 130 x 584 ft. inside, with a wing at the rear 40 x 51 ft., containing the boiler room and an ell on the side in which the locker and toilet room is located. The machine shop proper occupies the entire building with the exception of

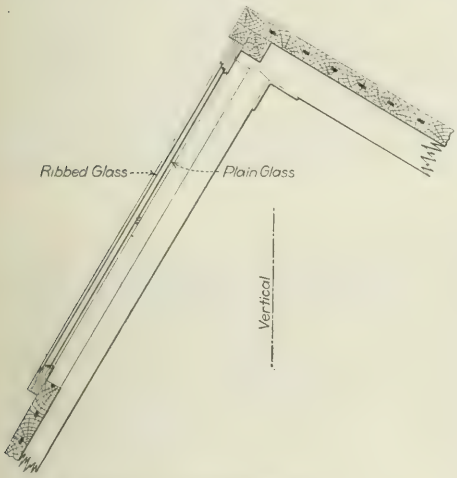


Fig. 4. Details of the Saw Tooth Sash Construction.

the space at the front, in which are located the offices and the pattern shop, and that at the rear, where are the engine room and forge shop. The area of the machine shop is 130 x 480 ft. inside. The forge shop is 40 x 70 ft and the engine room 40 x 60 ft. The building is one story throughout and is high studded, being 17 ft. from floor to the bottom of the valleys between the saw teeth, and 23 ft. to the apex.

The Details of the Saw-Tooth Roof

The sashes of the saw-tooth construction are not arranged to open, the purpose being to prevent any possibility of leaking during heavy north rains or at times of melting snow. The company decided that ventilation would be amply provided by a series of swinging cowls, of which there are four to each tooth. To secure an absolutely water-tight sash, it is made double, with ribbed glass on the outside and plain glass within, there being an air space between the two which serves two purposes—the saving of heat and the prevention of troublesome condensation in cold weather and the resultant dripping.

This construction is shown in detail in Fig. 4. The angle of the saw-tooth is 30 degrees with the vertical. Each sash is 10 ft. wide and 6 ft. high. The outside panes are of ribbed glass, about 5½ ft. long, 16 in. wide and 5/16 in. thick, the smooth side being toward the weather. The glass is heavily puttied at the top and sides, but not at the bottom, where the pane rests on the sash, and is held by two small iron brackets, a construction which offers practically no surface to hold the snow, ice or dirt. The inside glass is plain, in two pieces, the joint resting on a center rail running horizontally. The glass is held in place by narrow strips which separate the inside and outside panes, leaving a space of about ¾ in. Between the two glass surfaces at the bottom of the sash are vent holes to carry away condensed moisture, which, together with any drip from the glass on the inside of the building, is caught in a small copper trough, which empties into the conductor pipes that drain the roof. The result is a weather-tight construction. The cowls by their suction pull the air from the top of the shop, operating to procure ample ventilation in conjunction with the swinging sashes of the wall windows, and also the heating systems, for a coil of hot water pipes crosses the shop just beneath the valley of each saw-tooth, and coils encircle the great room beneath the windows, a combination which assists the air circulation in a very important way.

The roof covering was given very careful study by the engineers in charge of the design. With the exception of the backs of the skylights and the valleys between them, the roof is covered with one layer of sheathing

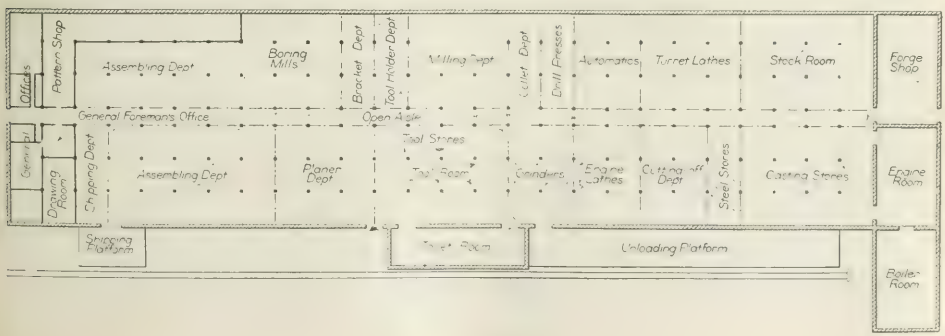


Fig. 5.—The Arrangement of the Machine Shop by Departments.

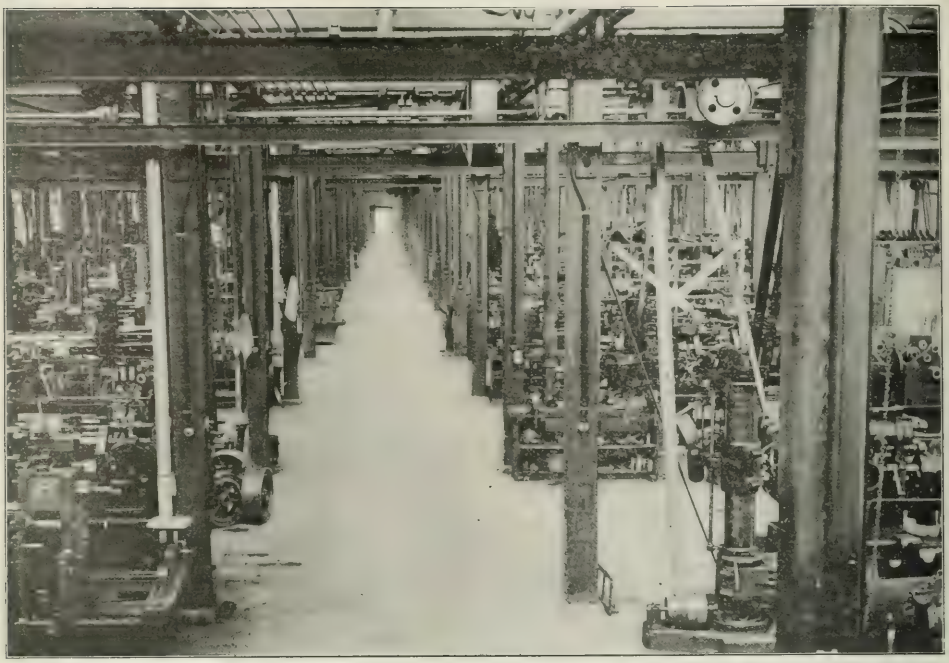


Fig. 6—The Interior of the Shop from the Office End, Showing the Long Open Aisle.

paper and with the best quality 5-ply coal tar felt, pitch and slag. The felt has an average weight of 2¼ oz. per sq. ft. A layer of medium weight rosin-sized sheathing paper was nailed to the planks with the joints well broken; next three layers of roofing felt were laid so that each sheet lapped the preceding one, and each exposed edge was



Fig. 7.—A Group of Gridley Automatics in Operation.

nailed, using tin washers. The three plys were then thoroughly mopped, covering the whole surface with coal-tar pitch. A fourth layer of felt was applied, lapping the edges 2 in., and was nailed every 3 in. along the lap, and the entire surface was again mopped with pitch. The fifth layer was laid in the same manner but without nailing, pains being taken that the laps did not come over those of the preceding layer. The whole surface was then covered with the composition and the slag was spread into it while hot.

The backs of the saw-tooth roofs first received a layer of the rosin-sized paper, and then three layers of asphalt felt. This surface being mopped with hot asphalt, the fourth layer of felt was rolled into it. After nailing the application of hot asphalt was followed by a fifth layer, lapping the fourth. The valleys were given an extra layer of felt, making them six-ply thick. The entire surface received a final covering of hot asphalt, with slag spread into it.

The Machine Shop Arrangement

The machine shop has much of interest in its design and arrangement, as will be seen in the several illustrations Fig. 6 is a view looking down the central aisle, which extends the entire length of the building from the main entrance of the general offices to the rear through the forge shop. The aisle is a feature in itself, in that an inviolable rule compels that its 10 ft. of width be kept open at all times for the passage of persons or trucks. The only obstructions are the doors at the office and forge shop ends. The center aisle requires only one-half the floor space of combined aisles at each outside wall, and is also more convenient in going from one part of the shop to another.

Fig. 7 is a group of Gridley automatics in operation. Figs. 8, 9, 10 and 11 show various departments, with an intimate glimpse into the machine arrangement. Fig. 13 is the erecting floor. Great pains were taken to secure an arrangement of the manufacturing departments, so that routing would be on a most economical basis. A study of the floor plan, Fig. 5, affords an excellent example of how well the company has succeeded in this attempt. Everything enters the shop at one end from the long unloading platform and leaves it at the other.

From the casting and steel stores and stock room rough material is delivered to the cutting-off department, to the engine lathes just beyond and to the turret machines and automatics across the aisle. Next are the grinders, drilling machines and the collet department; then the milling and tool holder and bracket departments. The planing and boring mills occupy opposite horizontal sections of the floor, an excellent arrangement, for the same hand-crane serves both, so that heavy work is quickly and easily transferred from one to the other. Finally the assembling department, occupying a large area, is reached. The tool room has a central position in the shop.

The toilet room has been isolated from the main building. It contains a steel locker for each man, and modern sanitary fixtures. The type of iron wash bowl deserves attention. On each side of the bowl are cast two studs which slide in a segment shaped slot in the frame of the stand. This permits the bowl to be tilted for the purpose of emptying its contents without the possibility of its leaving the stand.

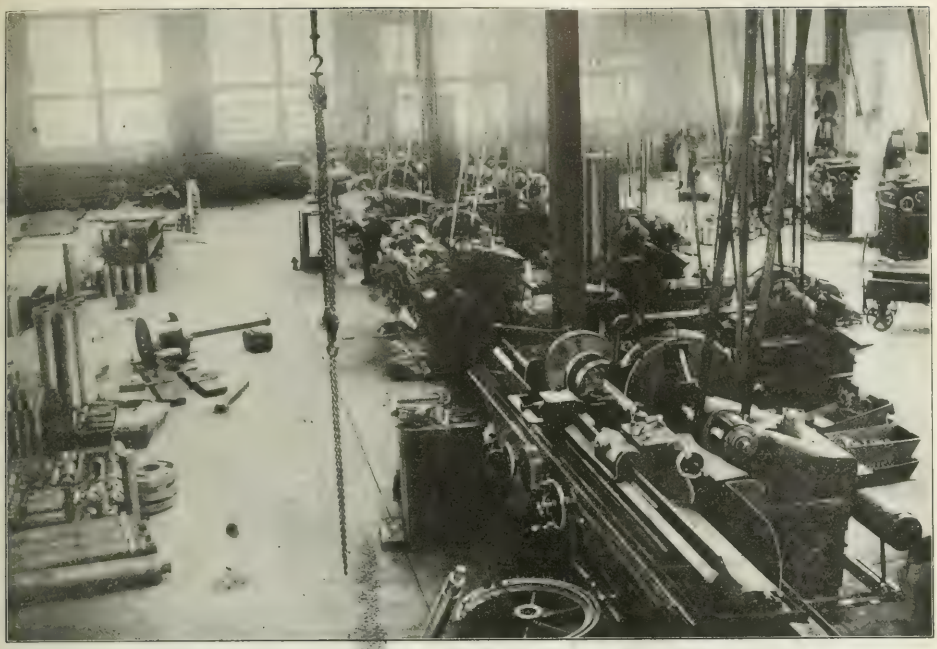


Fig. 8—The Grinding Machine Department.

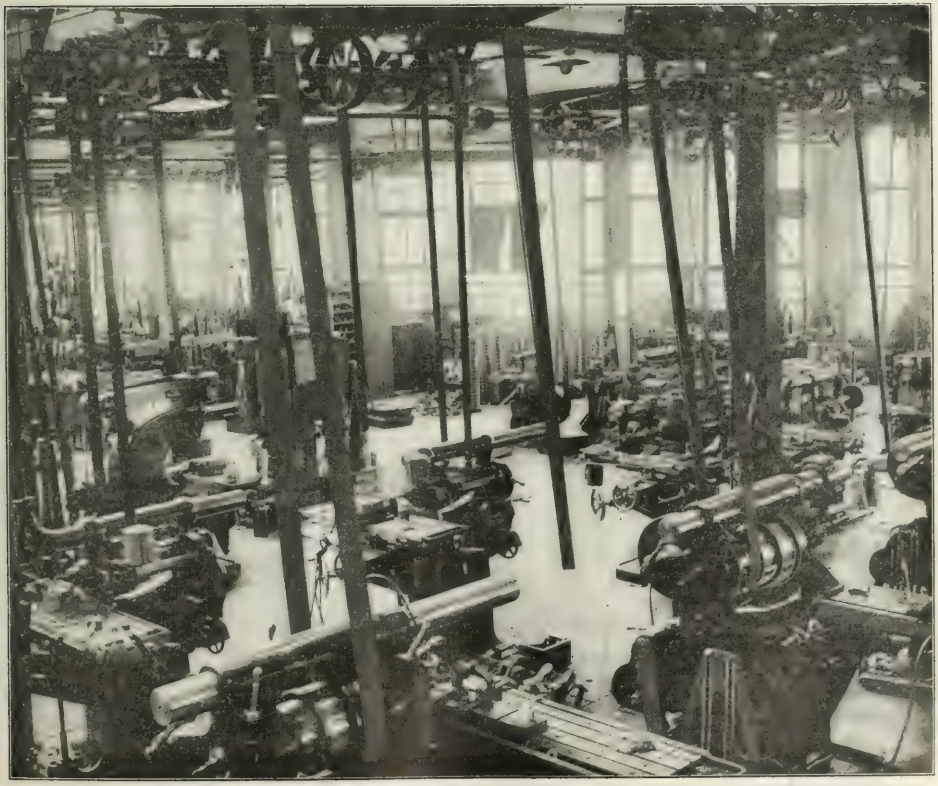


Fig. 9.—The Milling Machine Department.

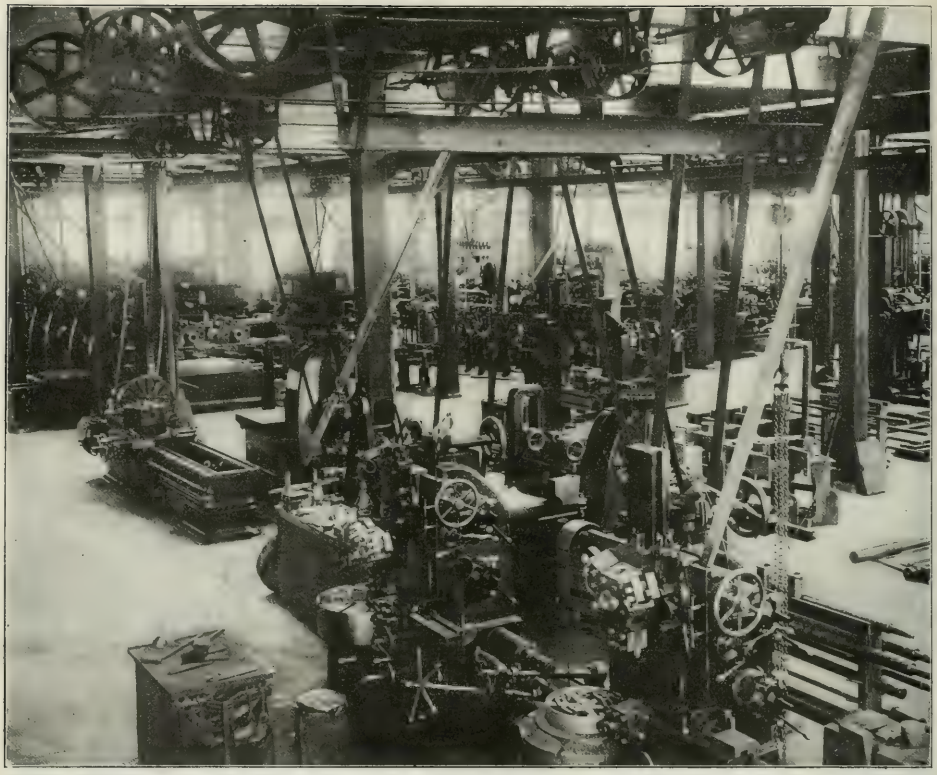


Fig. 10.—The Boring Department with a Glimpse of the Planers.

The High Speed Line Shafting

Returning to the shop, the line shafts extend across the building, each having its individual motor control. An unusually high speed, averaging 400 r.p.m., has been adopted for the shafting, and as a consequence pulleys on the line shafts are about the same diameter as those on the countershaft, a condition which is, of course, desirable. There are no wall benches. Instead individual benches are distributed at convenient points in the several departments. The floor of the shop is of solid concrete, 8 in. thick. Most of the ground was ready to receive the material without special preparation, being hard-pan. The remainder was filled in with suitable earth which was well tamped and puddled.

The forge shop, Fig. 14, is separated from the machine shop. Great care has been taken to give it complete ventilation. A high stack provides draft for the forges, and the fumes are carried away through hoods of ample proportions. The large concrete dipping tank is arranged for the easy handling of the work. The three furnaces are of the Brown & Sharpe type.

The drafting room and shop foreman's office are directly back of the main office. No door admits from the drafting room into the shop; entrance must be through the general foreman's office. In the view of the drafting room, Fig. 12, it will be noted that instead of the customary vault for the storage of drawings, the company has installed a modern fire-proof safe, especially fitted with drawers of the proper width to hold drawings of the different standard sizes.

A portion of the pattern shop is shown in Fig. 15. This gives an excellent idea of the arrangement of the window sashes for purposes of ventilation. The location of this department is in a sense temporary, for ultimately it will probably occupy space in another building.

The Power Plant

The power plant is worthy of careful study, for it contains much that is of interest to those who have in contemplation the installation of new power equipment for their own works. While the shops have not been operating many months, it is already certain that the power is manufactured and distributed very economically. Less coal is required for this large plant, which will employ more than 500 hands, than was consumed in the old shops of the Windsor Machine Company, when not half the power was generated. The lay-out of the equipment is shown in Figs. 16 and 17. Steam is supplied from a battery of three vertical Manning type boilers, located in a spacious building, Fig. 18, next the engine room. The piping, including the main supply for the engine, is shown in elaborate detail.

The power is from a Westinghouse-Parsons steam turbine, direct connected, with a 625 kva. generator, the current being 550 volts A.C. 3 phase 60 cycle. Fig. 19 shows the arrangement of the engine room. In the foreground at the left is the motor generator set, which supplies the direct current for variable speed motors. At the right is the De Laval steam turbine pump set, which forces the water through the heating system, and between them are the exciters, one being a turbo-driven, the other a motor generator set.

The switchboard arrangement is a feature of interest. Of the four wattmeters, one registers the total amount of current generated by the turbine unit; another the power consumed by the alternating current motors; a third the power consumed in lighting; and a fourth the power taken from the direct current generator. In this way the apportionment of power for its different purposes is recorded. The board is also connected with the town power plant. This current, when it is used, is distributed in the same manner as that from the generator, and may be switched over for use in lighting only.

The Problem of Water Supply

The pumping outfit is a very complete one. In fact, the problem of water has been one of the most difficult to solve. The water used for drinking in the bubbler drink-

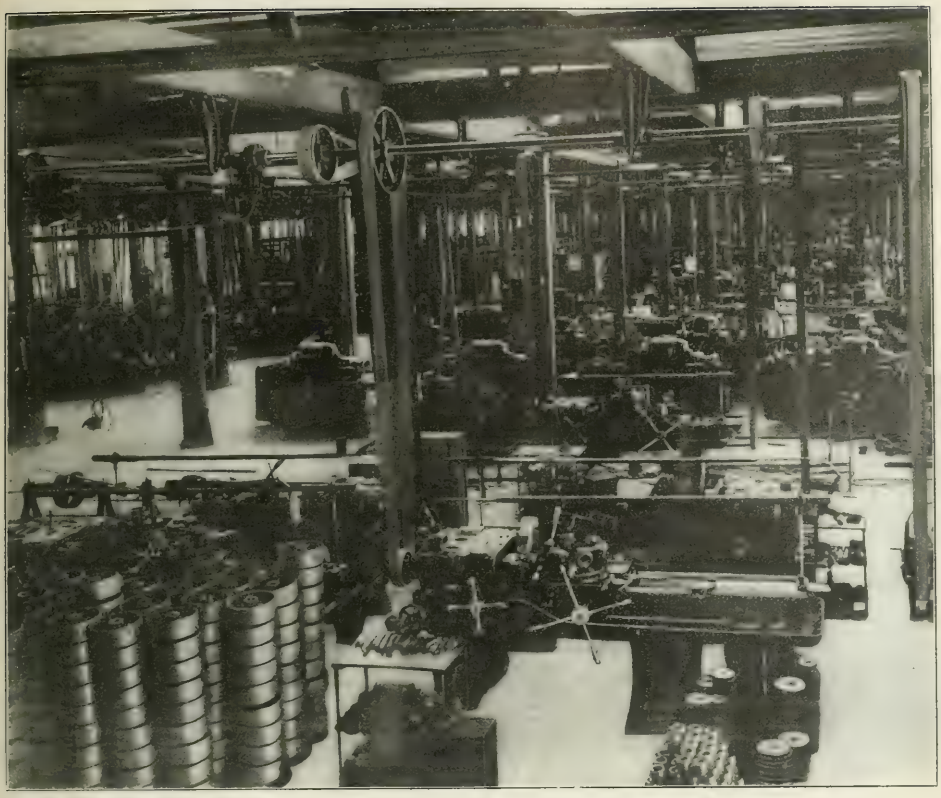


Fig. 11.—Some of the Automatics and the Turret Lathes.



Fig. 12.—The Drafting Room, Showing the Fireproof Safe.

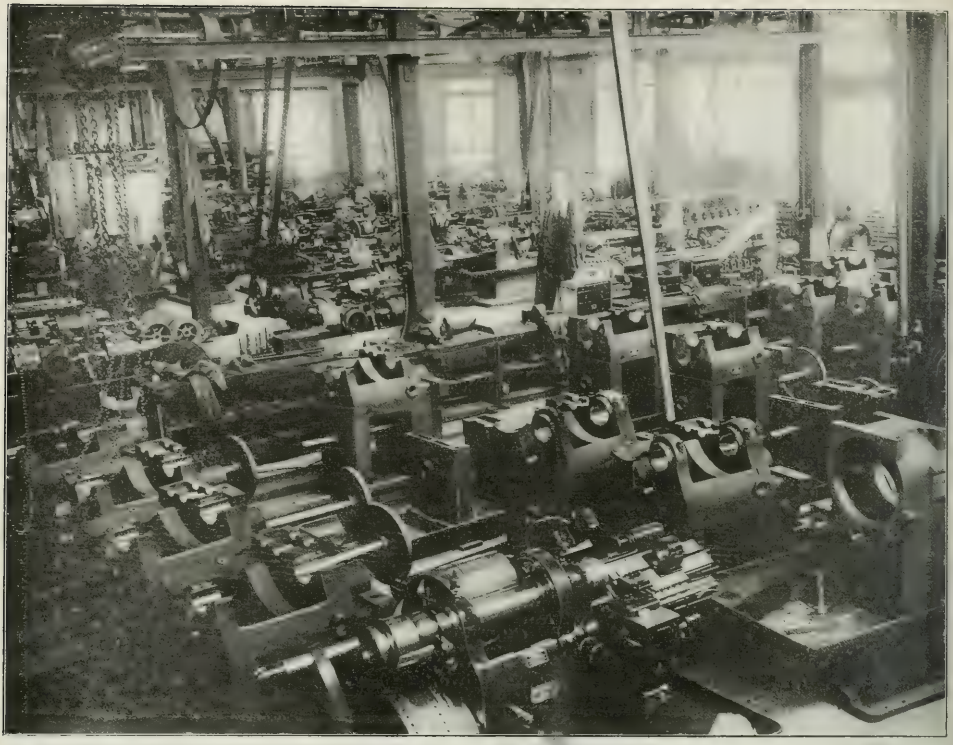


Fig. 13.—A Section of the Erecting Floor.

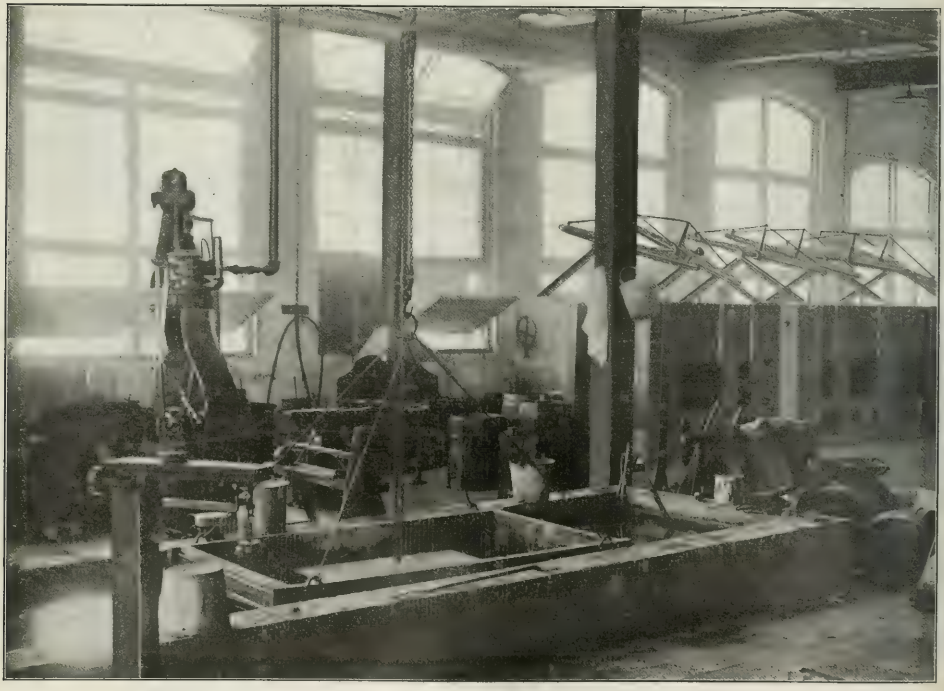


Fig. 14.—The Forge Shop.



Fig. 15.—A View in the Pattern Shop—Details of the Swinging Window Sashes.

ing fountains in the works and for similar purposes is drawn from the town mains, but the principal supply, including the water for the condenser and for the sprinkler tank, which holds 60,000 gal. and is 103 ft. high, is from the Connecticut River.

A general plan of the pumphouse is shown in Fig. 20. The river is located some 700 ft. from the main power house, has its mean level about 28 ft. below that of the floor, and a wide variation exists between high and low water, the extremes being 22 ft. apart. In building the pumping station a departure was made from the original plan, and as a result the company was compelled to operate its turbine without condensing for about two weeks.

The original decision was to sink the foundations of the building to the level of low water, so that the water would flow into the motor-driven centrifugal type general service and fire pumps, but construction difficulties were encountered and it was decided that the level of the pumps should be practically 10 ft. above low water, and that the suction pipe should be run down to low-water level and well out into the stream. By screening the opening into the pipe it was believed that impurities and debris from the river would be excluded.

But the contrary proved to be the case, for the condition of the river during very high water and for a week or two afterward is ill adapted for the arrangement as first carried out. Great masses of saw dust and shavings came down from the mills far above Windsor, the pipe became clogged, and it soon became necessary to cut out the condenser. However, the situation presented no serious engineering difficulties. As will be seen in the drawing, the solution of the problem is a concrete well with walls extending from above high water to a point below low water, receiving its supply from the river through well-screened openings.

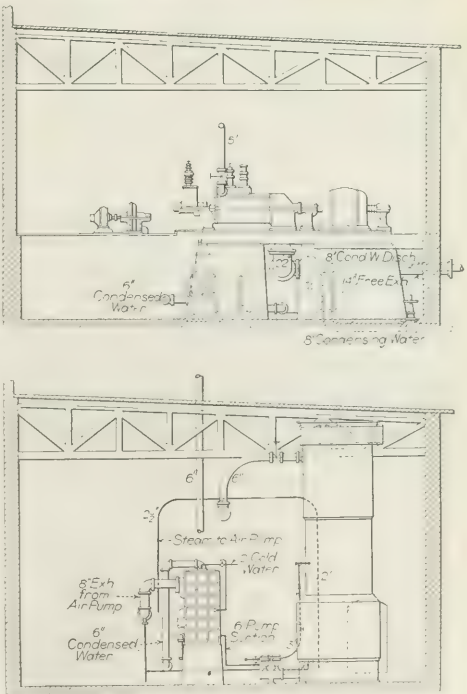


Fig. 16.—Sectional Elevations of the Power House Installation.

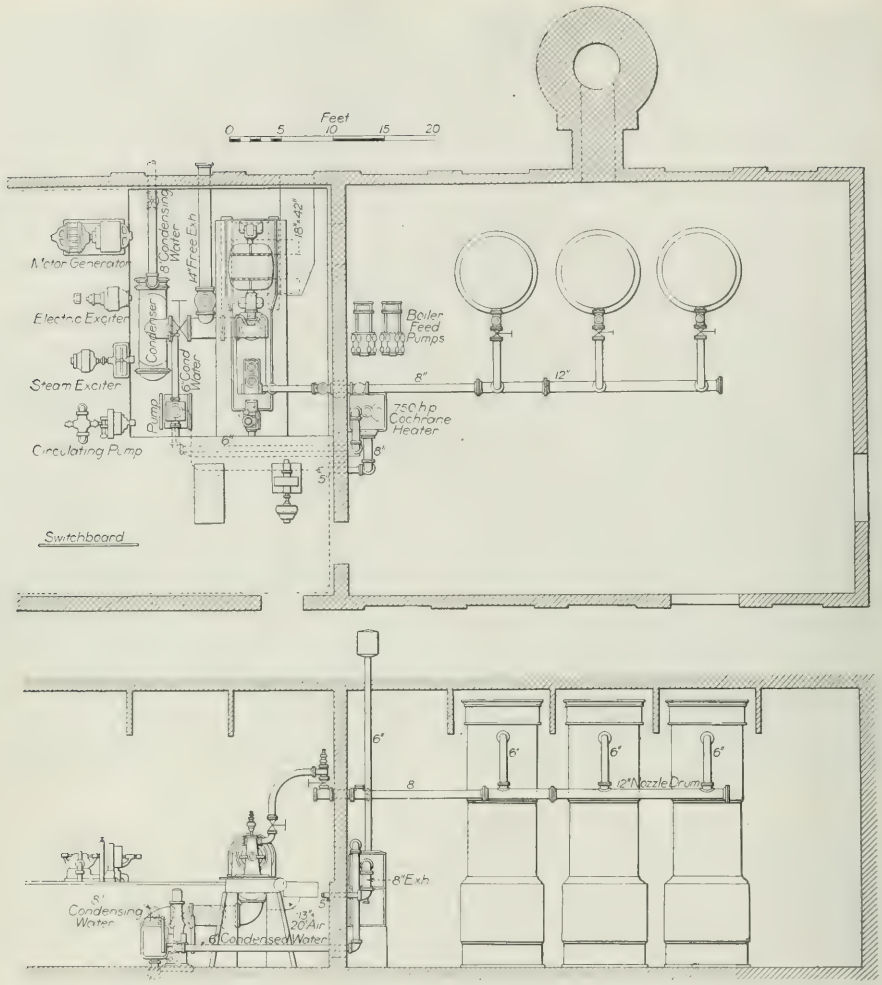


Fig. 17.—Plan and Elevation of the Power House Installation.

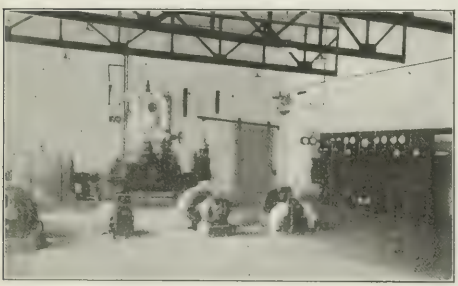


Fig. 19.—The Engine Room.

The Heating System

The shop is heated by the Evans-Almirall system of hot water, in which the water is heated under pressure. It passes through heaters built up of tubes, where it receives the heat from steam, either exhaust or direct. The circulation of the water through the heating coils is driven by a pump direct connected to a De Laval turbine. There are two heaters. The exhaust heater, so-called, uses the exhaust steam from the De Laval turbine, and a greater or less amount of steam taken from the Parsons turbine at one of its intermediate stages, this steam not being permitted to attain its maximum expansion in the engine. An auxiliary heater is employed when the works are shut down, receiving live steam from the boiler, a circulation system being maintained between them.

An adjustable reducing valve secures a predetermined constant steam pressure in the exhaust heater. The temperature of the shop is controlled by changing the amount

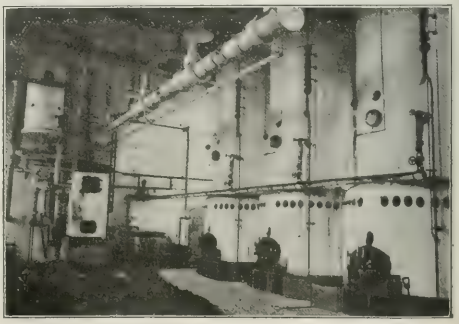


Fig. 18.—The Boiler Room.

of steam allowed to pass through the reducing valve, thus controlling the degree of heat in the circulating water, although the velocity of flow through the heating pipes can be governed to a considerable extent by varying the speed of the pump.

Errors of Design

In designing a great plant, new from one end to the other, containing many innovations, a certain percentage of error in design is certain, such as that of the pumping plant. Considering the magnitude of the undertaking and the fact that originality figures in so many details, the Windsor Machine Company has been fortunate in that there are no more mistakes to rectify, judging from the experience of the owners of most new works.

One other detail which was necessary to change was in

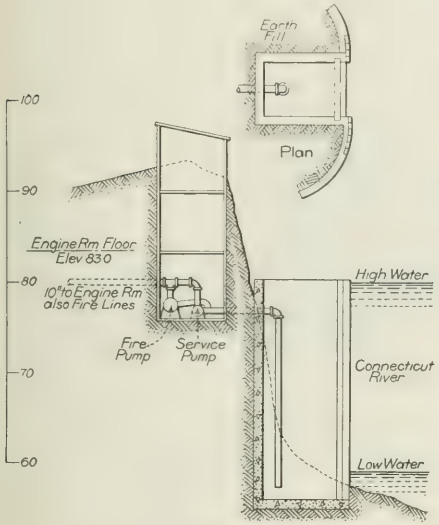


Fig. 20.—The Pumping Station at the River.

connection with the heating of the offices. The space under the floor was left open, and the timbers treated against decay. The hot-water heating pipes were placed beneath the floor instead of along the sides of the room as was first intended, and the result was so great a loss of radiation area that it became necessary to put in additional radiators. The management also makes the point that were another shop unit to be built hollow cast-iron columns would be used, through which the roof water would be taken instead of through conductor pipes. Referring to the offices, they are spacious, high stsudded, and admirably equipped for their purposes.

The Moll Steam Trap for Heating Plants

For handling the condensation from heating plants and for boiler feed purposes a steam trap, bearing as a trade designation the Ideal tilting return steam trap, has recently been placed on the market by William Moll, 1664 Columbus road, Cleveland, Ohio. The apparatus has several distinctive features, the purpose being to obtain simplicity, durability and efficiency. A general view is given in Fig. 1, while Fig. 2 is a sectional view of the interior, showing the valves and valve-operating mechanism in a filling position.

The relief valve plunger E is open, kept in that position by the stem D, which is in contact with the cam A. Under these conditions no pressure exists and water enters the trap. When the reservoir is filled it tilts under its weight, and the water is discharged, while at the same time the cam A turns slightly, closing the relief valve and opening the steam valve plunger C2. The cam in turning first comes in contact with the valve operating lever B at the point A1, which gives the valve a slow but powerful start against high pressure. As the cam turns further the point A2 is in contact with the lever, and the valve opens to its full capacity. This allows the live steam entering at H1 to flow through to the opening in the trunnion L and discharge the water.

The reservoir then tilts back to its filling position, the steam valve closes, the relief valve is opened and the trap is again ready to fill. The apparatus is placed above the boiler, so that when steam is admitted, equalizing the pressure in the trap and boiler, the water flows to the latter. Both the steam and relief valves close by gravity, doing away with the necessity of springs and weights.

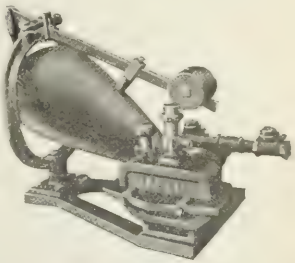


Fig. 1.—The Moll Return Steam Trap.

The receiver, oval in shape, is of cast iron. The trap is mounted on a substantial machined iron base, assuring alignment. The receiver and the steam box are tested at 200-lb. water pressure. The former is counterbalanced by a cast iron counterpoise on the end of the lever. In its tilting motion the receiver strikes both above and below against a spring, preventing jarring and making the operation practically noiseless. The valves and valve operating mechanism are entirely inclosed in the steam box, where they are protected from damage and where they can be

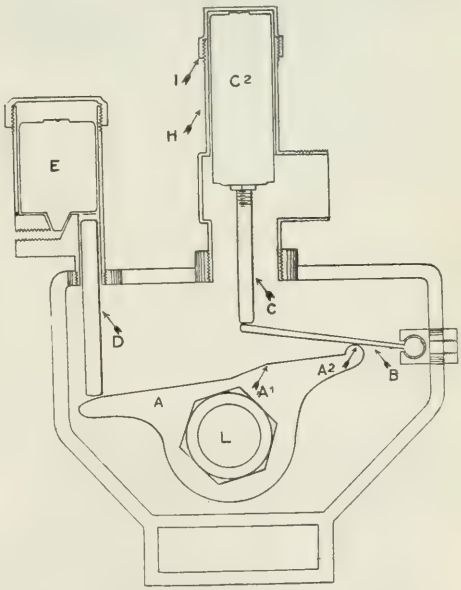


Fig. 2.—Details of the Moll Return Steam Trap.

reached quickly. By loosening two screws in the cover the steam box can be removed, exposing the entire valve and operating mechanism. The valves and trunnion are made of special bronze to insure the minimum amount of wear. The steam and relief valves are also of bronze. They can be taken out for inspection by unscrewing the caps, which have machined joints that require no packing. Lunkenheimer swing check valves are used to control the inlet and the discharge.

The trap is made in four sizes. The smallest size, with a 1-in. water inlet and outlet and a ¾-in. steam inlet, will drain 13,000 lineal ft. of 1-in. pipe, will discharge 350 gal. of water per hr. and drain 4333 sq. ft. of radiation. The largest size, with a 2-in. water inlet and outlet and a 1½-in. steam inlet, will drain 50,000 lineal ft. of 1-in. pipe, discharge 1000 gal. of water per hr. and will drain 16,667 sq. ft. of radiation.

A Poppet Valve Engine

A New Type Manufactured Under the Lentz Patent

A demand has existed for some time for more economical prime movers than have been hitherto built. This and the movement for the conservation of the country's resources has resulted in the investigation of various types of engines with a view to securing a prime mover of high quality and efficiency. The Erie City Iron Works, Erie, Pa., was one of the companies which undertook such an investigation and in its search steam turbines and internal combustion engines were both examined and finally the merits of the reciprocating engine using superheated steam were given consideration. As a result of this research work the company decided that the modified and improved poppet valve engine invented and developed by Hugo Lentz was the most economical and it secured the American manufacturing rights. The most interesting features about the engine are that no elastic packing is used throughout the engine—the valves maintain their tightness indefinitely, a special type of mechanism for operating the valves and a simply constructed governor. Figs. 1 and 2 are an exterior view and a longitudinal section of the engine respectively, while Fig. 3 is a section through the stuffing box and shows how the elastic pack-

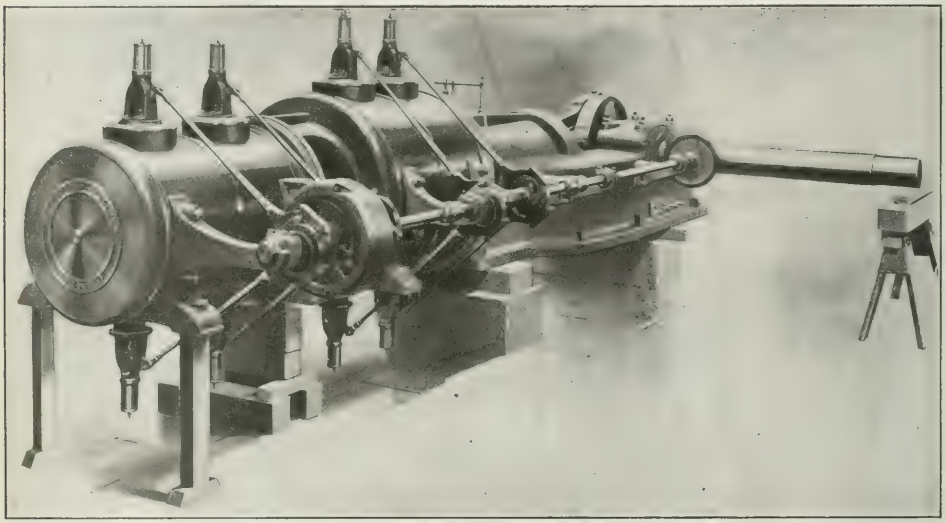


Fig. 1.—The Lentz Engine, Built by the Erie City Iron Works, Erie, Pa.

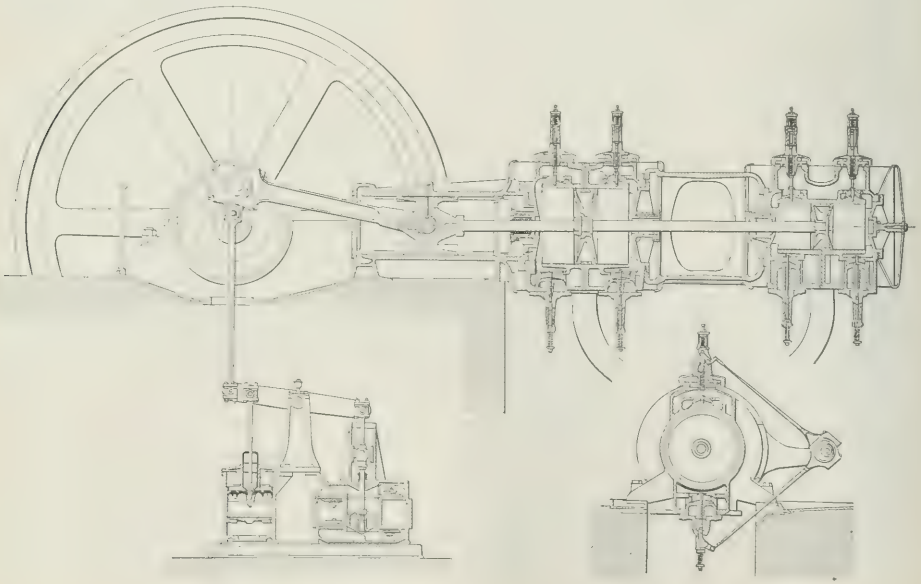


Fig. 2.—Longitudinal Section of the Engine.

ing ordinarily employed in an engine has been eliminated. The admission valve is illustrated in Figs. 4 and 5, the latter being a sectional elevation which shows a number of constructional details. A view of the various parts of

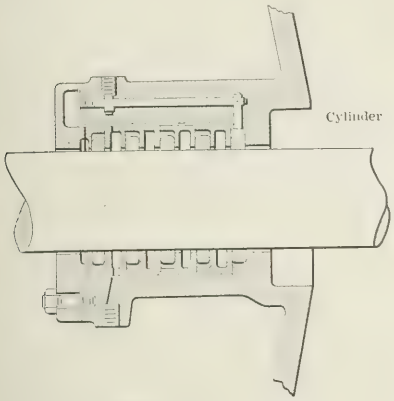


Fig. 3.—A Section Through the Stuffing Box.

the valve mechanism is given in Fig. 6, while the special type of governor is illustrated in Figs. 7 and 8, the latter being a transverse and an axial section.

The Engine in Detail

A longitudinal section of the engine is given in Fig. 2. As will be noticed, the framing is of the girder type with substantial feet to take the foundation bolts. The



Fig. 4.—The Admission Valve.

low-pressure cylinder is bolted to the frame and the high-pressure cylinder is secured to it by a distance piece. The feet of this cylinder are free to slide on the main frame with changes of temperature. The piston body is turned slightly eccentric so as to get a large bearing surface on the bottom of the cylinder.

No elastic packing is used throughout the engine. The stuffing boxes which are shown in section in Fig. 3 are bored and ground to within 0.001 in. of the exact dimension and in them are placed a series of cast-iron rings, turned and ground to fit the stuffing box and accurately faced. These rings do not touch the piston rod. Interposed between them are five cast-iron rings having a square cross section which fit the piston rod to the same

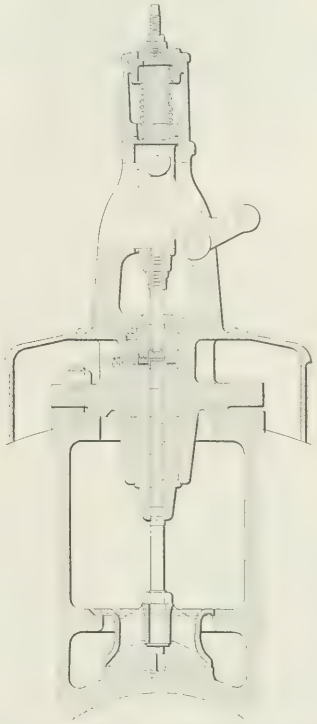


Fig. 5.—Sectional Elevation of the Admission Valve, Showing Constructional Details.

fraction of an inch. These are known as the floating rings. Oil can be kept circulating in the stuffing box if necessary, but water, the result of cylinder condensation, is sufficient to keep the box tight under pressure as great as 160 lb. These rings form a series of chambers, which are efficiently drained; any steam escaping from the front chamber enters the second one and expands there. A small part of this steam may escape to the third chamber and undergoes a further expansion, and so on; but the last ring it is claimed will never show the slightest leakage.

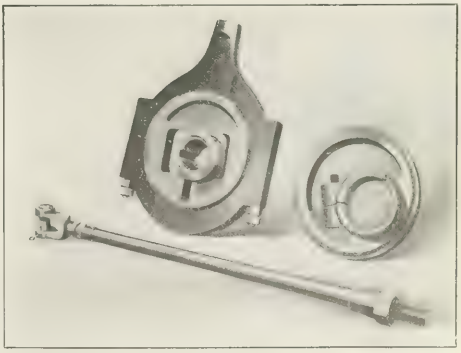


Fig. 6.—The Various Parts of the Eccentric.

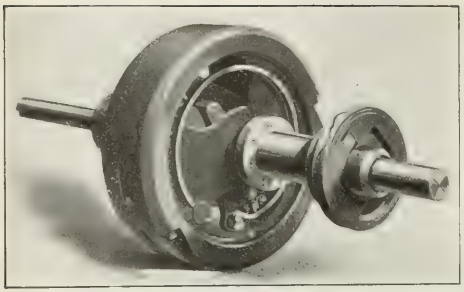


Fig. 7.—The Governor Used on the Lentz Engine.

The valve gear demands particular attention. An enlarged sectional elevation of the admission valve is given in Fig. 5. This is a double-seated poppet valve. The seats are not more than ⅛-in. wide. The valve spindles which are ground to fit the long bushings shown have no stuffing boxes. The bushings are bored and ground to fit the valve spindles within 0.001 in., grooves are turned in the spindles and there is no trace of the leakage. The valves are turned to such diameters that the lower one will just pass through the upper opening. No. dash-pots are used. The valve is moved by a cam acting on a roller. When the valve is seated the cam is not in contact with the roller, but the amount of clearance is too small to be shown in the drawing. The roller is always in contact with the cam until the valve is seated and consequently the engine makes no noise when running at speeds as high as 200 r.p.m.

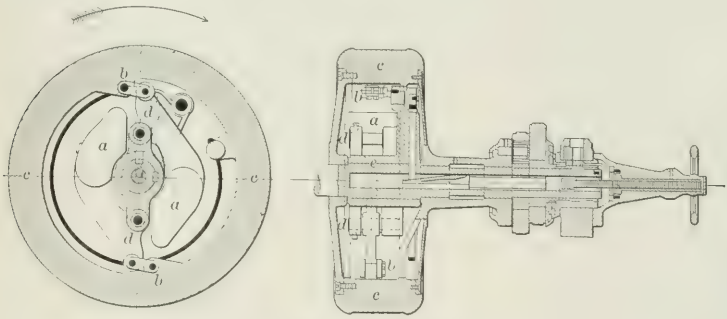


Fig. 8.—Transverse and Axial Sections of the Governor.

Alongside of the engine runs a horizontal lay shaft, shown at the right of Fig. 1, which is caused to rotate by a bevel gear between it and the crank shaft. This gear is very peculiar. In order to secure smooth running the gears constituting the drive are in the nature of friction cones and the shaft is driven by pressing the cones together. To prevent slip, however, teeth are provided, but these are very shallow, the points being turned off. The gears are inclosed in an iron case and run without noise. On the shaft are grouped eccentrics, one for each of the eight valves, the parts of which are illustrated in Fig. 6. The rods of these eccentrics are coupled directly to the ends of the cam levers as shown in the lower right corner of Fig. 1. The steam eccentrics can have their throw reduced to nothing by a wedge which slides in the shaft and in the eccentrics, and this wedge is moved by the governor to regulate the point of cut-off.

The governor, which is of a novel type, is shown in Fig. 7. Referring to Fig. 8, which gives the details of the governor, it will be noticed that there is a very heavy external inertia ring *cc*, and two centrifugal weights *aa*, which are controlled by flat bent springs that can be easily removed or replaced in a few minutes. The action of the governor shifts the wedge longitudinally, and so alters the throw of the eccentric. The two weights *a* are pivoted on a carrier *e*, keyed to the side shaft. These weights and the carrier are attacher by a spring and a knee joint formed by *d* and *b* respectively to the outer ring *c*, which performs the functions of a fly wheel. When the least change of load, and consequently of speed, takes place, the inertia of the outer ring which tends to keep its speed constant, causes it to move with relation to the carrier, and moving the eccentrics alrers the cut-off to suit the change of load. With the new speed the weights are balanced by the spring in the new position and so maintain the new cut-off. This governor regulates within a short time and the momentary change in speed due to load being put on or off is only slightly in excess of the permanent one. A hand wheel is provided at the end of the shaft to enable the engineer to change the speed of the engine by altering the tension of the governor spring while the engine is running.

All the joints in the engine are of the metal to metal type, the required tightness being secured by grinding and the workmanship is high grade throughout.

Chicago Engineers' Club New Quarters

Before the close of the summer it is expected that the Chicago Engineers' Club will be occupying its new house at 314 South Federal street, Chicago. For three years the club has been quartered in rooms leased from the Automobile Club. It is now moving into a property on which it has a 99-year lease. The new location adjoins the Union League Club, is within a stone's throw of the Post Office and affords the greatest possible advantages in its situation.

The building occupies a lot 25 x 100 ft. and is of brick and mill construction, seven stories. The façade will be finished in white stone, with gothic entrances and windows on the street floor, and in red brick for the upper floors. The club entrance is at the north end of the building and gives access to an electric elevator which serves the entire structure. The first three floors have been leased by the club for a period of ten years to the St. Hubert's English Grill Company, which is under contract to serve the club a table d'hote luncheon and an a la carte service. There is a separate entrance at the south end of the building for the Grill Company, so that there can be no confusion of identity between the club and its tenants.

The third floor banquet room is to be reserved for the exclusive use of the Engineers' Club members between the hours of 11 a.m. and 3 p.m., and the noon meal, table d'hote and a la carte will be served in this room.

In front there is a small reception room. A hallway leads into the club or lounging room, which is a long room with a beamed ceiling, having windows opening on the south and a large fireplace on the north. Opening off the lounging room at the west end, and separated from it by a folding glass partition, is the card room, a large light, airy room with windows opening on the south and west.

The fifth floor is to be finished in loft form and left vacant for further expansion. It will be utilized for billiard and club rooms when the need becomes apparent and further funds are available. The sixth and seventh floors each have seven bed rooms and three bath rooms.

The club will have in its new home ample and pleasant quarters, with plenty of room to expand and an investment that is expected to give it a comfortable surplus within a decade.

The Lake Superior Mining Institute will hold its sixteenth annual meeting on the Menominee range August 22 to 24. Arrangements are now under way for the entertainment of the members, and circulars will be issued giving the itinerary of the trip and the list of papers to be read. W. J. Richards, Crystal Falls, Mich., is president, and A. J. Yungbluth, Ishpeming, Mich., is secretary.

The Government Report on the Steel Corporation

Familiar Ground Traversed

An abstract is here presented of the report which Herbert Knox Smith, commissioner of corporations, has submitted to President Taft, covering his investigation of the United States Steel Corporation. The report is a rather voluminous document, covering 60 pages of closely printed matter, and deals with:

1. The marked development of consolidation, culminating in the organization of the Steel Corporation.

2. Capitalization by the Steel Corporation far in excess of property values. The bureau's valuation of tangible assets in 1901 is $682,000,000, against $1,400,000,000 of issued securities.

3. An analysis of cost of subsequent additions to property of the corporation, showing a total investment in tangible property December 31, 1910, of $1,187,000,000, against $1,468,000,000 outstanding securities.

4. An average rate of profit from 1901 to 1910 on the corporation's actual investment, as computed by the bureau, of 12 per cent.

5. An almost continuous decrease in the corporation's proportion of output of principal steel products, but a marked increase in its ownership or control of iron-ore deposits.

Development of Consolidation

The transformation in the steel industry was simply one phase of a movement toward industrial consolidation, characterized by three especially important features:

1. The restriction of competition through combination.

2. Integration, the linking up of productive processes through acquisition under one control of raw materials and manufacturing plants and through extensions and co-ordination of manufacturing processes.

3. The creation of a great amount of inflated securities.

The first undoubtedly was the principal cause of most consolidations in the steel industry. Profits had been sharply reduced by the competition which accompanies the depression of the middle nineties, and steel manufacturers were attracted to consolidation as a means of increasing returns. However, a desire to secure greater economies and advantages through integration undoubtedly played an important part. A conspicuous feature was the acquisition by iron and steel manufacturers of extensive reserves of ore and coal. The great bulk of the iron-ore deposits of the Lake Superior region had by 1900 passed under control of less than a dozen interests, chiefly steelmaking concerns. The most desirable coking-coal fields of the East had been secured, largely by the same steelmaking interests.

Such integration and co-ordination made possible the introduction of economies in manufacture, particularly in saving of fuel and labor. In considering general causes which led to consolidation, therefore, this element of integration should be given due weight.

The creation of new securities for the sake of a stock-market profit was a very important consideration. The public demand for such securities was unusually active at this time. So long as the demand for such issues was maintained, the supply was steadily increased.

The familiar history is given of the aversion of the threatened "steel war" in 1901 by the formation of the Steel Corporation.

Capitalization and Investment of the Steel Corporation in 1901

The bureau's valuations of the Steel Corporation's property in 1901, arrived at by three different methods, are compared with its outstanding capitalization in 1901 in the following table:

		Excess of securities over estimates.
Total capitalization, April, 1901, including underlying bonds and purchase money obligations	*$1,402,846,817	
Investment in tangible property alone	676,000,000	$726,846,817
Value of all property, tangible and intangible, as indicated by market prices of securities of constituent concerns	793,000,000	609,846,817
Value of tangible property estimated by departments of the business	682,000,000	720,846,817

*Excluding $535,407 unacquired stock in concerns for which no corresponding deduction was made in the first and third estimates.

The securities issued by the corporation greatly exceeded the indicated value of the property acquired, as established by any one of the three methods of valuation. The valuation of the tangible property arrived at by historical study, as well as that by departments of the business, shows an excess of capitalization greater than the indicated value itself. The valuation by departments, namely, $682,000,000, shows an excess of nearly $721,000,000. Even taking the indicated market value of the securities of the subsidiary concerns, $793,000,000, which includes the public estimate for intangible considerations as well as physical property, the excess of the Steel Corporation's capitalization was still over $609,000,000.

The bureau does not contend that the capitalization of the Steel Corporation should have been fixed at any one of the three valuations here presented. All attempted at the moment is to compare these valuations with the capitalization. Figures show that the entire issue of approximately $508,000,000 of common stock of the Steel Corporation in 1901 had no physical property back of it, and also a considerable fraction, say from one-fifth to two-fifths, of the preferred stock was likewise unprotected by physical property.

While, therefore, it is not the purpose of this report to say what should have been the capitalization of the Steel Corporation, it is obvious that the company was heavily overcapitalized, judged by any reasonable standard. Further, this overcapitalization is indicated by the fact that the underwriting syndicate got a commission of common and preferred stock amounting to $130,000,000 upon which the syndicate realized $90,500,000 with a net profit of $62,500,000, of which $12,500,000 went to managers and $50,000,000 to members. This was clearly unreasonable. Further, $20,000,000 more was paid by constitutent companies for underwriting services.

Additions to Property of Steel Corporation Since 1901

Since 1901 the Steel Corporation has increased its investment first, and most important, through new construction and additions out of surplus earnings and new capital from sale of securities; and, second, through acquisition of competing concerns through issue of securities directly.

The bureau has computed the actual investment of the Steel Corporation in its various properties at the close of 1910 at $1,186,982,038. This compares with a total valuation April, 1901, of $682,053,385. In other words, during the period from April, 1901, to December 31, 1910, the corporation has made an additional net investment of $504,928,653. Of this $435,000,000 was provided from earnings. These amounts are over and above the allowance for maintenance and depreciation. This has eliminated a considerable amount of the "water" in capitalization.

The total net capitalization December 31, 1910 (including purchase money obligations and mortgages, but excluding $620,352 par value of stocks of subsidiary companies not held by Steel Corporation) was $1,468,033,260. The excess of capitalization over indicated investment ($1,186,982,038) was $281,051,222, whereas at its organization in 1901 the disparity between the two figures was $720,846,817.

The Steel Corporation undoubtedly would contend that there was not a disparity of $281,000,000 between its capitalization and actual value at the close of 1910. In its balance sheet of December 31, 1910, total assets (after deduction of current liabilities) were of approximately $1,693,000,000, or, $225,000,000 over capitalization as above stated. Of this excess $164,000,000 was surplus and the balance sundry reserves. This balance sheet valuation is about $500,000,000 in excess of the investment as computed by the bureau.

It is true that the merger value of various properties acquired, taken together with the organization of this company as a going concern, have a value in excess of the sum of their values. Co-ordination made possible by combination under single control tends to reduce costs through economies or removing the necessity of paying profits to others. To allow a single company, which has secured the bulk of a given industry, credit for such merger value, as a basis on which to earn profits, raises, therefore, a question of far-reaching public policy. Because of the vital issue involved, as well as because of the practical consideration of establishing an investment

which shall permit of intelligent discussion of profits, the bureau, while admitting there is an element of merger value in a going concern, either from great concentration of control, monopolistic power, or other influences, has made no addition therefor to the investment of the Steel Corporation.

Profits of the Steel Corporation

Profits earned upon the investment of the Steel Corporation, as computed by the bureau (not on the capitalization), have averaged 12 per cent. for the entire period from 1901 to 1910. The extreme range was from 7.6 per cent. in 1904 to 15.9 per cent. in 1902. By profits is meant net before charges. The average for the first four and three-fourths years was 12.5 per cent., as against 11.6 per cent. in five years from 1906 to 1910. Therefore, in so far as any tendency may be noted, it is toward a lower rate of profit in recent years. The profit fell to 7.6 per cent. on investment in 1904 and 7.8 per cent. in 1908, as compared with a maximum of over 15 per cent. in 1902 and 1906. Prior to the formation of the corporation the industry was noted for violent changes in the rate of profit. This exhibit shows that business, although still subject to marked fluctuations in profits, has, even in the most depressed years shown a substantial return on actual investment.

Position of the Steel Corporation in the Industry

The Steel Corporation, despite its size, is not exempt from competition. Indeed, competition in the industry has steadily been increasing. Notwithstanding the great additions made to its properties from earnings and the acquisition of competing concerns, its proportion of the business in nearly every product except pig iron and steel rails is less than it was in 1901. Taking the production of steel ingots and castings as a basis, the Steel Corporation's percentage of the total output in the country fell from 65.7 per cent. in 1901 to 54.3 per cent. in 1910. This figure, perhaps, is the best single criterion by which to judge the change in the corporation's position in the steel industry from a producing standpoint.

While the corporation's proportion of the production of both raw materials and finished products shows a marked decrease, the proportions given do not fairly represent its true position in the industry as a whole. In iron ore, in particular, it undoubtedly occupies a dominating position. Its holdings for the whole Lake Superior region in 1909 were reckoned at about 1,625,000,000 tons, or 75 per cent. of whole, of which 1,258,000,000 tons was of the current commercial standard.

It also has a large amount of low-grade ore in the South. Altogether, it holds about 2,500,000,000 tons.

Not only on account of its great holdings of ore, but also on account of peculiar advantages enjoyed in the transportation of the ore the Steel Corporation occupies an extremely commanding position in the iron and steel industry. Indeed, in so far as its position is of monopolistic character, it is chiefly through its control of ore holdings and the transportation of ore.

The Great Northern Ore lease, on account of the royalties provided therein, has often been referred to as an indication of the increased value of Lake ore. While the average royalty which will actually be payable under this lease will depend on the quality of ore shipped, indications from the royalties on shipments to 1910, inclusive, are that the average iron content will not fall much below a 59 per cent. grade of ore.

A royalty of 85 cents, with annual increases of 3.4 cents, is absolutely unprecedented in the Lake ore trade. There is no indication that either the average quality of ore on the Hill lease or the costs of mining it justify the payment of exceptionally high royalties. The royalties stipulated in the Hill lease, therefore, were and are still far above the market value.

The high royalty named in this lease, therefore, instead of being indicative of marked enhancement in ore values, is evidence of the extent to which the Steel Corporation was willing to go to prevent this ore from falling into the hands of rival interests.

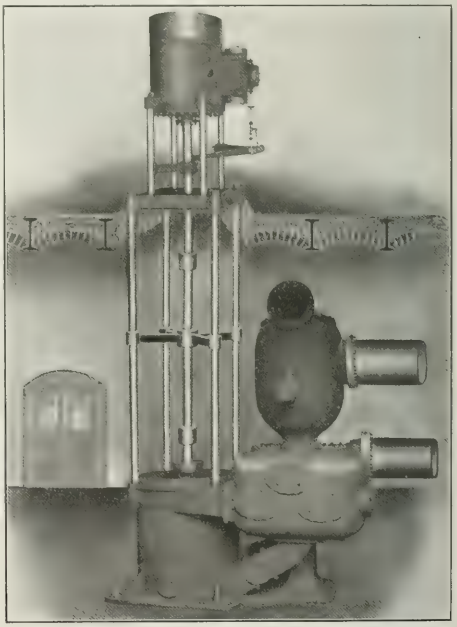
R. W. Oswald, Pittsburgh representative of the Pennsylvania Boiler Works, Erie, Pa., recently sold to the Fort Pitt Coal Company, Pittsburgh, 150 hp. boilers and the W. J. Rainey Coke Company, Uniontown, Pa., 125 hp. boilers.

A Special Air Pump and Jet Condenser

The vertical air pump and jet condenser shown in the illustration is built by the Dean Bros. Steam Pump Works, Indianapolis, Ind. It is of a special design for use where the engine room floor is too high vertically from the water supply to permit the application of standard practice. With this apparatus the distance from the air cylinder to the steam cylinder can be made to suit the conditions under which it is to be run, producing, it is claimed, an efficiency equal to that where the steam and air ends are closely connected. The objective is to condense the steam exhausted from the engine and at the same time give a vacuum in the cylinder of 26 to 28 in.

The air cylinder and condenser are placed within easy reach of the condensing water, while the steam end and the valve movement are always in view of the engineer. No additional steam is required than when the steam and air ends are closely connected. Adjustment may be made to procure a regular movement of the apparatus. In one extreme case the distance from steam to air was 50 ft. The straight push and pull movement with no side strains insures durability.

The steam end may be either simple, as shown in the cut, or compound, depending on the conditions of operation. The apparatus is made in sizes from 60-in. diameter air cylinder by 48-in. stroke down to 8-in. diameter air cylinder by 7-in. stroke. The side rods are accurately finished, bringing all parts in alignment. The piston rods are coupled with taper fits in steel couplings and are held in position by taper tool-steel keys. The air cylinder is lined with brass. All valves are in the valve chest at the side, where they are easily accessible through handhole openings. As there is no reason for getting at the cylinder bore except for replacing the packing around the air piston, it requires little attention. The steam end is made to stand easily a working pressure of 250 lb. and steam containing 150 deg. superheat.

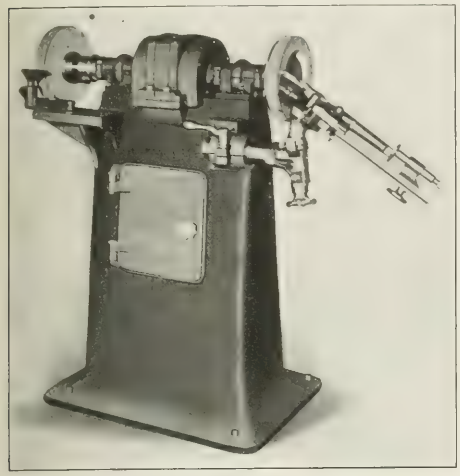


The Dean Bros. Steam Pump Works' Vertical Air Pump and Jet Condenser.

The Asbestos Protected Metal Company, Beaver Falls, Pa., has opened its new plant for the manufacture of asbestos protected metal and weatherproof non-rusting skylights. The executive offices of the company have been removed to the works, and all communications should be addressed to Beaver Falls.

A Combination Grinding Machine

The motor-driven grinding machine shown in the illustration, built by the Bridgeport Safety Emery Wheel Company, Bridgeport, Conn., is a combination machine arranged for dry grinding at one end and as a complete twist drill grinder at the other. The motor, of the alternating current type, is fully inclosed to keep out flying



The Bridgeport Combination Grinding Machine.

particles of abrasive. The heavy base is carried out wide enough so that the bearings may be bolted to the main body casting. The long bronze bearings, of the split sleeve, ring-oiling type, are movable and renewable. If the spindle should in time become worn it can be redressed and bronze bearings bored out, correspondingly small. The twist drill grinding attachment is built by the Washburn Shops, Worcester, Mass. and may also be used mounted on the Bridgeport No. ½ and No. 2 machines. The motor is of ample power to run wheels 12 in. in diameter. The specifications are as follows:

Hight from floor to center of spindle	40 in.
Length of ring-oiler bearings	8 in.
Diameter of spindle in bearings	1⅜ in.
Diameter of spindle between flanges	1⅜ in.
Distance between wheels	33½ in.
Length of spindle	43¼ in.
Floor space	24 by 20 in.
Weight	650 lb.

The report that Farley G. Clark has been appointed superintendent of the Westinghouse Electric & Mfg. Company, East Pittsburgh, Pa., it untrue. No such appointment has been made.

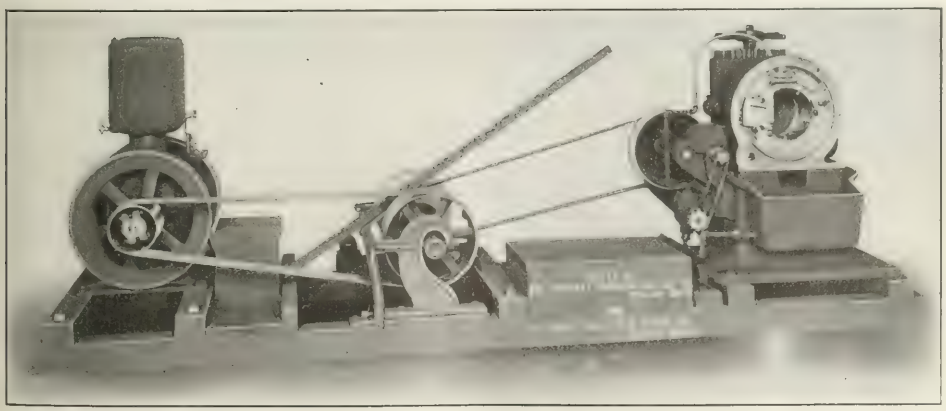
Toncan Metal.—In an address delivered before a sheet metal workers' association at Baltimore, Md., by A. H. Lovejoy, the subject of the causes of corrosion in modern steel and iron sheets was discussed and the good qualities of Toncan metal were set forth. A brief outline of how the lasting and working qualities of this metal are obtained was given as follows: "To overcome the trouble of pitting, in the making of Toncan metal no manganese is added during any of the several stages of its manufacture, and, through the system employed, all excess quantities of this element already present in the raw materials are eliminated, together with all excess sulphur and phosphorus, the result being that in the finished product there is no collection of these elements scattered throughout the metal to form into pits and eat into holes." Toncan metal is made by the Stark Rolling Mill Company, Canton, Ohio.

The Rateau Steam Regenerator Company, 140 Cedar street, New York, has been awarded a contract by the Delaware, Lackawanna & Western Railroad Company for a Rateau steam regenerator. This apparatus is for the Woodward Collieries. The regenerator will receive the exhaust discharge of two hoisting engines and will deliver a continuous flux of steam to a low-pressure turbine of 1000 kw. The heat absorption capacity of the regenerator, and therefore its heat-storage capacity, is such that it will be capable of delivering a steady flux of steam to the turbine when both hoisting engines remain idle for a period of two minutes.

A Portable Pipe Machine

The portable power pipe threading and cutting machine, which is shown in the illustration, has been brought out by the Merrell Mfg. Company, Toledo, Ohio, to supply a demand from heating and plumbing contractors. They require a power machine that can be used on the job in a building where considerable cutting and threading is necessary in the installation of pipe, a large saving of labor resulting as compared with hand threading. The machine is also designed for use in the installation of automatic sprinkling systems

The outfit consists of the company's power threading and cutting-off machine mounted on an oak skid with a 2½-hp. gas engine, the power being transmitted to the machine through a countershaft. The pipe threader itself is mounted directly on a special low base, which makes it light and convenient to handle. The entire outfit occupies a floor space of 3 by 10 ft. and weighs 1600 lb. With the use of rollers it can be easily loaded on a wagon and taken where wanted, or moved about a building. A box for tools, dies, etc., is conveniently located in the space between the threader and the countershaft. The illustration shows one of the company's 6-in. threaders. The outfit is also furnished with pipe machines of 4, 8 and 12-in. capacity.



The Merrell Portable Pipe Threading and Cutting Machine

The Machinery Markets

The railroads are becoming more active in some sections. The New York Central expects to close out about $50,000 worth of business within the month, and in Chicago the Atchison, Topeka & Santa Fé Railroad has closed out for $25,000 worth of equipment, about four-fifths of which was awarded to the Chicago branch of a large New York machine tool house. Government purchases have helped the machinery trade a great deal, as a large number of bids for metal working machinery were opened during the week and awards will be announced within a few days. An improvement in nearly all lines is noted in Cleveland and a similar condition exists in Cincinnati. The automobile manufacturers continue busy in Detroit and the machinery demand there is growing. The call for electrical equipment has increased in St. Louis and the general market there is improving. A more satisfactory volume of business is coming forward in New England and a better feeling has developed in Philadelphia, although the market there is irregular. Business in Baltimore is not up to normal, but it has grown of late. Cheerful reports come from Texas, where the prospect of a large cotton crop is helping business sentiment. Texas dealers are also selling a good deal of mining equipment for delivery in Mexico.

New York

NEW YORK, July 5, 1911.

The New York Central Railroad has received all the bids on the list it had out for its West Albany shops and assurance has been given to the bidders that contracts will be awarded within a month. This will mean the distribution of about $50,000 worth of orders. The Newark, N. J., Board of Education has bids in on about $17,000 worth of equipment for a new manual training school, and this business will also be closed during the present month if plans of those in charge are carried out. Later on an additional machine tool list is expected from this source for equipment for the new Central Manual Training & Commercial High School, which will be about equal in size to the one on which dealers have just put in their bids. With this business in sight a better month is expected than was experienced in June, when orders were not as plentiful as inquiries warranted dealers to expect. A better volume of inquiries developed during the week and a number of new enterprises which will call for considerable machinery buying came up. Automobile manufacturers and public garage owners have been buying more liberally during the past week and while no large lists of machinery are before the trade the outlook is decidedly more encouraging than it was a week ago.

An enterprise that will call for large expenditures for machinery, especially in the line of machine tools and metal working equipment, is that of the Edison Company, West Orange, N. J., to establish two new plants in Silver Lake, near West Orange, for the construction of storage batteries and industrial automobiles. A large dismantled factory at Silver Lake, which was formerly used as a licorice works, has been purchased by Thomas A. Edison and his associates and it will be remodeled and additions constructed. The plant of the Federal Storage Battery Company, now opposite the Edison Works at West Orange, will be moved to Silver Lake, together with that of the Lansden Company, which now has an electric automobile plant on Orange street, Newark. The Edison Company has large interests in both of these companies and it is understood that arrangements are to be made to extend their manufacturing facilities.

Final contracts for the construction of nearly 18 miles of tunneling from Yonkers, N. Y., to Greenpoint, Brooklyn, in connection with the extensions of the New York water supply have been awarded to four large contracting companies and they are now making arrangements to purchase air compressors and other equipment needed in the construction work which is about equally divided among them. The sections awarded and the contractors' addresses are as follows: Section 63, Mason & Hanger Company, Cornwall, N. Y., or H. B. Hanger, Hotel Astor, New York; Section 65, Pittsburgh Contracting Company, Elmsford, N. Y.; Section 66, Grant, Smith & Locker, 25 West Forty-second street, New York, and Section 67, Holbrook, Cabot & Rollins, 331 Madison avenue, New York.

A number of New York machinery houses are bidding on equipment for a large sugar mill to be installed at Occidental Negros, P. I., in which a number of Hawaiian capitalists are interested. The mill, which is to be capable of handling 20,000 tons of cane a day, will be equipped with three sets of rollers, in addition to other crushing equipment. Y. H. Lambert, who is now located in Hawaii, has been conducting the negotiations for the necessary machinery, and the enterprise includes the establishment of an electric light plant, an ice plant, telephone system and about 20 miles of industrial railroad. About $1,000,000 gold will be spent and construction work is to begin very shortly.

The W. A. Wood Automobile & Mfg. Company, Kingston, N. Y., which has purchased considerable machinery in this market of late, is inquiring for additional machine tools. This company is building the Comer industrial truck and the Guy Vaughan pleasure car.

The Bagley & Sewell Company, Watertown, N. Y., is planning the erection of a new factory building, of brick construction, to cost approximately $40,000. The plans are not as yet complete, and it is not certain as to whether the building will be erected this year or not.

The Osgood Scale Company, Binghamton, N. Y., has had plans prepared for the erection of a brick and concrete building, 50 x 150 ft., three stories, of mill construction. The plant is designed to be thoroughly fireproof and will be equipped with an automatic sprinkler system, electric elevators, etc.

J. M. Betton, manufacturer of Drucklieb injector sand blast apparatus in all forms, will remove about July 10 from 178 Washington street to 14 Park Place, New York.

The Unit Brick Company, Schenectady, N. Y., will build a one-story factory building and boiler house 60 x 149 ft., and a two-story office building 40 x 44 ft.

McCleary, Wallin & Crouse, Amsterdam, N. Y., are having plans prepared for a seven-story and basement factory building 80 x 200 ft., of structural steel and reinforced concrete construction, which they will build this summer.

The Empire Last Company, 130 Mill street, Rochester, is preparing plans for a factory building which it will erect on Palmer street.

The Ellsworth Collieries Company, Ellsworth, Pa., a subsidiary company of the Lackawanna Steel Company, Buffalo, has completed plans for the building of a central plant for generating and distributing electric power to the several mines operated by the company. Most of the equipment of the plant has been ordered from the General Electric Company and includes one 1750-kw., 60-cycle, 2300-volt generator, driven by a mixed pressure Curtis turbine and one 300-kw., 60-cycle, 2300-volt belt-driven generator.

New England

BOSTON, MASS., July 3, 1911.

Organized investigation of the condition of business in the metal industries revealed the fact that a great many concerns are receiving an entirely satisfactory volume of orders. These may be exceptions, but, on the other hand, their number is large. It is also true that they represent a wide variety of industries. The statement of one manufacturer is suggestive, that "while from reports we get, business is a little quiet, although on the increase since the first of June, we have been very busy." The experience is a common one. Manufacturers who themselves are running their works full are lead by common report to believe that they are very much the exception. It is true that most machine manufacturers find business dull, although in not a few cases some improvement is noted. Many of their customers, though probably not a majority, are running their equipment at full capacity or nearly so. It will take no great increase in demand to compel many shops and factories to go into the market for machinery, in spite of the fact that capacities are very

THE MACHINERY MARKETS

much greater than they were in 1907. A manufacturer of cranes and hoists states that he finds business very good indeed. A builder of pipe threading and cutting machines reports that business for the last six months has been the largest in the company's history, and that the outlook is good. A steam pump house states that this has been an excellent year for business so far. A maker of metal lockers and shelving has been running full for six months, with orders still on the books to insure a continuation of the condition for some time. These experiences are typical of a considerable element in the metal trades. It cannot be emphasized too strongly that business is in such shape that no very great change in the market will be necessary to put it on a rush basis. In the meantime the dealers are not finding any material improvement, nor had they expected to during the hot weather. They look to the autumn to see a smart revival.

The Sprague Meter Company, Bridgeport, Conn., manufacturer of cast-iron gas meters, has prepared plans for a two-story and basement brick and steel building, 61 x 151 ft., as an addition to its present factory. The company has purchased a plot of land adjoining the site of the present and proposed buildings to permit of still further extensions which will probably be necessary in the near future. The increase in capacity has been made necessary by the very rapid increase in the demand for the company's product.

The Terry Steam Turbine Company, Hartford, Conn., states that it will eventually be in the market for new machinery for the addition to its works, but is not ready to consider this matter at the present time. The new building will be 82 x 236 ft., making a total building of 82 x 436 ft. Ground will be broken this week.

The New Departure Mfg. Company, Bristol, Conn., will erect an addition 30 x 82 ft., two stories, which will be used for a testing laboratory.

The McNab Company, Bridgeport, Conn., has been incorporated with a Connecticut charter to take over the business of the McNab Indicator Company, manufacturer of indicators and registers for vessels under patents issued to Alexander McNab. Henry Bishop is president, F. J. Kingsbury, Jr., vice-president, and Norman Leeds, secretary and treasurer. These instruments have proved a success, and the purpose of the new company is to put them on the market in the proper way with several other devices the American agency for which Mr. McNab has recently secured in England.

The Lester & Wasley Company, Inc., Norwich, Conn., manufacturer of envelope machines, has organized with Fred W. Leeds as president; Howard L. Stanton, vice-president; Frank H. Allen, secretary; Percy Chapman, treasurer.

The Dunbar Bros. Company, Bristol, Conn., manufacturer of oil tempered springs, is considering the installation of additional automatic spring machinery.

The New York, New Haven & Hartford and Boston & Maine Railroads have taken the initial steps toward the creation of a tunnel beneath Boston Harbor, connecting the Boston & Maine terminal at East Boston with the New Haven system just outside of the South Station. A bill has been introduced in the Massachusetts Legislature providing for the right to proceed with this work. It includes the electrification of the Boston & Maine system as far as Beverley, Mass., and of the New Haven system as far as Readville, Mass.

George L. Riggs, 35 Congress street, Boston, formerly of Waterbury, Conn., has purchased from the Industrial Instrument Company, Foxboro, Mass., the business of the Standard Electric Time Company, manufacturer of electric clocks which are regulated from central master clocks. The business was formerly located at Waterbury, and it is possible that the factory still owned by the company in that city will be opened for some of the operations of manufacturing.

Additions to general manufacturing plants in New England include the following: Walpole Rubber Company, Walpole, Mass., a large plant at Providence, R. I., on a site just purchased, tentative plans only having been made; Crown Mfg. Company, Attleboro, Mass., cotton mill to cost $100,000; Cheney Bros., South Manchester, Conn., building to connect two mills, 28 x 56 ft., four stories; Oxford Paper Mill, Rumford, Me., two finishing buildings, one 75 x 96 ft., the other 70 x 200 ft., a machine building, 163 x 216 ft., and a beater building, 75 x 215 ft., the improvements to cost $500,000; Interlaken Cotton Mills, Harris, R. I., large addition; Bay State Brick & Steel Company, Springfield, Mass., brick, steel and concrete building, 45 x 244 ft., two stories.

W. A. Clinton and F. P. Lyons have purchased the business of the Hartford Iron Works, Hartford, Conn., manufacturer of architectural and ornamental iron works.

Philadelphia

PHILADELPHIA, PA., July 3, 1911.

While the market is still somewhat irregular quite a few merchants as well as manufacturers report the volume of business in June to have been somewhat larger than that of the previous month. Prospective buyers show a little more confidence in the business situation and in instances have placed orders which have been pending for some time. The general run of business has, however, been confined to single tool propositions. There has been a pronounced absence of railroad business, but it is believed that with the greater activity in railroad buying of track and motive power equipment it will not be a great while until purchases of shop equipment will develop. A considerable tool programme has been under consideration for months by some roads, but authority to make purchases has been lacking. With the opening of the fiscal railroad year a better buying movement is anticipated. Business during the week has not been very active, as might be expected on the eve of the national holiday. Many establishments shut down their plants from Saturday till Wednesday, making needed repairs in the interim. Merchants have also been observing the holiday, with the result that the week's business will be somewhat curtailed.

The demand for second-hand machinery has been quieter, due to the general conditions in the trade at this season. Moderate inquiries for power equipment still come out, but prospective buyers do not appear to be in any great haste to place orders. Steel casting plants report a better run of orders, but have not materially increased their productive rate.

The Pennsylvania Equipment Company, West End Trust Building, wishes to purchase a good second-hand 40 to 65-ton standard gauge geared locomotive.

The E. Keeler Company, Williamsport, Pa., has received the contract to install six 300-hp. water tube boilers in the Aspinwall Pumping Station for the city of Pittsburgh.

The Philadelphia Electric Company has awarded a contract to construct a one-story power house and substation, 54 ft. 10 in. x 84 ft. 11 in., at Schuylkill avenue and Chrisham street, to John R. Wiggins & Co.

The contract for the artillery ammunition assembly shop and scrap warehouse, to be erected for the Frankford Arsenal, in this city, has been awarded to John W. Emery, of this city.

The Main Belting Company is constructing a two-story addition to its plant at Twelfth and Carpenter streets. This will be designed particularly to take care of the increasing business in its black conveyor belt department.

The Tatersall Company, Trenton, N. J., has received bids for the construction of a concrete and steel coal pocket, 185 ft. long, from plans by Ralph White, Pennsylvania Building, this city.

Specifications for the construction work on the new Ritz-Carlton Hotel, to be erected at Broad and Walnut streets, have been sent out for estimate. Plans call for a 12-story building, 40 x 120 ft., of reinforced concrete, fireproof throughout and containing all modern improvements. Buildings on the site of the hotel are now being demolished.

The American Pulley Company reports the demand for pulleys as being well maintained and continues to operate its plant at full capacity. The export demand continues active, extensive shipments to Australia, England and Switzerland being reported. The domestic trade still buys in small lots for quick shipment, except on the Pacific coast, where deliveries in large quantities still continue to be made.

The Peerless Mfg. Company, Philadelphia, Pa., has acquired the old Ballard Knitting Mills at Washington street and McKinley avenue. The company is planning to build additions to the present buildings and equip the plant for the manufacture of fancy paper novelties and toilet paper. The plant when completed will employ between 40 and 50 hands. J. Cloude Smith, Norristown, Pa., is president of the company.

THE MACHINERY MARKETS

Baltimore

BALTIMORE, MD., July 3, 1911.

An improvement has been shown the past month in practically every branch of the iron, steel, machinery and industrial field. In no instance reported, however, has the gain been such as to bring plant operations up to a normal basis, although material improvements are reported in some instances over the relative rate of operations in May. In iron and steel lines, particularly finished products, the volume of business is somewhat greater, due in a measure, merchants state, to the prevailing lower range of prices, as a result of which consumers have been specifying somewhat more freely. Considerable structural steel work has come out in the South, particularly in Virginia, and some pretty fair contracts in Norfolk and Richmond are under negotiation. In this immediate vicinity the building work has been confined pretty generally to small propositions, but they have made up in number what they have lacked in individual size. Machine tool merchants note a better demand, occasional small lot orders for wood and metal working machinery having been placed, although the major portion of the business is still confined to single tool propositions. The demand for the heavier types of tools has been better and there is still a pretty good volume of inquiry, but no great amount of business is expected to be transacted in the opening week of July. The demand for small tools and shop supplies shows up better; consumers are placing orders in larger quantities and the past month's business is well ahead of that for May. Contractors' tools have also been in fairly active demand. There is little new business coming from the railroads in this vicinity. The Baltimore & Ohio has placed some equipment orders, but nothing of importance in the way of machine tools has come out. Extensions to the Hagerstown or Cumberland shops of the Western Maryland Railroad are talked of, but definite information is lacking. There is little new municipal work coming out at this time in which the trade is directly interested. Considerable general work, particularly in connection with sewers and roadways, is, however, in prospect. Contracting engineers are figuring on a fair amount of heating and ventilating work, and with the volume still in sight are encouraged with the outlook for the future. Boilers and engines have been in good demand, particularly those of moderate capacity. A number of important new installations are being figured on. A slight betterment is reported in the foundry trade, although some plants are still operating quite irregularly.

George H. Smith & Co., this city, have been awarded the contract for installing an electric lighting plant for the towns of Gassaway and Sutton, W. Va. The contract includes the buildings, boilers, engines, generators and transmission lines.

Theodore W. Pietsch, architect and engineer, will prepare plans for a large addition to the plant of the Paper Mills Company, at Wicomico and Scott streets. Tentative plans call for a three-story concrete and brick structure.

Plans are being prepared for an addition to the Belvidere Hotel, work on which is expected to be started early in the coming fall. An addition to the present power plant will also be necessary.

The Board of Awards opened bids June 28 for high service pumping engines for the Mount Royal Pumping Station. The Bethlehem Steel Company is understood to have submitted the lowest bid—$109,000, for a 54-in. and $111,000 for a 60-in. stroke pump, with 300 working days to complete the installation. Bids will be renewed by the Water Board before awards are made.

Local contractors are estimating on a contract for the erection of a two-story steel, concrete and brick addition, from plans by Haskell & Barnes, architects, to be built at the Canton plant of the Standard Oil Company. The new building is designed for a shipping warehouse and is estimated to cost about $75,000.

A five-story warehouse, 217-219 East Pratt street, has been purchased by the Maryland Cold Storage Company. An ice manufacturing plant is to be installed and the plant equipped particularly for the storage of fruit. The Consolidated Engineering Company has the contract for the major part of the work.

The Davidson Chemical Company has purchased a tract of about 200 acres of land, on the Patapsco River, adjoining its present plant. Additions to its plant will eventually be built, although it is stated that no definite plans have been made at this time.

The Edgemoor Iron Company, Edgemoor, Del., has the contract to supply the boilers for the power plant addition in the Baltimore Bargain House. Two 300-hp. water tube boilers will be installed.

Maurice E. Skinner, Calvert Building, and Charles R. Schmidt have been appointed receivers for the foundry business of H. C. Larabbee & Co. J. C. Murphy and L. C. Larabbee, copartners, filed the bill for receiver and ask also for a dissolution of the partnership. The receivers will dispose of the business.

It is reported that ground has been acquired in Highlandtown by A. Twining, on which to erect a plant for the manufacture of carpet tacks. Plans for the plant are to provide for a two-story building.

The new Era Electric & Mechanical Company has acquired a new factory building at 112 Hollingsworth street, which is to be equipped with additional machinery for the manufacture of elevators. F. M. Deemer is in charge. A portion of the equipment has been purchased.

Stowe & Stowe will prepare plans for a brick warehouse, 50 x 132 ft., to be erected at 617-619 West Pratt street, for the Baltimore Paper Box Company. The building is to have concrete floors and the usual modern warehouse facilities.

Sealed proposals will be received by the Governor of Maryland, Union Trust Building, Baltimore, until July 14, for the installation in the power house of the Springfield State Hosiptal, Sykesville, Md., of a power plant to include boilers, engines, generators, switchboard and piping, according to plans and specifications by Henry Adams, engineer, 855-859 Calvert Building, from whom copies can be obtained.

The Baltimore Gas Appliance & Mfg. Company is rapidly getting its plant in shape and equipment installed, although a considerable amount of miscellaneous supplies and materials still remain to be purchased. H. W. Hunter, president of the company, states that it expects to get the plant in operation, at least in part, by September 1.

The Aumen Machinery Company reports the volume of business taken in June as being considerably better than that of the previous month. A fair demand for machine shop supplies and small tools is reported.

The Dix Mfg. Company, maker of door hangers, reports a material increase in its orders in the past month. May was particularly quiet, but business taken in June more than brought the volume up to the average. Orders have been principally from the South and West.

The Chesapeake Iron Works reports business better in June than in any month since October, 1910. There has been a multiplicity of small orders, covering a very general line of plain, fabricated and ornamental iron and steel work.

The Consolidated Gas, Electric Light & Power Company has awarded a contract to J. Henry Miller, Inc., for the construction of a storage battery station in McClellans Alley, between Baltimore and Fayette streets. The building will be about 45 x 90 ft., two stories. The contract for the concrete foundations for an addition to its plant at Leadenhall and Spring Garden streets, which when completed will it is stated increase its floor space by 2,000,000 sq. ft., has been awarded to the Fidelity Construction Company.

The buildings on the site of the proposed Industrial Building, generally referred to as the Beehive Building, are being demolished preparatory to the erection of the new structure. The contract has been awarded to Henry Smith & Co. and permits for the construction work have been taken out by P. O. Kielholtz, architect and engineer. Plans call for a seven story steel frame and concrete building, providing every modern factory requirement, suitable for small manufacturing plants. About 1000 tons of structural material will be required, negotiations for which are now under way.

The Baltimore Retort & Fire Brick Company reports that while orders for early delivery have not been large a number have been entered for both special and regular clay shapes and bricks for forward delivery. Deliveries on contracts have been comparatively good during June and have exceeded those in the previous month.

Dietrich Brothers report a fair volume of miscellaneous orders for small structural and fabricated work, although inquiries have been coming out somewhat less freely. They are busy on work in hand. Specifications for the fabrication of the steel work for the Maryland Casualty Company's addition, for which this firm has the contract, are under preparation.

The Tube Bending & Polishing Machine Company, of this city, has been incorporated with a nominal capital stock under the laws of the state of Delaware, and has leased a large manufacturing building at Bayard and Carroll streets, 60 x 200 ft., together with power equipment, which will be fitted up for the manufacture

THE MACHINERY MARKETS

of tube bending and tube polishing machines under patents of Louis H. Brinkman, Newark, N. J., where these machines were previously manufactured. The plant will be equipped as a general machine shop, the major portion of the equipment coming from the Newark plant. A subsidiary company, known as the Compressed Copper Company, operating under patents of Mr. Brinkman, will be located in the same building. This company will make complicated shapes in copper under a new process. Officers of the new concerns have not yet been elected. H. D. Bush, vice-president of the Baltimore Bridge Company, is prominently connected with the new enterprises.

The Baltimore Bridge Company has taken some very fair contracts for structural steel work during the month, including that for the Army and Navy Club, Washington, D. C., requiring some 675 tons, and is the low bidder on about 1000 tons, for towers, to be erected for the Government at Arlington, Va. A contract for a market building at Cartoga, Costa Rica, has been received, as has also one from the Baltimore County Water & Electric Company for steel floor work at its Avalon, Md., pumping station. The structural work for the new storage battery house for the Consolidated Gas, Power & Electric Light Company has also been booked, while pier casings will be supplied the Seaboard Air Line Railway and a number of steel cylinders for export will be furnished the United Fruit Company.

The T. C. Bashor Company's bookings in June exceeded considerably those for the previous month. Recent orders taken include two Nagle Corliss engines, 125 and 325 hp., directly connected,, with Fort Wayne generators of 90 and 200 kw. capacity, for the new plant of the Coca Cola Company. Two Skinner 56-hp. engines and two General Electric 35-kw. generators are to be installed at Fort Howard for the Government.

Cleveland

CLEVELAND, OHIO, July 3, 1911.

July starts with a better feeling in the machinery trade than for some time. There has been some improvement in nearly all lines during the past two or three weeks, the betterment being more marked in general machinery than in the demand for standard machine tools. In handling equipment orders for trolleys, hoists and locomotive cranes have become quite satisfactory in volume, although there is still little demand for heavy handling equipment for large installations. Inquiries for pneumatic tools are somewhat more plentiful. The demand for automatic machinery shows some improvement. In forging machinery some good business has been placed and the outlook is more hopeful, although inquiries directly from the railroads are scarce. The demand for drilling machinery shows some improvement.

While trade is still rather quiet with the local machine tool dealers orders show an improvement over a month ago, and some of the dealers did a fair business during the week in from single tools to lots of three or four. Lathes appear in best demand. Business is very scattered, orders coming largely from moderately sized plants that need additional equipment. Few new industrial enterprises in metal working lines have started up recently, so that there is little demand from this source. The demand for second-hand machinery is dull.

The Auglaize Power Company, which was recently organized in Toledo, Ohio, with a capital stock of $1,000,000, is planning the erection of three hydro-electric plants for the development of the water power in the Maumee and Auglaise rivers in northwestern Ohio. It is announced that a $500,000 plant will be built at Defiance, Ohio, as soon as plans can be prepared, having a capacity of 4000-kw., and that two other plants will be built of smaller capacity as soon as the first one is completed. Toledo and New York capitalists are back of the project. The offices will be located in Toledo. The officers are: President, J. M. Ashley; vice-president, Robert R. Livingston; secretary, W. P. Wallace; treasurer, H. L. Crawford, the latter of New York.

The Ajax Mfg. Company, Cleveland, reports an improvement in the demand for forging machinery. This company has just received an order from a western car building plant for four automatic roll feed bolt heading machines and a No. 9 bulldozer. It has just installed in the shops of the Chicago & Northwestern Railroad at Chicago one of its 6-in. universal forging machines, weighing 219,000 lb.

The Toledo Commerce Club, Toledo, Ohio, has completed plans for a new power building to be built in that city to furnish quarters for small manufacturing concerns desiring power. The building will be located at N. Twelfth street and Woodruff avenue. It is planned to erect the building on the unit plan. The first unit to be erected at the start will cost about $200,000 and a power plant about $50,000. The matter is in the hands of a committee consisting of Isaac Kinsey, I. B. Hiett, W. W. Knight, F. P. Chapin and E. H. Cady.

Bids will be received by the Board of Public Affairs, Andover, Ohio, July 14, for the erection of a complete combined pumping unit of a triplex pumping engine direct connected and driven through a friction clutch by an oil, gasoline or natural gas engine of a capacity to pump 250 gal. of water per minute against a domestic head including suction lift of 150 ft.

The Perfection Spring Company, Cleveland, now located at 2414 Superior avenue, is planning the erection of a large plant on a new site in one of the east end manufacturing districts. To provide funds for the expansion a special meeting of the stockholders will be held July 31 to vote on the question of increasing the capital stock from $200,000 to $500,000.

The Meech Foundry & Casting Company, Cleveland, has been incorporated with a capital stock of $15,000 by P. D. Crane and others. The company operates the Meech foundry on Meech avenue.

The Metal Embroidery Hoop Company, recently incorporated at Canton, Ohio, will establish a plant for the manufacture of metal hoops for embroidery making. The incorporators are M. Luther Keagy, J. J. Lisbar, Fremont A. Coldren, D. L. Holwick and N. A. Sponseller.

The Foundries Company, Orrville, Ohio, has purchased the plant of the Pump & Furnace Company in that city, and will dismantle its present plant and move to the new quarters, which will prove more roomy.

Plans for a new hydro-electric plant to be built in connection with the new main power plant that is being erected by the Northern Ohio Traction & Light Company, at Cuyahoga Falls, Ohio, have been completed by the Cleveland Construction Company, 606 Citizens Building, and specifications for the equipment required have been sent to concerns interested.

The Harshaw, Fuller & Goodwin Company, Elyria, Ohio, refiner of glycerine and manufacturer of chemicals, is erecting a new factory 125 x 260 ft., of brick and steel construction. It is stated that the motor drive will be substituted for steam drive in the remainder of the company's plant. The Forest City Steel & Iron Company, Cleveland, has the contract for the structural steel for the new building.

The Director of Public Safety, Cleveland, will receive bids July 14 for a steam heating apparatus for a fire engine house at West 101st street and Loraine avenue.

The Canton Fertilizer Company, Canton, Ohio, will build a large brick fertilizer plant to replace one that was recently destroyed by fire.

The E. A. Miller Rotary Engine Company, Pittsburgh, Pa., is negotiating with the Board of Trade of Alliance, Ohio, for the use of the asbestos plant in that city as a site for a plant for the engine company.

Fire in the plant of the Ohio Iron & Brass Bed Company, Eaton, Ohio, June 22, caused a loss of about $15,000. The machine shop, foundry, boiler and engine rooms were destroyed.

It is announced that the Knight Tire & Rubber Company, Canton, Ohio, will shortly begin the erection of a new rubber plant.

Cincinnati

CINCINNATI, OHIO, July 3, 1911.

A slow but steady improvement is noticed by machine local tool builders. The inquiry is encouraging, especially that from the East. A seasonable dullness is reported on Southern business and the Pacific coast is not furnishing its usual number of orders. The export trade is good and local manufacturers are paying more attention to this particular field than ever before.

There is a moderate demand for second-hand machinery, running mostly to the smaller tools. Electrical equipment is moving in a very satisfactory manner. This applies principally to the smaller units of generators and motors. As there has been a reduction made recently in the price of electric current, locally, the call for small motors will no doubt increase very much.

The Allis-Chalmers Company announces that beginning with July 1 it will revive the engineering, purchasing and sales departments of the Bullock Electric Mfg. Company, a subsidiary plant at Norwood, Ohio, a Cin-

THE MACHINERY MARKETS

cinnati suburb. Heretofore all correspondence was carried on through the Milwaukee office, but the change means that the local plant will be operated more on a unit basis. E. T. Pardee, of Milwaukee, has been appointed general manager of the Bullock Works, in full charge of the engineering, manufacturing and sales departments, and E. R. Knight retains his present position as superintendent. About 40 employees will be transferred from the general offices at Milwaukee to the Norwood plant.

The recent campaign of the Cincinnati Commercial Association has raised the membership of that organization to nearly 1400. This association succeeded the old Cincinnati Industrial Bureau and its members are very much interested in securing new manufacturing plants. As a number of machine tool builders are moving to Oakley suburb there will soon be several desirable vacant factory buildings in the Camp Washington district that would be available for new concerns.

The Amor Steel Foundry Company, who purchased the old Steel Foundry Company's plant at Winton place, Cincinnati, announces that it will begin operations about August 1. Over 200 men will be employed and for the present the company will confine itself to making steel castings of all kinds.

A fire at Ironton, Ohio, June 29 destroyed the plants of the Ward Lumber Company, the Ironton Tool Handle Works and the Allen & Lester Planing Mill Company. No rebuilding plans have yet been announced.

The Triumph Electric Company, Oakley, Cincinnati, Ohio, reports June as being one of the best months in the history of the company. Among recent orders are 36 generators of different capacities for the Wesco Supply Company, St. Louis; three for the Ohio Mechanics Institute, Cincinnati; 18 motors for the R. K. LeBlond Machine Tool Company and 11 for the I. & E. Greenwald Company, Cincinnati. In addition to its domestic business the Triumph Company is shipping a large number of generators and motors to foreign countries.

It is rumored that the Dayton Gas Company, Dayton, Ohio, is having plans made for a large plant in the Edgemont district.

The Union Central Life Insurance Company, Cincinnati, has acquired the old Chamber of Commerce Building and will erect on this site an office building of about 20 stories. The architect has not yet been selected.

The Vincennes Tractor Company, Vincennes, Ind., is inquiring in this market or a second-hand 30-in. lathe, a milling machine, cutoff saw, drill press and other machine tools.

The C. A. Nelson Drain Tile Company has been incorporated at Beaver Dam, Ohio, with $10,000 capital stock, to manufacture drain title and brick. C. A. Nelson is the principal incorporator.

Tietig & Lee, architects in the Lyric Building, Cincinnati, are drawing up plans for the new cooperage factory of the Saufferle Cooperage Company, to be erected at Winton place. The new plant will be of brick construction and its estimated cost is placed at $20,000.

The Baltimore & Ohio Southwestern Railroad Company has taken out a permit to erect a boiler room at Spring Grove and Arlington avenues, to cost about $4,000.

The Henson Mfg. Company, Springfield, Ohio, is a new incorporation, with $10,000 capital stock, to manufacture a patented railroad lantern. O. R. Henson is named as the principal incorporator.

There is an unconfirmed report that the Wise, Shaw & Feder Company, Cincinnati, will soon make some large additions to its shoe factory. The company's capital stock was recently increased from $120,000 to $190,000.

The Incandescent Light & Stove Company is moving from its old quarters on Pearl street, Cincinnati, to its new concrete factory in the Oakley district.

The L. Schreiber Sons Company, Cincinnati, has acquired additional space adjoining its architectural iron plant and some extensions may be made at an early date. The general offices and drafting department of the company are to be moved to its Norwood factory about August 1.

The new plant of the Cincinnati Lathe & Tool Company, in the Oakley district, will be of brick construction, 80 x 150 ft., one story, with saw tooth roof. The M. Marcus Building Company, Cincinnati, the contractor, has already commenced work laying the foundations.

Chicago

CHICAGO, ILL., July 3, 1911.

The item of principal interest in the machinery market during the past week, in the matter of size at least, was the placing by the Atchison, Topeka & Santa Fé Railroad of its orders for about $25,000 of tools. Four-fifths of this business was taken by Manning, Maxwell & Moore. About half of the tools bought consisted of lathes ranging in size from 18 to 36 in. While not quite so active as in the preceding week trade is reported as showing a satisfactory improvement. The volume of miscellaneous orders ranging in value from $200 to $2,000 was well maintained. The addition to the International Harvester Company's Tractor Works machine shop will, it is expected, bring into the market very soon inquires for a number of machines. An interesting order for second hand tools for export to Great Britain was placed with a local dealer. Some departures from what are considered regular prices are reported as current here. Such concessions, it is believed, are made wholly upon the dealer's own responsibility.

A. E. Montgomery, Moline, Ill., formerly secretary and treasurer of the Moline Elevator Company, which is now owned by the Otis Elevator Company, has leased the building erected by the Moline Tool Company and will again engage in the elevator business. A company is about to be incorporated with a capital stock of $100,000 and new equipment will be purchased.

Patterson & Davidson, Chicago, are engineers and architects for a new factory building to cost $300,000. All of the equipment for the building has been purchased except one 300-kw., 220-volt, 3-phase, 60-cycle generator.

The fire which damaged the plant of the Star Brass Works Company, Kansas City, Mo., was not severe and the company is not in the market for new equipment.

The Kultgen Nichol Foundry Company, Chicago, has been incorporated with a capital stock of $10,000 to do a general foundry and machine shop business. The incorporators are John D. Kultgen, John G. Nichol and Nels J. Johnson.

The Crippen Improved Thresher Company, Arlington, Kan., has developed appliances for the more economical threshing of grain, both as to power consumption and perfect separation. It is about to build and equip a factory for the manufacture of these devices at a cost of $50,000.

The Federal Rubber Company, Milwaukee, Wis., recently reorganized with a capital stock of $1,000,000, is now manufacturing solid rubber tires, horseshoe pads and mechanical rubber goods. It expects to equip at once for the manufacture of pneumatic tires both for bicycles and automobiles. This will require a considerable tonnage of forms and molds and other foundry made equipment.

The Keystone Glue Company, South Milwaukee, Wis., is rapidly completing its plant, consisting of six buildings, among which are a boiler house and engine room 50 x 100 ft. and a one-story machine shop 22 x 96 ft.

The South

LOUISVILLE, KY., July 3, 1911.

The chief factor in business just now is uniformly stated to be the crop situation. The wheat crop in this section has been harvested, and was of average yield, but the oats and hay crops will be short. Cotton is threatened in some sections by drouth, although heavy rains have broken the dry period to a large extent. The feeling is that in the South the farmers will be able to market better than average crops at good prices, and that this will furnish a foundation for good business. Machinery trade continues about normal, with a good volume of inquiries and an average amount of business being placed. Some improvement as compared with a few weeks ago is in evidence.

A permit for the erection of a power house has been taken out by the Saints Mary & Elizabeth's Hospital. A good deal of new power machinery is to be installed. J. J. Gaffney is the architect. Two electric elevators for an addition to the building will also be required.

The millwright shop of the J. Lott Machine Company, Louisville, was damaged by fire June 29. Some wood-working machinery will be required to replace that which was damaged. The power equipment was not injured.

Electric motors will be required by Harcourt & Co., engravers, of Louisville, who are planning the remodel-

THE MACHINERY MARKETS

ing of another building and moving into it August 1. Additions to the equipment in the line of special machinery will also be needed.

Hite D. Bowman, an automobile dealer of Louisville, is erecting a two-story addition to his garage, and will add a lot of machine tools to the equipment of his repair shop, which will be greatly enlarged.

The Westinghouse Machine Company is installing a rotary convertor in the power house of the Louisville Railway Company. The latter is marketing $750,000 of bonds for the purchase of new rolling stock and making other improvements, and it is understood that the power house will be given a greater capacity, although officials of the company state that no enlargements will be made immediately.

The old post-office building in Louisville will be remodeled for use by the Louisville Courier-Journal. Elevators will be installed, and a good deal of equipment will be required, although most of this will be brought from the present building. John Bacon Hutchings is the architect.

An iron bridge is to be erected over Elkhorn creek, near Frankfort, Ky., the Fiscal Court of the county dividing the cost with citizens. The expenditure involved will be about $3,000.

The city of Sturgis, Ky., is planning to establish a water works plant. A public meeting is to be held shortly for the purpose of getting the matter into definite shape.

M. C. McNamara, Augusta, Ky., has purchased a building at Melbourne, and will remove his shoe factory to that point. Some enlargements of the plant are in contemplation.

Coal operations in the Eastern Kentucky field have been considerably strengthened by recent mergers. The Log Mountain Coal & Coke Company, which has $3,000,000 capital stock, is the name of a concern through which six mines will be operated. It is believed that by joining forces in this way necessary improvements can be much more readily financed than under other conditions.

The Model Machine Tool Company, which is being organized by Cincinnati interests for the manufacture of an improved turret lathe, is considering the establishment of its plant at Maysville, Ky. G. C. Atkinson, Cincinnati, is one of those interested, and he has had the matter of locating at Maysville under consideration. The Maysville Foundry & Machine Company, it is stated, has proposed turning over its plant to the new concern.

The Bowling Green Quarries Company, Bowling Green, Ky., is installing some new equipment. A diamond saw was placed last week. James Pickels is manager of the plant.

The Nicola Building Company, Pittsburgh, Pa., has the contract for the erection of the industrial town of Jenkins, Ky., which is being built by the Consolidation Coal Company, Baltimore. More than 1000 buildings will be put up. The Nicola Company is erecting and equipping sawmills, planing mills, blacksmith shops, etc., for the work, and will be in the market for equipment. The Consolidation company is contemplating the construction of water works and an electric light plant.

The New Bluegrass Canning Company, Owensboro, Ky., will rebuild its plant, which was destroyed by fire June 29. J. Ed. Guenther is general manager of the company.

The Barbour Air Grate & Mfg. Company has been incorporated at Owensboro, Ky., with $25,000 capital stock. The incorporators include T. M. Barbee, R. B. Thompson, M. Gano Buckman and others.

The Rose Run Iron Company, Olympia, Ky., is planning to develop its lumber interests in Bath County and is planning the erection of a sawmill and the construction of a railroad into the property. Clyde Young is general manager of the lumber department of the company.

The officers of the Gray & Dudley Hardware Company, Nashville, Tenn., which operates a foundry as well as conducts a wholesale hardware business, were re-elected at the annual meeting. R. M. Dudley is president and W. A. Griswold is superintendent of foundries.

The Virginia Iron, Coal & Coke Company has given out a statement to commercial interests at Bristol, Tenn., where it has a furnace and rolling mill which have been idle for over two years, stating that there is no immediate prospect of a resumption of business.

The Commercial Club of McMinnville, Tenn., has under consideration a proposition from Ohio interests for the establishment of a malleable iron foundry at that point. Local people are asked to subscribe to 7 per cent. of the capital stock of the new enterprise.

Bruce Baxter and associates have taken over the business of the King-Baxter Lumber Company, and plan to make improvements in the plant and to enlarge the scope of the business. The plant is located at Orange Grove, near Chattanooga, Tenn.

The furniture factory, planing mill and boiler room of the Loomis & Hart Mfg. Company, Chattanooga, Tenn., were destroyed by fire last week. Arrangements to rebuild are now under way. A large part of the machinery was destroyed and will have to be replaced.

Many plants in Bristol, Tenn., which have heretofore been operated by steam power have contracted with the Bristol Gas & Electric Company for electric power, which will be supplied as soon as the Watauga Power Company completes the construction of its hydroelectric plant on the Watauga river.

The Universal Account Register Company has announced plans for the removal of its plant from Knoxville, Tenn., to Bristol, Tenn. The Board of Trade of Bristol secured the change.

The Board of Trade of Knoxville, Tenn., is endeavoring to secure the location in that city of a branch of the Aluminum Company of America. It is stated that aluminum ore is to be found freely in Eastern Tennessee.

Bridge material is to be purchased immediately by the Fidelity Securities Company, Nashville, Tenn., H. H. Mayberry, president, for use in the construction of an interurban line.

The Memphis, Tenn., Compress Company is planning the erection of a new building for the purpose of doubling the capacity of its cotton compress. It is reported that an expenditure of $500,000 is contemplated.

The Knoxville Machine Tool Company has filed articles of incorporation at Knoxville, Tenn. The capital stock of the company is $25,000 and the incorporators are John P. Staub, John W. Cruze and Solon S. Kipp.

The Gadsden Concrete Company, Gadsden, Ala., is in the market for power equipment, including steam boilers and engines, as well as concrete working machinery.

The Gulf City Boiler Works, Mobile, Ala., has purchased the power plant of the White Line Railway and will equip it for the manufacture of boilers. Additional machinery which it is estimated will cost $15,000, is to be purchased. W. M. Evans is president of the company.

The Gulf Coast Automobile & Gas Engine Company has been incorporated at Moss Point, Miss., with $10,000 capital stock. Those interested include J. G. B. Rouse, M. A. Victor and others.

The repair shops of the Ft. Smith Light & Traction Company, at Ft. Smith, Ark., are to be considerably enlarged. J. W. Gillette, general manager of the company, has stated that this is the beginning of improvement work which will involve an expenditure of $200,000.

An issue of bonds to the amount of $75,000 may be made by the city of Dothan, Ala. An electric light plant and a water works system will be constructed if the issue is approved.

Plans have been drawn for an electric light plant and water works station which will be built at Hartsell, Ala., by the municipality, an issue of $28,000 of bonds for this purpose having been approved. Xavier A. Kramer, of Magnolia, Miss., is the engineer in charge.

Operations have been begun at Birmingham, Ala., by the International Harrow Cultivator Company, which recently completed a plant at a cost of $50,000. G. A. Neal is president and R. D. Johnson secretary of the company.

A plant for the manufacture of hay presses is being established at Oakvale, Miss., by J. I. Fortubury.

A hydroelectric plant is to be built near Alexander City, Ala., by the Industries Light & Power Company, which was recently organized for that purpose.

Western Canada

WINNIPEG, MAN., July 1, 1911.

The movement of trade has begun in earnest in Western Canada. There was some caution during the last two months, because mistakes were made last year through impulsiveness in venturing on the early promise of the crop, a promise that turned out to be largely disappointing. Building operations have this year been held back because of last year's experience. Now, however, the spirit of enterprise and confidence seems to have taken possession of the country, and business is in full tide. Everybody is predicting a 200,000,000-

THE MACHINERY MARKETS

bushel wheat crop in the country between the Great Lakes and the Rocky Mountains. Besides wheat there will be a large yield of other cereals. In the West the question of freight rates is being discussed at the present time. The carrying charges on iron and steel goods are shown to be much higher on Canadian railroads than on roads across the line. This is one of the grievances the Western Grain Growers' Association, a very aggressive organization, is now complaining about.

In all parts of Canada railway building is very active, but in the province of Saskatchewan it is more active than elsewhere. More than 1000 miles of new line will be constructed in that province this year. Last year it laid 475 miles, which was more than any other province laid. In Saskatchewan the Canadian Northern Railway is constructing 330 miles; the Grand Trunk Pacific, 340 miles, and the Canadian Pacific Railway, 348 miles. At the end of the year the province will have 4752 miles of line. In the province of Alberta the Canadian Northern will grade 150 miles of its main line west of Edmonton, will push its branch toward the Peace River country and will complete its Edmonton to Calgary line. In British Columbia it expects to complete 100 miles of line from Port Mann, its Pacific terminus, toward the interior.

The Winnipeg *Tribune* estimates at 345,000 tons the quantity of steel rails that have been ordered for Canadian roads this year.

The Canadian Northern Railway Company is spending between $2,500,000 and $3,000,000 upon the construction of two steel bridges in the Rainy Lake district near Fort Frances, Ont. Johnson & Carey, Minneapolis, have the contract for the difficult part of the reconstruction, of which these bridges are a part.

The Carter, Halls, Aldinger Company, Winnipeg, has obtained the contract to erect the Grand Trunk Pacific roundhouse at Regina, Sask., the cost to be $75,000.

The town of Macleod, Alberta, is bidding for the Canadian Pacific Railway Company's big western car shops, and so is Red Deer, in the same province. In the meantime Calgary and Medicine Hat, the greater rivals for the industry, are leaving nothing undone to capture it.

A very large number of grain elevators are being built and equipped in the Canadian West this year. The Saskatchewan Co-operative Elevator, Regina, Sask., will alone build 25.

The Saskatoon Drinkle Corporation has been incorporated at Ottawa with a capital stock of $2,000,000. Its head office is to be in Saskatoon, Sask.

The Hudson's Bay Company is about to build a $1,000,000 department store at Calgary, Alberta. It will be of structural steel framework, designed to carry six stories, of which but four are to be built at the outset.

The City Engineer of Winnipeg has laid before the Fire, Light and Water Committee a plan to extend the present high-pressure water service five miles.

The North British Rubber Company, Edinburgh, Scotland, is expected to establish a branch office and distributing warehouse at Calgary, Alberta.

The Sterling Refining Company, Cleveland, Ohio, is about to erect a large warehouse in Winnipeg.

A steel barge for the Great Lakes Dredging Company was launched from the yards of the Western Canada Dry Dock & Shipbuilding Company, Port Arthur, Ont., on Tuesday. This is the first output of the yards. The barge is 173 ft. long by 36 ft. wide, and 13 ft. deep.

Detroit

DETROIT, MICH., July 3, 1911.

Perhaps the most important feature of the week is the news that contrary to the usual custom many of the large automobile plants will not close at all this year, the amount of 1911 orders being so great as to keep them running at nearly full capacity through the Summer, and they are already figuring on getting next year's business under way. This is all the more significant when it is considered that many of the factories have increased their capacity during the past year and augurs well for future expansion. Naturally the accessory manufacturers and the trade generally will be benefited by this turn of affairs. Machinery dealers report conditions to be quite satisfactory, there being a goodly number of inquiries. There is also a fair demand for most lines of small tools, although the usual between seasons dullness is making itself felt somewhat.

Word comes from Grand Rapids, Mich., that a number of the furniture factories in that city are taking advantage of the shutdown caused by the furniture workers' strike to install new equipment and make extensive repairs.

Building conditions are chiefly notable for inactivity, no large contracts having been warded the past week.

The Universal Accessories Company was incorporated this week to manufacture pump regulators and other special pump accessories. The company has a capital stock of $25,000, with R. W. Baker, Victor Olson and Charles E. Bryant as the principal stockholders.

The Russel Wheel & Foundry Company, one of the city's largest producers of cars and structural steel work, has decided to increase its capital stock from $500,000 to $750,000 for purposes of expansion.

The Cross Gear & Engine Company has filed articles increasing its capital stock from $20,000 to $80,000. The business of the company has increased to the extent that it has become necessary to install new machinery and it is expected that large additions to the plant will be made in the near future.

The Frontier Engineering Company and the State Brass Works have consolidated and the plant of the latter company will be dismantled and removed to the Frontier plant, thereby increasing the facilities and capacity of the combination.

The Roberts Tube Works is a new copper and brass rolling concern just organized with $15,000 capital stock. The principal stockholders of the company are William H. and John K. Roberts.

The National Heater Company, manufacturer of a heater of special design, has been incorporated with a capital stock of $125,000. Alexander W. Finlayson and Ernest G. Joy are the men behind the new enterprise.

The Ideal Commercial Car Company, maker of light delivery cars, has found it necessary to increase its capital stock from $10,000 to $200,000 to take care of increasing business.

Detroit's newest accessory company is the Detroit Auto Top Fastener Company, which has just been organized with a capital stock of $50,000.

The Hecla Portland Cement Company has filed notice of dissolution. The company has a capital stock of $1,000,000 and owns a large plant at Bay City and considerable valuable equipment.

The Tatham Gold Mesh Company has been organized this week with a capital stock of $10,000 to manufacture dental supplies.

A new company has been incorporated under the style of the Simplex Machinery Company. George W. Dunphy, B. W. Doyle and Adam D. Boyd are the principal stockholders.

The plant of the Grant Brothers Foundry Company was completely destroyed by fire last week, entailing a loss of $12,000. It is stated that the company is contemplating continuing operations as soon as suitable quarters can be secured.

The Charles P. Limbert Furniture Company, Holland, Mich., is having plans prepared for extensive additions to its plant. The new structure will be of brick, four stories, and of L shape, one wing being 74 x 132 ft. and the other 64 x 200 ft.

The Apex Horseshoe Company, Albion, Mich., has filed articles of incorporation with $30,000 capital stock. The company will manufacture horseshoes and related articles.

The City Council of Mt. Clemens, Mich., has appointed a committee to obtain estimates on the cost of a large electric motor pump for the municipal water works plant.

The Gale Mfg. Company, Albion, Mich., a large manufacturer of agricultural machinery, has filed notice of increase of capital stock from $800,000 to $2,000,000.

The firm of John S. Weidman & Co., Mt. Pleasant, Mich., are making preparations to erect a sawmill at Trout Lake, near their lumber holdings. A logging road will be built to reach the timber.

The Carter Dump Wagon Company has been organized at Holly, Mich., with a capital stock of $50,000. The company will engage in the manufacture of dump wagons and road-making machinery.

Fire caused a loss approximating $25,000 at the Commonwealth Power Company's power house at Trowbridge, Mich. The building and equipment, which included a 6000-hp. generator, transformers, regulators, governors and other electrical machinery of the most expensive types and a battery of hydro-turbine engines, were completely destroyed. Officials of the company

THE MACHINERY MARKETS

state that new equipment will be ordered and the work of reconstruction commenced at once.

The Detroit Milling Company, Adrian, Mich., has awarded the contract for the construction of two new elevators to the Burrell Engineering Construction Company. Electrical machinery of the latest design will be installed. It is also stated that a new flouring mill will be erected in the near future.

The Duplex Printing Press Company, Battle Creek, Mich., is contemplating improvements which will double the capacity of its present plant and involve the expenditure of $500,000,000. A new foundry, new machine shop and erecting department, with complete new equipment, are planned.

The Cadillac Chair Company, Cadillac, Mich., has been organized with a capital stock of $100,000. A factory site has already been purchased and work on the buildings is to commence at once. D. B. Kelly and J. N. Perkins are president and secretary, respectively, of the new company.

The Bear River Paper & Bag Company, Petoskey, Mich., has filed a voluntary petition in bankruptcy and Leon Chichester and A. B. Mudgett have been appointed receivers. This plan was deemed advisable in order to effect a reorganization of the company and to secure more capital.

The L. G. Smith Egg Case factory, Smithville, Mich., is to double its capacity. The factory's motor power plant will be wholly rebuilt and modern equipment installed throughout the plant.

The Uncle Sam Macaroni Company, Tecumseh, Mich., has plans in the hands of the architects for the erection of a modern plant 68 x 431 ft. and of brick construction. A large amount of equipment, including a modern vacuum cleaning system, will be installed.

The George W. Manning Broom Mfg. Company, Grand Rapids, Mich., was organized this week with a capital stock of $30,000. George W. Manning, Curtis T. Wolford and G. W. Quick are the principal stockholders.

The Frankemuth Milling Company, Frankemuth, Mich., has filed articles of incorporation with the Secretary of State. The company has a capital stock of $32,000 and will do a flouring and grist mill business.

The J. W. Wells Lumber Company, Menominee, Mich., has filed notice of an increase of capital stock from $100,000 to $650,000.

The Monroe Mfg. Company, Pontiac, Mich., is completing two additional buildings in that city. One of the buildings will be used for sheet metal stamping and will be equipped with new machinery.

The Michigan Steel Casting Company, Detroit, is building two buildings which will double the capacity of its plant. The buildings are practically completed.

The Carter Car Company, Pontiac, Mich., is about to commence work on the erection of a model machine shop 70 x 144 ft., of one story, brick construction. The architectural work is in charge of W. E. Wood, Ford Building, Detroit.

Indianapolis

INDIANAPOLIS, IND., July 3, 1911.

E. D. Johnston, formerly president of a hydraulic company here, is planning to establish two electric power plants on the Whitewater Canal, one to occupy the old water works site and the other at a mill in the southern part of the city. There will be a 400-hp. reserve plant between the two.

The factory of the Central Stove & Foundry Company, Anderson, Ind., has been sold by the receiver to Chauncey B. Fisher, of Anderson, for $5,000.

The Bedford Harrow-Drag Company, Bedford, Ind., has been incorporated with $10,000 capital stock to manufacture machinery. The directors are Arthur J. McDonald, E. E. Mitchell and T. C. Underwood.

The Novelty Tool Company, North Vernon, Ind., has been incorporated with $10,000 capital stock, to manufacture tools. The directors are H. H. Dowd, F. X. Gettwallis, Harry Hicks, W. J. Hare and J. W. Linkhart.

The Terre Haute Iron & Steel Company, Terre Haute, Ind., has filed notice for dissolution with the Secretary of State.

The Standard Mfg. Company, Cambridge City, Ind., has redeemed its preferred stock and decreased its capital stock from $30,000 to $20,000.

The Vincennes, Washington & Eastern Traction Company, Vincennes, Ind., has increased its capital stock from $100,000 to $600,000.

The Superior Court at Michigan City, Ind., has ordered the closing up of the affairs of the Western Launch & Engine Works of that city, as it was found by the receiver that the plant could not be continued in operation without borrowing money. Martin T. Krueger has been receiver, but will be succeeded by another to be selected by the stockholders to wind up the company's affairs. The company has liabilities of $50,000.

James A. Sweeney, Plymouth, Ind., representing the National Cement Post Company, Cleveland, O., is organizing a company at Tell City, Ind., to establish a cement post factory there.

The Frolicker-Helmers Shoe Company, Maysville, Ky., has purchased the old spoke factory building at Lawrenceburg, Ind., for $10,000, and will convert it into a shoe factory.

The organizers of the Interstate Mill Supply Company, Ft. Wayne, Ind., have purchased a controlling interest in the Ft. Wayne Oil & Supply Company, instead of establishing the new concern. The officers are, under the reorganization: President, Edward Baltes; vice-president, Mark T. Cocherl; secretary and manager, E. W. Puckett; treasurer, W. A. Hobson.

The Indiana & Michigan Electric Company, South Bend, Ind., will construct a dam and power house at Elkhart, Ind., to develop 3,000 hp. William G. Fargo, Jackson, Mich., is the hydraulic engineer in charge.

St. Louis

ST. LOUIS, MO., July 1, 1911.

A number of good orders were placed during the week, especially by electrical and allied interests. These ran mainly to automatic screw machines, light drill presses and grinder equipment. The general run of business is not yet up to normal. The inquiries that are being received give ground for hope of better things shortly, the impression gaining that replacement on depreciation account will soon begin to have a bearing, to say nothing of the new needs incident to the opening out of the fall business. Machinery and crops are not exactly synonymous, but the reports of crop prospects from the St. Louis trade territory have had the effect of improving the tone of things in some respects. Included among the developments of the week was the presence in the market of a number of Texas and Oklahoma buyers, who placed orders and gave assurance that others were likely to follow.

The Wagner Electric Company, St. Louis, has completed arrangements to increase its capital stock from $1,200,000 to $1,500,000. The $300,000 of new funds will largely be expended in the establishment of a branch plant at Montreal, Canada, where manufacturing will be done for distribution on the other side of the tariff wall, as well as to comply with the patent requirements of manufacture in that country. Alfred Collyer, Montreal, will be the Canadian manager of sales. A subsidiary company will fill the technical legal requirements. The St. Louis plant is also to be enlarged.

The Imperial Clock Company, St. Louis, has been incorporated with $100,000 capital stock for the manufacture of clocks, etc. The incorporators are P. H. Huck, G. Carlander and R. E. Hayes.

The Big Brownie Mining Company, Joplin, Mo., has been incorporated with $40,000 capital stock by Fred. W. Kelsey, Charles W. Edwards and O. E. Marshall and will install machinery at its shaft at once.

The St. Louis Cash Register Company, to manufacture cash registers, has been incorporated in St. Louis with $500,000 capital stock by A. H. Fischer, R. M. Quackenboss and Leo Rassieur.

The Byrnes Belting Company, St. Louis, has bought a new site 60 x 155 ft. for a plant and will build and equip a three-story and basement structure which will more than double its present capacity.

Charles Baer, St. Louis, has organized a new laundry company with $100,000 capital stock which will equip a complete plant at once.

The St. Louis Shipping Case Company, St. Louis, has been incorporated with $50,000 capital stock by O. K. Berg, C. K. Berg and Emil Granberg to manufacture shipping cases. Equipment for a good sized plant will be bought.

The Huttig Sash & Door Company, recently burned out with a loss of more than three quarters of a million dollars, has bought the plant of the William G. Frye Mfg. Company, whose yards were burned but whose factory was saved. The Frye plant will be used to supply demand during the rebuilding of the Huttig

THE MACHINERY MARKETS

plant, and both will be operated in conjunction after that time. The Huttig plant was the second largest in the country and the Frye plant stood next to it in size.

Charles W. Martin & Co., with $50,000 capital stock, have leased quarters and will install equipment for the manufacture of fish net.

The Universal Dispenser Mfg. Company, St. Louis, has been incorporated with $20,000 capital stock by William H. Becker, Charles W. Stifel and William H. Taylor, and will install equipment for the manufacture of fountain dispensing machinery.

The Rolla Fire Clay Company, Rolla, Mo., has been incorporated with $14,000 capital stock by David E. Cowan, W. T. Dennison and J. A. Watson, and will install equipment for the manufacture of brick and other clay products.

The Standard Machine Mfg. Company, Carthage, Mo., with $30,000 capital stock; Charles B. Guinn, W. H. Phelps and J. P. Leggett are the incorporators. The company will establish a manufacturing plant at once.

The East Prairie Milling Company, East Prairie, Mo., has increased its capital stock from $25,000 to $40,000 for the purpose of extending its milling equipment.

The United States Government has just completed the installation of a new heavy size Cleveland open side planer at its shops at the Arsenal here.

The Fulton Iron Works has broken ground for its large new plant on a seven-acre tract west of the city, plans for which were announced recently.

The Curtis & Co. Mfg. Company reports a very good business in its manganese steel casting department, especially in its specialty of manganese steel crossings for street railways.

A number of the metal working industries of St. Louis are reported to contemplate the early enlargement of their plants either on their present sites or on entirely new sites, the plans calling for considerable new equipment when definitely decided upon.

The Mechanics & Kremer-Moon Heating Company, St. Louis, has been awarded the contract for installing the heating systems in 26 officers' quarters, the administration building, the commissary store house and a bowling alley at Fort Douglas, Utah, on a bid of $23,635.

W. F. Duncker, a machinery manufacturer of Hamburg, Germany, inspected a number of St. Louis manufactories of tools, gears, etc., the past week, his trip being for the purpose of studying American methods.

Eastern Canada

TORONTO, ONT., July 1, 1911.

The nearer prospects of the next Canadian harvest are brighter even than were the more distant ones. June, which has always been a critical month for the crops in the prairie country, has this year been auspicious. The weather was not too hot, there was a sufficiency but not an excess of moisture, and no destructive hailstorms swept over the fields. In less than six weeks harvest operations will begin in Alberta, Saskatchewan and Manitoba. It is estimated that 50,000 harvest hands will have to be assembled in the prairie country from other sources. The mobilization of this labor army would not be a difficult matter for the railways, but the recruiting of the force undoubtedly will. Whence are the men to be drawn? All the effective rough labor of the country is already fully absorbed in railway building and other fixing of capital in construction. All the pores of the country's manufacturing industries are open for the absorption of skilled labor. As the harvest outlook becomes the more assured the labor demand on railway and other construction account and on account of the manufacturing industries becomes harder to slake, and the detaching of hands from these employments in order to muster a host of harvesters becomes less and less possible. It has been proposed that harvest excursions, heretofore run from Eastern Canada to the West, be run from the British Isles for this season. The Canadian Pacific Railway, having both ocean and overland lines, could give special rates and make special arrangements for return trips, if the Canadian government would co-operate. The men selected would be capital immigrants, and their introduction to the country as harvest hands would win many of them as permanent settlers.

The railway equipment shops are exceedingly busy on locomotives and rolling stock that are due for delivery on the eve of harvest operations. There continues to be a lively demand for every variety of apparatus used by farmers. A development that appears to be now incipient is the opening of a large demand for electrical outfit for farmers. The Ontario Hydro-Electrical Commission is just now having inquiries and investigations made in Europe concerning the applications of power to farmers' economy. This is in pursuance of an act passed by the last session of the Legislature authorizing the running of branches from the commission's trunk transmission line into individual farms. The coming autumn is certain to bring a very great demand for every kind of equipment. Not only will there be the proceeds of a large crop to spend, but there will be the further inflow of capital from abroad, attracted by the great harvest reports and the growth of the country. This is Dominion Day, and it marks a higher point of progress in wealth production and general development than the country ever attained to before.

The North American Smelting Company expects to begin the erection of its smelter at Kingston, Ont., this month. Its lead ore will be drawn from its property at Loughboro, Ont.

The ratepayers of Belleville, Ont., have voted in favor of granting to the Marsh & Henthorn Company, foundrymen and machinery manufacturers, a free site, a $25,000 bond guarantee and a fixed assessment for 20 years. The ratepayers also approved the granting of municipal aid to the Allard Company, which is to establish in the city works for the reduction of ores containing gold, platinum and other metals.

The Aluminum & Crown Stopper Company, Toronto, has taken out a permit for the erection of a four-story brick warehouse, to cost $100,000.

The Oxford Knitting Company, Woodstock, Ont., is about to extend its works by the addition of a building 200 ft. long and 60 ft. wide. This will afford room for the employment of 150 hands more.

The Cockshutt Plow Company, Brantford, Ont., announces that it will make five large additions to its present plan and employ 500 hands more than it now employs, making the total number 1300.

The Telegraph, of Welland, Ont., says that it has information that the prospects of reciprocity between Canada and the United States are causing many people to hesitate in making further commitments in the town. Some factories that were in a fair way of being brought to the town are now kept from coming by doubt as to the adoption of the Knox-Fielding pact.

The International Electric Supply Company, an offshoot of the United States concern, but backed by local capital, has applied to the Light & Heat Commissioners of Guelph, Ont., for a lease of the Marlock Building, which belongs to the municipality, the purpose of the company being to use it for the manufacture of electric irons and other electric appliances.

The site for the Standard Cable Company's building in Hamilton, Ont., has been closed and building operations are to be begun at once. A plant is to be erected and equipped at a cost of $500,000.

The Chief Engineer of the Dominion Public Works Department, Ottawa, has approved the plans of the Pilson Iron Works, Toronto, for a dry dock in connection with the company's plant. The plans provide for a steel dock with a marine slip and water-tight bulkheads, and the chief engineer recommends that the 3½ per cent. government subsidy for this be upon an invested capital of $850,000. The company's estimate of the expenditure was $804,000. The steel dock itself would cost $256,000; the shops and machinery, $259,862; the dock machinery, $36,750; and the rest of the expenditure would go to wharfage and real estate.

The ratepayers of Woodbridge, Ont., have voted in favor of the by-law authorizing the expenditure of $40,000 upon the construction of a steel bridge over the Humber River.

The Dominion Turpentine Company, an organization of American and Canadian capitalists, proposes to establish a very large factory at Sudbury, Ont. The capital stock is to be $250,000, and will be provided by the parties who are now at the back of the undertaking. The Sudbury Board of Trade has been in negotiation with the parties.

The Grand Trunk Pacific Railway Company's transcontinental depot, which is to be erected on the Champlain market place in Quebec City, is to cost $750,000, and is to be completed at the end of next year.

Work is shortly to be started on a new steel-arch bridge to replace the present cantilever bridge crossing the Niagara River from Niagara Falls, Ont., to what

THE MACHINERY MARKETS

was the village of Suspension Bridge, and is now a part of the city of Niagara Falls, N. Y. The bridge will be built by the Michigan Central Railway Company.

The Montreal Water & Power Company has renewed for six months the option it gave the city of Montreal for the purchase by the latter of the company's interests for $1,020,000.

Texas

AUSTIN, TEXAS, July 1, 1911.

Industrial conditions throughout the State and the Southwest generally are unusually good for the midsummer season. The prospects for a very large cotton crop continues to keep up the demand for ginning and compress machinery. There are also a number of new cotton seed oil mills in process of construction and under consideration. Water storage reservoirs and pumping plants both for irrigation and for municipal supply systems, are receiving much attention. The demand for mining machinery in Mexico shows a marked improvement now that the government of that country is apparently rapidly approaching a settled basis.

The Victor Irrigation Company has organized at Midland with a capital stock of $125,000. It will construct a large system of irrigation and will install the necessary pumping machinery to place the water over the lands that are to be reclaimed. The incorporators are Alfred C. Owens, Jacob C. Swain and Parker B. Rodgers.

Machinery for the large pumping station, including the 20,000,000-gal. pump that is to be installed at the new White Rock reservoir for the municipal waterworks plant of Dallas has arrived upon the ground. The temporary 1,000,000-gal. pump which was obtained at Joplin, Mo., has been installed at the temporary station.

J. W. Hoit, Brownsville, is promoting the construction of a large system of irrigation in the valley of the Rio Grande near Donna. It is planned to run these canals and laterals through about 50,000 acres of land, all of which is now in a wild state. The proposed pumping plant will be one of the largest in the Rio Grande Valley and will be equipped with the most modern machinery. D. R. Swift, of Lake Charles, La., is also interested in the project.

Negotiations are in progress looking to the erection of a large cotton compress at Trinity. The State Bank of Trinity is interested in the project.

Lon C. Hill, Harlingen, and associates will erect a large cottonseed oil mill at that place. The same interests also contemplate installing an ice factory of large capacity.

The city of Denison has taken steps looking to the installation of a pumping station at some point on the Red River and the laying of a water pipe line from the station to that city, where connection will be made with the waterworks distributing system. The proposed pipe line will be about four miles long. At present the city is obtaining its water supply chiefly from wells.

The recent election at Waco voting on the proposition of issuing $200,000 of bonds for extending the sewer system, opening new streets and other municipal improvements resulted favorably to the proposition.

A reinforced concrete bridge is being constructed across the Colorado River at Stacy, Mitchell County. It will be 696 feet long. D. L. Gillis has the contract.

The Commercial Club of El Campo is making good progress in promoting the establishment of a brick plant there.

The City Council of Bryan will soon order a special election to vote on the proposition of issuing $20,000 of bonds for making further improvements to the waterworks and electric light plants and the sewerage system.

The Orange Commercial Club of Orange is creating a fund of $50,000, which is to be used in promoting the establishment there of new factories.

The Continental Wax Company, Little Rock, Ark., has let the contract for the installation at Sanderson, Tex., of a large factory for the manufacture of wax from the candelilla plant. There are many millions of tons of this plant growing in that section. It has heretofore been considered a worthless vegetation, and the discovery that it is valuable for its wax product is comparatively new.

S. A. Robertson, San Benito, and associates, who are constructing a system of gasoline motor interurban lines out of that place, have greatly enlarged their plans. The first 40 miles of the new road was recently opened for passenger and freight traffic and is now in regular operation. Arrangements have been made for constructing immediately about 60 miles more of track. It will be one of the longest gasoline motor railroads in the United States, it is said. The St. Louis & San Francisco Railway Company is back of the enterprise and the particular object of the system is to serve as a feeder for the St. Louis & Brownsville Railroad, which is owned by the 'Frisco. Gasoline motors will be given a thorough trial, and should they not prove satisfactory they will be replaced by electric transit.

Government Purchases

WASHINGTON, D. C., July 3, 1911.

The Paymaster General, Navy Department, Washington, D. C., will open bids July 11, under schedule 3718, for one engine lathe, one plain radial drill, one shaver, one sensitive drill, one speed lathe, one emery grinder, all to be motor driven, and one oxy-acetylene welding plant and generating outfit.

The Bureau of Supplies and Accounts, Navy Department, Washington, will open bids August 1 for two rapid action punches for delivery to Mare Island, Cal., schedule 3720.

Beekman Winthrop, Acting Secretary, Navy Department, Washington, will open bids until September 1 for the construction, complete, of four submarine torpedo boats.

The Light House Inspector, Fifth District, Baltimore, Md., opened bids June 1 for furnishing compressed air fog signal machine for light vessel No. 52 as follows: Remington Oil Engine Company, Stamford, Conn., $3631; De La Vergne Machine Company, New York, $4200; August Mietz, New York, $5000.

The Bureau of Supplies and Accounts, Navy Department, Washington, opened bids June 22 for material and supplies for the Navy Yards as follows:

Class 11, one splitting shear—Bidder 22, Berger & Carter Company, San Francisco, Cal., $1,835; 38, Cleveland Punch & Shear Works, Cleveland, Ohio, $1,300; 60, Eccles & Smith, San Francisco, Cal., $1,840; 128, Manning, Maxwell & Moore, New York, $2,385, $2,040 and $4,170; 160, Henry Pels & Co., New York, $1,840; 165, J. T. Ryerson & Son, Chicago, Ill., $1,250; 218, Drew Machinery Agency, Manchester, N. H., $863.

Class 32, one heavy duty gap lathe—Bidder 65, Fairbanks Company, Washington, D. C., $892; 128, Manning, Maxwell & Moore, New York, $900; 150, Niles-Bement-Pond Company, New York, $1,200; 158, Prentiss Tool & Supply Company, New York, $875.

Class 33, one heavy duty back geared engine lathe—Bidder 65, Fairbanks Company, Washington, D. C., $654 and $354; 69, Frevert Machinery Company, New York, $408 and $448; 73, Garvin Machine Company, New York, $346; 77, Griscom-Spencer Company, New York, $363.39, 107, J. P. Kemp, Baltimore, Md., $329.40 and $359.40; 128, Manning, Maxwell & Moore, New York, $482 and $583; 138, Miami Valley Machine Tool Company, Dayton, Ohio, $300; 149, D. Nast Machinery Company, Philadelphia, Pa., $359; 150, Niles-Bement-Pond Company, New York, $385 and $475; 158, Prentiss Tool & Supply Company, New York, $350; 175, Springfield Machine Tool Company, Springfield, Ohio, $463.

Class 34, one single geared crank shaper—Bidder 5, American Tool Works Company, Cincinnati, Ohio, $236; Fairbanks Company, Washington, D. C., $275 and $200; 69, Frevert Machinery Company, New York, $255; 73, Garvin Machine Company, New York, $420; 77, Griscom-Spencer Company, New York, $399.49; 103, A. R. Kelly Company, Xenia, Ohio, $240; 107, J. P. Kemp, Baltimore, Md., $217 and $323.80; 128, Manning, Maxwell & Moore, New York, $326 and $348; 149, D. Nast Machine Company, Philadelphia, Pa., $238; 150, Niles-Bement-Pond Company, New York, $265; 153, Potter Delaney Supply Company, Philadelphia, Pa., $295; 175, Springfield Machine Tool Company, Springfield, Ohio, $252 and $355.

Class 35, one universal milling machine—Bidder 18, Brown & Sharpe Mfg. Company, Providence, R. I., $922.38; 65, Fairbanks Company, Washington, D. C., $953 and $1,155; 73, Garvin Machine Company, New York, $972; 77, Griscom-Spencer Company, New York, $879 and $1,021.37; 107, J. P. Kemp, Baltimore, Md., $1,005; 128, Manning, Maxwell & Moore, New York, $920; 150, Niles-Bement-Pond Company, $940.

Class 36, one sliding head upright drill—Bidder 65, Fairbanks Company, Washington, D. C., $320 and $472; 69, Frevert Machinery Company, New York, $348; 73, Garvin Machine Company, New York, $388.50; 77, Griscom-Spencer Company, New York, $369; 107, J. P. Kemp, Baltimore, Md., $298 and $422; 128, Manning, Maxwell & Moore, New York, $268 and $340; 149, D. Nast Machinery Company, Philadelphia, Pa., $295; 150, Niles-Bement-Pond Company, New York, $310.

Class 37, one tool grinding machine—Bidder 65, Fairbanks Company, Washington, D. C., $72; 77, Griscom-Spencer Company, New York, $67.93; 107, J. P. Kemp, Baltimore, Md., $60.70; 128, Manning, Maxwell & Moore, New York, $60.50; 149, D. Nast Machinery Company, Philadelphia, Pa., $53; 150, Niles-Bement-Pond Company, New York, $60; 177, Sterling Emery Wheel Mfg. Company, Tiffin, Ohio, $91.02.

Class 38, one electric motor—Bidder 55, Diehl Mfg. Company, Elizabethport, N. J., $438.25; 70, General Electric Company, Schenectady, N. Y., $401; 75, Garwood Electric Company, Garwood, N. J., $414.15; 82, Holtzer, Cabot Electric Company, Boston, Mass., $326 and $470; 169 Reliance Electric & Engine Company, Cleveland, Ohio, $383; 182, B. F. Sturtevant Company, Hyde Park, Mass., $389.

Class 61, one hand, belt cutting machine—Bidder 6, Acme Machinery Company, Cleveland, Ohio, informal: 106, E. F. Kerwan, Baltimore, Md., $780; 107, J. P. Kemp, Baltimore, Md., $783.50; 108, Landis Machine Company, Waynesboro, Pa., $83[illegible]; 128, Manning, Maxwell & Moore, New York, $896; 150, Niles-Bement-Pond Company, New York, $775.

CURRENT METAL PRICES.

The following quotations are for small lots, New York. Wholesale prices, at which large lots only can be bought, are given elsewhere in our weekly market report.

IRON AND STEEL—

Bar Iron from Store—

Refined Iron:
1 to 1½ in. round and square..... ℔ lb 1.70c
1½ to 4 in. x ⅜ to 1 in..... ℔ lb 1.80c
2½ to 4 in. x ¼ to 0.5 ..... ℔ lb 1.80c
Reg... ⅜ and 11-16 round and square ℔ lb 1.80c
Cts. ℔ lb
⅜ in. x ½ in. and larger..... 1.90c
⅜ in. x 5-16 in. and ⅜ in. 2.00c
1½ to 2½ in. x ⅜ in..... 2.05c
1½ to 2 ¼ in. x 5-16 in. and thicker.. 1.95c
1 to 1½ in. x 5-16 in..... 2.05c
1 to 1½ x ⅜ in..... 2.10c
⅞ x ½ in..... 2.20c
⅝ x ⅜ in..... 2.35c
⅝ in. x ⅛ in..... 2.45c
½ x 0.532 in..... 3.90c
Toes:
1 in..... 2.35c
1¼ in..... 2.20c
1½ to 2½ x ¼ in..... 2.00c
1½ to 2½ x 5-16 in..... 2.10c
⅜ in. and larger..... 2.05c
Beams 1.90c
Channels, 3 in. x 4 larger..... 1.90c
Bands, 1¼ to 6 x 5-16 to No. 8..... 2.10c
"Burden's Best" Iron, base price..... 3.15c
Burden's "H. B. & S." Iron, base price.... 2.65c
Norway Bars 3.00c

Merchant Steel from Store—

per lb.
Bessemer Machinery 1.90c
Toe Calk, Tire and Sleigh Shoe..... 2.50@3.00c
Best Cast Steel base price in small lots..... 7c

Sheets from Store—

Black.

	One Pass. C R Soft Steel.	R. G. Cleaned.
No. 16.....	℔ lb 2.45c	2.55c
Nos. 18 to 20.....	℔ lb 2.50c	2.85c
Nos. 22 and 24.....	℔ lb 2.55c	2.95c
No. 26.....	℔ lb 2.60c	3.05c
No. 28.....	℔ lb 2.95c	3.30c

Russia, Planished &c.

Genuine Russia, according to assortment..... ℔ lb 12 @14½
Patent Planished, W. Dewees Wood..... ℔ lb A. 10c; B 9c net

Galvanized

Nos. 12 and 14..... ℔ lb 2.75c
No. 24..... ℔ lb 3.10c
No. 26..... ℔ lb 3.30c
No. 28..... ℔ lb 3.60c
No 20 and lighter 36 inches wide, 25c higher.

Genuine Iron Sheets—

Galvanized

Nos. 22 and 24..... ℔ lb 5.50c
No. 26..... ℔ lb 6.00c
No. 28..... ℔ lb 7.00c

Corrugated Roofing—

2½ in. corrugated	Painted.	Galvd
No. 24..... ℔ 100 sq. ft	$3.75	$4.70
No. 26..... ℔ 100 sq. ft	2.85	3.90
No. 28..... ℔ 100 sq. ft	2.50	3.65

Tin Plates—

American Charcoal Plates (per box)

AAA Charcoal:
IC, 14 x 20..... $6.65
IX, 14 x 20..... 7.90
AA Charcoal:
IC, 14 x 20..... 5.60
IX, 14 x 20..... 5.70

American Coke Plates—Bessemer—
IC, 14 x 20.....107 lb..... $4.50
IX, 14 x 20..... 5.50

American Terne Plates—
IC, 20 x 28 with an 8 lb coating..... $8.70
IX, 20 x 28 with an 8 lb coating..... 10.70

Seamless Brass Tubes—
List November 13, 1908. Base price, 18c

Brass Tubes, Iron Pipe Sizes—
List November 13, 1908. Base price, 18¢

Copper Tubes—
List November 13, 1908. Base price, 21c

Brazed Brass Tubes—
List February 1, 1911. 19½c ℔ lb

High Brass Rods—
List February 1, 1911. 14¢ ℔ lb

Roll and Sheet Brass—
List February 1, 1911. 14c ℔ lb

Brass Wire—
List February 1, 1911. 14c ℔ lb

Copper Wire—
Base Price. Carload lots mill 13¾c

Copper Sheets—

Sheet Copper Hot Rolled, 16 oz. (quantity lots)..... ℔ lb 18c
Sheet Copper Cold Rolled, 1c ℔ lb advance over Hot Rolled.
Sheet Copper Polished 20 in. wide and under, 1c ℔ square foot.
Sheet Copper Polished over 20 in. wide, 2c ℔ square foot.
Planished Copper, 1c ℔ square foot more than Polished.

METALS—

Tin—

Straits Pig ..... ℔ lb 47 @47½¢

Copper—

Lake Ingot ..... ℔ lb 14 @14¼¢
Electrolytic ..... ℔ lb 13¾@14 ¢
Casting ..... ℔ lb 13¾@14 ¢

Spelter—

Western ..... ℔ lb 6⅝@ 7 ¢

Zinc—

No. 9, base, casks.. ℔ lb 8¢|Open.. ℔ lb 8½¢

Lead—

American Pig..... ℔ lb 5¼@5½¢
Bar ..... ℔ lb 6⅜@6¾¢

Solder—

½ & ½, guaranteed..... ℔ lb 27½@28 ¢
No. 1 ..... ℔ lb 25½@26 ¢
Refined ..... ℔ lb 24½@24¾¢
Prices of Solder indicated by private brand vary according to composition.

Antimony—

Cookson ..... ℔ lb..@10½¢
Hallets ..... @10 ¢
Other Brands ..... 9@ 9½¢

Bismuth—

Per lb $2.00@$2.25

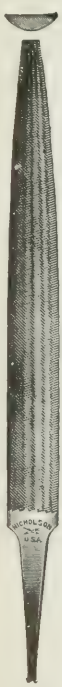
Aluminum—

No. 1 Aluminum (guaranteed over 99% pure), in ingots for remelting.....21¢ and 22¢
Rods & Wire.....Base Price 31¢
Sheets .....Base Price 33¢

Old Metals—

Dealers' Purchasing Prices Paid in New York.

	Cents.
Copper, heavy and crucible	10.75 to 11.00
Copper, heavy and wire	10.50 to 10.75
Copper, light and bottoms	9.50 to 9.75
Brass, heavy	7.25 to 7.50
Brass, light	5.75 to 6.00
Heavy machine composition	9.25 to 9.50
Clean brass turnings	7.00 to 7.25
Composition turnings	8.00 to 8.25
Lead, heavy	5.75
Lead, tea	3.50
Zinc, scrap	4.00



NICHOLSON

Granted that just ONE mechanic in your shop can save from ten to twenty minutes time per day through the use of NICHOLSON FILES—how great will be the saving when from fifty to one hundred or more men "get busy" with the fast cutting

NICHOLSON?

NICHOLSON U.S.A.



Nicholson File Company
Providence, R. I.

THE IRON AGE

Established 1855 — New York, July 13, 1911 — Vol. 88: No. 2

Published Every Thursday by the
DAVID WILLIAMS COMPANY
239 West 39th Street, New York

Entered at the New York Post Office as Second Class Mail Matter

Subscription Price, United States and Mexico, $5.00 per Annum; to Canada, $7.50 per Annum; to Other Foreign Countries, $10.00 per Annum.
Single Copies, 20 Cents.

W. H. Taylor, - - - - - - President and Treasurer
I. A. Mekeel, - - - - - - - First Vice-President
Harold S. Buttenheim, - - - - Second Vice-President and Secretary

Geo. W. Cope, - - - - -
I. A. Findley, - - } Editors
W. W. Macon, - - -

Branch Offices

Philadelphia, Real Estate Trust Building
Pittsburgh, Park Building
Boston, Compton Building
Chicago, Fisher Building
Cleveland, American Trust Building
Cincinnati, 807 Andrews Building

CONTENTS.

Steel Companies Take a Vacation 71
Important Discovery Regarding Oil Adulteration 72
Unfit Blast Furnaces 72
Suiting Processes to Conditions 72
Workmen's Foolish Investments 73
The Iron Age Index 74
Safeguarding Workmen in Small Plants 74
The International Steel Conference 74
Personal 75
Obituary 75
Customs Decisions 75
The Iron and Metal Markets ..... 76 to 85
Lake Ore Shipments for May 85
Iron and Industrial Stocks 85
Iron and Steel Expert Wanted 85
Trade Publications 86
Standards of Safety in Relation to Machinery 88
Furnace Slags in Concrete 90
Tests of Metals, 1909 90
Detecting Adulteration of Oils 91
Lifting Magnets in Foundries 92
Pure Irons from the Open Hearth Furnace 94
A New Baltimore Business Organization 95
The Steel Corporation's Unfilled Orders 96
The Wheeling Corrugating Company's Catalogue 96
Birmingham Notes 96
A British Handbook for Iron Founders 96
June Copper Production and Stocks 96
Ductility in Rail Steel 97
Railroad Equipment Orders 97
Mallet Articulated Locomotives on Ore Railroad 97
The Manila Times 97
New Publications 97
Lake Superior Mining News 98
The Sulphuric Acid Corrosion Test 99
An Oil Gas Producer 100
The Gary Sheet Bar Mill 102
A Garvin Plate Milling Machine 104
Improved Tool and Cutter Grinder 105
Shop System of Ferracute Machine Company 106
New Parallel Grinder 110
The Federal Heater Company 110
Automatic Office System 111
Sewage Disposal for a Hardware Works 112
The Machinery Markets 113
Government Purchases 123
The Albree Iron Works 123
Mesta Shipments 123

Steel Companies Take Short Holiday

Now Operating as Well as in June

Conditions continue to warrant the belief that the volume of business in the iron trade for the coming six months will show a considerable gain over the bookings of the first half of the year. The steel companies have taken less time than usual this year for midsummer repairs and inventories, and this in itself strongly indicates a better demand from consumers. The steel mills in the Pittsburgh and Youngstown districts are now operating as well as in June, or to between 70 and 75 per cent. of their capacity. The United States Steel Corporation is this week running slightly over 67 per cent. of its entire steel ingot capacity and this rate is shortly expected to be increased. The corporation gained only 11,000 tons in its accumulation of pig iron in the two weeks extending over the dull period of the latter part of June and beginning of July. It has made a net gain of two blast furnaces in operation, two additional stacks having been blown in at Ensley, Ala., to furnish pig iron for the Tennessee plant. The fact that its unfilled order statement for July 1 showed an increase of 246,871 tons, compared with June 1, has a further decidedly favorable bearing on trade conditions. The increase is considerably more than had been expected.

The week shows excellent bookings for finished products. Orders were placed in Chicago for 13,000 tons of rails while contracts for structural material exceeded 20,000 tons. The week's awards in structural material in New York comprised about 13,000 tons. Negotiations are pending for substantial tonnages of rails with Western and Northwestern roads, and orders for steel cars are steadily increasing. An interesting episode of the week was the statement issued by the Department of State, Washington, that contracts for 4100 tons of armor plate for an Italian war vessel had been awarded by the Italian Government to the Bethlehem Steel Company and the Carnegie Steel Company in competition with British, French and German manufacturers.

The pig iron situation presents some conflicting phases. The Eastern Pig Iron Association reports a heavier decrease in June in stocks of pig iron held by its blast furnaces than in any previous month this year. Members of that association who have been taking business at concessions have now practically withdrawn from the market, one company being reported to have sold within 30 days about 90,000 tons of pig iron, half of which was basic, and most of which selling was done quietly or under cover. In the Birmingham district in Alabama, on June 1 stocks were only [illegible] tons in pig iron stock was made, the movement from furnace yards having exceeded expectations.

Notwithstanding these rather encouraging conditions, pig iron prices in some localities show a further tendency to weaken. A round lot of basic iron has

been sold in eastern Pennsylvania at $14.25 delivered. Foundry iron is also slightly lower at Cleveland. Good sales of basic have, however, been made in eastern Pennsylvania at considerably above the price named and further buying is indicated. Large inquiries for basic pig iron are reported in the Pittsburgh district. The belief is gaining wider acceptance that the production of merchant furnaces is now below the rate of consumption and that this fact will become more apparent within the next few weeks. Meanwhile the demand may continue somewhat irregular, according to the impression made on individual consumers or the improvement they find in their own business.

Important Discovery Regarding Oil Adulteration

A notable contribution to science based on a discovery of very considerable economic importance has been unselfishly made by Alexander E. Outerbridge, Jr. Others like him have done likewise, but the instance of the successful outcome of the individual's persistence and study is one thing and the generosity of giving to all interested the opportunity to utilize the fruits of the labors is another and the circumstance well merits this special word. Mr. Outerbridge's discovery was given formal publicity in the shape of a paper read before the American Society for Testing Materials. It is that minute quantities of adulterants of high-priced animal or vegetable oils lend the property of fluorescence to the entire mass of the oil and that even the percentage of adulteration may be gauged by ocular inspection. It is not the first public service the discoverer has performed in his now over forty years' professional service. It is to him we owe our early knowledge that the tumbling operation removes the internal stresses common in cast material, and if memory serves rightly his name is closely linked with the use of ferro-silicon. This is not, however, the occasion to write an appreciative sketch of the career of a man who has apparently not yet stopped learning.

The point respecting the adulteration of high cost oils, like linseed, is not only that one is sometimes paying far more than the product is worth, but the resultant mixture does not really meet the requirements as well as the pure product. This is particularly true with the use of treated linseed in core making in the foundry. An equipment of precise physical apparatus for diverting for use the invisible or actinic rays of sunlight is not necessary, but the reflected light of an enclosed arc light in a room of otherwise diffused light serves to develop the fluorescence visible to the human eye. In short the method is intensely suited to daily use in the industrial establishment, requiring neither chemical analysis nor highly skilled operatives. A boy with a bottle of a suspected sample may ascertain the amount of adulteration by comparing the degree of fluorescence with a row of sample bottles of known adulteration. From the scientific side Mr. Outerbridge has intimated that the investigation in fluorescence may open up the study of the question of the true origin of mineral oils. He pointed out that both mineral oils and resin oils are hydrocarbons, but the one has not yet been rendered saponifiable, a latent discovery of high monetary value.

Unfit Blast Furnaces

In our issue of January 31, 1907, editorial reference was made to "The Lessening Number of Unfit Furnaces," it being pointed out that after a period of very high prices the development was that a much smaller number than usual of furnaces normally unfit had been brought into the running by the exceptionally high prices. The majority of furnaces, it was observed, had been improved and modernized, so that there were fewer normally unfit furnaces in existence than had usually been the case in the past.

Four years later the same observation can be made with emphasis as to the steel works furnaces, but there is a sharp contrast between the steel works furnaces as a class and the merchant furnaces as a class. There are few steel works furnaces which are measurably inferior to the best in equipment and economy of operation, starting with the same raw materials, whereas there are many merchant furnaces far below the standard of the best. Such being the case, we may expect to see, in times of insufficient demand for merchant pig iron, many stacks remaining idle for long periods of time, while some furnaces which have passed to the inactive list only within the past few months may pass to the abandoned list without any further period of activity. The investment thus lost will be relatively small, for there is a very wide difference in cost of construction between the modern furnaces and those of the older types which still survive. Here, indeed, lies a compensation. Even the most modernly constructed furnace may be unable to stay in the race, through shifting of the centers of consumption or through increasing difficulties in securing raw materials on advantageous terms. It must run almost continuously to make returns on the large investment and aim to retrieve this investment within a reasonable number of years. The old-fashioned furnace, on the other hand, can lie idle for a long period without losing much by way of return on its investment, and if it has to be abandoned altogether the loss is relatively light. It is not at all improbable that a number of furnaces which have been in operation within the past twelvemonth will be found in the abandoned class in the next few years. The capacity of such furnaces, however, is a much smaller percentage of the country's total capacity than was the case with the furnaces which the prolonged depressions of the seventies and nineties put out of the running.

Suiting Processes to Conditions

The success which is being made in the production of pig iron by electricity in Sweden helps to illustrate the commercial advantage of suiting the process to the conditions. There has always been a disposition, probably too great a disposition, in the iron trade to run in grooves, for manufacturers all to adopt certain processes because they have proved successful under certain conditions. The iron industry has grown so rapidly that there has hardly been time for careful analysis of principles and selection and adaptation to local conditions.

A large pig iron furnace at Trolhattan, Sweden, has been in operation since last November, starting out by producing three tons of pig iron per horse-power year, and doing better than that since then, and Prof. Joseph W. Richards, in a paper before the Engineers' Society of Western Pennsylvania, predicts that in from five to ten years all the pig iron of Scandinavia will be made by electricity. Professor Richards backs up his prediction by plain statements. Even in pig iron furnaces (not "blast furnaces"—there being no blast in an electric furnace) which were not working under conditions which can be attained the cost has been

materially less than in the ordinary charcoal furnaces. In Norway and Sweden there are many water powers available, far from centers of population but near rich deposits of iron ore, where power can be produced in large quantities at from $4 to $8 per horse-power year, and even at $8 per horse-power year there is computed a saving of $2 per ton of pig iron over the charcoal blast furnace.

The supply of charcoal in Sweden has become limited, owing largely to the requirements for paper pulp, but Professor Richards states that there is promised a supply for years to come sufficient to make 300,000 tons of pig iron a year by the straight blast furnace process—charcoal made from wood which is not available for pulp. It is to be observed that a few years ago the production of pig iron in Sweden was running above 600,000 tons annually, whereas in 1908 and 1909 it was much decreased, although of late considerable pig iron has been made with coke imported from England—clearly a temporary expedient. The argument is that as it requires only one-third as much charcoal to use the electric pig iron furnace as the straight blast furnace, and as there is much good ore and water power, the development will be rapid toward a condition of making say 900,000 tons of pig iron a year by the electric process, more cheaply per ton than 300,000 tons could be made a year by the old method.

It seems perfectly clear that this will be the future of iron making in Scandinavia, for Professor Richards speaks from personal investigation on the ground, but it by no means follows that an argument is furnished that the process will come to be applied elsewhere, if conditions are different. All the estimates made of cost are comparative, and the limit of their application is apparent when it is observed that, while the electric furnace beats the charcoal blast furnace in Sweden, yet at the present time considerable pig iron is being made in Sweden with coke imported from England. That, then, is also a better way, but it is obviously not one which will be practiced indefinitely, for a still better way would be to operate the blast furnace in England and move the ore.

Under other conditions the electric furnace would show up altogether differently. The reason for the economy is that power is extremely cheap and fuel dear. The low consumption of charcoal is due to the fact that it is used only for the chemical dissociation of oxygen from iron in the ore, while in the blast furnace about two-thirds of the fuel is used to obtain the smelting heat necessary to melt down the iron and slag. Now, in other places, where coke is used but is dear, the tendency is to conserve the heat produced. The only part of the energy of the fuel which is, according to strict theory, irretrievably lost is the part which is used to effect the chemical dissociation of iron and oxygen. The rest of the heat goes out in various ways, and some of these flows can be harnessed and directed. The heat of the pig iron, for instance, is utilized at practically all the steel works in the United States which produce their pig iron, by the employment of the direct metal process. There have already been proposals to utilize the heat of the slag, and probably this in time will be accomplished. In the blast furnace the loss by the conversion of carbon into CO instead of CO_2 is retrieved quite well by the use of gas engines. The electric furnace, working perfectly, produces CO_2 and practically no CO. When there is an attendant steel works with perhaps other industrial operations, most of the apparent losses of the blast furnace as compared with the electric furnace can be avoided, because they are losses only when the means of utilization are absent.

It is well to take a glance at the proportions of capital required to product obtained. Water power developments in Scandinavia are spoken of as involving capital expenditures of $25 to $30 per horse-power year for the hydraulic-electric plant complete. At $30, and with three tons of pig iron per horse-power year, one has $10 per ton of pig iron a year for the hydraulic-electric development, or $1,500,000 against a pig iron output equivalent to that of one of our modern blast furnaces. Power has a safe and permanent value, somewhat like gold in international trade, and $30 capital investment for a horse power looks much smaller, when thinking of a power proposition, than $1,500,000 capital expenditure does when regarded as part of the capital expenditure necessary to produce 150,000 tons of pig iron a year, for in the iron industry, on account of its well-known vicissitudes, there must be promise of retrieving the capital expenditure in a moderate number of years.

Such brief comparisons serve to illustrate the principle, more or less new in the development of iron making, that processes must in future be selected with strict reference to local conditions. Where fuel is cheap it may be unwise to adopt on a large scale all the economies necessary to regain all or the major part of the calorific value of the coal. Where it is more expensive it may pay to do this. Where power is very cheap it may pay to employ it in the electric production of pig iron. Development has already started along these lines. In the United States, at any rate, we see the greatest fuel economies at plants farthest from coal.

On account of occasional suggestions of large probable development in countries other than Sweden and Norway of electric pig-iron making, it may not be amiss to draw attention to the proportions. What is a large development for Sweden, for instance, involving several hundred thousand tons of pig iron a year, is a small one as compared with the production of the United States. Taking the latter at 25,000,000 tons a year, power development alone to duplicate such a production would call for a quarter billion dollars at the start, when total expenditures would be on a much larger scale. When the new process is proved feasible at a given point it does not follow that production will soon reach a large figure, judged by American standards.

Workmen's Foolish Investments

One of the responsibilities which is occasionally thrust upon the employer of labor comes from the foolish investments of his workmen. The prospectus which promises large and quick returns for money invested finds many victims among wage earners who have been thrifty and accumulated some means. The employer may be able to save something for the man out of the wreck of his speculation. Usually he feels compelled to make the attempt; it becomes a kind of family affair, for one of his people has been swindled and he is indignant. The promoter of dishonest schemes is naturally more fearful of an established name in the business world than of the poor man who has been led to partial or complete financial ruin.

The workman rarely seeks advice from his superiors in the beginning. The same employer whose

assistance he asks in the crisis would have been glad to explain to him the probable danger of the investment. In a recent instance an intelligent mechanic put all of his hoard of $1200 into a wildcat enterprise, dribbling the money a little at a time into the treasury of a palpably dishonest corporation until it was all gone. Then he sought the men whose knowledge would have prevented the catastrophe, and begged their intervention in reclaiming his funds. They were successful to some extent.

It is a curious failing of human nature that the apparently most conservative persons, when lacking in business training or instinct, easily fall victims to the promise of riches, made by men entirely unknown to them, concerning mines and plantations and real estate developments, located in places inaccessible to personal investigation. They will yield up their savings until they are safeguarded by a paternal government. In Massachusetts a bill is pending before the Legislature compelling the registration of mining companies doing business in the state, with affidavits of the promoters as to the actual value of the properties and the requirement that no stock shall be issued except as it represents a value equivalent to the investor's contribution. The penalty for the promoter would be, on the face of it, severe, for perjury and criminal misrepresentation of assets are serious offenses under the law, and the courts are quick to do their part toward the extermination of that class of swindlers who prey upon the earnings of the poor. Such a law should extend to fake plantation and farming schemes; in fact, to all advertised investments of the class. It would rid the community of a cause of dependency upon others of workers whose usefulness to industry and business has passed.

Some employers have exerted a beneficent influence in their works by their endeavors to keep their employees out of this kind of trap. Possibly the effort could be systematized. However, the government's stamp of disapproval would be the best remedy, such as may be secured when a national corporation act is established.

The Iron Age Index

The index to Volume 87 of *The Iron Age,* January 1 to July 1, 1911, has been compiled and printed and will be mailed to subscribers applying for it. A list of those who have received the index heretofore is kept in this office, and to all such the latest will be mailed without notice from them. Additional names will be put upon this list on request.

Safeguarding Workmen in Small Plants

David S. Beyer, chief safety inspector of the American Steel & Wire Company, in a paper on "Standards of Safety in Relation to Machinery," published elsewhere in this issue, urges strongly that small manufacturers give more careful study to the safeguarding of his work against accidents to employees. At the same time he tells them that the United States Steel Corporation passes out freely the benefits of its experimental work to all, even including those who are in competition for the same lines of business. The magnanimity, or perhaps it had better be called the philanthropy, of such an offer will be appreciated by those who study Mr. Beyer's article. With compulsory payment of damages for all accidents under workmen's compensation, every manufacturer, large and small, must for his own interest do everything possible to rid his works of casualties. Otherwise, his charges for compensation will be almost ruinously large, or, if he insures against this risk, the companies will fit the premium to the conditions as they find them.

The International Steel Conference

The international steel conference held at Brussels, Belgium, July 5 and 6, appears to have been satisfactory to its projectors. The information which has been received in this country is that from 120 to 130 individuals were present at the conference, comprising steel manufacturers of Austro-Hungary, Belgium, Canada, England, France, Germany, Italy, Russia and the United States. E. H. Gary, chairman of the United States Steel Corporation, was elected to preside and proceeded to lay before the conference his views concerning co-operation among the manufacturers of the world. He dwelt upon the idea that there should be established and continuously maintained a business friendship which compels one to feel the same concern for his neighbor that he has for himself. He proceeded to explain this as follows: "It is no less in principle than the Golden Rule applied to business. Is it possible? If it is, it will be certain to pay. True it is that sometimes, and too often, deceit is practiced and that advantage has been taken by those who have been given confidence by others, but this fact should dishearten no one." He described conditions in the United States and declared that Americans are anxious to cooperate with their European friends. Representatives of steel industries of other countries, especially those who visited the United States last year, spoke with hearty support of Judge Gary's ideas. It is the expectation that an international body, possibly to be known as the International Iron and Steel Institute, will be formed on the same lines as the American Iron and Steel Institute. A committee of 30 was selected, of which Judge Gary is chairman, and W. B. Peat, London, is secretary, to work out a plan for such an organization and to report at another conference.

In an interview with Judge Gary in Paris, which appears in the New York papers of July 9, he is reported as stating that the "details of whatever was done or discussed at Brussels will be printed in a few days and that all interested can have a copy of the report by applying to the secretary of the committee in London." Judge Gary said that he terms the Brussels international meeting a conference of peace, and continued as follows:

"Our combined efforts, in fact, have been in the direction of friendly understanding between all steel men, not for the purpose of killing competition, which I believe is necessary, but to make it friendly and fair. For instance, the suggestion that each concern should keep competitors informed of all individual business has been carefully considered. This should put a stop to commercial war and individual attempts to oust a competitor from the field.

"The era of this method of doing business, I believe, has passed. It is not to anybody's advantage to injure a rival; on the contrary, everybody's efforts should tend toward a loyal understanding, which, by making transactions easier, would necessarily result in better production and cheaper prices.

"That American law does not allow agreements between competitors is the first reason why a friendly understanding should exist among all steel men and then to consider the best means to bring about improvements in manufacture, the betterment of the conditions of employees, standardization, etc., in a word, to study all means tending to the improvement of the steel business.

"This, it has been suggested, would mean ideal conditions. But why should we not let the ideal be our goal if a change meant general improvement? So far as the idea of establishing friendly relations among us all, it seems to appeal to everybody. Our daily intercourse at Brussels, in both business and recreation, could not have been more cordial, and there is no doubt that the conference is a long step toward the realization of what I should term a scheme for the adoption of ideal business methods."

Personal

O. H. Linton has resigned his position with the Niles-Bement-Pond Company, New York, and has become associated with Griggs & Holbrook, consulting engineers, 3 South William street, New York, and will have charge of their Canadian business, with headquarters at 23 Scott street, Toronto.

N. B. Ayers has resigned the position of chief engineer of the Dayton Power & Light Company and organized the Ayers Engineering Company to handle power plant engineering, with office in the Conover Building, Dayton, Ohio.

Fritz A. Lindberg, electrical and mechanical engineer, has been admitted to the firm of Brill & Gardner, the firm name, business and location of which will continue as heretofore at 1133 Marquette Building, Chicago. Mr. Lindberg is a graduate of the Armour Institute of Technology and has been associated with the office for some time.

Charles Edward Lucke and Fred Ophüls announce the opening of their office as consulting engineers, under the name of Lucke & Ophüls, 30 Church street, New York City. The intention is to give particular attention to refrigerating and ice-making apparatus as well as to the engineering of complete plants.

Frank J. Vinson, auditor of the Brown-Ketcham Iron Works, Indianapolis, Ind., was arrested July 10 charged with embezzlement. The shortage is said to be $60,000.

J. W. Carrel, sales manager of the Lodge & Shipley Machine Tool Company, Cincinnati, Ohio, has returned from a six months' business and pleasure trip through Europe.

Obituary

HENRY BOLLER PANCOAST, a well-known iron merchant of Philadelphia, Pa., died at his home in Cornwells, Pa., July 2, after an illness of several months, aged 68 years. He was born in Philadelphia, was graduated from Haverford College in 1863, and then entered the employ of Morris, Tasker & Co. In 1870 he formed a partnership with Francis I. Maule, under the name of Pancoast & Maule. In 1892 the style of the firm was changed by the retirement of Mr. Maule, the business being continued by Mr. Pancoast under the name of Henry B. Pancoast & Co., and in 1909 was incorporated as the Henry B. Pancoast Company, with Mr. Pancoast as president. He leaves a widow, two sons and three daughters.

FRANCIS SCHUMANN, for many years prominent in the foundry trade, died June 29, at his home in Germantown, Philadelphia, Pa., aged 67 years. Born in Thuringia, Saxony, Mr. Schumann came to this country when a young man. In 1887 he founded the Tacony Iron & Metal Company, Philadelphia, of which he was president for a number of years. Later he became connected as president and general manager with the Pennsylvania Iron Works Company. Some five years ago he suffered a stroke of paralysis and has not been actively engaged in business since; a recurring stroke caused his death. He was the first president of the Philadelphia Foundrymen's Association and also the first president of the American Foundrymen's Association, a past president of the Engineers' Club and a member of the Franklin Institute and of the American Society of Mechanical Engineers. He leaves a widow and a son.

CYRUS CHAMBERS, JR., president of the Chambers Brothers Company, Philadelphia, Pa., died July 9 at his home at Overbrook, Pa., aged 78 years. He was born in Kennett Square, Pa., and developed inventive talents at an early age. His most noted achievements were the invention of paper-folding and clay-working machinery. He was almost totally blind at the time of his death. He leaves a widow and three daughters.

HARRY F. FROHMAN, Cincinnati, Ohio, one of the best known men in the foundry trade, died suddenly July 5 from heat prostration, aged 43 years. He was born in Cincinnati, was graduated from the Hughes High School and started with the S. Obermayer Company, foundry supplies, in 1886. He attained the position of secretary and treasurer with the old company, and after its reorganization he was elected treasurer and general manager, holding this position from 1901 until he died. He was a member of the Cincinnati Business Men's Club and the Chamber of Commerce. He leaves a widow.

We have received a copy of the Far Eastern Review, a monthly review of Far Eastern trade, finance and engineering, published at Manila, P. E., and treating of matters in China, Manchuria, Japan, Indo-China, Siam, Straits Settlements, Malay States, Burma, India, Malaysia and the Philippines. Among the articles of interest may be mentioned that on the West Siberian Railway, with illustrations; a very full account of the Taal disaster—the eruption of the Taal volcano—with 16 illustrations, and an illustrated article, "The Maine: Thirteen Years After."

Henshaw, Bulkley & Co., San Francisco, who were adjudged insolvent several weeks ago, have filed their schedule of debts and assets, showing total liabilities $429,967 and assets $463,000. Of the liabilities $101,354 are on notes and bills which other parties ought to pay, and do not represent debts of the firm other than as sureties. They have petitioned the court for appointment of a trustee, who will probably be named July 20.

Walter O. Amsler, Wabash Building, Pittsburgh, furnace engineer, has completed plans for the erection of a continuous heating furnace for the Seattle Steel Company, Seattle, Wash., manufacturer of merchant bars, etc. The furnace will have a capacity of eight tons of steel per hour and is similar to one in the plant of the Franklin Rolling Mill Company, Franklin, Pa., formerly used by M. Laughlin, general manager of the Seattle Steel Company.

The Clinton Iron & Steel Company, Pittsburgh, is making more extensive improvements in its blast furnace than stated last week. It is rebuilding the furnace, putting in new trestles, gas washer, and ore unloading machinery. All will be finished the latter part of September. The rebuilt furnace will have a capacity of over 350 tons per day, when running on foundry iron, and about 400 tons on Bessemer.

The Republic Iron & Steel Company put in operation July 10 its Atlantic blast furnace at New Castle, and is making preparations to blow in Hall furnace at Sharon, Pa.

Customs Decisions

Wire Bound Hose

The status of oil-resisting hose bound with wire is set forth in a decision made by the Board of United States General Appraisers in a test case brought by the Whitney Supply Company. The customs officials exacted duty at 45 per cent. ad valorem under the provision in the act of 1909 for manufactures in chief value of metal. The contention of the importer was for a rate of 30 per cent. under the paragraph in the law for flexible metal tubing or hose. In overruling the claim, the decision by General Appraiser Fischer says: "The proof offered in the case does not warrant a disturbance of the assessment in question. The only claim in the protest is that the hose is classifiable under the provision for flexible metal tubing or hose. It is clear that a cotton canvas hose bound with wire is not of that description. The protest is overruled, and the decision of the collector affirmed."

Wire Drawing Plates

The C. Newman Wire Company and others have succeeded in having the board reverse the customs authorities in their assesment of duty on wire drawing plates and wortles. Duty was assessed at the rate of 45 per cent under the provision in the law for manufactures in chief value of metal. The claim made and sustained is that the goods are dutiable properly at 35 per cent. as forgings of steel.

Alcohol Smoothing Irons

In denying a contention raised by the Emery, Bird, Thayer Dry Goods Company, Kansas City, the board holds that self-heating alcohol smoothing irons are dutiable properly at the rate of 45 per cent. as manufacturers of metal and not at 8/10 of 1 cent a pound as "cast iron sadirons," as claimed by the importer.

The Iron and Metal Markets

A Comparison of Prices

Advances Over the Previous Week in Heavy Type. Declines in Italics.

At date, one week, one month and one year previous.

	July 12, 1911.	July 5, 1911.	June 14, 1911.	July 13, 1910.
PIG IRON, Per Gross Ton:				
Foundry No. 2 standard, Philadelphia	$15.00	$15.00	$15.00	$16.25
Foundry No. 2, Valley furnace	13.50	13.50	13.50	14.25
Foundry No. 2 Southern, Cincinnati	13.25	13.25	13.50	14.75
Foundry No. 2, Birmingham, Ala.	10.00	10.00	10.25	11.50
Foundry No. 2, at furnace, Chicago*	15.00	15.00	15.00	16.50
Basic, delivered, eastern Pa.	*14.25*	14.50	14.50	15.75
Basic, Valley furnace	13.25	13.25	13.10	14.50
Bessemer, Pittsburgh	15.90	15.90	15.90	16.40
Gray forge, Pittsburgh	13.90	13.90	13.90	14.40
Lake Superior charcoal, Chicago	16.50	16.50	17.00	18.50
COKE, CONNELLSVILLE, Per Net Ton, at Oven:				
Furnace coke, prompt shipment	*1.80*	1.85	1.90	1.60
Furnace coke, future delivery	*1.85*	1.90	1.90	1.80
Foundry coke, prompt shipment	*1.80*	1.85	1.75	2.15
Foundry coke, future delivery	*2.05*	2.10	2.15	2.25
BILLETS, &c., Per Gross Ton:				
Bessemer billets, Pittsburgh	21.00	21.00	21.00	25.00
Forging billets, Pittsburgh	26.00	26.00	26.00	30.00
Open hearth billets, Philadelphia	23.40	23.40	23.40	28.50
Wire rods, Pittsburgh	27.00	27.00	29.00	29.00
OLD MATERIAL, Per Gross Ton:				
Iron rails, Chicago	14.00	14.00	14.00	16.75
Iron rails, Philadelphia	**16.75**	16.50	16.50	19.00
Car wheels, Chicago	12.50	12.50	12.50	14.75
Car wheels, Philadelphia	*12.75*	13.00	13.00	14.50
Heavy steel scrap, Pittsburgh	13.00	13.00	12.75	14.50
Heavy steel scrap, Chicago	**10.50**	10.25	10.25	12.25
Heavy steel scrap, Philadelphia	13.00	13.00	13.00	14.25
FINISHED IRON AND STEEL, Per Pound:	Cents.	Cents.	Cents.	Cents.
Bessemer rails, heavy, at mill	1.25	1.25	1.25	1.25
Refined iron bars, Philadelphia	1.25	1.25	1.25	1.50
Common iron bars, Pittsburgh	1.25	1.25	1.25	1.50
Common iron bars, Chicago	1.20	1.20	1.20	1.40
Steel bars, Pittsburgh	1.25	1.25	1.25	1.45
Steel bars, tidewater, New York	1.41	1.41	1.41	1.61
Tank plates, Pittsburgh	1.35	1.35	1.35	1.40
Tank plates, tidewater, New York	1.51	1.51	1.51	1.56
Beams, Pittsburgh	1.35	1.35	1.35	1.40
Beams, tidewater, New York	1.51	1.51	1.51	1.56
Angles, Pittsburgh	1.35	1.35	1.35	1.40
Angles, tidewater, New York	1.51	1.51	1.51	1.56
Skelp, grooved steel, Pittsburgh	1.25	1.25	1.30	1.50
Skelp, sheared steel, Pittsburgh	1.35	1.35	1.35	1.60
SHEETS, NAILS AND WIRE, Per Pound:	Cents.	Cents.	Cents.	Cents.
Sheets, black, No. 28, Pittsburgh	2.00	2.00	2.00	2.30
Wire nails, Pittsburgh†	1.70	1.70	1.80	1.80
Cut nails, Pittsburgh†	1.60	1.60	1.60	1.70
Bark wire, galv., Pittsburgh†	2.00	2.00	2.10	2.10
METALS, Per Pound:	Cents.	Cents.	Cents.	Cents.
Lake copper, New York	12.75	12.87½	12.75	12.62½
Electrolytic copper, New York	12.55	12.62½	12.50	12.37½
Spelter, St. Louis	5.60	5.60	5.32½	5.05
Spelter, New York	5.80	5.80	5.55	5.20
Lead, St. Louis	4.35	4.35	4.30	4.25
Lead, New York	4.50	4.50	4.45	4.40
Tin, New York	45.50	45.40	46.87½	32.65
Antimony, Hallett, New York	8.12½	8.12½	8.75	8.12½
Tin plate, 100-lb. box, New York	$3.94	$3.94	$3.94	$3.84

*The average switching charge for delivery to foundries in the Chicago district is 50c. per ton.

†These prices are for largest lots to jobbers.

Prices of Finished Iron and Steel f.o.b. Pittsburgh

Freight rates from Pittsburgh in carloads, per 100 lb.: New York, 16c.; Philadelphia, 15c.; Boston, 18c.; Buffalo, 11c.; Cleveland, 10c.; Cincinnati, 15c.; Indianapolis, 17c.; Chicago, 18c.; St. Paul, 32c.; St. Louis, 22½c.; New Orleans, 30c.; Birmingham, Ala., 45c. Rates to the Pacific Coast are 80c. on plates, structural shapes and sheets, No. 11 and heavier; 85c. on sheets, Nos. 12 to 16; 95c. on sheets, No. 16 and lighter; 65c. on wrought boiler tubes.

Structural Material.—I-beams and channels, 3 to 15 in., inclusive, 1.35c. to 1.40c., net; I-beams over 15 in., 1.45c. to 1.50c., net; H-beams over 18 in., 1.50c. to 1.55c.; angles, 3 to 6 in. inclusive, ¼ in. and up, 1.35c. to 1.40c., net; angles over 6 in., 1.45c. to 1.50c. net; angles, 3 in. on one or both legs, less than ¼ in. thick, 1.40c., plus full extras as per steel bar card effective September 1, 1909; tees, 3 in. and up, 1.40c., net; zees, 3 in. and up, 1.35c. to 1.40c., net; angles, channels and tees under 3 in., 1.40c., base, plus full extras as per steel bar card of September 1, 1909; deck beams and bulb angles, 1.65c. to 1.70c., net; hand rail tees, 2.45c.; checkered and corrugated plates, 2.45c., net.

Plates.—Tank plates, ¼ in. thick, 6¼ in. up to 100 in. wide, 1.35c. to 1.40c., base. Following are stipulations prescribed by manufacturers, with extras to be added to base price (per pound) of plates:

Rectangular plates, tank steel or conforming to manufacturers' standard specifications for structural steel dated February 6, 1903, or equivalent, ¼ in. thick and over on thinnest edge, 100 in. wide and under, down to but not including 6 in. wide, are base.

Plates up to 72 in. wide, inclusive, ordered 10.2 lb. per square foot, are considered ¼-in. plates. Plates over 72 in. wide must be ordered ¼ in. thick on edge, or not less than 11 lb. per square foot, to take base price. Plates over 72 in. wide ordered less than 11 lb. per square foot down to the weight of 3-16-in. take the price of 3-16-in.

Allowable overweight, whether plates are ordered to gauge or weight, to be governed by the standard specifications of the Association of American Steel Manufacturers.

Gauges under ¼-in. to and including 3-16 in. on thinnest edge, extra	$0.10
Gauges under 3-16-in. to and including No. 8	.15
Gauges under No. 8 to and including No. 9	.25
Gauges under No. 9 to and including No. 10	.30
Gauges under No. 10 to and including No. 12	.40
Sketches (including all straight taper plates) 3 ft. and over in length	.10
Complete circles, 3 ft. in diameter and over	.20
Boiler and flange steel	.10
"A. B. M. A." and ordinary firebox steel	.20
Still bottom steel	.30
Marine steel	.40
Locomotive firebox steel	.50
Widths over 100 in. up to 110 in., inclusive	.05
Widths over 110 in. up to 115 in., inclusive	.10
Widths over 115 in. up to 120 in., inclusive	.15
Widths over 120 in. up to 125 in., inclusive	.25
Widths over 125 in. to 130 in., inclusive	.50
Widths over 130 in.	1.00
Cutting to lengths or diameters under 3 ft. to 2 ft. inclusive	.25
Cutting to lengths or diameters under 2 ft. to 1 ft., inclusive	.50
Cutting to lengths or diameters under 1 ft.	1.55

No charge for cutting rectangular plates to lengths 3 ft. and over.
TERMS—Net cash 30 days.

Sheets.—Makers' prices for mill shipments on sheets in carload and larger lots, on which jobbers charge the usual discounts for small lots from store, are as follows: Blue annealed sheets, Nos. 3 to 8, U. S. standard gauge, 1.40c.; Nos. 9 and 10, 1.50c.; Nos. 11 and 12, 1.55c.; Nos. 13 and 14, 1.60c.; Nos. 15 and 16, 1.70c. One pass, cold rolled, box annealed sheets, Nos. 10 to 12, 1.65c.; Nos. 13 and 14, 1.70c.; Nos. 15 and 16, 1.75c.; Nos. 17 to 21, 1.80c.; Nos. 22, 23 and 24, 1.85c.; Nos. 25 and 26, 1.90c.; No. 27, 1.95c.; No. 28, 2c.; No. 29, 2.05c.; No. 30, 2.15c. Three pass, cold rolled sheets, box annealed, are as follows: Nos. 15 and 16, 1.85c.; Nos. 17 to 21, 1.90c.; Nos. 22 to 24, 1.95c.; Nos. 25 and 26, 2c.; No. 27, 2.05c.; No. 28, 2.10c.; No. 29, 2.15c.; No. 30, 2.25c. Galvanized sheets, Nos. 10 and 11, black sheet gauge, 2c.; Nos. 12, 13 and 14, 2.10c.; Nos. 15, 16 and 17, 2.25c.; Nos. 18 to 22, 2.40c.; Nos. 23 and 24, 2.50c.; Nos. 25 and 26, 2.70c.; No. 27, 2.85c.; No. 28, 3c.; No. 29, 3.10c.; No. 30, 3.30c. All above prices are f.o.b. Pittsburgh, terms 30 days net, or 2 per cent cash discount 10 days from date of invoice, as also are the following base prices per square for painted and galvanized roofing sheets, with 2½ in. corrugations:

Gauge.	Painted.	Galvanized.	Gauge.	Painted.	Galvanized.
29	....	$2.40	23	$2.40	$3.50
28	$1.40	2.55	22	2.60	3.70
27	1.55	2.60	21	2.80	4.05
26	1.65	2.65	20	3.05	4.35
25	1.85	3.05	18	4.05	5.70
24	2.10	3.15	16	4.90	6.50

Wrought Pipe.—The following are the jobbers' car load discounts on the Pittsburgh basing card on wrought pipe, in effect from October 1.

	Butt Weld. Steel Black.	Steel Galv.	Iron Black.	Iron Galv.
⅛ to 1½ in.	55	..	49	43
¼ in.	25	63	21	59
⅜ to 1½ in.	79	69	75	65
2 to 3 in.	80	70	76	66
	Lap Weld.			
2 in.	76	66	72	62
2½ to 4 in.	78	67	74	64
4½ to 6 in.	77	67	73	63
7 to 12 in.	75	59	71	55
13 to 15 in.	51½	..	..	..

THE IRON AND METAL MARKETS

Butt Weld, extra strong, plain ends, card weight.				
⅛, ¼, ⅜ in.	60	59	65	55
½ in.	74	68	70	64
¾ to 1¼ in.	78	72	74	68
2 to 3 in.	79	73	75	69
Lap Weld, extra strong, plain ends, card weight.				
2 in.	75	69	71	65
2½ to 4 in.	77	71	73	67
4½ to 6 in.	76	70	72	66
7 to 8 in.	69	59	65	55
9 to 12 in.	64	54	60	50
Butt Weld, double extra strong, plain ends, card weight.				
¼ in.	64	58	60	54
¾ to 1¼ in.	67	61	63	57
2 to 3 in.	69	63	65	59
Lap Weld, double extra strong, plain ends, card weight.				
2 in.	65	59	61	55
2½ to 4 in.	67	61	63	57
4½ to 6 in.	66	60	62	56
7 to 8 in.	59	49	62	56

Plugged and Reamed.

1 to 1½, 2 to 3 in. Butt Weld.
2, 2½ to 4 in. ..... Lap Weld

} will be sold at two (2) points lower basing (higher price) than merchants or card weight pipe. Butt or lap weld, as specified.

The above discounts are for "card weight," subject to the usual variation of 5 per cent. Prices for less than carloads are three (3) points lower basing (higher price) than the above discounts.

Boiler Tubes.—Discounts on lap welded steel boiler tubes to jobbers in carloads are now as follows

	Steel.
1¾ to 2¼ in.	65
2½ in.	67½
2¾ to 3¼ in.	70
3½ to 4½ in.	72½
5 to 6 in.	65
7 to 13 in.	62½

Less than carloads to destination east of the Mississippi River will be sold at delivered discounts for carloads lowered by two points for lengths 22 feet and under; longer lengths f.o.b. Pittsburgh. Usual extras to jobbers and boiler manufacturers.

Wire Rods and Wire.—Bessemer, open hearth and chain rods, $27. Fence wire, Nos. 0 to 9, per 100 lb., terms 60 days, or 2 per cent. discount in 10 days, carload lots, to jobbers, annealed, $1.50, galvanized, $1.80; carload lots, to retailers, annealed, $1.55, galvanized, $1.85. Galvanized barb wire, to jobbers, $2; painted, $1.70. Wire nails, to jobbers, $1.70.

The following table gives the prices to retail merchants on wire in less than carloads, including the extras on Nos. 10 to 16, which are added to the base price:

Fence Wire, Per 100 Lb.

No.	0 to 9	10	11	12 & 12½	13	14	15	16
Annealed	$1.65	$1.70	$1.75	$1.80	$1.90	$2.00	$2.10	$2.20
Galvanized	1.95	2.00	2.05	2.10	2.20	2.30	2.70	2.80

Market and Stone Wire in Bundles, Discount from Standard List.

Bright and Annealed:	
0 and coarser	80
10 to 18	80 and 10
19 to 26	80 and 10 and 2½
27 to 36	80 and 5
Galvanized:	
0 and coarser	75 and 10
10 to 16	75 and 10
17 to 26	75 and 10
27 to 36	72½
Coppered or Liquor Finished:	
9 and coarser	75 and 10
10 to 26	75 and 10
27 to 36	70 and 10 and 5
Tinned:	
6 to 18	75 and 10 and 10

Pittsburgh

PITTSBURGH, PA., June 12, 1911.—*(By Telephone.)*

Pig Iron.—In basic pig iron the market continues to reflect the higher price of $13.25 at Valley furnace quoted last week. There is tentative inquiry for about 60,000 tons, but some of this is not very serious. The most likely inquiry is for 6000 tons for a steel works on the Ohio River in the immediate Pittsburgh district for delivery over the last five months of the year. Considerable uncertainty exists as to what price would be done on a large block of basic, but no quotations are being made at less than $13.25, Valley furnace, and we note sales in the past few days of 150 tons for prompt delivery on this basis, the delivered price, Pittsburgh, being $14.15. Bessemer iron is firmer since the sales recently reported of odd lots at concessions, and we note a few sales of one carload each this week at $15, Valley furnace. The Westinghouse Electric & Mfg. Company is inquiring for a supply of foundry iron for its Allegheny and Cleveland works for the seven months of September to March inclusive. We quote as follows: Bessemer pig iron, nominally, $15; malleable Bessemer, $13.50; basic, $13.25; No. 2 foundry, $13.50 to $13.75; gray forge, $13, all at Valley furnace, the freight rate to Pittsburgh being 90c. per ton.

Steel.—Specifications on sheet-bar contracts for delivery this month are slightly greater than those for last month, which month showed an improvement over May. Billet specifications are fairly good. Very little business is being done in the open market, consumers being well covered by contracts. Since the furnaces have been quoting higher prices on basic pig iron it has been difficult for middlemen to put through conversion deals. We quote Bessemer and open-hearth billets, 4 x 4 in., and up to but not including 10 x 10 in., $21, base, and sheet and tin bars in 30-ft. lengths, $22; 1½-in. billets, $22; forging billets, $26, base, usual extras for sizes and carbons—all prices being f.o.b. Pittsburgh or Youngstown district, with freight to destination added.

(By Mail.)

While the flow of orders for finished steel products is not altogether as large thus far this month as the average for June, it is in excess of the average for May, and this, considering the season of the year, with a number of plants closed for inventory and repairs and many men away on vacations, is regarded as very favorable. One of the largest steel interests reports that its bookings last week exceeded its shipments by a very considerable margin, and the holiday is believed to have affected orders more than shipments, so that the showing is an excellent one. The steel mills are operating at practically as good a gait as in June, or on an average at between 70 and 75 per cent. of capacity. The recent activity has occurred with practically no assistance at all from the railroads, and this scattered buying is expected to continue, while the railroads are regarded as certain to be much larger buyers in the next few months than they have been lately. Active inquiry for cars totals up about 15,000, from over half a dozen different systems. This includes some 3800 cars for the Erie Railroad, bids on which were opened last Saturday, but awards have not yet been announced. It is believed that all the business will be closed by about August 1, and that if freight tonnage increases the same roads that are buying now will have to buy again. The Pennsylvania, for instance, is understood to have 4500 vacant numbers, but is figuring on buying only 2000 or 3000 cars at present, and it is likely therefore to be a purchaser later. Altogether the outlook is for a moderate degree of activity in the next few weeks, with a decided improvement thereafter, making the second half of this year much better than the first half has proved to be. Prices of semifinished and finished steel are being well maintained all along the line.

Ferromanganese.—The market is quiet, but considerable business is in sight for the second half. We continue to quote prompt and forward at $36.50, Baltimore, freight to Pittsburgh being $1.95.

Ferrosilicon.—There is no important inquiry in the market, and sales have been very light. We quote 50 per cent. at $51.50 to $52, Pittsburgh, for delivery over second half of the year; 10 per cent. blast furnace ferrosilicon, $22; 11 per cent., $24 and 12 per cent. $25, f.o.b. cars, Ashland and Jisco furnaces.

Muck Bar.—Nothing new is reported in muck bar since the sale mentioned in last report of 500 tons for July at about $28.50, delivered Pittsburgh. We quote best grades of all-pig muck bar at $28.50 to $29, one or two makers refusing to name less than the higher price.

Skelp.—As a number of skelp consumers are closed for the fortnight for inventory and repairs, deliveries are somewhat reduced and the market is quiet. We quote grooved steel skelp at 1.25c.; sheared steel skelp, 1.35c.; grooved iron skelp, 1.50c. to 1.60c. and sheared iron skelp 1.70c. to 1.75c. usual terms, all for delivery at consumers' mills in the Pittsburgh district.

Wire Rods.—Rod contracts being adjusted to the reduced price on wire rods named last month, specifications have been somewhat improved. We quote Bessemer, open-hearth and chain rods at $27, Pittsburgh.

Steel Rails.—The Edgar Thomson rail plant is running at about two-thirds full capacity, about half the output being rail for export. The Ohio plant, which was recently put on open-hearth rails to fill an order for 7500 tons for export, is back to billets and sheet bars, but will be put on open-hearth rails from time to time as occasion requires. Prices on light rails are as follows: 12-lb. rails, 1.25c; 16, 20 and 25-lb., 1.21c to 1.25c; 30 and 35-lb., 1.20c, and 40 and 45-lb., 1.16c. The prices are f.o.b. at mill, plus freight, and are the minimum of the market in carload lots, small lots being sold at a little higher price. Standard sections are held at 1.25c per pound for Bessemer.

THE IRON AND METAL MARKETS

Structural Material.—Specifications are coming in freely, and the structural mills are running as well as last month, but no important contracts are reported closed in the past few days. We quote beams and channels up to 15-in. at 1.35c, Pittsburgh.

Plates.—The Carnegie Steel Company is reported to have received 4500 tons of plates from the Treadwell Construction Company for the Los Angeles aqueduct. As noted before, there is inquiry for a total of about 15,000 steel cars, likely to be placed by about August 1, including 3800 cars for the Erie Railroad, bids upon which were opened Saturday. There is a good run of specifications coming in to the mills, on orders placed last month. We quote plates, ¼-in. and heavier, at 1.35c, Pittsburgh.

Sheets.—Buying of sheets is somewhat lighter than in June, but as a considerable part of the June buying was for forward delivery the mills have a little accumulation of business for this month and are able to run as well as formerly—about 65 per cent. of full capacity in the case of both American Sheet & Tin Plate Company and the independents. In a few cases mills have closed for repairs for the first fortnight of the month. Regular prices on black, galvanized and roofing sheets, as given on a previous page, are strictly maintained.

Tin Plate.—The largest independent tin plate mill was closed last week and is closed this week also, for much-needed repairs. Two or three other plants are closed or running light in order to make repairs, for which this time is regarded as especially propitious, as with the hot weather the output would be reduced. The tin plate mills as a whole are this week making an output of 65 to 70 per cent. of full capacity. A good line of specifications is on the books, and this rate of production is expected to be maintained without difficulty until the middle or latter part of August. We quote 100-lb. cokes, 14 x 20, at $3.70, Pittsburgh.

Bars.—The remainder of the implement trade in steel bars will likely be closed this month, the great bulk of the business having been placed under contract already. Tonnages have not run as heavy as in the best years, the implement makers having considerable stocks of finished implements. On Friday last, at Cambridge Springs, Fla., at the close of a two days' conference, the Western Bar Iron Association signed the Amalgamated Association scale for the year beginning July 1, the scale adopted being practically the same as that already accepted by the Republic Iron & Steel Company and containing no important changes from the previous scale. Some of the bar iron mills have closed for repairs, but will probably start before the end of the month. We quote steel bars at 1.25c. and common iron bars at 1.25c. to 1.30c., Pittsburgh.

Merchant Pipe.—Merchant pipe is rather quiet both as to specifications and new business, and mills are not running as full this month as last. The Ohio Fuel Supply Company has placed a contract for 25 miles of 16-in., the market otherwise being very quiet in line pipe. The A. M. Byers Company, whose large iron pipe plant at Girard, Ohio, has been idle for repairs the past fortnight, this week started one of the two puddle mills, containing 42 furnaces. Regular discounts in effect on iron and steel pipe are given on a previous page

Rivets.—The market on rivets is quite active, there having been good buying in the second half of June and specifications are coming in rather freely. We quote structural rivets at 1.70c. to 1.75c. and boiler rivets at 1.80c. to 1.85c., these prices being shaded only on the most desirable orders.

Wire Products.—No improvement has occurred in the wire trade since the price reductions of May 20 and mills are running quite slack, but it is believed that a good foundation has been laid for the fall trade and that orders and specifications will show marked improvement some time next month or early in September. We quote galvanized barb wire at $2 per 100 lbs., painted, $1.70; annealed fence wire, $1.50; galvanized, $1.80; wire nails, $1.70, and cut nails, about $1.60, f.o.b. Pittsburgh, full freight added to point of delivery. The quotation of $1.60 on cut nails might be shaded on a desirable order.

Shafting.—Buying at present is only of a hand-to-mouth character and shipments are relatively light, but good buying is expected soon from the agricultural implement trade. Regular discounts on shafting remain at 60 per cent. off in carload lots and 55 per cent. in less than carloads, delivered in base territory, but on desirable orders these discounts are being shaded somewhat.

Spelter.—The market has continued to decline and this has brought out more inquiry and somewhat more buying. We note sales of two carloads of prime Western to-day at 5.67½c., delivered Pittsburgh district, equal to 5.55c. East St. Louis, and quote the market at this, 5.70c. Pittsburgh being asked by some sellers. Some prospective buyers are waiting to see if the market declines further.

Hoops and Bands.—Specifications are coming in well on orders placed in June, and the mills are running at a comfortable gait, but purchases are confined to immediate requirements. We quote hoops at 1.40c. and bands at 1.25c., extras on the later as per the steel bar card.

Merchant Steel.—Orders and specifications are a little better than at this time last month. Regular quotations which, however, are being shaded, are: Iron finished tire, ½ x ½ in. and heavier, 1.40c., base; under these sizes, 1.55c.; planished tire, 1.60c.; channel tire, 1.80c., base; toe calk, 1.90c.; flat sleigh shoe, 1.55c.; concave or convex, 1.75c.; cutter shoes, tapered or bent, 2.25c.; spring steel, 2c.; machinery steel, smooth finish, 1.90c.

Boiler Tubes.—The market continues dull, with mills running at an unsatisfactory gait and regular discounts being regularly shaded.

Iron and Steel Scrap.—The embargo on scrap shipments to Monessen has been lifted, but the refusal of a steel mill down the Ohio River to take additional deliveries continues. There is little opportunity to sell scrap to the mills, as the open-hearth plants are well provided and most of the iron mills have closed for repairs and inventory. Quotable prices are unchanged, as follows, per gross ton, f.o.b. Pittsburgh:

Heavy steel scrap, Steubenville, Follansbee, Sharon, Monessen and Pittsburgh delivery	$13.00 to $13.25
No. 1 foundry cast	13.25 to 13.50
No. 2 foundry cast	12.75 to 13.00
Bundled sheet scrap, f.o.b. consumers' mill, Pittsburgh district	10.75 to 11.00
Rerolling rails, Newark and Cambridge, Ohio, Cumberland, Md., and Franklin, Pa.	13.50 to 13.75
No. 1 railroad malleable stock	12.00 to 12.25
Grate bars	10.50 to 10.75
Low phosphorus melting stock	16.00 to 16.25
Iron car axles	23.75 to 24.00
Steel car axles	18.50 to 18.75
Locomotive axles	23.00
No. 1 busheling scrap	12.00 to 12.25
No. 2 busheling scrap	8.50 to 8.75
Old car wheels	13.50 to 13.75
Sheet bar crop ends	15.50 to 15.75
Cast iron borings	8.75 to 9.00
Machine shop turnings	9.00 to 9.25
Old iron rails	15.00 to 15.25
No. 1 wrought scrap	14.25 to 14.50
Heavy steel axle turnings	10.00 to 10.25
Stove plate	10.50 to 10.75

*These prices are f.o.b. cars at consumers' mill in the Pittsburgh district.

Chicago

CHICAGO, July 12, 1911.—*(By Telegraph.)*

During the month of June progress of a sustained and satisfying character was made in increasing the volume of mill tonnage. Thus far in July this has been practically continued, giving rise to what is now a general feeling that the ensuing 90 days will witness a steady gain in business. The indications are that the local rail mills feel assured of a desirable rail tonnage for the last half and already the specifications by the railroads against their structural contracts have been sufficiently liberal to place the mills in a much improved position. The steel bar situation has been so far cleared up by the contracting of the larger interests and by the signing of last year's scale by the Western Bar Iron Association that weakness in the 1.25c. price has apparently been quite eliminated. The past week brought out the largest aggregate tonnage of fabricating contracts recorded for several months. Bar iron mills in this market resumed operations this week with the heaviest bookings of a year past. While that turn in sentiment which presages advancing prices does not seem imminent, the market tone has grown sufficiently stronger to make any lower prices very unlikely.

Pig Iron.—When pig iron prices are as low as they are at present, there is always the possibility that a rising market may be quickly inaugurated. Particularly does the melter of iron have this in mind when improvement is being reported in other directions. It is natural, therefore, that buyers are now watching the situation closely and are sending their inquiries into the market freely, although they do not wish to buy if prices will remain as they are indefinitely. The immediate situation presents no reason why it is better to buy for the last half now than a month from now.

THE IRON AND METAL MARKETS

There are even some indications that a fortunate buyer may later at an opportune moment be able to shade the current quotations. At the same time, it is to be remembered that the present price of $10, Birmingham, for Southern No. 2 foundry and $15, Chicago, for Northern iron are certainly favorable to the melter at any time. A survey of the situation would seem to indicate that the buyer requiring a moderate tonnage can scarcely go wrong on the present basis. The heavy melter may find the bottom and then the low price furnaces will be out of the market except at an advance. Only a moderate tonnage of iron is now being bought, sufficient to cover current needs and feel the market. We continue to quote for Chicago delivery, with the exception of local irons, which are f.o.b. furnace, the following prices:

Lake Superior charcoal	$16.50 to $17.00
Northern coke foundry, No. 1	15.50
Northern coke foundry, No. 2	15.00
Northern coke foundry, No. 3	14.75
Northern Scotch, No. 1	16.00
Southern coke, No. 1 foundry and No. 1 soft	14.85 to 15.10
Southern coke, No. 2 foundry and No. 2 soft	14.35 to 14.60
Southern coke, No. 3	14.10 to 14.35
Southern coke, No. 4	13.85 to 14.10
Southern gray forge	13.60 to 13.85
Southern mottled	13.60 to 13.85
Malleable Bessemer	15.00
Standard Bessemer	17.40
Basic	15.50
Jackson Co. and Kentucky silvery, 6 per cent	18.00
Jackson Co. and Kentucky silvery, 8 per cent	18.90
Jackson Co. and Kentucky silvery, 10 per cent	19.90

(By Mail.)

Rails and Track Supplies.—Indications are that negotiations are pending with the local mills, involving substantial tonnages of rails. It has been known that some of the Western and Northwestern roads have had the buying of rails under consideration and the attitude of the leading interest is indicative of developments in this direction. Among the rail orders recently placed are 1500 tons for the St. Joseph Valley Traction Company and 500 tons for the Illinois Traction Company. The Iowa Central Railroad bought about 4000 tons and a local terminal belt line took approximately 2000 tons. In addition miscellaneous orders aggregated close to 5000 tons. It is understood that a considerable tonnage of rails for export has been placed with the local mills. Rail orders have carried a good proportion of frogs, switches and crossovers. Orders for track fastenings are likewise active. We quote standard railroad spikes at 1.65c. to 1.75c., base; track bolts with square nuts, 2.10c. to 2.20c., base, all in carload lots, Chicago; Standard section Bessemer rails, 1.28c.; open hearth, 1.34c.; light rails, 40 to 45 lb., 1.16c. to 1.20½c.; 30 to 35 lb., 1.19½c. to 1.24c.; 16, 20 and 25 lb., 1.20½c. to 1.25c.; 12 lb., 1.25c. to 1.30½c.; angle bars, 1.50c. to 1.60c., Chicago.

Structural Material.—From the standpoint of mill bookings and fabricators' contracts as well, the past week has shown structural material to be one of the most active features of the market. Railroads are specifying quite freely against their bridge structural contracts. Car and locomotive orders show a gain. Building and bridge structural contracts placed during the week totaled over 20,000 tons. Some of the items reported are as follows: Rand-McNally building, Chicago, 6865 tons to the Vierling Steel Works, Chicago; Van Nuys building, Los Angeles, Cal., 3435 tons, to the Llewellyn Iron Works; steel tanks and mills for the Tonopah-Belmont Development Company, Tonopah, Nev., 1100 tons, to the Worden-Allen Company, Milwaukee; Multnomah County court house, Portland, Ore., 1470 tons, to Milliken Bros.; Masonic Temple, San Francisco, 2035 tons, to the American Bridge Company; bascule bridge near San Pedro, Cal., 1310 tons, to the King Bridge Company, Cleveland, by the Southern Pacific. The Minneapolis, St. Paul & Sault Ste. Marie contracted with the Pennsylvania Steel Company for 2855 tons of bridge steel; the Chicago & Alton ordered from the Toledo Bridge & Crane Company 400 tons of deck girders, and the Northern Pacific will have 675 tons of steel center sills built by the Pressed Steel Car Company. Among the smaller orders placed were 115 tons for a bridge at Mt. Vernon, Wash.; 335 tons, to Heil & Co., Milwaukee, for the Boston store in that city; 300 tons for the Pantages Theater, to the Central Iron Works, San Francisco; 295 tons of trestle steel for the Pacific Portland Cement Company at Cement, Cal., to the American Bridge Company, and 120 tons of pole fixtures for the Olympic Power Company, Port Angeles, Wash., to the Hubbard Company. We quote plain material from mill at 1.53c. to 1.58c. and from store 1.75c., Chicago.

Plates.—Western steel car plants have up to this time found business very dull. There is now, however, some demand for plates both from the Hammond and Hegewisch plants. General specifications for plate tonnage are very satisfactory. Chicago quotations for mill shipment are 1.53c. and from store, 1.75c.

Sheets.—The increase in the sale of galvanized sheets as compared with black sheets is an interesting tendency in favor of the more expensive but better protected material. Prices are reported as being maintained uniformly. While there is no buying far into the future, and probably will not be until the mills definitely advise the trade of advances in prices, the tonnage being placed for immediate requirements and for delivery through the remainder of the year has grown to be satisfactory from the mill standpoint. An order for 500 tons placed for forward delivery represents a good contract in the present market situation. Chicago prices on sheets are as follows: Carload lots, from mill: No. 28 black sheets, 2.18c.; No. 28 galvanized, 3.08c.; No. 10 blue annealed, 1.68c. Prices from store, Chicago, are: No. 10, 1.95c. to 2.05c.; No. 12, 2.00c. to 2.10c.; No. 28 black, 2.60c. to 2.70c.; No. 28 galvanized, 3.35c. to 3.45c.

Bars.—The departures from the price of 1.25c., Pittsburgh, for steel bars which were reported in connection with the placing of some of the large Western bar contracts, seem to have quite disappeared now that the most of that business has been placed. Current steel bar business shows improvement and the local bar iron mills are comparatively very active after the shutdown of last week. We quote as follows, f.o.b. Chicago: Soft steel bars, 1.43c.; bar iron, 1.20c. to 1.25c.; hard steel bars, rolled from old rails, 1.20c. to 1.25c. From store, soft steel bars, 1.70c. to 1.80c., Chicago.

Wire Products.—Some interest is being displayed in fall contracts for wire nails and barb wire and, as merchants' stocks are low, fair business is expected to result. Rather more liberal contracting is observed in connection with fence wire on the part of manufacturers, although held in check somewhat by the uncertainty of the crop situation. Jobbers' carload prices, which are quoted to manufacturing buyers, are as follows: Plain wire, No. 9 and coarser, base, 1.68c.; wire nails, 1.88c.; painted barb wire, 1.88c.; galvanized, 2.18c.; polished staples, 1.88c.; galvanized, 2.18c., all Chicago.

Old Material.—Some response to the greater activity in bar iron and finished steel lines has been felt in the scrap market and a better tone prevails. The local mills are taking material in small quantities only and there is still little opportunity for active trading. The Chicago & Alton Railroad is offering about 200 tons of rerolling rails, the Soo line has about 500 tons of mixed scrap to dispose of, and the Baltimore & Ohio has issued a list totaling in the neighborhood of 10,000 tons, but most of this will probably be marketed in the East. Prices are about the same, there being some variation depending upon the character and quantity of the material sold. We quote below for delivery to buyer's works, all freight and transfer charges paid per gross ton:

Old iron rails	$14.00 to $14.50
Old steel rails, rerolling	12.25 to 12.50
Old steel rails, less than 3 ft.	11.00 to 11.50
Relaying rails, standard sections, subject to inspection	24.00
Old car wheels	12.50 to 13.00
Heavy melting steel scrap	10.50 to 11.00
Frogs, switches and guards, cut apart	10.50 to 11.00
Shoveling steel	10.00 to 10.50
Steel axle turnings	8.50 to 9.00

The following quotations are per net ton:

Iron angles and splice bars	$12.50 to $13.00
Iron arch bars and transoms	13.75 to 14.25
Steel angle bars	10.25 to 10.75
Iron car axles	18.00 to 18.50
Steel car axles	16.00 to 16.50
No. 1 railroad wrought	10.00 to 10.25
No. 2 railroad wrought	10.00 to 10.50
Steel knuckles and couplers	9.25 to 9.75
Locomotive tires, smooth	16.00 to 16.50
Machine shop turnings	6.75 to 7.25
Cast and mixed borings	5.25 to 5.75
No. 1 busheling	8.75 to 9.25
No. 2 busheling	6.75 to 7.25
No. 1 boilers, cut to sheets and rings	7.50 to 8.00
Boiler punchings	10.00 to 10.50
No. 1 cast scrap	10.25 to 10.75
Stove plate and light cast scrap	9.00 to 9.50
Railroad malleable	10.00 to 10.50
Agricultural malleable	8.00 to 8.50
Pipes and flues	5.00 to 5.50

Cast Iron Pipe.—The United States Cast Iron Pipe & Foundry Company secured 350 tons for Los Angeles, Cal. A letting of 300 tons at Santa Barbara, Cal., is also reported. Scattering business in pipe is reported as being maintained in good volume. We continue to

THE IRON AND METAL MARKETS

quote as follows, per net ton, Chicago: Water pipe, 4 in., $25.50; 6 to 12 in., $24.50; 16 in. and up, $24, with $1 extra for gas pipe.

Philadelphia

PHILADELPHIA, July 11, 1911.

A more cheerful tone is apparent in nearly all branches of the trade, which has been substantiated in a certain degree by continued buying in crude and finished materials. A better movement in pig iron, both in steel making and foundry grades, is reported, and it is believed that this branch of the trade is now practically on a normal buying basis. The Eastern Pig Iron Association, which met last week, reports a sharp decline in stocks on furnace banks during June, greater than in any one previous month this year. The present productive rate in this district is now believed to be under the current consumption. The movement in finished materials since the holiday measures up to the demand previous to the first of the month and in instances a slight increase is reported. Mills have resumed operations at about the same basis as prior to the holiday suspension, and in the majority of instances order books are in somewhat better shape. Structural material continues active and a better demand for steel billets is reported. Considerable business is pending in heavy plates. Bars, however, remain quiet. The old material market is stronger on scattered buying.

Iron Ore.—Negotiations are still pending for a large block of Swedish ore; purchases of cargo lots are also being considered by several Eastern consumers. The domestic ore situation is quiet. Importations during the week ending July 8 include 4675 tons of Cuban, 12,500 tons of Newfoundland, 6394 tons of Swedish and 5533 tons of Spanish ore.

Ferromanganese.—There is still an entire absence of demand in this district. Prices are nominally quoted at $36.50, Baltimore.

Billets.—The demand has been somewhat broader. A moderate volume of small orders for early delivery is coming out and consumers are more disposed to contract, one order recently placed being for 1000 tons of rolling billets for delivery over the next three months. Forging billets also show a tendency to become more active. Recent quotations are firmly maintained, $23.40 being named for rolling billets and $28.40 for ordinary forging steel, delivered in this territory.

Plates.—Aggregate orders received during the past week measure up very favorably with those taken prior to the holiday. The greater part of the business placed has been in small lots, showing a continued activity on the part of the general trade. Some very satisfactory business in structural, boat and locomotive steel is pending and the trade looks for a moderate increase in the demand in the near future. Prices are unchanged, 1.50c. minimum being named for ordinary plates delivered in buyers' yards in this vicinity.

Pig Iron.—The market appears just a trifle broader. In several instances pending negotiations have been closed and consumers appear to be making their purchases on a more even basis. A price level has apparently been established in a majority of the grades at which buyers are willing to take care of their regular requirements without much shopping around, which brings the business on a more normal basis. Current quotations are unchanged. One of the leading interests in this district, which for a month past has been a most aggressive seller, now has its product for the next four months practically contracted for and has decided on a more conservative policy. Stocks on merchant furnace banks are smaller and do not show any indication of increasing. One furnace, Robesonia, in the Lebanon Valley, was blown out this week, while preparations to blow in the No. 2 furnace of the Warwick Iron & Steel Company are being made, and this stack is expected to be making iron by August 1. A better movement in both foundry and steel making grades has been reported. One block of 5000 tons of basic was taken by an Eastern steel mill for prompt shipment at $14.25, delivered, while a sale of 7500 tons, shipment in equal portions during the last five months of the year, was made to a central Pennsylvania melter at $15, delivered. One block of about 5000 tons for August-September delivery is before the trade. Transactions in low phosphorus iron have been unimportant. In foundry iron the most active movement has been in the pipe making grades. One Delaware River melter has been inquiring for a lot of 6000 tons, while another has been making purchases against a recent inquiry for 5000 tons, one sale of 2000 tons of off basic for August-September delivery at a price between $14.25 and $14.50 being reported. In the higher foundry grades the quantities taken have, as a rule, been smaller, ranging from carloads to lots of a few hundred tons, for near future to extended delivery. Standard brands of eastern Pennsylvania No. 2 X foundry are pretty generally maintained at $15 minimum, delivered here, although reports are occasionally heard that small concessions are made in competition, but lack confirmation, and it is believed that with low-priced sellers sold up the tendency to shade prices will disappear. There has been little movement in Virginia foundry grades. Small sales are reported at unchanged prices, although lower quotations are said to have been named by one producer for iron of special analysis. The sale of a block of 1000 tons of coke malleable, for delivery over the last half to a consumer in this district, is reported. The demand for forge iron for mill purposes continues quiet and prices are nominally quoted at $14, furnace. The following range of quotations is named for standard brands, delivered in buyers' yards in this district during the third quarter and, in instances, the second half of the year:

Eastern Pennsylvania No. 2 X foundry	$15.00 to $15.25
Eastern Pennsylvania No. 2 plain	14.75 to 15.00
Virginia foundry	15.05 to 15.50
Gray forge	14.50
Basic	14.25 to 15.00
Standard low phosphorus	20.50 to 20.75

Structural Material.—Current orders for plain shapes have been fully up to the volume prior to the holiday, but there has been less new business offered in this immediate district in the way of fabricated material. The smaller fabricators are not bidding very extensively on anything but small jobs, as the larger projects usually go to the larger concerns on a price basis, and until they get filled up little betterment in fabricated prices is anticipated. The steel work for the new high school in West Philadelphia will be subject to re-estimation, as the contract for the construction under revised specifications has just been given to Cramp & Co., contractors. Some moderate bridge business is being figured on and the trade anticipates continued active conditions. Prices for plain shapes are firmly held at 1.50c., delivered here.

Sheets.—Mills in this district have resumed operations at practically full capacity. A considerable amount of business accumulated during the suspension last week and buyers are urging shipments. There has been little forward business placed, makers not being anxious for such orders at current prices. Individual orders, however, are reported as being larger in size. Sheet mills are encouraged with present conditions and look forward to a period of continued activity. Prices are firm, the following range, f.o.b. Eastern maker's mill, being named: Nos. 18 to 20, 2.30c.; Nos. 22 to 24, 2.40c.; Nos. 25 to 26, 2.50c.; No. 27, 2.60c.; No. 28, 2.80c.

Bars.—The market still lacks strength. Small lot buying in refined iron bars continues and no difficulty is experienced in obtaining the recent minimum, 1.20c., mill, for the general run of business. No inquiries of sufficient size to thoroughly test the market have been reported. A moderate business in steel bars is reported at 1.40c., delivered here. Refined iron bars continue to be quoted at 1.27½c. to 1.32½c., delivered in this vicinity.

Coke.—A very fair demand for both furnace and foundry coke is reported and there seems to be a tendency on the part of sellers to stiffen up prices, particularly in cases where extremely low prices have recently been named. Some further business has been closed against recent inquiries for large blocks of furnace coke. Further sales of prompt coke are also reported. In foundry coke contracts in lots covering upward of 1000 tons are reported at prices ranging from $2 to $2.30, at oven. The following range of prices, per net ton, is named for deliveries in buyers' yards in this vicinity:

Connellsville furnace coke	$3.65 to $4.00
Foundry coke	4.10 to 4.55
Mountain furnace coke	3.25 to 3.60
Foundry coke	3.70 to 4.15

Old Material.—While purchases have not been numerous or involved any large quantities, the tone of the market is firmer and it is believed that prices are strictly at the bottom and that any movement must be upward. Consumers are showing more interest in the market and in several instances prices are slightly higher. Heavy melting steel shows a somewhat wider range; odd lots can still be had at $13, delivered, but $13.25 is offered for strictly No. 1 material and $13.50

THE IRON AND METAL MARKETS

would be necessary to bring out any quantity. Wrought iron pipe has also been in more active demand. No. 1 railroad wrought is stronger and borings have been in better demand. Stove plate has also been more active. The recent offerings of 1000 tons of Panama scrap, for which bids were opened yesterday, will, no doubt, go to the Alan Wood Iron & Steel Company, which was the high bidder at $11.13. Considerable criticism is heard on the new plan of bidding for the Panama scrap as now outlined by the Isthmian Canal Commission, which will receive proposals on September 5 for the purchase of the "French scrap" in the Canal Zone, Panama. The plan is to sell the material as it lies, the purchaser to bear all expense of breaking up, hauling, removing and transporting. Bids are to be in a lump sum for the entire amount of scrap, and three years will be allowed for the removal of the material. The following quotations, while still to a certain extent nominal, represent about the market for early deliveries in buyers' yards, eastern Pennsylvania and nearby points, carrying a freight rate from Philadelphia varying from 35c. to $1.35 per gross ton:

No. 1 heavy melting steel scrap	$13.00 to $13.50
Old steel rails, rerolling (nominal)	14.00 to 14.50
Low phosphorus heavy melting steel scrap	16.75 to 17.25
Old steel axles (nominal)	19.25 to 19.75
Old iron axles	24.00 to 24.50
Old iron rails	16.75 to 17.25
Old car wheels	12.75 to 13.25
No. 1 railroad wrought	15.00 to 15.50
Wrought iron pipe	12.50 to 13.00
No. 1 forge fire	11.00 to 11.50
No. 2 light iron (nominal)	6.75 to 7.25
Wrought turnings	8.75 to 9.25
Cast borings	8.50 to 9.00
Machinery cast	13.00 to 13.50
Railroad malleable (nominal)	11.50 to 12.00
Grate bars, railroad	10.00 to 10.50
Stove plate	10.00 to 10.50

Cincinnati

CINCINNATI, OHIO, July 11, 1911.—(*By Telegraph.*)

Pig Iron.—No decided change toward activity has taken place, but there is an improved feeling that is partially supported by the number of inquiries coming in and by the sale of a few medium-sized lots of iron for last half delivery. The larger consumers are watching the situation closely and at the first sign of any advance in present price will doubtless enter the market. It is understood that the foundries in this territory are covered for the third quarter and a majority of them have enough iron to last throughout the year. Among inquiries is one from a southern Ohio manufacturer for 600 tons each of Southern and Northern iron, averaging 2.25 to 2.50 in silicon, and about 900 tons of Northern foundry iron with silicon analyzing 1.25 to 1.60. A northern Indiana melter wants 2000 tons of foundry and malleable, and in Michigan is a prospective customer for 1000 tons of malleable. There are a number of small inquiries before the trade, but a large proportion of these is probably from consumers who are already stocked up and are merely testing the market. Two Indiana melters bought 500 and 1000 tons of Northern No. 2 foundry around $13 at furnace. A southern Ohio consumer took 800 tons of Southern No. 2 foundry at $10, Birmingham. Several small sales of Southern iron have been made, and $10 is the recognized price for delivery during the remainder of the year. A southern Ohio manufacturer is reported to have purchased a round lot of Northern basic at the regular market price. Based on freight rates at $3.25 from Birmingham and $1.20 from Ironton we quote, f.o.b. Cincinnati, as follows:

Southern coke, No. 1 foundry and 1 soft	$13.75 to $14.00
Southern coke, No. 2 foundry and 2 soft	13.25 to 13.50
Southern coke, No. 3 foundry	12.75 to 13.00
Southern coke, No. 4 foundry	12.50 to 12.75
Southern gray forge	12.50 to 12.75
Ohio silvery, 8 per cent. silicon	16.98 to 17.50
Lake Superior coke, No. 1	14.70 to 14.95
Lake Superior coke, No. 2	14.20 to 14.45
Lake Superior coke, No. 3	13.70 to 13.95
Basic, Northern	14.45 to 14.70
Standard Southern car wheel	25.25 to 25.75
Lake Superior car wheel	20.00

(By Mail.)

Coke.—A central Western consumer has signed a 12 months' contract covering a daily supply of 50 to 100 tons of Pocahontas furnace coke. There is also some straggling contracting in foundry coke. It is reported that Eastern interests have done some heavy buying of furnace coke, but this has not been confirmed. Prices are stationary in all three fields, and we quote per net ton at oven, as follows: For prompt shipment 48-hr. coke $1.40 to $1.55, with the probability that last half business would be accepted at the latter figure, with a premium of a few cents to cover a year's supply. Foundry coke is not in much demand around $2 for prompt shipment, but contracts for future requirements are made all the way from $2.10 to $2.35.

Finished Material.—Specifications on sheets are coming in freely; especially from jobbers, who are taking advantage of present quotations to stock up. The jobbers are also getting a good business from their customers. The mills rolling sheets in this section of the Middle West have all closed down for the usual midsummer repairs. Prices on sheets are unchanged and the regular quotations based on Pittsburgh delivery govern in all contracts made. Steel bars and structural material hold up well, and local warehouse prices are 1.70c. per lb. for steel bars and 1.80c. for structural material. Hoops and bands show some improvement, so far as the inquiry is concerned, but actual business booked is about the same as during nearby previous weeks. Railroad track material is moving better.

Old Material.—The midsummer holiday season, that includes the shutting down of the rolling mills for usual repairs, has contributed to the present dullness in the scrap market. A number of the foundries are covered for a future supply, and there are no indications of any change either in the demand, or in present quotations. Prices for delivery in buyers' yards, southern Ohio and Cincinnati, are as follows.

No. 1 railroad wrought, net ton	$11.50 to $12.00
Casting borings, net ton	4.50 to 5.00
Steel turnings, net ton	5.50 to 6.00
No. 1 cast scrap, net ton	9.50 to 10.00
Burnt scrap, net ton	6.50 to 7.00
Old iron axles, net ton	16.50 to 17.00
Bundled sheet scrap, gross ton	7.25 to 8.25
Old iron rails, gross ton	13.50 to 14.00
Relaying rails, 50 lb. and up, gross ton	21.00 to 22.00
Old car wheels, gross ton	10.75 to 11.75
Heavy melting steel scrap, gross ton	10.00 to 10.50

Cleveland

CLEVELAND, OHIO, July 11, 1911.

Iron Ore.—Practically no sales are being made and there is very little inquiry. Sellers are looking for some activity next month as some furnace interests will need ore but have announced that they will not place their orders until the latter part of the season. The amount of buying will depend considerably on the condition of the pig iron market during the next few weeks. Conditions in the lake trade show some improvement over June. We quote prices as follows: Old range Bessemer, $4.50; Besaba Bessemer, $4.25; old range non-Bessemer, $3.70; Mesaba non-Bessemer, $3.50.

Coke.—The recent buying movement of foundry grades for the last half has subsided, a large percentage of consumers in this territory not yet having covered for their requirements for the remainder of the year. Some of these do not appear disposed to make contracts but are buying small lots as they need it. There is no activity in furnace grades. We quote standard Connellsville furnace coke at $1.45 to $1.50, per net ton at oven for spot shipment, and $1.60 to $1.70 for the last half. Connellsville 72-hr. foundry coke is quoted at $1.75 to $2.15 for spot shipment and $2.15 to $2.40 for the last half.

Pig Iron.—Local selling agencies report a moderate demand from outside this territory from small consumers in lots of 400 tons and under. In this immediate territory the market is quiet, sales being limited mostly to lots of 200 tons and under. Some consumers seem to think that prices may go lower and are buying only a few weeks' supply instead of covering for their last half requirements. The only foundry iron inquiry for a round tonnage is from the Westinghouse Electric & Mfg. Company; an unspecified tonnage for its Cleveland and Pittsburgh plants for delivery during the last four months of 1910 and the first three months of next year. This inquiry is for No. 1, 2 and 3 iron. It is understood that the amount that will be purchased will depend on the price. Sellers who quote on the inquiry for the first quarter of next year state that they will ask about 50c. a ton over their last half quotations. The southern Ohio steel interest that had an inquiry out for basic is understood to have closed during the week for considerable tonnage, none of this business going to Cleveland interests. A new inquiry is for 1000 tons of malleable iron for the last half. Cleveland furnaces that have maintained for some time the price on foundry

THE IRON AND METAL MARKETS

iron for Cleveland delivery at $14.25, delivered, for No. 2, have all reduced their price 25c. a ton, one seller first making the reduction and the others meeting the price. For outside shipment No. 2 foundry is quoted at $13.50, at furnace, which is now pretty well established as the Valley price. For prompt shipment and for the last half we quote, delivered Cleveland, as follows:

Bessemer	$15.90
Basic	14.00
Northern foundry, No. 2	14.00
Gray forge	13.25
Southern foundry, No. 2	$14.35 to 14.60
Jackson Co. silvery, 8 per cent. silicon	17.50 to 17.75

Finished Iron and Steel.—The recent improvement in the demand for all finished lines is maintained in spite of the fact that the intensely hot weather during the past few days has interfered somewhat with business and some buyers are holding off until their inventories are finished. Orders are quite numerous but they are mostly for small lots. The aggregate tonnage is quite satisfactory. General reports from consumers indicate some improvement in their orders. Some of the implement manufacturers have started up their plants at full capacity with a satisfactory volume of contracts on hand and good specifications for steel bars are coming from this source. Local bolt and nut makers, whose business has been light for some time, report a marked improvement in inquiries. The bulk of the steel bar consumers in this territory are now under contract, although a few are still holding out for lower prices. The steel bar market is now firm, with little, if any, price shading. The demand for structural material is fairly active and some new building work is coming out, requiring lots of around 200 tons or under. Bids for the 2000 tons of steel for the new city hall in Cleveland will be received July 18. The city will also be in the market shortly for a large tonnage for rebuilding the Central viaduct. The Pennsylvania Railroad is advertising for bids for foundation work in connection with a large amount of grade crossing elimination work in Cleveland, and is expected to be in market for a considerable tonnage of steel shortly. The demand for iron bars continues light. We quote iron bars at 1.25c. to 1.30c., Cleveland. The city of Cleveland has awarded the contract for 3600 tons of cast iron pipe for the water works department to the United States Cast Iron Pipe & Foundry Company at $23.85 delivered mostly in 12 to 24-in. sizes. The same bidder has been awarded the contract for 945 tons of cast iron pipe for the city of Columbus, Ohio, at $24 per ton. The contract for 230 tons of special castings for the Cleveland water works department was given to the Bowler Foundry, Cleveland.

Old Material.—The market is firmer with a better feeling among dealers than for some time. A local steel mill purchased during the week several thousand tons of scrap for delivery until October 1. Most of this was heavy steel scrap, for which the consumer paid $11.50 to $12. Some new inquiry for heavy steel scrap has also come from the Pittsburgh district. Local bar iron mills are closed down and are taking no scrap. Dealers have advanced prices 25c. a ton on heavy steel scrap and from 25c. to 50c. a ton on a few other grades. The Pennsylvania Railroad received bids July 11 on a large tonnage. Dealers' prices per gross ton, f.o.b. Cleveland, are as follows:

Old steel rails, rerolling	$13.00 to $13.50
Old iron rails	15.00 to 15.50
Steel car axles	17.50 to 18.00
Heavy melting steel	11.75 to 12.25
Old car wheels	11.50 to 12.00
Relaying rails, 50 lb. and over	22.00 to 23.50
Agricultural malleable	10.75 to 11.00
Railroad malleable	11.50 to 12.00
Light bundled sheet scrap	8.50 to 9.00

The following prices are per net ton, f.o.b. Cleveland:

Iron car axles	$11.00 to $11.50
Cast borings	6.00 to 6.50
Iron and steel turnings and drillings	6.75 to 7.00
Steel axle turnings	8.00 to 8.50
No. 1 busheling	10.00 to 10.50
No. 1 railroad wrought	11.00 to 12.00
No. 1 cast	11.00 to 11.50
Stove plate	10.00 to 10.50
Bundled tin scrap	11.00 to 11.50

St. Louis

ST. LOUIS, Mo., July 10, 1911.

The improvement in the market continues to manifest itself. Prices that would have been accepted two weeks ago are flatly declined, while inquiries are more numerous and more insistent. Dealers are refusing to consider first half 1912 business on the present basis, and even last quarter business is not desired. Not the least interesting feature of the situation is the encouragement received by the agricultural implement houses, which through their representatives have learned that the reports of crops damage have been much exaggerated as a whole, while recent rains have repaired much of the loss in this district.

Pig Iron.—The status of the pig iron market may best be realized from the fact that where a week or 10 days ago $10 would have been accepted for No. 2 Southern, offers in quantity of $10.25 have been refused by the sellers, who, moreover, are not particularly inclined to consider business beyond the present quarter at existing prices. Another interesting development is a shortage in this market of low grade iron, especially No. 4, of which not enough could be found the past week to make a quotation on an inquiry received. Still another encouraging feature is the fact that the agricultural implement houses are showing signs of entering the market more strongly, having become satisfied through the reports of their agents as to crops. There are no new developments of special interest in basic, malleable, northern foundry and other irons.

Coke.—The quotations on coke show a better feeling. Where $1.90 would have been taken two weeks ago for prompt delivery, $2.10 is now the figure, while for last half delivery $2.25 to $2.35 is the price for the best 72-hour selected Connellsville. The inquiries are increasing and during the week quotations were asked on 6000 tons of Connellsville and Wise county in about equal proportions. The inquiries on half year and full year contracts are of a very satisfactory character, but with no closings of importance as yet. A review of the month of June in practically all the offices shows that the aggregate business was larger than for any month since February. This has all, or nearly all, been done on requisitions on regular contracts, which shows that the consuming demand is setting in more and more strongly. The situation in pig iron is the same, the month's business bulking up well above the preceding three or four months.

Finished Iron and Steel.—There has been a good steady business in the finished products line all through the past week, with no exceptionally large inquiries or sales. In standard section steel rails the inquiries for the week aggregate probably 1600 tons, but none has been closed. Structural material is moving well, the contractors using up their supplies and calling for more to keep their stocks in shape. In this division of the market there have been no large new inquiries and no especially important sales. Plates have been quiet with very little doing and no change in prices. In the light rails the coal mines are making inquiries, but the lumber lines have shown no activity. Bars are in the same old situation and the differential in favor of iron still keeps them from cutting any material figure in the transactions. Track fastenings continue in fair request. Altogether the market seems to be in a good condition, with a feeling on the part of the principal houses that there will be a much more active business soon.

Old Material.—There is practically nothing new to report in the scrap market. Dealers are still taking lots for utilization later in the season, when, they feel sure, there will be greater activity. The prices are firm, and while the present situation continues speculative in a measure the foundation for the future is substantial. Much of the present tone of the scrap market is due to the generally better feeling in the new material lines. Dealers' prices per gross ton, f.o.b. St. Louis, are as follows:

Old iron rails	$12.50 to $13.00
Old steel rails, rerolling	11.25 to 11.75
Old steel rails, less than 3 ft.	10.25 to 10.75
Relaying rails, standard section subject to inspection	23.00 to 23.50
Old car wheels	13.00 to 13.50
Heavy melting steel scrap	10.25 to 10.75
Frogs, switches and guards cut apart	10.25 to 10.75

The following quotations are per net ton:

Iron fish plates	$11.00 to $11.50
Iron car axles	18.50 to 19.00
Steel car axles	17.50 to 18.00
No. 1 railroad wrought	10.75 to 11.25
No. 2 railroad wrought	9.75 to 10.25
Railway springs	9.00 to 9.50
Locomotive tires, smooth	14.50 to 15.00
No. 1 dealers' forge	8.50 to 9.00
Mixed borings	5.00 to 5.50
No. 1 busheling	9.00 to 9.50
No. 1 boilers, cut to sheets and rings	8.00 to 8.50
No. 1 cast scrap	10.00 to 10.50
Stove plate and light cast scrap	8.00 to 8.50
Railroad malleable	8.00 to 8.50
Agricultural malleable	7.00 to 7.50
Pipes and flues	8.00 to 8.50
Railroad sheet and tank scrap	7.25 to 7.75
Railroad grate bars	8.00 to 8.50
Machine shop turnings	6.50 to 7.00

THE IRON AND METAL MARKETS

Buffalo

BUFFALO, N. Y., July 11, 1911.

Pig Iron.—Business for the week has been very good, with larger inquiry and a greater number of sales than for the week preceding. Placements noted aggregate about 40,000 tons of foundry irons of various grades and malleable from New York State, New England and Canada and for last half delivery. The orders include a number of large individual tonnages. Most of the furnace companies, being in better shape as to bookings for present quarter business, and as to bookings and prospects for output for last quarter, are much less inclined to make concessions in quotations and are well satisfied to hold off for better prices which many furnacemen anticipate will soon be in evidence, prices which have been ruling being considered altogether too low. One furnace interest has put prices up 25c. per ton over the entire schedule list. We quote as follows f.o.b. Buffalo for last half delivery:

No. 1 X foundry	$13.75 to $14.25
No. 2 X	13.50 to 14.00
No. 2 plain	13.25 to 13.75
No. 3 foundry	13.00 to 13.50
Gray forge	13.00 to 13.25
Malleable	13.75 to 14.25
Basic	14.00 to 14.75
Charcoal	16.50 to 17.25

Finished Iron and Steel.—The general situation continues to show a very favorable aspect and all indications point to a more than usually active midsummer trade. There has been further contracting for steel bars in the week with good demand in sheets and some business in plates and billets. Structural specifications are quite satisfactory and a good deal of fabricated work is coming up with architects. Prices have a strengthening tendency and are gradually getting better. Bids have gone in this week for the Eastman Kodak Company's office building, Rochester, N. Y., requiring about 1500 tons of steel, but the awarding of the contract has not yet been announced. John Gill & Son, Cleveland, have received the general contract for the Buffalo General Electric Company's 17-story building, requiring about 2000 tons. The George Kellogg Structural Company is the low bidder for steel for the Plymouth Methodist Church, Buffalo, about 100 tons. Figures are soon to be received for a business building for the Magnus Beck Brewing Company on Lafayette Square, Buffalo, taking 100 tons.

Old Material.—Good inquiry continues, but consumers are not willing to pay the prices asked by dealers. Consequently material is not going out on new orders in very large quantities. Some grades have been advanced. We quote as follows per gross ton f.o.b. Buffalo:

Heavy melting steel	$12.50 to $13.00
Low phosphorus steel	15.50 to 16.00
No. 1 railroad wrought	13.50 to 14.00
No. 1 railroad and machinery cast scrap	13.50 to 14.00
Old steel axles	18.50 to 19.00
Old iron axles	22.00 to 22.50
Old car wheels	13.00 to 13.25
Railroad malleable	12.00 to 12.50
Boiler plate	11.00 to 11.50
Locomotive grate bars	11.00 to 11.50
Pipe	9.50 to 9.75
Wrought iron and soft steel turnings	7.00 to 7.25
Clean cast borings	6.50 to 7.00

Birmingham

BIRMINGHAM, ALA., July 10, 1911.

Pig Iron.—The sale of 2000 tons of gray forge iron is reported for shipment in September at $9.25, Birmingham. A lot of 1000 tons of No. 3 foundry for shipment the last half was sold at $9.50, Birmingham, and 750 tons of No. 2 soft for the same delivery brought $10. The sale of 600 tons of No. 3 foundry for third quarter delivery at $9.50 is also reported. Smaller lots than those mentioned placed during the week aggregate from 3500 to 5000 tons and are practically all for nearby shipment. The most important inquiries now pending consist of a lot of 2000 tons required by a stove manufacturer for shipment during the remainder of the year and 500 tons for early delivery by a pipe manufacturer. Considerably more demand for spot shipments has been noted than for some weeks, but the individual requirements are comparatively small. The movement from furnace yards so far this month has exceeded expectations and has represented practically the entire daily output at all furnace plants in operation. A scarcity of low grades has become very perceptible, in the case of one large producer, no grades below No. 2 foundry now being offered. The close adjustment of the furnace output to order-book requirements was emphasized by the stock returns of July 1, which showed only an increase of 1000 tons in the aggregate accumulation in the month of June. This increase is easily accounted for by the suspension of operations at foundries the last week in June, and at this time the actual consumption is believed to be greater than the production. Since the receipt of stock reports quotations on forward deliveries are no doubt firmer. A leading interest now adheres strictly to a basis of $10.25, Birmingham, for last half shipment, and with other concerns the tendency to limit commitments at $10 to shipments within the third quarter is decidedly more pronounced. As a result of the difference in views as to terms for delivery of tonnage sold at prevailing prices the business placed the past week went largely to two of the producing interests. It is noted that three of the smaller producers remain practically out of the market for any deliveries and that as yet no figures applicable to deliveries during the first quarter or first half of next year have been elicited from any producers. The accumulation of basic iron in this district was very materially reduced in the month of June, and returns from charcoal iron furnaces also showed a reduction. We quote the local market for prompt shipments as below, per gross ton, f.o.b. cars here, with an advance of from 25c. to 50c. per ton quotable for deliveries to cover the remainder of the year:

No. 1 foundry and soft	$10.50
No. 2 foundry and soft	10.00
No. 3 foundry	9.50
No. 4 foundry	9.25
Gray forge	9.25
Mottled	9.00
Standard basic, chill cast	10.25
Off basic	9.75
Charcoal car wheel iron	22.50

Cast Iron Pipe.—It is understood that the contract for Los Angeles, Cal., recently placed, went to a Virginia company. Local concerns are bidding on a lot of 750 tons for San Diego, Cal., which will probably be placed within two weeks. The city of Dothan, Ala., is soon to enter the market for sufficient tonnage to construct a modern water works system, and several other Southern cities will place orders as soon as financial arrangements can be made. Both of the local plants are now in full operation with sufficient on order-books to warrant steady going for some months. No change has been made in quotations for any sizes or grades, and we continue to quote water pipe as follows, per net ton, f.o.b. cars here: 4 to 6-in., $22; 8 to 12-in., $21; over 12-in., average $20, with $1 per ton extra for gas pipe. These prices are probably subject to shading for large municipal contracts.

Old Material.—Dealers do not report any change in the condition of this market in the past week, although, with the scarcity of low-grade pig iron more pronounced, a much stronger demand for light cast is anticipated. Forwardings of steel grades during the week were very light and the receipts at dealers' yards of little consequence. The tonnage of railroad wrought offered in this market for some months has been exceptionally light, but with the dismantling of the old Gate City rolling mill a good tonnage of machinery cast will be offered. We continue to quote, nominally, as follows, per gross ton, f.o.b. cars here:

Old iron axles (light)	$13.50 to $14.00
Old steel axles (light)	12.50 to 13.50
Old iron rails	12.50 to 13.00
No. 1 railroad wrought	11.00 to 11.50
No. 2 railroad wrought	9.50 to 10.00
No. 1 country wrought	7.50 to 8.00
No. 2 country wrought	7.00 to 7.50
No. 1 machinery	9.50 to 10.50
No. 1 steel	8.50 to 9.00
Tram car wheels	8.00 to 8.50
Standard car wheels	9.50 to 10.50
Light cast and stove plate	7.00 to 7.50

Coal and Coke.—Standard Alabama 72-hour foundry coke is now quoted at an advance of 25c. per ton over last quotations for contracts covering a twelve-month period. The price for furnace and domestic coke is unchanged, but those grades are more in demand. No change has been made in the current quotations for steam coal. The 1911-1912 contracts for this last named have practically all been placed and the mines generally have been allotted a good tonnage, but the surplus production which has resulted from the opening of new shafts and the increase in the force employed at other mines is not yet fully taken care of. The movement of domestic coal is fairly under way with prices very close to those obtained last season.

THE IRON AND METAL MARKETS

New York

NEW YORK, July 12, 1911.

Pig Iron.—A fair business is reported in moderate lots. No large transactions have occurred in this immediate territory as far as could be ascertained. Inquiries are few, but among them is one for 5000 tons. While a limited number of eastern Pennsylvania makers are somewhat aggressively seeking business, the Buffalo producers, on the other hand, appear to entertain more confidence as to the immediate future and are holding prices firmly at a slight advance. Northern iron at tidewater is quoted as follows: No. 1 foundry, $15.50 to $15.75; No. 2X, $15 to $15.25; No. 2 plain, $14.50 to $15. Southern No. 1 foundry is quoted at $14.75 to $15.25 and No. 2, $14.25 to $14.75.

Cast Iron Pipe.—The city of New York will open bids on 1200 tons of water pipe for Long Island City July 14. The demand for small lots is less active. Carload lots of 6-in. are quoted at $21 to $22 per net ton, tidewater.

Finished Iron and Steel.—A conspicuous feature of the week was the small amount of new large work in structural lines offered to fabricators and steel producers. A fair aggregate of large work, however, was awarded as the enumeration below shows. Bar iron is dull, but no price changes are reported. No additional evidence was obtained of specially large orders in New York territory for steel bars. Plate mills are said to be running about 70 per cent. capacity, but orders are for immediate shipments. Jones & Laughlin Steel Company will fabricate the 3300 tons of the Adams Express Building, New York, and the 900 tons of an insurance building in Richmond, Va.; the Pennsylvania Steel Company will supply 1000 tons for Boston & Albany bridges at Worcester, Mass., 1000 tons for a Delaware & Hudson bridge and the 550 tons for the Glen Onoko bridge of the Central Railroad of New Jersey; the Fort Pitt Bridge Company has been given 400 tons of New York Central work in New York and 1000 tons for the Delaware, Lackawanna & Western piersheds in New York; the Hay Foundry & Iron Works has 800 tons for a Newark bank; the A. E. Norton Company has 700 tons for a loft on West Thirty-seventh street, New York; Radley Steel Construction Company has 1000 tons for a loft building at Thirty-sixth street and Madison avenue; the Lackawanna Bridge Company has 800 tons for the American Radiator Company's warehouse at Bayonne; American Bridge Company has 500 tons for the Wilkins building, Washington, and the Cambria Steel Company has 300 tons for a powerhouse extension, General Electric Company, at Schenectady, N. Y. Bids are now in for the 2500 tons of piersheds at Norfolk, Va.; taking of bids for the 12,000 or 14,000 tons for the Kansas City terminal has been postponed to July 20 and bids are being taken for a 1500-ton brewhouse structure for Jacob Ruppert, New York. An estimate of 4000 tons has been made for the requirements of the revised Æolian building. It is expected an award will before long be made for the plates for two government colliers, involving approximately 8000 tons. Provisional awards for parts of the Lexington avenue subway have been made, but the additional official approval required and the present consideration of operating arrangements do not necessarily make them final. Sections 6, 8, 10 and 11 have been given to the Bradley Contracting Company, including 16,800 tons of riveted steel and steel beams and 2600 tons of steel bars, and section 7 has been given to Chas. H. Peckworth, including 8000 tons of riveted steel and steel beams and 400 tons of steel bars.

Old Material.—Conditions continue exceedingly unsatisfactory in this branch of trade. Dealers find it very difficult to do business at the existing level of prices. On the one hand, consumers are persistently endeavoring to purchase cheaper, while on the other hand those who have stocks are unwilling to let them go at a price to enable transactions to be put through. Sales are limited to small quantities, steel scrap being probably the leader in the tonnage moved. The foundries are purchasing cast scrap quite sparingly at present, as they are having difficulty in keeping their molders at work, owing to the hot weather. The Isthmian Canal Commission is inviting bids, to be opened September 5, for the purchase of material in the Canal Zone, Isthmus of Panama, consisting of abandoned locomotives, dump cars, dredges, parts of old machinery and miscellaneous junk, and all other French material that has not been taken up by the Canal Commission and credited to "French scrap." The material will be sold as it lies, the purchaser to bear all expense of breaking up, handling, removing and transporting it within three years. Quotations are as follows per gross ton, New York and vicinity:

Old girder and T rails for melting	$10.75 to $11.00
Heavy melting steel scrap	10.75 to 11.00
Relaying rails	20.00 to 21.00
Rerolling rails	(nominal) 12.00 to 12.25
Standard hammered iron car axles	21.00 to 21.50
Old steel car axles	16.75 to 17.25
No. 1 railroad wrought	12.75 to 13.25
Wrought iron track scrap	12.00 to 12.50
No. 1 yard wrought, long	11.50 to 12.00
No. 1 yard wrought, short	10.00 to 10.50
Light iron	4.25 to 4.75
Cast borings	5.25 to 5.75
Wrought turning	6.25 to 6.75
Wrought pipe	9.50 to 10.00
Old car wheels	11.00 to 11.50
No. 1 heavy cast, broken up	11.00 to 11.50
Stove plate	8.50 to 9.00
Locomotive grate bars	8.50 to 9.00
Malleable cast	10.00 to 10.50

Metal Market

NEW YORK, July 12, 1911.

The Week's Prices

Cents Per Pound for Early Delivery.

	Copper, New York.		Lead.		Spelter.	
July.	Lake.	Electrolytic.	Tin. New York.	New York.	St. Louis.	New York.	St. Louis.
6	12.87½	12.62½	44.75	4.50	4.35	5.80	5.60
7	12.87½	12.62½	44.00	4.50	4.35	5.80	5.60
8	12.87½	12.62½	.....	4.50	4.35	5.80	5.60
10	12.80	12.60	43.75	4.50	4.35	5.80	5.60
11	12.75	12.55	43.75	4.50	4.35	5.80	5.60
12	12.75	12.55	43.50	4.50	4.35	5.80	5.60

Tin is listless and lower. Copper is in poor demand and somewhat weaker. Lead is dull but firm. Spelter continues fairly active.

Copper.—The copper market has been quiet all the week and prices have fallen off somewhat. Many consider the weakening of the market due to the lack of demand, as price reductions were certainly not very marked and some holders of copper have refused to make any concessions under the price demanded a week ago. Electrolytic copper could be bought in the New York market to-day for 12.55c., while lake could be had at 12.75c. The London market was easy this morning with spot copper offered at £57 2s. 6d. The exports of copper so far this month have been fairly good, amounting in all to 9795 tons.

Copper Averages.—The Waterbury average for June was 12.62½c. The average price of lake copper for June was 12.71c. and the average price of electrolytic was 12.47c.

Pig Tin.—The expected arrival of the steamer Minnetonka to-morrow with 1000 tons of tin on board has reduced the premiums on spot tin and to-morrow will see the end of a shortage in the immediate supply of tin in this country for the time being. During the week the tin on board the Minnetonka has been traded in at from 1c. to 1¼c. less a pound than was the price demanded in the New York market. This tin has been bought and sold and resold to such an extent that it now belongs to consumers and will be shipped to them direct from the boat. This relieves the situation, as consumers will be largely supplied for their early wants and not much buying is expected. The tin that is left will be put on the market and lower prices will probably result. Outside of trading in the Minnetonka tin there has been little doing in the New York market as the demand has been light and the weather conditions have contributed to the general listlessness in trading. Spot tin is offered in this market this morning at 43.50c. and tin on board the Minnetonka can be had at about 1c. less. The London market has been inactive and somewhat weaker. This morning spot tin was sold in London at £195 10s. and futures at £188 15s. Arrivals of pig tin in this country so far this month have been 971 tons, while there are 2500 tons afloat, which includes those on board the boat due to arrive to-morrow.

Tin Plates.—The market in tin plates is quiet and the price is unchanged at $3.94 for 100-lb. coke plates. Foreign tin plates were offered this morning at the same price as a week ago, which is 13s. 9d. at Swansea, Wales.

Lead.—While lead is firm there has been very little buying. Consumers show no interest, but the outside sellers who are usually the first to cut the market are looking for an increased demand and are maintaining their price very firmly at 4.50c. New York, and 4.35c. St. Louis.

Spelter.—A fairly active demand exists for spelter, brass manufacturers being the principal buyers. Prices

THE IRON AND METAL MARKETS

have been fairly steady all the week, but the market is somewhat disorganized, and sellers are, in some cases, obliged to make concessions to induce trade. The metal was offered in New York to-day at 5.80c., and in St. Louis at around 5.60c. It is possible that these prices might be shaded.

Antimony.—Antimony has been quiet, and nothing more has been heard from the syndicate with the exception that some of those interested have been cutting prices, which is taken as an indication that they have quit the combination. Hallett's is weak at 8.12½c., and it can be bought for August and September delivery at 7.75c. Cookson's is 8.50c., and Chinese and Hungarian grades are 7.30c.

Old Metals.—The market is steady, with dealers' selling prices, New York, unchanged, as follows:

	Cents.
Copper, heavy cut and crucible	12.00 to 12.25
Copper, heavy and wire	11.50 to 11.75
Copper, light and bottoms	10.75 to 11.00
Brass, heavy	8.00 to 8.25
Brass, light	6.75 to 7.00
Heavy machine composition	10.50 to 10.75
Composition turnings	8.75 to 9.00
Clean brass turnings	8.00 to 8.25
Lead, heavy	4.20 to 4.25
Lead, tea	3.95 to 4.00
Zinc, scrap	4.25 to 4.30

Chicago

JULY 11.—The market for metals is dull and sluggish, with prices soft. Copper is off slightly and concessions were recorded in pig tin. We quote Chicago prices as follows: Casting copper, 12.65c.; lake, 13.00c., in carloads, for prompt shipment; small lots, ¼c. to ⅜c. higher; pig tin, carloads, 45c.; small lots, 42c.; lead, desilverized, 4.45c. to 4.50c. for 50-ton lots; corroding, 4.70c. to 4.75c. for 50-ton lots; in carloads, 2½c. per 100 lb. higher; spelter, 5.65c. to 5.70c.; Cookson's antimony, 9¼c., and other grades, 8¼c. to 8¾c., in small lots; sheet zinc is $7.50 f.o.b. La Salle, in carloads of 600-lb. casks. On old metals we quote for less than carload lots: Copper wire, crucible shapes, 10¾c.; copper bottoms, 9½c.; copper clips, 10¼c.; red brass, 9½c.; yellow brass, 7½c.; lead pipe, 3.90c.; zinc, 3.90c.; pewter, No. 1, 26c.; tin foil, 33c.; block tin pipe, 37c.

St. Louis

JULY 10.—The condition of the metal market is very satisfactory, quotations generally being firm and the metals in good demand. Pig tin is quotable at 44.85c., with an excellent demand. Lake copper is firm at 13.10c. and electrolytic at 13c., the same as last week, but well held at the figures. Antimony, Cookson's, is 8.85c. and strong. Lead is in good request and well held at 4.37½c., while spelter is also strong at 5.55c. to 5.60c. The ore market at Joplin holds up well on a basis of $42.31¼ per ton for 60 per cent., choice lots going as high as $45. Calamine is in good demand at $21 to $24 on a basis of 40 per cent. zinc at the bins and choice lots as high as $30. Lead ore is passing as high as $57 to $60 per ton at the bins. Old metals are quoted as follows: Light brass, 5c.; heavy brass and light copper, 8c.; heavy copper and copper wire, 9c.; zinc, 3c.; lead, 3¼c.; pewter, 20c.; tin foil, 29c.; tea lead, 3c.

Lake Ore Shipments for May

The movement of Lake Superior ore from upper Lake docks in June was 7,316,592 gross tons, an increase of 1,235,234 tons over May, but a decrease of 2,490,087 tons from June, 1910, or 34.03 per cent. The total shipments to July 1 this year were 14,918,258 tons, a decrease of 6,075,350, or 40.72 per cent. from 1911. In the following table the shipments are given by ports for the two years in gross tons:

Port and Dock	June, 1911.	June, 1910.	To July 1, 1911	To July 1, 1910.
Escanaba	588,108	767,615	1,067,740	1,734,735
Marquette	314,807	533,358	583,736	1,150,244
Ashland	304,555	704,248	662,412	1,515,585
Superior	1,635,651	1,321,877	2,951,490	2,632,835
Duluth	1,102,979	2,567,077	2,050,134	5,097,262
Two Harbors	840,345	1,418,414	1,577,426	2,782,627
Total	4,826,505	7,316,592	8,842,908	14,918,258
Decrease	2,490,087		6,075,350	

The Vigo Iron Company and the Wabash Iron Company, both of Terre Haute, Ind., have filed notices of dissolution. The former company operated a blast furnace for a number of years, but ceased its activity about 1897. The latter ran a rolling mill which was sold to the Republic Iron & Steel Company and was dismantled about 1905.

Iron and Industrial Stocks

NEW YORK, July 12, 1911.

The stock market of the past few days has chiefly been influenced by the weather reports, stocks generally advancing or declining according to the news from the agricultural sections. One stock whose course was determined by unknown influences was Virginia Iron, Coal & Coke, which made the phenomenal rise of $24 per share from Wednesday to Friday. American Steel Foundries and American Shipbuilding common declined because of the passing of dividends. The range of prices on active iron and industrial stocks from Wednesday of last week to Tuesday of this week was as follows:

Allis-Chalmrs., com	8½ - 9	Pressed St., com	36 - 36¼
Allis-Chalmrs., pref	28 - 29	Railway Spgs., com	35½ - 36
Beth. Steel, com	32¾ - 33	Railway Spgs., pref	101 -
Beth. Steel, pref	62 - 63	Republic, com	29⅝ - 30⅛
Can. com	16 - 17¼	Republic, pref	93½ - 93¾
Can., pref	84½ - 86	Sloss, com	48½ - 49
Car & Fdry., com	55 - 56	Tenn. Coal	16 - 16¼
Car & Fdry., pref	117	Tenn. Copper	55⅝ - 56
Steel Foundries	36 - 40	U. S. Steel, com	77½ - 79¼
Colorado Fuel	34¾ - 34⅝	U. S. Steel, pref	118 - 119
General Electric	159 - 163	Westinghouse Elec	74½ - 76¼
Gt. N. ore cert	56½ - 61	Va. I. C. & Co	73 - 97
Int. Harv., com	122 - 123¾	Am. Ship, com	57 - 63½
Int. Harv., pref	124 - 127	Am. Pneu. Tool	51½ - 51¾
Int. Pump, com	40½ - 41½	Cambria Steel	44½ - 45
Int. Pump, pref	89 - 89¾	Lake Sup. Corp	25 - 26¼
Loc motive, com	41	Pa. Steel, pref	106½ -
Nat. En. & St., com.	18 - 19¾	Crucible St., com	12¾ - 13
Nat. En. & St. pref.	95 - 96	Crucible St., pref	81½ - 81¾
Pittsburgh St., pref.	103⅞-105	Harb. Walk Ref., pref	98

Dividends Declared.

The Collins Company, Collinsville, Conn., regular semi-annual, 4 per cent., and extra 1 per cent.

The Turner Tanning Machinery Company, semi-annual, 3½ per cent., payable July 25.

The International Steam Pump Company, quarterly, 1½ per cent. on the common and 1¾ per cent. on the preferred.

The American Wringer Company, quarterly, 1½ per cent., payable July 15.

The American Steel Foundries has announced the suspension of dividends on its capital stock, the reason being the long-continued economies of the railroads.

The Vulcan Detinning Company, regular quarterly, 1¼ per cent., payable July 20.

The Harbison-Walker Refractories Company, regular quarterly, 1½ per cent., payable July 20.

Iron and Steel Expert Wanted.—The United States Appraiser of Merchandise at the Port of New York is looking for an iron and steel expert. About two million dollars' worth of steel is imported at New York each year. The examiners under the appraiser examine, classify and value this for the assessment of duty. The maximum legal salary for the position is $3,500 per annum. Examiners are customarily paid from $1,800 to $2,500 per annum on their entry into the service.

The Superior Court, Indianapolis, has approved the sale of the Jenney Electric Company's plant at Anderson, Ind., to the American Rotary Valve Company, Chicago, for $135,000. This company was the sole bidder at the sale of the plant at the office of the receiver, the Security Trust Company, Indianapolis. The plant is in operation, and the new owners took possession July 1. The property includes 10 acres of ground as well as the factory buildings. The company may consolidate two plants now operated in California and Illinois. In addition to motors (manufactured by the Jenney Company) it is announced that street car air compressors, vacuum cleaners and rotary valves will be made at the Anderson plant.

The American Steam Gauge & Valve Mfg. Company announces that Gardner Cornett, its vice-president, is now permanently located at the company's office, 30 Church street, New York. This office is under the management of Charles A. Allen, who has been connected with the company for many years.

The Warwick Iron & Steel Company, Pottstown, Pa., is preparing to blow in its No. 2 furnace.

The Pulaski Iron Company's blast furnace at Pulaski, Va., was blown in July 3 after an idleness of a month for repairs.

Trade Publications

Rolling Mill Machinery.—The Youngstown Foundry & Machine Company, Youngstown, Ohio. Catalogue. Size, 7 x 9½ in. This is the company's 1911 catalogue, illustrating and describing a line of rolling mill machinery which includes rolls, roll lathes, shears and ingot cars. The roll lathes are built in various sizes from 18 to 42 in. for either belt or direct connected motor drive and the shears include belt and motor driven lever types and a billet shear.

Steam and Power Pumping Machinery.—American Steam Pump Company, Battle Creek, Mich. Catalogue No. 18. Size, 6 x 9 in.; pages, 188. Illustrations and descriptive matter explain the operation of an extensive line of steam and power pumping machinery which includes the Marsh steam pumps and air compressors and American simple, compound and power pumps and air compressors. The catalogue is divided into sections each of which deals with some particular group of apparatus, as boiler feed pumps, tank and vacuum pumps, air compressors, deep well pumping engines, automatic feed pumps, sugar house and creamery pumps, sinking pumps, etc. In each of these sections the various styles of machinery made are grouped with illustrations, brief descriptions and capacity tables. A number of tables of useful information giving capacity of pumps in gallons, dimensions and weight of wrought iron pipe, friction loss in pipe in pounds pressure and the duty of pumping engines complete the catalogue.

Punching, Shearing and Bending Machinery.—New Doty Mfg. Company, Janesville, Wis. Catalogue G. Describes and illustrates a line of punching and shearing machinery and bending and straightening rolls for use in all shops where heavy machinery is used for working up iron and steel. A general description of the machines is first given followed by half tone engravings of the special types and complete dimension tables.

Light and Power Transformers.—Triumph Electric Company, Cincinnati, Ohio. Circular. Devoted to the Triumph type L transformers which are designed for use on pole lines carrying single-phase current. The special features of this transformer are a low copper loss, good regulation and a low reactive drop. These features together with others of its construction are pointed out and a table giving the efficiency of the different sizes together with the core and copper losses and the approximate weights is included. These transformers are made in sizes ranging from 0.6 to 50 k.v.a., and can be supplied for any frequency from 50 to 140 cycles, although the normal figure is 60. The normal voltages are 1100-2200 on the primary and 110-220 on the secondary with a variation of 10 per cent. above and below. *The Iron Age*, February 2, 1911, contained an illustrated description of this transformer.

Chucks.—The Cushman Chuck Company, 39 Ann street, Hartford, Conn Catalogue. Size, 5½ x 7¾ in.; pages, 32. Illustrates and describes an extensive line of chucks and face plate jaws. The various types of chucks listed include independent two and four jaw chucks, universal geared scroll chucks, special chucks with three and four jaws for the back end of cutting-off machines, universal two-jaw chucks, a centering chuck and two styles of drill chucks. In addition to the chucks space was given to illustrations and descriptive matter concerning the Cushman reversible face plate jaws which are intended to be used on large lathes and boring mills as a substitute for chucks. Under the illustrations of the various chucks brief specifications and a list of prices are given. Several styles of drill chuck arbors are illustrated and a list of repair parts and prices completes the catalogue.

Draft Gear.—The T. H. Symington Company, Baltimore, Md. Pamphlet entitled "Two Yokes in Transportation." Gives general description and specifications of the Farlow draft rigging, the special feature of which is that there is no yoke. The description is divided into three parts dealing with the machanical, the transportation and the economic features. The illustrations on the two center pages show the contrast between the replacing of a coupler having a yoke and the M. C. B. slotted butt coupler with the Farlow key connection. Instructions for assembling a draft gear are included and an illustrated list of the Farlow parts for one car completes the pamphlet.

Portable Crane and Hoist.—The Franklin Portable Crane & Hoist Company, Franklin, Pa. Pamphlet. Size, 4 x 7¼ in.; pages, 32. Contains illustrations and brief specifications on facing pages of 12 sizes of a portable crane and hoist for use in shops, factories or wherever it is necessary to lift or to transfer heavy bodies. The construction of the hoist and its operation are briefly described with illustrations. It is designed as an accessory to and in some cases as a substitute for the overhead crane and the industrial railway since two men can easily lift and carry three-ton loads to all corners of the shop.

Pneumatic Hammer.—Ingersoll-Rand Company, 11 Broadway, New York City. Bulletin No. 2010. Refers to the Crown pneumatic hammer which is made for both chipping and riveting. The construction of the hammer is described, the text being supplemented by illustrations of the various parts and a complete list of repair parts is included.

Air Brakes.—Allis-Chalmers Company, Milwaukee, Wis. Bulletin No. 1504, superseding No. 1500. Lists the various repair parts for the auxiliary air brake apparatus made by this company and contains numerous illustrations with prices.

Rope Drive.—Lambeth Rope Corporation, New Bedford, Mass. Pamphlet entitled "The Natural Transmission." After a brief historical account of the origin and development of the driving, the manufacture of the Lambeth transmission rope is described, followed by discussions of the relative merits of cotton and manila rope and the causes of rapid wear and power loss in transmission rope. A table of the power transmitted under favorable conditions by rope of various sizes and at different velocities is given, as well as a set of detailed instructions for splicing rope.

Automatic Screw Machine Work.—The National-Acme Mfg. Company, Cleveland, Ohio. Leaflet and sample of work. The piece is 1 in. long and ⅝ in. in diameter at the large end, which is knurled, and there is a ¼-in. threaded hole extending about half way through, while the other end is externally threaded and reamed with a ¼-in. hole to meet it. In producing this piece the tapping, threading and the knurling were done in one operation and six other operations were performed in the time required to form the piece. Nine tools in all were used to form the piece and this was done by operating on the piece in four positions. In the first, the piece was formed with the side tool and a ¼-in. hole drilled with an end tool. In the second position the top was faced and the small tapped hole drilled. In third position the piece was tapped and the thread cut from the end position with a combination tap and die and the head knurled from the top slide. In the last position the piece was tapered, the large hole reamed from the end and the piece finally cut off with a side tool.

High-Speed Planer and Matcher.—S. A. Woods Machine Company, Boston, Mass. Circular. Illustrates the No. 400 series of Wood's planers which are built for handling hard and soft wood at feeds running as high as over 200 lineal feet per minute. The equipment of these machines includes a profile attachment for working on various types of molded stock at from 100 to 200 lineal feet per minute which was illustrated in *The Iron Age*, October 6, 1910.

Transformers.—Crocker-Wheeler Company, Ampere, N. J. Folder. Treats of the Remek transformer in which it is claimed the eddy currents set up in the lap-joints of the core laminations are eliminated as well as the vibration of the laminations at the joints. Other special features are an exceptionally high permeability and the securing of uniform and low temperature by exposing the larger portion of the transformer coil to freely circulating oil.

Boilers.—The Babcock & Wilcox Company, New York City. Catalogue. Relates to the Rust water tube boiler. After a brief history of the boiler its general construction is taken up followed by the results secured in service and reports of a number of efficiency and capacity tests. The illustrations which include the special features of the boiler and numerous installations are almost all the full size of the page 5 x 7¼ in.

Metallic Packing.—C. Lee Cook Mfg. Company, Louisville, Ky. Pamphlet. Relates to a line of metallic packing which is made in single and double types for piston rods and Corliss valve stems. In addition two types of split metallic piston rod packing designed for inside and outside use are made which is the company's standard type of split packing for all classes of service. The various kinds of packing are illustrated on the pages facing the text description and in the engravings the various parts are lettered to correspond with the text so as to identfy them and serve as a guide to the proper application.

Hot Saw and Burring Machinery.—Ajax Mfg. Company, Cleveland, Ohio. Folder. Deals with the Ajax hot saw and burring machine which is made in three sizes having a saw and burring head 15, 20 and 30 in. in diameter. This machine is designed for operation at a peripheral speed of 6500 ft. per minute and will saw a 1-in. bar in 1 sec. or will mill 1 in. of stock from a 1-in. bar in 10 sec. *The Iron Age*, February 2, 1911, contained an illustrated description of this machine.

Calorimeter and Burner.—Precision Instrument Company, 49 West Larned street, Detroit, Mich. Two bulletins. In the first, G, illustrations and descriptive matter explain the operation of Roland Wild's calorimeter for estimating the heating value of solid fuels. This instrument is of the sodium peroxide type in which a mixture of the fuel and sodium peroxide is fired in a combustion chamber immersed in water and is offered as a simple machine and accurate instrument. The second bulletin, H, deals with Carpenter's Metropolitan argand burner No. 2, which is said to be the only burner which approaches perfect combustion with any kind of gas whether coal gas, enriched coal gas or coal gas mixed with carbureted water gas. One of the special features of this burner is that the air supply can be adjusted for the different kinds of gas being burned.

Foundry Coke.—Graceton Coke Company, Graceton, Indiana County, Pa. Booklet showing by analysis and test the structure and toughness of the Graceton foundry coke, its freedom from ash and impurities. Numerous cupola tests are reported and a large amount of information of use to the foundryman is inserted.

Coal Washing.—Foust Concentrator Company, 332 South Michigan Avenue, Chicago, Ill. Pamphlet. Is a general discussion of the process of coal washing to remove the impurities occurring in coal deposits, and shows how the use of the Foust jig increases the efficiency of the process. The construction and the operation of the jig are described at length, and two line engravings on facing pages give the details of its construction.

Ball Bearings.—J. C. Bretz Company, 1904 Times Building, New York City. Catalogue. Size, 6¾ x 9¼ in.; pages, 133. De-

scribes the various styles of F. & S. ball bearings which this company handles as the sole American agent. Two general styles of bearings are made, namely, the single and double row bearings. These can be supplied in a number of different types for journals and also for single and double thrust bearings. The various types of bearings are illustrated and a table giving the principal dimensions and specifications for them is given underneath the illustrations.

Engineering Specialties.—Wm. Powell Company, 2814 Spring Grove Avenue, Cincinnati, Ohio. Catalogue No. 10. Size, 5¼ x 8 in.; pages, 320. This is the company's 1911 catalogue illustrating and describing a complete line of engineering specialties and supersedes all previous editions. Among the various articles listed are the company's Whit, Star globe, angle and check valves in a number of different sizes; gate valves, Powell valves, White Star and sliding stem gate valves, injectors, needle point and safety valves, lubricators, steam traps, relief valves, etc. Under all of these different specialties a list of the various sizes in which they are made together with the prices is given. The main portion of the catalogue occupies 287 pages, and the remaining pages are given over to tables of useful information. These deal with steam boilers, boiler horsepower, capacity of chimneys, weights of various metals, areas and circumferences of circles, carrying capacity of copper wire and belting.

Concrete Mixer.—The Standard Scale & Supply Company, 243 Water street, Pittsburgh, Pa. Three bulletins. The first, Y 35, contains a number of testimonial letters from contractors and users of the Eclipse concrete mixer which was illustrated in *The Iron Age*, November 24, 1910. The construction of the mixer and the various sizes in which it is made are illustrated and described in bulletin Y-40, while Y 43 shows how money may be saved by the purchase of one of these machines.

Mechanical Stoker.—The American Stoker Company, 11 Broadway, New York City. Bulletin A-1, entitled "Furnace Stoker Proofs." Contains a list of repeat orders which have been received by the company from its patrons during a period extending in some cases as far back as 1898.

Steel Shapes and Springs.—Harrow Spring Company, Kalamazoo, Mich. Monthly stock list. Gives the various quantities of flat, round, square and oval bars, channels, angles, special shapes and sections, and spring, alloy, machinery, reinforcing and automobile steels which this company regularly carries in its warehouse. All of the special shapes and sections and the different types of steel springs are illustrated and briefly described.

Wells Drilling Cable.—American Mfg. Company, 65 Wall street, New York City. Pamphlet. Size, 5¼ x 7 in.; pages 31. Deals with the American drilling cable which is made from a special grade of Manila hemp. The preparation and manufacture of the rope are described and the special features of non-stranding, elasticity and waterproofness are discussed. Space is also given to other products of this company including sand, sucker rods, tubing and torpedo lines.

Pumps.—Henry R. Worthington, 115 Broadway, New York City. Two bulletins. The first, No. W-17625 A, pertains to the Worthington type D centrifugal pumps for low-head service. These pumps were designed to meet the demand for a reliable pump at a low price and are especially suitable for contracting work such as pumping out coffer-dams and excavations and also for small irrigation plants where a low first cost is more important than economical operation. The drive for these pumps is from a line shaft, engine or motor through a belt connection, although if desired gas engine direct connected units can be used on very low heads and where the space is limited, as, for example, in the case of circulating pumps on shipboard a steam engine can be directly connected to the pump. A number of combinations of the pump are shown including a portable direct connected gasoline engine set. Tables of capacity, speed, horsepower and dimensions are given as well as instructions for installing and operating the pumps. The second bulletin No. W-18525 describes and illustrates single and two stage house pumps which are designed for direct connection to an electric motor. Directions for installing and operating the house pump together with a diagram showing a two-stage unit installed with an elevated tank and a float for automatic operation are included. Space is also given to the Worthington standard sump pump which is of the submerged type. On account of its position in the pit the pump is continually primed and can be started by a float which closes the motor circuit as the level of the water in the sump rises.

Platinum and Platinum Apparatus.—J. Bishop & Co., Platinum Works, Malvern, Pa. Catalogue. Size, 5 x 8¼ in.; pages, 47. This is the company's 1911 catalogue illustrating a line of platinum laboratory apparatus including the Auppere combustion apparatus, plain and Gooch crucibles, dishes, incinerating pans, retorts, bottles, filter cones, crucible tongs, tweezers, anodes, cathodes, electrodes, triangles, deflagration spoons, wire, foil sheets and gauze. All of these are illustrated and briefly described, and in addition instructions on the care and use of platinum wire, tables of weights of wire and foil and areas and circumferences of circles are included.

Metals.—Empire Metal Company, Syracuse, N. Y. Five pamphlets. Deal with the various types of metals produced by this company which include solder of various compositions and shapes, silver metal that is used as a galvanizing flux alloy, phosphor, tin and copper, iron magnite which consists of silicon combined with sodium and ammonia salts and forms an economical substitute for phosphorus as a deoxidizer, several kinds of aluminum metals and a number of different types of bearing metals for various conditions of service. In all of the booklets the general forms in which the different metals are marketed are illustrated and a brief description given of their properties and uses.

Pyrometers.—Wilson Maeulen Company, 1 East Forty-second street, New York City. Pamphlet and chart. The former describes and illustrates the various types of electric pyrometers which this company manufactures for stationary and portable use together with fire rods, thermocouples and pyrometer tubes. The pyrometers listed include those of the standard type as well as a long scale instrument, an indicator for high temperature pyrometers and a portable Le Chatelier pyrometer which is an exceptionally accurate instrument. The chart gives the melting points of the elements according to the records of the United States Bureau of Standards and on the reverse side is given a table of factors for the exact conversion of Centigrade degrees to Fahrenheit and vice versa together with a table of inter-[illegible] values.

Machinist Tools and Supplies.—Peter A. Frasse Company, 417 Canal street, New York City. Wall hanger containing a map of New York showing the principal points of interest, steamship piers, railroad stations, etc., and the new office building recently completed by the company.

Induction Motors and Air Compressors.—Allis-Chalmers Company, Milwaukee, Wis. Two bulletins. The first, No. 1081, superseding No. 1040, describes and illustrates a line of polyphase induction motors and their applications. Tables of ratings and illustrations of installations are included. The second, No. 1523, superseding No. 1513, describes portable and stationary air compressors for industrial purposes operated by either direct current or induction motors. The various parts of the compressors are illustrated and described and a number of data tables complete the bulletin.

Conveying Machinery.—Chain Belt Company, Milwaukee, Wis. Catalogue No. 40. Size, 6 x 9 in.; pages, 278. Shows a complete line of elevating and conveying machinery for coal, ashes and wood pulp; box elevators, freight hoists and conveyors and water elevators together with the various types of chain, sprockets, buckets and gears used. A complete list giving the dimensions and prices of the various sizes of parts made and an extensive alphabetical index are special features.

Drop Forged Steel Lathe Dogs and Clamps.—The Armstrong Bros. Tool Company, 339-357 North Francisco avenue, Chicago, Ill. Catalogue, 3½ x 6¼ in.; pages 8. Deals with a line of lathe dogs of various types, all of drop forged steel. They include bent tail and straight tail dogs with single screw, in sizes ⅜ to 6 in.; heavy duty dogs with straight tail and double screw, 2 to 8 in.; clamp lathe dogs with capacities between screws from 1¾ to 3½ in.; U clamp dogs in capacities from ⅜ to ⅝ in. up to 1½ to 5 in.; U clamp drill holder in sizes ¾ to 1 in. up to ¾ to 3 in.; a bolt driver in 2, 3 and 4 in. sizes; machinists' clamps; and an improved type of C clamps in sizes from ¾ to 12½ in. The pamphlet contains illustrations and tables of sizes.

The Remek Transformers.—The Crocker-Wheeler Company, Ampere, N. J. Catalogue, 3½ x 6¼ in.; pages 18. Devoted to the Remek transformer and copiously illustrated, showing the construction and the reason for efficiency and durability. Tables give the results of a series of tests.

Industrial Railway Equipment.—Ernst Wiener Company, 38 and 40 Dey street, New York. Pictorial circular. Gives illustrations of practically everything entering into the equipment of industrial railroads, from track and switches to cars and locomotives.

Cut-off Coupling Friction Clutch.—Carlyle Johnson Machine Company, Manchester, Conn. Bulletin 100. Describes a type of the company's clutch which is modified to meet cut-off coupling requirements in connecting the ends of two shafts. Its chief use is in connecting the motor to the propeller shaft of motor boats, the device being small and compact and at the same time capable of handling considerable power at high speed. It is made in five sizes, ranging from 2 to 6 h.p. The maximum diameter ranges from 4¾ in. to 6¼ in., the length of the clutch body from 4 3-16 in. to 6 13-16 in., and the standard lengths of hub from 4 in. to 8½ in.

Tobin Bronze.—Ansonia Bronze & Copper Company, 99 John street, New York, and Ansonia, Conn. Pamphlet devoted to Tobin bronze, of which the company is the sole manufacturer. Illustrated; 36 pages. Contains much valuable information regarding the metal, including scientifically procured data as to its physical characteristics and tables of tests. Its use for special purposes is brought out in considerable detail.

Heraeus Le Chatelier Pyrometer.—Charles Engelhard, Hudson Terminal Building, 30 Church street, New York City. Two pamphlets. One is the nineteenth edition of the catalogue of this device, containing 86 pages, in which the apparatus is described in much detail with illustrations. The second is known as "Hand Book No. 1" and is a guide for the correct installation of the pyrometer in annealing ovens, heating and tempering furnaces, potteries, brass works, blast furnaces, factories, boiler plants and chemical works.

Steel Furniture and Trucks.—Angle Steel Stool Company, Otsego, Mich. Pamphlet. Describes the company's line of steel stools, chairs, work tables, tool trucks, etc. The description of one of this company's trucks appeared on page 1574 in *The Iron Age* of June 29. The construction of this line is shown in detail in the circular and the price lists of the various sizes are given.

Standards of Safety in Relation to Machinery*—I.

The System of the United States Steel Corporation in Ridding Works of Their Dangers—The Problems That Have Been Solved

BY DAVID S. BEYER.

No one knows definitely, or even approximately, how many men are injured in industrial accidents in the United States. The laws and regulations which cover the recording of such accidents vary widely in different parts of the country and the resulting statistics are scattering and incomplete. The Government Department of Commerce and Labor, after an investigation of this matter in 1908, estimated that there are from 30,000 to 35,000 fatal and not less than 2,000,000 non-fatal accidents every year.

A writer in one of our current magazines makes a somewhat different estimate; he substantiates his figures by a comparison with foreign countries where there is a better record of such statistics, and asserts that there are 100,000 violent deaths in our industries every year, and that the total number of men killed or seriously injured is approximately 500,000. He further states that the loss in the entire Russo-Japanese war, including casualties on both sides, was about 335,000. If it is true that each year of industrial activity in the United States rolls up a larger total of killed and injured men than all the battle fields of the great Asiatic war, it seems not inappropriate that this writer in treating of the accident situation heads his article "The Carnage of Peace."



Fig. 1. The Convenient Hanging Push Button, Which Stops the Motor Driving a Mill Unit. With Each Unit Is a Lamp Which Is Kept Burning.

In 1906-'07 Miss Eastman made a detailed study of 12 months' fatalities in the Pittsburgh industrial community, during which period she found that 526 men were killed and as many more suffered permanent injury. About half of these men were married, and a considerable percentage of the remainder had relatives who were dependent upon them.

It is unnecessary for me to point out the vital relation of the accident hazard to the other social problems of an industrial community. It involves not merely the care of the injured workman, but that of the wife and family, or other dependents, who are directly affected in almost every case. It reaches out beyond the hospitals and charitable institutions into the homes, where it interferes with the development and education of the children, and handicaps them at the very start. There are more than 3000 boys and girls in the various homes and children's institutions of the Pittsburgh district alone, and approximately 15 per cent. of them are there as a result of industrial accidents and trade diseases ("Children's Institutions and the Accident Problem," by Miss F. L. Lattimore. The Survey, Sept. 3, 1910.) How many more are spending their days in shops and offices instead of under normal home and school influences, cannot be even approximated.

A discussion of this sort naturally falls into two general divisions—the man and the machine—that is, the education of the workmen to make use of safety devices and to exercise care and prudence in dealing with the dangers to which they are necessarily exposed, on the one hand, and the application of mechanical devices, such as gear covers, railings, arrangements for quickly stopping machinery, etc., on the other. There is a third element worthy of brief mention, as it is a serious one in some cases, and that is the cost of carrying out safety recommendations.

Financial Considerations

A case was recently brought to my attention where a factory inspector in one of the Western States called for safety devices in one plant which would require the expenditure of $70,000. This would have paralyzed the resources of the small organization that owned the plant, if the order had been rigidly and promptly enforced; but an arrangement was made whereby the work could be carried along gradually, relieving to a certain extent the financial burden that otherwise could hardly have been carried.

Within the United States Steel Corporation, however, this consideration has not entered seriously into the task of the safety inspector. Several years ago Judge E. H. Gary, chairman of the board of directors, expressed his hearty sympathy with the movement, and stated that every practical suggestion for bringing about safer working conditions for the men would be approved by the finance committee, and that there would be no hesitation in authorizing necessary appropriations to carry on the work.

This involves large expenditures. Automatic engine stops in the mills of the American Steel & Wire Company (which constitutes only about one-seventh of the entire corporation) have cost approximately $50,000, and its equipment of automatic stop valves in boiler plants amounts to about $100,000 more; $6,200 was appropriated for placing a walkway on the side of an open hearth building, to allow the crane boys to escape quickly in case a ladle of hot metal should be spilled; a subway under railroad tracks, to enable workmen to reach a mill without the risk of crossing these tracks, amounted to $12,000. In another plant $30,000 was appropriated for placing overhead walks and runways for the use of window-cleaners and electricians.

In considering the question of mechanical safeguards I will describe in detail three different devices that may serve as illustrations of what is being done along this line.

Automatic Stops for Power Driven Machinery

The first installations of this kind consisted of an arrangement for closing the steam valve of an engine, controlled by electric push buttons placed at various convenient points throughout the mills; all that was required to stop the machinery in an entire department was the touching of a button, as one would ring a door bell. Where a man is caught in power-driven machinery the extent of his injury is likely to be in direct ratio to the time that elapses before the machinery can be stopped and the man released, and the push button stop system seemed to be an admirable method of preventing or limiting such accidents.

About 100 large engines in the plants of the American Steel & Wire Company have been equipped with these

*Paper presented before the National Conference of Charities and Correction, Boston, June 13, 1911.

†Chief Safety Inspector of the American Steel & Wire Company.

stop systems, and they have proved valuable in many cases. There is a condition, however, that is not at first apparent, but which has an important bearing on the question of engine safety stops, and that is the effect of the flywheel with which practically all such engines are equipped. There is enough energy stored in one of these large flywheels to keep the machinery in motion anywhere from 20 to 30 seconds up to 1½ min., or even more, after the main valve has been shut and steam cut off. Most of the shafting driven by these engines runs at high speeds, from 100 to 200 or more r.p.m., so it will readily be seen that the man who is being carried around a shaft, or who is being drawn into a machine, cannot put much dependence on the engine being checked in time to save him, by means of the push-button stopping-device.

The use of electricity for driving mills and factories simplifies the problem considerably. Electric motors are usually installed in smaller units, which are easier to control, and they have practically no flywheel effect. That is, under similar conditions, a motor will come to a stand-still in a much shorter space of time after the electric current has been cut off, than is required by an engine after the steam valve has been closed. From this it will be seen that electric power is safer and more easily controlled than the older form of steam power, which it is gradually displacing, and push-button systems are most effective for shutting down electric motors.

In the use of stop buttons for both engines and motors, however, dependence is placed on a third factor, which is of a decidedly variable nature, and that is the man who shall push the button. When an accident does occur, this man may be absent altogether; he may be looking the other way—or he may even become excited (as has happened in two cases which have come under my own observation) and run away to find his "boss," without doing anything to help the fellow who is in trouble. Obviously, something more is needed that will work swiftly and surely in case of emergency, and in which the minimum of human uncertainty enters.

This can be accomplished in most cases by the use of a lever or rope which a man's body will strike when he is caught, and automatically stop the machinery, without requiring any voluntary action on the part of himself or any one else. We have a number of cases on record where there is no doubt that one of these devices prevented what would otherwise have been a serious accident. They work so quickly that if any injury is inflicted it is slight, and in some instances the man has escaped entirely unharmed. This seems like the last word on the question of automatic stopping arrangements, and the principle can be applied to almost any machine where there is the unavoidable risk of an operator being caught.

Ladder Protection

Another important item in the work of accident prevention is the protection of ladders. A ladder seems like the most simple and harmless piece of equipment that could be devised, and yet no accident list is complete without a generous contribution from this source. A committee of the National Manufacturers' Association, which made a special study of accidents in foreign countries last summer, is responsible for the statement that almost 20 per cent. of all industrial accidents in Germany can be attributed to falls from ladders.

When we consider that there are numerous vertical ladders in our industrial establishments of 40, 50, 100, or even 200 ft. in hight, and that the slipping of a hand or foot from a rung of one of these ladders, the breaking of a worn or defective part, a little dizziness, the "loss of nerve" which a man who made a business of repairing chimneys once described to me—when we consider that any one of several causes which would be of no consequence to a man on the ground may mean certain death if he is at the upper end of a high ladder—we are not surprised at the prominent place ladder accidents occupy in casualty records.

This risk was early recognized by the men interested in accident prevention in the Steel Corporation, and the first preventive measures consisted in substituting steel ladders for wooden ones. A steel ladder is practically indestructible, and the rungs do not wear or break as they do when made of wood.

Ladders which are carried by the men from place to place add a notable element of risk, for various reasons. A pile of material may be found in the location where the ladder should be placed, so that it is erected at an unsafe angle; the floors may be of concrete or metal plates which offer an insecure bearing for the foot of an ordinary ladder; the weight may be unevenly distributed, so that the ladder tips or swings out of place. Thus where a portable ladder is used there is not only the danger of a man falling from the ladder, but the added possibility of the ladder falling with the man.

To improve this condition, portable ladders have been shod at the foot with sharp steel spikes, and various combinations of safety, non-slipping feet have been designed.

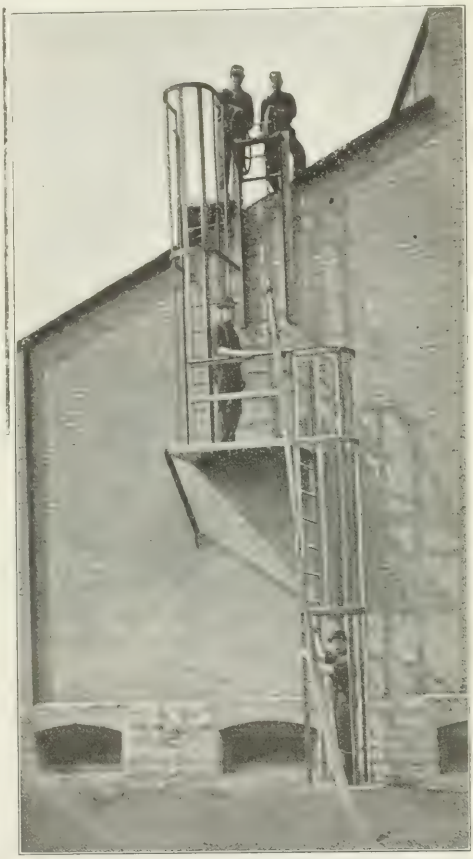


Fig. 2. A Safety Cage Ladder.

These expedients, however, are merely palliative and do not really get down to the root of the danger. It is possible, in many cases where portable ladders have been used, to erect platforms and walks from which the men can work with perfect safety. It is often possible to replace a ladder with a stairway which the workman can ascend and descend comfortably and without risk, even when carrying tools or repair parts as is sometimes necessary.

There are certain locations, however, where there is not sufficient space to erect a stairway, and a vertical ladder seems to furnish the only possible solution. For such cases a "safety cage" has been designed which largely reduces the danger. This cage consists of several parallel bars fastened by bands to the ladder proper, so that, in effect, they make a tube about 2 ft. in diameter through which the man climbs. If his hand slips from one of the rungs his shoulders merely drop back a few inches until they strike the bars. It would be possible for an armless man to go up or down such a ladder, using only his feet on the rungs.

There is still a remote possibility of hands and feet both losing their hold at the same time, resulting in a

fall downward through the inside of the inclosure—so the further expedient has been adopted of placing landings at intervals of 10 to 15 ft. which would break such a fall, and limit the space through which any one could drop, irrespective of the length of the ladder.

To summarize, the policy which has been adopted by the American Steel & Wire Company for reducing ladder accidents is as follows:

First: The use of stairways wherever possible in place of fixed ladders.

Second: The application of safety cages to ladders of this type which must necessarily be retained, breaking long ladders by suitable landings which would limit the distance a man could fall.

Third: Cutting down the use of portable ladders by installing permanent platforms and walks for oiling, and operating valves, etc.

Fourth: Where portable ladders cannot be done away with, having them equipped with spikes or safety feet.

By these various means we are reducing accidents of this sort to a minimum and will almost entirely eliminate this class of hazard.

Safety Hand Leathers

In the wire mills men handle heavy bundles of rods and wire, which become more or less heated in passing through the dies. In order to protect their hands while engaged in this work, they use "hand leathers," consisting of a loose flap of leather with a strap across the back of the hand to hold it in position. This leaves a free end

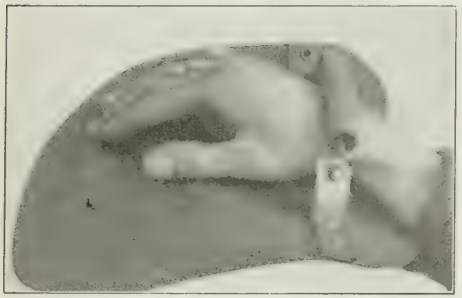


Fig. 3.—Safety Hand Leathers for Wire Workers.

to the leather, which hangs down from the hand, so that it is liable to be caught in the machinery and draw the operator in after it.

Many experiments were tried before anything was found that would satisfactorily overcome this danger, but it was finally achieved in the following way—the strap which holds the leather is cut in two and the loose ends joined by a small coiled spring; a piece of rubber or other flexible tubing is placed around the spring so that it will not chafe the hand of the man using it. This one simple device will, undoubtedly, save one or two lives and several serious injuries in the wire mills every year.

(To be continued.)

The schedule of the Brown-Ketcham Iron Works, Indianapolis, filed under the receivership recently instituted, shows assets of $1,022,639 and liabilities of $520,207. The Indianapolis plant is valued at $121,352, the Huff plant at $70,400, machinery and tools, $372,750; merchandise and material on hand, $81,368; patterns and flasks, $13,095. The debts due on open accounts, mostly unpaid balances on contracts in various parts of the country, are $317,455. The money on hand is $34,500. An indebtedness, originally to Hathaway, Smith, Folds & Co., Chicago, but now to 15 banks, is $190,000; to the Lackawanna Steel Company, $126,150; to Indianapolis banks, $95,000. Of the total liabilities $154,693 is reported secured by liens; unsecured claims, $274,293.

The Dentler Mfg. Company is building at Warwood, Wheeling, W. Va., a brick and steel plant 65 x 75 ft., to contain a 3-ton Carr patented portable furnace for the manufacture of sash weights, counterbalances, grate bars, etc. The plant will be ready for operations July 15. W. L. Dentler is president and Charles E. Lynn is secretary-treasurer.

Furnace Slags in Concrete

The Carnegie Steel Company, Pittsburgh, Pa., has issued an important booklet entitled "Furnace Slags in Concrete." It gives the details of a series of tests to determine the practicability of blast furnace slags for use in concrete. It is pointed out that over 10,000,000 tons of this slag are produced annually in the United States. While until recently the material was considered a waste product, in recent years it has become a valuable material, and, in the light of recent developments, the most important use is as a base in Portland cement. The booklet deals with the subject with a great deal of care. A chapter each is given to materials and mixtures, and voluminous tables deal with the average weights of concrete, the relation of the volume of concrete to the volume of aggregate, the approximate weights of slags, chemical analyses and granulometric analyses. The results of the tests are most instructive, being taken up under the headings of gravel, bank slag, machine slag, limestone, river sand and slag sand. Of especial interest is a summary of the minimum, maximum and average results, pounds per square inch, of the tests of concretes.

Tests of Metals, 1909.—The report of the tests of metals and other materials for industrial purposes made with the United States testing machine at Watertown Arsenal, Mass., during the fiscal year ended June 30, 1909, is for sale by the Superintendent of Documents, Government Printing Office, Washington, D. C. The price for the full set of three volumes is $6.85.

The National Metal Trades Association has issued the synopsis of the proceedings of the thirteenth annual convention, held at the Hotel Astor, New York City, April 12 and 13. The 268 pages of the volume contain much that is of interest, for the meetings included many features of importance to the metal industries.

At the annual meeting of the stockholders of the Westinghouse Machine Company recently held in East Pittsburgh, Pa., directors were re-elected as follows: J. D. Callery, H. M. Brackenridge, William H. Rea, T. L. Brown, John S. Wallace, New York; Horace E. Smith, Philadelphia; H. H. Westinghouse and George Westinghouse. John R. McCune, New York, was elected to fill the place of H. C. Baughman, who resigned.

The Pittsburgh Crucible Steel Company, which is an identified interest of the Crucible Steel Company of America, will shortly place contracts for the building of six 65 or 75-ton open-hearth furnaces and a 40-in. blooming mill at Midland, Pa. While it is likely that the company will erect finishing mills, plans for these have not yet been made.

"Apparatus and Methods for the Sampling and Analysis of Furnace Gases" is the title of a 22-page pamphlet by J. C. W. Frazer and E. J. Hoffman, issued by the Bureau of Mines, Department of the Interior, Washington, D. C. It describes the apparatus and methods used by the authors in connection with certain investigations of the Technologic Branch of the United States Geological Survey, especially those bearing on the improvement of furnace conditions and on efficiency in the use of fuel. The apparatus is fully illustrated.

The American Railway Association reports that the number of idle cars has decreased 3,800 in the two weeks intervening since the previous report. The surplus of coal cars decreased from 73,462 to 72,885, while the number of box cars remained practically stationary.

The Co-Operative Flint Glass Company, Beaver Falls, Pa., manufacturer of blown and pressed table and druggists' glass ware, jars, lamps, etc., is improving its plant by repairing furnaces, installing presses and band saw, lathes, shaper and other equipment, for which contracts have already been placed.

The Homestead Valve Mfg. Company, Pittsburgh, Pa., has appointed as its agents in Scranton, Pa., and vicinity, Charles B. Scott & Co., 119 Franklin avenue, who will carry a stock of its valves.

Detecting Adulteration of Oils

New Method Discovered for Determining Oil Adulteration by Mineral or Resin Oil

BY ALEXANDER E. OUTERBRIDGE, JR.

When examined by reflected light, hydrocarbon oils (improperly named "mineral" oils), whether crude or partially refined, show a peculiar greenish tinge commonly called "bloom." When examined by transmitted light the bloom disappears and the true color of the oil is seen. This color ranges from dark red or mahogany tint through various shades of orange and yellow up to "water white," according to the degree of refinement. Resin oil possesses the same peculiar characteristics, except that the color of the bloom is pure blue. Its chemical composition is so nearly like that of a hydrocarbon oil that these resemblances appear to me to be more than accidental coincidences and suggest the possibility of a common origin between so-called mineral oil and resin oil. This speculation, however, is not germane to our topic, which has to do strictly with a new practical application of that property commonly called bloom to the instantaneous detection of adulteration of vegetable or animal oils with hydrocarbon oils.

Fluorescence of Certain Oils

Doubtless everyone has noticed the bloom in mineral oils and wondered perhaps as to the cause of this singular greenish appearance, which is especially noticeable in crude oil and in heavy lubricating oils. Bloom is merely a popular name for a remarkable property possessed by a number of substances, the scientific name for which is "fluorescence." In simple non-technical words, fluorescence is a property inherent in some substances of becoming self-luminous while exposed to certain rays of light known as "ultra-violet" or "actinic" rays. These rays are always found in sunlight and in some forms of electric light.

In the course of my investigations I found that the greenish bloom of fluorescence of mineral oil and the blue bloom of resin oil noticeable in daylight can be enormously intensified or magnified, perhaps a thousand fold, so that, if a single drop of mineral oil be placed in a vessel containing a hundred or even a thousand drops of pure linseed oil, or ony other non-fluorescent oil, its presence may be instantly detected by the greenish fluorescence which it imparts to the whole of the oil. The same is true of resin oil, which gives blue fluorescence. The utilization of this observation for practical purposes of detecting adulterations is the gist of this paper.

By preparing standard samples of any non-fluorescent oil containing one-tenth, one, two, three per cent., and upward, of mineral or resin oil, in clear glass test tubes placed in a suitable frame against a dark background, each showing readily and unmistakably the increasing proportions of the adulterant under a light giving ultra-violet rays, a "fluorescent scale" has been established, somewhat similar to the well-known carbon color scale used in steel foundry laboratories for quickly determining, by color comparison, the proportion of carbon in an acid solution of steel.

I am prepared to make unhesitatingly the broad assertion without fear of contradiction that there is no method known by which the presence of either mineral or resin oil in any non-fluorescent oil in small or large amount can be so disguised as to be undetectable instantly by this method, and this certainly is an interesting and important fact of considerable practical value to consumers of costly oils.

Test Applicable to De-Bloomed Oils

Methods of chemical treatment of mineral oil have been discovered to "de-bloom" mineral oil so that it can be used with impunity, so far as the bloom is concerned, as an adulterant for expensive vegetable and animal oils, and I learned that there is a very large trade in de-bloomed oils for this purpose. Samples of de-bloomed oils of different grades and colors were obtained. They are free from bloom in bright sunlight or ordinary diffused daylight, or in the light from an ordinary electric arc, but when subjected to the kind of light which I shall presently describe *they all became highly fluorescent*, and even the proportion of adulteration with de-bloomed mineral oil in any specimen of non-fluorescent oil mixed with such de-bloomed mineral oil may be stated. I anticipate that this positive statement now made for the first time will cause some consternation among makers of de-bloomed mineral oil.

If both mineral oil and resin oil be used in combination as adulterants, it becomes more difficult to make quantitative determinations instantly by the fluorescent method; hence the qualification implied in the word often. But "practice makes perfect" in many operations, and this is no exception to the rule.

How Fluorescence Is Obtained

It is the *ordinary inclosed arc*, so commonly used in industrial works by reason of its relative economy, that happens to give out rays of the exact wave lengths needed to enormously increase the fluorescence of these oils. If the plain glass cover of this light fits properly, so that air does not enter as rapidly as it is consumed, the arc burns in a partial vacuum or, at least, the air is rarified and, under these normal conditions, this light shows continuously, after burning a minute, a faint rosy light in addition to the powerful white light. If now a vessel containing any mineral oil, crude or refined, or any resin oil, be placed in the path of these rays the most intense fluorescence appears, even in daylight, greenish in the case of mineral oil, blue in the case of resin oil, thin films glowing in the same manner. So strong is this fluorescence that I have even detected 1 c.c. of crude mineral oil in 999 c.c. of non-fluorescent oil.

I have examined a large number of vegetable oils, such as cotton-seed oil, corn oil, China bean oil, China wood oil, etc., and have not found a trace of fluorescence in any of them. It is stated in some text-books that "oleic acid," which is found in lard oil, is fluorescent. On examination I find that pure white strained lard oil is entirely free from fluorescence under the ultra-violet ray, but all of the samples of so-called No. 1 or No. 2 lard oil (sold for use in machine shops) examined possess some fluorescence, and this may prove to be a novel means of rapidly determining the proportion of oleic acid in lard oil, though I only suggest it tentatively, not having studied the matter carefully from this point of view. The slight fluorescence of ordinary lard oil is different in appearance from that of mineral oil or resin oil, and does not materially interfere with the application of the fluorescent test for its adulteration with mineral or resin oil.

Simple Scheme of Testing

In daily practice I have found it convenient to put the standards in narrow tubular oil-test bottles holding about 50 c.c. each; these are corked, labeled and placed side by side in small wooden racks (like test-tube holders) on a shelf in proximity to an inclosed arc light, beginning with pure oil at the left-hand side. Then a similar sample containing 0.1 per cent. of mineral or resin oil, as the case may be, then 1 per cent., and so on, increasing by single percentages up to 10 per cent. It is advisable to prepare several different series of standards with fluorescent oils of different grades. Crude mineral or resin oils are much darker in color than refined oils, and the color by transmitted light is a guide to the kind of oil that has been used for adulteration and is consequently an indication of the proper standard series to be used for comparison in making a quantitative fluorescent analysis.

It is not necessary to prepare standards for each kind of vegetable or animal oil; thus, the standard series prepared with linseed oil serves for examination of cotton-seed oil, corn oil, China wood oil, China bean oil or any other non-fluorescent vegetable oil. It is necessary, however, to prepare special standards with lard oil for testing adulterated lard oils.

The compounding of core oils has become a large business and nearly all samples that have come to my notice contain mineral or resin oil or both. Neither of these oils impart any valuable properties to core oils, but are used simply to dilute more costly oils; and, in point of fact, they are positively deleterious,

being of a non-drying nature, impairing the good oil binder and requiring more fuel and a longer time for baking the cores in the ovens.

I have found that "Soya" oil expressed from beans grown in enormous quantities in China and elsewhere is an excellent substitute for linseed oil for making cores if used in its natural state, without having been compounded or adulterated by core-oil makers. It costs about 60 cents per gallon for finer grades. The very best substitute for linseed oil as a binder for oil cores that I have discovered is crude whale oil, costing about the same as Soya oil, the only objection to its use being an unpleasant fishy smell which escapes from the core ovens during the baking of the cores. It makes a splendid binder. Cotton-seed oil is used for the same purpose, but so much larger proportion of oil to sand is required that there is little economy in its use as compared with the other vegetable oils.

A simple and practical test of the value of core oils is to make a dozen companion test cores 1 x 1 x 15 in. from batches of pure linseed oil and sharp sand, and also from the same proportions of any other oil and sharp sand. These are placed side by side on an iron plate and baked under precisely the same heat conditions. When cold they are broken on a transverse testing machine with supports 12 in. apart. The relation between the average strength of the two sets of test cores is a measure of the binding qualities of the oils.

Lifting Magnets in Foundries*

Economies Resulting from Their Application in an Industry Which Has Been Slow to Accept Them

BY H. F. STRATTON, CLEVELAND, OHIO

An analysis of figures relating to the tonnage and the cost of handling the pig used by the foundries in this country, seems to indicate that the lifting magnet is becoming an economic necessity to foundries producing a large proportion of the total foundry tonnage. There appear to be three huge businesses which can profitably use lifting magnets for the transporting of iron and steel products:

First is the steel industry, with probably 10,000,000 tons annually which can be economically handled by the magnet, and in this industry the magnet found rapid and extensive use, with savings to the steel mills of probably close to $1,000,000 annually. Second, the railroads have discovered that magnets are large money savers in the handling of their scrap material, and probably 100 lifting magnets are at present in use at the scrap docks operated by the various railroads throughout this country. In several cases the economies effected by the use of magnets in handling railroad scrap have proved to be so large and so obvious as to warrant the installation of very complete equipments, consisting of special cranes, several magnets, and a convenient and scientifically arranged collection of bins, shears, etc. A quotation from a paper by F. D. Reed, assistant to vice-president of the Chicago, Rock Island & Pacific, will give a summation of this matter. "Sorting of scrap, the way we handle it here, can be done for 4 to 7 cents per ton; in other words, we can handle scrap in and out with our facilities for 10 to 12 cents per ton, including the sorting. Prior to May, 1909 (at which time our crane and magnet were installed), when all scrap was handled by hand, the cost per ton in and out ranged from 30 to 35 cents per ton, which is about what it is costing any railroad to-day that is handling scrap by hand, or even with very good modern facilities for handling, and to keep it down to this figure the railroad must have good and convenient scrap-dock arrangements and efficient organization."

Magnets in the Foundry

The third industry, which would appear to have opportunities to effect savings by the use of magnets, is the foundry. It has been estimated that the foundries of this country melt annually about 6,000,000 tons of pig iron and scrap, and although the writer has no definite knowledge of the relative proportions, it would seem reasonable to conclude that of this total about 1,000,000 to 2,000,000 tons is represented by scrap iron and steel.

Of these three-named industries in which the lifting magnet can apparently be used to economic advantage, the foundry has been by far the most reluctant to embrace or even to investigate the economies which are apparently open to it.

An analysis of the costs can be best undertaken from the separate considerations of cost of installation and cost of operation. A magnet thoroughly capable of withstanding hard abuse costs about $1,300 per ton of lifting capacity of pig iron. Standard magnets are constructed in about four different sizes, and although this figure just named does not hold accurately for all sizes, yet it is a fairly close index to the selling price and is sufficiently accurate for purposes of estimate. It may be mentioned at this point that the approximate lifting capacities of these different sizes of magnets in service are, expressed in pounds of pig iron per lift, as follows: 800, 1350, 1950, 2400.

Of course, some kind of a crane is necessary for handling a magnet, and if the foundry already has its yard equipped with either an overhead traveling crane or a locomotive crane, the installation of the lifting magnet becomes a simple and relatively inexpensive matter. If it be applied to an electric overhead traveling crane, it is merely necessary to run leads from the crane to the magnet, and to provide some simple mechanism for taking up the slack in these leads as the magnet is hoisted. If the magnet be applied to a locomotive crane, current can be furnished to the magnet either by suitable plug stations installed at various points in the yard, or an engine taking generator set can be put on the crane, the generator delivering current to the magnet and the engine taking steam from the boiler of the locomotive crane. This latter arrangement, while more expensive in first cost, is preferable in that it provides a flexible unit which is operative at any place which the locomotive crane can reach.

A high-grade four-wheel ten-ton locomotive crane, complete with an engine generator outfit, can be installed at an expense of about $5,500, and such a crane will handle a magnet at a boom radius of about 40 ft., thereby covering a large area, even if the crane runs on only one track. Of course, by the use of parallel spurs, a large area can be conveniently, cheaply and completely served by the locomotive crane. A locomotive crane is of such general use to a foundry that it is only fair to charge but a portion of its cost to the magnet. The locomotive crane can, for instance, be used for loading and unloading heavy castings and machinery, and for shunting freight cars. For about $1,000 extra it can be equipped with a two-line outfit and a bucket for unloading sand and coal. If we consider that $3,000 be a proper proportion of the locomotive crane cost to charge against the magnet, and if a magnet be selected of such size that it will have a lifting capacity of about 1350 lb. of pig iron, the cost of the magnet installation then becomes about $3,900, or, in round figures, $4,000, installed and ready to operate.

The Operating Cost

The operating cost of a magnet consists of certain charges, including operator's wages, fuel and oil, which will exist only when the magnet is in operation, and depreciation charges on the equipment which will not depart much annually from a fixed amount, whether the tonnage be sufficient to keep the equipment busy practically all the time or only an hour or two a day. It follows, then, that the operating cost, which is the sum of these two charges, will necessarily be lower per ton of material handled if the equipment can be kept in service the majority of the time. Most foundries, however, do not melt sufficient metal daily to require the services of the magnet more than two or three hours per day.

A concrete case will be selected for the double purpose of indicating how similar estimates may be made to cover any particular foundry, and for pointing out a daily tonnage at which the installation of the magnet and crane appears to be an economic necessity. The assumption will be made that a foundry melts 35 tons of metal daily, 300 days in the year. All of this metal must, of course, be handled twice; that is, it must be unloaded from

*Presented before the American Foundrymen's Association, Pittsburgh, May 25, 1911.

the car to piles and loaded from the piles to some kind of a wagon on which it is carried to the cupola platform. For a foundry of this capacity the following figures pertain:

Charges per Hour.	
Operator's wages	$0.30
Fuel (at $3 per ton and using ½ ton per 10 hours)	.15
Oil, etc	.03
Total	$0.48

A crane and a magnet of the size referred to before will conservatively handle 35 tons per hour, which will make a cost of 1.4c. per ton. The annual depreciation on the $4,000 equipment at 12 per cent. would be $480, and as 35 tons handled twice per day for 300 days represents 21,000 tons handled annually, the depreciation cost on this tonning basis is 2.3c per ton. This brings the total cost of handling, including wages, fuel, oil and depreciation, up to 3.7 c. per ton. The writer is told by a gentleman well versed in foundry practice that 10c. per ton is a fair figure to assume for the cost of loading or unloading pig by hand, and on this basis the saving would be $1,323 annually, or 33 per cent. on an investment of $4,000.

Magnets in the Large Foundry

If the case of a larger foundry be selected, melting, say 100 tons per day for 300 days per year, and assuming in this case that metal is handled more cheaply at, say 9c per ton, by hand labor, the annual saving effected by the use of the magnet is $4,080, or over 100 per cent. on the investment. It may be mentioned in the case of the smaller foundry that the time the magnet is in use daily would be about two hours, and in the case of the larger foundry, with the magnet selected, about six hours daily would be required. In this latter instance it would doubtless be more economical to install a magnet having a lifting capacity of about 1950 lb., instead of 1350 lb., which was the basis on which the estimates were made.

With these figures fresh in mind, attention is directed to this conclusion: A foundry melting 35 tons of metal daily can install both a crane and a magnet, and expect a return upon the investment, after allowing all charges, of more than 30 per cent. If it happens that a foundry is already equipped with either an electric or a locomotive crane, a magnet can then be installed on a very profitable basis when the tonnage to be handled is considerably less. For instance, if an assumption be made that a foundry melts 20 tons daily, and that a magnet be installed on an existing crane, the cost of the magnet being about $900, then the cost of handling, per ton, including wages, fuel, oil and depreciation on the magnet, is about 2.3c., which would represent a saving in this foundry of about $924 each year, or more than 100 per cent. on the investment.

Handling scrap, in general, will be more expensive than handling pig iron, whether it be done by hand or by magnet, but the advantage in favor of the magnet is more marked in the case of scrap than in the case of pig. As before stated, the railroads have carefully investigated the comparative cost of handling scrap and large castings by means of magnets and by hand labor, and the following information is therefore submitted as being pertinent to the question of scrap handling in foundry yards. N. A. Mears, of the Lake Shore & Michigan Southern, gives the following comparative figures:

Cost per Ton.	
Loading locomotive tires by hand	$0.17
Loading locomotive tires by crane with chains	.08
Loading locomotive tires by crane with magnet	.04
Loading heavy castings by hand, almost impossible.	
Loading heavy castings by crane with chains	.20
Loading heavy castings by crane with magnet	.03

Another gentleman identified with the railroads states that it costs, for an average of 100 cars, $7 per car to unload scrap by hand, and $2.83 per car to unload the same character of scrap by crane and a magnet. Mr. Reed, of the Chicago, Rock Island & Pacific, says he can unload unsorted scrap with a magnet at 2 to 5c. per ton, and sorted scrap at ½ to 1½c. per ton. When this work was done by hand labor the expense was about three times as much.

Incidental Advantages

Exclusive of the economies already cited, incidental advantages, somewhat in the order of their importance, may be mentioned as follows:

1. The elimination of labor trouble, this being particularly true where common laborers are apt to be very unreliable, as in the South; or where the demand for labor for harvesting the crops is extraordinary at certain times of the year, as in the West.

2. The ability of a lifting magnet to handle a drop ball for the breaking of castings too large to charge into the cupola. For this application the magnet not only serves to lift and release accurately the ball, but also to pick up and transport the broken pieces of the casting. For this particular work, not only is the matter of economy to be considered, but also the question of increased safety to the operator.

3. The ability of a magnet to unload castings too heavy to handle by hand, and often of such shape as to be very inconveniently handled even by a crane with chains.

4. The ability to stock pig and scrap in piles higher than would be possible were hand labor employed, and thereby make more efficient use of the available space in the foundry yard.

5. The ability to unload cars more quickly, and thereby save demurrage.

6. The recovery of small pieces of iron in the bottom of freight cars, which can be magnetically swept up, but which would be neglected if the cars were unloaded by hand. This figure is considerable in the aggregate, and has been as high as 700 lb. per car.

7. The convenient recovery of nails and iron shot in foundry sand. This is accomplished by slowly passing the magnet above the sand and as close to the sand as possible, and as it passes over successive portions of the ground the small iron and steel particles, mechanically associated with the sand, will break through their confinement and leap to the magnet bottom, where they will be held until the magnet is de-energized.

8. Independence of weather is particularly noticeable in the South, where the negro is temperamentally opposed to cold weather, and where difficulty is sometimes encountered in getting the common laborer to work out of doors during cold and inclement weather. The magnet, if anything, lifts more on a cold day than on a hot one, and will lift pig iron when covered by snow.

The Element of Danger

The question of safety is often raised, and during the time when the magnet was being commercially introduced its use was frequently combated on the score that it was dangerous to workmen. Of course, it cannot be denied that if a man is standing under a magnet that is carrying a load, and the circuit is interrupted, something is going to happen to that man. The writer maintains, however, that it is safer to use a magnet for the transportation of material than it is to use chains, and for several reasons: First, the magnet is inherently a labor-saving device, and when it is used the number of laborers in its vicinity is reduced, and frequently the magnet entirely displaces ground labor. Second, a laborer always looks upon a magnet with a high degree of suspicion, since there is nothing tangible to hold up the load, and he avoids getting under a load supported by a magnet more than he would under a load supported by chains; in other words, he uses more caution. Third, the accidental opening of the magnet circuit probably does not occur as often as the breakage of chains supporting a load.

Manganese bronze should, in the opinion of a committee of the American Society for Testing Materials, investigating nomenclature and other things of nonferrous alloys, be the term applied to metal conforming to the following limiting analysis: Copper, 55 to 60 per cent.; zinc, 39 to 45 per cent.; iron, not over 2 per cent.; tin, not over 2 per cent.; aluminum, 0.5 per cent.; manganese, 0.5 per cent. The foregoing is a proposed standard definition on which the society has not yet taken a vote.

The furnace of the Robesonia Iron Company, Ltd., Robesonia, Pa., will be blown out this week for relining and repairs. It has been running a little over two and a half years. A new structural steel and cement tile roof will be put on the cast house, and connections will be made to a new stove recently erected. The furnace will be blown in as soon as the various repairs are completed.

The Bullard Machine Tool Company, Bridgeport, Conn., has concluded arrangements with Harry Ellis, Jr., 1138 Mutual Building, Richmond, Va., for direct representation in the territory surrounding Richmond, extending to the West Virginia line.

Pure Irons from the Open Hearth Furnace*

The Method of Manufacture of What Is Regarded as a New Iron

BY DR. ALLERTON S. CUSHMAN

It is the object of this paper to present to your attention the important step in metallurgical development which has made possible a process for making irons of extraordinary purity on the large scale usual in steel-making operations in the open-hearth furnace. Purity in a commercial product is difficult, if not impossible, to define, and it is necessary in the beginning to state emphatically that although the words "pure irons" in the title have been selected advisedly, there is no intention to go beyond the actual facts.

That the electrolytic theory of corrosion is now accepted, by the large majority of authorities both in this country and in Europe, as having left the realm of pure theory for that of fact, is shown by numerous very recent contributions to this subject. In the early days of these investigations experimenters found it extremely difficult to obtain samples or specimens of steel which were to any extent free from manganese, although, of course, many examples of charcoal and puddled wrought iron of a high degree of purity in this respect could be obtained.

Beginnings of Pure Open-Hearth Metal

About this time, however, a prominent American manufacturer, struck by the voluminous literature which had been appearing on both sides of the controversy, determined to make the effort to produce open-hearth metal of the highest possible commercial purity, which would be not only as free as possible from manganese but also from the other four chief impurities which have in the past been taken special note of in the manufacture of steel. This decision on the part of the manufacturer took the experimental work for the first time from a purely laboratory to a large mill scale of operation.

As this experimental work proceeded, the material at first produced was simply a low-manganese mild steel; and while the movement was decidedly in the right direction it was only a step forward and the product obtained was not very essentially different from mild steels that had been produced elsewhere from time to time. When, however, in following up this work the attempt was made to eliminate the manganese and carbon completely from the metal, the resulting ingots were of such an oxidized character as to be entirely unsatisfactory and to lead to most serious troubles in the attempt to roll and manufacture it into a final product. In fact, material made at this stage of the progress of the investigations was not pure iron and was of little utility.

It has been the usual practice in the past to apply the term iron when used in its specific sense only to the products of either the charcoal knobbling fire or the puddling furnace, although, the product of the busheling or fagoting method of production has also yielded material which has managed to masquerade as iron. In conjunction with the results of chemical analysis, the microscope has recently been developed as a means of enabling the metallurgist to easily distinguish iron from steel. These methods of investigation have gradually led to considering iron to be a name applicable only to products which show slag inclusions under the microscope. Steel, from the very nature of its manufacture, does not exhibit this peculiarity, and it is not surprising, therefore, that the mere presence or absence of slag should gradually have come to be held as the distinguishing characteristic between steel and iron.

Border Line Between Iron and Steel

The practical production of a new form of the metal, by a process in which the product was finished in the molten condition and cast into molds, necessarily yielding a slagless body, has reopened the question in some quarters as to whether or not the claim is justified that these pure forms of metal should be called iron and not steel. From the purely scientific standpoint, when we use the word iron, we must inevitably refer to a product which in all of its characteristics essentially corresponds to the element itself. It was, of course, impossible to decide just where the border line between an iron and a steel should lie, until the results of metalographic investigations which have been made within the last few years had taught us the essential difference between the pure ferrite structure and the carbon-iron steel.

From the modern standpoint, neither the presence nor absence of slag could be held to settle the matter of nomenclature, except that the presence of slag inevitably points to the process by which the material was prepared. In the opinion of the writer, it is difficult to understand how a product which is in every way essentially metallic iron and exhibiting a true ferrite structure, could be defined as steel after the carbon had been eliminated to practical traces irrespective of whether the metal is found to contain inclusions of slag. In fact, a metal which contains 3 per cent. or more of a foreign body such as slag falls just that far short of being pure iron, and from a perfectly reasonable standpoint it would appear that after the carbon-iron alloy field has been eliminated, the nearer the metal approaches to the theoretical constitution of the element itself, the more it justifies the name of iron.

Justification for the Name Ingot Iron

This pure iron made in an open-hearth furnace has become generally known in this country and to a certain extent in Europe as "ingot iron." This term, as we are well aware, originated many years ago and was applied chiefly to the lower carbon product of the Bessemer converter and the open-hearth furnace. Of late years, however, it has fallen into disuse and from the standpoint of the steel maker it was undoubtedly a misnomer, so that gradually the term mild or soft steel took its place. Low-carbon Bessemer or open-hearth steel which usually carries from 0.3 to 0.5 per cent. of manganese or over is not iron, for the simple reason that it does not show the true ferrite structure and contains enough carbon to provide it with mild hardening qualities. Besides these facts, mild steels possess many qualities not possessed by iron and may be used for purposes for which iron would be unsuitable, although this applies more especially to the slag-bearing iron as made by the original processes. On the other hand, a pure slagless iron is probably superior for many other purposes to the general run of carbon-bearing metals. It would appear that the term "ingot iron" is especially suitable to a pure iron product made in an open-hearth furnace and cast while molten into ingot form.

The Copper in the Metal

Practically all the scrap available in this country carries copper varying from very small quantities to amounts in some cases exceeding one per cent. A great many conflicting statements in regard to the influence of copper upon iron have appeared in the literature, but in most cases it appears to have been considered an undesirable element, imparting the property of red shortness to iron or steel. When present in considerable quantities, this is unquestionably the case, and when accompanied at the same time with sulphur the effect is highly intensified. In very small percentages copper does not seem to appreciably affect the working or rolling of the product.

Quite early in the investigation with which the writer has been associated, it was found that certain quantities of copper when added to steel would very appreciably retard the solution of the steel in dilute mineral acids. This was also found to be true, though to a much less extent, with the carbon and manganese-free product of the open-hearth furnace, for the resistance to acid attack is to a large extent influenced by the purity of the metal. In fact, the presence of oxygen in the metal has been found to be more responsible than that of any other element as far as the much-discussed question of acid resistance is concerned. In the writer's experience and practice, the question of copper in iron has been given very careful attention; a wide range of heats have been made, which have purposely been given increasing quantities of copper up to as high as 1.5 per cent. These iron-copper alloys were of necessity made on the usual large scale of operation, but no particular difficulties were encountered in rolling or finishing them. It should not, however, be understood that the intention has been to have copper present in these purer forms of open-hearth irons, for, on the contrary, even though it should appear that the pres-

*From a paper read at the annual meeting of the American Society for Testing Materials.

ence of copper within reasonable limits is no detriment to the product, the effort would still be strenuously made to reduce the percentage of copper to the lowest possible point.

If the selling price of the product was commensurate with the expense attendant on securing metal entirely free from copper, there is no reason why such irons could not be readily produced, but it would immediately render useless for the purpose much of the pig iron and most of the scrap at present available.

The Treatment of the Metal in the Furnace

The manufacture of pure iron in open-hearth furnaces in its entirety is undoubtedly a distinctly new development, in spite of the fact that the process has a great many points in common with the open-hearth production of mild steel. In the case of the iron the oxidizing operation under highly basic conditions is carried forward to an abnormal extent. It is not too much to say that the effort is made to do what has generally been conceded to be bad practice in an open-hearth furnace, that is to say, the metal is deliberately over-burned. This treatment yields a bath of metal and slag heavily charged with gas and in a highly super-oxidized condition. The elimination of the carbon and manganese to such low percentages that they amount to no more than traces makes this super-oxidation a necessary step in the process.

Having obtained the desired purity with respect to these elements the bath is given a heroic treatment,* whereby a thorough deoxidation takes place, the gas being at the same time satisfactorily eliminated. No difficulties of any importance are encountered in the pouring of the metal into the ingot molds. It would naturally be expected that such treatment as described might yield a wild metal difficult to handle in the pouring, but this is not the case if the work has been satisfactorily performed. As a matter of fact, the resulting ingots of this process not only possess great purity but are as free from oxygen and gas as any ingots produced from well-made mild steel.

Large Tonnage Possibilities of the Metal

The process is necessarily a more expensive process than that of soft-steel manufacture, owing to the necessary prolongation of the heat and the higher temperature required during the latter stage of the operation. For these reasons, labor, furnace repairs, ladle linings, fuel charges, and the item of metallurgical waste must all be necessarily in excess of those encountered in the making of soft steel. The process, however, holds forth the same tonnage possibilities as in the making of mild steel, and it permits of the making of iron on a basis comparable to the high-pressure methods employed in modern steel manufacture. It also, in contradistinction to the previous methods of iron manufacture, permits of the making of iron in very large masses, and the subsequent rolling of the same in a manner similar to that of mild steel. It is a well-known fact that the greater the amount of work that is given to iron or steel, the more superior will be the resulting product. This permits the making of commercial products out of iron that have been customarily made of steel owing to the steel's superior workability when compared with iron made by earlier methods.

Up to the present time ingot iron has not been manufactured into all the products that are customarily made of steel, and of charcoal and puddled iron, but it has been successfully and easily rolled into billets, slabs, plates, sheets, merchant iron, wire, nails, rivets, pipe and boiler tubes. A wide variety of forgings have also been produced.

TABLE I.—*Analyses of Normal Ingot Iron.*

	(1)	(2)	(3)	(4)	(5)	(6)
Silicon	0.003	0.002	0.005	0.004	0.006	0.003
Sulphur	0.014	0.015	0.019	0.017	0.018	0.014
Phosphorus	0.002	0.001	0.005	0.004	0.003	0.003
Carbon	0.009	0.011	0.015	0.02	0.016	0.008
Manganese	0.012	0.015	Trace	0.02	0.015	0.025
Oxygen	0.024	0.020	0.021	0.016	0.022	0.019
Copper	0.06	0.07	0.05	0.08	0.04	0.02
Aluminum	0.005	0.011	0.012	0.010	0.013	Trace
Nitrogen	0.006	0.004	0.005	0.003	0.005	0.007
Hydrogen						

The foregoing are a few analyses of normal ingot iron as it is being produced to-day, all of which serve to show the possibilities of this process in the production of pure iron. The analyses are extremely accurate, the carbon and the oxygen being determined by combustion with the special care necessary in dealing with the determination of such minute quantities:

In tensile strength it closely approximates high-grade well-rolled charcoal iron, and in elongation and reduction of area it not only equals but in many cases surpasses the finest soft steel. It is a well-known fact that iron is usually inferior to steel in elongation and reduction of area. Owing to its more steel-like qualities in this respect, therefore, pure open-hearth iron becomes available for deep drawing and stamping purposes where very often ordinary wrought iron is unavailable and steel must usually be employed.

*It is understood that the author in his revision of the paper will explain the treatment at some length, involving as he mentioned at the meeting the addition of pig iron.

A New Baltimore Business Organization

A committee of prominent business men, called the Greater Baltimore Committee, was recently organized with the determination to greatly develop Baltimore and the State of Maryland industrially, economically, agriculturally and along other lines and to push Baltimore rapidly toward a million population. It is waging a vigorous campaign in arousing greater loyalty among the people at home and giving the widest possible publicity abroad to the advantages and activities of Baltimore. In this connection the committee, various trade bodies and the municipality will cooperate.

Edwin L. Quarles, formerly secretary of the Southern Commercial Congress and an expert on community development, is the director of the committee's work and has been especially emphatic and determined that this shall not be in any way considered as a spectacular "boom" or "boost," but that it will be carried along solid business lines to accomplish things that will be permanently constructive in their nature. Its aim is to stimulate investment of capital in local enterprises and new factories; find out the particular need for any one kind of an enterprise and then have it located; establish an industrial building in which all the commercial organizations in the city will have their headquarters; arrange for an "All Maryland Convention" in Baltimore for the purpose of arousing State-wide interest and development, etc. It is also intended to do publicity work through handsome books illustrating Baltimore and placing Baltimore newspapers in the reading rooms of hotels, commercial organizations and libraries throughout the country.

Charles H. Dickey, president of the Maryland Meter Company, who originated the idea and is very enthusiastic over the work, is chairman of the committee. Charles T. Crane, president of the Farmers' and Merchants' National Bank of Baltimore, is treasurer. Norman D. Parrott is secretary, as well as being an officer in several trade organizations. The executive committee is composed of the officers previously named and Mayor James H. Preston, ex-Mayor J. Barry Mahood, D. C. Ammidon, H. F. Baker, president of the Thomsen Chemical Company and of the Merchants' and Manufacturers' Association; Jacob Epstein, owner of the Baltimore Bargain House; William H. Fehsenfeld, president of the Travelers' and Merchants' Association; O. F. Hershey, a prominent lawyer; Jacob W. Hook, president of the Old Town National Bank; Joseph C. Whitney, president of the Merchants' and Miners' Transportation Company, and Herbert Sheridan, manager of the Traffic Bureau, Chamber of Commerce.

The Foreign Rail Trade.—Almost complete stagnation prevails in the rail trade, says the London Ironmonger, but some good-sized business is to be settled within the next few weeks, which it is hoped will come largely to British works. An order for 4000 tons of 90's for the Bengal Nagpur Railway has been placed with the Northeastern Steel Company, this being the only business which seems to have been actually put through, while there have not been any new inquiries about. The Longitudinal Railway of Chili has placed its order for locomotives, dividing it between the German firms of Henschel & Son and Koppel. British and American engineers tendered for the business, but they were much underbid by the Germans.

A. H. Baldwin, Chief of the Bureau of Manufactures, Department of Commerce and Labor, Washington, D. C., has issued "Foreign Tariff Notes No. 3," covering recent tariff changes in a large number of countries.

The Steel Corporation's Unfilled Orders

The monthly report of the United States Steel Corporation on the amount of unfilled orders, issued July 11, shows that on June 30 orders amounting to 3,361,058 tons were on its books, an increase from May of 247,871 tons. The improvement follows two consecutive months of decreasing totals. The new figure is 39,485 tons less than February, and 86,243 tons less than March. With the exception of these two months, the tonnage is larger than any month since August, 1910.

The following table gives the unfilled tonnage of the United States Steel Corporation by months since June 30, 1910, together with tonnage at close of each quarter from December 31, 1902, to June 30, 1910:

June 30, 1911	3,361,058	Dec. 31, 1907	4,624,552
May 31, 1911	3,113,187	Sept. 30, 1907	6,425,008
April 30, 1911	3,218,704	June 30, 1907	7,603,878
Mar. 31, 1911	3,447,301	Mar. 31, 1907	8,043,858
Feb. 28, 1911	3,400,543	Dec. 31 1906	8,489,719
Jan. 31, 1911	3,110,919	Sept. 30, 1906	7,936,884
Dec. 31, 1910	2,674,757	June 30, 1906	6,809,850
Nov. 30, 1910	2,760,413	Mar. 31, 1906	7,018,712
Oct. 31, 1910	2,871,944	Dec. 31, 1905	7,605,086
Sept. 30, 1910	3,158,106	Sept. 30, 1905	5,865,377
Aug. 31, 1910	3,537,128	June 30, 1905	4,829,655
July 31, 1910	3,970,931	Mar. 31, 1905	5,579,560
June 30, 1910	4,257,704	Dec. 31, 1904	4,696,203
Mar. 31, 1910	5,402,514	Sept. 30, 1904	3,027,436
Dec. 31, 1909	5,927,031	June 30, 1904	3,192,277
Sept. 30, 1909	4,756,833	Mar. 31, 1904	4,136,961
June 30, 1909	4,057,939	Dec. 31, 1903	3,215,123
Mar. 31, 1909	3,542,595	Sept. 30, 1903	3,278,742
Dec. 31, 1908	3,603,527	June 30, 1903	4,666,578
Sept. 30, 1908	3,421,977	Mar. 31, 1903	5,410,719
June 30, 1908	3,313,876	Dec. 31, 1902	5,347,523
Mar. 31, 1908	3,765,343		

The Wheeling Corrugating Company's Catalogue

The Wheeling Corrugating Company, Wheeling, W. Va., with offices at New York, Chicago, Philadelphia, St. Louis and Chattanooga, has issued a new catalogue, No. 290, devoted to sheet metal and sheet metal products. The volume is unusual because of the exceptional effort that has been made to give something of lasting value to the sheet metal trade. The character of the illustrations is noteworthy, as is also the arrangement for convenient inspection, that buyers may realize the company's ability to serve its customers to advantage. The seven half-tone inserts show the factory plant and the large rolling mill at Wheeling, W. Va., and the factories and rolling mills at Martin's Ferry, Ohio, and the pictures of the branch offices demonstrate the facilities to handle orders promptly.

The catalogue gives useful information in reference to the gauges and weights of sheet iron and tables showing the number of Crescent black sheets contained in a bundle and instructions as to the application of galvanized and painted roofing sidings. A complete line of corrugated sheets for use in connection with concrete work, the various brands of tin for roofing with the Wheeling old style tin plate, continuous roll roofing, metal shingles, eaves trough, ridge roll, conductor pipe and accessories for the roofer occupy some 80 pages.

Twenty-seven pages are devoted to metal laths and architectural metal work. Solders, ventilators, tinners' tools, stove pipe precede some 48 pages devoted to black and galvanized iron stamped ware and piece ware, including fire buckets, ash cans, wash tubs and measures. The catalogue closes with some 27 pages of Wheeling metal ceilings, including many attractive designs, as well as pictures of interiors where the Wheeling metal ceilings have been used. List prices are presented on all goods which are usually not sold on quotation.

The Railway Age Gazette of July 7 prints an article by Max H. C. Brombacher on "Application of Scientific Management to a Railway Shop," which was awarded the first prize of $50 in the competition on that subject which closed June 15. Mr. Brombacher is a practical production or efficiency engineer at 94 West 183d street, New York City, whose name will be recognized by our readers in connection with the authorship of quite a number of articles which have appeared in these columns.

The Pittsburgh Bridge & Iron Works, Rochester, Pa., has made important improvements in its plant. These include an extension to the building and the addition of new machinery, which will increase the output at least 25 per cent. Other improvements are planned which will not be completed until fall.

Birmingham Notes

The furnace of the Shelby Iron Company at Shelby, Ala., one of the oldest in the district, has been blown out for repairs. This furnace has been operated on charcoal iron for many years.

Preparations are being made by the Sloss-Sheffield Steel & Iron Company for the blowing out of Hattie furnace at Sheffield, Ala., and the blowing in of Philadelphia furnace at Florence, Ala.

No. 3 furnace of the Tennessee Coal, Iron & Railroad Company at Bessemer, Ala., has just been relined and will take the place of No. 4 furnace at that plant, which is to be blown out for repairs. Two furnaces were blown in at the company's Ensley plant last week.

By reason of the increased activities at the plants of the Tennessee Coal, Iron & Railroad Company considerable additions necessarily have been made to the force employed, while the installation of machinery at the plant of the American Steel & Wire Company at Corey, Ala., which has been resumed, has afforded employment to some 2000 men.

The steel plant of the Southern Iron & Steel Company at Alabama City, Ala., has been closed down temporarily for repairs. The blast furnace will be kept in operation.

A British Handbook for Iron Founders

The Frodair Iron & Steel Company, Fenchurch House, E. C., London, England, has issued a "Handbook for Iron Founders" which must possess much value to manufacturers of castings, to whom it will be a volume for ready reference. In its 155 pages the subject is taken up in detail, including the different elements in pig iron, interaction of different chemical elements, the selection of irons for special castings, hints on cupola practice, blowing machines, chilled castings, cylinder castings and adding steel to cast iron in the cupola. Other chapters are devoted to the areas of round, square and rectangular pouring-gates, the arrangement and regulation of cupola blast, the relation between transverse test records and admiralty and standard engineer's bar, approximate (working) capacity of foundry ladles, judging temperature of molten iron by color and the approximate melting capacities of different cupolas. A number of pages are devoted to blank forms for the benefit of those who wish to secure analyses of Frodair iron. The handbook is carefully indexed.

A lecture by John F. P. Lewis, of the above-named company, on "Improved Cast Iron, How to Get It in the Foundry," delivered before the British Foundrymen's Association (Scottish Branch), has been issued in pamphlet form. It contains much interesting information.

June Copper Production and Stocks

The Copper Producers' Association has issued its statement for the month of June as follows:

	Pounds.
Stock of marketable copper of all kinds on hand at all points in the United States, June 1	165,995,932
Production of marketable copper in the United States from all domestic and foreign sources during June	124,554,232
Deliveries of marketable copper during June:	
For domestic consumption	61,655,561
For export	71,460,519
	133,116,080
Stock of marketable copper of all kinds on hand at all points in the United States, July 1	157,434,164

This statement shows a decrease in stocks from June 1 to July 1 of 8,561,768 lb. The month's production was a decrease as compared with May of 2,408,312 lb. Deliveries for domestic consumption decreased 2,888,402 lb., while exports showed an increase of 9,481,962 lb.

The Empire Steel & Iron Company blew out its blast furnace at Oxford, N. J., July 10, for repairs. The furnace had been in blast a little over two years and had made the most successful run in its history, practically doubling the output of any previous period of the same length. This speaks well for the General Electric Company's turbine blower which was installed at this furnace about 16 months ago. The product of the furnace is basic pig iron, made from ores mined on the property of the company in the immediate vicinity of the furnace.

The Dowman-Dozier Mfg. Company, Atlanta, Ga., announces the removal of its estimating office to 1507-8 Candler Building.

Ductility in Rail Steel*

BY P. H. DUDLEY.

Owing to the exhaustion of the available low-phosphorus ores, Bessemer rail steel is now of necessity a high-phosphorus and low-carbon alloy, the mean carbon being about 0.50, manganese about 1.00, and silicon 0.10 to 0.20 per cent. (The chemical compositions refer in all cases to 100-lb. rails.) The impurity of phosphorus is limited to 0.10, while that of sulphur was limited formerly to 0.075 or 0.08 per cent. The manufacturers this year charged for this limitation of sulphur 5 cents extra per 100 lb. and it has been omitted from most specifications, though it is generally required that its content be reported.

Melts of open-hearth rails for the New York Central Lines contain from 10 to 24 ingots and make from 90 to 180 rails. Three butts are tested from different ingots of each melt; one is from the second ingot teemed, one from the middle of the melt and a third from the ingot before the last one poured. To pass the melt each butt must show a ductility of at least 5 per cent. in 2 consecutive in. upon the base or of 6 per cent. in 1 in., while in one butt the ductility of the steel is totally exhausted. The butts for this record are selected in rotation from the different ingots and the range for the melts is thus ascertained. The tests as a rule indicate that the ductility is quite uniform for each melt. The exceptions can usually be traced to colder rolling, differences in heating, and sometimes to brittleness of the metal itself.

The New York Central & Hudson River and the Boston & Albany Railroad companies have had a large experience concerning the requisite ductility of rails as girders to carry and distribute the wheel loads and also to resist flange abrasion upon curves under heavy traffic. Of the many thousand tons of Bessemer rails of 0.06 per cent. phosphorus and 0.60 to 0.65 per cent. carbon which the author commenced to roll in 1891 and continued until the exhaustion of the low-phosphorus ores in 1902, 90 per cent. were required to exceed a minimum ductility of 5 per cent. per inch as shown under the drop test, which in fabrication by the manufacturers was raised to 95 per cent. The maximum ductility was about 18 per cent., and the average was over 12 per cent. The minimum ductility was 4 per cent. per in. for acceptance of 10 per cent. of the rails, though confined by good mill practice to 5 per cent. of the output. The rails proved to be tough and but few fractures have occurred in service, while many are still in the tracks.

Six-inch, 100-lb. rails made in 1894, after sixteen years of service carrying 250,000,000 tons of traffic with a loss of less than 0.125 in. on the head, were tested early this year under the drop, base down on the supports. One butt gave 6 per cent. elongation before it sheared through the bolt holes and a butt from another heat gave 8 per cent. The metal in the head of either rail, like thousands of others in the track, did not flow to the sides but wore uniformly, owing to the efficient support of the metal of high elastic limit underneath the bearing surface. The resistance to flange abrasion was excellent, rails lasting six to ten years upon three and four-degree curves under heavy traffic. Rails of the same sections containing 0.10 per cent. phosphorus and 0.50 per cent. carbon used to replace them cut out upon the same curves in two or three years, although there has been some increase in the traffic.

Railroad Equipment Orders.—Orders for railroad equipment include the following: Great Northern, 20 Mikado locomotives; Illinois Central, 10 Mikado and 10 Pacific type locomotives, with specifications out for 2000 box cars; Atchison, Topeka & Sante Fe, 81 locomotives; Ann Arbor, 450 freight cars; Missouri Pacific, 50 Mikado locomotives and 50 passenger cars; Northern Pacific, 1000 steel underframes for box cars; Lehigh Valley, 25 steel baggage cars; Louisville & Nashville, 1000 steel frame underframes for box cars.

Corrigan, McKinney & Co.'s blast furnace at Josephine, Pa., has resumed operations after being shut down for several months for relining and some improvements.

*From a paper presented to the American Society for Testing Materials.

Mallet Articulated Locomotives on Ore Railroads

DULUTH, Minn., July 7, 1911.—The experience of two of the Minnesota iron ore railroads with the new Mallet articulated locomotives has been somewhat interesting. Both the Great Northern and the Duluth, Missabe & Northern have put such locomotives in service this year, the former for main line haul, the latter for the hill from its yards at Proctor down to the docks at Duluth. In the case of the former the attempt was made to handle 130 loaded cars over the main line, and the result was havoc for drawheads and all draft mechanism. The trains pulled to pieces, and there were occasionally as many as 1000 loaded cars out on the line under temporary repairs. The gross train loads that were being pulled amounted to a trifle more than 10,000 tons, and the revenue loads were more than 6000 gross tons. There is a state law in Minnesota that forbids the continuous labor of a train crew for more than sixteen hours, and this complicated the situation, as it was found generally impossible to make the run within that time from Kelly Lake yards, at the range end, and the docks. Train loads have now been cut down to 110 cars and the service is going better. Former loads, with locomotives that had been customarily used, were from 70 to 80 cars.

In the case of the Duluth, Missabe & Northern, there is a six-mile run from the Proctor yards to the docks on which the grade with traffic is 2 per cent. It was the plan of the company to operate these big engines on this hill, with especial reference to the haul of empties up to this yard, where main line trains for the mines are made up, and where they are broken, when coming down loaded. One locomotive had been able to pull but 27 cars up the hill, but the Mallets pull up 70 and with a trifling additional fuel cost. When the locomotives are running smoothly it is expected that there will be no greater coal consumption for 70 cars than there had been with 27. This road does not use these engines anywhere between the mines and Proctor. D. E. W.

New Publications

Quelques Mots sur L'Industrie Metallurgique Russe.—(Some Words on the Russian Metallurgical Industry,) by Hippolyte Gliwitz, mining engineer, 5 Rue Otchakoffskaia, St. Petersburg. An abstract specially made for the Turin International Exposition from the author's larger work, "The Iron Industry of Russia." Paper. Fifty-two pages of text, 20 pages of descriptions of enterprises and 16 pages of maps, statistics, etc.

Among the various chapter headings of the work are the following: Deposits of iron ore; historical sketch; exploitation of iron ore and coke production; production of iron and steel castings; foreign trade of the Russian metallurgical works; iron consumption in Russia. The diagrammatic charts show the fluctuations from 1870 to 1909 in the Russian production and consumption of metallurgical products.

The Manila Times.—The second annual edition, being a supplement of the Manila Times, Manila, P. I., for March 19, 1911, has been received. This large, well-printed and beautifully illustrated publication would be well worth mention on account of the number, variety and interest of the articles therein if emanating from some of the long-established publishing houses of the United States, but coming as it does from so distant a part of the world, whence we are unaccustomed to expect such an elaborate special number, its size and contents are the more remarkable. The wonderful progress already achieved and the spirit of enterprise that has been awakened are set forth in an article on "The New Philippines." "The Progress of Scientific Research in the Philippines" deals with the practice of medicine and sanitary conditions and of the constant efforts toward improvement in the latter particular. "Education in the Philippines" shows by the variety of trade schools conducted that study is not merely along academic lines, but that the practical training of the Filipino youth is being attended to. Other articles are scarcely less interesting. The whole publication exudes the most confident optimism.

Lake Superior Mining News

Explorations in Canada

DULUTH, MINN., July 8, 1911.—There is some activity in exploration in the Canadian region to the north of Fort William and Port Arthur. To some extent this is due to the construction of the Grand Trunk Pacific Railroad, and some of the work is connected with that company. The expected construction of a connecting link for the Canadian Northern between Port Arthur and the eastern lines of the company is also responsible for some of this work. Canadian Northern interests have financed the construction of its Lake Superior division, which will connect its western and eastern lines and give it an all-rail through road to the Pacific. It is estimated that this link will cost about $20,000,000, and work thereon is to begin the coming winter. It will run from the vicinity of Sudbury to Port Arthur.

Explorations in Minnesota

Some abatement is noticeable in Vermillion range explorations. The concrete shaft of the North American Iron Company, near Tower, is again full of water, which broke in about the point where the shaft is ledged. The pumps were drowned, and an attempt is now being made to unwater. The Camp shaft of the Vermillion & Mesaba Iron Company is now down 100 ft. and is still in ore, which has assumed much the character of that for which the nearby Chandler mine has been so famous in times past. This shaft has been in ore for something like 75 ft., and it begins to look very much as though a mine would result from this exploration. The same company's other shaft is about 100 ft. deep, in greenstone, and will be pushed to about 150 ft., where a drift will be run to ore that was cut by diamond drilling. The two shafts are 580 ft. apart.

A few of the numerous explorations that were under way some time ago and were then described in *The Iron Age* have ceased for the present; others are as active as ever. Those most active are the Vermillion & Mesaba, the Almar and several of the properties on and near Pine Island, north of Vermillion Lake. Drilling on a considerable scale is under way in the greenstone just east of the Ely group of mines and between them and Section 30 mine.

Some interesting exploration is under way on lot 12, section 6, 58-15, eastern Mesaba range. Three recent drillings are as follows:

	No. 1. Feet.	No. 2. Feet.	No. 3. Feet.
Surface	142	187	142
Ore	148	93	..
Ore and paint rock	..	..	..
Ore	15	..	..
Ore and decomposed taconite	10	..	..
Ore	5	25	3
Ore and decomposed taconite	15	175	151
Ore	10	16	..
Ore and decomposed taconite	56	..	..
Ore	5	..	..
Ore and decomposed taconite	14	..	..
Decomposed taconite and ore	45	..	..
Same and ore seams	14	..	..
Taconite	93	..	..
Greenulite	42	..	..
Quartzite	11	..	..
Totals	635	..	..

Nos. 2 and 3 holes are not completed. The interesting facts of this drilling are as follows: That the formation at this point is very narrow, not exceeding half a mile in width, and these holes are about 1800 or 1900 ft. from the north line; that ore bearing formation in the only completed hole is 477 ft. thick, of which 248 ft. is merchantable ore, and that these tracts were extensively drilled in the past with the result of finding a small deposit of high grade ore, that was partially developed by very costly and difficult shafts, so difficult, in fact, that the property was abandoned by the operators then in charge. Now a very large body of ore is being found. From the depth at which ore has been found and its distance from the north line it will be seen that the dip of the formation at this point, instead of being about 8 deg., as is common to the Mesaba range as a whole, is more than 20 deg. The Longyear & Bennett interests, that control this lease, have a large tonnage of ore close by and will soon develop for mining on a large scale. For this purpose it will be necessary to divert the course of the outlet of Wine Lake, which is a large body of water, for a considerable distance, probably by a very large concreted conduit capable of caring for the entire flow of a large river.

Cuyuna range explorations continue practically unchanged, with most of the work in the vicinity of the mines that have been opened to the south and southwest of Rabbit Lake. Shipments from the Kennedy mine go forward steadily, but not yet in large volume. M. A. Hanna & Co. are sinking a shaft at a point several miles southwest of all prior developments, where they have located a body of ore and from which they expect to make shipments next year. If no change is made in present plans there will be five shipping mines in that range next year.

On the Marquette Range

G. J. Maas and associates have organized a company to hold the lands they have been drilling in T 48-28, near the American mine, Marquette range. They are closing some leases with operating concerns for portions of these lands and expect the tracts to be opened very soon. A considerable tonnage of good ore, both hematite and magnetite, has been found by their explorations. It was on these lands that Mr. Maas sank the deepest diamond drill holes in the United States—3265 ft. This is quite a little deeper than the hole sunk by the Clergue interests some years ago at Republic.

Ore Shipments

Total shipments from the Cuyuna range have been 28,300 tons to July 1, and ore is now going forward at the rate of 500 tons per day, but this will now increase, as a steam shovel is at work at the Kennedy mine. Concrete shaft sinking, that has been in progress on that range for some time, has ceased for the present, and the Foundation Company has stored its material. Five of these shafts have been sunk, four of them for Rogers, Brown & Co. and one for the Inland Steel Company.

To July 1 the Duluth, Missabe & Northern Railroad has shipped but 2,050,000 tons of ore as compared with 5,097,000 tons for the corresponding period of last year, but the Great Northern has shipped 2,893,000 tons against 2,633,000 tons last year. Were it not for the Steel Corporation's contract with the Great Northern for the mining of the latter's lands the Great Northern would show a considerable falling off while the Missabe's loss would be very much less than it is. The famous Great Northern contract will have a marked tendency, for a number of years, to reduce net earnings of the Steel Corporation's two iron ore roads in this region.

Iron ore shipments from old ranges are increasing somewhat, though one mine that shipped as high as 3,000,000 tons in a season is now running at the rate of 30 or 40 cars a day. The Mahoning, which forwarded 1,500,000 tons in 1901, will output 1,000,000 tons this season. Its royalty rate on 1,000,000 tons is 15 cents, while on 1,500,000 tons it would pay but 12.5 cents. It is one of the Great Northern mines that is not included in the Steel Corporation leasehold.

Hearings before the Interstate Commerce Commission will soon begin at Superior, Wis., in which L. E. Lum of Duluth seeks to force the Great Northern Railroad to name an iron ore rate from the vicinity of Grand Rapids, Minn., to its docks on Lake Superior. Mr. Lum states in his complaint that he deems 40 cents a ton a reasonable and satisfactory rate. Grand Rapids is at the western end of the Mesaba range and is not less than 140 miles from the Great Northern's ore docks. No rate has ever been made from there as there has been no ore for transportation. Indeed, there is none now, and there are slight indications of any in the near future. The suit is, of course, an endeavor to secure a reduction of freight rates from all Mesaba range points. This is the first case of the sort to come before the commission, others having been before the Minnesota Railway and Warehouse Commission.

D. E. W.

The Massillon Bridge & Structural Company, Massillon, Ohio, has had plans prepared for the erection of a large new plant on the site formerly occupied by the local rolling mill of the Republic Iron & Steel Company, on which an option has been taken. The business of the company has outgrown the capacity of its present plant. A structural shop 135 x 600 ft. is proposed. The erection of the plant, it is stated, will depend on the disposal of $100,000 in 7 per cent. preferred stock, for which the company expects to find a ready market. Elton Rice is president and general manager and Charles D. Yost secretary and treasurer.

The Sulphuric Acid Corrosion Test*

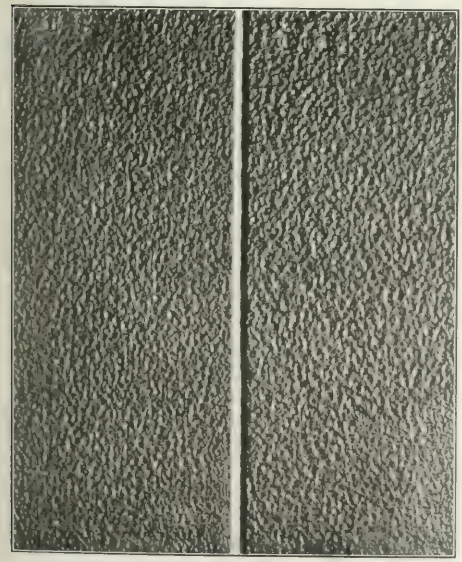
BY CLOYD M. CHAPMAN.

Materials are sometimes tested for a quality which in service they are not called upon to develop. The list of false or misleading tests which might be cited in this connection is a long one. Probably the most notable case of testing a material for a quality which is not required in service is that of subjecting cement to a tensile test.

Of the many examples of misleading tests there is one which, more than others, has come to the notice of Westinghouse, Church, Kerr & Co. Users of sheet iron and steel have been persuaded to believe that a metal which will best stand the sulphuric acid test as outlined in the Proceedings of the Society, Vol. VII, 1907, p. 231, is the one which will last longest under the usual conditions of weather exposure. With this belief in their minds they have purchased at greatly advanced prices metal which, while it would stand the sulphuric acid test admirably, was possibly no better suited to withstand the corrosive action of the particular exposure for which it was purchased than other metals purchasable at much lower prices.

This sulphuric acid test may be briefly described as follows: Samples of the metals to be tested are prepared by polishing their surfaces with fine emery, rubbing in a direction at right angles to the direction in which the metal was rolled. The size of the test piece recommended is 1-16 x ½ x 2 in. After careful weighing these small plates are immersed in a 20 per cent. solution of chemically pure sulphuric acid for one hour at a temperature of 15 deg. C. (59 deg. F.). They are then removed from the acid, washed, dried and again weighed. The loss in weight is taken as an indication of the ability of the metal to withstand corrosive influences.

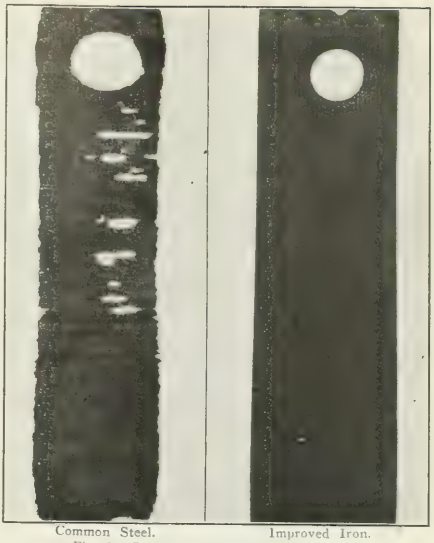
To demonstrate the differences between two methods of testing, namely, the weather exposure test and the sulphuric acid test, there are shown in Fig. 1 photographs of two plates, one of improved iron and one of common steel, showing results of weather exposure for 18 mo. The improved iron contained only minute quantities of impurities; the steel analyzed about 0.06 per cent. carbon, 0.095 per cent. phosphorus, and 0.38 per cent. manganese. These plates were clean and new when exposed side by side on the roof of the Maritime Building at the southern



Common Steel. Improved Iron.
Fig. 1.—Results of Exposure to the Weather for 18 Months.

extremity of New York City. They seemed to be rather free from mill scale, but any mill scale present was left on, as it usually would be in practice.

*Paper substantially in full, read before the American Society for Testing Materials, Atlantic City, June 28.



Common Steel. Improved Iron.
Fig. 2.—Results of a 12-Hour Acid Test.

They were exposed at an angle of 45 deg., facing south. This exposure is a rather severe one because of the fogs, smoke and the salt air from the bay, all of which are present in this locality. At the end of 18 months they were removed and their surfaces briskly brushed with a wire brush until the rust was removed and the surface of the metal brought to a polish. A careful examination of these plates fails to show any considerable difference in the corrosion and pitting which has taken place. As far as the eye can distinguish, each plate has rusted to the same extent. The depth and size of the pits formed by rust on the surfaces of these two plates are very nearly the same, but careful comparison shows slightly larger and deeper marks on the surface of the improved iron than on the surface of the common steel.

Having thus compared the ability of the two metals to withstand the action of the weather, a sulphuric acid test was made on parts of the same plates which had been exposed to the weather. Strips cut from the ends of these plates were prepared as above described, brought to about the same weight, and immersed in dilute sulphuric acid until one of them was nearly destroyed, while the other had lost only 7 per cent. in weight. At the end of the 1-hr. period prescribed by the test the improved iron had lost 0.83 per cent. while the common steel had lost 6.7 per cent. Fig. 2 shows the two specimens as they appeared after being subjected to the acid test for twelve hours.

It is quite unnecessary to point out that, although weather exposure caused approximately the same amount of rusting and pitting on the two plates, yet under the acid test one was attacked several times as violently as the other.

The makers of this improved iron claim that it is much more resistant to the corroding influences usually met with in service than are any of the ordinary grades of iron or steel, and they back up their claims by citing the sulphuric acid test as an indicator of the relative resistance of their metal to corrosion under service conditions.

We do not wish to be understood as claiming that the sulphuric acid test is useless or that when properly used it may not give useful information, but we do wish to call attention to its utter inability to give a reliable indication of the relative ability of metals to withstand the corrosive action of exposure to the weather.

The Republic Iron & Steel Company has moved the executive offices and the Eastern sales offices to a commodious suite of apartments on the sixteenth floor of the Whitehall Building, 17 Battery place, New York, overlooking the Hudson River.

An Oil Gas Producer

A New Power Generator Employing California Crude Oil

The problem of developing a satisfactory and efficient producer for generating gas from California crude oil has been a difficult one to solve, but recently the International-Amet Gas Power Company, 609 Central Building, Los Angeles, Cal., has placed on the market one which is said to be highly satisfactory. At the present time the company is installing three 400 hp. units in a gas electric power station which is being built for the Holton Power Company at El Centro, Cal. Fig. 1 shows front and end elevations of the producer while Fig. 2 is a section giving constructional details.

The installation is very interesting as the oil used has an asphalt base which has generally been considered capable of being burned under steam boilers only. In designing this particular producer an effort was made to secure a permanent gas at a temperature which would not distill the asphalt base into a vapor which in turn would be carried to the engine cylinder and come down as solid carbon and score the walls. The system upon which the producer operates is known as the Amet-Ensign and generates a gas that is claimed to hold approximately 70 per cent. of its heat in fixed hydro-carbon compounds, the remainder being carbon monoxide and free hydrogen, the highest quantity of the latter being 12 per cent. by volume. The best thermal value of the gas is said to be between 200 and 250 B. t. u. cubic feet although it is possible to produce gases having a value ranging from 170 to 270 B. t. u. Difficulty was first experienced in keeping the thermal value of the gas constant under different load conditions, but this has been overcome by maintaining the oil automatically at a fixed temperature to insure constant viscosity and regulating the quantity of oil forced into the producer so as to secure the proper relation between it and the quantity of air. The proportions of oil and air in the mixture are adjustable and are under perfect control of the operator, although after an adjustment has been made it is possible to vary a load over a wide range without materially altering the thermal value of the gas. One of the especially advantageous features of this system is the possibility of starting it instantaneously from the cold plant. The minute the fire is lighted gas is generated, thus making it possible to operate the producer in large installations with a maximum economy by varying the number of units in service with changes in the load on the plant. It is claimed that while the efficiency of gas generation is lowered for approximately 15 min. after starting, this figure is only a small fraction of the maximum amount. Where the producer is operated in warm weather, or the fuel is artificially heated in cold weather to a temperature of 100 deg. F., it is stated that a producer can be put in full operation under full load in from 1½ to 2 min. which is the time required to start the auxiliary apparatus. It is claimed that one man may operate a plant having a capacity of 300 hp., while if special care has been taken in laying out the machinery a 500-hp. plant can be operated with the same help. The amount of attention required is the same as that which should be given to oil-fired boilers of the same capacity or about 3 min. every half hour.

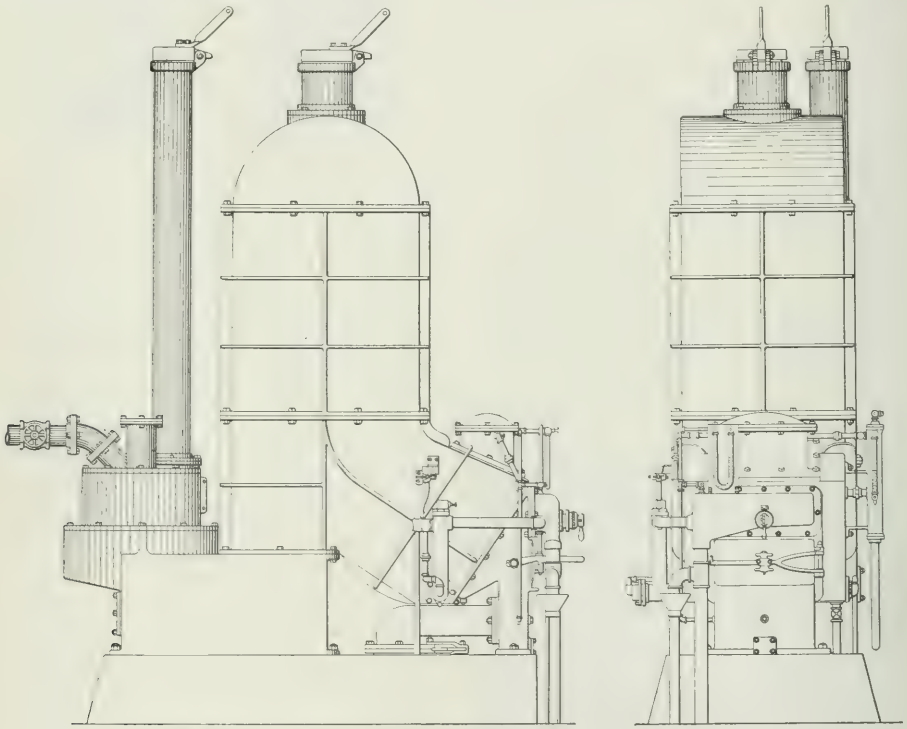


Fig. 1.—Front and End Elevations of a New Type of Oil Gas Producer, Built by the International-Amet Gas Power Company, Los Angeles, Cal.

Details of the Producer

Referring to Fig. 2 which shows some of the constructional details of the producer, the oil fuel is fed in from a weir-box, provided with an adjustable needle valve. Oil runs down the adjacent inclined slide or plate while the air comes up from below and passes under the lower edge. It has been found in operation that only the oil containing a high percentage of asphaltum reaches the lower edge of the plate and by burning there maintains the heat required to gasify the lighter constituents of the oil. At this point the products of combustion and distillation pass up through the brick lined combining tube at the right and pass down to the first water seal. In the newer types of producers it is expected that steam will be used which will be supplied by a small boiler. This steam which experiments have shown to be beneficial in its effects

will be furnished at practically atmospheric pressure and will maintain a slightly lower temperature immediately above the slide although this is not absolutely necessary. To maintain the relative amounts of oil and air constant with the production of various quantities of gas the difference of pressure on two sides of an orifice through which the air passes is applied to the oil in the weir-box. This automatic control of the relative proportions of oil and the air has proved to be one of the vital features of the gas making process and in operation it is very remarkable in the uniformity of the gas which it maintains under varying requirements. The gas after passing through the first water seal enters a rotary washer which is shown at the base at the left of Fig. 2. At the top of the producer proper and on a stand-pipe connected to the gas main beyond the washer are burn-out valves which are used in starting up, ordinarily, although in the case of a smaller producer it is sometimes necessary to open this valve at intervals to clear the combining tube of a soft deposit of carbon. This operation requires but a moment and while it is being performed the oil is shut off. It is stated that after a producer has become thoroughly warmed up and is running regularly this valve need not be opened except at intervals of several hours. The temperature, pressure and various other conditions occurring in a producer are indicated by various gauges of the customary type.

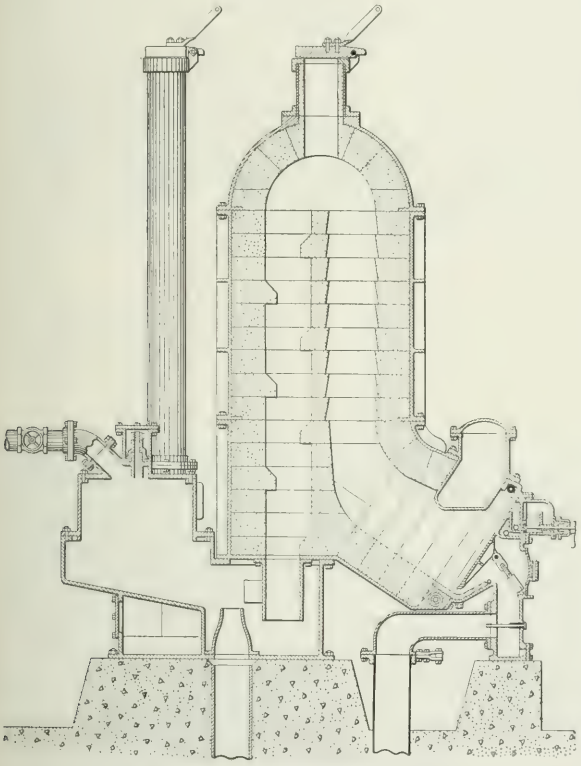


Fig. 2.—Sectional Elevation of a 300-H.P. Producer.

As the flow of oil through the needle orifice and over the weir depends both on the pressure and the viscosity, it is desirable to maintain the oil supply at a reasonably constant temperature. To do this a water-jacketed chamber is placed in the oil supply line and the circulation of the water is controlled by a thermostat immersed in the oil. In rating these producers 1 hp. means that the producer has sufficient capacity to generate gas having a heat value of 10,000 B. t. u. per hour as shown by chemical analysis and checked by a calorimeter.

Other Installations

Among the first commercial units installed was one for the United States Reclamation Service at Yuma, Ariz., which supplies gas for two 50-hp. engines operating a scoop wheel for raising water from the Colorado River. This producer was not of course as perfect as those now being built, but it was reported to have given highly economical and reliable operation. The guaranteed oil consumption for this plant was 1 gal. per 6½ b. hp. and in actual operation this has been considerably exceeded. It is stated that no interruption of service due to any fault of the producer has been experienced and the engine cylinders are still in excellent condition. In another installation at Avondale, Ariz., a 200-hp. producer plant developed 10 b. hp. per gallon of oil at a 75 per cent. load.

El Centro, the site of the Holton Power Company's plant, is in the heart of the richest agricultural section of the world, namely, the Imperial Valley, and is located about 50 ft. below sea level. With the completion of the great irrigation project for this section numerous small communities have sprung up, and towns have been established. For supplying these with light and power the Holton Power Company has constructed an hydraulic plant at Holtville and a steam auxiliary plant at El Centro. The gas producer-gas engine plant is an addition to the latter and will take care of the rapidly growing service. The installation which will be housed in addition to the present buildings consists of three 400 hp. producers supplying a 1000-hp. twin tandem gas engine directly connected to a three-phase 60-cycle, 2400-volt alternator, operating at a speed of 150 r.p.m. A 15-ft. fly wheel weighing approximately 40,000 lb. provides very close electrical regulation, and it is expected that it will be possible to operate the gas-engine unit in parallel with the hydro-electric and the steam plants. The main oil supply for the producers will be stored in a concrete tank which will supply auxiliary tanks provided with pumps for forcing the oil to the producers.

All the water required for this installation will be for the gas washer, the oil chamber and the engine cylinder water jackets. Although the amount required for the last will be comparatively large, the supply will be used continuously, so that practically the only loss will be by evaporation from the cooling tower.

Producers of this type make a small amount of lamp-black as a by-product, but as the El Centro plant already includes an illuminating gas plant making this substance as a by-product, but not in sufficient quantities to furnish the steam required when burned under a boiler in connection with the illuminating gas process, the lamp-black made by the producer will be delivered to the settling tank of the other gas plant. This plant, however, is not the customary arrangement, as ordinarily a small settling tank located close to the producer is employed, and the wash water is used over and over again and a small amount of lamp-black skimmed from the top.

The Sauer Power Generating Company, 5115 Rosetta street, Pittsburgh, manufacturer of Sauer patented shaft bearings, small steam turbines, gas burners and other specialties, finds its list of possible customers so large that it feels justified in increasing its capacity. It has several manufacturing sites under consideration and will likely close soon for one of them. This is in a growing part of Pennsylvania, with good railroad and interurban connections, close enough to Pittsburgh to secure raw materials and low freight rates. A small foundry for gray iron castings and possibly one for brass work are being considered in connection with the new location, and some machine tools, in addition to those now used, will be purchased at a later date.

The Gary Sheet-Bar Mill

An 18-Inch Continuous Mill Built by the Indiana Steel Company

At the time plans were being prepared by the Indiana Steel Company (subsidiary of the United States Steel Corporation) for the 24-in. billet mill at Gary, Ind., the lay-out of the sheet-bar mill was also considered. Completion of the sheet mills of the American Sheet & Tin Plate Company at Gary has already made obvious the immediate occasion for this new sheet-bar capacity. This early need of the mill was so far from being anticipated at the time of the erection of the billet mill building that no provision was made then for the entrance into the sheet-bar mill. The making of this 100-ft. opening was required to be done without interrupting the operation of the billet mill. This span is now carried on a single truss, the vertical members of which are the former building columns. After the balance of the truss was built and riveted in place, so that the load could be carried on it, the building columns were cut out below the bottom chord of the truss. The 24-in. billet mill was described in *The Iron Age* of October 21, 1909.

The relative location of the sheet-bar mill to the 24-in. billet mill is shown in Fig. 1. Steel for the sheet-bar mill is to be supplied in the form of a bloom, 4.4x7½ in., which bloom may be an entire ingot rolled in one length after being cropped off by the horizontal shears previous to running on to the 24-in. billet mill transfer table. An ingot of this size will weigh approximately 8500 lb. Where the ingot is rolled down to a smaller sized bloom, it will have to be cut to a length not greater than 90 ft., which is the length of the transfer table carrying the bloom from the 24-in. mill feed table to the sheet-bar mill feed table. The product of the sheet-bar mill will be bars varying from 8 in. x ¼ in. up to 8 in. x 1½ in., this latter size being the limit of capacity provided by the steam flying shear.

The course of the bloom through the sheet-bar mill is briefly as follows: Brought from the 24-in. billet mill run-out table by the above-mentioned transfer, Fig. 2, to the sheet-bar mill feed table, it is carried to the gear-driven flying crop shear. From this shear the bloom passes directly into the mill proper, which is an eight-stand 18-in. continuous mill, the first six stands of which are arranged for rolling the billets in closed passes, the last two in plain rollers. From the mill the billet runs through the steam flying shear, Fig. 3, where the bloom is cut into lengths of 30 ft. These pieces slide over a friction roller table to a set of pinch rollers, Fig. 4, which deliver the pieces to the bar piler beyond. Alongside of this bar piler is a 3 x 30 ft. Fairbanks scale, on which bars may be weighed in transit from the bar piler to the cooling beds alongside.

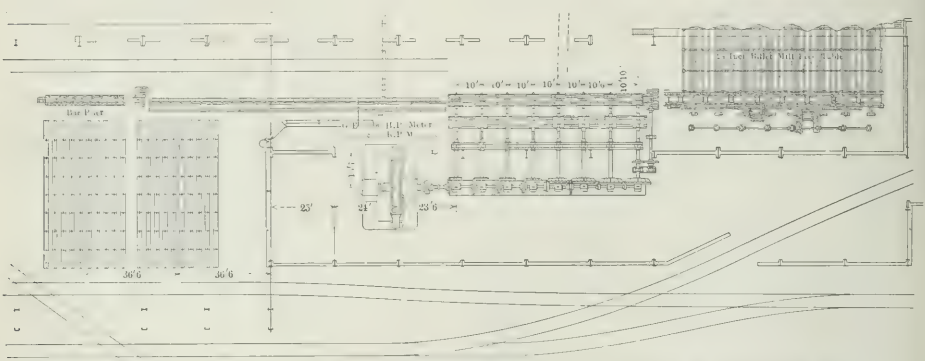


Fig. 1.—Lay-out of the Gary 18-inch Continuous Sheet-Bar Mill, showing Its Relation to the 24-inch Billet Mill.



Fig. 2.—View of the Gary Sheet-Bar Mill, Showing a Portion of the Transfer Table from the Billet Mill and the Mill Feed Table.

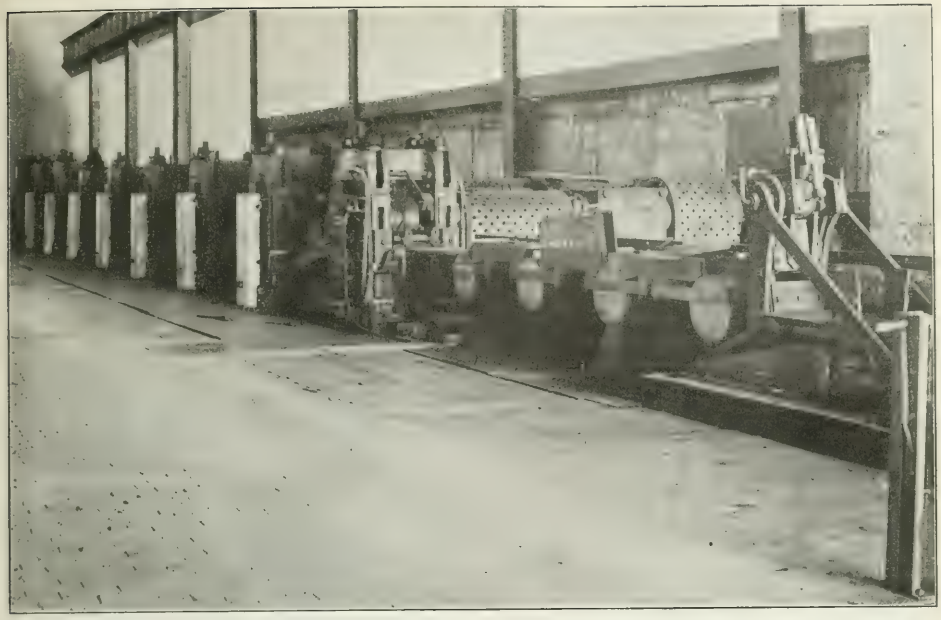


Fig. 3.—View of the Gary Sheet-Bar Mill, Showing the Steam Flying Shear.

Immediately south of these cooling beds is the loading track. A 20-ton Alliance Machine Company crane having a special cradle, also shown in Fig. 4, spans this end of the building and handles the material from the bar piler to the cooling beds and from there to the cars in the loading track.

The transfer table at the head of the mill is of simple rail type construction, with ordinary chains and dog, and was built by the American Bridge Company at the Pencoyd Works. This table is approximately 90 ft. long over all and spans a distance of 57 ft. 4 in. between the center lines of the billet mill feed table and the sheet mill approach table. This transfer table is not provided with skids, the chains and drive being arranged so that they



Fig. 4.—View Showing the Pinch Rolls at the End of the Shear Runout Table, Crane and Special Bar Cradle, and Cooling Beds. The Bar Piler as Here Shown is Incomplete.

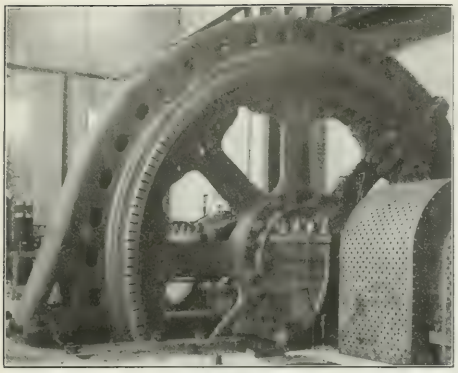


Fig. 5.—The General Electric 6,000 H.P. Main Drive Motor for the Sheet-Bar Mill.

can be reversed. This approach or mill feed table, with the exception of its structural work, which was furnished by the North Works of the Illinois Steel Company, was also built by the American Bridge Company. It is similar in design, but the opposite hand, to the approach table installed in the 18-in. billet mill and was designed with the idea of using as many parts as possible which were duplicate with that table. The crop shear is driven by means of gearing from the spindle driving the first pair of mill rolls. This crop shear is intended to operate only on billets where crop ends are to be removed or for the saving of the undamaged portions of a bloom "cobbled" in the mill. This shear was designed and built by the Morgan Construction Company, which company also built the remainder of the mill.

The sheet-bar mill is of the standard Morgan Construction Company type, except that after each stand beyond the third there are provided what are known as looping tables which are arranged with apron plates that may be raised and lowered by hydraulic control, each apron plate being operated independently from its own cylinder. As ordinarily provided in a continuous mill, it is necessary that each succeeding roll shall operate at a speed directly proportional to the reduction in that pass and also with proper relation to the speed at which the bloom is being delivered from the preceding roll. This necessitates a certain fine and intimately related adjustment of the consecutive stands. The function of the apron plates in this instance is to raise up and take up the slack in the bloom if the speed of the following stand is not quite as rapid as the delivery speed of the preceding stand. By means of this arrangement the buckling downward and sideward of the bloom is prevented.

The distance from the gear-driven flying crop shear to the first stand of rolls in the mill is 5 ft.; between stand No. 1 and stand No. 2, 10 ft. 10 in.; between stand No. 2 and stand No. 3, 10 ft. 6 in.; and between the stands in the remainder of the mill, 10 ft. The housing shoes and pinion shoes of the mill are bolted together in continuous form in the direction of the mill. Each stand is arranged so that it can be removed entire and another stand substituted when roll changes are desired. The speeds of the mill passes, based on 18 in. pitch diameter of the rolls and 83.3 revolutions of the driving motor, are, for the first stand, 78.5 ft. per min., and for the eighth stand 626 ft. per min. The intermediate stands increase the speed of passing between these two in accordance with the gear ratio of the drive.

The mill is driven from a 6000 h. p. fly-wheel rotor type General Electric induction motor, Fig. 5, a duplicate of the motor driving the 18-in. continuous billet mill. This motor operates at a normal speed of 83.3 r.p.m. and drives through a bevel gear train shown in Fig. 6.

From the last stand of the mill the bloom is delivered to an Edwards steam flying shear. The design of this shear has long been familiar and the method of obtaining quick cutting action by the exhaustion of steam from one side of the operating piston is well known. The run-out table from the steam flying shear is about 84 ft. long and carries the bar to a set of motor-driven pinch rollers. These rollers seize the bar and deliver it on the bar piler. The pinch rollers are driven by a variable speed motor, which permits accommodating the speed of the rolls to the speed at which the bar is delivered from the flying shear. The first bar running on the bar piler from the pinch roller drops down a sufficient distance below the center, so that bars may accumulate to the height of 30 in. before requiring to be lifted off to the cooling bed. The bar piler consists essentially of blocks with intervening spaces, the bars resting on the blocks and permitting crane hooks to enter below them. At the end of the bar piler is a disappearing stop, or collapsible bumper, which is designed to be dropped down so that a bloom can pass completely over the bar piler in the event of not having been sheared to short lengths in passing through the flying shear. Directly opposite the bar piler is cooling bed No. 2. This consists of fire-brick piers covered with cast-iron coping plates having ridges in the top to allow circulation of air around the piles of sheet bar. The capacity of the sheet-bar mill is about 50,000 tons a month.

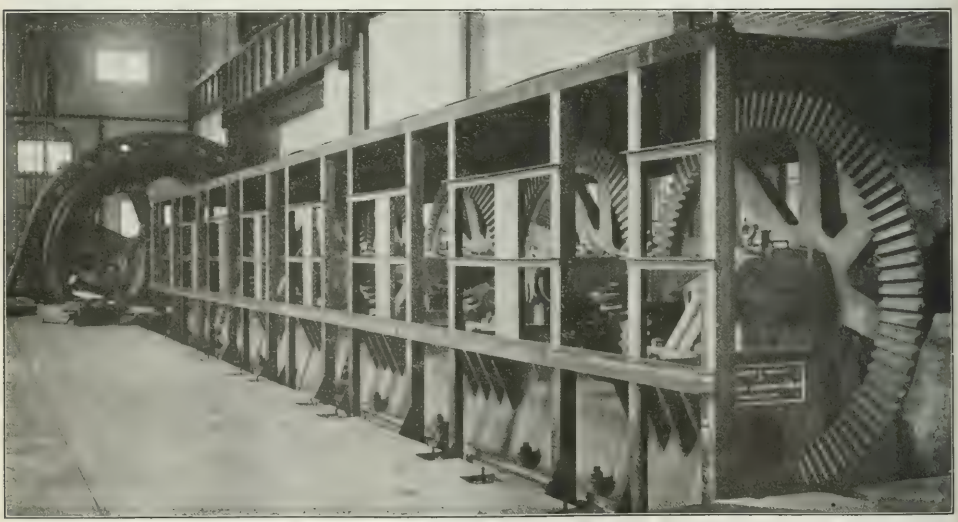


Fig. 6.—Driving Motor and Bevel Gear Drive for the Gary Sheet-Bar Mill.

A Garvin Plain Milling Machine

The plain milling machine shown in the illustrations, known by its builder, the Garvin Machine Company, Spring and Varick streets, New York, as the No. 22, is

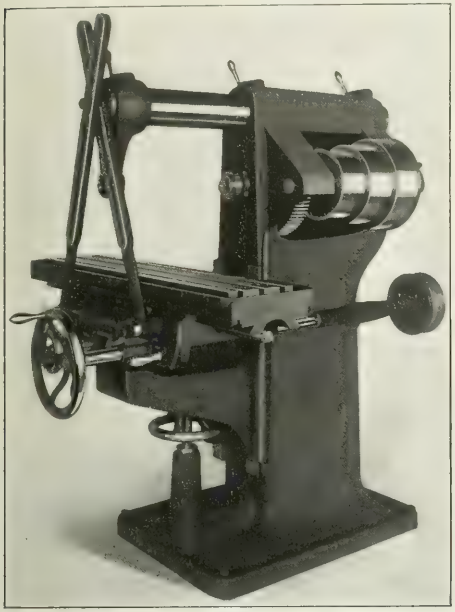


Fig. 1.—The Garvin No. 22 Plain Milling Machine.

designed primarily for manufacturing, to meet the purposes of those who want a powerful machine of large capacity with parts reduced to the plain essentials and capable of continuous hard work. In Fig. 1 will be seen the new feature that one side of the machine is closed, joining the arm and spindle bearings rigidly together and to the body of the machine, the idea being to secure the utmost solidity and freedom from vibration. The feed is driven from the spindle or the back shaft, the change being accomplished by the throwing of an eccentric, seen in Fig. 2. A range from 1/200 in. to ¼ in. per revolution of spindle is obtained. The changes are easily made through change gears and the drive is by a wide belt with a tightener.

The large oil grooved table is driven by a non-rotating screw and steel nut, as in Fig. 3, both screw and nut being hardened. The hand feed is through a large hand wheel and spiral gears running in oil. The rotary feed nut is driven direct by a hardened steel worm gear and worm running in oil. The feed box is built into the saddle so that the stresses are taken directly with a minimum number of joints. The massive saddle has micrometer adjustment in and out. The knee has a Garvin closed top construction and is raised by micrometer hand wheel and screw which does not pass through the floor. The arm is

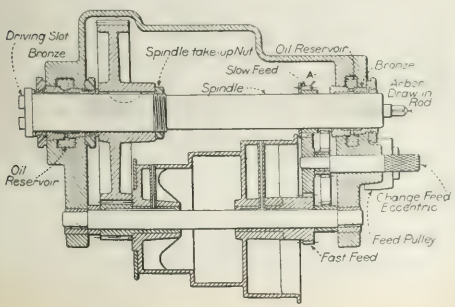


Fig. 2.—The Feed Changing Mechanism.

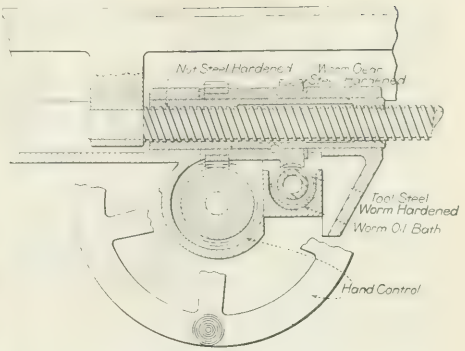
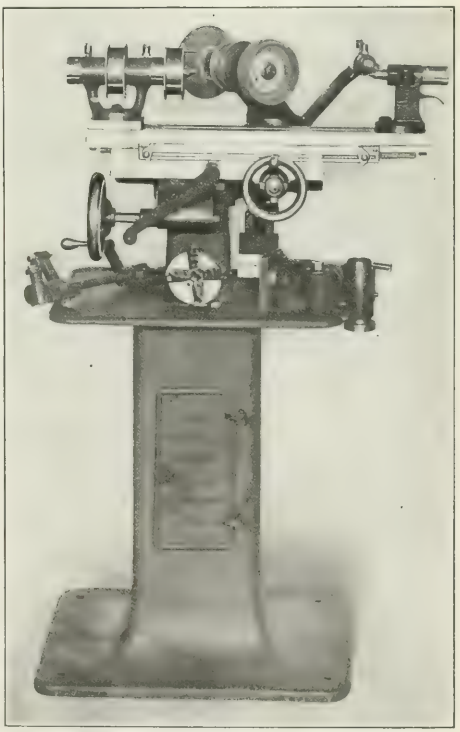


Fig. 3.—The Details of the Table Drive.

exceptionally large and is connected by braces to the saddle, leaving the yoke free to adjust itself to suit the arbor and the position of the cutter. All gears are protected. The machine weighs 3050 lb.

Improved Tool and Cutter Grinder

The Miami Valley Machine Tool Company, Dayton, Ohio, has brought out improved models of its No. 1 universal tool and cutter grinder and the plain cutter and reamer grinder. The chief feature of change is the



An Improved Tool and Center Grinder, Built by the Miami Valley Machine Tool Company, Dayton, Ohio.

square pedestal with a tool shelf, as seen in the illustration. This affords convenient space for the laying of work and tools, while the cupboard has ample room for storing all attachments, which at the same time gives additional weight.

The Holophane Company announces that the address of its New York office, including all of its departments, was changed to 16 East Fortieth street July 10.

Shop System of Ferracute Machine Company

Details of Administration and Operation of the Works at Bridgeton, N. J., for Making Metal Stamping and Forming Presses

BY HUGO DIEMER*

The Ferracute Machine Company, Bridgeton, N. J., was established about 1863. It employs about 200 men in the manufacture of machinery for press working of metals. The range of sizes of these presses varies from presses for the stamping of small coins up to presses for stamping out metal burial caskets.

Administrative Organization

The organization of the company is as follows:

The president acts as administrative and general supervisional officer. This office does not carry on any routine work.

The secretary and treasurer has charge of the accounting department and also the selling department.

The engineering department creates the designs but does not have any direct official connection with the shop except through the medium of the production department.

The superintendent and assistant superintendent, according to the official organization chart of the company (which is posted in various places in the offices and shops) are responsible for the direction of the manufacturing departments through the production department. This department has charge of the transforming of all orders received from the sales or the engineering departments into shop orders, as well as the scheduling and routing of work, instruction cards to employees, bonus wage system, stores, time and cost records.

Under conditions existing at the present time, the superintendent devotes his personal time exclusively to the technical operation of the shop, devoting practically no attention to the production department, excepting in the course of the daily conferences as described later.

The assistant superintendent makes the production department his headquarters, but devotes the greater part of his time to being in the shop and following out the practical working of the instruction cards and bonus system.

An expert in factory organization, Frederic A. Parkhurst, has been with the company for three or four years as organizing engineer, and lately has been acting in the additional capacity of special works manager. These duties are ultimately to be assumed by the vice-president.

Order System

Customers' orders are transcribed in the accounting department on a general order form, which is made out in triplicate, one copy remaining on file in the accounting room, one copy going to the engineering room, and one copy going to the production department. So far as the shop is concerned, the general order stops when it reaches the production department.

Production Department and Factory Board

It is the function of the production department to analyze the general orders and to reissue them in such form as they see fit. The engineering department prepares all the necessary technical data which are needed by the production department in order properly to reissue the order to the shop.

There are "factory board meetings" held every morning except Saturday. These meetings are held at 8 o'clock and last about three-quarters of an hour. The special works manager presides at these meetings, which are attended also by the assistant manager, superintendent, assistant superintendent, chief draftsman, production clerk, and order of work clerk. At these meetings the condition of work in the shops is considered, also what work is to be started through for stock, what shipments are to be made, etc. There is a stenographer present who takes short-

MATERIAL LIST — FERRACUTE MACHINE CO

DATE April 18 1911

MATERIAL REQUIRED FOR Press D A-E 3

FOR The Simms Magnet Co

QUANT.	NAME OF ARTICLE	MATERIAL	PIECE SYMBOL	DRAWING	SKETCH	REMARKS
1	Bolster	IC	B1DA3a	5771		
4	Bolster clamp	SC	B2-2a		3885	
4	" " bolt	WI.	B3-2a 86	5773		
4	" " nut	SC.	B4-2a		3891	
2	Lower die bolt	WI.	B5a 85	5773		
1	Bolster bushing	IC	B6 DA3a	5772		
1	" " blocking ring	"	B7 DA3a	"		
1	Right front bolster block	MCH S	B8 DA3a 10	5773		
1	Left back " "	"	B8DA3a 11	"		
1	Left front " "	"	B9DA3a 12	"		
1	Right back " "	"	B9DA3a 13	"		
4	Bolster block screw	WI	B10DA3a 56	"		
4	" " bolt	MCH S	B11DA3a 9	"		
1	Clutch side	CHROME NICKEL STEEL	CP1-9b 3	10392		
1	Beam	BEST CRES CENT STEEL	CP2-9b		5028	
1	" pusher	C.S. LOW GRADE	CP3-9b		3988	
1	" spring	BRASS	CP4-9b 24	10392		
1	" gland	IC	CP5-8b 17	"		
1	Lock	MI.	CP6-9b 8	"		
1	Clutch slide bushing	AJAX MAN-GANESE BR	CP7-9a		3786	
1	Clutch lever	SC	CP8-9b		3586	
1	" " stud	WI.	CP9-9a 12	10392		
1	Lever spring	BRASS	CP10-9a 23	"		
1	" " hook	WI.	CP11a 15	"		
1	" " bolt	"	CP12-9a 22	"		
1	Upper brake	IC	CP13-9a		3639	
1	Lower "	"	CP14-9a		3646	
1	Upper brake leather	LEATHER	CP15-9a 29	10392		
1	Lower " "	"	CP16-9a 28	"		
12	Brake dowels	WOOD	CP17a 32	"		
1	" bolt	WI	CP18-9a 14	"		
1	" spring	BRASS	CP19-9a 25	"		
1	" stud	WI.	CP20-9a		4095	
1	" stud washer	"	CP21-9a 27	10392		
1	" adj screw	"	CP22-9a		5054	

LISTED R.M.C.G. CHECKED ..... APPROVED ..... ORDER 27042c

5 SHEETS. SHEET 1.

Fig. 1.—Material List Sent by Engineering Department to Production Department.

*Professor of Industrial Engineering, Pennsylvania State College, and consulting industrial engineer.

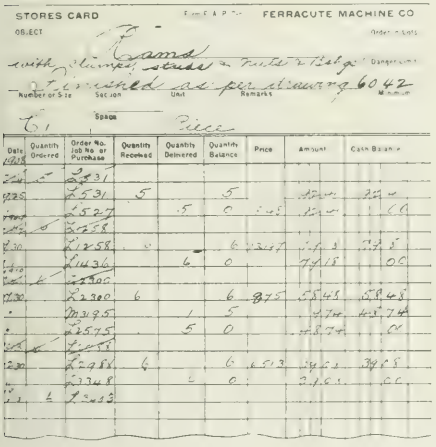
hand notes. Within half an hour after the meeting each one present is handed a typewritten copy of the minutes. These minutes contain the daily repair order list, also all shipments promised for the day, also a statement of large jobs which are being operated on the bonus wage system, showing the time started as well as the total time put in to date. A definite date of completion is written down for every order. This date is established as the result of the daily conferences. All parts for repair orders are built on the order number covering the repair order.

Shop Orders

All machines are built on a separate job series designated as merchandise or M jobs. All work for plant is made on "Plant" or P jobs, which include special machinery as well as small tools. All work for factory such as furniture, fixtures and building repairs is built on F jobs. Items incidental to shop expenses such as light, heat, janitor services, etc., are charged on S jobs, the S jobs being subdivided into 55 numbers which are closed monthly. These are also departmentalized monthly. Repair of small, rapidly wearing tools is included in this series.

All expenses incidental to business is charged to L jobs, which include administrative salaries, taxes, advertising, legal expenses, etc.

All work built for stock is charged to L jobs, L designating lot. The only manufactured goods are those included in the L type of jobs. The parts made on L jobs are the only ones which are carried on a perpetual inventory.


STORES CARD — FERRACUTE MACHINE CO

OBJECT — Order — Stock

Number or Size | Section | Unit | Remarks

Space

Date	Quantity Ordered	Order No. Job No. or Purchase	Quantity Received	Quantity Delivered	Quantity Balance	Price	Amount	Cash Balance
		2331						
9 25		2531	5		5			
		2527		5	0			
		2558						
		2558						
		2436		6	0			
		2200						
		2200	6		6			
		2525		1	5			
		2575		5	0			
		2575						
12 30		2488	6		6			
		2348		6	0			
		2443						

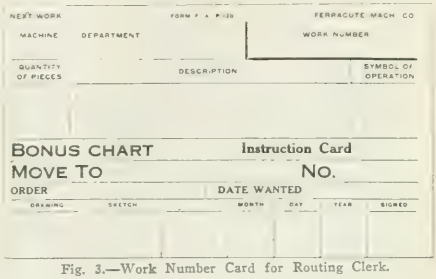
Fig. 2.—Stores Ledger Card.

Material List

The engineering department writes out a material list for each general order as per Fig. 1. The present drawing room practice is to draw but one piece on a sheet with as many views as are necessary to depict the piece. The complete dimensions are shown or can be obtained by scale only on the pattern shop copy. The machine shop copy of the drawing shows dimensions only where these are needed with the machine shop in order to do their machine work properly. When the material list is received in the production department it is first checked against the stores' ledger cards in order to see how much of their material is in stock or should be made on stock orders.

The store ledger cards carry a money value for each item as well as the total money equivalent of the balance on hand at any time; that is, the balance in stock is expressed in dollars and cents at the time of making each entry. See Fig. 2. A monthly record is kept of all debits and credits to stores. This record is combined with the value of the stores on hand at the beginning of the month as a check on the value of the stores on hand at the end of the current month. The stores' ledger has between 6000 and 7000 entries in it. The money value of the manufactured parts is altered from time to time as the cost of production changes.

A general survey of the cards shows a uniform reduction of costs since the introduction of the present production and bonus wage system.


NEXT WORK — FORM F. A. P.—20 — FERRACUTE MACH. CO

MACHINE — DEPARTMENT — WORK NUMBER

QUANTITY OF PIECES — DESCRIPTION — SYMBOL OF OPERATION

BONUS CHART — Instruction Card

MOVE TO — NO.

ORDER — DATE WANTED

DRAWING — SKETCH — MONTH — DAY — YEAR — SIGNED

Fig. 3.—Work Number Card for Routing Clerk.

Since the introduction of the production department, it has been possible to fill orders far more promptly than previously. An important matter disclosed after the production department was in running order was the fact that the foundries that were supplying castings were furnishing with promptness only the larger and more desirable parts and holding back on the smaller and more difficult pieces, in this way, holding up the company's delivery of shipments.

Castings and manufacturing materials and supplies are all requisitioned from the production department.

Organization of Production Department

The production department is divided into two sections; one section designated as the controlling side. The assistant superintendent is located in the production office. He acts in the capacity of shop engineer and has control of the planning of the shop operations, time studies, instruction cards and bonus system. The controlling side of the production department employs beside the shop engineer, an order of work clerk, a chief routing clerk with one boy as assistant, one time boy, one factory mail boy and one schedule clerk.

The statistical side of the production department is presided over by the production clerk and includes also a stores' clerk, two cost clerks, the time-keeper and the shipping and receiving clerk.

The bill of material, when received from the engineering department, is turned over to the chief routing clerk. The chief routing clerk subdivides the general orders into "jobs" and subdivides these "jobs" into "work numbers." He also lists all operations, using letter symbols to designate each operation. He also designates which machine is to do each operation. He indicates bench work where such is required. He indicates the "Work Numbers" to which the men in the shop must charge their time when doing the work. The boy assistant makes out the "Work Number" cards in triplicate from the routing clerk's sheet, (see Fig. 3). One copy of each of these work cards goes to a rack in the shop, one copy to a rack in the production

Chart 208, Feb. 6, 1911.

P4 Shafts—CE, FA, TN and TH complete, ready to 6R from rough turned forging of .50 car steel drawing, 6L.

Time each.	Bonus each.
3.35 hours	$ .076
3.25 hours	.086
3.15 hours	.096
3.05 hours	.106
2.95 hours	.116
2.85 hours	.126
2.75 hours	.136
2.65 hours	.146
2.55 hours	.156
2.45 hours	.166
2.35 hours	.176
2.25 hours	.186
2.15 hours	.196
2.05 hours	.206

Fig. 4.—Bonus Chart Given Workman with his Work Card, Showing Amount of Bonus to be Paid for Time Reductions.

office which contains pockets arranged by numbers of machines, and one copy goes into a file in the production department office, in which the work cards are arranged by order numbers.

The chart that is made out by the routing clerk also serves as a cost sheet and is called a "Schedule Cost Sheet."

After the work cards have been issued from the schedule cost sheet the production department office copies are turned over to the time-keeper. He makes entries on the schedule cost sheet of labor reported from time to time, each days' entries being made on horizontal lines directly below the last preceding entry. As the order of operations constitutes the headings of vertical columns, the entries of labor made from day to day form a curve showing the progress of work through the shop and in this form the sheet serves also as a tracing record. By adding up the vertical columns, one may also obtain the individual operation costs. Departmental operation costs can be obtained by adding the operations which are done in any one department.

When there is an 'extra or bonus pay, a special time slip is written out in the factory, approved by the assistant superintendent and the bonus time and pay is entered beneath the regular time in the proper operation column on the schedule cost sheet.

The time boy in the production department writes out a time ticket daily for each man. These time tickets are filled out by the gang bosses for each man. The time clerk in the production department checks them against the clock cards.

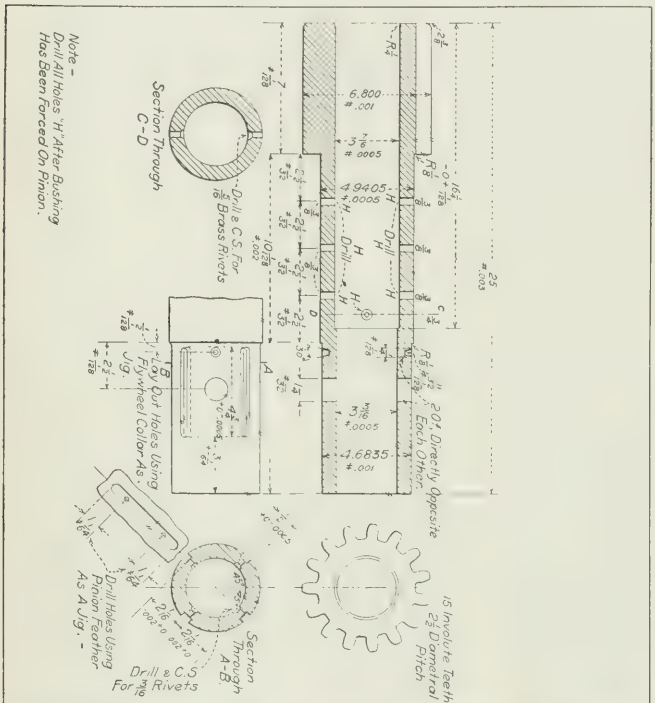


Fig. 5.—Copy of Typical Blueprint from Sketch on Cross-hatched Bond Paper.

In making time entries on the schedule cost sheet, green ink is used for over-time, and yellow ink for the monthly inventory summary. Material and sundries used on each order are also posted on this same cost sheet in columns provided for them.

When the time cards go into the production office from the gang bosses, the time boy transposes the "Work Numbers" to the corresponding "Job Numbers" by reference to the numerically arranged file of carbon copies of work slips already referred to, making entries on the time-cards showing the "Job Numbers." The time clerk then fills in the rate of wages and the total amount on each coupon and checks the total amount in hours and dollars and cents to agree with the clock card. The time card is simply a series of coupons, each coupon representing a separate "Work Number." The time boy separates these coupons after the time has been checked against the clock card. The various coupons being arranged by job numbers, these coupons are handed to the cost clerk, who transcribes the entries of each on the schedule cost sheet. If the coupon is stamped "Done," the cost clerk rules a red ink line against the top of the column in which the entries for that operation are made. In this way it is easy to see just how far the various operations have progressed by reference to the schedule cost sheet.

The total of the time and money value entered on the cost sheets is checked against the pay-roll every week.

In the shop there is a series of wall pockets to contain the order-of-work tickets, there being three pockets for every machine tool. One of these pockets contains the work at present at the machine, the second contains slips covering all the work for which there is material at the machine (these slips being arranged in the order in which the work is to be done); the third pocket contains the slips for work, the material of which is not yet delivered at the machine.

Bonus Wage System

For all bonus work each man is furnished a memorandum showing the stated time as determined by time study, together with the scheme of bonus premiums which will be paid by reductions of time below the "standard time." (See Fig. 4.) In the establishment of these bonus premiums 25 to 30 per cent. bonus is paid for doing the work in the time determined; inducement is offered before this time is reached and extra remuneration for extra effort. The premium is expressed in dollars and cents and increases at a greater rate than the time reduction. In other words, a man's earnings increase at a more rapid rate than the reductions of time below the stated.

On privately interviewing the superintendent and several mechanics, they all expressed themselves as well satisfied with the system. The key-note of the success of this system at this plant is struck in the remark made several times that employers had found that the company intended to do the fair thing and that as a rule, they had decided that they would make as much money out of the system as they could.

The thought may suggest itself that the company would

TIME STUDY. FORM F. A. P. 45a. FERRACUTE MACHINE CO.

TIME STUDY NO. ..... SHEETS, SHEET

ARTICLE ..... SYMBOL

SKETCH or DRAWING ..... , QUANTITY ..... , OPERATION .....

MAN No. ..... MACH. No. ..... DEPT. ..... Work, Job or Order No. .....

TIME ..... A.M., P.M.

MATERIAL ..... OBSERVER ..... DATE 19

NOTE.—The observer must exercise extreme care in making time studies to see that the proper sequence of operations is maintained, that all unnecessary operations or moves are eliminated, that proper appliances are provided (including cutting tools in sufficient quantities) and that the proper and most economical combinations of Speed, Feed and Cut are used. When time is slow, due to man's natural slow moves, note (in margin at extreme right below) what time should be for a fast man moving at his best normal speed. Have certain operations repeated if necessary to satisfy yourself that the time is correct and continue to do so until the study is satisfactory.

Sub-Operations	DETAIL DESCRIPTION OF OPERATIONS, SPEED, CUTS, ETC.	MINUTES and HUNDREDTHS 1	2	3	AVERAGE	SHOULD TAKE
1						
2						
44						
45						
46						
	TOTALS CARRIED FORWARD					

FINISHED ..... A.M. P.M. ELAPSED TIME FOR ..... = ... MIN.

Fig. 6.—Time Study Data Sheet for Establishing Bonus Wages and Instructions to Workmen.

pay a high penalty if an error were made in rate fixing if the time standard were set too high. The likelihood for such errors is very small, inasmuch as the time standards are all based on observation time study.

Mechanics have made anywhere from $2 to $6 per week bonus over their former wages and are very well satisfied.

The company's shop drawings, while they show only the needed dimensions, do show limits of accuracy. The drawing is made to scale in pencil on cross-hatched thin bond paper, and inked in on this same paper, which serves as a tracing for blue-printing. Border lines, instructions as to routing and tools, as well as title plate and border lines are printed on the original paper before blue-printing. A typical drawing is shown in Fig. 5.

Time-Study Observations

The time-study work is under the supervision of the assistant superintendent, who either takes the observations himself or delegates a special time-study man to take them. The results of the time-study are recorded on a form shown in Fig. 6.

With the time-study sheet as a basis a detailed instruction sheet for the workman is prepared for each bonus job, specifying the tool, cut, feed and speed to be used, as per Fig 7.

High-speed tool steel is used in the machines, which are run at brisk cutting speeds, heavy cuts and coarse feeds wherever feasible. The cut with ⅛ in. feed made at the surface of a fly-wheel in a boring-mill showed a surface speed of 70 ft. per minute. The superintendent showed with considerable pride a number of pieces of work on which the time has been reduced one-half and more through the medium of the bonus wage system, together with a high degree of mechanical excellence.

Cost of the System

It is declared for this type of organization, production and wage system, that the net profits per year which are resulting from economies due to its introduction and proper operation are considerably more than the increased cost of salaries involved by the use of the system. There is a noteworthy spirit of co-operation on the part of the entire force and an apparent feeling of confidence in and enthusiasm for the success of the system.

INSTRUCTION CARD Form F. A. P. 35 a FERRACUTE MACHINE CO.

NOTE
All time is expressed in Hours and Decimals.

INSTRUCTION .....

.....SHEETS, SHEET.....DATE....., 19....

ARTICLE OR JOB .....

OPERATION .....

Quantity..... Material..... Hand or Machine..... Sketch or Drawing.....

TOTAL LOT TIME..... TOTAL PIECE TIME..... BONUS CHART.....

SUB OPERATION	DETAIL INSTRUCTIONS	TOOL	CUT	FEED	SPEED	PIECE TIME	LOT TIME
1							
2							
3							
31							
32							
	Carried Forward, or TOTAL						

WHEN MACHINE CANNOT BE RUN AS SPECIFIED, CANC BOSS MUST REPORT AT ONCE TO.....

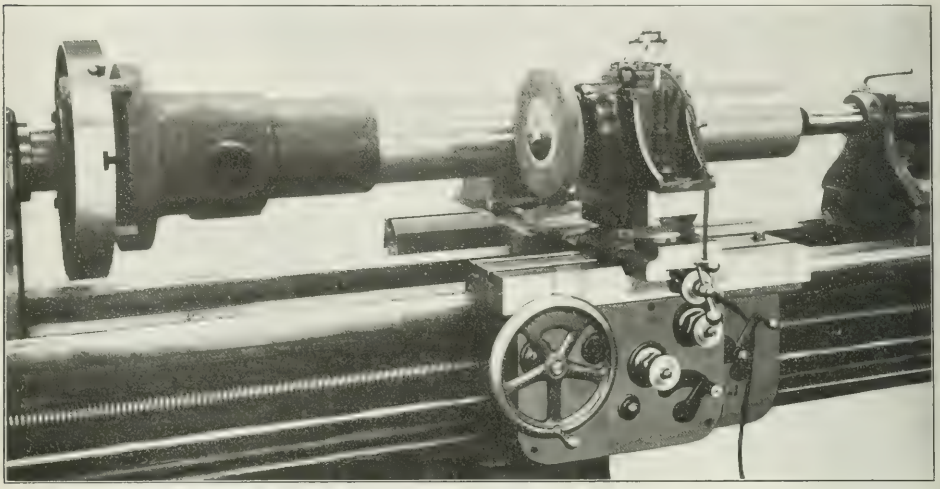
INSTRUCTION.....

Fig. 7.—Instruction Card Specifying Tools, etc., in Connection with Time Standard and Bonus.

New Parallel Grinder

The Hisey-Wolf Machine Company, Cincinnati, Ohio, is placing on the market a new grinder designed for parallel work. The tool is portable and can be quickly and easily attached or detached, thus enabling great savings in time and labor over the method of moving the work from the lathe to another machine to be effected.

The grinder can be used on a lathe, boring mill, milling machine or planer, and when not needed can be quickly removed. In the accompanying engraving it is shown attached to a lathe for finishing a drill press column which has been rough turned. The method of attaching the tool to a lathe is simply to bolt the angle plate in the tool post rest. A vertical adjustment of 4 in. which brings it in line with centers is provided. The bearings are adjustable to compensate the wear and the machine is enclosed in a dust-proof cover. Four sizes of grinder rated at ½, 1, 2 and 3 hp. are built.



A New Grinder for Parallel Work Made by the Hisey-Wolf Machine Company, Cincinnati, Ohio.

The business of the New Process Steel Company, Lancaster, Pa., has been taken over by a new corporation, known as the New Process Steel Corporation, with an authorized capital stock of $50,000, fully paid in. W. A. Sherwood is president. The former concern, which has been engaged in the manufacture of high-grade material in various shapes, overreached itself and its owners could no longer successfully finance it. The new corporation has taken over the entire plant, assets, and good will of the old company, and is putting into the plant new machinery and increased facilities for handling its business. The product will consist of the best grades of tool steel in all shapes, sizes and forms, and a special alloy steel for the automobile trade. The new management starts off with a good supply of orders, particularly for drawn-steel shapes and special alloy material.

The standard structural shapes now manufactured by the Bethlehem Steel Company, South Bethlehem, Pa., have been made the subject of a 16-page pamphlet. The 28-in. standard structural mill which the company put in operation in June produces standard angles, standard channels and standard I-beams of smaller sizes to supplement the larger sections rolled by the company's Grey mills. In connection with the Bethlehem structural shapes, which are now widely known, it is felt that the addition of the standard shapes affords a larger range of structural shapes applicable to all kinds of steel construction than is offered by any other mill.

The Colonial Iron Company, Riddlesburg, Pa., through its engineers, Frank C. Roberts & Co., Philadelphia, has purchased for its new furnace plant a condensing turbo-blowing engine from the General Electric Company. The engine will have a capacity to deliver 25,000 cu. ft. of air per mi. against a pressure of 25 lb. per sq. in., but will be designed to be most economical when delivering 20,000 cu. ft. against a pressure of 13 lb. per sq. in.

The Keystone Tube Works, Inc., Pittsburgh, with works at Connellsville, Pa., which recently purchased some additional property adjoining its present plant, is taking bids on some new steel buildings and also on a crane, contracts for which will be awarded about August 1. A material increase in its capacity for the manufacture of steel tubes is intended by the company.

The Federal Heater Company

Seven house-heater manufacturing companies have been consolidated in the Federal Heater Company, a corporation organized under the laws of Delaware with $4,000,000 of 7 per cent. cumulative preferred stock and $4,200,000 of common stock. It embraces the following concerns: International Heater Company, Utica, N. Y.; Peck-Williamson Heating & Ventilating Company, Cincinnati, Ohio; L. J. Mueller Furnace Company, Milwaukee, Wis.; Twentieth Century Heating & Ventilating Company, Akron, Ohio; Henry & Schreible Company, Cleveland, Ohio; Quaker Mfg. Company, Chicago, Ill.; Ideal Furnace Company, Detroit, Mich. Holders of preferred and common stock have equal voting rights. The preferred stock is redeemable at any dividend period at 110. The stock is to be listed on the Chicago Stock Exchange. The main office of the company will be in Chicago, but the individual factories are to be operated as heretofore. The combined companies will have a total output of 40,000 heaters a year, and the combined profits of the constituent companies in 1910 are given as $450,000. They produce warm-air furnaces, hot-water and steam boilers for heating purposes designed for both coal and gas, tank heaters, piping, casings, fittings and registers. The officers of the company are as follows: President, A. W. Williamson; vice-presidents, L. J. Mueller and John Kerch; secretary, D. M. Compton; treasurer, F. H. Moore.

J. Kearny Rice has been appointed receiver for the Ball & Wood Company, 50 Church street, New York. The company makes automatic cut-off engines and its plant is at Elizabeth, N. J.

The Thomas D. Prosser Company, Schmulbach Building, Wheeling, W. Va., dealer in pig iron, coke, cinder, scale, and general construction materials, has arranged to represent the Universal Portland Cement Company, Pittsburgh, and has also secured the sales agency for the Walker Brick & Tile Company, Dillonvale, Ohio, maker of common red and face brick.

Automatic Oiling System

Employing a Combination of Pressure and Gravity

A new system for lubricating an engine and filtering the oil automatically has been recently developed and placed on the market by the Burt Mfg. Company, Akron, Ohio. A distinctive feature of this system, which is said to embody important improvements over former methods of lubrication, is that the oil is delivered to the various bearings of a stationary engine by pressure and gravity combined. Fig. 1 gives a view of the complete system, while Figs. 2 and 3 show an exterior side and a sectional elevation of the filter respectively.

It is claimed for the system that it is entirely automatic in operation until the supply of lubricant needs replenishing, which is not oftener than every four or six months, and at this time the filter should be thoroughly cleaned, an operation which requires about 30 min. Among the advantages claimed for this system are that it is a practically self-contained and reliable system, which not only effects a saving in the amount of oil used, but also does away with the necessity of watching a number of small oil cups. In this system the new oil is not mixed with that which has been used until the latter has been filtered a number of times and the supply becomes low, and as the oil is being filtered continuously and much more frequently than in the ordinary gravity systems, a copious supply of oil, free at all times from grit and foreign substances, is provided for all the bearings. The system is an adaptation of an arrangement for lubricating automobile engines, and was thoroughly tested in actual service for more than a year before being applied to stationary engines.

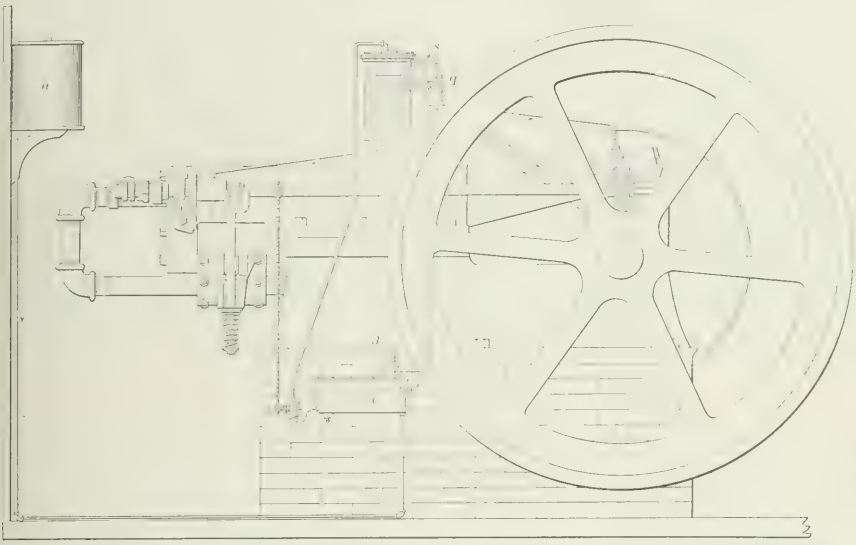


Fig. 1.—A New Combination Pressure and Gravity Lubricating System, Made by the Burt Mfg. Company, Akron, Ohio.

The essential parts of the system are an oil reservoir, *a*, Fig. 1, the filter *b*, an automatic drain tank, *c*, a gear-driven pump for circulating the oil through the system, sight feeds, a pressure equalizer and fittings. The oil reservoir is placed in any convenient location, and a pipe connects it with the float chamber of the drain tank. A small pump driven by a chain from the engine forces the

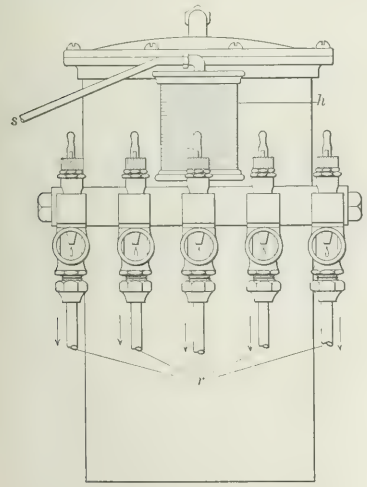


Fig. 2.—Side Elevation of the Filter.

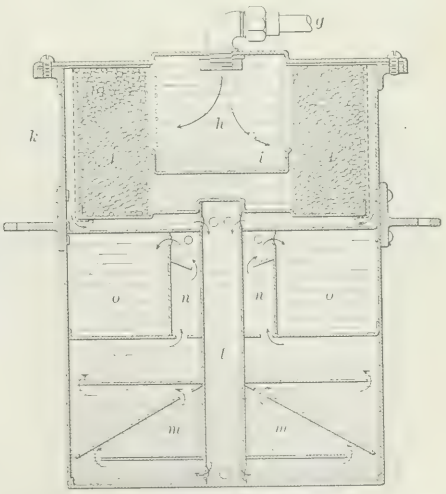


Fig. 3.—Sectional Elevation of the Filter, Showing Constructional Details.

oil from the drain tank through the filter, and from the latter the lubricant is carried to the bearings by a combination of pressure and gravity. The drippings from the bearings are collected in drain troughs along the engine bed, and flow by gravity through a drip pipe, *d*, back to the drain tank, and from here the used oil is pumped back into the filter. The supply of oil in the drain tank is automatically regulated by a float, *e*, and an attached ball valve, *f*. The former rises and falls with the variation in the level of the oil in the drain chamber, and when the supply of lubricant in the system gets to a predetermined low point it opens the ball valve and the pump automatically draws fresh oil into the system from the reservoir.

The filter used is small, and is claimed to be very efficient and free from intricate mechanism, as no valves or other parts likely to become worn or loose are employed in its construction. The oil is delivered to the filter through the inlet *g*, Fig. 2, at the top of the filter, and passes through a fine screen cylinder, *h*, having a removable sediment pan, *i*, at the base to facilitate cleaning. It next passes through a cylinder filled with finely divided bone black, *j*, and then through a ply of specially woven filter cloth, *k*. The oil then flows down the central tube *l*, and, passing through and around the baffle plates at the lower end, rises to the top of the water compartment *m*, in which it is thoroughly washed and cooled. From here it goes through the water separator *n*, and splash arrestor into the pure oil reservoir *o*, with which the outlet to the system is connected.

A glass pressure equalizer, *p*, Fig. 2, and a manifold, *q*, having the required number of feeds *r*, are attached to the filter outlet. This pressure equalizer is a glass arrangement of sufficient size to enable the engineer to see from any part of the engine room whether or not the system is working properly, the evidence of an ample supply of oil in the system being indicated by its appearance in the equalizer. The amount of lubricant fed to the bearings is regulated by the sight feeds, but the equalizer, as its name indicates, makes the pressure uniform on all of them. An overflow, *s*, connects the equalizer with the drain tank. The filter is made in two styles, brass being employed for one and galvanized iron painted to represent aluminum being used for the other.

Three sizes of filter are made, having reservoir capacities of 5, 10 and 20 gal. of water respectively. An inlet on the outside of the filter at the left of Fig. 2 and a drain at the lower right corner enables fresh water to be added to the filter.

Sewage Disposal for a Hardware Works

Sewage Treatment System at Plants of Thos. Devlin Mfg. Company, Burlington, N. J.

BY CHAS. A. BLATCHLEY, PHILADELPHIA

This paper describes a disposal plant recently constructed at the works of a manufacturing company, where the service is probably more severe and varied than would be the case with an institution.

In the early part of the year 1909 the State Board of Health of New Jersey notified the Thos. Devlin Mfg. Company, whose works are located at Burlington, that it must cease to discharge sewage and waste water from the plant directly into the Delaware River, and must provide some other approved means of disposal.

The question of entering into a long-term contract with the local sewage company was given careful consideration, the location and levels of main sewers and their sizes, together with the limitations in the capacity of the plant, being thoroughly investigated before action was taken. As a result of these investigations the Thos. Devlin Mfg. Company decided to install a private sewage disposal plant at its works, located directly west of the town of Burlington and on the bank of the Delaware River. Small hardware and malleable iron pipe fittings are the chief products manufactured.

The group of buildings to be cared for by the sewage plant consists of the foundry and core-making department, pattern shops, drafting room, buckle department, annealing rooms, tumbling department, sorting rooms, power plant, blacksmith shop, galvanizing department, storage rooms, washing rooms, machine shop, tapping department, and offices. About five hundred men are employed about the works.

In the old sewage system the roof and surface drainage water were collected into the main sewers and discharged into the river with the sewage and waste water from the plant. In the construction of the disposal plant the sewage and waste water have been diverted to a new set of mains, the old mains being still used to carry the drainage water direct to the river. In this way the required size of the disposal plant has been kept down, and an element which, especially in times of heavy rains, would seriously dilute the sewage, has been eliminated.

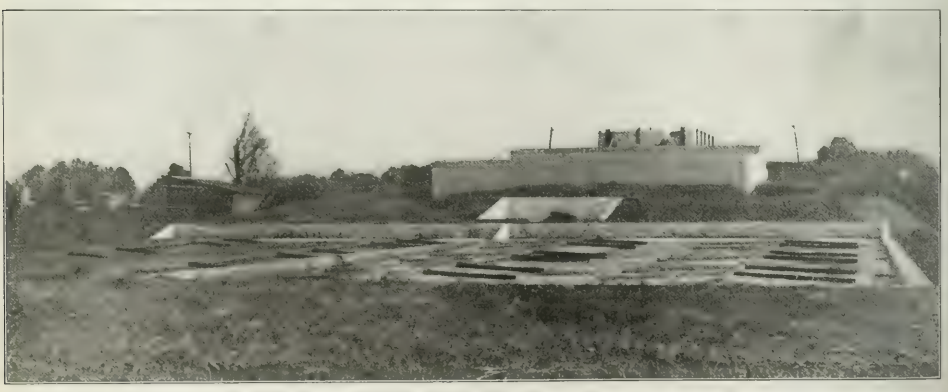


Fig. 1.—A Sewage Disposal Plant for a Hardware Works—General View from the River Bank.

The disposal plant, which is situated about 500 ft. west of the works, consists of a collecting well, septic tank, douching basin, stone filter, settling basin, sand filter and sludge pit. The relative locations of the various units are shown in Fig. 1, which is a photograph of the plant as seen from the river bank. The sand beds are shown in the foreground, with the stone filter and septic tank on the higher elevations in the background.

The works are in operation 10 hr. per day, the sewage

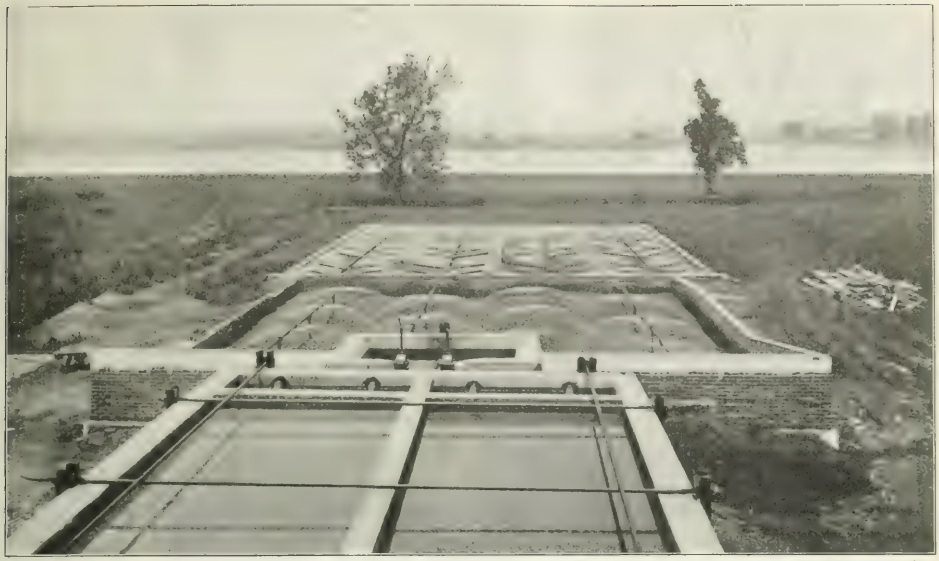


Fig. 2.—The Septic Tank, Showing Discharge End, and the Douching Basin.

running only during that time. The amount handled per hour from toilets, lavatories, etc., is about 3000 gal.; while about 500 gal. additional is received from washing tanks, tapping machine wastes, etc. In this latter quantity there is about ½ per cent., by volume, of muriatic acid. The present flow of sewage is thus about 35,600 gal. per 10-hr day. In order, however, to provide for the growth of the works the disposal plant has been designed to handle 50,000 gal. per 10-hr. day.

The main sewage discharges by gravity into the collecting or receiving well, not shown in the illustrations, 10 ft. in diameter, constructed with brick sides and concrete bottom, the main sewer entering the well about 4½ ft. above the bottom, thus giving a capacity of about 2700 gal. or 45 min. flow of sewage. The sewage is lifted from the well by means of submerged centrifugal pumps, and raised to the septic tank, which is located about 250 ft. west of, and at an elevation of 30 ft. above the wall. There are two pumps, one located on the bottom of the wall, and the other about a foot below the sewer inlet, operated by direct connected electric motors, provided with automatic float control. The floats are so adjusted that both pumps start up when the water level has reached the mouth of the inlet sewer; the upper pump taking out the scum and floating sludge from the surface while the lower pump takes the water and heavier matter. The float controlling the upper pump is arranged to stop this pump when the water level has dropped to its suction inlet; the lower pump continuing to run until the well is emptied. With both pumps in service the well can be emptied from the maximum level in 26 min. The pumps then lie idle for 45 min. while the well is again filling. A pump house has been built over the well for housing the motors and electrical equipment.

After the sewage has been pumped from the well to the septic tank it passes by gravity through the various basins and filters, until finally discharged into the river.



Fig. 3.—Sand Filters Under Construction, Showing the Broken Stone Bottom with Drain Pipes in Position—Settling Basin in Foreground.

The septic tank is constructed of reinforced concrete. The bottom pitches to a collecting gutter at the discharge end. The tank is divided longitudinally in the center by a vertical partition, thus forming two independent sections. Baffle plates extend down from the top of the tank at both the receiving and discharge ends. Both the inlet and outlet pipes enter the ends of the tank near the top, the baffle plates, referred to above, preventing agitation of the sewage in the main body of the tank. A thick scum forms over this main portion, which keeps down all objectionable odor. The inlet and outlet pipes are divided, permitting of either side of the tank being operated while the other is being cleaned or repaired.

A pipe line leads from the collecting gutter in the bottom of each half of the tank to the sludge pit; into this the contents of the tank may be discharged when desired. In the foreground of Fig. 2 is seen the discharge end of the tank, with baffle plates and discharge pipes. The sewage is discharged from the septic tank into the douching basin, also constructed of concrete, seen immediately ahead of the septic tank in Fig. 2. At the bottom of the basin is a Miller bell and syphon, by means of which an intermittent discharge is obtained over the sprinking filter without loss of head and with a minimum of agitation in the septic tank. It is also possible to predetermine accurately and maintain the quantity of each douch.

The intermittent discharge from the douching basin is distributed over the surface of the stone filter by pipe lines supported above the filter bed. Each distributing pipe contains sprinkling heads, located at regular intervals. The pipes are graded for gravity flow, and reduce in size after passing each sprinkling nozzle. The inverted type of Taylor sprinkling nozzles are used and the nozzles are staggered on alternate distributing pipes.

When the sewage in the douching basin has reached the predetermined hight, syphoning action commences, the sewage discharges through the distributing pipes to the various sprinkling nozzles, and the spraying action starts under a maximum head, and therefore with rings of spray of a maximum diameter. As the head in the douching basin falls during discharge, the rings of spray from the sprinkling nozzles will contract in diameter until, when the douching basin is practically empty and the discharge is about to stop, the nozzles are discharging but a small stream on a point directly beneath them. In this way a uniform distribution of the sewage is obtained over the entire filter bed at each discharge of the douching basin. The sprinkling nozzles are shown in action in the center of Fig. 2. The distributing pipes are arranged so that either half or all of the filter may be used as desired.

A series of flushing pipes of varying lengths are located along the bottom of the filter bed, by means of which water under pressure may be forced through the stone bed for cleansing.

The effluent from the filter flows from a collecting gutter in the discharge end to a settling basin, constructed of concrete and having an outlet in the form of an overflow near the top. Any flaky or solid matter which may pass through the stone filter settles out in this basin, and may be drawn off to the sludge pit.

From the settling basin the sewage passes to the sand filters, which are constructed in two sections with side and end walls of concrete, and bottoms of loose broken stone. Open-joint drains are laid in the stone bottom and lead to a collecting gutter at the discharge end of the beds. Fig. 3 is a view of the sand filters under construction, showing the broken stone bottom with the drain pipes in position. The settling basin described above is shown in the foreground in this figure.

The filtering material is composed of selected and well-washed river sand; and on the surface of this is laid distributing tile. These are laid with open joints and with a number of smaller branches on either side of the main channels, thus insuring a thorough and uniform distribution of the material to be filtered over the entire bed.

The sand beds are designed for use one at a time, each one being in service every alternate two days, thus permitting the surface of each bed to become well aerated. In the background of Fig. 2 are shown the completed beds in operation. The effluent from the sand filter is discharged to the river through an underground pipe line.

The data in the accompanying table are taken from the report of the State Board of Health on the chemical and bacteriological analysis of catch samples of the raw sewage and final effluent:

Analysis Showing Efficacy of Sewage Treatment.

	Raw Sewage.	Effluent.
Solids in susp	400	0
Fixed solids in susp	74	0
Volatile solids in susp	326	0
Oxygen consumed	126	
Oxygen consumed in sol	30	
Oxygen dissolved	...	8.4
Iron	...	35
Turbidity	2,000	0
Sediment	15,000	0
Bacteria per cc. 20 deg	63,000	less than 1000
Bacteria per cc. 37 deg	30,000	less than 1000
Red colonies 37 deg	30,000	less than 1000
B. coli per cc	10,000	less than 100
Putrescibility	...	Over 14 days

While these results are well within the State's requirements, they are constantly improving as the employees become more familiar with the care and operation of the plant.

The average maintenance costs since the plant has been in operation (the plant was first started in October, 1909) are less than 40 cents per day; and the required attention has amounted to the time of one man on an average of about one hour a day. The total cost of labor and material for the construction of the plant amounted to $9,100. The plans and specifications for the plant were prepared and the construction supervised by the author. The work was performed by day labor under the direction of John Hercker, superintendent of the works.

The author is indebted to the State Board of Health, especially H. M. Herbert, chief of division of sewerage and water supply, and Chas. Daniels, chief chemist and bacteriologist, for their co-operation and assistance during the early stages of the preparation of the plans, and in the determining upon the proper type and design of plant to best produce the results desired.

It may be added that the question of acidulated and oily waters was taken up with the State Board of Health prior to the design for the plant, and after a careful study of records and experiences along these lines, the chief chemist of the board decided that the proportion of acid and grease in the sewage of this plant would not be in excess of, if equal to, that usually found in the general sewage disposal plant of a town where the great portion of the sewage is waste from kitchen sinks and also contains large quantities of soapy water.

The portion of acid in the waste from the machines amounts to ½ per cent. by volume, and when this is mixed with the general sewage from the plant the proportion is not over 0.07 per cent. The operation of the plant has borne out the decision of the chief chemist, and we have found that this small proportion of acid does not in any way interfere with the bacteriological process and satisfactory purification of the sewage.

The Cleveland Cliffs Iron Company has established a mine rescue station on the Marquette range, Mich. A supply of oxygen helmets has been purchased, as have a number of large tanks which will be kept charged with oxygen, and picked crews of men at the various mines are being trained to the use of the apparatus. An interesting supplemental device is a pulmotor, to revive persons overcome by gas or smoke. It is expected that the example of the company will be followed by others of the more important Lake Superior iron mining operators.

Hendricks & Class, 30 Church street, New York, have been appointed representatives for New York City, Brooklyn, Jersey City and adjacent territory for the C. C. & E. P. Townsend Company, New Brighton, Pa., manufacturer of rivets, wire nails and wire.

The New York Supreme Court has declared constitutional the law under which the New York City fire commissioner ordered the installation of sprinkler systems in factories. Thousands of manufacturing plants of all descriptions are affected, and the amount of money involved in carrying out the requirements of the order is estimated in very large figures.

The Orenstein-Arthur Koppel Company, Pittsburgh, Pa., states that the agricultural department of its branch house at Johannesburg, South Africa, is in the market for agricultural implements, comprising hay presses, corn shellers, portable forage presses, feed and ensilage cutters, grain threshers and corn huskers.

The Machinery Markets

While the usual summer dullness generally prevails in the machinery trade, in some sections the market has taken on a better tone. This is observed in Cincinnati, where increased inquiries are coming out and the foundries in that vicinity are extending their operations. The railroads are buying more freely in the Cincinnati market, especially in the way of small shop supplies. The outlook in Cleveland is good, but the warm weather has interfered with immediate business. Engines and boilers are selling well in the Cleveland market. A slight gain in trade is noted in St. Louis and machine tool dealers are doing about 60 per cent. of their normal business. Inquiries are coming out slowly in Detroit, but there is a better call for electrical equipment. The demand for machine tools is greatly increasing on the Pacific coast, and there is a good volume of export business to the Orient. In Texas there is a great demand for irrigation machinery. In New York, Philadelphia and New England trade is quiet.

New York

NEW YORK, July 12, 1911.

There is no doubt that the warm weather which prevailed in this vicinity during the last week has affected the machinery trade materially, as many prospective buyers show no disposition to discuss business and are putting purchases off. Inquiries are scarce and there is nothing in the way of lists. It was hoped that the New York Central Railroad would begin its buying before this time, but the large list it has out has not been filled. Floor sales have fallen off, as many people who make it a rule to place orders for machinery when their business brings them into New York have deferred their purchasing. Considering that this is a vacation season a dull business is expected at this time, but nevertheless the buying during the week was small compared with what the inquiries lead the dealers to expect.

The Newark Automobile Mfg. Company has purchased a large plot of land on Bigelow street, that city, on which it will erect a one-story brick building, 75 x 100 ft. The company is now buying machinery to equip the plant. The requirements include a general line of tools, equipped with motor drive. The company proposes to manufacture industrial trucks of one-half ton and one-ton capacity. Later on larger machines will be manufactured. Joseph J. Rafter, 800 Broad street, Newark, is president of the company.

The Fire Department of New York will receive bids at 157-169 East Sixty-seventh street, on Monday, July 17, on one of the largest lists of mill supplies issued in the trade this year. The equipment will include valves of all descriptions, couplings, oil feeders, oil cups, sight feed glasses, lubricating devices, valve reseating machines, reamers, cutting and threading machines, twist drills, machine taps and an extensive line of heavy hardware. The list covers 24 pages of typewritten matter.

The Hawley Down Draft Furnace Company, Chicago, Ill., has acquired a nine-acre site with connection with the Lehigh Valley Railroad in the suburbs of Easton, Pa., and is reported to have plans prepared for the erection of a large plant there.

John Crossley & Sons, Halifax, England, carpet manufacturers, have secured through the Board of Trade at Easton, Pa., a 15-acre tract with the view to establishing a branch plant for the manufacture of carpets, rugs, etc. The general contract for the first of the buildings has been let and bids for the construction work will be received soon.

The Illuminating Products Company, Newark, N. J., has been incorporated with $25,000 capital stock to manufacture a new design of flaming arc lamp, sign lamp transformers, etc. The company has plans for a factory in Newark and will begin construction work as soon as a suitable site can be secured. The affairs of the company are in the hands of Steinharter & Jost, 320 Broadway, New York.

The Eastern Sanitary Mfg. Company, 299 Broadway, New York, has been incorporated with $150,000 capital stock to manufacture a line of plumbers' supplies, etc. The incorporators are A. W. Shipman, A. H. White and F. N. Dede.

John Pells & Son, Inc., manufacturers of shoe lasts, 86 Mechanic street, Newark, N. J., will build a two-story and basement factory, 60 x 200 ft., at Tichenor and Hermon streets, Newark. The building will cost about $40,000, and it will be equipped with up-to-date woodworking machinery.

Business Changes

The firm name of the Omaska Tractor Mfg. & Foundry Company, St. Louis, Mo., has been changed to the Downs Tractor Company.

New England

BOSTON, Mass., July 11, 1911.

The intense heat has, of course, had a serious effect upon business. Not much has been done by the machine tool dealers and the manufacturers have noticed a similar condition in their mail. Many plants were shut down for the regular summer vacation, and in some cases, because of a desire to curtail production, while other works were compelled to close because of the abnormally high temperature. The general stimulus to manufacturing is naturally slow to be felt on account of the season.

The report from the cotton crop indicates an exceptionally great yield. If nothing happens in the meantime to reduce the present estimate New England will undoubtedly be a large gainer industrially. The business of the cotton mills has been seriously affected by the high price of the raw material and more or less curtailment has been necessary. The consumption of cotton cloth has fallen to a very low point; buying has been light all along the line to the ultimate consumer, with the resultant promise of a very large demand later, for it is generally believed that a sharp decline in prices will bring a large buying movement which would put the mills on full time with maximum working forces. The cotton industry constitutes a very important factor in the metal trades of this territory. Here are located very large works for the manufacture of textile machinery. Also the requirements for general mill equipment and supplies total large figures. The textile machinery business has been dull, as a general rule, for a year or more, and the effect of a large cotton crop should be felt soon after the harvest has been gathered.

The Henry & Wright Mfg. Company, Hartford, Conn., manufacturer of sensitive and radial drilling machines, has purchased about six acres of land at Detroit, Mich., fronting on Kircheval avenue and siding on the Michigan Central Railroad, and is having plans prepared for a factory covering approximately 30,000 sq. ft. of floor space. The business will be removed from Hartford as soon as the new works are ready for occupancy. The company plans to create shops modern in every respect, and work on the buildings will commence as soon as the plans are completed and the contracts can be awarded. It will probably be nearly the first of the year before the removal can be made. The new works will give the company very largely increased manufacturing space which is required because of the rapid growth of the business. The intention had been to build the new establishment in Hartford, but it was finally decided that a location in the Middle West would be more desirable. The business is comparatively young and has been exceedingly successful. R. G. Henry is the president of the company; Joseph H. King, vice-president, and D. M. Wright, secretary and treasurer.

The Smith-Delahanty Electric Pump Company, Inc., 12 Warner street, Hartford, Conn., has organized under a Connecticut charter with M. B. Smith as president and John J. Delahanty, secretary and treasurer. The company will make a specialty of a rotary pump that it has developed, and also of a piston for automobile engines for which a patent has been issued and for which a very high efficiency is claimed. Other products will be electric governors and electric switches.

At the annual meeting of the Sessions Foundry Company, Bristol, Conn., William E. Sessions, who has held the offices of president and treasurer, relinquished the treasurership in favor of his son, Joseph B. Sessions, who will assist in the management of the finances and will also devote his time to purchases and the general management of the plant. William Kenneth Sessions, another son, was elected vice-president succeeding his brother. He will be connected with the sales depart-

THE MACHINERY MARKETS

ment which is in direct charge of Arthur T. Woodford, the secretary.

The G. W. Bradley's Sons, Inc., Westport, Conn., have closed negotiations for the erection of a new factory at Peekskill, N. Y. Details regarding equipment, the size of the structure, floor plans, location, etc., have not been formulated. The company manufactures axes and edge tools, the business being a very old one, dating from 1832. The works at Westport were destroyed by fire recently.

It is announced at Springfield, Mass., that the plant of the Otis Elevator Company has been purchased by the Hendee Mfg. Company, of that city, manufacturer of motor cycles. It is understood that the property will be used for the future extension of the Hendee business.

Additions to general manufacturing plants in New England include the following: The A. C. Peabody Leather Company, Peabody, Mass., five-story factory, 49 x 152 ft., of reinforced concrete construction; the B. & R. Rubber Company, North Brookfield, Mass., an additional brick factory, 25 x 150 ft. and one story; the Farley Paper Company, Greenfield, Mass., two new buildings, one 36 x 320 ft., one story, the other 40 x 94 ft., two stories; the Fisk Rubber Company, Chicopee Falls, Mass., factory buildings, 59 x 91 ft., and 30 x 58 ft., and an office building, 49 x 210 ft.

Philadelphia

PHILADELPHIA, PA., July 11, 1911.

The trade is simply marking time, and little of importance is expected to develop in the immediate future. Orders have been mostly for single tools and have been pretty well scattered. One small shop equipment, covering the general range of tools, has been contracted for. With the exception of an occasional single tool, the demand for equipment on the part of the railroads in this district is practically at a standstill. Manufacturers in a number of instances observed a three-day holiday over July 4 and plant operations have, therefore, been irregular.

The demand for second-hand tools, machinery and power equipment has been light.

The Pennsylvania Railroad has sent out an inquiry for a 1½-in. bolt header.

The County Commissioners, Berks County, Reading, Pa., will shortly invite proposals for the construction of a reinforced concrete bridge over the Schuylkill River at Penn street, Reading, Pa.; it is estimated that from 30,000 to 40,000 barrels of cement will be required.

Contractors are estimating on the new plant to be erected for the A. H. & F. H. Lippincott Company at Twenty-fourth and Locust streets.

Penckert & Wunder, engineers and architects, have completed plans and asked for bids for the construction of a five-story brick and stone warehouse 30 x 161 ft., to be erected at 107-109 De Lacey street for Stohrers Keystone Pickle Works. The building is to be of slow burning mill construction with fire tower, electric power elevator and electric lighting.

Proposals will be opened July 18 for a quantity of naval supplies for the League Island Navy Yard, including under schedule 3735 files, and under schedule 3740 steel oil tank and lockers. Specifications may be obtained from the Navy Pay Office, Philadelphia, or from the Bureau of Supplies and Accounts, Washington, D. C.

Revised bids have been received by the property committee of the Board of Education for building the proposed new West Philadelphia High School Building, original proposals having exceeded the appropriation. The proposition of withholding the contract for the electric and power installation until the buildings are approaching completion is being considered; this would reduce the cost, now estimated at $1,248,840, by nearly $200,000. Final awards for the work are expected to be made in about a week.

The American Pattern Company reports business as having been quite active and the plant is now fairly busy on a general line of work. This concern recently delivered to the Lorain Steel Company, Johnstown, Pa., a shipment of two carloads of wood patterns for frog and switch work.

The Board of Awards, Baltimore, Md., has, it is stated, awarded the contract for supplying the pumping engines for its Mount Royal pumping station to the Bethlehem Steel Company at a bid of $114,000. The same board has also awarded a contract for the construction of the first section of the Jones Falls sewer to M. M. Elkan, Macon, Ga., at a cost of $533,990. Plans and specifications for the building of the second section of this extensive sewerage system are now being prepared by the city engineer.

A charter has been granted to the West Lebanon Electric Light & Power Company, Lebanon, Pa., for the purpose of providing electricity for light and power in that township. The incorporators named are Daniel Weaver, Jacob B. Weaver, Henry Weaver, R. S. Bicksler and John S. Weaver. The company is organized with a nominal capital stock of $5,000.

Ballinger & Perrot, engineers, have completed plans and asked for bids for the construction of a five-story concrete factory 55 x 121 ft. to be built for the Esterbrook Steel Pen Mfg. Company, Camden, N. J. The company is not yet prepared to consider the purchase of power and mechanical equipment required for the new addition.

Cleveland

CLEVELAND, OHIO, July 11, 1911.

The improvement in the local machinery market noted recently has not been maintained during the past week. Blame for the falling off in orders is placed on the intensely hot weather that prevailed for several days. Buyers showed a disposition to attend to only such business as was absolutely necessary, and the closing of some pending negotiations for machinery was postponed. In spite of the dullness the improved feeling in the trade continues, and while not a great deal of activity in machine tool lines is expected during July and August, dealers are looking for a fair volume of business in the fall. The demand for machinery for new manufacturing plants in metal working lines is rather limited, as work of this character in many cases is being held up. Machine tool orders are very scattering, purchases being largely to replace old tools or because buyers are adding new products and need some equipment different from what they already have. Orders for engines and boilers are fairly good. The demand for electrical equipment in small units is quite active. Building operations in this city in the line of office and mercantile structures continue active, so that there is a good demand for power, heating and lighting equipment. Railroads in this territory are buying practically nothing in the line of machine tool equipment. The demand for second hand tools is light. Not as many used tools are being placed on the market as there were a few weeks ago.

The Hydraulic Press Mfg. Company, Mt. Gilead, Ohio, will build a new erecting shop. Plans for the building have been prepared by the Roberts & Abbott Company, engineers, Cleveland, and contracts for its erection will be placed shortly by the press manufacturing company. The building will be about 50 x 100 ft. of brick and steel construction. It will be equipped with a 20-ton electric crane and will be so located that a railroad siding will run into one end of the building.

Contracts will be placed shortly for 12 or more 1 to 10-hp. motors, five or six electric elevators and other electrical equipment and the steam piping for power and heating for the new warehouse and manufacturing plant of the William Edwards Company, Cleveland, wholesale grocer. Contracts already placed include a 225 and a 75-kw. generator given to the Triumph Electric Company, two engines awarded to the Ball Engine Company and two boilers to the McNaull Boiler Mfg. Company, Toledo, Ohio. F. C. Werk, engineer, New England Building, is in charge of placing the orders for the mechanical equipment.

The Champion Bed Spring Company, Cleveland, has let contracts for the erection of a new plant at 3715 Iron court. It will be 65 x 300 ft., three stories, of reinforced concrete. The company will make kitchen tables in addition to bed springs. Some new metal working and wood working machinery will be required. J. P. Macbeth is president and treasurer.

Contracts will be placed shortly for a large amount of electrical equipment for the new Statler Hotel, Cleveland. No power plant will be installed, electricity for power being furnished by a commercial company. George B. Post & Sons, Cleveland office, 1111 Schofield Building, are the architects.

The Kinsey Mfg. Company, Toledo, Ohio, will shortly begin the erection of two buildings that will enable it to increase its output of automobile supplies one-third. One building will be 80 x 100 ft., four stories, and the other a one-story saw-tooth building 100 x 100 ft.

The U. S. Automatic Company, Amherst, Ohio, has awarded a contract for the erection of a new factory

THE MACHINERY MARKETS

building. It will be 50 x 126 ft., of brick and steel construction.

The City Council of Cleveland has authorized the expenditure of $200,000 for the construction and equipment of a new downtown high pressure pumping station and $700,000 for the construction of a new West Side water tunnel.

The General Fireproofing Company, Youngstown, Ohio, will build a large four-story reinforced concrete addition to its plant.

The Defiance Tick Mitten Company will erect a new branch factory in Toledo, having just acquired a site on Indiana and Avondale avenues and Hawley street.

Fire in Ironton, Ohio, June 30, destroyed the plants of the Ward Lumber Company, the Allen Roller Coaster Company and the Ironton Tool Handle Company. Considerable machinery was destroyed.

Detroit

DETROIT, MICH., July 10, 1911.

New business seems to be rather scarce in the machinery market, and there is an absence of any buying in quantity. Inquiries for standard lines of machine tools are coming out very slowly, the business done being almost entirely on a single tool basis. The dealers in small tools, however, continue to report a very fair business and there is some demand for electrical machinery. The combination of the national holiday and the protracted spell of hot weather has caused many factories to operate in an irregular manner and a number of plants in the hot metal trades have posted notices of closing for one or two weeks. Business in building lines is quite active, figures being asked for a considerable amount of new work, and some good-sized contracts being awarded.

An important feature of the week was the announcement by the Cadillac Motor Car Company that extensive additions to the present plant have been decided upon. The company recently acquired a large parcel of ground adjoining its Trombly avenue plant, including a building 60 x 320 ft., occupied by hte Hayes Mfg. Company. The new buildings will consists of an addition to the iron foundry 72 x 220 ft., a brass foundry 50 x 140 ft., and a three-story manufacturing building 60 x 270 ft. Two additional stories will be added to the Fort street body building plant, 60 x 428 ft. and 60 x 76 ft., respectively. There will also be constructed modern molders' sand bins of concrete, 50 x 288 ft. W. C. Leland, general manager of the company, states that the output for the coming season will be considerably enlarged and the increased capacity is to take care of the rapidly increasing business.

In addition to the extensions to the Ford Motor Company's plant recently announced the company will erect a new machine shop 260 x 560 ft., and a large craneway between this and the new manufacturing building. Contracts for the erection of the new buildings have been awarded to the W. E. Wood Construction Company of this city.

The Abbott Motor Company has decided to increase its capital stock from $300,000 to $1,000,000 to take care of increasing business. Officials of the company state, however, that no steps will be taken at present to enlarge the plant.

The Yeomans Box Company, manufacturer of boxes and crates, has filed notice of an increase of capital stock from $50,000 to $100,000.

The Detroit Concrete Receptacle Company has been incorporated with a capital stock of $25,000 to manufacture a sanitary garbage receptacle. M. E. Von Mac and Joseph B. Urban are the principal stockholders.

The Zenith Carbureter Company has incorporated with a capital stock of $10,000, and will manufacture carbureters and other automobile accessories. Victor R. Heftler is the principal stockholder.

A new automobile company of considerable importance has been incorporated this week with a capital stock of $100,000 to be known as the Bantam Motor Truck Company. The men behind the new enterprise are Hiram H. Walker, George D. Bantam and Jacob M. Stookle.

The Turner & Moore Mfg. Company has been organized with a capital stock of $25,000 to manufacture work jigs, tools and special machinery of various kinds. The principal stockholders are William F. Turner, W. C. Moore and J. H. James.

The Johnson Bearing Company, with a capital stock of $100,000, has been organized by Charles O. Johnson and Hugh T. Wilson. The company will manufacture and deal in bearings, auto parts, engines and dynamos.

The Ideal Furnace Company has merged its plant with the new combine of heating and ventilating companies, to be known as the Federal Heating Company. The capital stock of the new company is $8,200,000.

The Federal Light & Power Company has been organized by Frank E. Robson, Angus Smith and Henry W. Dakin, with a capital stock of $100,000. The new company will generate and deal in electrical current.

A new industry of minor importance is the United States Motor Castings Company, which has been incorporated with a capital stock of $5,000 to manufacture the smaller automobile castings.

The W. A. Paterson Company, Flint, Mich., a large manufacturer of carriages, has increased its capital stock from $200,000 to $330,000.

A new company has been organized at Port Huron, Mich., under the style of the Brennen Furniture Company, with a capital stock of $25,000. No manufacturing plans have been given out.

The rapidly increasing business of the Grand Ledge Paint Company, Grand Ledge, Mich., has necessitated the erection of an addition to its present factory. The new building will be of cement brick, 44 x 52 ft.

The Vogt-Schmidt Company, with a capital stock of $25,000, has been organized at Saginaw, Mich., to carry on a general packing business. The construction of the necessary buildings and the installation of equipment will be rushed, it is said.

Harrison, Mich., has bonded itself to the amount of $8,000 for the purpose of extending and improving its electric light and waterworks systems.

The taxpayers of the school district of Dowagiac, Mich., will vote this month on a proposition to bond for $6,000 for a new central heating plant.

The electric lighting, street railway and water works plants of Ironwood, Mich., have been purchased by the Gogebic & Iron Counties Railways Light Company. The new company promises to extend and improve the lighting plant and street railway.

S. B. Monroe, Fred M. Hodge and James S. Dewing, of Kalamazoo, Mich., are reported to be interested in the organization of a paper company which will erect a large mill at Kalamazoo. The company will have a capital stock of $150,000.

The City Council of Saginaw, Mich., has voted to ask for bids for two new pumps for the west side pumping station. Duplex compound pumps with a rated capacity of 3,000,000 gal. each 24 hours are desired. The city is also contemplating the construction of a new lift bridge across the Saginaw River.

Fire, which caused a loss of $45,000, totally destroyed the large grain elevator of McLane, Swift & Co., at Battle Creek, Mich. It is expected that the burned structure will be immediately replaced.

A new company is in process of organization at Charlotte, Mich., to be known as the Charlotte Carbureter Company. R. Crofoot and M. K. Miller are president and manager respectively of the company. The new concern will manufacture a patent carbureter and it is planned to erect a good-sized building.

The Lewis Spring & Axle Company, Jackson, Mich., is erecting a new plant, 250 x 250 ft., one story, of brick construction, at a cost of $60,000. The company, which manufactures axles, gears, controls and other automobile accessories, will thereby increase its capacity about one-third.

Cincinnati

CINCINNATI, OHIO, July 11, 1911.

There is no material change in the general situation, though there is a continued slight improvement in the machine tool inquiry. A number of tool builders and other manufacturers followed their usual custom of shutting down the first week in July for repairs, and this cessation of activities was doubly welcomed by both employers and employees, due to the intense heat that has prevailed in the Middle West lately. Several foundries report a small increase in their melt, at the beginning of the present week, but taking them as a whole, they are operating to barely 60 per cent. of capacity.

Dealers in second-hand machinery are doing moderately well. There is a reported slackening in the demand for machinery and engineering supplies, and dealers in building materials are also making some complaint. On the other hand, the railroads are reported as having issued more requisitions for small shop supplies than for some time past.

The National Society for the Promotion of Industrial Education will hold its next annual convention in

THE MACHINERY MARKETS

Cincinnati, November 2, 3 and 4. F. A. Geier, president of the Cincinnati Milling Machine Company, and vice-president of the society, is making preliminary arrangements for entertaining the visiting delegates.

The Kentucky Lumber Company, First National Bank Building, Cincinnati, will soon be in the market for four miles of standard section rails, logging cars and a Shay locomotive, for delivery near LaFollette, Tenn.

The Brackett Bridge Company, whose sales offices are in the First National Bank Building, Cincinnati, has leased a building at Fifth and Toledo streets, which will be fitted up for fabricating structural material, bridges, fire escapes, etc. Only part of the necessary equipment has yet been provided for.

Reports as to the fire damage sustained by the Swing Electric Company, Cincinnati, have been exaggerated. The office was practically destroyed, but the plant is intact, and no delay will be experienced in filling orders.

The foundry of the Peck-Williamson Heating & Ventilating Company, at Oakley, Ohio, will soon be enlarged. This company recently merged with the Federal Heater Company, and it is proposed to make the Oakley plant one of the largest of its kind in the country.

The Norwalk Drilling & Tool Company, Norwalk, Ohio, has increased its capital stock from $10,000 to $20,000. It has not yet been announced if any additions to present facilities are planned.

The Eagle Woodenware Mfg. Company, Circleville, Ohio, has awarded the contract for the construction of a factory at Hamilton, Ohio. The main building will be 50 x 160 ft., workshop 50 x 130 ft., and boiler room 33 x 34 ft., all one story and of regular mill construction. In addition there will be a number of dry kilns.

George Barkman, architect, Hamilton, Ohio, is drawing up plans for a heating system for the Hamilton Infirmary, to cost about $15,000. The present system is said to be inadequate for the institution's needs.

The Hanna Paint Company, Columbus, Ohio, has acquired a site at Water and Long streets, on which it proposes to erect a large paint factory structure within the next 12 months.

The South

LOUISVILLE, KY., July 11, 1911.

Dull conditions have been relieved by a fair number of inquiries, but actual sales have been light and prospects are not particularly good. It is hoped that, now that the railroads have started on new fiscal years, in many cases they will be more active buyers. As it is they have been purchasing little or nothing beyond absolute necessities.

The Alvey-Ferguson Company, Louisville, which is erecting a plant at Oakley, near Cincinnati, has announced that it will not abandon the Louisville plant, but will continue it in operation. Morris U. Bernheim, president of the company, said that the new factory would be completed and put in operation in August. All the machinery for it has been purchased, he said. The company manufactures conveying machinery.

A report from Clarksville, Tenn., is that the foundry and machine shops which were conducted by the Red River Furnace Company will be reorganized under the name of the Clarksville Machine & Foundry Works. Louisville stockholders of the company said that certain changes are contemplated, but that they have not yet been definitely decided upon.

The General Council of Louisville has formally approved plans for the construction of the new hospital plant, which will cost between $800,000 and $900,000. D. X. Murphy & Bro., Louisville, the architects, have announced that bids will be asked for late in August. There will be a large tonnage of reinforcing bars required, as most of the buildings will be of reinforced concrete. The plant will produce its own power, but details as to the capacity of the power house, etc., have not yet been worked out.

Jacob Greenburg and others have purchased the Galt House in Louisville and will make many improvements. An entirely new power plant is to be installed and two new elevators will be provided. The new owners, who have organized the Louisville Galt House Company, plan to spend in the neighborhood of $50,000.

The Kentucky Electric Company, of Louisville, has let a contract to the Kennicott Company, of Chicago, for the erection of a steel stack at its new power house. It is 205 ft. high and 13 ft. in diameter.

Louis B. Glass, of the Pearl Laundry, Louisville, is planning the construction of a new power plant. He will be in the market shortly for a 50-hp. boiler.

The Standard Laundry, Eleventh and Main streets, Louisville, is considering the erection of a new plant and will be in the market for power and special equipment.

The Long Towel Supply Company, Louisville, is installing some new equipment. Contracts for special machinery have been let to the American Laundry Machine Company, Cincinnati, and the Troy Machine Company, Troy, N. Y.

The Coil Coal Company, which is planning the operation of a mine near Madisonville, Ky., is erecting a power house and tipple. Mining machinery is to be installed at once.

The Rotary Hoisting Engine Company of America has filed articles of incorporation at Owensboro, Ky., giving its capital stock as $100,000. The incorporators are Hugh Roy, Guy G. and James W. Gilbert. The object of the company is to manufacture the hoisting type of Moore rotary engine, which was patented in May, 1910.

The quarters of the Isbell-Chapman Electric Company, Bowling Green, Ky., dealer in electric apparatus, were burned July 5 entailing a loss of $4,000, partially insured.

The Brush Creek Mining & Mfg. Company, Barbourville, Ky., is planning the installation of a compressed air plant and other equipment during the next few months. The improvements will aggregate $40,000, it is reported.

The Anglo-American Milling Company, Owensboro, Ky., has taken over the plant of the Hoagland Buggy Company in that city and is planning to equip it for the manufacture of Midget flour mills. The mills have been made on a small scale heretofore by the Kentucky Electric Company, Owensboro, but the new concern will have an annual production of 350. Fifty men will be employed in the new plant.

It is reported that the distilling plant of G. & B. Burdes, Cincinnati, Ohio, which is located at Nicholasville, Ky., is to be reconstructed, a new power plant being among the improvements contemplated. Details regarding the work are not available.

Boston capitalists, it is stated, are planning the erection of a power plant on Dix River, near Danville, Ky., for the purpose of furnishing light and power to the surrounding cities of Danville, Harrodsburg, Richmond, Stanford and Lancaster. A dam of concrete and steel will be built, according to the report, and a hydro-electric power plant will be constructed, the total amount it is planned to expend being $1,250,000.

The Murfreesboro, Tenn., Water Works Company has been purchased by J. R. Jetton and Henry King. They plan considerable improvements in the property.

The Lookout Boiler Works, Chattanooga, Tenn., has been awarded the contract for the erection of a water tower and the installation of mains for a tuberculosis sanitorium at Chattanooga.

The Chattanooga Railways Company, Chattanooga, Tenn., is erecting a new power house for the operation of cars up the incline to Lookout Mountain.

The Knoxville Board of Trade, Knoxville, Tenn., is negotiating with the French Bread Mfg. Company, Barnard, N. C., relative to the removal of the handle plant of the company to Knoxville. It is stated that there is a strong probability that this will be done.

Business men of Knoxville, Tenn., have organized a traffic bureau for the purpose of handling freight matters in their interest. Among the members of the bureau are the Southern Pipe & Foundry Company, Ty-Sa-Man Machine Company, Knoxville Foundry & Machine Company, Knoxville Iron Company, Fair Foundry Company and Sanford-Day Iron Works.

The Southern Sash & Door Company, Montgomery, Ala., part of whose plant was destroyed by fire recently, will rebuild the damaged portion at once.

The Cotton Belt Lumber Company, Bearden, Ark., is making plans for the reconstruction of its saw and planing mills, which were recently burned.

A band mill is to be erected at Richardson, Miss., by the A. G. Little Lumber Company.

The W. A. Rowe Vehicle & Machinery Company has filed articles of incorporation at Ft. Smith, Ark. It has $10,000 capital stock. Among those interested are M. A. Rowe and J. V. Hinckley.

The Morgan County Cotton Compress & Warehouse Company is being organized with $25,000 capital stock at Decatur, Ala., by Robert G. Cortner, H. B. Bynum and others. A compress with a capacity of 1,000 bales a day will be erected.

THE MACHINERY MARKETS

For the purpose of establishing a water works system the municipality of Kentwood, La., is contemplating the issue of $50,000 of bonds.

The Southern Hay Press Mfg. Company, Silver Creek, Miss., is contemplating removal to Hattiesburg, Miss. M. L. Bixler, secretary of the Hattiesburg Commercial Club, is in communication with the company.

Dothan, Ala., is to hold an election in the near future to decide the question of issuing $75,000 of bonds for the purpose of erecting electric light and water plants.

The Eagle Aeroplane Company has been organized at Brunswick, Ga., with $100,000 capital stock by John M. Biggs, Percy B. Morris and C. A. Lincoln. The company plans to begin manufacture in the near future.

The commissary department of the Sloss-Sheffield Steel & Iron Works at Bessemer, Ala., was burned recently with a loss of $10,000.

The Noiseless Wheel & Truck Company, Cedartown, Ga., has taken over the plant of the Cedartown Iron Company, which includes machine shops and foundry and wood working departments, and will operate it for the manufacture of a patented truck and the noiseless wheel. An additional building is to be erected. Philadelphia men are interested in the company.

The city of Sentinel, Okla., will let contracts shortly for equipment for an electric light plant, including engine boiler, generator, etc.

The power plant of the Athens Electric Railway, Athens, Ga., at Mitchell's Bridge, is being increased to 1000 hp. Another power plant which the company operates is to be enlarged also.

George C. Brown & Co., Memphis, Tenn., will erect a band sawmill in Arkansas.

St. Louis

ST. LOUIS, MO., July 8, 1911.

The past week has been a quiet one in the machine tool market, though dealers report a generally better feeling and some slight gain in business. There have, however, been no lists of consequence out and none of this character, it is believed, can be expected until the turn to fall business develops. A conservative statement is that the machine tool dealers are doing about 60 per cent. of a normal business. This, however, is better than for the greater part of the past six months and is encouraging to dealers. The business, however, for this district depends to a measurable extent on the money coming out of the crops, and until the recent hot spell and its effect have been discounted it is not likely that there will be any very active inquiry in this market.

The Fulton Iron Works has about closed for its crane system for its new plant on the western edge of the city and announcement of the award of the contract, which amounts to about $25,000, is expected shortly. The other new equipment for the plant will not be settled on until later.

The city of St. Louis the past week awarded to the Dravo-Doyle Company, Pittsburgh, Pa., a contract for two turbine pumps for the waterworks of 40,000,000 gal. daily capacity. The figure was $54,950. The Myers Construction Company, St. Louis, will build a new intake tower gate for $9,250.

The St. Louis Independent Packing Company has completed arrangements to build a three-story addition to its refrigerator building and will increase refrigerating machine capacity.

The National Plumbing & General Supply Company has been incorporated in St. Louis with $100,000 capital stock to take over the bankrupt business of the National Plumbing Company. It will modify the present equipment of the old company and will operate a lead pipe manufacturing plant in East St. Louis. The officers are George H. Robinson, president; Fred G. Turner, vice-president; Robert W. Moore, secretary; Valle Reyburn, treasurer.

The Pyrite Mining Company, with $25,000 capital stock, has been incorporated in St. Louis by G. W. Hess, J. S. McIlvaney and Le Roy Baker, to operate a mine in southeast Missouri. They will purchase new equipment.

The Kimball-Sawyer Milling Company, Kansas City, Mo., has been incorporated with $50,000 capital stock by George I. Kimball, M. J. Harrington and H. A. Sawyer and will equip a plant at once.

The Springfield Drain Tile Company, Springfield, Ill., has been incorporated with $30,000 capital stock by Joseph A. Long, C. G. McIntosh and John F. Miller and will install equipment for the manufacture of tile products.

The upper works of the Wilharm mine at Belleville, Ill., owned by the St. Louis & O'Fallon Coal Company, were destroyed by fire the past week with $10,000 loss, requiring the purchase of new hoisting equipment.

The Imperial Clock Company will build a two-story factory building, 40 x 110 ft., and equip it for the manufacture of clocks. The location is 3419 Rutger street, St. Louis.

The Moon-Hopkins Billing Machine Company has leased a new six-story factory building at Twenty-second and O'Fallon streets, St. Louis, and will equip it at once for the manufacture of its product. This is an increasei n its capacity. The company has a capital stock of $2,500,000.

The machine shop, erecting shop and offices of the Lennox Machine Company, at Marshalltown, Iowa, were destroyed by fire, June 25, entailing a loss of $125,000. The records of the company were saved, as was also a considerable stock of unassembled parts. It will be possible to proceed with the business of the company therefore without interruption. Temporary manufacturing facilities are to be arranged at once pending the completion of plans for a new plant. The location of the new plant has not been decided further than that it is not planned to rebuild at Marshalltown. The Lennox Machine Company is owned by Joseph T. Ryerson & Sons, and the officers are Clyde M. Carr, president; E. T. Hendee, vice-president; W. A. Morey, secretary and treasurer.

Eastern Canada

TORONTO, ONT., July 8, 1911.

The extreme heat has greatly retarded operations in the manufacturing industries. In all works and all over the country there has been a decided slowing down because of the heat, men being unable to keep up their accustomed exertions. To some extent, too, the weather has affected the demand. The fruit prospects of the Niagara district and other sections of Ontario have been much changed for the worse by the extremely high temperatures of the last week and by the lack of rain. Millions of dollars have been taken off the value of Ontario's fruit expectancy this year as a consequence of the unfavorable weather. Ontario's meadows, which are a very great source of wealth, have been made much less productive by the drought. The hay crop of the province will be relatively short and the dairy output much lessened. These changes in the outlook have not been without effect on the spirits of business men, though the very promising grain harvest seems to assure an exceptionally good year to the agriculturists. British capital continues to flow in, Western municipalities alone having floated debentures in the first half of the year amounting to upward of $64,000,000. There is a strong probability that the Dominion elections will be held this fall unless the government succeeds in having closure rules adopted early in the reopening of the session less than two weeks hence, for the opposition will otherwise hold up supply if the government persists in pushing the reciprocity bill through without consulting the people. A general election would be somewhat unsettling to business, but it is certain the campaign would not be protracted.

D. Lorne McGibbon's scheme to produce hydro-electric power at the Cedar Rapids, near Montreal, contemplates a development of 100,000 hp. It is said that $600,000 has been expended in the purchase of the rights.

The Electrical Distributing Company of Ontario, which has arranged to deliver power in Windsor, Ont., and in Detroit, Mich., expects to be making delivery 12 months hence. It has a capital stock of $2,500,000. It is under contract to take from 15,000 to 30,000 hp. from Niagara Falls.

The ratepayers of Windsor, Ont., are to vote on three money by-laws on July 24. One is to raise $50,000 to lay a new intake pipe in the Detroit River, another is to raise $178,550 to spend on fire equipment, most of the money to be laid out on motor fire trucks. The third is to exempt the National Spring & Wire Company from taxation and give it a free supply of water, the company undertaking to put up and operate a plant of considerable capacity.

The Garton Pew Fisheries Company, Gloucester, Mass., proposes to establish a plant, to cost from $40,000 to $50,000, at Louisbourg, N. S., on condition that certain local privileges be granted.

The Canadian Flour Mills, Chatham and Blenheim, Ont.; Taylor Milling Company, Chatham, Ont.; Hessel Bros., Milverton and Listowel, Ont.; Tavistock Milling

THE MACHINERY MARKETS

Company, Tavistock, Ont.; James Goldie Company, Guelph, Ont.; McLeod Milling Company, Stratford, Ont.; Carter Milling Company, St. Mary's, Ont., and John Campbell Company, St. Thomas, Ont., are joining in a new flour mill merger.

The Colonial Engineering Company, Montreal, is seeking franchises from Ontario towns for street railroads, water works and interurban electric lines.

The Dominion Corset Company, Quebec, has purchased a large site at Maisonneuve, Montreal, on which to erect a factory. Seven hundred hands are to be employed at the outset and an additional 500 in the near future.

The Canadian Steel Foundry Company, Welland, Ont., expects to increase its present strength of 500 men to 750 men.

The Montreal Water & Power Company expects to have its big filtration plant completed a year from the present. It intends to install a new 10,000,000-gal. pump within the next twelvemonth and will increase its main trunk system by the addition of about three miles of 4-ft., 3-ft., 30-in. and 16-in. steel and iron mains.

The Railway Department of the Dominion Government is about to place orders for 12 locomotives, 12 passenger coaches, 3 diners, 3 express and postal cars and 500 freight cars for the Intercolonial Railway.

It is rumored in Ottawa that the contract for the Dominion Government's naval vessels has been awarded to the newly formed British-Canadian Shipbuilding & Dry Dock Company, whose headquarters are to be at Sydney, N. S. Sir Henry Pellatt, Toronto; Mr. Gibson, Lieutenant-Governor of Ontario, and Sir Charles Ellis, chairman of the John Brown Company, Clyde Bank, Scotland, the company that built the Lusitania and the Mauretania, are directors of the British-Canadian Shipbuilding & Dry Dock Company.

The Ford Motor Company of Canada, Walkerville, Ont., is about to enlarge its factory to almost double its present capacity.

It is stated that D. A. Gordon, M. P., will build a sugar refinery at Chatham, Ont.

R. Scott & Son, wheel manufacturers, and Canadian Motors, Ltd., have purchased five acres of land each from the Parks Commission in Galt, Ont., on which they will at once build modern plants.

Work has been commenced on a new boiler house at the Allen shafts collery of the Dominion Coal Company at Stellarton, N. S. The equipment is to consist of six B. & W. boilers of 3000 hp., to which are to be added six others of the same capacity. The company's building for electrical power purposes will soon be completed. It will be one of the largest in the province.

The City Engineer of Toronto has been instructed by the Board of Control to proceed at once with the construction of the municipal street railroad lines authorized by the ratepayers. The outlay on construction plant, rails, poles, wires and other equipment, exclusive of rolling stock, will amount to $213,529.

All employees of the Angus shops, Montreal, have been granted increases by the Canadian Pacific Railway directors.

The Vickers-Maxim floating dock for Montreal is to be built at the firm's works in England and will be towed across the Atlantic. It will lift 25,000 tons and will have a length of 950 ft.

Carsley & Co., bankers and brokers, Montreal, are moving in the interest of certain capitalists to build a $300,000 hotel in Kingston, Ont.

A by-law is to be submitted to the ratepayers of Hamilton, Ont., July 25 to raise $500,000 for a local distribution plant to be operated in connection with the Hydro-Electric Commission's system.

The government of New Brunswick and the City Council of St. John are considering proposals for the establishment of a steel shipbuilding industry in that city.

The United States & Canada Sulky Company, promoted by manufacturers from Marion, Ohio, will start operations shortly in Stratford, Ont.

The Positive Clutch & Pulley Works, Aurora, Ont., is erecting a factory.

The Niagara Brand Spray Company is negotiating with the town of Brighton, Ont., to establish a factory there.

The Massey-Harris Company is calling for tenders to erect a factory warehouse at its works in Brantford, Ont.

The Standard Underground Cable Company, Pittsburgh, is having plans prepared for a factory to cost $400,000, to be built in Hamilton, Ont. The name of the company was incorrectly given recently in this correspondence.

The Montreal Locomotive Works has had plans prepared for a factory at Long Point, Montreal.

Western Canada

WINNIPEG, MAN., July 8, 1911.

Harvest prospects continue excellent in the Canadian West. The great question is will there be hands enough to take the crop off? Sir William Whyte, who holds sway for the Canadian Pacific Railway Company in that part of the country, says that 162,000 men will be required for the harvest and of this number about 50,000 will have to be drawn from outside sources. The financing of the crop movement may not be effected without disturbance to manufacturers, as the volume of currency is not much greater now than it was a year ago when a crop of not more than half the magnitude of the present one had to be handled. Basic conditions are, however, all that could be desired and current business is excellent.

Equipment is required for the extension of water works for Medicine Hat, Alberta. Pumps, boilers, pipe, etc., will be needed.

The contract for building the Canadian Northern Railway section between Hope and Camloops at a cost of $15,000,000 has been awarded to the Northern Construction Company.

George F. Brown, of the Farmers' Metal Granary Company, Winnipeg, is endeavoring to organize a company to start a branch factory in Regina, Sask.

The City Commissioners, of Edmonton, Alberta, have awarded the contract for the steel work of the east end bridge to the Dixon Bridge Company.

The Starr & Reed Company, Philadelphia, has asked to be allowed to compete for the establishment of a gas plant in Edmonton, Alberta.

The new Calgary Nail Works, Calgary, Alberta, is endeavoring to get coöperation of the local Board of Trade to bring about a reduction of freight rates on raw materials coming into the city.

It is stated that if the reciprocity agreement is established the Quaker Oats Mfg. Company and the Nelson Morris Company, both of Chicago, will at once establish large manufacturing plants in Calgary, Alberta.

The Electric Light Company, Brandon, Man., is spending about $100,000 on additions to plant and new equipment. A 2250-hp. engine will be installed by the Goldie McCullough Company, Galt, Ont., and in conjunction therewith there will be a new generator and 15 new boilers.

The Powell River Paper Company at Powell River, B. C., which is about 80 miles up the coast from Vancouver, will begin manufacturing operations about the middle of next month. Its plant has cost about $2,500,000.

The Pacific Coast

SAN FRANCISCO, CAL., July 5, 1911.

The movement of machine tools is slowly increasing in volume, and, while the majority of orders are for one or two machines of rather insignificant size, inquiries for heavy tools are much more numerous than earlier in the year. More activity is noted through the country than in San Francisco owing to improvements to small shops. Increasing activity is noted in electrical equipment of all descriptions. A number of rather important hydroelectric plants are either under construction or in contemplation for the near future, and the use of electric power is gaining ground both for large manufacturing plants and agricultural uses. The export trade to the Orient continues active, machinery forming an important part of the cargo of nearly every steamer. The farm implement trade has developed most rapidly, but considerable electrical and mill equipment is also being shipped. The demand for sawmill and wood-working machinery is well sustained, and notwithstanding general complaint in the lumber industry plans are being developed for a number of new mills. A few old plants are also increasing their capacity, though the majority of the business consists of necessary replacements. Mining and dredging machinery is still receiving considerable attention, though little additional business is expected from Alaska this season. Shipbuilding plants along the coast are well occupied and there is a steady demand for marine gas engines. Engines of coast manufacture have the preference for this purpose.

THE MACHINERY MARKETS

The demand for mining machinery has been very active for the last few weeks. Orders for large outfits have not been much in evidence, but air compressors, pumps and hoisting machinery are being shipped in considerable quantities to all the mining districts in California, as well as to Nevada. The Western Pacific Railroad is carrying a heavy tonnage of mining, logging and sawmill equipment, both from San Francisco and from eastern points to the Plumas County district, which has formerly been handicapped by lack of transportation. Buyers in the oil fields are also coming into the market more freely than for some time past.

Considerable encouragement is taken from the fact that the Union Iron Works Company, controlled by the Bethlehem interests, is materially increasing its investment in San Francisco. The company has let a contract to the Pacific Rolling Mill Company for a new steel building, the upper floor of which is to be used as a laying-out room for marine work, and another steel building is to be erected in the near future. The additions will include a new copper shop and plate shop.

The Columbia Steel Company has installed a wireless telegraph outfit for direct communication between its San Francisco offices at Market and First streets and the plant near Antioch, Cal., a distance of about 36 miles in a direct line. This company has just produced a steel casting said to be the first of the kind ever turned out on the Pacific Coast, consisting of a stern post and rudder frame for the steamer Watson. It is 26 ft. high, 14 ft. wide, with a maximum thickness of about 12 in., weighing 11,300 lbs.

The steel foundry of the C. L. Best Gas Traction Company, Oakland, Cal., is getting a considerable volume of outside work and has recently made some large castings for the Standard American Dredging Company.

The city of Albuquerque, N. M., will receive bids July 8 for a pumping plant of 300 gal. per minute capacity against a 360-ft. head, 8 miles of water mains and a 150,000-gal. steel tank and tower.

The Pacific Electric Railway Company expects to start work shortly on its new car shops at Los Angeles.

Los Angeles County has just received bids for two steam road rollers.

R. A. Baker & Co. are planning to install a new rock crusher at their quarry, South Pasadena, Cal.

The city of Los Angeles is taking bids on a centrifugal pump with 100-hp. electric motor.

Los Angeles County will receive bids August 31 for two engine generator sets for the Hall of Records building.

The city of Pasadena, Cal., has ordered a new unit for the municipal light plant, amounting to about $22,000.

The Great Western Power Company is starting operations on its new plant at Big Meadows, Cal., which will require the installation of a lot of heavy machinery. In connection with the dam construction two impulse wheels with an aggregate capacity of 1500 hp., with Pelton oil pressure governors, have been purchased from the Pelton Water Wheel Company. The Great Western Power Company is also planning a material increase in its Big Bend plant and is expected to be in the market for machinery in the near future.

The Western Water Company, serving the west side oil fields in Kern County, Cal., has placed orders for two 250-hp. pumping plants.

The Tulare Power Company, Tulare, Cal., expects to start work on a large hydroelectric plant about the end of summer. Plans are also being made for a number of substations and auxiliary steam plants.

The Nevada Power & Transportation Company, Reno, Nev., expects to begin work shortly on a 4000-hp. hydroelectric plant on Truckee River.

N. E. Otterson, representing the Chicago Pneumatic Tool Company, has received numerous orders from the oil fields recently. One compressor of 150 cu. ft. per minute capacity has been shipped to the Midway field, to be used in the construction of steel tanks.

The Yosemite Lumber Company announces that it will commence work on its new mill at Merced Falls, near Merced, Cal., in about a month.

The Olson & Mahony Lumber Company, San Francisco, will let contracts shortly for a 225-ft. steel steamer with a triple expansion engine and two Scotch boilers.

The Pacific Gas & Electric Company is preparing to install a 5000-kw. steam turbine generator at or near San Rafael, Cal.

The Hihn-Hammond Lumber Company is installing a lot of sawmill machinery at Watsonville, Cal.

W. L. Dunn and the Oxnard Mfg. Co. Garage & Machine Company, Oxnard, Cal., have consolidated as the Dunn Mfg. Company with a capital stock of $150,000. The principal stockholders are W. L. Dunn, J. A. Driffill, H. R. Staples, G. C. Robbins and H. E. Thomas. Some new equipment is being purchased.

Philip H. Silverman, of the San Francisco Iron & Metal Company, scrap dealer, will be in Philadelphia about the middle of the month.

The Pomona Mfg. Company, Pomona, Cal., manufacturing pumps, traction engines, etc., is planning to enlarge its plant.

The Pacific Basket & Barrel Company, San Francisco, is installing two new planers, two motors and a large Mershon band resaw.

George Real is starting a small machine shop at Sacramento, Cal.

The Natomas Consolidated Mining Company, of California, has placed an order with the Yuba Construction Company, Marysville, Cal., for the construction of a new gold dredge at a cost of about $275,000.

The A. L. Young Machinery Company, San Francisco, has sold a 12-ton steam roller to the city of Oakland.

The Spring Valley Water Company is taking figures on a pumping station to be erected at Lake Merced, San Francisco.

San Joaquin County, Cal., has just received bids for a 12-ton gasoline road roller.

The West Tacoma Steel Company has been incorporated at Tacoma, Wash., with a capital stock of $500,000 by M. E. Gunston, W. R. Flaskett and R. W. Taylor.

The Washington Steel & Iron Company, Spokane, Wash., is considering plans for a new steel plant at Leavenworth, Wash.

The Hoquiam, Wash., Steam Boiler Works is preparing to install a shop in that city.

It is reported that a manufacturer of harvesting machinery of Minneapolis, Minn., is considering the installation of a branch factory at Astoria, Ore.

The Standard Oil interests are completing plans for one of the largest oil distributing plants on the Coast to be installed at Richmond Beach, on Puget Sound. Large storage tanks will be erected both for fuel oil and refined products.

The L. T. Eyer Gravel Company, Seattle, Wash., has a 15-year contract for working gravel beds at Irondale, Wash., and a lot of machinery will be required for handling the material.

Dearing, Gordon & Co., J. R. Crawford and others, of Vancouver, B. C., have secured mining rights on Siwash Creek. A power plant, flume and hydraulic outfit will be installed.

It is reported that the Washington Water Power Company will expend about $4,000,000 on its new power plant at Long Lake, near Connell, Wash.

Arrangements are being made for the immediate replacement of the power plant of the Portland Railway, Light & Power Company at Vancouver, Wash., which was destroyed by fire early this month.

The O'Connel Lumber Company, Winlock, Wash., will erect a new mill to replace that which was burned May 18.

The Richardson shingle mill, Olympia, Wash., which was burned recently, will be replaced shortly.

The Monroe Shoe Mfg. Company, Monroe, Wash., has leased a large building at that place and will install a factory with a daily capacity of 100 pairs.

It is announced at Valdez, Alaska, that California interests will install a gold dredge on Slate Creek near that place next summer.

The Morgan-Stansbie Company, Eugene, Ore., has increased its capital stock and is preparing to make extensive additions to its planing mill.

It is reported that the Great Northern Railway will put in a large car shop near Everett, Wash.

The Skagit Commission Company, Sedro-Woolley, Wash., is preparing to install a feed mill.

The Shultz Belting Company, St. Louis, Mo., has opened an office at Tacoma, Wash., with Chas. E. Grigg as sales manager.

The California Eucalyptus Lumber Company, Los Angeles, has placed an order for a complete saw and planing mill outfit with C. W. Willette, Seattle, Wash., representing the Phoenix Mfg. Company.

It is reported that the Monasha Woodenware Company will install a new plant at North Bend, Ore.

The Fidalgo Island Clay Works Company, Anacortes, Wash., is preparing to install a factory at an estimated expenditude of $125,000.

The Bend Company, Bend, Ore., is planning to increase the capacity of its electric lighting plant and sawmill.

THE MACHINERY MARKETS

The Seattle Car Mfg. Company has completed plans for a steel building for a forge and machine shop at Renton, Wash.

The Loggers' & Contractors' Machinery Company, recently incorporated in this city, has opened an office at Seattle, Wash., under the management of G. L. Davis.

The Columbia Box & Veneer Company is starting work on a large plant at Puyallup, Wash.

The Crown Pulp & Paper Company, Oregon City, Ore., has placed an order for a lot of large pulp digesters with the Portland Oxyacetylene Company, of this city.

A representative of the Berlin Machine Works, Beloit, Wis, has been in Portland, Ore., for some time to complete arrangements for the establishment of the proposed branch shops. While the precise location and proposed equipment of the plant have not been announced, its establishment is assured and the installation will amount to about $750,000.

A complete logging camp outfit has just been shipped to Wrangell, Alaska, for the McDonald & West Lumber Company.

Texas

AUSTIN, TEXAS, July 8, 1911.

Good rains covering a big part of the cotton belt of Texas have improved business conditions the past week. An increase of activity in general building operations and a growing demand for machinery are noted. Several irrigation projects of great magnitude are being promoted and each of them will require much machinery in their fulfillment. Industrial conditions in Mexico are gradually improving and many orders for mining and other machinery are now being placed in the United States.

D. B. Chapin, who is promoting the construction of a large dam across Devil's River and the establishment of a system of irrigation that will reclaim more than 100,000 acres of desert land in the vicinity of Del Rio, announces that a syndicate of New York men have agreed to finance the project, provided certain stipulations are complied with in the matter of securing the necessary lands. Mr. Chapin has obtained options on 90,000 acres of land and says that he will close contracts for 30,000 more acres. His plans also embrace the installation of a large hydroelectric plant and the construction of power transmission lines to a number of towns in west Texas. A number of industrial plants, among them being a cotton mill, are proposed in connection with the project.

The American Rio Grande Land & Irrigation Company, Mercedes, is enlarging its irrigation system in that section. Contracts have been let for the construction of three additional miles of main canal and about 35 miles of laterals at a cost of about $100,000. The work involves the construction of a concrete flume one-quarter of a mile long across Campacaus Lake. The extensions that are now being made will bring 6000 acres of additional land under irrigation.

The Commissioners' Court, of Hidalgo County, has acted favorably on a petition of citizens for the formation of the Llamo Grande Improvement District for the purpose of issuing bonds to the amount of $125,000 to drain 90,000 acres of land in the vicinity of Donna and Mercedes. George B. Merriweather, of Donna, was appointed engineer to make a report upon the feasibility and cost of the proposed drainage system. The plans contemplate the dredging of a channel through the lands by which the flood waters will be given a free outlet to the sea.

The City Council of Sherman has ordered the purchase of pumps, engines and compressors for the municipal water works plant to cost about $25,000.

The Board of Water Commissioners of Waco has been petitioned by local taxpayers to arrange for a bond issue of $350,000 to construct a water storage reservoir and install a water works plant and distributing system with a capacity of supplying a population of 100,000 people. The proposition seems to be meeting with general favor and it is believed that it will be carried out.

H. M. Smith, Ft. Worth, will erect a grain elevator with a capacity of 12,500 bu. at Brownsville.

The San Antonio Machine & Supply Company will install a large plant at San Antonio for the manufacture and repair of gasoline engines.

The City Council of Yoakum is arranging to let the contract for the installation of a garbage crematory to cost about $2,500.

The Alamogordo Improvement Company, Alamogordo, N. M., is installing a canning factory, which will have a capacity of 5,000 cans per day.

William Palmer, Jr., Las Cruces, and associates will erect a large flour mill at Rincon, N. M.

The Hydroelectric Mining Company will construct an extensive system of irrigation in the Sulphur Springs Valley, near Tombstone, Ariz., where it has taken up considerable land under the desert land act.

Andrew Mackenzie, of Mexico City, has been granted a concession by the government of the State of Hidalgo for the installation of a large hydroelectric plant and the construction of transmission lines to run to the Zimapam, Mexico, mining district and other industrial centers of the State of Hidalgo. The concession authorizes him to use the waters of the Moctezuma and Tula rivers for the generating of the electric power.

The Waxahachie Gas Company has been organized with a capital stock of $125,000—$64,900 paid in—to build a modern water gas plant at Waxahachie within one year.

The Temple Gas Light Company, Temple, will build a water gas plant in that city within the next six months. The company has been organized with a capital stock of $150,000, of which $80,000 has been paid in.

J. C. Wilson is arranging to build a factory at Crockett for the manufacture of pressed brick. Considerable machinery will be required for the proposed plant.

The City Council of Amarillo contemplates issuing $15,000 of bonds for extending the municipal sewer system.

The Greer Filter Mfg. Company, Pittsburgh, Pa., has the contract for installing a water filtering plant for Brownsville. The plans call for a plant with a capacity of filtering 1,000,000 gal. of water a day and so designed that it can be increased to supply 2,000,000 gal. with but little additional cost.

The Wharton County Warehouse Company is erecting a large elevator at El Camp. The building will soon be ready for the installation of machinery.

The installation of a large hydroelectric plant on the Gila River near Red Rock, N. M., is contemplated by Col. J. W. Carter, of Silver City, and associates. Engineers are making preliminary surveys with a view of locating a site for the proposed plant. Transmission lines will be built from the power station to the Mogollon mining district for supplying the energy for operating the machinery of the mines and mills. Other transmission lines will also be constructed to Silver City and a number of towns and industrial centers within a radius of about 100 miles of Red Rock.

The formal transfer of the local water works system to the city of Tucumcari, N. M., has taken place. The plant will be enlarged and otherwise improved.

J. H. Hays and Robert S. Waters will install a hydroelectric plant on Trout Creek in the eastern part of Mohave County, Ariz. The power will be transmitted to mining districts in that section and used to operate machinery of the mills.

The Oklahoma Iron Works will establish large machine shops at Tampico, Mexico.

The Huasteca Petroleum Company will construct a steel tank of 350,000 bbls. capacity for storing oil at Tampico, Mexico. This company is laying another 8-in. pipe line from its Juan Casiano oil field to Tampico, a distance of about 80 miles. It is also constructing nine steel oil storage tanks each of 55,000 bbls. capacity along the route of its pipe lines.

Albert E. Andrade, of Mexico City, will build a plant at Monterey, Mexico, for the manufacture of oleomargarine. Considerable machinery will be installed.

The Texas Company, Houston, will construct two oil storage tanks at Tampico, Mexico, each of a capacity of 55,000 bbls.

Chicago

CHICAGO, ILL., July 10, 1911.

The first week of July did not develop business at quite the rate that prevailed in June. The extreme weather conditions have undoubtedly contributed to sluggishness. At Grand Rapids, Mich., the equipment of a high school will bring into the market from $8,000 to $10,000 worth of machines. The Chicago & Alton Railroad is to buy a list aggregating in value from $15,000 to $20,000 and the American Bridge Company is in the market for approximately $7,000 worth of tools.

J. K. Stewart, of the Stewart & Clark Company, Diversey boulevard, Chicago, is building an eight-story concrete building at 319-335 Wells street to cost $200,000, where the company's business of manufacturing speedometers and flexible shafting will be moved.

The Scranton works of the Allis-Chalmers Company, which has been used for the building of hydraulic and sugar manufacturing machinery, is to be moved to Milwaukee, Wis. About 1000 men were nominally employed at the Scranton works, which is at Scranton, Pa.

The National Machine Company, Milwaukee, will erect a $10,000 building at the corner of Eleventh and National avenues in that city.

The Korff Mfg. Company, Lansing, Mich., is to build an addition to its plant 80 x 120 ft. Among the new equipment that will be required will be one No. 3 punch press, one power riveter, a complete nickel and copper plating outfit and a 10-hp. motor.

The Korff Mfg. Company, Lansing, Mich., is to build a 10-stall engine house and machine shop at Virginia, Minn., and will be in the market for boiler and tool equipment. This equipment will be purchased in the office of E. Langham, Canadian Northern Railroad, Winnipeg, Manitoba.

The Denver & Rio Grande Railroad will spend $60,000 in improvements for its shops at Salt Lake City.

Government Purchases

WASHINGTON, D. C., July 9, 1911.

The Bureau of Supplies and Accounts, Navy Department, Washington, will open bids July 25, under schedule 3748, for the following foundry equipment: One core making machine, one centrifugal sand mixing machine, three pneumatic tripod sand shakers.

The Isthmian Canal Commission, Washington, will call for bids at an early date for one 500-kw., 3-phase, 35-cycle with two 200-volt turbo-generator unit with switchboard and auxiliaries complete.

The Paymaster General, Navy Department, Washington, will open bids July 25, under schedule 3720, class 1, for two single-end rapid action punches for Mare Island Navy Yard.

The Isthmian Canal Commission, Washington, will open bids July 24, under canal circular 636, for 22 spillway gates, two steel caissons, steam gates, gate valves, culvert valves, bulkhead gates and screens.

The Bureau of Yards and Docks, Navy Department, Washington, opened bids July 1 for furnishing 16 electrically driven capstans for the New York and Pearl Harbor navy yards as follows: Williamson Brothers Company, Philadelphia, Pa., $50,255; Hyde Windlass Company, Bath, Me., $53,290.

The Department of the Interior, Washington, opened bids July 3 for furnishing and installing ash handling machinery at the power plant and Post Office Building. Various alternate bids were received; the bids for the complete work, only, are as follows: C. H. Barker, Washington, D. C., $7,483; Jeffries Mfg. Company, Columbus, Ohio, $6,500; R. H. Beaumont Company, Philadelphia, Pa., $5,317; Philips-Lang & Co., Chicago, Ill., $8,250; Link Belt Company, Philadelphia, Pa., $7,880; Guarantee Construction Company, New York, $4,534.

The Albree Iron Works.—The Chester B. Albree Iron Works Company, North Side, Pittsburgh, has completed the construction of a second automatic air toggle riveter which automatically adjusts itself to any length of rivet or any thickness of work. The first machine of this kind built by the company has been in successful operation in a Pittsburgh structural iron plant for several months. In addition to automatic adjustment the machine possesses all the advantages of the pneumatic riveter, such as compressed air for operation, portability and small size and weight. It thus saves in power and secures the advantage of the hydraulic machine. Recent contracts placed with the Albree Company include the following: For the West Carson street improvements, Pittsburgh, 7000 ft. of fence in which bent 2-in. channels are used; Larimer Avenue bridge, Pittsburgh, complete railing; for the roadway along South Eighteenth street, Pittsburgh, 2000 ft. of railing, and for a fence for a traction company at Morristown, N. J., 1000 ft. The Albree Company is running to good capacity in its plant on these contracts and miscellaneous work, with indications that it will be able to continue to operate thus for some time in the future.

Mesta Shipments.—The Mesta Machine Company, Pittsburgh, with works at West Homestead, Pa., has shipped a two-stage air compressor, having a capacity of 36,000 cu. ft. per min. at 100 lb. pressure, to the Four States Coal & Coke Company, Worthington, W. Va., and has completed a four-stage compressor with a capacity of 24,000 cu. ft. per min. at 1000 lb. pressure for the same company. These compressors will be used for charging air locomotives. Shipments will shortly be made as follows: Lackawanna Steel Company, Buffalo, N. Y., a 57-in. high-speed condenser and a 12 and 34 x 16-in. dry air pump; Portsmouth Steel Company, Portsmouth, Ohio, a 72-in. high-speed condenser and a 12 and 30 x 21-in. dry air pump; Inland Steel Company, Indiana Harbor, Ind., a seven-spindle bar twisting machine; American Sheet & Tin Plate Company, Chester, W. Va., a large cut gear, 17 ft. 9 in. in diameter with 30-in. face and 88 teeth of 7¼-in. pitch and a pinion 8 ft. 9 in. in diameter with 30-in. face and 40 teeth of 7¼-in. pitch, being among the largest cut gear and pinions ever built.

The Globe Iron Company, Jackson, Ohio, advises us that an error was made in our issue of July 6 in classing Globe furnace among those blown out in June. The furnace is still running and making a large tonnage of high silicon irons, and the company has no other intention at this time than of continuing in blast. The error arose from a misunderstanding of the company's report.

The Dominion Steel Corporation's output of steel from its open-hearth furnaces at Sydney, Nova Scotia, in June amounts to 31,000 tons, which exceeds the last previous record by 3000 tons.

During the fiscal year ended June 30, 1911, 1527 vessels of 302,391 gross tons were built in the United States, compared with 1502 vessels of 347,025 gross tons for the year ended June 30, 1910. The decrease is due to a falling off of 05,000 tons on the Lakes.

The Strong Steel Foundry Company, Buffalo, N. Y., maker of open-hearth steel castings, has acquired a site of 10 acres on Elmwood and Hertel avenues, being 667 ft. deep and having 1432 ft. on the Erie Railroad. The company was organized three years ago and now occupies the buildings formerly used by the Buffalo Cement Works at Amherst and Main streets. It has lately added the manufacture of special steel castings, such as vanadium, chrome, nickel, titantium and manganese. Plans are now being prepared for fireproof buildings which will be equipped with the most modern machinery. O. H. P. Champlin is president and treasurer of the company.

Gratifying recognition of the value of their new line of heat-treating furnaces is being received daily by Tate, Jones & Co., Inc., Pittsburgh. After several years of study and experimenting their new line of tempering, annealing and case-hardening furnaces, eliminating the weaknesses of old designs and embodying some extremely valuable new principles, was brought out about three months ago, and a large number of orders is now coming in.

I. F. Lehman of the Knox Pressed & Welded Steel Company, Pittsburgh, returned last week from an extended business trip, visiting large steel manufacturers, to acquaint them with the Knox patented water-cooled doors, frames and ports for open-hearth furnaces. Various contracts were taken for such devices. The Knox Company is making the open-hearth equipment for the Keystone Furnace Construction Company. The latter's records show that Knox open-hearth devices have been in continuous service for 13 months.

The Journal of Industrial Safety for June-July has been issued. The leading article, entitled "Factory Safeguards," is by Luther D. Burlingame, chief draftsman of the Brown & Sharpe Mfg. Company, Providence, R. I. The other important articles are "A Safety Attachment for Drawing Brass," "A Safety Subway Under Massive Machinery," "A Locking Switch," "First Aid Against Producer Gas," "Safeguarding Hand-fed Rolls," "The Voluntary Compensation Plan in New York State," "Safeguarding a Motor-Driven Head Stock," "Fatal Accidents in Coal Mining" and "Central Station Welfare Work."

CURRENT METAL PRICES.

The following quotations are for small lots New York. Wholesale prices, at which large lots only can be bought, are given elsewhere in our weekly market report.

IRON AND STEEL—

Bar Iron from Store—

Refined iron:
1 to 1½ in round and square ₤ lb 1.70¢
1½ to 4 in ⅜ to 1 in ₤ lb 1.80¢
1½ to 4 in ¼ to ⅜ ₤ lb 1.80¢
Rods, ⅝ and 11-16 round and square ₤ lb 1.80¢
Angles: Cts ₤ lb
3 in. x ¼ in. and larger 1.90¢
3 in. x 5-16 in. and ⅜ in. 2.00¢
1½ to 2½ in. x ⅜ in. 2.05¢
1½ to 2½ in. x 5-16 in. and thicker 1.95¢
1 to 1¼ in. x 5-16 in. 2.05¢
1 to 1¼ in. x ⅜ in. 2.10¢
⅞ x ⅛ in. 2.20¢
⅝ x ⅛ in. 2.25¢
⅝ in. x ⅜ in. 2.15¢
½ x 3-32 in. 3.00¢
Tees:
1 in. 2.55¢
1¼ in. 2.20¢
1½ to 2½ x ¼ in. 2.00¢
1½ to 2½ x 5-16 in. 2.10¢
3 in. and larger 2.05¢
Beams 1.90¢
Channels, 3 in. and larger 1.90¢
Bands—1¼ to 6 x 6-16 to No. 8 2.10¢
Burden's "H. B. & S." iron, base price 2.95¢
"Burden's Best" iron, base price 3.15¢
Norway bars 3.60¢

Merchant Steel from Store—

per lb
Bessemer machinery 1.90¢
Toe calk, tire and sleigh shoe 2.50@3.00¢
Best cast steel, base price in small lots 7¢

Sheets from Store—

Black.	One pass, soft steel.	C.R.	R. G. cleaned.
No. 16	₤ lb 2.45¢		2.75¢
Nos. 18 to 20	₤ lb 2.50¢		2.85¢
Nos. 22 and 24	₤ lb 2.55¢		2.95¢
No. 26	₤ lb 2.60¢		3.05¢
No. 28	₤ lb 2.95¢		3.30¢

Russia, Planished &c.

Genuine Russia, according to assortment ₤ lb 12 @14½
Patent planished, W. Dewees Wood ₤ lb A, 10¢; B, 9¢ net

Galvanized

Nos. 12 and 14 ₤ lb 2.75¢
No. 24 ₤ lb 3.10¢
No. 26 ₤ lb 3.30¢
No. 28 ₤ lb 3.60¢
No 20 and lighter 36 inches wide, 25¢ higher.

Genuine Iron Sheets—

Galvanized

Nos. 22 and 24 ₤ lb 5.50¢
No. 26 ₤ lb 6.00¢
No. 28 ₤ lb 7.00¢

Corrugated Roofing—

2½ in. corrugated	Painted	Galvd
No. 24 ₤ 100 sq. ft.	$3.75	$4.70
No. 26 ₤ 100 sq. ft.	2.85	3.90
No. 28 ₤ 100 sq. ft.	2.50	3.65

Tin Plates—

American Charcoal Plates (per box)

"A A A" Charcoal:
IC, 14 x 20 $6.65
IX, 14 x 20 7.90
A Charcoal:
IC, 14 x 20 $5.60
IX, 14 x 20 5.70

American Coke Plates—Bessemer—

IC, 14 x 20, 107 lb $4.50
IX, 14 x 20 5.50

American Terne Plates—

IC, 20 x 28 with an 8 lb. coating $8.50
IX, 20 x 28 with an 8 lb. coating 10.70

Seamless Brass Tubes—

List November 13, 1908. Base price, 18¢

Brass Tubes, Iron Pipe Sizes—

List November 13, 1908. Base price, 18¢

Copper Tubes—

List November 13, 1908. Base price, 21¢

Brazed Brass Tubes—

List February 1, 1911. 19½¢ ₤ lb

High Brass Rods—

List February 1, 1911. 14⅝¢ ₤ lb

Roll and Sheet Brass—

List February 1, 1911. 14⅝¢ ₤ lb

Brass Wire—

List February 1, 1911. 14⅝¢ ₤ lb

Copper Wire—

Base price, Carload lots mill 14¢

Copper Sheets—

Sheet copper hot rolled, 16 oz. (quantity lots) ₤ lb 18¢
Sheet copper cold rolled, 1¢ ₤ lb advance over hot rolled.
Sheet copper polished 20 in. wide and under, 1¢ ₤ square foot.
Sheet copper polished over 20 in. wide, 2¢ ₤ square foot.
Planished copper, 1¢ ₤ square foot more than polished.

METALS—

Tin—

Straits pig ₤ lb 47 @47½¢

Copper—

Lake, ingot ₤ lb 14 @14½¢
Electrolytic ₤ lb 13⅞@14 ¢
Casting ₤ lb 13¾@14 ¢

Spelter—

Western ₤ lb 6⅝@ 7 ¢

Zinc—

No. 9, base, casks.. ₤ lb 8¢ Open.. ₤ lb 8½¢

Lead—

American pig ₤ lb 5½@5¾¢
Bar ₤ lb 6⅝@6¾¢

Solder—

½ & ½, guaranteed ₤ lb 27½@28 ¢
No. 1 ₤ lb 25½@26 ¢
Refined ₤ lb 24½@24¾¢
Prices of solder indicated by private brand vary according to composition.

Antimony—

Cookson ₤ lb..@10½¢
Hallets @10 ¢
Other brands 9@ 9½¢

Bismuth—

Per lb $2.00@$2 25

Aluminum—

No. 1 aluminum (guaranteed over 99% pure), in ingots for remelting 21¢ and 22¢
Rods and Wire Base price 31¢
Sheets Base price 33¢

Old Metals—

Dealers' Purchasing Prices Paid in New York.

	Cents.
Copper, heavy and crucible	10.75 to 11.00
Copper, heavy and wire	10.50 to 10.75
Copper, light and bottoms	9.50 to 9.75
Brass, heavy	7.25 to 7.50
Brass, light	5.75 to 6.00
Heavy machine composition	9.25 to 9.50
Clean brass turnings	7.00 to 7.25
Composition turnings	8.00 to 8.25
Lead, heavy	3.75
Lead, tea	3.50
Zinc, scrap	4.00



THE IRON AGE

Established 1855 | New York, July 20, 1911 | Vol. 88: No. 3

Published Every Thursday by the
DAVID WILLIAMS COMPANY
239 West 39th Street, New York

Entered at the New York Post Office as Second-Class Mail Matter.

Subscription Price, United States and Mexico, $5.00 per Annum; to Canada, $7.50 per Annum; to Other Foreign Countries, $10.00 per Annum. Unless receipt is requested, none will be sent. Credit for payment will be shown by extending the date on the wrapper of your paper.

W. H. Taylor, - - - - - - President and Treasurer
I. A. Mekeel, - - - - - - - First Vice-President
Harold S. Buttenheim, - - - - Second Vice-President and Secretary

Geo. W. Cope, - - - - -
A. I. Findley, - - - - - } Editors
W. W. Macon, - - - - -

M. C. Robbins, - - - - Manager
Charles S. Baur, - - - Assistant Manager

Branch Offices

Philadelphia, Real Estate Trust Building
Pittsburgh, Park Building
Boston, Compton Building
Chicago, Fisher Building
Cleveland, American Trust Building
Cincinnati, 807 Andrews Building

CONTENTS.

Heavy Chicago Steel Business..... 125
Steel Mill Labor and Hot Weather..... 126
Problem in Steel Tempering..... 126
A Model Navy Repair Ship..... 127
An Undeveloped Asset..... 127
The Campaign Against Factory Fires..... 128
Warning Against Subscription Impostors..... 128
Engineers Inspect Panama Canal Gates..... 129
The Russian Duty on Pig Iron..... 129
The Heppenstall Forge & Knife Company's Improvements..... 129
The Iron and Metal Markets..... 130
The Porceliron Stove Company..... 140
An Improved Hydraulic Testing Plank..... 140
Safety as Applied to Grinding Wheels..... 140
Obituary..... 141
Personal..... 142
Ingram-Richardson Improvements..... 142
Railroad Equipment Orders..... 142
The Georgian Mfg. Company's Proposed Enlargement..... 143
The Robertshaw Mfg. Company..... 143
Amalgamated Scale Signers..... 143
Air Compressors for Light Work..... 143
International Iron and Steel Conference..... 144
The Lake Superior Ore Railroad Hearing..... 147
Steel Castings from Electric Furnace..... 148
Integral Cam Grinding Attachment..... 150
Two New Fay & Scott Machines..... 150
Aeroplane Propeller Testing Plant..... 152
The Friedrich Changeable Open-Hearth Furnace Port..... 152
Electro Steel Company of Canada at Judicial Sale..... 153
A Study of Steel Tires..... 154
A Semi-Automatic Rivet Drilling Machine..... 155
Strength of Steel from Structural Shapes..... 156
New Portable Electric Drills..... 158
Standards of Safety in Relation to Machinery.—II..... 160
A New High Duty Drill..... 163
A New Toggle Drawing Press..... 164
An Example of Good Machine Shop Lighting..... 164
A Ring Grinding Wheel Chuck..... 165
Powder for Ready Plating of Metals..... 165
Aiken Hydraulic Valves..... 165
The Machinery Markets..... 166
Government Purchases..... 175
Current Metal Prices..... 176

Heavy Chicago Steel Business

Large Transactions in Basic Pig Iron

Low Prices on Fabricating Contracts

The most interesting bit of news in trade circles is the fact that a Chicago subsidiary of the United States Steel Corporation booked orders the past week for about 100,000 tons of steel products for early shipment. This is about double its normal weekly bookings. The greater portion of the material sold consisted of rails and track fastenings, but structural shapes, plates and bars figured in the tonnage to quite an extent. It is understood that some of the business thus taken was for export. As compared with May, the month of June had shown an increase of 50 per cent. in this company's bookings, but July thus far has made a much better showing than June.

Conditions in finished lines appear to have been somewhat better in Chicago than in Pittsburgh, where the volume of business seems to have been running along in about the same volume as for the previous week. The steel mills in the vicinity of Pittsburgh are reported to be operating on an average of between 60 and 65 per cent. of full capacity, with their activities dependent chiefly upon orders received from day to day. The most active line in that market is probably sheets, the quietest being wire products, in which respect this branch of trade stands between seasons. Steel bars rank next to sheets in activity, while merchant pipe, like wire, is seasonably quiet. Plates, shapes and rails fall between. In all lines a marked improvement is looked for within a few weeks.

The steel plants of the United States Steel Corporation as a whole are operating at a better rate than that given for the Pittsburgh mills in general. Last week the corporation's plants were operated to 70 per cent. of their steel ingot capacity, and are scheduled to run at 69 per cent. this week.

Chicago has shown greater activity in structural lines than other trade centers, as the fabricating contracts closed there in the past week aggregate about 16,000 tons, among which was a bridge for the Atchison, Topeka & Santa Fe Railroad, about 10,000 tons, and a local telephone building, about 5000 tons. In New York City and vicinity the structural contracts of the week have been few and small, the largest being less than 1500 tons. It is somewhat disquieting to learn that extremely low prices are again being made on fabricating contracts, as it had been supposed that fabricating shops had become fairly well supplied with work for the rest of the summer and that competition would, therefore, not be so keen as earlier in the year.

The pig iron market is improving very slightly. Prices show firmness in some sections, while they are soft in others. Efforts are being made to secure a little higher price in eastern Pennsylvania and at Buffalo, but in the Central West it appears that some ground has been lost in the movement to get higher prices on basic. Pig iron stocks, however, are being

reduced to some extent. Stocks at independent furnaces in western Pennsylvania and Ohio were lowered 11,400 tons in the first half of this month and reports from other sections indicate similar conditions. Some large transactions have occurred in eastern Pennsylvania, but principally in low grades for the requirements of cast iron pipe foundries, although consumers of foundry irons are also taking fair-sized quantities for delivery through the remainder of the year. The Cincinnati market does not show the activity which had been expected, as fewer inquiries are being received in that market for prices on round lots. Good sales of basic pig iron have been made in the valleys, one transaction calling for 60,000 tons, and the demand for foundry iron is also better in that part of the country.

The demand for iron ore at Cleveland is showing some improvement. A round tonnage of non-Bessemer ore was sold last week, this having been the first ore sale of any size for some time.

The machinery trade is developing more life. Enterprises which have been hanging fire for months are being revived and better buying of power generators and other plant equipment is promised.

Steel Mill Labor and Hot Weather

It has been remarked in the past fortnight, in some at least of the steel producing districts, that the men stand extremely hot weather better than they did a few years ago. While there has been considerable interference with operations by the hot weather recently, it is observed that in the old days similar weather would have produced a great deal more trouble.

Several causes are likely to be assigned for such change as is noted. There is, of course, some difference in the mills themselves. There are more well-arranged plants than formerly, because the new plants are naturally designed better, and in recent years the old practice of squeezing additional equipment into the old building has not been followed as much as formerly. In certain cases there is a definite purpose to procure better working conditions by the equipment being spread out. In the case of tin and sheet mills the ventilating system has come much into vogue in the past three years, a large volume of outside air being conducted to the train of hot rolls, with a release at each stand of rolls. The majority of new plants built lately have been thus equipped and many old plants have had the system installed.

That the change mentioned is not altogether due to improvements in mill conditions is evidenced by testimony at hand, relating to a large steel plant conducting a variety of operations, and which has not been materially altered in the recent past, yet the observation as to this plant is unmistakable that in the past few weeks the men have suffered much less than in former years under similar weather conditions. There appears to be a difference in the men themselves, and for this their progress in sanitation and hygiene is held largely responsible. The skilled workmen, the rollers and heaters in sheet and tin mills in particular, have long known how to "train" for their work, regulating their diet and clothing and in many cases their drink. The common labor in the steel mills has had no such personal knowledge, but has rather grown up to the conditions. The ordinary men have become accustomed to steel mill conditions merely through habit, which accounts for their being able to work in temperatures which they could not bear in the open air under the sun, although the man accustomed to such outdoor work would quickly succumb in the steel mill. This class of labor has probably learned little, but it is living year by year under more sanitary conditions, and the health laws of the various States have probably operated to improve its position.

There is an excellent field for humanitarian work along these lines. Present-day thought is running very strongly toward prevention of accidents and the installation of safety devices, while so far as we know, relatively little attention has been paid to the cultivation of knowledge among the men which will help them resist the effects of very hot weather. A series of simple lessons could be arranged which would undoubtedly have a marked effect in lessening the number of prostrations and deaths due to the heat in summer. Work of this sort merits more serious attention than has been given it. The fact that it is not spectacular, as is the installation of safety devices, does not lessen the promised benefit, while there is the not inconsequential feature that the expense would be practically nil.

Problem in Steel Tempering

One of the little things, and yet most bothersome, with which erectors of structural steel have to contend is the breaking of rivet snaps such as are commonly used in air hammers. These tools are usually sold at $1.25 to $1.75 apiece, but the breakage is so great that not only do the number of sets required run the purchase price into a very considerable amount, but the time lost in placing new stools in the guns is the occasion for an unwarranted expense and annoyance. It is the common practice in the erection of structural steel buildings to have one man in charge of various tools used in the building, and he is generally located on the ground floor. The workman doing the riveting has with him only the snap he is using, and when it breaks it necessitates sending down to the tool room for a new one. On a building in process of erection, and particularly when the work is in the upper stories, the cost of this change in loss of time is almost equivalent to the value of the rivet set itself.

Makers of these tools have been acquainted with the trying conditions and have not lacked information as to the failure of the tools in question. Formerly rivet sets for percussion work were made exclusively from carbon tool steel, and experimentation was in the direction of varying the heat treatment in tempering these tools. Some modifications in the design of the tools were also made. For example, it was found that breakages commonly occur in the shank of the tools right at the fillet where the head begins. The common breaking at this one point came to be considered as due, aside from natural crystallization, to excessive leverage arising from the great length of the head under the severe conditions of riveting at the various angles required in structural work. The head was accordingly shortened, and somewhat better results were then obtained.

It has been found, however, that failure of these tools results as frequently from improper manufacture as from any other cause. The difficulty of properly tempering steel to give uniform results for very severe service, such as riveting, is well known, but the frequency with which tools containing water cracks and

tempered too hard are sold has been particularly exasperating. Recent experiments seem to have shown conclusively that rivet sets can easily be tempered too hard, for tools so soft in the cup as to readily show the marks of riveting when reamed out after some service have given a very satisfactory life. The conclusion which may be drawn from this seems to be that the crystalizing action set up in the tool from the constant hammering results in the easy breakage of the tool tempered too hard, while it improves the structure of the softer steel.

Rather serious investigation by the manufacturer in the direction of using alloy steels has brought into the market various tools in which nickel, chrome and vanadium alloy steels have been used. Claims of greatly superior service have been made for these steels, but experience thus far seems to indicate that they are as uncertain as the carbon tool steel. It is true that tools made of alloy steel have in several instances shown exceptional endurance. This would seem to indicate that, when properly treated in manufacture, these steels possess superior advantages for this class of work. But the great difficulty still remains that they are unreliable. To the end that a better average life may be obtained from these rivet snaps, it would seem exceedingly desirable that manufacturers concentrate serious efforts upon the more careful manufacturing methods and treatment of the steels in the making of these sets.

The extent to which such tools are used and the value of a satisfactory article may be indicated in the fact that one manufacturer of pneumatic hammers alone contracted to take 25,000 snaps during the current year. Rivet sets with which from 15,000 to 20,000 rivets may be driven uniformly would be indeed of one carrying this burden.

A Model Navy Repair Ship

In the report of the Secretary of the Navy, which will be a basis for the next appropriation for naval construction, he dwells on the urgent need of a new repair ship. The navy has the Vulcan, equipped as a floating shop, but not only is one such vessel insufficient for so large a naval establishment, but the ship is rather a makeshift, being a converted merchantman. The growing size and power of ships must increase the amount of urgent repair work. Each vessel has its own machine shop which is supposed to take care of the ordinary run of mishaps. A repair ship goes beyond this. It should contain shops of sufficient size and variety of equipment to do practically anything that is possible outside of a dry dock. It should have a speed which would maintain its place with the fighting ships. In time of war the mobile repair base will become an imperative necessity. Its presence or its absence would determine to some degree the radius of activity of a fleet. In time of peace on long cruises it must have an important influence in maintaining a squadron intact, because at times it does away with the necessity of sending vessels to a yard.

Regarding the subject from an economic standpoint, it presents two aspects. The navy is adopting an efficiency system with the purpose of reducing its cost of maintenance to a minimum. Already large economics have been effected and the saving should reach a higher percentage each year for some time to come. One of the elementary and very important factors in an efficiency system is, of course, the equipment. It is not possible that the Vulcan can do work at so low a cost as a larger vessel designed throughout for the specialized purpose of repair work at sea. In handling work alone the economy of time and money would be something not to be lost sight of. The mere fact that the new shop would be able to keep a battleship with the fleet as against the alternative of a run to a navy yard should figure into many thousands of dollars annually.

The second point is that the model repair ship would constitute a magnificent traveling exposition of American machine tools and other equipment. Sailing with a fleet, it would visit many ports in many lands, where it would be open to the inspection of visitors. They would include buyers who would gladly avail themselves of the opportunity to see high-class machinery in practical operation. It is to be hoped that the President and Congress will consider the recommendation of the Secretary of the Navy in all of these various aspects, and not consider the ship in the light of a fighting unit that demands rather than conserves expense.

An Undeveloped Asset

Akin to the wide extension of credit of the present day is the custom of capitalizing "good will"; it is something belonging to this age, a natural consequence of the times. Just as credit is founded upon an assumption as to the average moral integrity of the business world, so is the consideration of good will as an asset based upon an assumption that the present good status of a concern will continue in the future. There is nothing certain about either credit or good will; at least, nothing as dependable as the value of ordinary commodities, such as buildings, machinery, or the like.

We frequently hear of instances of an unwise extension of credit, of the almost instant reduction in the value of good will from many thousands of dollars to nothing. In spite of the instability of the value of good will, there is doubtless no parallel case in which such enormous valuation has been given to so uncertain a quantity. With some great corporations, a considerable part of the capitalization at their formation represented no tangible property, being instead an assumed value for an ability to make profits. The justice of such capitalization is still in the process of being tested, but that good will does possess a value which is just as apparent in profit making as a splendid shop or an efficient selling organization is not to be denied. Good will, or whatever other name may be chosen to call what it represents, is something much to be sought; not easily attained. Like many things in this world which are worth while, it is slowly gained and quickly lost.

When good will, profit-making ability, springs from a monopoly, more or less, in the manufacture and sale of any commodity, the justice in its capitalization is not clear to the average American citizen; but when such good will is the result of, and the indication of, a good honest business character, when it has been earned or built up by an effort on the part of the concern to do the square thing to its customers, there arises less antagonism to its profiting by the fruits of its honest effort to do business in a straightforward way.

To one who may be making a study of social conditions and especially those conditions as they exist in manufacturing plants, to one who likewise is cognizant of how much effort is being made to secure the good will of which we have spoken, it seems quite incon-

sistent that so little effort should be made by employers to secure the good will of their help. It is not that good will is altogether lacking between employer and employee; it is simply that not enough attention is paid to increasing this asset. Labor is really doubly an asset. It is an asset in the same way as is the machinery in which a huge amount may be invested; it is an asset because of its latent productive capacity—not the ordinary capacity for which the customary day's wage is willingly paid, but the capacity that lies ready to respond to the kindly word, the recognition of efficiency, the offer of additional income.

And if, perhaps, we can be convinced that the crowds that swarm into our shop yards and out again at the whistle's call have in them this latent productive capacity, are we not guilty of countenancing a waste, of being feeble conservationists? And are we not failing to develop an asset having a direct bearing on the year's profit and loss statement? Good will from one's customers has carried many a concern over a rough passage; good will on the part of the help is of far greater significance than is generally understood. Sometimes it seems as if there existed a premium on insincerity, so that it is hard for an employer to know just how he stands with his help. A little thought and retrospection will tell him whether he has really striven to obtain the good will of his men or not. They will never tell him themselves. It is not customary for them to do so. But if he will really study how best such good will can be strengthened and built up, and if he will do what he can to develop this asset, he will find that he does not have to be told how he stands with his help; he will know instinctively that he has won their loyalty and has won it only because he has deserved it. A great many unlooked-for responsibilities attach to the calling of the manager of property and men. Full appreciation of their gravity ought to possess all who answer to such a calling, and an efficient stewardship be given. Moreover, complacency should be one of the last emotions to enter the breast of one carrying this burden.

The Campaign Against Factory Fires

The campaign for the prevention of fires in manufacturing establishments appears to be gaining momentum as time goes on. The latest movements are those of the State of Pennsylvania providing for a compulsory fire drill in industrial establishments where women and girls are employed, and of the fire marshal of the State of Michigan in ridding factories, as well as other buildings, of accumulations of rubbish.

The Pennsylvania statute, which has just received the governors signature, provides that a fire drill shall take place not less than once a month, and that the persons employed shall be instructed in and made familiar with the use of the fire escapes and appliances and exits, which shall be actually employed while all persons are removed in an expeditious and orderly manner to a place of safety on the ground outside. The enforcement of the law is made mandatory upon the fire marshal in cities of the first and second class and upon the department of factory inspection elsewhere, the penalty for non-compliance being a minimum fine of $25 with imprisonment for a minimum period of 10 days. Probably most employers will welcome this law as one tending to fix responsibility and to reveal the failure to carry out factory rules as to fire prevention.

In Michigan the fire marshal has designated Tuesday, July 25, as "cleaning day." He has requested the chiefs of fire departments and village officials, and instructed deputy fire marshals throughout the State, to make it their special business to see that the provision of the law requiring the cleaning up of rubbish be strictly enforced, and to urge upon the public the importance of keeping their premises clean thereafter.

Those persons who have occasion to visit many manufacturing establishments cannot help being impressed by the frequent cases where inflammable rubbish is present, sometimes in dangerous proximity to valuable equipment and materials. Constant vigilance is necessary if the results of native untidiness, which exists in many men, are to be prevented. In one recent case the pit of an elevator well was seen to contain a mass of debris of wood and paper, thickly covered with dust, proving that it had been there for a long time. Few more dangerous places for such accumulations could be found. Out-of-the-way corners are favorite receptacles for rubbish that a lighted match or a short-circuited wire would quickly cause to burst into flames. It has frequently been urged from many sources that greater care be taken in this detail of factory management. A significant percentage of disastrous fires in manufacturing plants is due to this form of shiftlessness.

Warning Against Subscription Impostors

Certain subscription agents, who have formerly represented the David Williams Company, and others who have never been authorized to solicit subscriptions for us, have recently been securing subscription orders and making collections under false pretenses.

Every agent authorized to solicit subscriptions or make collections on *The Iron Age, Iron Age-Hardware, Metal Worker* or *Building Age* is furnished with proper credentials to that effect, signed by the circulation manager of this company, and with a definite time limit stated therein.

Subscribers are requested to insist that such credentials be shown them before paying any money to subscription agents, and it is also strongly urged that any irregularities be reported promptly to the New York office.

DAVID WILLIAMS COMPANY,
239 West 39th street, New York.

The Standard Tool Company, Cleveland, Ohio, announces the opening of a Western branch at 552 West Washington boulevard, Chicago. In this store a complete stock of all styles of twist drills, reamers, milling cutters, taps, drill chucks, taper pins, etc., manufactured by the company will be carried, enabling immediate delivery to be made on orders. The convenience of the new arrangement will doubtless be appreciated by the company's Western trade.

The annual report of the Commissioner of Patents for the year 1910 has been issued. The volume is a most extensive work, covering 1089 pages, most of which space is given up to indexing the patents. The opening pages are devoted to the report of the commissioner, as sent to the House of Representatives in February.

The Stanley Committee has adopted a resolution for a searching scrutiny of books, papers and accounts of the United States Steel Corporation. This work will be done by Farquhar McRae, expert accountant in the employ of the committee. The committee will begin public hearings in New York July 27.

The Strauss Bascule Bridge Company, 901-904 Fort Dearborn Building, Chicago, has received, as consulting engineer, an order for plans for a 60-ft. clear span bascule of its design, which will be built over the Old Basin Canal, Hagan avenue, New Orleans. Bids for the work will probably be asked by the city in about two months.

Engineers Inspect Panama Canal Gates

The McClintic-Marshall Construction Company, Pittsburgh, on Saturday, July 15, took a party of about 250, composed principally of members of the Engineers' Society of Western Pennsylvania, to its large fabricating shops at Rankin, Pa., for an inspection of the Isthmian Canal lock gates now in course of construction. The visitors were taken in special cars over the Baltimore & Ohio Railroad. Luncheon was served the party in the company's dining room, after which the callers were taken in charge by E. W. Pittmann, manager of the Rankin plant, and various other officials and representatives. The party was divided into squads to enable everyone to hear the guides' explanations.

The contract for the gates amounts to considerably over $5,000,000. Forty-six pairs, or 92 leaves, of mitering lock gates are to be used in the three locks of the canal, and the contract will call for 58,000 tons of structural steel work and steel castings. The length of each of these leaves is 64.912 ft., center to center of bearings, and their hights vary from 47 ft. 5 in. to 82 ft. Each leaf will consist essentially of a system of horizontal girders, vertical end girders, frames, diaphragms and intercostals, forming its skeleton, and of a steel plate sheathing extending from the top to the bottom on both sides of the leaf. The leaf will be swung by means of a stiff strut fastened to it at the top and operated by an electrically driven engine located in the lock wall, and drawn into proper position and held tightly there by a mitering device at the miter ends.

A steel manshaft will extend from the top of the air chamber to the top of the leaf and will have a manhole at the top. In each leaf will be five transverse vertical frames built in between the horizontal girders and extending from the bottom to the top of the leaf, three of which are to be made water-tight within the air chamber. Each frame will have a manhole cut in the web so that free access can be had to all parts of the leaf. All the horizontal girders except the bottom girders are to have similar manholes.

The construction of the lock gates and of several large bridges recently constructed by the McClintic-Marshall Construction Company, notably the Beaver bridge over the Ohio River, for the Pittsburgh & Lake Erie Railroad Company, and the Missouri River bridge at Kansas City, for the Union Depot Bridge & Terminal Railway Company, have required the installation at the plant of a large amount of new machinery and special equipment of the highest character. The general excellence of the workmanship on these structures was not demanded nor deemed possible of attainment until very recent years.

The Rankin shops are of the most modern and efficient arrangement and comprise duplicate plants, each having a capacity of over 4000 tons of finished structural material per month. They have facilities for shipment both by rail and water. In addition to the Rankin shops, the company operates plants at Carnegie and Pottstown, Pa., the capacity of the works aggregating over 150,000 tons per year.

The inspection of the Panama gates at Rankin took up the afternoon, the engineers getting back to Pittsburgh about 5 o'clock. The McClintic-Marshall Construction Company gave each visitor a copy of an illustrated booklet that had been specially prepared, which contained views of the gates and sectional cuts, together with a view of Culebra cut, a map of the canal zone and a description.

H. J. Koontz, dealer in second-hand machinery and other equipment, has removed his offices from the Farmers' Bank Building to 1931 Carson street, South Side, Pittsburgh, where he has secured a large warehouse.

The Keystone Bronze Company, Pittsburgh, Pa., has placed a contract with the Penn Bridge Company, Beaver Falls, Pa., for an extension to the foundry building at its Brighton Works, New Brighton, Pa.

The Newport Rolling Mill Company, Newport, Ky., whose mills have been closed down for the usual annual repairs, will resume operations July 24.

The Russian Duty on Pig Iron.—The Council of Ministers has been empowered, on receiving special applications, to authorize, on the following conditions, the import from abroad till July 1, 1912, at reduced rates of customs duty, of pig iron for the needs of the iron and steel industry: The total amount of this pig iron is not to exceed 10,000,000 poods (161,210 tons). Any iron and steel company is authorized to import, at reduced rates of customs duty, pig iron to an amount not exceeding its average quarterly pig-iron consumption during its last operating year. The extent of the reduction of customs duty is to be determined separately in each case. On dispatch of the pig iron from the customs house the owners must lodge a deposit guaranteeing payment of the full duty, and, later, on documentary proof being submitted that the pig iron has been delivered at the works designated in the permit, the owners will pay the reduced rate only, fixed in each case by the Council of Ministers.

The Heppenstall Forge & Knife Company's Improvements.—The Heppenstall Forge & Knife Company, Forty-seventh street, Pittsburgh, has completed plans for the erection of an addition to its plant. New steel buildings are to be erected on the site formerly occupied by the Velte Foundry & Machine Company. A forging shop and machine shop are to be fitted up. The former will be equipped with steam hydraulic hammers and the machine shop with a complete line of modern electrically operated machine tools for the manufacture of axles, shafting and heavier forgings. Inquiries out call for a complete line of machine tools, two 30-ton four motor cranes and a 30-ton three motor crane, the latter for serving the storage yard. The additions will be completed and ready for operation early in September and will practically double the company's present capacity for the manufacture of hammered forgings, shaftings, shear knives, die blocks, etc.

Recent orders taken by the C. O. Bartlett & Snow Company, Cleveland, Ohio, include the following: Coal handling plant for the Chicago & Northwestern Railroad at Chicago, including 600-ton storage, track hopper, crusher, elevator, and distributing hopper and distributing conveyor; a 4-roll crusher for the Twin City Rapid Transit Company, Minneapolis, Minn.; three double skip hoists for the Pennsylvania Salt Mfg. Company, Philadelphia; a single skip hoist for the American Steel & Wire Company, Cleveland; coal handling plant for Harvey Brothers, Cleveland; five conveyors for the Barrett Mfg. Company, Philadelphia.

C. W. Leavitt & Co., 30 Church street, New York, state that "another well-known American steel company whose name and plans cannot be disclosed at this time has signed a contract for license to use the Girod electric furnace; the company manufactures the highest grade of steel castings and other forms of steel of high quality."

The Laclede Steel Company, recently organized and ultimately to have a capital stock of $500,000, has decided to locate its plant at Madison, Ill., across the river from the northern end of St. Louis. Work will begin immediately on the buildings. The plant will be thoroughly modern and will be laid out in unit form in order to enable extensions as business grows. Among the specialties of the company will be steel for reinforced concrete work and shapes for agricultural implements.

Tate, Jones & Co., Inc., Pittsburgh, Pa., report late sales of their new type of heat treating furnaces to the Simplex Motor Car Company, M. Hoagland & Sons Company, Pacific Tool & Supply Company, Erie City Iron Works, Rogers-Shear Company, Mattatuck Mfg. Company, and Keystone Steel & Wire Company.

The foreign commerce of the United States in the fiscal year ended June 30 was the largest in our history. The total passed for the first time the $3,500,000,000 line. The exports passed for the first time the $2,000,000,000 line, and the imports were only exceeded in value by one earlier year, 1910. The excess of exports over imports was $521,000,000, a sum greater than in any year since 1901, save in the high record year 1908, when the excess was $666,500,000.

The Iron and Metal Markets

Comparison of Prices

Advances Over the Previous Week in Heavy Type. Declines in Italics.

At date, one week, one month and one year previous.

	July 19 1911.	July 12 1911.	June 21 1911.	July 20 1910.
PIG IRON, Per Gross Ton:				
Foundry No. 2 standard, Philadelphia	$15.00	$15.00	$15.25	$16.25
Foundry No. 2, Valley furnace	13.50	13.50	13.50	14.25
Foundry No. 2 Southern, Cincinnati	13.25	13.25	13.25	14.75
Foundry No. 2, Birmingham, Ala.	10.00	10.00	10.00	11.50
Foundry No. 2, at furnace, Chicago*	15.00	15.00	15.00	16.50
Basic, delivered, eastern Pa.	14.25	14.25	14.50	15.75
Basic, Valley furnace	*13.00*	13.25	13.00	14.50
Bessemer, Pittsburgh	15.90	15.90	15.90	16.40
Gray forge, Pittsburgh	13.90	13.90	13.90	14.40
Lake Superior charcoal, Chicago	16.50	16.50	16.50	18.50
COKE, CONNELLSVILLE,				
Per Net Ton, at Oven:				
Furnace coke, prompt shipment	1.40	1.40	1.40	1.60
Furnace coke, future delivery	1.55	1.55	1.60	1.80
Foundry coke, prompt shipment	1.80	1.80	1.75	2.15
Foundry coke, future delivery	*2.00*	2.05	2.05	2.25
BILLETS, &c., Per Gross Ton:				
Bessemer billets, Pittsburgh	21.00	21.00	21.00	25.00
Forging billets, Pittsburgh	26.00	26.00	26.00	30.00
Open hearth billets, Philadelphia	23.40	23.40	23.40	28.50
Wire rods, Pittsburgh	27.00	27.00	27.00	29.00
OLD MATERIAL, Per Gross Ton:				
Iron rails, Chicago	14.00	14.00	14.00	16.75
Iron rails, Philadelphia	**17.50**	16.75	16.50	18.50
Car wheels, Chicago	12.50	12.50	12.50	14.75
Car wheels, Philadelphia	**13.00**	12.75	13.00	14.00
Heavy steel scrap, Pittsburgh	13.00	13.00	13.00	14.50
Heavy steel scrap, Chicago	10.50	10.50	10.25	12.25
Heavy steel scrap, Philadelphia	**13.25**	13.00	13.00	14.00
FINISHED IRON AND STEEL,				
Per Pound:	Cents.	Cents.	Cents.	Cents.
Bessemer rails, heavy, at mill	1.25	1.25	1.25	1.25
Refined iron bars, Philadelphia	1.27½	1.27½	1.27½	1.45
Common iron bars, Pittsburgh	1.25	1.25	1.25	1.50
Common iron bars, Chicago	1.20	1.20	1.20	1.40
Steel bars, Pittsburgh	1.25	1.25	1.25	1.45
Steel bars, tidewater, New York	1.41	1.41	1.41	1.61
Tank plates, Pittsburgh	1.35	1.35	1.35	1.40
Tank plates, tidewater, New York	1.51	1.51	1.51	1.56
Beams, Pittsburgh	1.35	1.35	1.35	1.40
Beams, tidewater, New York	1.51	1.51	1.51	1.56
Angles, Pittsburgh	1.35	1.35	1.35	1.40
Angles, tidewater, New York	1.51	1.51	1.51	1.56
Skelp, grooved steel, Pittsburgh	1.25	1.25	1.25	1.50
Skelp, sheared steel, Pittsburgh	1.35	1.35	1.35	1.60
SHEETS, NAILS AND WIRE,				
Per Pound:	Cents.	Cents.	Cents.	Cents.
Sheets, black, No. 28, Pittsburgh	2.00	2.00	2.00	2.30
Wire nails, Pittsburgh†	1.70	1.70	1.70	1.70
Cut nails, Pittsburgh†	1.60	1.60	1.60	1.65
Barb wire, galvanized, Pittsburgh†	2.00	2.00	2.00	2.00
METALS,				
Per Pound:	Cents.	Cents.	Cents.	Cents.
Lake copper, New York	12.75	12.75	12.75	12.62½
Electrolytic copper, New York	12.55	12.55	12.50	12.25
Spelter, St. Louis	5.57½	5.60	5.55	5.05
Spelter, New York	*5.75*	5.80	5.75	5.20
Lead, St. Louis	**4.40**	4.35	4.35	4.25
Lead, New York	4.50	4.50	4.50	4.40
Tin, New York	*42.00*	43.50	44.87½	33.25
Antimony, Hallett, New York	*8.00*	8.12½	8.75	8.00
Tin plate, 100 lb. box, New York	$3.94	$3.94	$3.94	$3.84

* The average switching charge for delivery to foundries in the Chicago district is 50c. per ton.
† These prices are for largest lots to jobbers.

Prices of Finished Iron and Steel f.o.b. Pittsburgh

Freight rates from Pittsburgh in carloads, per 100 lb.: New York, 16c.; Philadelphia, 15c.; Boston, 18c.; Buffalo, 11c.; Cleveland, 10c.; Cincinnati, 15c.; Indianapolis, 17c.; Chicago, 18c.; St. Paul, 32c.; St. Louis, 22½c.; New Orleans, 30c.; Birmingham, Ala., 45c. Rates to the Pacific Coast are 80c. on plates, structural shapes and sheets, No. 11 and heavier; 85c. on sheets, Nos. 12 to 16; 95c. on sheets, No. 16 and lighter; 65c. on wrought boiler tubes.

Structural Material.—I-beams and channels, 3 to 15 in., inclusive, 1.35c. to 1.40c., net; I-beams over 15 in., 1.45c. to 1.50c., net; H-beams over 18 in., 1.50c. to 1.55c.; angles, 3 to 6 in. inclusive, ¼ in. and up, 1.35c. to 1.40c., net; angles over 6 in., 1.45c. to 1.50c. net; angles, 3 in. on one or both legs, less than ¼ in. thick, 1.40c., plus full extras as per steel bar card effective September 1, 1909; tees, 3 in. and up, 1.40c., net; zees, 3 in. and up, 1.35c. to 1.40c., net; angles, channels and tees under 3 in., 1.40c., base, plus full extras as per steel bar card of September 1, 1909; deck beams and bulb angles, 1.65c. to 1.70c., net; hand rail tees, 2.45c.; checkered and corrugated plates, 2.45c., net.

Plates.—Tank plates, ¼ in. thick, 6¼ in. up to 100 in. wide, 1.35c. to 1.40c., base. Following are stipulations prescribed by manufacturers, with extras to be added to base price (per pound) of plates:

Rectangular plates, tank steel or conforming to manufacturers' standard specifications for structural steel dated February 6, 1903, or equivalent, ¾ in. thick and over on thinnest edge, 100 in. wide and under, down to but not including 6 in. wide, are base.

Plates up to 72 in. wide, inclusive, ordered 10.2 lb. per square foot, are considered ¾-in. plates. Plates over 72 in. wide must be ordered ¼ in. thick on edge, or not less than 11 lb. per square foot, to take base price. Plates over 72 in. wide ordered less than 11 lb. per square foot down to the weight of 3-16-in. take the price of 3-16-in.

Allowable overweight, whether plates are ordered to gauge or weight to be governed by the standard specifications of the Association of American Steel Manufacturers.

	Cents per lb.
Gauges under ¼in. to and including 3-16 in. on thinnest edge, extra	.10
Gauges under No. 8 to and including No. 8	.15
Gauges under No. 8 to and including No. 9	.25
Gauges under No. 9 to and including No. 10	.30
Gauges under No. 10 to and including No. 12	.40
Sketches (including all straight taper plates) 3 ft. and over in length	.10
Complete circles, 3 ft. in diameter and over	.20
Boiler and flange steel	.10
"A. B. M. A." and ordinary firebox steel	.20
Still bottom steel	.30
Marine steel	.40
Locomotive firebox steel	.50
Widths over 100 in. up to 110 in., inclusive	.05
Widths over 110 in. up to 115 in., inclusive	.10
Widths over 115 in. up to 120 in., inclusive	.15
Widths over 120 lb. up to 125 in., inclusive	.25
Widths over 125 in. to 130 in., inclusive	.50
Widths over 130 in.	1.00
Cutting to lengths or diameters under 3 ft. to 2 ft., inclusive	.25
Cutting to lengths or diameters under 2 ft. to 1 ft., inclusive	.50
Cutting to lengths or diameters under 1 ft.	1.55

No charge for cutting rectangular plates to lengths 3 ft. and over
TERMS—Net cash 30 days.

Sheets.—Makers' prices for mill shipments on sheets in carload and larger lots, on which jobbers charge the usual discounts for small lots from store, are as follows: Blue annealed sheets, Nos. 3 to 8, U. S. standard gauge, 1.40c.; Nos. 9 and 10, 1.50c.; Nos. 11 and 12, 1.55c.; Nos. 13 and 14, 1.60c.; Nos. 15 and 16, 1.70c. One pass, cold rolled, box annealed sheets, Nos. 10 to 12, 1.65c.; Nos. 13 and 14, 1.70c.; Nos. 15 and 16, 1.75c.; Nos. 17 to 21, 1.80c.; Nos. 22, 23 and 24, 1.85c.; Nos. 25 and 26, 1.90c.; No. 27, 1.95c.; No. 28, 2c.; No. 29, 2.05c.; No. 30, 2.15c. Three pass, cold rolled sheets, box annealed, are as follows: Nos. 15 and 16, 1.85c.; Nos. 17 to 21, 1.90c.; Nos. 22 to 24, 1.95c.; Nos. 25 and 26, 2c.; No. 27, 2.05c.; No. 28, 2.10c.; No. 29, 2.15c.; No. 30, 2.25c. Galvanized sheets, Nos. 10 and 11, black sheet gauge, 2c.; Nos. 12, 13 and 14, 2.10c.; Nos. 15, 16 and 17, 2.25c.; Nos. 18 to 22, 2.40c.; Nos. 23 and 24, 2.50c.; Nos. 25 and 26, 2.70c.; No. 27, 2.85c.; No. 28, 3c.; No. 29, 3.10c.; No. 30, 3.30c. All above prices are f.o.b. Pittsburgh, terms 30 days net, or 2 per cent cash discount 10 days from date of invoice, as also are the following base prices per square for painted and galvanized roofing sheets, with 2½ in. corrugations:

Gauge.	Painted.	Galvanized.	Gauge.	Painted.	Galvanized.
29	...	$2.40	23	$2.40	$3.50
28	$1.40	2.55	22	2.60	3.70
27	1.55	2.60	21	2.80	4.05
26	1.65	2.65	20	3.05	4.35
25	1.85	3.05	18	4.05	5.70
24	2.10	3.15	16	4.90	6.50

Wrought Pipe.—The following are the jobbers' carload discounts on the Pittsburgh basing card on wrought pipe, in effect from October 1, 1910:

	Steel Black.	Steel Galv.	Iron Black.	Iron Galv.
Butt Weld.				
1 to 1½ in.	..	..	49	43
1½ in.	75	63	71	59
¾ to 1¼ in.	79	69	75	65
2 to 3 in.	80	70	76	66
Lap Weld.				
2 in.	76	66	72	62
2½ to 4 in.	78	67	74	64
4½ to 6 in.	77	67	73	63
7 to 12 in.	75	59	71	55
13 to 15 in.	51½	..	53	..
Butt Weld, extra strong, plain ends, card weight.				
⅛, ¼, ⅜ in.	69	59	65	55
½ in.	74	68	70	64
¾ to 1¼ in.	78	72	74	68
2 to 3 in.	79	73	75	69

THE IRON AND METAL MARKETS

Lap Weld, extra strong, plain ends, card weight.				
2 in.	75	69	71	65
2½ to 4 in.	77	71	73	67
4½ to 6 in.	76	70	72	66
7 to 8 in.	69	59	65	55
9 to 12 in.	64	54	60	50
Butt Weld, double extra strong, plain ends, card weight.				
½ in.	64	58	60	54
¾ to 1½ in.	67	61	63	57
2 to 3 in.	69	63	65	59
Lap Weld, double extra strong, plain ends, card weight.				
2 in.	65	59	61	55
2¼ to 4 in.	67	61	63	57
4½ to 6 in.	66	60	62	56
7 to 8 in.	59	49	62	56

Plugged and Reamed:

1 to 1½, 2 to 3 in. Butt Weld
2, 2½ to 4 in. Lap Weld

} will be sold at two (2) points lower basing (higher price) than merchants or card weight pipe. Butt or lap weld, as specified.

The above discounts are for "card weight," subject to the usual variation of 5 per cent. Prices for less than carloads are three (3) points lower basing (higher price) than the above discounts.

Boiler Tubes.—Discounts on lap welded steel boiler tubes to jobbers in carloads are as follows:

	Steel.
1¾ to 2¼ in.	65
2½ in.	67½
2¾ to 3¼ in.	70
3½ to 4½ in.	72½
5 to 6 in.	65
7 to 13 in.	62½

Less than carloads to destination east of the Mississippi River will be sold at delivered discounts for carload lowered by two points for lengths 22 ft. and under; longer lengths f.o.b. Pittsburgh. Usual extras to jobbers and boiler manufacturers.

Wire Rods and Wire.—Bessemer, open hearth and chain rods, $27. Fence wire, Nos. 0 to 9, per 100 lb., terms 60 days, or 2 per cent. discount in 10 days, carload lots, to jobbers, annealed, $1.50; galvanized, $1.80. Carload lots, to retailers, annealed, $1.55; galvanized, $1.85. Galvanized barb wire, to jobbers, $2; painted, $1.70. Wire nails, to jobbers, $1.70.

The following table gives the prices to retail merchants on wire in less than carloads, including the extras on Nos. 10 to 16, which are added to the base price:

Fence Wire, Per 100 Lb.

No.	0 to 9	10	11	12 & 12½	13	14	15	16
Annealed	$1.65	$1.70	$1.75	$1.80	$1.90	$2.00	$2.10	$2.20
Galvanized	1.95	2.00	2.05	2.10	2.20	2.30	2.70	2.80

Market and Stone Wire in Bundles. Discount from Standard List.

Bright and Annealed:	
9 and coarser	80
10 to 18	80 and 10
19 to 26	80 and 10 and 2½
27 to 36	80 and 5
Galvanized:	
9 and coarser	75 and 10
10 to 16	75 and 10
17 to 26	72½ and 10
27 to 36	72½
Coppered or Liquor Finished:	
9 and coarser	75 and 10
10 to 26	75 and 10
27 to 36	70 and 10 and 5
Tinned:	
6 to 18	75 and 10 and 10

Pittsburgh

PITTSBURGH, July 10, 1911.—*(By Telephone.)*

Pig Iron.—It is understood that the Republic Iron & Steel Company has closed an exchange deal with the Struthers Furnace Company by which it buys 60,000 tons of basic iron, delivery being 6000 tons per month up to May 1 next, and gives ore in part payment, there being two tons of ore per ton of pig iron. The pig iron and ore figure in the transaction at practically current market prices for the deliveries involved. Late last week the same buyer obtained 2000 tons of prompt basic at $13, Valley furnace, giving some ore in partial exchange. Sales of about 4000 tons of basic iron were made last week to two steel works on the Allegheny River at $12.75 to $13, Valley. The market is now firmer, and it is doubtful whether $13 can be shaded, even for early delivery, while for the remainder of the year $13.25 is demanded. Sales of foundry iron have been heavy in the past fortnight, aggregating about 50,000 tons in this territory, nearly all being sold at $13.50 at furnace for early delivery, the remainder being for extended delivery at slightly higher figures. A considerable portion of the iron sold at $13.50 was by furnace interests having freight rates of 75c. to 85c. into Pittsburgh. A sale of 1200 tons of malleable is reported for delivery over the remainder of the year at $13.25, Valley; silicon being 1¼ to 1¾, and manganese 1½ to 1¾ per cent. We quote as follows: Bessemer, $15; basic, $13 for early delivery, and $13.25 for extended delivery; No. 2 foundry, $13.50 to $13.75; malleable, $13.25 to $13.50; gray forge, $13, all at Valley furnace, the freight rate to Pittsburgh being 90c. per ton.

Steel.—New buying of steel is very light, but specifications on sheet bar contracts continue good. Specifications on billet contracts are picking up, and prices continue firm. We quote Bessemer and open-hearth billets, 4 x 4 in., and up to but not including 10 x 10 in., $21, base, and sheet and tin bars in 30-ft. lengths, $22; 1½-in. billets, $22; forging billets, $26, base, usual extras for sizes and carbons—all prices being f.o.b. Pittsburgh or Youngstown district, with freight to destination added.

(By Mail.)

Business in finished steel products this week is of about the same volume as last, perhaps a trifle better than toward the close of last week, and is keeping the steel mills operating on an average of between 60 and 65 per cent. of full capacity. Operations are dependent chiefly upon orders received from day to day, since as regards the bulk of the business it is only a very short time from the entering of an order until it is put on the mill books and rolled. The most active line in the list is probably sheets, the quietest being wire products, in which the market stands between seasons. About three-fourths the total number of sheet mills in the country are in operation, and nearly as large a proportion of the tin mills, while merchant bars come next in point of activity, pipe and wire being the lowest, with plates, shapes and rails falling between. On all hands the opinion is expressed that the fall trade will be good, a marked improvement being expected to start within the next few weeks. In some cases this opinion is being backed up by action, as there has been heavier buying of pig iron, a considerably larger total tonnage changing hands than is regularly reported in the market. Scrap, also, has taken a turn and dealers have been bidding higher prices for material although thus far it is not apparent that mills are buying more freely or offering higher figures. The awards of the Pennsylvania Railroad late last week went at higher prices than formerly, and at prices above those currently quoted in the trade, since bids at those figures failed to secure any material.

Ferromanganese.—The market continues quiet, with prices unchanged. We quote prompt and forward at $36.50, Baltimore, freight to Pittsburgh being $1.05.

Ferrosilicon.—No important sales are reported. We quote 50 per cent. at $51.50 to $52, Pittsburgh, for delivery over the second half of the year; 10 per cent. blast furnace ferrosilicon, $22; 11 per cent., $24 and 12 per cent. $25, f.o.b. cars, Ashland and Jisco furnaces.

Muck Bar.—There is no change in the position of muck bar, which can be quoted at $28.50 to $29 for best grades of all-pig bar, delivered Pittsburgh.

Skelp.—The skelp market continues quiet, as the pipe mills are doing less than formerly. Prices, however, are unchanged, and we quote grooved steel skelp, 1.25c.; sheared steel skelp, 1.35c.; grooved iron skelp, 1.50c. to 1.60c. and sheared iron skelp, 1.70c. to 1.75c., usual terms, all for delivery at consumers' mills in the Pittsburgh district.

Wire Rods.—Consumers are well covered by regular contracts, on which they are taking only moderate deliveries. We quote Bessemer, open-hearth and chain rods at $27, Pittsburgh.

Steel Rails.—The local rail mill is running at about the same rate as formerly, chiefly on old specifications. Prices on light rails are as follows: 12-lb., 1.25c.; 16, 20 and 25-lb., 1.21c. to 1.25c.; 30 and 35-lb., 1.20c. and 40 and 45-lb., 1.16c. These prices are f.o.b. at mill, plus freight, and are the minimum of the market in carload lots, small lots being sold at a little higher price. Standard sections are held at 1.25c. per lb. for Bessemer.

Structural Material.—Local structural interests have booked a few thousand tons of fabricated material in the past week, no large jobs being up. Structural mills are running fairly well, as the structural shops are operating at nearly full capacity, and close to their best rate for the year. We quote beams and channels up to 15-in. at 1.35c., Pittsburgh.

Plates.—Plate mills are operating on slightly reduced schedules this week, specifications being lighter. While a large volume of car inquiry is in the market, calling for nearly 15,000 cars in the aggregate, orders are being placed very slowly. This is probably on account of its being the vacation season, and a good lot of car business is fully expected to be closed before September 1. We quote plates, ¼-in. and heavier, at 1.35c., Pittsburgh.

Sheets.—The demand for sheets continues to be better than for most other finished steel products, and the sheet mills are operating on an average of 70 to

THE IRON AND METAL MARKETS

75 per cent. of the entire capacity. Buying is chiefly for early delivery, although occasionally contracts are made for two or three months ahead. Several plants which were closed for the first week or fortnight of July have resumed operations. Prices as given on a previous page are being strictly maintained, except that it is reported that occasionally some Ohio mills are basing prices at their mills, for Western shipment, instead of on Pittsburgh.

Tin Plates.—The McKeesport Tin Plate Company, which operates the largest single independent plant, started its 22 mills at McKeesport in full this week, after a fortnight's idleness for needed repairs. About two-thirds of the mills of the leading interest and independents are in operation. New buying is light and specifications are only of moderate volume, so that there is likelihood of slightly decreased operations next month. The market is firmly maintained on the basis of $3.70, Pittsburgh, for 100-lb. coke plates.

Bars.—New buying of bars is light, as the agricultural implement interests have placed practically all their contracts, although thus far their specifications have been light. The steel bar mills are running at an average of 50 to 60 per cent. of capacity, although a few are doing better than this. Most of the iron mills which closed July 1 for repairs are operating again, although not at full capacity. We quote steel bars at 1.25c. and iron bars at 1.25c. to 1.30c., Pittsburgh.

Merchant Pipe.—The demand for merchant pipe from jobbers is very light and is confined to orders needed to make up stocks, which are kept down to the lowest notch. There is very little inquiry for line pipe and the mills are running at less than half capacity in this branch. Regular discounts in effect on iron and steel pipe are given on a previous page.

Rivets.—The market on rivets is fairly active, but not as active as it was in June. We quote structural rivets at 1.70c. to 1.75c., and boiler rivets at 1.80c. to 1.85c., these prices being shaded only on the most desirable orders.

Wire Products.—Orders for wire products are very light, as it is between seasons in the wire trade. Manufacturers using wire are specifying about the same as formerly on their regular contracts, while specifications from jobbers for nails and other wire products are light, with very little contracting. The regular fall trade is expected to open up about the middle of next month. Prices are being well maintained, and we continue to quote: Galvanized barb wire, $2 per 100 lb.; painted, $1.70; annealed fence wire, $1.50; galvanized, $1.80; wire nails, $1.70 and cut nails, $1.60, f.o.b. Pittsburgh, full freight added to point of delivery.

Shafting.—Buying of shafting continues to be of a hand to mouth character, and regular prices continue to be shaded somewhat on particularly desirable business. We quote regular discounts at 60 per cent. off in carload lots and 55 per cent. in less than carloads, delivered in base territory.

Spelter.—The market is quieter this week, there being few inquiries in local territory, and hardly any sales. Producers are fairly well sold up and are a trifle firmer in their views, although the market is hardly quotable at a higher price. We quote prime western grades at 5.67½c. to 5.70c., delivered Pittsburgh, freight from East St. Louis being 12½c.

Hoops and Bands.—Specifications on hoop contracts are fairly good, this being usually an active season. New buying is relatively light. We continue to quote: Hoops, 1.40c.; bands, 1.25c., extras on the latter as per the steel bar card.

Merchant Steel.—There is no change in the rate of buying, which is moderately good. Regular prices, which, however, are being shaded, are: Iron finished tire, ½ x ½-in., and heavier, 1.40c., base; under these sizes, 1.55c.; plain shed tire, 1.60c.; channel tire, 1.80c. base; toe calk, 1.90c.; flat sleigh shoe, 1.55c.; concave or convex, 1.75c.; cutter shoes, tapered or bent, 2.25c.; spring steel, 2c.; machinery steel, smooth finish, 1.90c.

Boiler Tubes.—The boiler tube market continues in an unsatisfactory condition, the demand being light, while the mills continue to shade the regular discounts, which have been nominal for a long time.

Iron and Steel Scrap.—The dealers a few days ago suddenly started to bid higher prices for material, evidently expecting the mills to take a great deal more scrap within the next month or two, although thus far the mills are not buying at any better rate than formerly, and are not bidding any higher prices. The Pennsylvania Railroad scrap lists, which were awarded last week, went at higher prices than the previous lists, and dealers bidding the open market quotations got hardly any material. We revise prices on many of the leading lines, and now quote as follows, per gross ton, f.o.b. Pittsburgh:

Heavy steel scrap, Steubenville, Follansbee, Sharon, Monessen and Pittsburgh delivery	$13.00 to $13.50
No. 1 foundry cast	13.25 to 13.50
No. 2 foundry cast	12.75 to 13.00
Bundled sheet scrap, f.o.b. consumers' mill, Pittsburgh district	11.00 to 11.25
Rerolling rails, Newark and Cambridge, Ohio, Cumberland, Md., and Franklin, Pa.	13.75 to 14.00
No. 1 railroad malleable stock	12.50 to 12.75
Grate bars	10.75 to 11.00
Low phosphorus melting stock	16.00 to 16.25
Iron car axles	23.00 to 23.50
Steel car axles	18.00 to 18.50
Locomotive axles	23.00
No. 1 busheling scrap	12.00 to 12.25
No. 2 busheling scrap	8.50 to 8.75
Old car wheels	13.50 to 13.75
Sheet bar crop ends	15.50 to 15.75
Cast iron borings	8.75 to 9.00
*Machine shop turnings	9.00 to 9.25
Old iron rails	15.00 to 15.25
No. 1 wrought scrap	14.25 to 14.50
Heavy steel axle turnings	10.00 to 10.25
Stove plate	10.50 to 10.75

* These prices are f.o.b. cars at consumers' mill in the Pittsburgh district.

Coke.—The demand for prompt coke has been very light and prices have sagged off somewhat. There is no demand for contract furnace coke at the prices asked, consumers who were anxious to be covered having already placed contracts, and fresh demand depends on furnaces now idle blowing in. Most of the contract foundry coke has been placed for the twelve-month beginning July 1, but a few contracts expire July 31, and inquiry against such requirements is beginning to appear. We quote standard grades of furnace coke for prompt shipment at $1.40 to $1.50, and on contract over the last five months of the year at $1.65 to $1.75, with 72-hr. foundry coke for prompt shipment at $1.85 to $2 and for contract at $2 to $2.25, all per net ton at ovens. The output of coke last week in the Connellsville and lower Connellsville regions was 267,122 tons, a decrease of 9000 tons, shipments being 7646 cars, a decrease of 800 cars.

Chicago

CHICAGO, July 19, 1911.—*(By Telegraph.)*

Pig Iron.—The very low price of pig iron continues to be responsible for the buying of a moderate volume for delivery in the last half. Except in comparatively few instances where melters have permitted their stock to run very low and now require immediate shipment of a car or two to cover their ordinary needs, purchases reflect the volume of hoped for business rather than the tonnage of business now on the books. Producing capacity has been greatly reduced and current sales are sufficient in volume to reduce somewhat the stocks of iron on furnace yards. Progress in this direction is tending to make the furnace position firmer as to prices, and as long as this ratio continues it will, of course, be possible to maintain the present quotations. The weakness in the situation lies behind the fact that the movement which is reducing the furnace stock piles is simply increasing the melters' supply. The hope for a stronger market depends upon an increase in melting orders in the next 60 days, derived from business not now in sight. Southern No. 2 iron can still be bought on the basis of $10, Birmingham, for last half delivery, but where at least a part of the iron cannot be taken for prompt shipment an advance of 25 cents per ton is asked. Local irons are held nominally at $15, f.o.b. furnace. We quote for Chicago delivery, except on local irons, which are f.o.b. furnace, the following prices:

Lake Superior charcoal	$16.50 to $17.00
Northern coke foundry, No. 1	15.50
Northern coke foundry, No. 2	15.00
Northern coke foundry, No. 3	14.75
Northern Scotch, No. 1	16.00
Southern coke, No. 1 foundry and No. 1 soft	14.85 to 15.10
Southern coke, No. 2 foundry and No. 2 soft	14.35 to 14.60
Southern coke, No. 3	14.10 to 14.35
Southern coke, No. 4	13.85 to 14.10
Southern gray forge	13.60 to 13.85
Southern mottled	13.60 to 13.85
Malleable Bessemer	15.00
Standard Bessemer	17.40
Basic	15.50
Jackson Co. and Kentucky silvery, 6 per cent.	17.90
Jackson Co. and Kentucky silvery, 8 per cent.	18.90
Jackson Co. and Kentucky silvery, 10 per cent.	19.90

THE IRON AND METAL MARKETS

(By Mail.)

Standing out above the general situation, in which improvement has just about held its own during the past week, the tonnage booked by the local office of the Steel Corporation was distinctly a feature. Approximately 100,000 tons of prompt shipment orders were placed on the books, which is about 100 per cent. over the normal weekly tonnage. The greater portion of this business consisted of rails and track fastenings, but the volume of structural shapes, bars and plates also showed increases. As compared with May, the month of June was reported by the leading interest as showing an increase of 50 per cent., while July thus far is making a better showing than June. An Atchison, Topeka & Santa Fe railroad bridge requiring 9910 tons and a building for the Chicago Telephone Company requiring 5085 tons were the principal orders for fabricated steel. From the standpoint of tonnage the general business in finished products is apparently reasonably good. The same cannot be said of prices, from the standpoint of the producer, particularly with regard to sheets and bar iron, and the demand for material is not sufficiently insistent to warrant any present hopes for improvement in this direction. The position of the dealer in old materials is also an unprofitable one at present prices. For pig iron still lower prices are rumored from the South.

Rails and Track Supplies.—As suggested in this report a week ago, orders for a large tonnage of rails were pending. It is now reported by the Illinois Steel Company that its rail bookings of last week totaled a very handsome figure. Liberal specifications for track fastenings were also received. To what extent domestic railroads figured in the above tonnage is not known. The demand for light rails is meager. We quote standard railroad spikes at 1.65c. to 1.75c., base; track bolts with square nuts, 2.10c. to 2.20c., base, all in carload lots, Chicago; standard section Bessemer rails, 1.28c.; open hearth, 1.34c.; light rails, 40 to 45 lb., 1.16c. to 1.20½c.; 30 to 35 lb., 1.19½c. to 1.24c.; 16, 20 and 25 lb., 1.20½c. to 1.25c.; 12 lb., 1.25c. to 1.30½c.; angle bars, 1.50c. to 1.60c., Chicago.

Structural Material.—Approximately 16,000 tons of steel will be required for fabrication to fill contracts placed during the past week. Of this total the major portion will go into the Sibley bridge over the Missouri River for the Atchison, Topeka & Santa Fe Railroad, which calls for 9910 tons, and into the Chicago Telephone Company's building at Chicago, which will take 5085 tons. The American Bridge Company will fill both of these contracts. This company will also furnish 110 tons for two spans for the Utah Light & Railway Company at Salt Lake City and 195 tons for nine transmission towers for the Southern California Edison Company. The King Bridge Company, Cleveland, will furnish 130 tons of bridge work for the Missouri, Kansas & Texas; Lowith Bros. Iron Works, 155 tons for St. Joseph's Hospital, Denver; the Hubbard Company, 185 tons for transmission poles for the Olympic Power Company, Port Angeles, Wash. The Great Northern also ordered 205 tons of girder spans. The 450 steel underframe cars placed with the Western Car & Foundry Company by the Ann Arbor Railroad will also bring corresponding orders into this market. The mill orders for the week held up very well. We quote plain material from mill at 1.53c. to 1.58c. and from store 1.75c., Chicago.

Plates.—Miscellaneous orders from Western roads for all steel baggage and railroad mail cars have brought all of the local car builders into the market for at least a limited quantity of plates. The Proctor & Gamble Company is inquiring for 100 tank cars. Augmented by a moderate tonnage of tank plate the aggregate plate business continues fairly good. Chicago quotations for mill shipment are 1.53c. to 1.58c. and from jobbers' stocks, 1.75c.

Sheets.—While the volume of sheet business continues to be maintained the dissatisfaction with existing prices offsets somewhat the better feeling which the improved tonnage might otherwise engender. The Indiana Harbor mill is running full on sheets, but some of the mills that buy sheet bars do not find the present situation very profitable. Chicago prices on sheets are as follows: Carload lots, from mill: No. 28 black sheets, 2.18c.; No. 28 galvanized, 3.18c.; No. 10 blue annealed, 1.68c. An error was made in quoting galvanized sheets last week, the correct price now being given. Prices from store, Chicago, are: No. 10, 1.95c. to 2.05c.; No. 12, 2.00c. to 2.10c.; No. 28 black, 2.60c. to 2.70c.; No. 28 galvanized, 3.35c. to 3.45c.

Bars.—The leading interest reports the closing of more steel bar tonnage. There can no longer be any question but that the implement interests have closed for practically their entire quota. Conflicting opinions as to the firmness of the 1.25c. Pittsburgh price are noted, but it is not believed that shading of this price goes beyond small concessions for desirable and immediate delivery business. The activity in bar iron has moderated and bar iron mills generally are disappointed because of the low prices existing. We quote as follows, f.o.b. Chicago: Soft steel bars, 1.43c.; bar iron, 1.20c. to 1.25c.; hard steel bars, rolled from old rails, 1.20c. to 1.25c. From store, soft steel bars, 1.70c. to 1.80c., Chicago.

Wire Products.—Manufacturers of fencing are showing a disposition to contract for fall delivery and generally those grades of wire for manufacturing requirements show more activity than country wire. Nails also indicate a limited demand. Jobbers' carload prices, which are quoted to manufacturing buyers, are as follows: Plain wire, No. 9 and coarser, base, 1.68c.; wire nails, 1.88c.; painted barb wire, 1.88c.; galvanized, 2.18c.; polished staples, 1.88c.; galvanized, 2.18c.; all Chicago.

Cast Iron Pipe.—The pipe market has been supported by the large number of inquiries for municipal water systems from the smaller towns. Miscellaneous orders are reported as above the average. The United States Cast Iron Pipe & Foundry Company reports contracts as follows: Council Bluffs, Ia., 400 tons; Mellen, Wis., 500 tons; Milan, Mo., 200 tons; Flora, Ill., 700 tons. The 11,000-ton order at Detroit has not been placed, although it is understood that R. D. Wood & Co., Philadelphia, were the low bidders. In the past the Detroit shop of the American Car & Foundry Company has usually been the successful bidder for this business. We quote as follows, per net ton, Chicago: Water pipe, 4 in., $25.50; 6 to 12 in., $24.50; 16 in. and up, $24, with $1 extra for gas pipe.

Old Material.—A very quiet week, with no change in the price level, seems to have been the situation with regard to scrap. The Chicago & Alton sold its rerolling rails at a delivered price between $12.50 and $13. This consignment will probably be applied against old orders, of which there are still some in the market at $13, for it is unlikely that consumers would pay over $12.50 for rerolling rails at this time. Transactions during the week in No. 1 wrought at prices as high as $11.40 per ton were of the same character; several hundred tons of this grade were bought by a consumer at $11.25, delivered, but this buying probably exhausted the current demand at that price. The Baltimore & Ohio Railroad sold the material offered on its recent list, only a small part of it coming to this market. We quote below for delivery to buyer's works, all freight and transfer charges paid, per gross ton:

Old iron rails	$14.00 to $14.50
Old steel rails, rerolling	12.25 to 12.50
Old steel rails, less than 3 ft.	11.00 to 11.50
Relaying rails, standard sections, subject to inspection	24.00
Old car wheels	12.50 to 13.00
Heavy melting steel scrap	10.50 to 11.00
Frogs, switches and guards, cut apart	10.50 to 11.00
Shoveling steel	10.00 to 10.50
Steel axle turnings	8.50 to 9.00
The following quotations are per net ton:	
Iron angles and splice bars	$12.50 to $13.00
Iron arch bars and transoms	13.75 to 14.25
Steel angle bars	10.25 to 10.75
Iron car axles	18.00 to 18.50
Steel car axles	16.00 to 16.50
No. 1 railroad wrought	11.00 to 11.25
No. 2 railroad wrought	10.00 to 10.50
Steel knuckles and couplers	9.25 to 9.75
Locomotive tires, smooth	16.00 to 16.50
Machine shop turnings	6.25 to 6.75
Cast and mixed borings	5.25 to 5.75
No. 1 busheling	8.75 to 9.25
No. 2 busheling	6.75 to 7.25
No. 1 boilers, cut to sheets and rings	7.50 to 8.00
Boiler punchings	12.00 to 12.50
No. 1 cast scrap	10.25 to 10.75
Stove plate and light cast scrap	9.00 to 9.50
Railroad malleable	10.00 to 10.50
Agricultural malleable	9.25 to 9.75
Pipes and flues	8.00 to 8.50

Philadelphia

PHILADELPHIA, July 18, 1911.

A comparatively good volume of business, considering the season, continues to come out. The stronger undertone recently noticeable in the general market appears to be gradually increasing. In the pig iron market the most pronounced movement has been in the low grades, although a very fair amount of business is being done in the higher grades and the trade

THE IRON AND METAL MARKETS

is encouraged with the situation. In finished material better specifications are coming out. Structural steel work continues the most active. More business has been placed for billets, while sheets are also in good demand. Iron bars still remain quiet. Old material shows an advancing tendency, not so much the result of actual transactions, but from the fact that bidders failed to get scrap from the railroads at prices recently prevailing. In instances consumers are offering slightly better prices for some grades of material.

Iron Ore.—The movement has been light. Negotiations are still pending for cargo lots of foreign ore, and an inquiry for a moderate amount of lake ore is reported. Importations in the week ended July 15 include 15,318 tons of Spanish, 7740 tons of Newfoundland and 4900 tons of Cuban ore.

Pig Iron.—Conditions are reported to be gradually assuming better shape. Stocks on furnace banks in this district are comparatively low and sellers' order books are in more satisfactory shape. In instances sellers express the opinion that they have practically all the business they want at low prices and show less disposition to urge purchases. At the same time consumers feel that the market is at the bottom and would buy for fourth quarter or more extended shipment, and, while business for the former delivery has been done, no one is apparently willing to sell at present prices for delivery beyond the year end. In a number of instances consumers of foundry grades are urging deliveries on iron already contracted for, which is taken as an indication of small stocks in melters' hands and promises a more active movement, particularly in small lot buying. The most pronounced movement has been in low grade iron. One Delaware River pipe foundry has contracted for upward of 5000 tons of Northern iron, while another has taken 3000 tons of Southern forge, the price for which is reported to have been $9.50, Birmingham. Several moderate sales of Virginia low grade, to pipe makers in that district, are also reported. One Delaware River pipe foundry is said to be still in the market for a block of 6000 tons. A machinery builder has purchased 5000 tons of No. 2 plain iron, for last half delivery, and is said to be in the market for another block of the same size. Tenders for 1500 tons, part No. 2 X and part No. 3 foundry, for the Lackawanna Railroad, delivered at Scranton during the next four months, go in to-day. Inquiry for several moderate lots of malleable foundry and charcoal iron is reported. A very fair moderate lot business in standard brands of No. 2 X and No. 2 plain foundry grades, for third quarter shipment, continues to be done. Outside of the transactions in low grade iron little has been done in Southern iron in this district. Virginia foundry grades have been sold in small and moderate lots, few exceeding 100 tons, principally for third quarter shipment, at unchanged prices. Lower quotations for special analysis iron are still being talked of. Forge iron still remains inactive, a nominal quotation being about $14, Eastern furnace. Less activity is noted in the steel making grades. No further sales of basic have been reported, although one melter in this district is still in the market for a lot of 5000 tons. Producers are, as a rule, pretty well sold up for near future delivery and refuse to consider less than $14, furnace, for this grade. Small sales of standard low phosphorus iron continue to be made at unchanged prices. The general range of prices is unchanged, quotations for standard brands, delivered in buyers' yards, in this vicinity, ranging as follows:

Eastern Pennsylvania No. 2 X foundry	$15.00 to $15.25
Eastern Pennsylvania No. 2 plain	14.75 to 15.00
Virginia foundry	15.05 to 15.50
Gray forge	14.50
Basic	14.25 to 15.00
Standard low phosphorus	20.50 to 20.75

Ferromanganese.—Inquiry for several moderate lots for Western shipment are reported, but the demand in this district continues at a standstill. Prices are nominally quoted at $36.50, Baltimore.

Billets.—A somewhat better inquiry is reported, with consumers more inclined to purchase for forward delivery. Orders for early shipment are running larger and a sale of 1000 tons of rolling billets for three months' delivery, at market quotations, is reported. Forging steel is in better demand, but no large sales have been made. Quotations are well maintained, open hearth rolling billets commanding $23.40 and ordinary forging billets $28.40, delivered in this vicinity.

Plates.—Business has been closely confined to small and moderate lot orders. In the aggregate, however, the volume has been up to the recent average and mills continue to operate on an even basis. Plates for structural work have been in the most active demand, with a fair run of business in locomotive, tank and boiler plates. Prices are unchanged at 1.50c., delivered here, for ordinary plates.

Structural Material.—The bulk of the business closed here has been confined to small lots, although contracts have been closed for several fair sized buildings and bridge work in other districts. The Cambria Steel Company has the contract for the Scranton aqueduct, requiring about 1600 tons. Fabricators are figuring on several good jobs in the South, including the structural work for the First National Bank Building in Richmond, Va. Bids are being asked for the Ritz-Carlton Hotel in this city, which, it is said, will likely go to the leading interest. A comparatively good business has been done in plain shapes, prices for which are firm at 1.50c., delivered here.

Sheets.—A very satisfactory volume of business continues to be taken by the Eastern mills. While the general run of orders continues small and for early delivery occasional bookings of larger size are reported and the trade feels more encouraged with the outlook for future business. Quotations are well maintained, the following range of prices being named, f.o.b. Eastern maker's mill: Nos. 18 to 20, 2.30c.; Nos. 22 to 24, 2.40c.; Nos. 25 to 26, 2.50c.; No. 27, 2.60c.; No. 28, 2.80c.

Bars.—The demand for refined iron bars continues irregular and is usually for small lots. For business of an ordinary character 1.20c. mill is still the ruling quotation. Reports of price concessions for steel bars do not appear to be trustworthy, as investigations have not confirmed the rumors. Sellers in this territory continue to take a fair volume of business at the 1.25c., Pittsburgh, base. For delivery in this vicinity refined iron bars are quoted at 1.27½c. to 1.32½c., and steel bars at 1.40c.

Coke.—Moderate activity in foundry coke continues to be reported. Sales in lots ranging from 500 to 1500 tons for forward delivery have been made at prices varying from $2 to $2.35 at oven, depending on the grade. For prompt coke $1.90 has been done. Inquiries for furnace coke for extended delivery, which have been before the trade for several weeks, are slow in closing. Transactions in prompt furnace coke at $1.40 at oven are reported, but for extended delivery prices range from $1.50 to $1.65. The following range of prices per net ton is named for deliveries in buyers' yards in this district, shipment extending over the balance of the year:

Connellsville furnace coke	$3.65 to $3.90
Foundry coke	4.15 to 4.60
Mountain furnace coke	3.25 to 3.50
Foundry coke	3.75 to 4.20

Old Material.—The market has a stronger tone and in instances prices show an upward movement, due in a measure to the fact that recent bids against railroad lists at about current prices failed to get any tonnage. At the same time some consumers, as well as merchants, are offering a trifle better prices than have been reported. Strictly No. 1 heavy melting steel commands from $13.25 to $13.50, and some sellers have even higher ideas as to prices. Yard steel is still available, however, at $13, but is frequently subject to rejection after inspection by the buyer. Higher prices are also being bid for some of the special grades of old material. Wrought iron pipe is slightly higher on better bids by consumers; wrought turnings, cast borings and stove plate also show an advance, due to the same cause. Scrap merchants are very much encouraged with the outlook and are disinclined to make sales in any quantity under present market conditions. The following quotations, while still to a certain extent nominal, represent about the market for early deliveries in buyers' yards, eastern Pennsylvania and nearby points, carrying a freight rate from Philadelphia varying from 35c. to $1.35 per gross ton:

No. 1 heavy melting steel scrap	$13.25 to $13.75
Old steel rails, rerolling (nominal)	14.00 to 14.50
Low phosphorus heavy melting steel scrap	16.75 to 17.25
Old steel axles (nominal)	19.50 to 20.00
Old iron axles	24.50 to 25.00
Old iron rails	17.50 to 18.00
Old car wheels	13.00 to 13.50
No. 1 railroad wrought	15.00 to 15.50
Wrought iron pipe	12.75 to 13.25
No. 1 forge fire	11.00 to 11.50
No. 2 light iron (nominal)	6.75 to 7.25
Wrought turnings	9.00 to 9.50
Cast borings	8.75 to 9.25
Machinery cast	13.00 to 13.50
Railroad malleable (nominal)	11.50 to 12.00
Grate bars, railroad	10.00 to 10.50
Stove plate	10.50 to 11.00

THE IRON AND METAL MARKETS

Cleveland

CLEVELAND, OHIO, July 18, 1911.

Iron Ore.—A round tonnage of non-Bessemer ore was sold in one lot by a local ore firm during the week, this being the first sale of any size for some time. A few small lots were also sold. The general feeling in the ore trade shows an improvement. While sellers expect the next few weeks to be quiet they are looking for a fair volume of business about the first of September. Shipments this month are expected to show some improvement over June. A large percentage of the ore now being shipped is being stored on the docks. We quote prices as follows: Old range Bessemer, $4.50; Mesaba Bessemer, $4.25; old range non-Bessemer, $3.70; Mesaba non-Bessemer, $3.50.

Pig Iron.—Conditions are slightly more in favor of sellers. One selling agency reports one sale of a round tonnage of foundry iron for the last half delivery and several other inquiries for good-sized lots have come out. A number of sales of lots of 500 tons and under are also reported. Little demand has developed as yet in this immediate territory. The sentiment among producers has improved. While prices are very low it is believed that they have reached the bottom and that with the large number of merchant stacks out of blast it will not take a great amount of activity to make prices a little stiffer. Attempts have been made during the past few days by buyers to obtain foundry iron at $13.25, Valley furnace, for No. 2 for the last half, but the market appears firm at a minimum price of $13.50. The general asking price of $14, delivered Cleveland, quoted by local furnaces can probably be shaded slightly. There is little inquiry for Southern grades. For prompt shipment and for the last half we quote, delivered, Cleveland, as follows:

Bessemer	$15.00
Basic	$13.75 to 14.00
Northern foundry, No. 2	13.75 to 14.00
Gray forge	13.25
Southern foundry, No. 2	14.35 to 14.60
Jackson Co. silvery, 8 per cent. silicon	17.50 to 17.75

Coke.—Following the activity in foundry grades a few weeks ago the market is very dull. Many foundries have not yet covered for their last half requirements, but are buying car lots as they need it. There is no demand for furnace coke. We quote standard Connellsville furnace coke at $1.40 to $1.50 per net ton at oven for spot shipment, and $1.60 to $1.70 for the last half. Connellsville 72-hr. foundry coke is quoted at $1.75 to $2.15 for prompt shipment, and $2.15 to $2.40 for the last half.

Finished Iron and Steel.—The demand in practically all finished lines shows a further improvement over preceding weeks. Mill agencies are getting a fair volume of small orders from nearly all sources and quite liberal specifications on contracts. Improved conditions are reported by manufacturers in a large number of lines. The steel bar market is firmer, and some consumers who have been holding back in the hope of getting steel at 1.20c. have closed contracts during the week for the remainder of the year at the regular price. While some shading on steel bars is reported, it appears that this price has been made only for round lots for immediate shipment. The demand for structural material is quite active, and liberal specifications have come from fabricators. The American Bridge Company has taken 1700 tons for four bridges for the Detroit, Toledo & Ironton Railroad. Other structural work placed during the week includes 400 tons for an addition to the Colonial Hotel, Cleveland, and 140 tons for an addition to the plant of F. Widlar & Co., Cleveland, both taken by the National Iron & Wire Company, Cleveland, and 125 tons for a building for the Continental Motor Mfg. Company, Detroit, taken by the McClintic-Marshall Construction Company. Bids were received July 18 for about 2000 tons for the new city hall, Cleveland. The Cambria Steel Company has taken orders for 600 tons of standard rails, 500 tons of which are for extensions to be made by the Erie Traction Company, Erie, Pa. The demand for shafting is moderate, and prices are not firm. Sales are reported at 60 and 10 per cent. off. The demand for rivets is more active than for some time, but prices are still low; for desirable orders we quote structural rivets at 1.60c., Pittsburgh, and boiler rivets at 1.70c. There is a fair demand for sheets and considerable contracting is being done for the last half delivery. The demand for iron bars continues very light, prices are unchanged at 1.25c. to 1.30c. at mill. The Union and Empire rolling mills, Cleveland, are still shut down, and it has not been decided when either will be started up.

Old Material.—The market is generally quiet, but prices are firm. The new inquiry for heavy steel scrap noted last week has resulted in very little business, consumers apparently being unwilling to pay the prices asked for future delivery. Dealers declare that they can sell a large tonnage for extended delivery at current prices, but they expect a further advance within the next few weeks and are holding for the advance, so that not much scrap is to be had at present prices. Sales during the week have been limited mostly to small lots on cars. Quotations are unchanged. Dealers' prices per gross ton, f.o.b. Cleveland, are as follows:

Old steel rails, rerolling	$13.00 to 13.50
Old iron rails	13.00 to 13.50
Steel car axles	17.00 to 18.00
Heavy melting steel	11.75 to 12.25
Old car wheels	11.50 to 12.00
Relaying rails, 50 lb. and over	22.50 to 23.50
Agricultural malleable	11.75 to 11.00
Railroad malleable	11.50 to 12.00
Light bundled sheet scrap	8.00 to 8.50

The following prices are per net ton, f.o.b. Cleveland:

Iron car axles	$21.00 to $21.50
Cast borings	6.50 to 6.75
Iron and steel turnings	6.75 to 7.00
Steel axle turnings	8.00 to 8.50
No. 1 busheling	10.00 to 10.50
No. 1 railroad wrought	11.50 to 12.00
No. 1 cast	11.25 to 11.50
Stove plate	9.50 to 10.00
Bundled tin scrap	11.00 to 11.50

Cincinnati

CINCINNATI, OHIO, July 18, 1911.—(*By Telegraph.*)

Pig Iron.—During the past few days there were fewer requests for prices on round lots of iron as well as on small tonnages. An Illinois consumer is asking for 750 tons each of Southern and Northern foundry and two Michigan melters want 1500 and 2000 tons of either Northern or Southern iron. About 600 tons of Northern No. 2 foundry was sold to a central Ohio consumer at $13, Ironton, for last half shipment, although a few brands are bringing an advance over this figure, and 700 tons of No. 2 foundry went to an Indiana manufacturer at $13.25 at furnace for the same delivery. Southern iron sales include 1300 tons of No. 2 foundry and 1000 tons of No. 4 foundry for shipment to Iowa on the basis of $10, Birmingham, for No. 2 foundry. Malleable is in better demand and a sale of 1800 tons for shipment to Indiana was made this week. Malleable is quoted around $13.25 to $13.50, Ironton. Several inquiries for malleable are outstanding that are expected to be closed shortly. There is no activity in basic but any indication of a change would doubtless awaken consumers in this district. Southern basic is quotable around $10, Birmingham, for delivery throughout the year. Based on freight rates at $3.25 from Birmingham and $1.20 from Ironton we quote, f.o.b. Cincinnati, as follows:

Southern coke, No. 1 foundry and 1 soft	$13.75 to $14.00
Southern coke, No. 2 foundry and 2 soft	13.25 to 13.50
Southern coke, No. 3, foundry	12.75 to 13.00
Southern coke, No. 4 foundry	12.50 to 12.75
Southern gray forge	12.50 to 12.75
Ohio silvery, 8 per cent. silicon	16.95 to 17.20
Lake Superior coke, No. 1	14.70 to 14.95
Lake Superior coke, No. 2	14.20 to 14.45
Lake Superior coke, No. 3	13.70 to 13.95
Basic, Northern	14.45 to 14.70
Standard Southern car wheel	25.25 to 25.75
Lake Superior car wheel	19.00

(By Mail.)

Coke.—A southern Ohio furnace is understood to have closed for 7500 to 10,000 tons of Pocahontas 48-hr. coke, for delivery throughout the next 12 months. With this exception there has been no activity in either furnace or foundry grades. Inquiries are very scarce, and the output in all districts is being curtailed. Prompt shipment furnace coke is obtainable around $1.40 to $1.50 per net ton at oven, and between $1.50 and $1.65 on contracts. Foundry coke remains at about $2 for prompt shipment, with future delivery quotations ranging from $2.10 to $2.35 per net ton at oven. The above prices are quoted in the Pocahontas, Wise County and Connellsville fields.

Finished Material.—Neither orders nor inquiries are coming quite so freely, but this cessation is probably due to the usual holiday and stock-taking period. Jobbers have also been quietly specifying to cover future requirements, and a number in this territory

THE IRON AND METAL MARKETS

have about all the stock on hand and contracted for that they need to carry them through the next few months. Any change for the better in the business situation would doubtless bring these same merchants into the market as heavier purchasers, and it is believed that prices on all kinds of finished material have reached bottom. Steel bars are quoted from warehouse stock at 1.70c., and structural material at 1.80c. Mill agencies are holding firm to the regular Pittsburgh prices on carload shipments of all finished iron and steel products.

Old Material.—The demand for scrap of all kinds is limited, and there has been a softening in prices on a few grades. However, dealers expect a change for the better within the next 30 days, as by that time the rolling mills in this section will be in full operation again. The foundry business is also expected to show some improvement soon, as it has been rather limited for some time. Prices for delivery in buyers' yards, southern Ohio and Cincinnati, are as follows:

No. 1 railroad wrought, net ton	$10.50 to $11.00
Casting borings, net ton	4.50 to 5.00
Steel turnings, net ton	5.50 to 6.00
No. 1 cast scrap, net ton	9.50 to 10.00
Burnt scrap, net ton	6.50 to 7.00
Old iron axles, net ton	16.50 to 17.00
Bundled sheet scrap, gross ton	7.25 to 8.25
Old iron rails, gross ton	13.50 to 14.00
Relaying rails, 50 lb. and up, gross ton	21.00 to 22.00
Old car wheels, gross ton	10.25 to 11.00
Heavy melting steel scrap, gross ton	10.00 to 10.50

St. Louis

ST. LOUIS, MO., July 17, 1911.

The iron and steel market here continues to show improvement, the average of recent times having been approached more closely. Business for the first half of July is reported better in practically all quarters, while some houses assert that the business booked the first 15 days of the month equals that of the entire month of June. There has been a stiffening of prices in most quarters, but with some sales the past week for immediate shipment at concessions from the quoted figures. Inquiries continue to increase and the tonnage movement is very good as compared with the recent past, but, of course, it is not yet anywhere near capacity. The improvement applies to both the raw and the finished product.

Pig Iron.—The pig iron market has stiffened materially and with less comment as to $10 iron. Several of the larger producers for this territory are reported as having even placed their prices for No. 2 Southern iron as high as $11, but this is regarded largely as an announcement that they have taken all the business that they care to at and below $10.50, rather than that the market is on an $11 basis. The sales made during the week were nearly all on an immediate shipment basis and included lots of 200 tons, 500 tons and 1000 tons, the last being for Southern high manganese. On all these the prices were off from the quotable figure. Nothing new transpired in Northern, basic, malleable or other irons. On contracts the requisitions during the week have kept shipments well up in tonnage and out of this comes encouragement to the dealers that the consumers are keeping close up with the situation.

Coke.—The better feeling with relation to coke which was noted last week continues and the prices to-day are fully as stiff at the figures given as they were. The growing number of inquiries for last half and for full year delivery—to July, 1912—demonstrates increasing interest and the probability of larger demand on new business. Specifications on contracts are up to the mark, with practically no delinquencies, some even anticipating their quantities. The price of last half delivery, Connellsville, continues around $2.25 to $2.35, with prompt shipment coke at $1.90 to $2. The aggregate of tonnage still shows better than for any preceding period since last winter and the dealers generally believe that the increase will continue.

Finished Iron and Steel.—The business for the week in finished products has shown up much better than for a long time and in addition to the improvement noted indications are for the development of some good sales within the next week or 10 days. One sale of standard steel rails closed in the week was for about 700 tons for a Kansas City line. Several other inquiries are in the market, none very large, but with an aggregate amounting to a good bit of business. In light rails the coal mining companies increased their demand in the week, the improvements at the mines developing as the necessities for fall and winter work make themselves apparent. The inquiries from the lumber roads are better, but not much is expected from this direction for the present. In structural steel the orders during the week have been very good, but most of the tonnage has been specified for quick shipment. It is anticipated that the fabricators will begin to order for stock very soon. In plates the only business for the week, and the first for some time, was an order for 450 tons, which will be used for the construction of government barges. In the present quiet state of the plate market quotations are on a basis of about $1.30 Pittsburgh. In bars some tonnage is moving, but the aggregate is not heavy. This continues to be largely due to the low price of iron, which effects quite a differential in favor of the latter. Track fastenings have been quiet. A promising indication in the market has been the inquiries of a car company for figures in the preparation of estimates for an order of 3000 steel cars for the Illinois Central road. Estimates are also being prepared for several smaller orders from other roads, but the outcome is not yet definitely indicated in these.

Old Material.—The dullness of the scrap market continues, with little to be said beyond an anticipation of better things by the first of the month. Dealers are buying on a speculative basis, believing that the material is worth holding at present figures. The market tone reflects the feeling of the new material situation rather than any inherent condition of its own. Dealers' prices per gross ton, f.o.b. St. Louis, are as follows:

Old iron rails	$12.50 to $13.00
Old steel rails, rerolling	11.25 to 11.75
Old steel rails, less than 3 ft	10.25 to 10.75
Relaying rails, standard section, subject to inspection	23.00 to 23.50
Old car wheels	13.00 to 13.50
Heavy melting steel scrap	10.25 to 10.75
Frogs, switches and guards cut apart	10.25 to 10.75

The following are quotations per net ton:

Iron fish plates	$11.00 to $11.50
Iron car axles	18.50 to 19.00
Steel car axles	17.50 to 18.00
No. 1 railroad wrought	10.75 to 11.25
No. 2 railroad wrought	9.75 to 10.25
Railway springs	9.00 to 9.50
Locomotive tires, smooth	14.50 to 15.00
No. 1 dealers' forge	8.50 to 9.00
Mixed borings	5.00 to 5.50
No. 1 busheling	9.00 to 9.50
No. 1 boilers, cut to sheets and rings	8.00 to 8.50
No. 1 cast scrap	10.00 to 10.50
Stove plate and light cast scrap	8.00 to 8.50
Railroad malleable	8.00 to 8.50
Agricultural malleable	7.00 to 7.50
Pipes and flues	8.00 to 8.50
Railroad sheet and tank scrap	7.25 to 7.75
Railroad grate bars	8.00 to 8.50
Machine shop turnings	6.50 to 7.00

Buffalo

BUFFALO, N. Y., July 18, 1911.

Pig Iron.—The firming up of prices by producers has apparently checked interest in the market on the part of consumers and inquiries and orders have fallen off noticeably in the week as compared with the previous two weeks. Inquiries under negotiation in the week aggregate only about 3000 tons, including a small amount of malleable, and the total tonnage reported booked is under 5000 tons, composed chiefly of small lots. Most furnaces in this district have advanced asking prices 25 to 50c. per ton from the recent low schedules and are not making special effort to secure business. They have sufficient orders on their books to take care of their output for the current quarter and $13 iron seems to be no longer obtainable. We quote as follows, f.o.b. Buffalo, for last half delivery:

No. 1 X foundry	$13.75 to $14.25
No. 2 X foundry	13.50 to 14.00
No. 2 plain	13.25 to 13.75
No. 3 foundry	13.25 to 13.50
Gray forge	13.25 to 13.50
Malleable	13.75 to 14.25
Basic	13.75 to 14.25
Charcoal	16.50 to 17.25

Finished Iron and Steel.—Business in most lines of finished products is coming forward in good volume, taking into consideration that this is the usual period of midsummer quiet. Considerable increase in contracting in bar products and plain structural materials is noted since the cessation of the extremely hot weather, and orders for some good sized tonnages of concrete reinforcing bars have been placed in the week. Most mills are running on an output of about 75 per cent. of capacity and selling agencies report prospects good for a brisk fall trade. In fabricated structural lines a large amount of business is developing, particularly in small and moderate sized building projects. The contract for the fabrication and erection of the

THE IRON AND METAL MARKETS

steel for the new factory building to be erected by the Pfaudler Company, Rochester, N. Y., about 100 tons, was taken by the Lackawanna Bridge Company, of this city, and the American Bridge Company secured the contract for the 1600 tons of steel required for the 16-story office building to be erected by the Eastman Kodak Company, Rochester. The general contract for the new passenger station for the New York Central Railroad at Rochester, requiring a large tonnage of steel, has been let to Gorsline & Swan, of that city. The plans for the steel work for the Buffalo General Electric Company's 17-story office building, Buffalo, are to be slightly revised before bids are taken by the general contractors, Gill & Son, Cleveland. Plans for the Hutchinson High School, Buffalo, which call for 800 tons of steel, are also being revised, the bids having largely exceeded the estimates.

Old Material.—The market is somewhat stronger in tone, with a good demand for almost all classes of material. Prices are firmer, and although consumers demur at paying the advanced figures demanded by dealers material is coming out only at the new prices. We quote as follows per gross ton, f.o.b. Buffalo:

Heavy melting steel	$13.00 to $13.50
Low phosphorus steel	15.50 to 16.00
No. 1 railroad wrought	13.50 to 14.00
No. 1 railroad and machinery cast scrap	13.50 to 14.00
Old steel axles	18.50 to 19.00
Old iron axles	22.00 to 22.50
Old car wheels	13.00 to 13.50
Railroad malleable	12.00 to 12.50
Boiler plate	11.50 to 12.00
Locomotive grate bars	11.00 to 11.50
Pipe	9.50 to 9.75
Wrought iron and soft steel turnings	7.00 to 7.50
Clean cast borings	6.75 to 7.25

Birmingham

BIRMINGHAM, ALA., July 17, 1911.

Pig Iron.—The price of $10, Birmingham, for No. 2 foundry seems to be applicable to deliveries throughout the remainder of the year, although it is without doubt true that such a price can be obtained from but few makers, and most of these seem to be short on certain grades. There has been more buying than the current reports would indicate. Thus far no sales are reported for deliveries running further ahead than the last quarter of the current year. Prices are quotable as follows, per gross ton, on board cars at furnaces in this immediate district:

No. 1 foundry and No. 1 soft	$10 50
No. 2 foundry and No. 2 soft	10.00
No. 3 foundry	9.50
No. 4 foundry	9.25
Gray forge	9.25
Mottled	9.00
Standard basic, chill cast	10.25
Off basic	9.75
Charcoal car wheel iron	22.50

Cast Iron Pipe.—Inquiry is good for water mains, and shipments on old contracts continue to move at a fair rate. Prices on this line have not really declined in full sympathy with the reduction in pig iron to the present level. Chief interest here centers now in the final results of the reported deal whereby the largest interest in cast-iron pipe is reported as having taken over the plant of the Dimmick Pipe Company at North Birmingham. This plant is now idle, and there is more or less speculation as to whether or not work will be resumed at an early date. We continue to quote on water pipe as follows, per net ton, f.o.b. cars here: 4 to 6-in., $22; 8 to 12-in., $21; over 12-in., average $20, with $1 per ton extra for gas pipe. These prices are probably subject to shading for large municipal contracts.

Old Material.—Prices ruling are such as to fail to attract any interest of consequence in any quarter, and it is felt among dealers here that such condition will continue to prevail. No large transactions have taken place in some time, and there is in reality barely sufficient trading taking place to make a market. We continue to quote, nominally, as follows, per gross ton, f.o.b. cars here:

Old iron axles (light)	$13.50 to $14.00
Old steel axles (light)	12.50 to 13.50
Old iron rails	12.50 to 13.00
No. 1 railroad wrought	11.00 to 11.50
No. 2 railroad wrought	9.50 to 10.00
No. 1 country wrought	7.50 to 8.00
No. 2 country wrought	7.00 to 7.50
No. 1 machinery	9.50 to 10.50
No. 1 steel	8.50 to 9.00
Tram car wheels	8.00 to 8.50
Standard car wheels	9.50 to 10.50
Light cast and stove plate	7.00 to 7.50

Coal and Coke.—More interest is felt in the coal trade here this month, as a number of contracts are being renewed; but the prices are materially below the figures that prevailed a year ago. The mines are operating on a much smaller output and conditions are rather unsatisfactory to the operators. Foundry coke is in fair demand. Some contracts have been closed recently for Virginia and West Virginia coke for foundry use, and some business that would ordinarily go to Alabama ovens has been diverted to other fields on account of the change in freight rates in Alabama affecting certain consuming interests materially.

San Francisco

SAN FRANCISCO, CAL., July 12, 1911.

A little better feeling is observed than for some time, though the general movement remains quiet. The tonnage of sales in most departments, in fact, is smaller thus far in July than for the latter part of June and large inquiries of a definite nature are comparatively few. Improvement is noted, however, in general mercantile and industrial business, as well as in building, which is expected to react favorably on the steel trade. Financial conditions, as shown by current bank clearings, are about normal and crops, though below the average, are bringing exceptionally good returns.

Bars.—The principal demand, as for some time past, is for reinforcing bars, for which a number of good-sized orders have recently been placed. While foreign material is used for this purpose to a considerable extent, domestic mills are now getting a fair proportion of the business. Purchases for stock are extremely small, as merchants are still carrying a considerable tonnage of imported bars and the jobbing movement is confined to narrow limits. More inquiry is expected from manufacturing interests in the near future, but the buying from this source so far has been merely for current needs. Bars from store, San Francisco, are quoted at 2c. for steel and 1.90c. for iron.

Structural Material.—While the official figures show very little increase in the last few months, contractors and architects report more activity than for two years or more. Local fabricating orders for the last fortnight, though hardly as large as for the two weeks previous, include several important jobs and considerable prospective work will soon be ready for figuring. The most important item here is the Masonic Temple, taken by the American Bridge Company. Dyer Bros. have secured the award for cells for the county jail and have booked orders for the Brown building on Sixth street, about 200 tons, and the O'Sullivan building at Fourth and Minna streets. The general situation at Portland, Ore., is rather quiet. The Pacific Rolling Mill Company is erecting a building for the Union Iron Works in this city, and the latter interest will open bids at the end of the week for the general construction of a building requiring about 500 tons, to be used as a shipbuilding structural shop. New bids will be received shortly on the Knights of Columbus building, but the outcome is uncertain. Plans for the Girls' high school, about 1000 tons, will be ready for figuring about the end of the month. The Schrader Iron Works will furnish 157 tons for the Rolkin building in this city. Plans are under way for a large number of Class A buildings in this city, but some time will elapse before most of them are ready to be let. Bids have been taken on a lot of bridge work at Tacoma, Wash., and the Northern Pacific Railway is seeking permission to erect a steel draw over the Lake Washington Canal at Seattle. Bids will be opened July 31 for steel work in the Judiciary building, Honolulu.

Rails.—The Fresno, Hanford & Summit Lake Railroad is reported to have ordered 4500 tons of 70-lb. rails, but no information on the deal is obtainable here. As a rule the prospect of business from new interurban lines is very indefinite, though some of the established roads are coming out for small lots for extension work. There is considerable inquiry in Oregon and Washington both for logging and electric lines, and the larger interests are also working on many new branches in that territory. No active demand is noted for light rails, the movement for the season being below expectations.

Sheets.—The movement shows little variation from the recent average, though somewhat more activity is noted in the leading consuming industries. Some fairly large stocks are held on the coast and neither merchants nor consumers have yet shown any inclination to buy much in advance of current needs.

THE IRON AND METAL MARKETS

Plates.—Buying is limited almost entirely to immediate requirements, but the demand for tank plates continues fairly active. The outlook for tank construction in the oil fields is better than for some time. San Francisco has rejected the bid of Dyer Bros., the only one received, for the construction of a 500,000-gal. tank for the fire protection system. The Los Angeles Mfg. Company has taken an order for 3½ miles of 16-in. riveted pipe for Corona, Cal.

Merchant Pipe.—The distributive movement through the State, which has been dull all the season, shows no signs of improvement. A few orders of moderate importance have been placed recently by oil and water interests, but competition for all such business is extremely strong, and some shading of prices is reported. Conditions in the oil industry are very unsettled, and the continued accumulation of oil in storage does not encourage new development. A revival in the jobbing trade should occur before the end of September, but merchants are buying very conservatively.

Cast Iron Pipe.—The tonnage of recent orders is hardly as large as for the latter part of June, but is satisfactory for this territory, and there is considerable new business in prospect. The Pacific Gas & Electric Company has placed some substantial orders for interior points, and is still in the market. Aside from this the principal business is in southern California. The city of Los Angeles has placed a new order for about 300 tons. That city has taken over the water companies at Alamitos Beach and Long Beach, and will operate the property as part of the municipal system, installing a number of extensions. The city of Santa Barbara, Cal., has purchased 150 tons of pipe, and the Southern California Edison Company is in the market for a small quantity.

Pig Iron.—Local requirements have not increased materially, and the foundry trade is buying only in small lots, principally for immediate needs. Prices on foreign iron are still more or less unsettled. No. 2 Southern foundry iron is nominally quoted at $20.

Old Material.—Cast iron scrap remains extremely quiet, with a heavy tonnage accumulating in the hands of dealers, though prices show no further reduction. Wrought scrap is also dull. Consumers of steel melting scrap and rerolling rails are still inclined to hold off, but some good-sized deals are in prospect, and an active movement is expected about the end of the month. Prices show little variation, being quoted as follows: Cast iron scrap, per net ton, $16; steel melting scrap, per gross ton, $10.50 to $11; wrought scrap, per net ton, $11 to $15; rerolling rails, per net ton, $11.

New York

NEW YORK, July 19, 1911.

Pig Iron.—A rather better feeling is observed in pig iron circles. The transactions of the week have not been large, but the volume of business has been quite fair for the season. The stiffening of prices in eastern Pennsylvania and at Buffalo may have caused some buyers to defer intended purchases, but others have paid the rates now asked, thus indicating the growth of a little more confidence. Northern iron at tidewater is quoted as follows: No. 1 foundry, $15.50 to $15.75; No. 2 X, $15 to $15.25; No. 2 plain, $14.50 to $15. Southern No. 1 foundry is quoted at $14.75 to $15.25, and No. 2, $14.25 to $14.75.

Ferroalloys.—Sellers of ferrosilicon here could dispose of some good-sized quantities if they were willing to meet the prices quoted of late, but they are refusing such business. It is a significant fact that European ferrosilicon cannot be brought to this country and laid down at dock for less than $58 a ton, and, as the syndicate is in good control of the market there, it is thought in New York that prices will go higher. Accordingly sellers are demanding $53 a ton for 50 per cent. A good demand for ferromanganese exists, but prices are weak. The usual quotation is $36.50, Baltimore. Some sellers are demanding a higher price, but they are not getting the business.

Cast Iron Pipe.—Quiet conditions still prevail. A few public lettings are advertised for this territory, but they are usually under 500 tons. Carload lots of 6-in. are quoted at $21 to $22 per net ton, tidewater.

Old Material.—Notwithstanding the fact that transactions are light, a more confident tone is observed among some of the leading dealers. They believe that the trade has seen the worst of the depression in old material and that a better demand is to be looked for shortly. The volume of business continues about the same as in recent weeks, but with some consumers deliveries are being taken a little more freely. Quotations are as follows per gross ton, New York and vicinity:

Old girder and T rails for melting	$10.75 to $11.00
Heavy melting steel scrap	10.75 to 11.00
Relaying rails	20.00 to 21.00
Rerolling rails (nominal)	12.00 to 12.25
Standard hammered iron car axles	21.00 to 21.50
Old steel car axles	16.75 to 17.25
No. 1 railroad wrought	12.75 to 13.25
Wrought iron track scrap	12.00 to 12.50
No. 1 yard wrought, long	11.50 to 12.00
No. 1 yard wrought, short	11.00 to 11.50
Light iron	4.25 to 4.75
Cast borings	5.25 to 5.75
Wrought turnings	6.25 to 6.75
Wrought pipe	9.50 to 10.00
Old car wheels	11.00 to 11.50
No. 1 heavy cast, broken up	11.00 to 11.50
Stove plate	8.50 to 9.00
Locomotive grate bars	8.50 to 9.00
Malleable cast	10.00 to 10.50

Finished Iron and Steel.—Some new offerings of good size structural jobs have been made, as here listed, but not many of the contracts of the spectacular sort have been closed. Renewed charges are in the air of low fabricating prices, but where they were formerly directed against one company in particular they are now laid against another. Business in plates is without feature and mills are probably running about 60 per cent. capacity. In steel bars there is a probability that more business has been taken in recent weeks than is generally believed, with the danger of the late buyers thus overstaying the market. Bar iron suffers most from no dominant price-staying element and contracts are being closed at the low rather than the high quotation. New structural work appearing since last week's report includes 1000 tons for Chesapeake & Ohio bridges; 1000 tons for the Brigham Hospital, Boston; 1200 tons for a high school at Albany, N. Y.; 2800 tons for a bank building, Richmond, Va.; 500 tons for the Times-Dispatch building, Richmond; 300 tons for a warehouse at Coenties slip and Water street, New York, and 1200 tons for the McKeon loft building, West Twenty-fifth street, New York. Bids are now being taken for the 2000 tons of the highway bridge at McElhatan, Pa., for the 3000 tons of the Æolian building, New York, and for the 300 tons for the R. H. Macdonald loft building on Nineteenth street, New York, and Jas. Stewart & Co. are general contractors for the building at the West Point Military Academy, requiring 700 tons of steel. The American Bridge Company has the contract for 1200 tons for the Wilson building, Thirty-third street, New York; the Pennsylvania Steel Company has 1100 tons for the Ontario & Western bridge at Hancock, N. Y., 900 tons for pier work for the Boston & Albany and 200 tons for a bascule bridge, Charles River, for Boston elevated system; and Jones & Laughlin Steel Company has contracts as follows: 400 tons, Poli theater, New Haven; 150 tons, Pennsylvania passenger station, Newark, N. J., and 500 tons for the Presser office building, Philadelphia. The Hecla Iron Works is credited 200 tons for work for the post office building at the Pennsylvania station, New York. Quotations are: Plain structural material and plates, 1.51c. to 1.56c.; steel bars, 1.41c. to 1.46c.; bar iron, 1.30c. to 1.35c., all New York. Plain material and plates from store, New York, 1.80c. to 1.90c.

Metal Market

NEW YORK, July 19, 1911.

The Week's Prices

Cents Per Pound for Early Delivery.

	Copper, New York.		—Lead.—		—Spelter.—	
		Electro-	Tin.	New	St.	New	St.
July.	Lake.	lytic.	New York.	York.	Louis.	York.	Louis.
13	12.75	12.55	43.35	4.50	4.37½	5.57½	5.80
14	12.75	12.55	43.25	4.50	4.40	5.57½	5.75
15	12.75	12.55	.....	4.50	4.40	5.57½	5.75
17	12.75	12.55	42.70	4.50	4.40	5.57½	5.75
18	12.75	12.55	42.35	4.50	4.40	5.57½	5.75
19	12.75	12.55	42.00	4.50	4.40	5.57½	5.75

Tin is in better supply and 1½c. lower than a week ago. Copper is weak, but prices have not changed. Lead is higher in St. Louis; and unchanged, but very firm in New York. Spelter is lower.

Copper.—There is little to be said about copper except that, although the market is weak in tone, prices have not changed. Consumers seem to have filled their wants at the lower prices which prevailed early in June. There appears to be no great anxiety on the part of large holders of copper to dispose of their stocks, and the offers of cheap copper have been made by other interests having outside lots. Some sales of electrolytic

THE IRON AND METAL MARKETS

copper have been made at 12.65c. to 12.70c. delivered in the Connecticut Valley. This is about equal to 12.50c. to 12.55c. New York, for prompt delivery. The usual quotation is the latter price and Lake cannot be had for less than 12.75c. cash, New York, although it has been sold for delivery in the Naugatuck Valley, 30 days cash, at around 12.80c., where, as a rule, the price for Lake copper sold on such terms as ⅛c. higher than the price for spot in New York. Copper has been nearly stationary in London all the week at £56 13s. 9d. for spot, and £57 5s. for futures. The exports of copper so far this month have not been very large, amounting to 17,931 tons.

Pig Tin.—Heavy arrivals of pig tin in this port have resulted in bringing the price down 1½c. within the week and it can now be had at the import parity. Although tin is plentiful enough for all immediate needs it is, however, not in abundant supply and any great demand might change the situation. There has been very little trading and the disappearance of the premium on spot tin has not aroused any interest among the consumers. The London market has been declining steadily for the last six days and this morning it was down to £191 10s. for spot and £184 15s. for futures. The arrivals of pig tin so far this month have amounted to 3124 tons, which is close to what is normally a full month's arrivals. There are 2464 tons afloat.

Tin Plates.—There is a good jobbing demand for tin plates, but large consumers are not buying very heavily. The price continues at $3.94 for 100-lb. coke plates. The foreign market is weak and New York metal houses who have London connections have been informed that a reduction will shortly be made on quotations on Swansea plates as a result of the weakening of the pig tin market. At present, however, quotations are the same as they were a week ago, namely 13s. 9d. at Swansea, Wales.

Lead.—Lead has advanced in St. Louis, although there is very little buying. The market here is firm and some outside sellers are demanding more than the price asked by the leading interest. This is the first time this year that independent dealers have been above the price asked by the leading interest as they have been underselling ever since last December. To-day lead was selling at 4.40c., St. Louis, and 4.50c., New York.

Spelter.—There were some large inquiries last Thursday and Friday for spelter, but consumers refused to place orders on the terms quoted by sellers. Quotations were reduced slightly, until to-day spelter in New York is offered at 5 points less than a week ago. Those who made the inquiries, however, still refuse to do business. To-day's quotations are 5.75c., New York, and 5.57½c., St. Louis. The market shows signs of going lower.

Antimony.—Antimony continues to decline, and from all accounts some of those most deeply interested in the recent syndicate show the most anxiety to sell. Hallett's was down to 8c. this morning, which is 1c. under the price made when the syndicate tried to take control of the market. Cookson's is offered at 8.50c., but some sellers are shading that price slightly. Hungarian grades are not so weak and the usual quotation is 7.30c. Chinese grades may be had for about 5 points less than the Hungarian grades.

Old Metals.—The market is dull and barely steady, with dealers' selling prices, New York, nominally unchanged, as follows:

	Cents.
Copper, heavy cut and crucible	12.00 to 12.25
Copper, heavy and wire	11.50 to 11.75
Copper, light and bottoms	10.75 to 11.00
Brass, heavy	8.00 to 8.25
Brass, light	6.75 to 7.00
Heavy machine composition	10.50 to 10.75
Composition turnings	8.75 to 9.00
Clean brass turnings	8.00 to 8.25
Lead, heavy	4.20 to 4.25
Lead, tea	3.75 to 4.00
Zinc, scrap	4.25 to 4.30

Chicago.

JULY 18.—The copper market has been active. Tin and lead are also in good demand. Spelter is quiet. Prices fluctuated during the week and at this writing we quote, Chicago delivery, as follows: Casting copper, 12.65c.; lake, 13.00c., in carloads, for prompt shipment; small lots, ¼c. to ⅜c. higher; pig tin, carloads, 44c.; small lots, 46c.; lead, desilverized, 4.47½c. to 4.50c. for 50-ton lots; corroding, 4.72½c. to 4.75c. for 50-ton lots; in carloads, 2½c. per 100 lb. higher; spelter, 5.65c. to 5.70c.; Cookson's antimony, 9¼c., and other grades, 8¼c. to 8¾c., in small lots; sheet zinc is $7.50 f.o.b. La Salle, in carloads of 600-lb. casks. On old metals we quote for less than carload lots: Copper wire, crucible shapes, 10¾c.; copper bottoms, 9½c.; copper clips, 10¼c.; red brass, 9½c.; yellow brass, 7½c.; lead pipe, 3.90c.; zinc, 3.00c.; pewter, No. 1, 26c.; tin foil, 33c.; block tin pipe, 37c.

St. Louis.

JULY 18.—The metal market retains its firm condition and prices are well held here except tin, which shows the effect of the manipulators' work. The quotation here is 43.72½c. against 44.85c. last week. The demand is good. Lake copper stands at 13.10c. and electrolytic at 13c., both the same as last week, but well held and the demand good. Cookson's antimony remains unchanged at 8.85c. Lead continues in good request with the last quotations at 4.37½c. to 4.40c. Spelter is firm at 5.60c. Railroad requirements in the metal market are having some effect on the stiffness of the prices. In the ore market at Joplin blende prices have been a little weaker during the past week, ranging from $42 per ton down to $38, on a basis of 60 per cent. metallic zinc, though choice lots have brought as high as $44 per ton. The contract system of selling which was inaugurated six months ago expired the past week, but virtually all producers have renewed for another six months' period. Calamine is bringing $21 to $23 per ton on a 40 per cent. assay, choice ore running as high as $26. Lead ore brought during the week $56 to $58. Shipments continue heavier than for the same week last year. Old metals are quoted as follows: Light brass, 5c.; heavy brass and light copper, 8c.; heavy copper and copper wire, 9c.; zinc, 3c.; lead, 3¼c.; pewter, 20c.; tin foil, 29c.; tea lead, 3c.

The German Iron Market

Abrupt Improvement in Bars

BERLIN, July 7, 1911.—Conflicting price tendencies are apparent in the iron trade, especially with bars, the most important section of the trade. It has been mentioned at various times in this correspondence that bar prices have for several months been declining, but this tendency has apparently been reversed, so far as export business is concerned. While ordinary basic steel bars were quoted at 89 to 90 marks per ton, f.o.b. Antwerp, as recently as the last week of June, a sudden rise to 93-94 marks has occurred since then, caused by the arrival of heavy orders from Japan and India. It is added that many of the big establishments now have orders running till late into the autumn as the result of this recent business. Bar prices in the home market have at least been steadied by this change in the foreign trade, although the downward movement continued until a week ago. On the Düsseldorf Exchange last week bars were quoted at 98 to 103 marks, as compared with a previous price of 101 to 105 marks. At the same time several organizations of dealers marked down the price of bars, plates and bands by 5 marks per ton for anything rolled to order and 10 marks for ordinary sizes from stock. It is reported this week, however, that the mills are asking better prices in the home market, as the natural result of the improvement in foreign business. Sales are now being made mostly at 99 to 102 marks, though some selling is still reported at lower prices. The mills are expecting a still greater improvement in bar prices for home delivery, if the latest market dispatches are to be believed.

The Pig Iron Syndicate

Much interest in the fate of the Pig Iron Syndicate is still manifested. After the Gutchoffnungs-Hütte put forward its demand for a big increase in its allotment, as previously mentioned, the period for giving notice of withdrawal from the syndicate was prolonged till tomorrow in the hope that this concern would withdraw its demand after maturer reflection. In the meantime, however, the Mathilden-Hütte in Harzburg, has given notice of its withdrawal, but it is believed that this is only a step toward negotiating for bigger allotments. A conference with the Lorraine-Luxemburg group of furnaces has been held, with the result that they declared their willingness to join upon suitable terms.

The May return of the Steel Works Union shows the largest production ever reached in the B products (bars, rods, plates, tubing, etc.). The production of bars amounted to 317,566 tons, against 288,460 tons in April, and 271,000 tons in May, 1910. Wire rods were returned at 71,297 tons, plates at 95,197 tons—both figures denoting records.

THE IRON AND METAL MARKETS

Pig Iron Imports Increasing

The foreign trade returns for June show a sudden increase in imports of pig iron. These amounted to 19,047 tons, against 9155 last year. Exports of pig reached 60,160 tons, against 58,443; blooms and ingots, 41,977, against 31,505; beams, 27,259, against 42,474; rails, 28,888, against 46,278, and ties, 6188, against 13,217.

The past fortnight has been a time of unusual activity in fusions and community of interest arrangements in the iron trade. The agreement between Deutsch-Luxemburg and the Nümelingen-St. Ingbert works, previously mentioned in this correspondence, has now been perfected. It puts Deutsch-Luxemburg in control of very valuable ore properties in the vicinity of its Diffendingen plant. The directorates of the Rheinische Stahlwerke and the Balcke, Tellering Company have also worked out a plan for a community of interest arrangement under which the two companies are to be operated in common for 30 years, and the profits distributed in a fixed ratio. The latter is a tubing mill. Several years ago it paid regularly dividends of 8 to 10 per cent., but its latest was only 5 per cent. Hence the Rheinische Stahlwerke got control of it at very favorable terms, provided the agreement goes through.

The Absorption of Coal Mines

The absorption of coal mines by iron companies also continues. The Budorus Eisenwerke of Wetzlar, which has hitherto been without a fuel supply of its own, has annexed the Massen Coal Company. Budorus gives 8,400,000 marks of its own stock for the mine, bringing its capital up to 22,000,000 marks. A more important fusion, which is still under negotiation, is that of the Koelner Bergwerkeverein with the Krupp Company. The former is one of the most profitable coal mines in Germany; its dividends during the past 10 years have ranged between 25 and 30 per cent. It holds allotments of 904,000 tons of coal and 253,000 tons of coke in the Coal Syndicate. Although the Krupp Company owns three coal mines it has to buy about 1,000,000 tons of the 1,700,000 tons of coke consumed yearly. In this connection it may be mentioned that Krupp, according to a report emanating from Luxemburg, has recently acquired about 500 acres of land in Normandy for the purpose of establishing an iron and steel plant there. It was recently mentioned in this correspondence that the iron magnate, Thyssen, had begun to build a furnace plant in that region.

According to a report of the Bamburg Chamber of Commerce the ore discoveries in Franconia, already mentioned in these letters, turn out to be considerably more valuable than at first indicated. Already about 250,000 acres of claims have been taken up. About 1000 shafts are into the ore, which is only 4 to 7 feet below the surface and is 9 to 13 ft. thick. The ore can be taken out by open mining. Development work is being vigorously pushed forward.

Iron and Industrial Stocks

NEW YORK, July 19, 1911.

A very dull period has been experienced on the stock exchanges. On some days no transactions whatever occurred in some of the leading stocks. Values have been quite steadily held and in some instances good advances have taken place. The range of prices on active iron and industrial stocks from Wednesday of last week to Tuesday of this week was as follows:

Beth. Steel, com.	32 - 33¼	Railway Spes., com.	36¼ - 37
Beth. Steel, pref.	60 - 62⅝	Republic, com.	29⅜ - 30
Can., com.	11 - 11¾	Republic, pref.	93⅜ - 93⅞
Can., pref.	85¾ - 87	Sloss, com.	48¼ - 49
Car & Fdry., com.	56 - 57⅜	Sloss, pref.	112
Car & Fdry., pref.	117¾	Pipe, pref.	56½
Steel Foundries	38⅝ - 40	U. S. Steel, com.	78¾ - 79⅛
Colorado Fuel	34⅝ - 36	U. S. Steel, pref.	118¾-118⅞
General Electric	161¾-162½	Westinghouse Elec.	75¼ - 75½
Gr. N. Ore Cert.	60¾ - 61	Va. I. C. & Co.	86 - 88
Int. Harv., com.	122 -122¾	Am. Ship, com.	57 - 58
Int. Harv., pref.	124 -124½	Am. Ship, pref.	112
Int. Pump, com.	41 - 42½	Chic. Pneu. Tool	50½ - 52
Int. Pump, pref.	88⅞ - 89½	Cambria Steel	44¾ - 45¼
Locomotive, com.	40 - 41	Lake Sup. Corp.	25¾ - 27
Locomotive, pref.	108	Warwick	10
Nat. En. & St., com.	18 - 20	Crucible Steel, com.	12¾ - 13
Nat. En. & St., pref.	94½ - 96½	Crucible Steel, pref.	81½ - 82⅝
Pressed Steel, com.	36 - 36⅞	Harb. Walk Ref., pref.	98

Dividends Declared

The Columbia Weighing Machine Company semi-annual 4 per cent on preferred and 4 per cent on common, payable July 11.

The Canadian Car & Foundry Company, Lmt., quarterly 1¾ per cent on the preferred, payable July 25.

The Plymouth Cordage Company, quarterly 2 per cent. payable July 20.

The International Harvester Company quarterly 1¾ per cent on preferred, payable August 1.

The Porceliron Stove Company

The above-named company, recently incorporated with a capital stock of $25,000, under the laws of Pennsylvania, has leased a plant at Beaver Falls, Pa., which contains about 75,000 sq. ft. of manufacturing space. New machinery, consisting of emery grinders, drill presses and other equipment, is now being added. The company is in the market for machinery for polishing the tops of cooking ranges, the bodies of which will be of porceliron. The company will be in a position to contract for stove castings in about two weeks. It will also require a lot of miscellaneous fittings, such as gas valves, etc. The finished product will be porceliron cooking stoves, which will have advantages in being light, clean and attractive. Ernest Richardson is president; Lewis Ingram, vice-president; M. N. Hurd, secretary and treasurer. The product will be on the market about the latter part of September.

An Improved Hydraulic Testing Plant

The Worcester Polytechnic Institute, Worcester, Mass., has been given funds for the erection of a new building for the hydraulic testing plant in the neighboring town of Holden. The structure will be 32 x 36 ft., one story and basement, and will inclose a flume in which two vertical Hercules water wheels will be installed, working under a head of 14 ft., and developing about 40 hp. An interesting feature of the equipment will be apparatus for testing all kinds of gear drives including spur, bevel and worm gears, and also belt and rope drives of different types. In the basement the opportunity will be offered to rate Pitot tubes in pipe lines of various sizes. The hydraulic station is already well equipped for this work and the new laboratory will extend the usefulness still farther.

Safety as Applied to Grinding Wheels

The Norton Company, Worcester, Mass., has published an instructive pamphlet entitled "Safety as Applied to Grinding Wheels," which must be of much interest to every user of grinding machinery. A second title is "Preventive and Protective Safeguards—Modern Devices Which Can Be Practically Applied in the Use of Grinding Wheels and Machines." The company has given the subject a great deal of attention and has developed a number of efficient safety devices which are illustrated and described in detail in the pamphlet. Attention is also paid to the correct practice in mounting wheels, which, in itself, is a means of preventing accidents. Other topics taken up are glass shields, the leather spark brush, glasses and goggles and dust systems. Yet another subject is speed changing, attention being paid to devices for eliminating the danger of overspeeding. The company's machine for testing grinding wheels is shown.

The Union Steel Casting Company, Butler street, Pittsburgh, manufacturer of steel castings, Union truss roof annealing boxes, etc., reports that its new additions are coming along nicely. The McClintic-Marshall Construction Company is erecting the steel buildings and foundations have been placed for the two new 25-ton open-hearth furnaces. Contracts for the other equipment have been awarded and it is expected that the new plant will be ready for operation early in October.

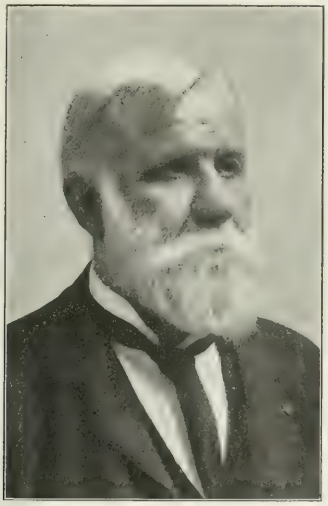
The C. W. Raymond Company, Dayton, Ohio, manufacturer of clay working machinery, has taken an order from the Admantine Clay Products Company, Martinsburg, W. Va., for a complete equipment to manufacture 50,000 paving blocks per day. Included are a power plant, low frame pans, an 888 machine, No. 2 cutting table and all auxiliary apparatus, as well as metallic radiation dryer tunnels. A producer-gas-fired continuous kiln will burn all the brick manufactured.

Obituary

Oscar J. Beale

Oscar J. Beale, Providence, R. I., died July 16, aged 68 years. He was born in Dover, Maine, and his early life was spent on a farm. In 1856 he moved to Winthrop, Maine, where his first mechanical experience was gained. During the years following he was gathering mechanical knowledge, principally in Portland and the Portsmouth Navy Yard, and in April, 1869, he went to Providence and entered the employ of the Brown & Sharpe Mfg. Company, then located in the old shop on South Main street. In 1872 he became chief inspector.

Mr. Beale showed mechanical ability at once. Among his first inventions was the odontograph. In 1885 he became a designer. His best work has been the producing of accurate standards of measurements in the designing of measuring machines and in the perfecting of machinery for making accurate graduations. For his



OSCAR J. BEALE.

work in the study of measurements he received a diploma of honorable mention at the Columbian Exposition in 1893. Afterward the Louisiana Purchase Exposition awarded him a silver medal for being a collaborator with the Brown & Sharpe Mfg. Company.

He made the standard yard used at the factory and when it was taken to Washington it was found to be accurate to within 0.00002 in. He invented the automatic bevel gear generating machine and contributed many improvements of a varied sort which have materially benefited modern manufacturers. Many patents were taken out by him. He wrote extensively for the technical press, his articles possessing that authority which commands attention. He also produced two books of authoritative value, a "Handbook for Apprenticed Machinists," and a "Practical Treatise on Gearing."

Robert B. Humphryes

Robert B. Humphryes, Mansfield, Ohio, died July 10, aged 65 years. He had been in ill health for a number of years, but the immediate cause of his death was paralysis. He was one of the founders of the Humphryes Mfg. Company, maker of hand and power pumps of iron and brass. Born in Newark, N. J., he went to Mansfield in 1884 and in connection with his brother John organized the company. For a number of years he held the position of superintendent. On the death of his brother, who was general manager, he assumed the duties of general manager along with those of superintendent. These positions he held until he retired from the active conduct of the business, due to his decline in health. He continued to hold a connection with the company, acting as its vice-president and as a



ROBERT B. HUMPHRYES.

member of the board of directors. In his residence at Mansfield of 27 years he had become one of the city's most highly respected business men.

HARRY A. FENNERTY, Pittsburgh, for 14 years purchasing agent of the Carnegie Steel Company in that city, died July 12. He was for a time employed by the Pennsylvania Railroad and about 23 years ago became connected with the Carnegie-Phipps Company, starting in the voucher department. He was a member of the Duquesne Club, Pittsburgh Country Club and Pittsburgh Athletic Association. He leaves a widow and a son.

CHARLES S. EATON, Olympia, Wash., a member of the pig iron house of Thomas A. Mack, Cincinnati, Ohio, from 1884 to 1890, died suddenly July 14, while on a fishing trip near his home, aged 55 years. He was a brother of Frank M. Eaton, resident partner of Hickman, Williams & Co., and W. G. Eaton, of Eaton, Rhodes & Co., Cincinnati pig iron merchants.

JAMES MACKAY, long prominently identified with the heating industry and for some years a manufacturer of house heating boilers and equipment as an officer of the Kellogg-Mackay Company, Chicago, died at his home in that city, July 18, after a few weeks' illness with typhoid pneumonia. He was born in Montreal, on November 25, 1853, and began his career at the age of 13 years as apprentice in a tinsmithing, plumbing and heating business. He went into business for himself in Montreal, was later an active representative of the American Boiler Company and he helped to organize the Kellogg-Mackay-Cameron Company, which later became the Kellogg-Mackay Company. He was president of the American Society of Heating and Ventilating Engineers in 1908 and made many valuable contributions to heating engineering.

MAJOR C. BROOKS, president of the Southwark Foundry & Machine Company, Philadelphia, died suddenly, July 19, from heart disease, aged 67 years. He won the rank of major in the civil war.

It is announced that the proceedings of the Congress of Technology, held in Boston April 10 and 11, will be published. The single volume of about 500 pages, which will be sold at a moderate price, will contain the technical papers, numbering over 70, relating to many fields of industry, which were read at the celebration of the fiftieth anniversary of the granting of the charter of the Massachusetts Institute of Technology.

Personal

The steamship Olympic, which arrived at New York on Wednesday, brought from Europe James A. Farrell, president of the United States Steel Corporation, and Charles M. Schwab, president of the Bethlehem Steel Company.

John W. Gates has been lying at the point of death in Paris for the past week, but hopes of his recovery are now entertained.

From Youngstown, Ohio, comes the report that E. M. Wilson, who has been chosen president of the Pacific Coast Steel Company, San Francisco, Cal., was a former Youngstown attorney and held the office of probate judge in Mahoning County, Ohio, for a term. He then entered the iron business, in which he met with success. With him are interested Thomas Piggott, an experienced blast furnace man, and William Bert, an accountant experienced in steel work, both formerly of Youngstown. The Pacific Coast Steel Company recently took over several plants on the Pacific coast, including works at San Francisco, Portland, Ore., and Seattle, Wash.

George D. Evans, formerly in charge of the Bray continuous sheet mill of the American Sheet & Tin Plate Company, Sharon, Pa., and now superintendent of the Carnakan Tin Plate & Sheet Company, Canton, Ohio, is seriously ill, and little hopes are entertained for his recovery.

Richard G. Wood, vice-president of the Alan Wood Iron & Steel Company, Philadelphia, has been elected president, succeeding the late Howard Wood. Jonathan R. Jones, formerly secretary and treasurer, has been elected vice-president and treasurer. W. W. Lukens has been elected secretary and assistant treasurer.

C. S. Lomax, formerly American representative of the Coal Distillation Company, 1211 Singer Building, New York, is now employed by Dr. F. S. Pearson. Thomas Littlehales, for many years connected with the American Coke & Gas Construction Company, Camden, N. J., has been appointed to succeed Mr. Lomax.

W. A. Sterns has resigned as mechanical engineer of the Louisville & Nashville at Louisville, Ky., to become assistant to the chief mechanical engineer of the American Steel Foundries at St. Louis.

J. C. Hussey, of the publicity department of the American Tool Works Company, Cincinnati, Ohio, has gone on a vacation trip to Canada.

W. L. Friedlander, president of the Hisey-Wolf Machine Company, Cincinnati, Ohio, has returned from a few weeks' vacation in Canada.

James N. Heald, treasurer and manager of the Heald Machine Company, Worcester, Mass., has returned from a six weeks' European trip in which he combined business with recreation.

R. A. Rung, who was lately connected with the selling force of the New York offices of Schuchardt & Schutte, has gone to Vienna, where he will take charge of the Austrian territory for the Allied Machinery Company of America.

E. W. Patten, lately of the New York offices of Schuchardt & Schutte, has joined the sales force of the Marshall & Huschart Machinery Company, Chicago.

Louis P. Zimmerman, Cincinnati, correspondent of the Iron Trade Review, has resigned to engage in business on his own account in Minneapolis, Minn.

C. N. Thorn has resigned his position of purchasing agent of Hugh Kelly & Co., New York, to become affiliated with the Allied Machinery Company of America, New York, in the capacity of assistant general manager.

J. J. Chisholm, formerly chief engineer of power house of the Westinghouse Electric & Mfg. Company, East Pittsburgh, Pa., has assumed the duties of superintendent of power for the Tennessee Coal, Iron & Railroad Company, Ensley, Ala.

W. A. Grieves, manager of the employment department of the Jeffrey Mfg. Company, Columbus, Ohio, has been appointed by Governor Harmon as one of the Board of Awards under the new Ohio employers' liability law.

Robert Wuest, commissioner of the National Metal Trades Association, has returned from a six weeks' trip to Europe.

W. R. Grace, vice-president and treasurer of the Ingersoll-Rand Company, 11 Broadway, New York, has returned from Europe after a two months' absence.

Ingram-Richardson Improvements. — The Ingram-Richardson Mfg. Company, Beaver Falls, Pa., manufacturer of enameled metal signs, has built an extension to its boiler house in which it has installed a new Erie City 150-hp return tubular boiler, a 320-hp Buckeye engine direct connected to a 200-kw Crocker-Wheeler generator for lighting and power purposes and a new switch board. Under erection is a new pickling department, of brick and steel construction, 50 x 50 ft., in which a pickling machine, special drying furnaces, portable tracks for a new industrial system, etc., are to be installed. A. M. Allen & Co., Cleveland, Ohio, made the plans for this work. A new carpenter shop is being added; it is of frame construction, about 50 x 50 ft., and the equipment has been purchased. The company is also rearranging its machinery for grinding enamels, each machine to have its individual motor. Part of these have already been equipped. The motors required range from 10 to 30 hp each.

Railroad Equipment Orders.—Orders for railroad equipment have been given out as follows: The Canadian Northern, 20 consolidation locomotives and 200 box cars; the Proctor & Gamble Company, in the market for 100 tank cars; the Chicago, Memphis & Gulf, in the market for 100 box and flat cars; the Havana Central, Cuba, in the market for 300 to 400 box cars; the Boston Elevated making inquiries for 50 car bodies.

The Hercules Motor Truck & Car Company, Grove City, Pa., manufacturer of commercial motor trucks, has been testing its first car for the last two months. The test having proved satisfactory, the Bessemer Gas Engine Company, also of Grove City, purchased the machine. It will be used in transferring material and engines from one department to another and between the plant and the freight stations. The Hercules Company expects to have more motors ready to test out within the next 60 to 90 days.

The Wheeling Corrugating Company, manufacturer of sheet metal and sheet-metal products, Wheeling, W. Va., on September 1 will open a branch office and warehouse at Tenth and Hickory streets, Kansas City, Mo. Large stocks of all lines will be carried for prompt delivery. The branch will be in charge of H. J. Morgan, who has been assistant manager of St. Louis. A goodly number of salesmen will travel the territory. This is the sixth of a chain of large distributing stations.

The Puxico Iron Company, Pilot Knob, Mo., miner of brown and specular iron ore, states that it has placed the old Pilot Knob mine in a good, lively producing state, notwithstanding the skepticism of many who scoffed at the attempt to operate the property again.

The working of the Japanese protective tariff, which went into effect July 17, is shown in the placing with Japanese mills of some 4000 tons of light structural material for electric power transmission towers. Designs and tenders had been received from American steel interests, but the contract was not secured. The towers, 1,258 in all, are for use in conducting electricity from the plant of the Kinugawa Hydro-Electric Power Company at Shimotaki to Tokio, 77 miles distant. It is understood that Japan is also to furnish the copper transmission wire.

The steamship Harvester, built for the Wisconsin Steel Company, subsidiary of the International Harvester Company, was launched July 15 at the Lorain yard of the American Shipbuilding Company. The Harvester is the third vessel to be built on the lakes of the Isherwood construction. This boat is 545 ft. long with 58-ft. beam.

The city of Erie, Pa., has employed the firm of Chester & Fleming, consulting engineers, Pittsburgh, to prepare preliminary plans and estimates for extensive improvements to the water works system.

The Georgian Mfg. Company's Proposed Enlargements.—The Georgian Mfg. Company, Binghamton, N. Y., will erect an addition to its machine shop, 64 by 175 ft., two stories and basement, of the gallery type. It will be used for the machining of the company's iron and brass valves, the demand for which has so increased that an enlarged capacity has become necessary. The building will be of concrete, brick and steel. Electric traveling cranes will serve the shop floor, and each line shaft will have its individual motor. The machinery will be of the company's special design. Increased facilities for testing and assembling the new output will be provided, and upon the completion of the building, which should be within 90 days, the working force will be enlarged 50 per cent. The company's product is sold through the Fairbanks Company, 416 Broome street, New York City.

The Robertshaw Mfg. Company.—This company has secured quarters in a building located at Ferry and Water streets, Pittsburgh, where it is installing a line of lathes, drills, grinders, etc., for the manufacture of Robertshaw thermostats, Excelsior ball cocks and brass machine work. Frederick W. Robertshaw, superintendent of the Acheson Mfg. Company, Rankin, Pa., has severed his connection with that concern to take charge of the first-mentioned company. He is well known in plumbing circles, and the sale of his plumbing specialties has increased to such an extent that it is necessary for him to increase the facilities for their manufacture, besides giving the business his individual attention.

A. M. Byers & Co., Inc., Pittsburgh, will place 46 puddling furnaces in operation July 31, with its No. 2 puddling mill which will give employment to 200 additional workmen. The company has not yet awarded the contract for another continuous heating furnace for the 72-in. mill and may not take such action for some time, although the installation is being considered. It is installing a Hughes gas producer, similar to the one now being operated. This will be ready for operation in August.

The Stove & Range Company of Pittsburgh has recently made some changes among its officials as follows: G. W. J. Bissell, formerly president, has been succeeded by William H. Schoen, well known in manufacturing circles. John S. Graham, former secretary and treasurer, recently resigned owing to ill health, has been succeeded by H. E. Porter. H. M. Baldwin continues as vice-president and manager of sales. The company has moved its offices from Robinson and Darragh streets, North Side, Pittsburgh, to suite 907 Columbia Bank Building. This building is centrally located and enables the company to handle its business to better advantage.

The business of J. P. Kemp, 19 East Lombard street, Baltimore, Md., will hereafter be carried on under the name of the Kemp Machinery Company. S. V. Kemp, who has had a wide experience in practical mechanical and engineering work, has become associated with the business. The company will specialize on machine tool equipments and is the authorized representative of a number of well-known manufacturers, including the Lodge & Shipley Machine Tool Company, Cincinnati Milling Machine Company, Cincinnati Bickford Tool Company, Cincinnati Planer Company, Colburn Machine Tool Company, Acme Machine Tool Company, Mechanics Machine Company, Gould & Eberhardt, Lea Equipment Company and Loew Mfg. Company.

S. N. Craig, vice-president of the Treadwell Construction Company, Midland, Pa., states that his company contracted last month with the Los Angeles Aqueduct Commission for five steel syphons, which will require 4200 tons of plates and 300 tons of rivets, to make pipes 9 ft. 3 in., 10 ft. and 11 ft. in diameter. The plates and rivets for this work are to be furnished by Pittsburgh makers. This contract, with other plate work, consisting principally of tanks, ladles, etc., will give the Treadwell Construction Company approximately five months' work.

A patent on a cinder car was granted July 11 to Erwin Sherman, Youngstown, Ohio. It has been assigned to the William B. Pollock Company, Youngstown. The patent number is 997,630.

Amalgamated Scale Signers

The national office of the Amalgamated Association of Iron, Steel and Tin Workers has received signed scales from the following mills:

Pope Tin Plate Company, Steubenville, Ohio.
Follansbee Brothers Company, Follansbee, W. Va.
N. & G. Taylor Company, Cumberland, Md.
Empire Iron & Steel Company, Niles, Ohio.
National Enameling & Stamping Company, St. Louis, Mo., and Granite City, Ill.
Zug Iron & Steel Company, Pittsburgh, Pa.
Youngstown Iron & Steel Company, Youngstown, Ohio.
American Rolling Mill Company, Middletown, Ohio.
Newport Rolling Mill Company, Newport, Ky.
Whitaker-Glessner Company, Wheeling, W. Va., and Martins Ferry, Ohio.
Thomas Steel Company, Niles, Ohio.
Cleveland Hardware Company, Cleveland, Ohio.
Tyler Tube & Pipe Company, Washington, Pa.
Texas Rolling Mill Company, Ft. Worth, Texas.
Licking Rolling Mill Company, Covington, Ky.
Carnahan Tin Plate & Sheet Company, Canton, Ohio.
De Forest Sheet & Tin Plate Company, Niles, Ohio.
Pittsburgh Forge & Iron Company, Pittsburgh, Pa.
Lockhart Iron & Steel Company, Mckees Rocks, Pa.
Standard Chain Company, Columbus, Ohio.
Inger Rolling Mill Company, Joliet, Ill.
Republic Iron & Steel Company for its works as follows: Mahoning Valley Works, Youngstown, Ohio; Brown-Bonnell Works, Youngstown, Ohio; Inland Works, East Chicago, Ind.; Tudor Works, East St. Louis, Ill.; Sylvan Works, Moline, Ill.; Toledo Works, Toledo, Ohio; Gate City Works, Gate City, Ala.
American Car & Foundry Company, Detroit, Mich.
Empire Rolling Mill Company, Cleveland, Ohio.
Ft. Wayne Rolling Mill Co., Ft. Wayne, Ind.
Highland Iron & Steel Company, Terre Haute, Ind., and Blue Island, Ill.
Interstate Iron & Steel Company, East Chicago, Ind.
Helmbacher Forge & Rolling Mill Company, St. Louis, Mo., and Madison, Ill.
Kansas City Bolt & Nut Company, Kansas City, Mo.
Lake Erie Iron Company, Cleveland, Ohio.
National Rolling Mill Company, Vincennes, Ind.
Ohio Falls Iron Company, New Albany, Ind.
Railway Steel Spring Company, Detroit, Mich.
Union Rolling Mill Company, Cleveland, Ohio.

Air Compressors for Light Work.

The Automatic Pittsburgh Air Pump Company, Inc., Pittsburgh, has erected a manufacturing building of fireproof construction. It is equipped with motor-driven machine tools which were furnished by the Brown & Zortman Machinery Company, Pittsburgh. The motors were manufactured by the Burke Electric Company, Erie, Pa. The company's products are direct-connected, motor-driven air compressors, automatic and non-automatic; also belt-driven compressors for all purposes, from 25 to 150 lb. pressure per square inch. Its principal lines of manufacture are air compressors for bar purposes, deep wells, whitewashing, paint spraying and garage use. Mounted on automobiles, these compressors do away with cranking in starting the engine and take care of tire troubles. An illustrated folder describes the several designs. H. E. Hunt is president; F. U. Price, vice-president; A. S. Manchester, secretary, and S. H. Bennett, treasurer. The plant is in full operation on miscellaneous orders.

The Republic Iron & Steel Company is operating six out of eight open-hearth furnaces at its Haselton, Ohio, plant, while the Brown-Bonnell and the Mahoning Valley Works, both at Youngstown, are being operated to capacity. The 6-in. and 18-in. finishing mills and the old puddle mill at the Mahoning plant resumed work last week. The company has been somewhat delayed in completing its new office building at Youngstown, but it will be ready for occupancy August 20, when the general offices now located in the Oliver Building, Pittsburgh, will be removed to Youngstown.

The Slatington Rolling Mills is the name of a new corporation which has been formed to take over the entire plant and good will, exclusive of the book accounts, of the Slatington Rolling Mill Company at Slatington, Pa., in the Lehigh Valley. The new company is making alterations and repairs and expects to have the plant completely overhauled and in readiness to operate within a few months. The superintendent of the plant has had long experience in manufacturing high-grade bar iron.

The Lawlor Molding Machine Company has moved its offices from the Century Building to the headquarters of the Union Foundry & Machine Company, on West Carson street, Pittsburgh. The latter concern makes the Lawlor line of jarring and squeezing machines, and the Lawlor Company considered it desirable to locate at the plant.

International Iron and Steel Conference

No Association Formed at the Brussels Meeting, but the Whole Matter Is Referred to a Committee Representing the Different Countries

(EDITORIAL CORRESPONDENCE)

BRUSSELS, BELGIUM, July 5, 1911.—The American delegation to the international iron and steel conference recognized Independence Day by holding an informal dinner at the Laiterie in the Bois de la Cambre, one of the numerous fine parks which are the pride of Brussels. The affair was organized in the afternoon of July 4, and was participated in by nearly all the American contingent, including the ladies of the party. The Baron and Baroness von Bodenhausen were also present. E. A. S. Clarke was introduced by Mr. Butler as toastmaster, and remarks were made by C. M. Schwab, E. C. Felton, Willis L. King, Powell Stackhouse, James A. Campbell and T. J. Drummond, who spoke for Canada. The speakers, as guests in a foreign city, avoided mere glorification of their home country, dwelling rather on the pleasant auspices under which they were gathered and the good fellowship which existed, heightened as it was by the spirit of the great national holiday.

A particularly pleasant incident of the late evening was the addition to the American party of a number of representatives of Great Britain who had been dining in the same garden. Following the demonstration which marked their entrance, Sir Hugh Bell spoke most felicitously and was roundly applauded.

BRUSSELS, BELGIUM, July 6, 1911.—The Brussels conference of American and European iron and steel manufacturers, which has been looked forward to as of much significance to the world's iron trade, adjourned today. The first session, held yesterday morning, really compassed all the formal action of the meeting—the passing of a resolution referring to a committee the whole question of an international iron and steel association—and the brief second session of today was simply for the announcement of the membership of the committee.

The convention did not undertake to decide whether the proposed association is desirable or feasible, though the tenor of the discussions was favorable, and the size and character of the delegations, especially from the leading steel producing countries, indicated that the idea had taken a strong hold on some of the most important interests engaged in international trade.

It is of more than passing moment that the American type of publicity in matters affecting important industries was indorsed by the convention when it decided to have all its proceedings reported by stenographers and afterward printed in full and given to the press. Meantime, however, only an outline of the transactions is available.

The committee in whose hands now rests the question of an international organization on the lines of the American Iron and Steel Institute may report for or against the proposal, and it is empowered to call another international meeting whenever it has a report ready. It appears, therefore, that the movement, to which some impetus was given by the international iron and steel conference in New York last October, will require time in proportion to the magnitude and diversity of the interests involved.

Full Representation of Important Companies

What makes the meeting most remarkable was the very full representation of the important iron and steel companies in the respective countries. Counting the American delegation as standing in a sense for all the membership of the American Iron and Steel Institute, it may fairly be estimated that fully 80 per cent. of the world's steel production was represented. No such gathering of steel manufacturers has ever been held, and outside of the United States (and possibly Germany) no meeting in any of the countries has brought together so full a representation of its steel producing capacity.

There is no large basis for prediction as to the final outcome of the conference. Its immediate result is the formation of an acquaintance and friendliness among international competitors. Much weight is given in the informal discussion of its fruits to the fact that so many of the chief men in the industry in the leading countries of Europe were willing to come together even to consider cooperation.

It hardly need be said that the single important resolution passed had little in it to bring out differences of opinion and that its adoption gives no indication of what sort of organization, if any, could be formed or what would be its scope and its influence on the international trade in steel. It may be doubted if any cooperative movement is possible which would have a very direct or widespread effect upon prices, and no serious thought need be given to any newspaper talk of an international steel trust. International commercial rivalry is too strong to be much affected by any such mild mannered movement as is now talked of, taking form in some sort of international advisory committee. It was suggested in the discussion of Wednesday morning that there is much more in cooperation among steel manufacturers than the question of prices, which is ordinarily put first. A manufacturers' organization, it was pointed out, might aid in the unification of specifications—a work on which the engineering societies have been making commendable progress. It might also give direction to the betterment of labor conditions, as has already been done in the United States in the face of not a little cynicism and distrust.

Since the United States started the international movement and is the country in which cooperation among producers is looked upon with most suspicion, it is evident that developments in our own country will have much to do with further organization. It may be that a provision for national incorporation of American consolidations, with some legislation by which, under government advice and oversight, the large producers of steel and other commodities may know more clearly what they may do lawfully in respect to production and prices, will have to precede any important action in conjunction with steel producers abroad—that is to say, action affecting generally the international trade in iron and steel.

The First Day's Meeting

The sessions were held at the Salles des Fêtes, of the Restaurant de la Monnaie, and that of Wednesday, July 5, was called to order at 10:30 o'clock by A. Greiner, of the Cockerill Works, Seraing, Belgium. On his nomination Judge E. H. Gary was made chairman of the convention, and W. B. Peat, London, England, of the auditing firm of W. B. Peat & Co., was chosen secretary. In outlining the objects of the meeting Judge Gary spoke as follows:

Judge Gary's Speech

As one of the large number who are responsible for bringing together this large assemblage of distinguished representatives of the iron and steel industry throughout the world, I beg to express grateful appreciation of your presence.

I am most unfortunate in being unable to speak a language or languages understood by all who honor me by their attention. It may be suggested, however, that many of us have learned by experience that our hearts speak the same language and that our instincts concerning everything worthy are the same; that to know what is the best thing and the right thing to do, is the chief desire of all. The fact that so many leading men interested in one of the most important and competitive branches of industrial activity have voluntarily met to take one another by the hand is significant. The coming together from long distances to look one another full in the face with a confident desire to unselfishly advance the welfare of each other may excite surprise on the part of onlookers, but when understood should secure the admiration of all.

THE WORLD IS GROWING BETTER

In the long past, to a greater or lesser extent, business has meant business just as war has meant war, to use a common expression. We have been actuated by motives of

cupidity, we have been selfish, narrow and shortsighted. Our individual rights have been paramount to those of our neighbors.

In the treatment of competitors, customers and employees we have in some measure at least dealt at arm's length. Believing we were acting in self-defense—often forced to the conclusion—we have been quite inclined to extend the club rather than to offer the olive branch. And as the result of hasty conclusion, we have often been properly chargeable with injustice. To the extent we have thus governed our conduct we have not stood on the platform of good morals or good policy. We have brought upon ourselves unnecessary difficulty, trouble and loss. For the many disagreeable conditions sometimes appearing in connection with our various and varied responsibilities—known and realized by all of us and not necessary to be referred to in detail at this time—we are partly at fault. But the world is growing better. Nations are coming to realize that arbitration is better than war; that justice is superior to power; that the settlement of any question should be based upon what is right rather than upon the strength of arms or the power of money; and that for every reason, even from the selfish view, it is to the interest of every nation to secure and maintain the most intimate and friendly relations with all other nations.

Many of those who are here will live to see the day when war is a thing of the past and when every nation will adopt the sentiment that "right makes might," when all will be disposed to "live and let live."

IDEALS IN BUSINESS.

Is it saying too much to express the hope that representatives of the steel industry throughout the world, acting in harmony and presenting an undivided front, may be of use in assisting to bring about universal peace? It is believed that what can be and will be realized by nations is not impossible as applied to the every-day business life. That there are many difficulties in the way; that time and patience and above all honest effort and unreserved sincerity are requisite in order to reach a satisfactory solution, no thinking person will deny. The skeptic may, the practical and successful business man will, be tempted to shrug the shoulder, to say that we are groping in the land of dreams, that we are endeavoring to substitute ideas for practical results of experience. But on reflection who would not wish for ideals in business if it were possible to secure them? How much better and more comfortable it would be if we could at all times know that we had the approval and commendation of the general public; if we should never have any controversy, however good natured, with our employees; if our customers without exception were satisfied with our treatment; if healthy competition, however aggressive, should take the place of bitter and destructive competition.

Even a doubting Thomas would admit the desirability of all this; and if so he would be relegated to the claim that it is impossible; that long experience has taught that selfishness is the controlling element in the conduct of mankind.

Is it practicable and desirable? Let us for a moment deal in imagination. Suppose a company of men engaged in business, possessed of much capital and power and influence, should by conduct unjust or oppressive secure universal disapproval, disgust and antagonism on the part of the public. In a brief space of time these men would be driven out of business.

Suppose the producer of any commodity for sale should in any way within his power ill-treat all his customers How long before the producer would be in bankruptcy? Suppose the employer of labor manifestly treats the employed unfairly and cruelly. In a short time, as the result of action on the part of those interested, aided by public sentiment, a remedy would be found, and this after great interruption to business and loss of money.

Again, let us assume that during a given year the demand for a product equals less than half the capacity to produce, and yet each producer is greedy and anxious to sell more than his fair proportion and acts accordingly, and this attitude is maintained until the destructive results, which we all know, are almost certain to be realized.

These commonplace references may serve to present the question that it is at least practically beneficial to secure, if we can, the ideal in business; that from the viewpoint of good policy it is profitable to reach a position so high and so near perfection that at the first blush it appears to be Utopian

HOW TO BRING ABOUT BETTER RELATIONS.

It is insisted that the most intelligent consideration of these questions leads to the conclusion that it is the part of wisdom, even from a selfish, pecuniary standpoint, to conduct our affairs in such a way that we may not be justly reproached. But can we bring about the conditions which we so much desire? It is to be regretted that there seems to be no certain, easy and summary way of securing all that we might wish in this respect. Still we need not despair. If we have the right disposition, courage and patience and if we apply our highest thought, it is believed we may in the course of time reach a position which it will be a pleasure and an honor to occupy. If so, we shall have done something worth while for ourselves, and what is better, for all others who are dependent upon our attitude and conduct. The first essential is a thorough acquaintance with each other. This means that each must learn by actual contact and frequent intercourse how much merit and how little fault is possessed by all others; how desirous everyone really is to have the respect, the confidence and the affectionate regard of others; how mistaken each of us has been in supposing that his inclinations were better and fairer than those of others. There should be established and continuously maintained a business friendship which compels one to feel the same concern for his neighbor that he has for himself. It is no less in principle than the Golden Rule applied in business. Is it possible? If it is, it certainly will pay.

Many of you know by long and intimate acquaintance with others that all that has been suggested in regard to the desirability of reaching a satisfactory basis of business friendship is entitled to our most careful consideration. True it is that sometimes and too often deceit is practiced and advantages taken by those who have been given the confidence of others. But this fact should dishearten no one. Take, for example, any two men in this room who are engaged in competitive business, but who are sufficiently acquainted to have entire confidence in each other. Is there any doubt that in the daily conduct of their affairs neither will be disposed to do anything unneighborly or unreasonable toward the other, or that the acquaintance will bring to both better results than could be realized if they were unfriendly or engaged in a bitter and destructive competition. If they are in frequent discussion of the questions in which they are interested, freely interchanging opinions, frankly disclosing the conditions concerning their business, will not the individual conclusions reached by each naturally be of a higher order and more satisfactory in every particular? And the argument, if sound, applies with greater force whenever a large number are in the habit of meeting one another with the same spirit of friendship which exists with reference to the smaller number.

BUSINESS CONDITIONS IN AMERICA.

If it is pardonable to refer to conditions in America, for the reason that I am familiar with them, I should like to say that during the last few years there has been a wonderful demonstration of the possibility of applying, in matters of business, the principles of what have been termed conciliation and cooperation.

No doubt all present are acquainted with the facts. It is sufficient to say that as a result it is beyond question that the iron and steel industry there, taken as a whole, is on a higher and better plane than ever before that the methods generally pursued are far preferable to those of the days long since past. The interests of all those connected with the industry as well as others closely or remotely affected have been promoted. Frequent intercourse and intimate acquaintance have brought about respect and confidence. Knowledge by each of the business and methods of others has enabled every one to improve his practice, to lower his cost of production and administration and has influenced to a marked degree each one to have higher regard and greater consideration for those with whom he comes in contact, including those for whose welfare he is in a large degree responsible. There has been success in the movement on the only basis that any similar action can succeed—namely, results that are beneficial to all concerned and injurious to no one. We cannot prosper on any other lines and none of us would expect the contrary. What has been said of the steel industry in America no doubt can be said with greater force in respect to some of the other countries at least, which are far in advance of manufacturers in America in many particulars. In the ranks of real progress you occupy places which entitle you to the respect and admiration of all who are familiar with your attainments. Americans are pleased to recognize your ability, your skill and your wonderful success.

AMERICAN AND EUROPEAN RELATIONS.

It should go without saying, Americans are anxious to get and to keep near their European friends. We can and we wish to learn from you much that would be of profit to ourselves. We are not so mean as to pretend that close and abiding friendship with you is not of great advantage to us. We are, however, bold enough to come to the manufacturers of Europe with the same confidence that we would approach each other in our own country; because in the past you have in many ways, at all times and under all circumstances, furnished evidence of your unqualified esteem I need not say, indeed I am unable to express in words, that on the occasion of this visit we who come from

America have had from our brethren in Europe a reception and hospitality which for generous cordiality has never been excelled. Our gratitude is unbounded; our obligations beyond estimate; and whatever we may decide upon at this time, we hope the relations which now exist between all the members of the great fraternity engaged in the iron and steel industry throughout the world may never become less intimate than they are at present.

It has been the ambition and expressed wish of many who are present that there might be formed an international iron and steel association or an organization of some kind, which would be calculated to cement the existing fraternal relations and which might afford opportunity for the interchange of opinions and information between the iron and steel producers of the world, concerning all the questions relating to the industry—an organization distinguished from and broader in its scope and activities than the existing great and splendid institutions which have become so thoroughly established and which have potential force and influence in many directions.

THE NEED OF AN INTERNATIONAL ORGANIZATION.

Whether or not there is need for such an organization as the one now under discussion, or what would be the result, or whether or not the benefits to be derived are sufficient to justify the undertaking, are questions to be considered. It has seemed to me that if we could have a common meeting place where the iron and steel manufacturers of the world could meet for the discussion of economical, ethical and sociological questions it would be useful. It would appear that an institution having aims and objects like those I have suggested might be a great influence for good. If it stood for the ideals in business and should reach a measure of success in this respect we would have cause to be gratified with the results. Certainly it would be an honor to be enrolled on the list of membership. No member would be disposed to do anything dishonorable towards another member. I believe it feasible to organize and conduct an organization which would be valuable in its results. Necessarily it should be formed and managed so as to avoid any antagonism or interference with any other institution and so as to secure the approval of public sentiment. If all of us who are considering the matter approach the subject with the proper spirit, if we are in earnest, if we are frank and unselfish, we may accomplish much. Many will see difficulties, and there would be many, especially in administration. We may determine after full deliberation that what is proposed is not practicable although desirable; but it is worthy of our unbiased attention.

However high and commendatory our actions and objects, we must nevertheless exercise reason and prudence, looking far ahead for the purpose of seeing if possible what will be the effect upon our respective interests and upon those of others. I think all will agree that it is better to go right than to go rapidly; that all the matters involved should receive great deliberation before final conclusion. If so, I would suggest that if after full discussion we decide that the question of forming an international association has merit, we should at this meeting appoint a committee, made up, say, of two or three from each country to consider the whole subject and report their conclusion and recommendation at a future meeting to be determined upon and called by the committee.

Whatever may be the decision, I beg to express the hope that the bonds of business friendship which now bind us together may never be loosened; that as we become better acquainted, our feeling of friendship and confidence may be increased; that our hopes and aspirations and even our dreams may be realized; that we may be happy in the belief that we have done something to place and to keep our department of industrial life on a plane which entitles it to respect and influence.

In any event, all of us who have been permitted to enjoy the hospitality of this beautiful city and country will so long as we live cherish the memory of the exquisite pleasure which has been afforded by our visit.

Expressions by Other Speakers

Expressions were called for of the views of the various delegations, as these had been brought out in some cases in conferences, by countries, held previous to the general meeting. The speakers were Sir John Randles and Sir Hugh Bell of England, Baron von Bodenhausen and Fritz Thyssen of Germany, A. Greiner and G. Trasenster of Belgium, A. Dreux of France, W. Kestranek of Austria, Armin von Biro of Hungary, Count de Zubiria of Spain, M. Witmeur of Russia, T. J. Drummond of Canada and J. A. Farrell, C. M. Schwab, Willis L. King and E. A. S. Clarke.

The following resolution, proposed by Sir Hugh Bell and seconded by Baron von Bodenhausen, was unanimously adopted:

That this meeting thanks his honor, Judge Gary, for his address and approves the views therein expressed. The meeting accepts the suggestion that a committee be appointed to consider in what manner practical effect can be given to these views such committee to consist of not more than five representatives from each country, and to be empowered to consider the full question and to report the results of its labors at a subsequent meeting to be convened by the committee.

Adjournment was then taken until Thursday morning at 10 o'clock, with the understanding that the respective delegations would meet meantime and select their representatives on the general committee.

Thursday's Proceedings

Little time was given to the formal proceedings of Thursday morning, when the second and final session was held. In fact, the deliberations of the full convention at both the sessions occupied scarcely more than three hours. The announcements of members of the Committee on Organization were made by the different delegations as follows:

United States.—Elbert H. Gary, James A. Farrell, E. A. S. Clarke, Charles M. Schwab, Willis L. King.

Great Britain.—G. Scoby-Smith, Bolckow, Vaughan & Co., Ltd., Middlesborough; Sir John Randles, Workington Iron & Steel Company, Ltd.; Harry Steel, Jr., Steel, Peech & Tozer, Ltd.; M. Mannaberg, Frodingham Iron & Steel Company, Ltd.; Archibald Colville, David Colville & Sons, Ltd.

Germany.—Baron von Bodenhausen, E. Schaltenbrand (chairman German Steel Syndicate), F. Thyssen, Herr Reusch and Dr. E. Schroedter.

Belgium.—A. Greiner, G. Trasenster, F. Lacanne and Messieurs Demoulin and Renson.

France.—Messieurs A. Dreux, Pralon, Laurent, de Labriolle and L. Charbonnel.

Austria.—A. R. von Kerpely, Wilhelm Kestranek, Dr. F. Schuster.

Hungary—Armin von Biro.

Russia.—J. Jasiukowics, O. Bibet.

Spain.—Count de Zubiria.

Judge Gary brought the convention to a close with a few words of congratulation on the good spirit which had prevailed, expressing the hope that the work of the international committee might be carried forward to the satisfaction of all who had shared in its creation.

At a meeting of the committee held after the adjournment Judge Gary was chosen chairman and W. B. Peat, London, secretary. The calling of a meeting of the committee to take up its work was left with the chairman. Judge Gary has made no decision as to the time or the country, and the matter may remain in abeyance for some months.

Entertainment

The first of the social features of the meeting was a dinner to the delegates given on Wednesday evening, July 5, at the Restaurant la Royale, rue d'Arenberg. About 125 guests attended, including a number of Belgian guests who had not participated in the convention. A. Greiner presided and introduced the after-dinner programme with an address bristling with humor. Judge Gary made the first response and was followed by Baron von Bodenhausen, Sir Hugh Bell, Baron Laveleye, Hugo von Noot, W. Kastranek and others, the speeches being all of a high order of excellence.

Luncheon was served to the delegates Thursday in rooms adjoining the meeting hall, and at 1:30 they were driven to the Royal Palace, where a reception was given by King Albert. The palace is on the hill, or upper town, facing the principal park of the city. Later in the afternoon the members of the convention and the visiting ladies were taken in automobiles to Waterloo, thence to Tervueren, a suburb about 10 miles out, hidden behind the Forest of Soignes. It contains the new Colonial Palace, opened in 1910, to which have been transferred the rich Colonial collections formerly found in the Palais du Congo, built for the Brussels Exposition of 1897. Returning to the city, the guests were entertained at dinner at the Laiterie in the Bois de la Cambre.

In spite of the strenuous entertainment of Thursday an early start was made on Friday, a special train at 8 o'clock taking the guests to Namur. Here motor cars were provided and a trip was made to Han through the beautiful Meuse Valley by way of Durant. The famous Han

grottoes were visited in the afternoon, and the journey was continued to Rochefort, where train was taken for Brussels, dinner being served on the return trip.

Those in Attendance

The list of the delegates to the convention, as given out by the secretary, is given below. We have inserted the official connections of those present from the United States. This information was not made available in the case of the other delegations, though a number of them, particularly in the British list, will be recognized by readers in the United States as connected with important firms. The lack of detail in the compilation is certainly regrettable:

UNITED STATES.

J. G. Butler, Jr., president Bessemer Pig Iron Association; James A. Campbell, president Youngstown Sheet & Tube Company; E. A. S. Clarke, president Lackawanna Steel Company; James A. Farrell, president United States Steel Corporation; E. C. Felton, president Pennsylvania Steel Company; Elbert H. Gary, chairman United States Steel Corporation; Willis L. King, vice-president Jones & Laughlin Steel Company; Wm. A. Rogers, president Rogers-Brown Iron Company; Charles M. Schwab, president Bethlehem Steel Company; Powell Stackhouse, director Cambria Steel Company. Hon. James T. McCleary, secretary of the American Iron and Steel Institute, was prevented from attending by illness in his family.

AUSTRIA.

W. Kestranek,
Hugo von Noot,
Carl Noot,
Dr. E. Herz,
A. R. von Kerpely,
Oscar Rothballer,
Dr. F. Schuster.

BELGIUM.

G. Trasenster,
A. Greiner,
Van Hoergaerden,
Jacques Ochs,
G. Renson,
Demoulin,
Fr. Lemaire,
C. Bourgy,
Stoumon,
Lacanne,
F. Spalart,
Paul Keim,
A. Rabault,
E. Tonneau,
A. J. Dudgeon,
Stouls,
L. Spaak,
Baron de Laveleye,
J. B. Dessart,
Aug. Collon.

GREAT BRITAIN.

Sir J. S. Randles,
Sir Charles Allen,
Arthur Cooper,
R. Dyson,
I. S. Gibson,
W. H. Hewlett,
H. Steel, Jr.,
Herbert Eccles,
F. W. Gilbertson,
A. Darby,
E. Peter Jones,
E. T. John, M. P.,
C. J. Bagley,
M. Mannaberg,
Geo. Ainsworth,
Geo. Hatton,
Thompson Jowett,
W. Simons,
G. A. Mitchell,
D. Colville,
Lincoln Chandler,
A. Good,
W. J. Armitage,
N. Retallack,
E. Cottam,
W. P. Rylands,
I. H. Chapman,
W. S. Laycock,
Hy. Summers,
G. Scoby-Smith,
Sir Hugh Bell,
F. Scott Smith,
Robert Maclaren,
Cecil A. Cochrane.

CANADA.

J. T. Drummond, Lake Superior Corporation,
J. H. Plummer, Dominion Steel Corporation.

FRANCE.

A. Dreux,
A. Resimont,
Jules Bernard,
Fould,
Laurent,
de Janze,
Soldcroup,
Progreaux,
Ducloux,
Limbourg,
Pralon,
L. Charbonnel,
Baron d'Huart,
C. Frérichs,
R. de Labriolle.

GERMANY.

L. Roechling,
E. Schaltenbrand,
Aug. Thyssen,
Fritz Thyssen,
von Bodenhausen,
J. Muller,
M. Boecker,
B. Nothmann,
Gussmann,
S. Raetzer,
Dr. Léo Laval,
Burgers,
Rablenbeck,
Raache,
Kreuger,
Huschmann,
Dr. E. Schrödter,
Reusch,
Zillessen,
Fritz Baare

HUNGARY.

Armin von Biro,
Dr. Paul von Biro.

RUSSIA.

Witmeur.

SPAIN.

le Comte de Zubiria

The Lake Superior Ore Railroad Hearing

DULUTH, MINN., July 15, 1911.—In the case of L. E. Lum, of Duluth, against the Great Northern Railway, asking the Interstate Commerce Commission for a rate on iron ore from Grand Rapids, Mich., to Lake Superior, and suggesting 40 cents a ton as a reasonable charge, Commissioner B. H. Meyer, on July 11, continued the hearing until October. This was done that the commission might have opportunity to consider points adduced by the defense, chiefly the point suggested in this correspondence two weeks ago, when it was stated that the complainant had never offered any ore to the road for delivery on Lake Superior or elsewhere and on the further claim that other Minnesota iron ore carrying roads had not been made parties to the defense. As to the first contention Mr. Lum stated that he was interested in some 8,000,000 tons of ore near Grand Rapids, and that the reason why none had been offered the defendant was that the latter had never made a rate; and as to the second defense, he said that he would, if desired and necessary, amend his complaint before the continuance of the hearing.

Mr. Lum quoted rates of railroads running on lake ports from other ranges, saying that they were but half the Minnesota rate, and that in justice they should be receiving a higher proportionate rate than the Great Northern, on account of the fact that their equipment was not so economical in operation as that of the latter.

As to these claims, it is well to show the facts, and they are as follows:

	Miles	Rate per ton
Marquette range to Marquette	18 to 36	$0.32
Marquette range to Escanaba	65 to 75	.40
Menominee range to Escanaba	2 to 60	.40
Gogebic range to Ashland	12 to 50	.40

While Mr. Lum's contention that the rate from other ranges to ports on the lakes, aside from Duluth-Superior, is 40 cents, is essentially correct, it does not bear analysis, for the rate per ton per mile is not greatly different from those from Minnesota ranges to Duluth-Superior, and it is not a question of absolute comparison of price from one terminal to another, but of the ton-mile rate. This is best shown as follows, considering the average length of haul from each range to its ports:

	Miles average haul.	Rate per ton	Ton-mile rate
Marquette range to Marquette	25	$0.32	$0.0128
Marquette range to Escanaba	70	.40	.0057
Menominee range to Escanaba	80	.40	.0080
Gogebic range to Ashland	45	.40	.0088
Mesaba range to Duluth (D.M.& N.R.R.)	77	.80	.0104
Mesaba range to Superior (G't Nort'rn)	**115**	**.80**	**.0070**
Elv to Two Harbors	94	1.00	.0106
Soudan to Two Harbors	73	.90	.0123

It will be noticed that the highest rate of all given on iron ore on Lake Superior is that from Marquette range points to Marquette, while next to the lowest is that of the Great Northern Railway to Superior. The argument that Mesaba rates should be lower on account of better facilities can scarcely be taken seriously, even if true; and the matter of better facilities is to be considered in the light of information as to many outside conditions bearing on the queston of haul. The writer is not trying to justify the 80-cent rate from Mesaba range points to Lake Superior, for it is doubtless very profitable, but the above facts are brought out merely to give opportunity for a dispassionate view of the entire situation. D. E. W.

The United States Steel Products Company has established a sales office in Toronto, Canada, under the management of Frederick C. Brunke, who has for a long time been connected with the Buffalo office of the Carnegie Steel Company. The United States Steel Products Company has been making its Canadian sales through the Buffalo office of the Carnegie Steel Company, but hereafter Ontario sales will be negotiated through its Toronto office, located at 220 King street, West.

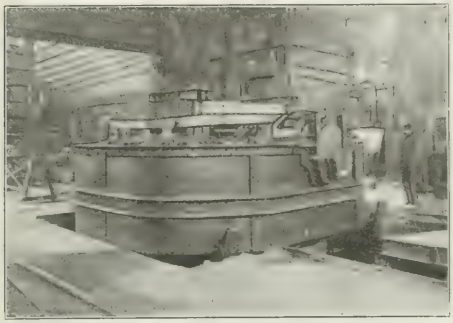
The Independent Bridge Company, North Side, Pittsburgh, Pa., builder of steel bridges and buildings and making a specialty of Government work, such as appliances for dams, has secured the contract for repairs to be made on the Seventeenth Street bridge over Wheeling Creek, at Wheeling, W. Va.

Steel Castings from Electric Furnace*

One Phase of the Practicability of the Roechling-Rodenhauser Induction Furnace

BY C. H. VOM BAUR†

The electric induction furnace for making steel has been in regular commercial operation in Europe for more than 10 years, and more than 30 of these furnaces are in regular commercial operation there. It has now been brought to the United States in its improved form, which permits sizes of 8 to 16 tons' capacity, and 30-ton furnaces have been projected. These electric furnaces are of the Röchling-Rodenhauser induction and resistance type, operating on single, two or three-phase alternating current, utilizing any convenient voltage of commercial circuits; 25-cycle is preferred, but 60-cycle current can be used in the smaller sizes.



Electric Induction Furnace, Showing Slag Removing Door.

The furnace action is similar to any ordinary transformer. The primary coil, receiving the incoming current, is subdivided into series of steps, usually five, which, by the aid of a switch, regulate the current and consequently the heat in the metal bath. The secondary current is mainly (70 per cent.) induced directly in the bath, which is really one short-circuited turn of the secondary winding of the transformer. The remaining energy, 30 per cent., is induced in a large copper bar secondary winding, wound directly over the primary winding, which latter receives the electric current from the alternator. This auxiliary secondary current is carried to two steel pole plates, set beneath the lining, one at each end of the bath The magnesite lining covering these plates is the hearth of the furnace and becomes the conductor of electricity when red hot, acting similarly to the filament of a Nernst lamp in this respect.

The metal can be kept at any practicable temperature between a dull red and, say, 4700 deg. F. (which is the limiting temperature of the magnesite lining). As there is no involuntary change in the current, and no violent fluctuations take place, there is no strain placed on the prime mover. The furnace runs quietly and there are no carbon particles blowing through the air. The amount of steel in the furnace being known, the heat can, with a little practice, be accurately determined by observing the ammeter reading. No foreign ingredients can inadvertently get into the metal bath, like sulphur, phosphorus, carbon or substances from any flame, electrodes or lining, which fact makes the furnace most gratifying to operate.

Chemical composition and temperature can be regulated independently of each other. The composition of the metal can easily be changed and the temperature held at the desired point. The metal can be poured at the temperature to suit the conditions; for large castings, into crane ladles; for small castings, into bull ladles or small hand ladles. The furnace, being of the tilting variety, facilitates the pouring and the removing of the slag by the rear door.

When charging cold materials for making steel castings, the cheapest steel scrap can be used to advantage and refined to the desired degree. The following makes a cheap and effective mixture:

Cost of Electric Steel per ton. Material Charged Cold.	
⅓ Bundled scrap at $11.25 per ton	$2.81
⅓ Machine shop and heavy turnings at $9.25 per ton	2.31
⅓ Old steel rails at $13.75	6.88
Total	$12.00
Oxidation loss 5 per cent.	.60
Total	$12.60

Electric current is being produced to-day for 0.6 cent per kilowatt hour with internal combustion engines, running on blast furnace, producer, natural gas or crude oil. The electric induction furnace provides a high load factor, operating, as it should, at full load for the greater part of the day. This continued operation insures this low cost for electricity

The conversion cost per ton is, therefore, as follows (2-ton furnace with 280 to 300 kw., operated at Völklingen):

	Per Long Ton.
700 kw. hr. for melting at 0.6 cent per kw. hr	$4.20
200 kw. hr. for refining at 0.6 cent per kw. hr	1.20
	$5.40
Fluxes, etc.—roll scale 22 lb., lime 77 lb., fluor-spar 11 lb., sand 20 lb., ferro-manganese 8.8 lb.	.44
Loss of fluxes owing to ¼ of all metal remaining in the hearth	.16
Labor, American equivalent, 2 to 3 men	1.50
Tools, repairs, and lining	.67
Depreciation 10 per cent., interest 5 per cent. on $11,300—300 days, 6 tons a day*=$1,695 ÷ 1,800 tons	.94
Auxiliary apparatus (cooling air for transformer)	.04
Total	$9.15

Adding this, we get

Raw material	$12.60
Conversion cost	9.15
Cost of one ton electric steel ready to pour	$21.75

To this cost must be added a slight license fee per ton, depending on the output. The time of heat is about 4 to 4½ hr.

When charging hot metal for refining or merely for thorough deoxidation and segregation, it may come directly from the blast furnace, from a mixer, a cupola or some other furnace. At Dommeldingen very impure pig iron was charged into an induction furnace of the Röchling-Rodenhauser type and refined as shown in the table. Such impure hot metal is rarely charged in the elec-



Tapping the 4-Ton Electric Induction Furnace.

*From a paper read before the recent meeting of the American Foundrymen's Association.

†American Electric Furnace Company, New York.

*12-hour day.

tric furnace, except under unusual conditions, as it can be partly refined by a gas-fired furnace cheaper than in an electric furnace.

Results of Refining Pig Iron in Electric Furnace.

	Analysis of Charge. Per Cent.	Analysis of Cast. Per Cent.
Carbon	4.0	0.5
Phosphorus	1.8	0.025
Sulphur	0.2	0.03
Manganese	..	0.76
Silicon	1.00	0.056

Duration of conversion, 3 hours.

Cost of Refining Hot Metal from Mixer

The cost of refining hot metal taken from the mixer at Dommeldingen, allowing for American conditions, is as follows for a 5-ton furnace:

Raw material	$12.00
Oxidation loss 3 per cent.	.36
	$11.36
Current—280 kw. hr. at 0.6 cent	1.68
Fluxes, etc.	.60
Labor	.56
Tools, repairs, and lining	.64
Depreciation 10 per cent., interest 5 per cent. on $17,000—300 days at 40 tons a day* = $2,580 12,000 tons	.22
Auxiliary apparatus	.00
Total	$16.06
Cost of preliminary refining, about	3.00
Total cost of one ton of electric steel ready to pour	$19.06

Time of each heat about 2½ hr.

Cost of Refining Hot Metal from Cupola

The estimated cost of refining hot metal melted in the cupola, and consisting mainly of steel scrap, having about 2 per cent. carbon in the resultant mixture, is as follows:

Raw material	$14.00
Total oxidation loss 8 per cent.	1.12
	$15.12
Conversion cost similar to the above	4.90
Cost of preliminary melt in cupola, about	3.00
Cost of one ton of electric steel ready to pour	$23.02

Time of each heat about 3½ hr.

Output with Hot and Cold Charges

Under ordinary conditions there is no very great difference in the total cost of hot metal ready to pour into the ladle, when charging either hot or cold material. The discrepancy is in the output. With a 5-ton furnace it is as follows:

	—Per Month.— Single Turn Tons.	Double Turn Tons.
Cold charging	235	470
Hot charging	500	1,000

The electric current, and all the machinery it entails, does not enter largely in the total cost of a casting. It is usually not over ¼ cent a pound, or as little as 5 per cent. or even 2 per cent. of the selling cost of the finished

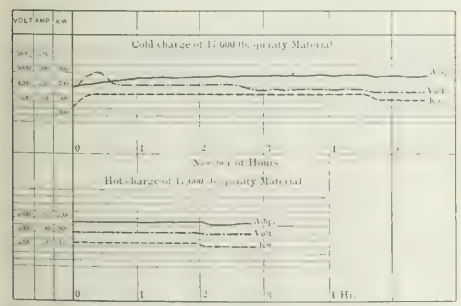


Diagram Showing Steady Consumption of Power in Rochling Rodenhauser Electric Furnace

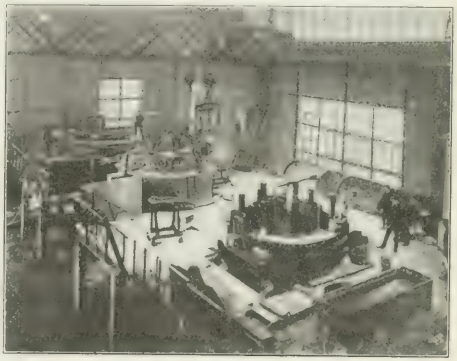
product. It follows that steel can be melted in the electric furnace for $4.20 in a 2-ton furnace, and for about $3.50 in an 8-ton furnace with electricity at 0.6 cent per kw.-hr. At the same time, though, the output is decreased by about one-half, as indicated above, for two reasons: 1. It takes longer to treat cold metal than hot. 2. We only pour three-quarters of the capacity of the furnace when charging cold material, instead of the total

*24-hour day.

contents of the furnace when treating hot material. When charging cold metal, a little of the hot charge remains in the furnace to complete the electrical circuit. Cold scrap being in many pieces, does not meet the conditions, as the voltage in the bath, being as low as 2 or 3 volts, is not sufficient to overcome the contact resistance between these many pieces.

Quality of Electric Steel

The metallurgical course of the process is very similar to that employed during the refining period in a basic open-hearth furnace. The limestone and roll scale are charged



Charging 4-Ton Furnace with Molten Metal. (Note Men Standing in Furnace.)

and the bath is then refined until the analysis shows that no phosphorus remains or the process may be stopped before this, thus retaining some phosphorus and cheapening the process. This refining usually lasts an hour or so, varying somewhat with the initial percentage of phosphorus present. During this dephosphorizing period the carbon is greatly reduced and the silicon entirely or almost entirely eliminated. This first slag is then thoroughly removed by tilting the furnace backward at a slight angle and rabbling off the slag. Then, according whether mild or hard steel is required, a quantity of carbon is added to meet the requirements. At this time sufficient ferro-manganese is charged to meet the specifications. The desulphurizing slag is then added. As soon as this is melted, the bath and slag are deoxidized, the slag becomes white, and, owing to the now increased temperature, absorbs the departing sulphur rapidly, the refining being dependent upon the temperature at the point of contact between the metal and the slag. The gases are now expelled and likewise the small particles of slag which are brought about by deoxidation; in the same manner the sulphides are absorbed by the white lime slag while a small part of the sulphides volatilizes; otherwise the composition of the bath remains the same. Carbon is then analyzed for and the necessary modifications made.

In the case of alloy steels, the alloys are only added after the deoxidation period, so that any loss which might be caused through the formation of slags is avoided. This deoxidation period usually lasts an hour. It is this deoxidation period, so thorough and effective, which has no parallel in any gas-fired furnace or converter. The sulphur has meanwhile almost entirely disappeared, getting as low as 0.01 per cent. to 0.005 per cent. After a last analysis shows that the deoxidation of the metal is complete, the furnace is tapped without any additions of any kind. Castings of any intricacy from ½ pound to the capacity of one or more furnaces are regularly made. In one of the works of Luxemburg, from which the following figures are taken, four grades of steel for castings have a call:

Four Grades of Steel Made at Luxemburg.

Grade.	Tensile Strength. Lbs. per Sq. In.	Elongation Per Cent.
a	56,900 to 64,000	25
b	64,000 to 71,000	20
c	71,000 to 85,400	15 to 18
d	85,400 to 99,600	8 to 10

For the electrical industry, a particularly soft steel of

the following analysis has a market: C, 0.05 to 0.06; Si, traces; Mn, 0.20; P, 0.005; S, 0.003.

Three pieces of equal weight, brightly polished, one of electric steel, one of open-hearth steel and one of Bessemer steel, of similar chemical analysis, were placed in an acid solution. Electric steel may lay claim to incontestable preference wherever materials have to be furnished to meet the strictest specifications in respect to resistance to acids and weahter. It showed much less loss than the other kinds of steel.

Integral Cam Grinding Attachment

A new attachment for use on its plain and universal grinding machines which were illustrated in *The Iron Age*, April 21 and July 21, 1910, respectively, has been developed by the Landis Tool Company, Waynesboro, Pa. This device has been designed especially for grinding cams in place on their shafts, both made from the solid forging and of the built-up type. Fig 1 is a front view of the attachment and Fig. 2 is an end view.

The attachment is constructed on the swinging principle, the main table being suspended from bearings on supports at the end. The work is held between the centers and the footstock is adjustable along the table for different lengths, the movement of the latter being controlled by the lever E, Fig. 1. It is a very easy matter to apply the attachement to the machine as all that is required is to clamp it to the table and remove the head and the footstocks, no other alteration in the machine being required. The work in addition to being carried on the centers is supported by adjustable steady rests on the shaft between the cams. These rests have detachable jaws which can be changed for different sizes of work and are adjusted by the screws D.

A special master is furnished with each attachment and is copied directly from the cams of a model shaft, which is fitted in the place of a master for this operation. This master cam is made from solid steel, thus eliminating any chance of the cams becoming loosened from the shaft, which would affect the timing. This cam, which is shown at A, operates in contact with a roller, B, which gives the swinging motion to the table as the master revolves for forming and reproducing the cam shape on the work. Both of these parts are hardened, which makes them durable and assures the maintenance of the form of the master cam. The roller is in contact with the cam of the master corresponding to the one being ground, while the work of grinding is being done and is shifted along the machine table as the wheel is moved from one cam to another on the work. While this shifting operation is being performed the table is swung away from the wheel by pulling down the upright lever C, at the end, which disengages the master cam and swings the table so that the master cam will clear the roller while the latter is being shifted. The size of the roller corresponds to the size of the grinding wheel, which is used in grinding the master cam and is located in the same relation to the master cam as the grinding wheel is to the work.

Power for driving the attachment is secured by connecting the pulley at the end of the attachment by a belt to the countershaft of the machine. Provision is made in the work driving fixture for timing so that the cams will be ground in proper relation to the keyway or the flange.

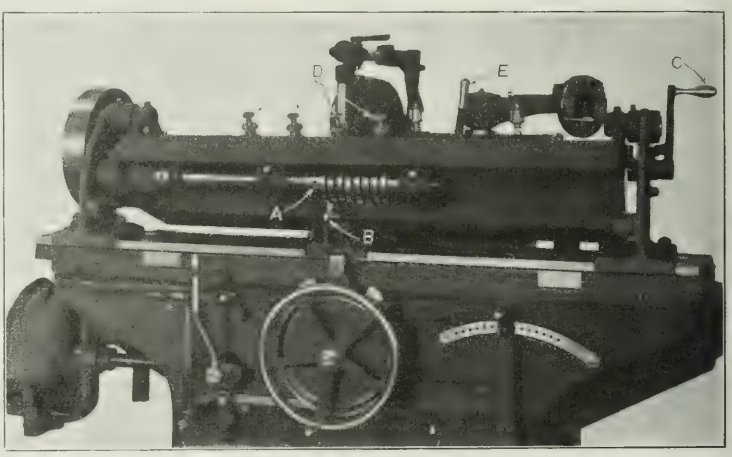


Fig. 1.—Front View of an Integral Cam Grinding Attachment for Use on Plain and Universal Grinding Machines Made by the Landis Tool Company, Waynesboro, Pa.

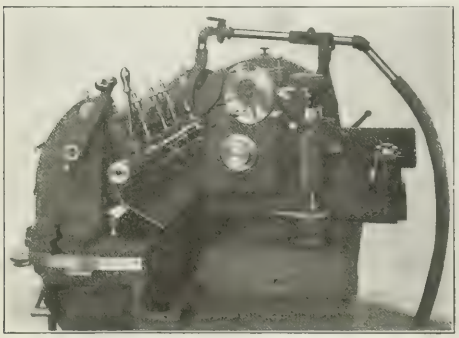


Fig. 2.—End View of the Attachment.

The Youngstown Steel Company, Youngstown, Ohio, expects to blow out its blast furnace about August 1. During the shutdown it will be relined.

The committee appointed to examine the sale sheets of the Republic Iron & Steel Company, Union Rolling Mill Company, Fort Wayne Rolling Mill Company and the Highland Iron & Steel Company for the 60-day period ending June 30, 1911, found that the price for boiling and finishing mills for the months of July and August, 1911, will be based on a 1.25c. card rate scale of 1911-12, which entitles the puddlers to $5.62½ a ton. The sheet and tin plate rates will be the base of scale.

Two New Fay & Scott Machines

The two new tools shown herewith, built by Fay & Scott, Dexter, Me., are a double end centering machine, designed for centering bar stock, and a heavy motor-driven face-plate lathe. The centering heads have renewable spindle bearings of bronze. The spindles, of hammered steel, have hand-lever feeds, through rack and pinion. The heads are pivoted so that by a slight tilting either the drill or the countersink is brought into centering position. The left-hand head is stationary, while the other is adjustable the entire length of the bed by rack and pinion. The chucks, which are self-centering, have hardened steel jaws which operate simultaneously by means of right- and left-hand screws. The chucks are adjustable to any required position.

The centering heads are driven through silent chain from a shaft which runs the length of the machine. The

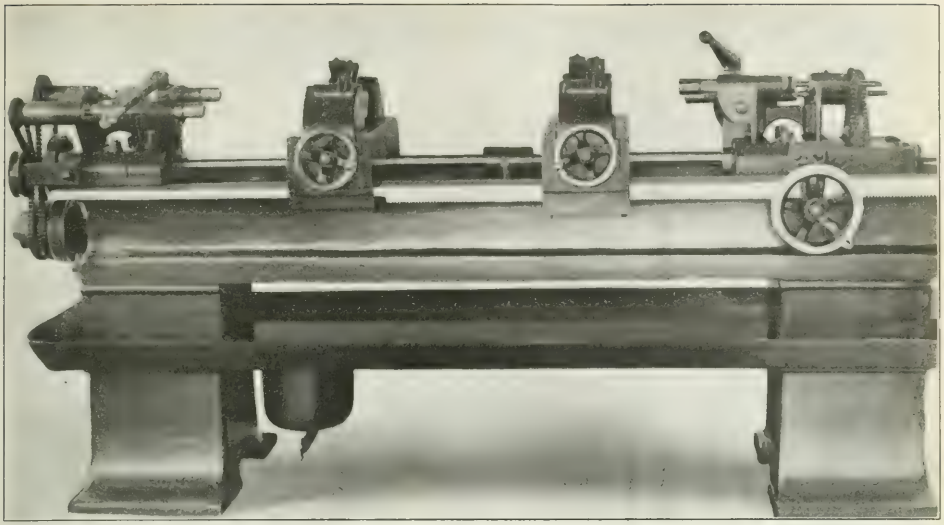


Fig. 1. The Fay & Scott Double End Centering Machine.

bed is of the standard lathe type, and has a liberal number of box tiewards. The V's are 40 deg., with tops slightly rounded. The specifications of the machine are as follows:

Swings over bed	18 in.
Spindle bearings	1¼ by 9 in.
Spindles chucked, No. 2 Morse taper, drill spindle speed	425 r.p.m.
Countersink spindle speed	250 r.p.m.
Driving shaft diameter	1 7/16 in.
Maximum distance between drills, in table 10-ft. bed	60 in.
Chucks taking maximum diameter	6 in.
Driving shaft pulley	8 by 4 in.
Countershaft driving pulleys	12 by 4 in.
Countershaft speed	135 r.p.m.
Weight of 10-ft. machine	3500 lb.
Weight of bed, per ft.	100 lb.

The large motor-driven face-plate lathe, shown in Fig. 2, is an improved type containing various refinements of design. The headstock spindle, driven by a variable speed motor, has speeds ranging from 22 to 1100 r.p.m. The machine swings 100 in. over the base plate and can take work 7 ft. between centers.

The General Fireproofing Company, Youngstown, Ohio, maker of all-steel furniture and filing equipment, expanded steel lath and other metal specialties, is arranging to double the capacity of its plant. The building will be of reinforced concrete and will cost about $30,000. It is expected to be completed about October 1. Considerable new equipment will be installed.

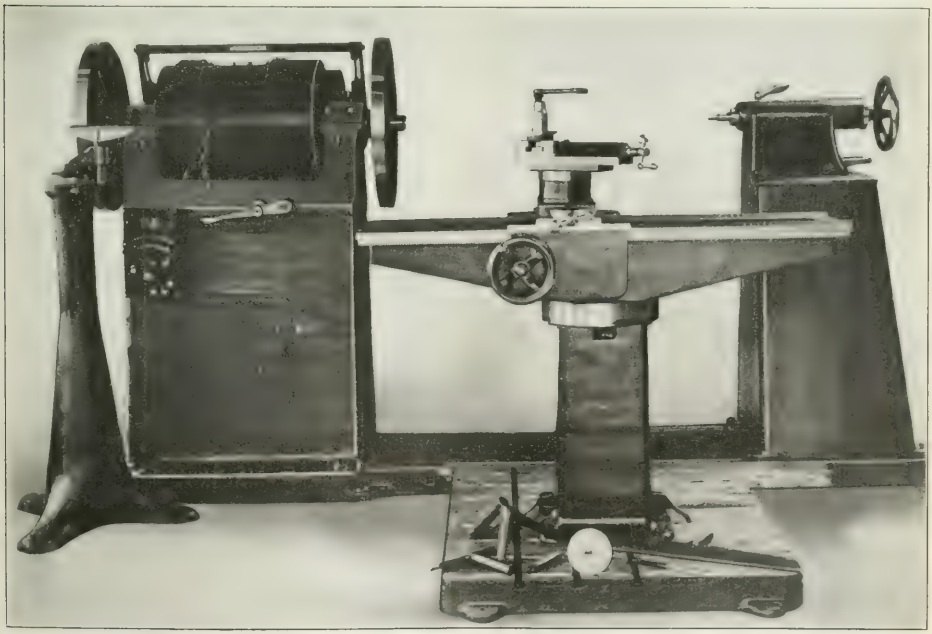


Fig. 2.—The Fay & Scott Motor-Driven Face Plate Lathe.

Aeroplane Propeller Testing Plant

One of the causes of breakdown and accident in aeroplanes is the faulty design of propellers. Generally speaking, little exact knowledge has been obtained of the various influences which must be taken into consideration before the propeller is perfected. The Worcester Polytechnic Institute, Worcester, Mass., has established an experimental station, the purpose of which is to carry out a long series of tests under conditions as they exist in working machines. The apparatus was designed by David L. Gallup, assistant professor of gas engineering at the institute. The station is located at Chaffin's, a suburb of Worcester, where are the institute's hydraulic engineering laboratories. The installation is seen in the photograph.



The Worcester Polytechnic Institute Aeroplane Propeller Testing Plant.

As a basis Professor Gallup took the apparatus which has been used in testing current meters. A large shaft is embedded in a boulder in the bottom of the lake which supplies water to the hydraulic plant. At the top of this shaft is a heavy boom, 84 ft. in length, which swings in a circle of 42 ft. radius, making a circumference of approximately 264 ft.

The propeller is mounted on one end of this boom, its axis being tangent to the circumference at that point, and is driven by a 75 hp. variable speed motor located at the center of the boom. At the present time the boom is turned on its axis by the action of the thrust exerted by the propeller, but later a supplementary motor will be installed which will drive the boom at a speed up to at least 60 miles per hour at the tip. The tip speed of the boom or the velocity of the propeller through the air is measured by means of a delicate electrical arrangement and is checked by a Warner speedometer which shows the speed in miles per hour.

Tests are to be run on various makes of propellers, determining the relation between "standing" thrust and "moving" thrust. That is to say, the propeller is to be anchored and the thrusts obtained for various speeds of rotation of the propeller. Then the propeller is to be operated at a definite number of revolutions per minute, say 1500, and various drags placed on the boom so that the speed of the propeller through the air will vary from 10 to 60 miles per hour. The propeller will next be run at 1400 r.p.m. and a sufficient drag placed on the boom to allow the propeller to go through the air at various rates of speed, and similarly for 1300, 1200, 1100 r.p.m., etc. Of course this performance will be varied in detail on account of varying pitches and diameters of the propellers which are undergoing test, but the instance cited serves as an illustration of the work which Professor Gallup plans to perform.

Another subject of investigation will be the resistance met with by different shapes of blades in passing through the air. Pitot tube measurements will also be made to determine the variation and thrust from positions at the center of the shaft out to the tip of the propeller.

The Friedrich Changeable Open-Hearth Furnace Port

In a recent issue of Stahl und Eisen an illustrated description was given of the Friedrich changeable open-hearth furnace port, which has been adopted at a number of well-known plants, both within and outside of Germany.

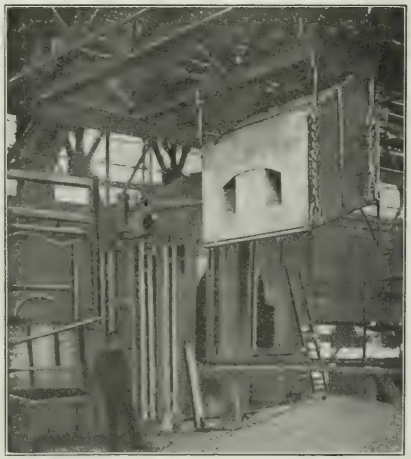


Fig. 1.—The Port Ready for Putting in Place

It is controlled by the engineering concern, Poetter, G. m. b. H., Düsseldorf, Germany.

The change is completed in from 4½ to 5 hours, and the method of procedure may be seen in the accompanying illustrations. The valves are set so that the port to be changed is at the outgoing end of the furnace. The gas is shut off, the tie rods are removed and the roof of the air port is removed with the crane. The side walls are quickly broken down by a gang of men on each side of the furnace. Finally the whole removable part, resting on

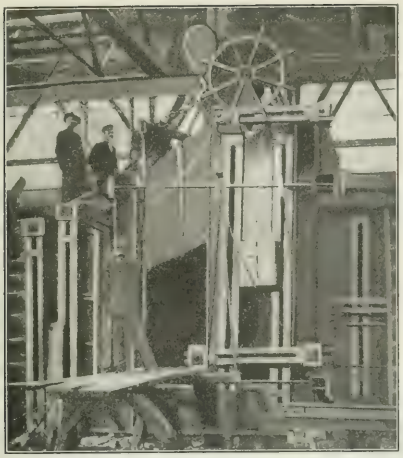


Fig. 2—During the Operation



Fig. 3.—Placing the Roof of the Air Port.

the cast steel plate is lifted and removed. The edges of the solid masonry are carefully smoothed and the new port is lowered into place.

Fig. 1 shows the construction and that this part only forms the bottom of the air port. Fig. 2 shows the operation. It has been found better to build up the side walls and back of the air port by hand, after the putting in place of the new port. After a little experience this can be done very quickly. In this way a very good connection is made with the fixed part of the ports, and a tight joint between the gas and air ports. Finally the roof is put in place, as may be seen in Fig. 3.

In many places only one gas port is now used, as shown in the right part of the drawing, Fig. 4. Opinions are divided on this procedure, but it has been successful in several places. One plant reports the following with the changeable port: "After 300 to 350 heats, the ports were changed. The second change came after a total of 550 to 650 heats. Several times a series of 1000 heats has been made with three changes before the whole furnace needed rebuilding."

The weight of the changeable port for a 40-ton furnace is about nine tons. It has been successfully applied to small and large furnaces, being in use in one furnace of 3½-ton capacity. It permits of a saving in the original installation cost of the furnace and, through the shorter time necessary for repairs, gives an increased output; also, if the changes are made at the proper time, the rest of the furnace lasts much longer. C. E. W.

Electro Steel Company of Canada at Judicial Sale.—Bids have been asked on the property of the Electro Steel Company of Canada, Ltd., by George W. Wells, K. C., Welland, Ont. Tenders will be received up to 4 p. m. September 5, 1911. The property consists of about 113 acres of land on which is located a main building, 75 x 165 ft., of concrete, with several additions and a store house. The equipment includes six generators, six transformers, motors, two traveling cranes, a rock crusher, etc. The property will be sold either in separate parcels or en bloc. The company, which has gone into liquidation, had for its object the reduction of iron ore by electricity.

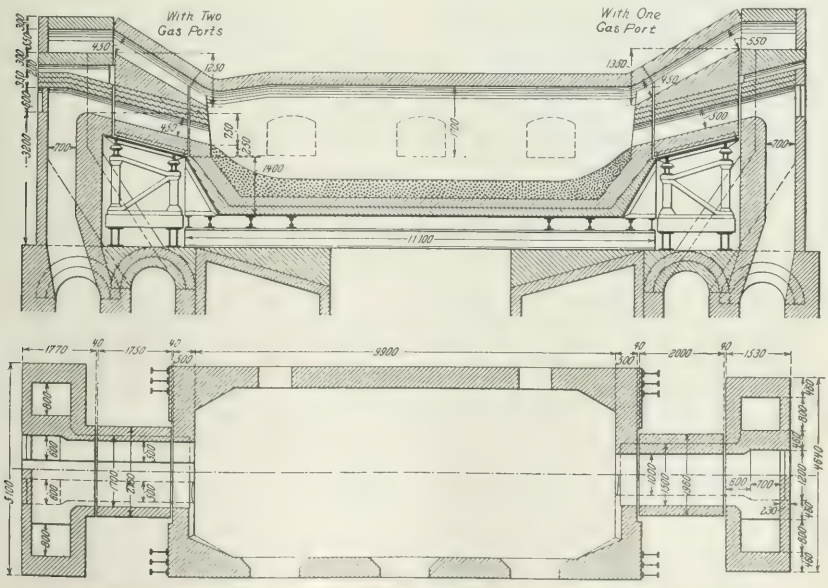


Fig. 4.—The Friedrich 50-ton Open-Hearth Furnace with Changeable Ports. Dimensions in Millimeters.

A Study of Steel Tires*

Scheme for Getting Test Specimens Without Impairing Value of Tires—Microphotographs for Specifications

BY ROBERT JOB AND MILTON J. HERSEY.†

In general the practice has been to take a transverse full section of the tire, as near as possible to the point of fracture or failure, making careful scrutiny of the polished surface to detect any visible defect. The section was then etched to develop seam lines and similar defects. Meanwhile a standard test piece was cut from another portion of the tire and the usual tensile tests were made. A ¾-in. section was next cut from the centre of the transverse section and polished and etched for microscopic investigation, and another similar section was taken from the transverse section, and microscopic examination was made of a face ½ in. from the outside surface of the tire. Borings were also taken from the tire for analysis, the carbon being determined by direct combustion in a current of oxygen in an electric furnace. Photo-micrographs were taken at a magnification of 50 diameters to determine the size of grain, that magnification having been found the most satisfactory for the purpose. The hardness of the steel was determined with the Shore scleroscope.

A fair proportion of failures were due to radically defective composition, as, for instance, tires which contained over 1 per cent. carbon. The proportions of manganese, phosphorus and sulphur were generally within the usually accepted limits for tires. The carbon varied from 0.53 per cent. to 1.03 per cent.

In one case the metal had a tensile strength of 165,650 lb. per square inch, with elongation of 10.9 per cent. in 2 in., the proportion of carbon being 0.86 per cent., with granular size of about ¼ in. at fifty diameters. A marked difference was found between the tensile properties of test pieces taken longitudinally and those taken transversely from the same tire, as shown by the following:

	Tensile strength, lb. per sq. in.	Elongation in 2 in., per cent.	Per cent. carbon.
Longitudinal	157,000	9.3	0.795
Transverse	126,700	2.3	0.795
Longitudinal	150,000	11.0	0.77
Transverse	118,300	1.5	0.77

* From a paper read before the American Society for Testing Materials, Atlantic City, N. J., June 28.

† Mr. Job is vice-president, Milton-Hersey Company Ltd., Montreal, Can.; Mr. Hersey is city analyst of Montreal.

Fig. 1, which represents a tire which fractured in service, had this composition: Carbon 0.649 per cent., phosphorus 0.057 per cent., manganese 0.697 per cent., sulphur 0.039 per cent., silicon 0.100 per cent.

The huge size of the grain proves that the tire was finished at an excessively high temperature, and that it was ill adapted to meet even the more ordinary conditions of service.

Fig. 2 represents similar tire which also fractured in service. The size of grain is smaller, indicating a lower range of temperature, but the size is excessive and unquestionably a source of weakness. The composition was: Carbon 0.539 per cent., phosphorus 0.052 per cent., manganese 0.781 per cent., sulphur 0.032 per cent., silicon 0.254 per cent.

Fig. 3 has been taken from a tire which had been annealed. The granular form is fairly fine, although the structure is rather irregular. It represents, however, steel of far greater toughness and power of resistance to shock than Figs. 1 and 2 shown above



Reproductions of Microphotographs at 50 Diameters of Parts of Steel Tires. Figs. 1 and 2, Center of Locomotive Tires Fractured in Service. Fig. 3, Center of Locomotive Tire Annealed. Fig. 4, Center of 0.53 Per Cent. Carbon Locomotive Tire. Fig. 5, Same Tire as Fig. 4, but ½ in. from Surface. Fig. 6, Center of 0.83 Per Cent. Carbon Locomotive Tire. Fig. 7, Same Tire as Fig. 6, but ½ in. from Surface.

In the examination of tires which had not been defective in service, we found the usual range in composition. The hardness tended toward the lower figures, as, for instance, about 42 to 47 deg., with carbon at about 0.70 to 0.80 per cent. and manganese at about 0.70 per cent. The granular structure in such tires was usually fairly fine with granules at 50 diameters about ¼ to ⅜ in. diameter, though with the lower proportion of carbon, *e. g.*, 0.50 per cent., the metal was in some cases coarsely granular.

The failure of a tire may be caused by any one of many variables, both in composition and in physical properties, as well as by changes induced by conditions of service, as, for instance, by skidding. If a tough, fine-grained structure is secured by annealing the tires, the elastic limit of the steel is at the same time lowered and the tire is thus more liable to crush in service.

According to an account in the Proceedings of the New York Railroad Club December, 1906, it was found after 88 million tons' traffic that the annealed rails averaged 31.9 per cent. the more rapid wear and that they also showed the greater tendency to mash down and splinter, but we found then on test, that the elastic limit of the steel had been reduced from 80,600 lb. to 70,225 lb. per square inch, the carbon averaging 0.54 per cent. and manganese 1.06 per cent

A section of a tire for a tensile test cannot be taken from a tire without rendering the latter unfit for service, but it is entirely feasible to take a section for microscopic work in such manner that the service value of the tire is not in the least impaired. A study of this section gives a clear idea as to the heat treatment which the tire has received at the mill.

In the first experiments sections were taken from the edge of the tire at a distance of ¼ in. from the surface, but it was quickly learned that such a section might not indicate the condition of the metal beyond the immediate surface of the tire. It was found that by taking the section at a depth of ½ in. from the surface of the tire, a very clear indication as to the character of the granular form at the centre of the tire could be obtained, and the relative difference in size of grain, at the centre, and at ½ in. from the surface of the same tire, is shown in Figs. 4 and 5, the former being at the centre of the tire, and the analysis as follows: Carbon 0.53 per cent., phosphorus 0.037 per cent., manganese 0.54 per cent., sulphur 0.030 per cent.

In Figs. 6 and 7 a similar example is given of a coarse-grained steel, Fig. 6 being from the centre of the tire and Fig. 7 from a point one-half inch from the surface. The composition was: Carbon 0.83 per cent., phosphorus 0.077 per cent., manganese 0.47 per cent., sulphur 0.049 per cent., silicon 0.21 per cent.

It was found also that a test section sufficiently large for the purpose could be obtained by boring into the tire with a hollow drill of special steel with walls not exceeding ⅛ in. in thickness and having a core ¼ in. in diameter; thus the drill had an outside diameter not exceeding ½ in. A hole slightly more than ½ in. deep was then sunk into the tire, preferably from the inside, using screw cutting oil or compound, and the core was broken off with a small wedge, and the end filed off until the face was just ½ in. from the surface of the tire. This small section of ¼ in. diameter was then polished, etched and photographed.

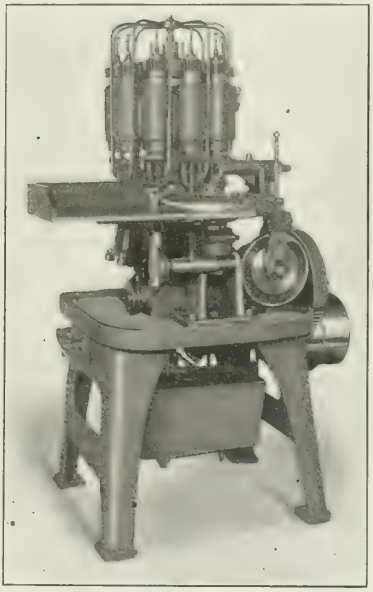
In drawing up specifications for the regulation of the heat treatment, it is simpler and far more satisfactory to make an engraving from a photomicrograph at 50 diameters showing the maximum size of grain which will be accepted, printing this cut as part of the specifications. The small ½ in. test piece may also be used subsequently, if so desired, in making the hardness test with the scleroscope, provided a plane face is ground longitudinally on one side of the steel, using care to have this face exactly parallel with the opposite side at all points.

A Semi-Automatic Rivet Drilling Machine

For drilling the ends of different types of solid rivets, and especially those used in the tread of auto truck tire shoes, the Langelier Mfg. Company, Providence, R. I., has recently designed and built a semi-automatic machine. The main feature considered in its design was high productive capacity coupled with a low operating cost, as the machine was to be operated by cheap female help. This made it necessary to produce a machine that could be operated without requiring the services of high-priced skilled men, which were necessary to keep fully automatic machines in running condition, and as a result semi-automatic operation was decided upon. The drilling is carried on continuously without losing any time for inserting or ejecting rivets. The machine has ten spindles, nine of which are constantly at work while the other one is being loaded with rivets. The output desired was 50 soft steel rivets per minute drilled with a hole 0.17 in. in diameter and 7-32 in. deep, a condition that in continuous operation would probably have caused trouble if a fully automatic hopper feed had been used. For that reason a very simple and quick hand feed was substituted.

The machine consists of a one-piece column of ten drilling heads revolving at the rate of 5 r. p. m. around a central stationary upright post which is cast integral with the table. Each head has a drilling spindle running in a two-piece feed quill so constructed as to overcome the drilling pressure if hard rivets should be encountered, thus eliminating the stalling of the machine or breakage of the drills. At the top of the inner side of each of these feed quills a roll is located which is held in contact with a rim feed cam fastened to the top of the central post by a compression spring. It will be readily seen that the rim feed cam being stationary and the drilling heads revolving at a speed of 5 r. p. m., nine rivets will be drilled simultaneously or ten rivets for each revolution of the column, thus giving the required output of 50 per minute. For accommodating the machine to different depths of holes and for taking up the wear of the drills, adjustments are provided at the top of the central column. This enables very minute regulation to be secured as the mechanism is in plain sight and readily accessible. To enable the machine to be used for drilling rivets of different lengths a vertical adjustment of the rim cam is provided.

Power for driving the drilling spindles is transmitted from the driving pulley shaft through bevel gearing to a vertical shaft running through the center of the central post. At the upper end of this shaft is located a common driving gear which engages ten fiber pinions, one for each spindle. The column is driven by a worm and worm gear, the worm shaft being connected to the pulley shaft through a pair of spur gears. For holding the rivets while the drilling operation is being performed each drilling head has an anvil and a clamping vise jaw. Bell crank levers, the lower end of which have a roll making contact with a stationary plate cam, open and close the vises at the proper time. This stationary plate cam is adjustable to enable the vise jaw to clamp rivets having different thicknesses of heads. A drill steady jig or rest is attached to the lower end of each feed quill and at the lower end of the jig there is a sliding bushing with a cupped end. This enables the rivets to be located accurately in a central position with respect to the drill and also provides lateral support for the drill during the drilling operation. The locating action takes place at the beginning of the downward feed of the drilling spindle and just prior to the clamping of the rivet by the vise. The former action causes the bushing to be pressed firmly over the rivet and the continued feed of the spindle does the drilling.



A New Semi-Automatic Machine for Drilling Rivets Built by the Langelier Mfg. Company, Providence, R. I.

The rotary movement of a circular friction dial carries the rivets automatically to the vises and they are fed into them by a push finger. This finger derives its motion from a cam, the shaft of which is driven by the worm shaft through a pair of spiral gears. Storage space for a quantity of rivets is provided by a hardwood shelf placed at the level of the upper face of the dial. In this way it is possible to feed the rivets easily by having the operator push the blanks head downward on the dial. After the drilling operation is completed they are ejected by a stationary thin sheet steel finger which reaches into the opening of the vise and wipes the pieces out as they pass by.

The floor space required by the machine is 32 x 39 in. and the net weight is approximately 1600 lb.

Strength of Steel from Structural Shapes*

An Investigation Into the Effect of Overstraining by Gagging and the Amelioration by a Period of Rest

BY P. L. HANCOCK.†

In rolling it seems reasonable to suppose that the web and flange of I-beams get more work done upon them than the root, and also that they are finished at a lower temperature. It would be expected, therefore, that the root metal would have a somewhat lower elastic limit than either the flange or the web, and that the web would have the highest elastic strength. This would be especially true in the thick heavy beams and much less true in the lighter thin beams where the work done upon the material is more nearly the same for different parts of the profile. That almost 50 per cent. of the beams reported should show results differing from what would naturally be expected challenges the attention, and one is led to investigate further the elastic strength of structural shapes.

During the present year tests have been made at the Worcester Polytechnic Institute under the direction of the writer to see if further reasons could be found for the irregularity observed in so many cases hitherto reported, and to account, if possible, for the rather low elastic limit in some cases. Nine stub ends of structural shapes were selected as follows: Three standard I-beams, 12, 15 and 18 in.; one 24-in. Bethlehem beam; three standard channels, 4, 12 and 15 in.; one 10-in. Bethlehem H section and one 6-in. angle. The details regarding these materials and the results of tests are given in Table 1.

TABLE 1. *Tests of Material of Various Structural Shapes.*

Depth. Inches.	Beam Weight per ft., Lbs.	Specimen cut from	Elongation, in 8 in. %	Reduction of area. %	Elastic limit, lbs. per sq. in.	Yield point, lbs. per sq. in.	Max. strength, lbs. per sq. in.	
12	31.5 I beam	Web	28	61.5	32,000	36,300	59,300	No strain lines
		Flange	24.5	68.5	26,000	31,300	52,200	Strain lines
		Root	15	55	24,000	46,600	62,000	" "
15	60 I beam	Web	26	58	24,000	31,000	60,100	Pitted with rust
		Flange	26	59	24,000	32,000	62,500	" " "
		Root	28	57.3	24,000	31,900	.....	" " "
18	55 I beam	Web	24	48.7	34,000	36,500	65,300	No strain lines
		Flange	30.5	63	30,000	33,800	61,200	" " "
		Root	28.5	55	26,000	32,200	60,700	" " "
24	73 Bethlehem I	Web	23.5	56.5	44,000	50,000	67,500	" " "
		Flange	27.5	62.3	38,000	42,000	62,600	" " "
		Root	25.5	61.2	40,000	42,000	64,200	" " "
2	5.25 Channel	Web	24.5	61.5	42,000	44,000	63,200	Heavy strain lines
		Flange	25	49.2	34,000	40,700	64,200	" " "
		Root	25	50.4	46,000	50,000	65,500	" " "
12	20.5 Channel	Web	27	58.5	34,000	41,600	63,200	No strain lines.
		Flange	23	58	34,000	43,800	65,300	Strain lines
		Root	21	55	40,000	51,500	66,000	" "
15	33 Channel	Web	26	63.7	24,000	35,900	56,500	No strain lines.
		Flange	28	59.3	28,000	32,200	60,300	" " "
		Root	27	65.7	32,000	35,800	59,500	" " "
6	21.9 Angle	Web-1	27	59.6	34,000	39,000	58,300	" " "
		Root	24	53	34,000	38,600	62,900	" " "
		Web-2	30	63.3	34,000	34,200	54,200	" " "
10	88.5 Bethlehem H	Web	31	50	26,000	31,600	53,800	" " "
		Flange	36	53	20,000	28,500	52,200	" " "
		Root	31	51	18,000	26,000	53,100	" " "

It is seen from this table that out of the nine structural shapes investigated only three give the relation web, flange, root. The heavy beam 15 in. 60 lb. shows no variation between web, root or flange. The channels all give a higher value for the root and about the same for the web and flange, except in the case of the small 4-in. channel, where the web is considerably above the flange. In considering the results of tests on these channels it should be noticed that they are all rather light sections and that in any case the root of a channel received much more work in rolling than the root of an I-beam. The angle showed no variation. The Bethlehem beam section showed the relation of web, root, flange.

A determination of the carbon and manganese was obtained for three of these shapes, resulting as follows:

		Manganese.	Carbon.
4 in. 5.52-lb. channel	root	0.473	0.258
	web	0.428	0.160
15-in. 53-lb. channel	root	0.410	0.195
	web	0.467	0.205
24-in. 73-lb. Bethlehem I	root	0.628	0.151
	web	0.708	0.191

The rather high percentage of manganese in the Bethlehem beam may possibly account for the high elastic limit shown for the test pieces cut from it. The high values obtained for the 4-in. channel cannot be attributed to its chemical composition, but may be accounted for in part by the fact of the thinness of the metal.

Cold Bending of Beams in Straightening (Gagging)

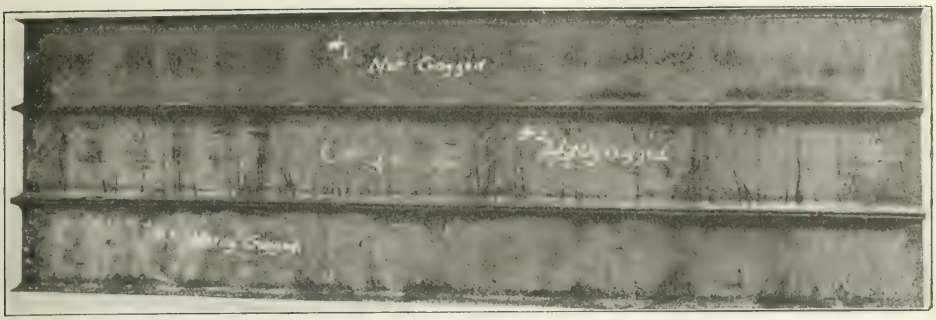
After the beams and channels come from the hot rolls and are allowed to cool they become bent, due to the unequal cooling of the various parts. It becomes necessary, therefore, to straighten them while cold. This process is known as gagging, and often causes the mill scale to come off, causing what will be called "strain lines." The presence of these strain lines indicates that the metal has been overstrained in straightening. Overstrain in this connection is to be understood as meaning that the yield point of the metal has been reached in the portions of the beam where the strain lines appear. This falling off of the mill scale is seen in all tension tests of mild steel when the yield point is reached, providing the mill scale has not been previously removed.

The effect of overstraining iron and steel in tension upon the elastic properties has been investigated by Muir, the writer and others (Philosophical Magazine, June, 1907), and it has been found to have a very marked effect. It has been found that overstraining a piece in tension or compression reduces its elastic limit to zero or nearly zero (depending upon how much of the yield at the yield point was developed before releasing the load. After a sufficient rest, varying from a few hours to 8 or 10 days, according to the kind of material, the elastic limit gradually returns and reaches a value somewhat higher than the original. Since beams are straightened cold at the mills, as indicated by the strain lines, it occurred to the writer that this might be a cause for the low values obtained for the elastic limit in some cases and the high or irregular values in others.

The occurrence of the strain lines indicates that the material has been overstrained. It should then be expected that it would follow, if possible, the same laws that govern overstrained tension test pieces, namely: That its elastic limit would be reduced to zero or nearly so; that subsequent rest would bring this elastic limit back to and even

*From a paper read before the American Society for Testing Materials, Atlantic City, N. J., June 30.

†Professor Applied Mechanics, Worcester Polytechnic Institute, Worcester, Mass.



Three Beams, Showing Strain Lines Due to Overstraining

above its original value. It seems reasonable to suppose, however, that the recovery will not be as rapid in a beam as in a single test piece; that it will be more rapid in small or thin beams than in large or thick beams; that it will be retarded by the presence of adjacent material that has not been overstrained. This latter supposition will be made clearer by referring to the engraving. This photograph shows three 10-in. 25-lb. I-beams as they were received from the mill. No. 1 is marked as "not gagged," but it shows strain lines all along both flanges, indicating that it had been straightened. No. 2 was "lightly gagged" and No. 3 "heavily gagged." The depth of the strain lines on the web indicates the spots where the overstraining was most severe. These overstrained portions and the adjacent portion not overstrained indicate that there must be internal stresses in the beam and that recovery from overstrain might be considerably retarded by these stresses.

In selecting the material from which the tests of Table 1 were made, particular attention was paid as to the evidence of overstrain in the portion of the beam by observing the presence or absence of strain lines. The last column gives a record of these observations. Examining this table with this information in mind we observe that in the case of the 12-in. beam the web shows no evidence of overstrain, while the flange and root show such evidence. The results for the elastic limit would be entirely consistent with the above observations as well as with the idea of the amount of work done in rolling.

The 15-in. beam was so pitted with rust that all strain lines, had they ever existed, must long since have been obliterated. There is no variation in the elastic limit, and since this is a thick heavy beam a very high elastic limit would not be expected. A difference due to work in rolling might be expected, however. No strain lines are shown on the 18-in. beam, and the values obtained for the elastic limits are explainable on the idea of work in rolling. The Bethlehem beam, 24-in., showed no strain lines, and the values for the elastic limit of root and flange are so nearly equal as to call for no particular discussion. The 4-in. channel was evidently heavily gagged, and the high values obtained for the elastic limit may be attributed to the complete recovery from the overstrain. That the root is so much higher than the other portions may be due to a greater amount of work in rolling. In the 12-in. channel there seems to have been complete recovery from the overstrain, while in the 15-in. channel and the angle there was no sign of overstrain.

The 10-in. Bethlehem H section was selected as a type of heavy section, the flange being 1 in. thick. This particular section had been in storage two years, so that all strain lines had disappeared, and the metal should have recovered its normal elastic properties. It is believed that the values found for the elastic limit for these pieces are low because of the small amount of work done in rolling and the comparatively high finishing temperatures.

An attempt was made to test the three beams shown in the half-tone engraving as beams by supporting them at the ends and loading them at the middle. The results of the tests were not satisfactory since the beams yielded on account of lack of side restraint. An 18-in. length was cut from the middle of each beam and from the left-hand end. Test pieces were cut from the compression flange and root and from the center of the web. These were tested in tension and the results are shown in Table 2.

It is presumed that the end sections of the beam (E) were so slightly stressed that the elastic properties in tension were not appreciably changed. The test pieces cut from the ends E should then show the strength of the metal from beams 1, 2 and 3, irrespective of the bending tests.

The time intervening between the gagging of the beams and the cutting of the sections was about three months, and the tests were made about a month later. The beams were thin and light and the material probably had sufficient time to recover from the overstrain due to gagging before the tension tests were made. This view is confirmed by the values of the elastic limit for the E pieces given in Table 2.

TABLE 2.—*Results of Tests of Pieces cut from 10-in. 25-lb. Standard Beams.*

Test-Piece.	Elongation in 8-in. %	Reduction of area %	Elastic limit lb. per sq. in.	Yield point lb. per sq. in.	Tensile strength lb. per sq. in.
1 E W	30	62.2	32,000	36,600	57,700
2 E W	32	60	32,000	36,200	58,100
3 E W	29.5	58	32,600	36,000	58,400
1 E F	30	64.2	28,000	33,100	57,800
2 E F	25.5	62.3	20,000	30,900	58,000
3 E F	26	60.2	24,000	33,400	58,600
1 E R	30	62.5	28,000	33,500	58,000
2 E R	25.5	58	20,000	33,300	59,100
3 E R	23.5	63	28,000	32,000	59,200
1 C W	29.5	66	30,000	35,600	53,300
2 C W	30	63.3	30,000	35,200	57,700
3 C W	29.5	62.8	28,000	35,100	59,500
1 C F	29	58.7	16,000	32,200	58,100
2 C F	25	60	28,000	31,800	58,300
3 C F	22	62	14,000	35,700	58,200
1 C R	..	62.8	14,000	29,500	57,200
2 C R	24.5	58.7	22,000	37,600	60,000
3 C R	22	61.2	16,000	38,300	59,750

NOTE.—Nos. 1, 2 and 3 refer to the beams Fig. 2. E refers to the end portion and C to the center portion. W, F and R refer to web, flange and root.

The sections C were overstrained in the testing machine about one month before being tested in tension. Beam 2 was not overstrained quite as much as beams 1 and 3. The effect of this overstraining is shown in the low values obtained for the elastic limit of the flange and root pieces. It is believed that this overstrain reproduces very closely the same effect as the gagging at the mill and the tension tests show that even after the lapse of three or four weeks the material has not regained its original elastic strength. The great difference between the elastic limit and yield point should also be noted. The similarity of the low elastic limit occurring with the normal yield point in the root and flange pieces of C to those obtained by Professor Marburg (Proceedings 1909, p. 385) suggests a probable similarity of cause. That is it seems reasonable to suppose that portions of his beams from which test pieces were obtained had been recently gagged.

Test pieces were cut from the other side of the compression flange of the C sections. These were heated to about 1600 deg. F. and allowed to cool slowly. They were then finished and tested. The results are as follows:

Tests After Metal Was Heated to 1600 Deg.

Test-Piece.	Elastic limit after heating.	Elastic limit other side of flange untreated.
1 C F	24,000	16,000
2 C F	24,000	28,000
3 C F	26,000	14,000

The results show a considerably higher elastic limit after treatment for the pieces from beams 1 and 3, as would be expected if the low values were caused by overstrain. Test pieces 2 C F show little variation.

To determine whether or not the results of tests

obtained by the writer last year could be checked this year by testing pieces from the opposite root and flange (most of these had been saved), test pieces were prepared from the opposite root and flange of beams H (15 in. 60 lb.) and K (20 in. 65 lb.). The results of these tests are shown below:

Tests to Show Value of Rest on Elastic Limit.

Test-Piece.	Beam	Elastic limit obtained 1910	Elastic limit obtained 1911 from opposite flange and root
15-in. 60-lb.	Flange	22,500	28,000
	Root	13,500	22,000
20-in. 65-lb.	Flange	24,000	26,000
	Root	16,500	24,000

This seems to indicate a recovery of the elastic limit, although there was at this time (1911) no evidence of strain lines on either of these beam sections. The expense of the preparation of the test pieces has made impossible the testing of pieces from the remaining sections investigated in 1910, although most of these sections have been stored for safe keeping.

Further tests were made upon material from an 18-in. 55-lb. standard beam to determine the effect of gagging. One section of the beam was heavily gagged and another section not gagged at all. From these test pieces were cut from the root and web and tested as soon as possible (within a month of the time of gagging). The results are as follows:

Tests of Material of Heavily Gagged 18-in. Beam.

Test-Piece	Treatment.	Elongation 8-in. %	Reduction of area %	Elastic limit lb. per sq. in.	Yield point lb. per sq. in.	Tensile strength lb. per sq. in.
Web	gagged	23	57	20,000	32,800	60,100
Web	gagged	28.5	59	18,000	30,600	59,000
Root	gagged	20.5	56	22,000	36,600	61,100
Root	gagged	26	50	18,000	36,100	62,000
Web	not gagged	30	55	28,000	33,300	58,700
Web	not gagged	28	56	30,000	34,000	59,000
Root	not gagged	28.5	56	26,000	33,100	59,700
Root	not gagged	30	55	24,000	32,000	60,500

The average value of the elastic limit for the gagged pieces is 19,500 and that for the pieces not gagged, 27,000.

All the evidence seems to show that overstraining a beam lowers the elastic limit of the metal in the beam temporarily, but that this elastic limit returns after a period of rest, the time at which the normal elastic limit has again been reached depending upon the amount of overstrain, the size of the beam (height and thickness) and probably somewhat upon the chemical composition of the material. From the few tests made the statement might be made that the time necessary for complete recovery varies from three months to a year for beams from 10 in. to 20 in.

It has been noticed that nearly all the finished test pieces were slightly bent, due, supposedly, to the internal stresses, and an attempt was made to find some relation between the condition of the test piece as to bending and its elastic limit. With the Ewing extensometer used in making the recent tests this bending due to internal stresses does not seem to affect the results. It was noticed that the pieces that were annealed before finishing (1 CF, 2 CF and 3 CF) showed no signs of bending.

Conclusions

The review of the tests thus far made on steel cut from different parts of the profile of structural shapes and a study of the conditions of manufacture of such shapes leads to the following conclusions:

1—That the tensile strength, per cent. of elongation and per cent. of reduction of area are practically not affected by chemical composition or treatment during or after rolling; that the yield point is affected but slightly; that the elastic limit is affected, but not seriously, when the proper precautions are taken.

2—The chemical composition of open-hearth beams is so uniform throughout the beam as to cause no practical difference in the strength of metal cut from different parts of the profile of the beam.

3—If all parts of the profile of a beam were finished at the same temperature it would be expected that the root of the web would have a slightly lower elastic limit than the center of the web or the flange because of the smaller amount of work done upon it in rolling. But the flange and web, being thinner, are finished at a slightly lower temperature than the root, and so have their elastic strength increased still more, due to this lower temperature. The web probably received more work than the flange in rolling.

4—Overstraining structural shapes lowers the elastic limit of the metal, but not permanently.

New Portable Electric Drills

Some Recent Products of the Van Dorn & Dutton Company

A new line of electrically operated portable drills and reamers has recently been brought out by the Van Dorn & Dutton Company, Cleveland, Ohio. Several changes in design and various improvements over the Hard Service line formerly made by this company have been embodied in their construction, although the only claims made by the maker are marked improvements in the construction both electrically and mechanically considered rather than anything radically new. The special features claimed for these tools are durability, simplicity in construction, reliable operation, ability to withstand long continuous service, the lightest possible weight that is consistent with the power developed and the minimum amount of repairs. Eight types of machines go to make up the new line, six of which have a capacity for drilling

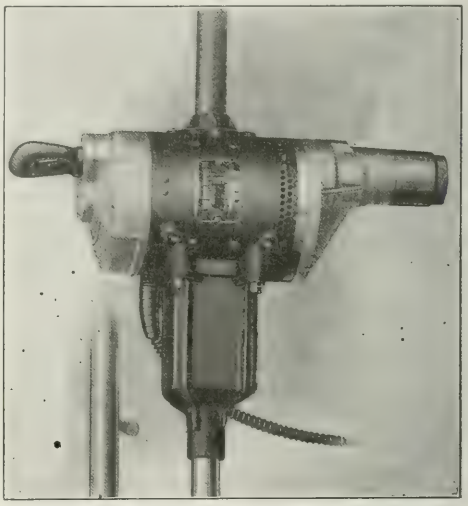


Fig. 1.—The New Type DC-3 Portable Electric Drill, Made by the Van Dorn & Dutton Company, Cleveland, Ohio.

holes from 0 to 2 in. in diameter for operation on direct current circuits of either 110 or 220 volts and two sizes with a drilling capacity up to ⅜ in. for operation on either direct or alternating current circuits of the same voltages. Figs. 1, 2 and 3 show three of the direct current machines having maximum drilling capacities of 1¼, ½ and ¼ in. respectively, while Fig. 4 illustrates the smaller size of the universal drill.

Series motors developing the greatest amount of power obtainable for the size and weight are used. In the larger machines four pole motors are employed, while those of the smaller are of the bi-polar type. The design is such that the harder the tool is forced the greater is the torque developed. The armature is of the slotted drum type and is built up of special analysis soft steel laminations on a hollow shaft, each disk being uniformly insulated. The armature and the field coils are form wound with insulated soft copper wire and all insulated parts are subjected to a very high voltage test.

In the larger machines the field frames are constructed of sheet steel, while in the smaller tools this part is built up of laminations in a manner which is very similar to the construction of the armature. This construction gives great rigidity with light weight. By removing the screws that hold the bottom head and the armature and plate, all interior parts and connections are readily accessible. The larger sizes have a removable socket or adapter set into the spindle which enables the tool to be removed quickly without using a drift. The lower head and the gear case which are reinforced with ribs to prevent distortion are made of cast aluminum.

Special attention has been given to the matter of lubri-

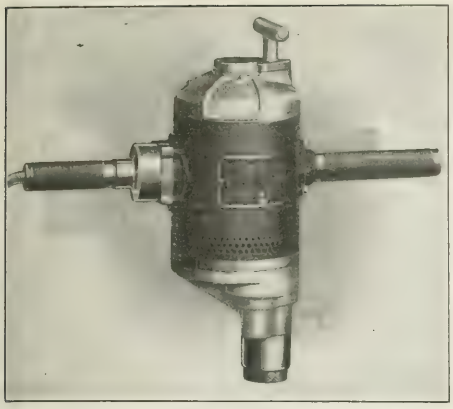


Fig. 2.—A Portable Direct Current Tool for Drilling ½-In. Holes in Steel.

cation and the bearings in designing these drills, as they are two features which are of great importance in tools of this character. A simple but very effective method of lubrication has been adopted. The gears are inclosed in a case which is entirely separate from the windings and not only serves as a housing for the gears, but also as a lubricant chamber for the gears themselves and the spindle and the thrust bearings. Channels running from this case to the bearings enable all of them with the exception of that supporting the spindle to be lubricated while this one is provided with an easily accessible receptacle. The motion of the gears forces the lubricant through these channels, thus assuring proper and sufficient lubrication at all times. The oiling system is so designed that one charge of non-fluid oil, it is claimed, will answer for several weeks. Ordinary machine oil can be used for lubricating the spindle. The wipe system is employed for this part, and it is so arranged that the wick is constantly in contact with the spindle. In designing the bearings an ample factor of safety was allowed, and it is claimed that friction has been reduced to a minimum. For the high speed members imported ball bearings are used, while elephant bronze bushings are used as bearings for the slower speed members.

All of the gears used in the tool are made from an alloy steel and are hardened and ground to size to secure great strength and long wearing qualities. The teeth forms are all accurately generated. The spindle and the socket are of a special design which is said to eliminate slipping and breaking, and these parts are made of a special grade of steel which is hardened and ground. A fan having sufficient capacity to keep the motor cool is provided with the drill and this is of a special design supported at the top and the bottom by a rim which gives it strength. The heated air is forced out by the fan and is replaced by cold air which is drawn in by suction.

A quick-break switch having a capacity of 50 per cent. in excess of that required is employed. In the larger machines, which are also used for reaming, mechanically operated automatic switches are used that will stop the drill if the operator should accidentally release the handle when the tool is in operation. These switches will break instantaneously, thus eliminating a very heavy and destructive arcing, while in the smaller machines a special design of switch is employed in which the contacts are designed so as to be readily replaced at a low cost. The brush holder is well insulated and direct connection is secured from the brush to the terminal block by leads. The brushes can be readily removed, although they are firmly held in place. In general, the construction of this line is such that the tools are easily assembled and

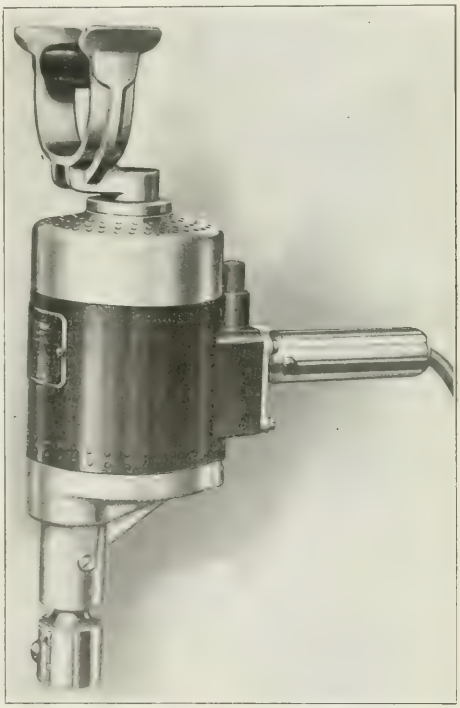


Fig. 4.—The Type DA-00 Universal Drill.

taken apart and all parts are interchangeable and easily accessible.

The sizes and capacities of the eight types of machines are given in the following table, the first six being for direct current only and the last two for either direct or alternating current:

Type.	Drilling capacity, in.	Reaming capacity, in.	Weight, lb.	Hight, in.
DC-4	½	1⅜	85	20¾
DC-3	1¼	13/16	54	17½
DC-2	⅞	11/16	30	14
DC-1	¾	7/16	20	13
DC 0	⅝		14	12¾
DC-00	¼		6½	9¾
DA-0	⅜		14	12¾
DA-00	¼		7	10¾

The hight measurement given in the last column of the foregoing table is made from the top of the head cover to the end of the spindle or chuck, as the case may be. The first three machines are not equipped with a chuck, but the five remaining sizes can be equipped with either a chuck or a spindle. When the machine is equipped with a chuck the hight measurement is increased by 14½ in.

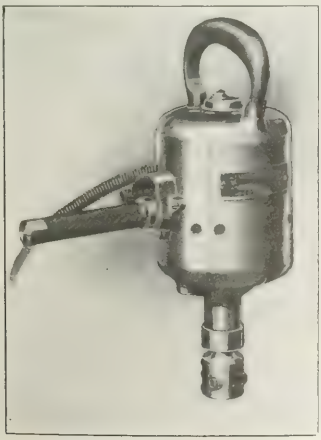


Fig. 3.—The Smallest Size of Drill Made, Maximum Capacity, ¼-In. Holes in Steel.

Standards of Safety in Relation to Machinery*—II.

The System of the United States Steel Corporation in Ridding Works of Their Dangers—The Problems That Have Been Solved

BY DAVID S. BEYER.†

The Human Factor

A large percentage of our industrial accidents can be attributed to carelessness, indifference, willingness to take chances—the same fundamental human failings and shortcomings that are found in the office and the home as well as in the mill. Rudyard Kipling has recognized the universal nature of our human characteristics and expresses it in the following lines:

"Who shall doubt the secret hid
Under Cheop's pyramid
Is that the contractor did
Cheops out of several millions;
Or that Joseph's sudden rise
To Controller of Supplies
Was a fraud of monstrous size
On King Pharaoh's swart civilians."

I venture the further surmise that if we could dig up the tablets on which the accidents of that day were recorded, we would find that men were suffocated in the wheat bins of Egypt, just as they are in Chicago's grain elevators; and I do not doubt that if the wearing of safety goggles had been made compulsory among the stone masons who built the pyramids these goggles would often have been found on the foreheads instead of over the eyes they were intended to protect—just as I have seen them in a modern steel foundry.

With the development of the complex and powerful machinery which is used in our modern industries, we have added an additional and magnified element of risk, that is lacking in the more simple and fundamental occupations. The men who hurriedly jostles against his neighbor in the street may do so with impunity, but it is a different matter when a steam engine or an electric crane is substituted for the passer-by. In the steady, rhythmical motion of a large machine one readily forgets the 1000 hp. of energy back of it, in comparison with which the human body is as insignificant as a pebble to the steam roller.

It is not strange that a man who has worked day after day for several years in a blast-furnace plant, without any inconvenience, should forget that the colorless, odorless gas which is present in greater or less degree at all times can deprive him of his senses, or even of his life, without any perceptible warning—if he happens to breathe too much of it. It takes a tragedy to bring this home to his consciousness, and even then the effect soon wears off.

I have in mind a plant where several men have died as a result of being overcome by gas. The most recent accident involved a man who had had several years' experience about the plant and knew of the former accidents. He was on duty in a motor house near the gas washer. There were no gas mains or direct connections to the little building in which he was located, and the work was so light that one man could easily have taken care of it. As a special precaution, however, an extra man was always employed at night so that a single person would not be left alone where he might be overcome by gas without anyone knowing about it.

One night the motors were shut down for a few hours and these two men had some idle time on their hands. They locked the doors of their house on the inside so that they would not be disturbed and one of them made a bed of waste back of the switchboard, lay down and went to sleep. The other one sat in a chair, but he, too must have become drowsy and did not notice that the water had escaped from a valve outside the building and that gas was leaking in through openings in the walls. When the doors were broken open a short time afterward both men were dead.

You may say that this is an extreme case—and so it is—but examples of similar short-sightedness are constantly coming to our attention, and I could multiply them indefinitely. Frequently, as in this instance, it is the man who is careless who has to pay the penalty—but fortunately the penalty is not often as severe as it was in the case I have described.

An accident recently occurred where the foreman in charge of a boiler house opened a valve and allowed hot water and steam to blow into the ash pit of a boiler, seriously scalding one of his helpers, who had told him a few minutes before that he was going into this pit to do some work. Not more than six months ago I talked to this foreman about carrying out a rule in regard to locking valves for the protection of men under similar conditions, and he scouted the idea that he might ever make such a mistake.

Take the case of hammering tools used by blacksmiths. Almost every man who has worked at this trade for any length of time has scars, or even pieces of steel imbedded in his body, caused by allowing his tools to become "mushroomed" over at the edges, so that pieces break from them and fly. Such a piece may knock out an eye and leave him partially blind for the rest of his life. The danger can be



A Warning Against High Tension Electric Currents, Understandable in Many Languages

eliminated if he keeps his tools properly dressed, and yet a shop where every tool is in good condition is a rarity. Even with the system we have in vogue, where an inspector goes through each shop weekly and reports defective tools, something of the same condition is found, though in a greatly lessened degree.

Printed Rules and Warnings

It is possible to issue rules and instructions covering certain specific dangers. For instance, we tell the workman that he must not oil, or wipe, or adjust, his machine while it is running, and in order to keep this before his mind we post signs in conspicuous places throughout the mill on which this rule is displayed. We tell the crane operator that he must not leave his cage and go on top of the crane without locking a switch so that no one can throw on the power and catch him unawares, and this, together with a number of other safety precautions, is printed and posted in his cage where it is always before

*Paper presented before the National Conference of Charities and Correction, Boston, June 13, 1911.

†Chief Safety Inspector of the American Steel & Wire Company.

him. We place on high voltage electric equipment a red and black marked sign with a white skull and cross bones and the one significant word "Electrika," which is universally understood in all languages.

Such precautions can be taken where a certain definite and specific risk is involved, but anyone who has made a detailed study of accidents must be impressed with the large percentage of them which are due to some unusual condition or some peculiar combination of circumstances that could not possibly be foreseen and covered by general instructions.

For instance, the case I have just cited of the man who was scalded in the ash pit would not have occurred if one of the connections to a grate bar had not suddenly given way. It was in an effort to fix it that the injured man crawled into the pit, where he worked with a bed of hot coals directly over his head. One would naturally not expect a man to be in such a location, so the knowledge that he was there escaped the mind of the foreman at the critical moment, even though he had been properly informed of it.

So much depends on the exercise of judgment and thoughtfulness and the individual interest of each employee that too much stress cannot be placed upon the education of the workman along these lines, and the desirability of keeping the subject actively before his mind.

Workmen's Safety Committees

One of the most important agencies for this purpose has been the workmen's safety committees which are established in every plant of the American Steel & Wire Company. These committees make weekly inspections and are urged to be constantly on the lookout for new safety suggestions, or the enforcement of those already in effect, and their personnel is changed at frequent intervals, so that a large number of men receive the benefit of this experience. More than 1000 men out of a total of about 30,000 employed by the company are thus brought into direct contact with the safety problem each year and made to realize something of the object aimed at, and it can be readily understood what an effective agency this represents.

Committees are sent from one mill to another of the American Steel & Wire Company, as well as from one subsidiary company to another of the United States Steel Corporation, and this gives the stimulating effect of healthy competition. A committee which finds some set screws in the machinery of a neighboring plant and writes them up in its report is likely to go back home with a keener eye for its own short-comings and a strong resolve to eliminate every projecting set screw there before the visit is returned.

I will not burden you with a description of the permanent foremen's safety committee which is organized in each mill, or of the special inspectors who look after cranes, engines, shops and other more important equipment. I will not tell you of the district safety inspectors who are constantly at work in addition to these local agencies and you already know about the State factory inspectors, who add their quota to that which our own men accumulate.

When I tell you that there are no less than eight distinct agencies of this sort, each viewing the matter from a different angle, and all actively engaged in making inspections and piling up safety recommendations, I think you will begin to sympathize with the mill superintendent who is responsible for carrying out the recommendations. I fear you will agree with the social investigator who alluded to this matter in a recent magazine article, and spoke of the mill man as having "safety cranks" added to his otherwise overburdened existence. The superintendent is instructed that he must not make repairs or do any work on machinery while it is in operation; and he is now forbidden to have repair gangs out during the Sunday shut-down, which used to be the favorite time for getting these matters cleaned up. He is not infrequently placed in a quandary as to whether a mill should be stopped and 100 men stand idle while a safeguard is being installed, or whether he shall take a chance on an accident happening before a regular shut-down occurs.

And yet, notwithstanding all this, the work is being done as fast as the recommendations are turned in. As many as 300 or 400 individual suggestions are carried out monthly in some of the larger mills. Special "safety gangs" of from two or three up to 12 or 15 men are constantly at work on present equipment in each of the plants, and new installations are being designed and erected so that adequate safety provisions are made from the start.

Some General Conclusions

Much is being said these days about "workmen's compensation," and "employers' liability," and, as you all know, new legislation of this kind is now being drafted in a number of States. Both these lines of effort are valuable, tending as they do to a fairer economic distribution of the burden of industrial accidents, and carrying with them a certain punitive effect for the employer who is careless or indifferent to the safety of his workmen. But how much more important than liability or compensation laws, which take effect after a man has been injured, is the actual prevention of the injury! That eliminates alike both questions of responsibility and remuneration and checks the evil at its fountainhead.

Legislation is necessary for the protection and preservation of society, and yet it is largely expressed in terms of negation. We can say "Thou shalt not kill"; "Thou shalt not steal"; "Thou shalt not bear false witness against thy neighbor"; but who could ever hope to enact a law big enough and broad enough to specify all the positive constructive activities of a social community? And so it is with the accident problem; positive constructive work that does not confine itself to the mere limits of legislation is the thing that is necessary if we are to realize anything like the full possibilities of accident prevention.

Illinois now has one of the most rigid factory laws in the United States and its staff of inspectors is probably equal to that of any other State. About a year ago one of the State inspectors in going through an Illinois plant of the American Steel & Wire Company stated that he considered it the best equipped from the safety standpoint of any of several hundred plants which he had visited. He made no report of recommendations for further improvement—and yet each one of our own inspectors who are at work in that plant is making continual additions to its list of safety recommendations, and we have been spending, and will continue indefinitely to spend, about $1,000 per month on safety work in this particular mill.

Some time ago an Ohio inspector visited one of the company plants in Cleveland, and in commenting on conditions, he said that it was the first plant he had ever inspected in which he did not make some recommendations. A little later another mill was added to the same honor roll. And yet our local inspectors are busy in those plants, and a constant volume of safety work is under way there at all times. I cite these instances not with any desire to exploit or magnify the work that is being done in our own company but because they cast an interesting side light on the extent to which the work of progressive accident prevention outdistances legislation.

The Movement Wide Spreading

And, notwithstanding the indifference that is sometimes manifested in this direction, I feel that a note of optimism is not out of order at this time. The energy and resourcefulness of some of the most efficient industrial organizations of the world are now being directed upon the problem of accident prevention. I have made frequent mention of the United States Steel Corporation because I am familiar with the work it is doing, but I also know that there is a widespread and growing interest in the problem all over the country. The International Harvester Company, the National Cash Register Company, the Westinghouse Electric Company, the Jones & Laughlin Steel Company, the Lackawanna Steel Company, and many other large manufacturing and railroad organizations have safety and welfare departments, which are all working along the same lines.

There are other agencies such as the American Museum of Safety in New York, the National Association of Manufacturers, the accident insurance companies and various engineering and trade organizations which are taking an active interest in accumulating and scattering abroad information on this subject, and rapid strides are being made in the general improvement of safety conditions.

The problem is not so much that of the large manufacturer, who is used to looking at such things in a

broader way, as it is of the owner of a small plant where only a few men are employed. To him the cost of protective measures looms up like a threatening cloud on his financial horizon. He feels that this expense is coming directly out of his own pocket, and prefers to take chances on a possible future penalty rather than meet the unavoidable present cost. In the aggregate this class of manufacturers employs a large body of men, and is more difficult to reach on account of the smaller working units into which it is divided, and the great number of people who must be interested individually before they will do anything along this line.

Yet there are ways in which the small employer must inevitably be reached, sooner or later. The wave of legislation that is spreading over the country will help bring the matter home to him, through the heavier penalties that will be imposed, and because these penalties will be made unavoidable, instead of leaving so many loop-holes through which he may escape.

The pioneer work that is being done by some of the large concerns which I have mentioned, will aid immeasurably, by demonstrating the practicability of all sorts of safety devices and by arousing greater interest in their use. There are many dangers which are commonly considered as "unavoidable trade risks," where it can be demonstrated that they are not unavoidable, and that they can be almost completely eliminated if the necessary effort is put forth. Such is the case with the blacksmith's hammering tools, the wire drawers' hand leathers, and the ladder accidents which I have described.

Results of Research Open to All

But before much general interest can be aroused it is necessary for someone to show conclusively that a given safety device is practical, and that it will not cause too much interference with the necessary actions of the workmen. This is being done on a large scale by the United States Steel Corporation, and the benefit of its experimental work is being passed out freely to all who apply—even to the man who is in competition for the same lines of business.

As regards the question of cost—it is my personal opinion that this can be made to take care of itself. I believe it can be proven that the large expenditures which are necessary to carry out a broad policy of protection will pay not only a good rate of interest on the money invested, but a sinking fund as well, so that what seems to many people like an unproductive outlay of money can be shown to be a paying investment.

So far as I am aware, there are no convincing records of this sort available at present, and it takes a period of years to make such a record convincing. If we can ultimately prove, as I think we can, that the use of safety equipment will make a good return in hard American dollars, it will be a most important contribution to the cause of accident prevention, and will remove the greatest obstacle in the mind of the man who is not susceptible to the less obtrusive, humanitarian motive, which ought to be the most impelling one of all.

A Policy of Conservation

Conservation is a subject that is now receiving a large degree of attention, and when we listen to the appeal of the men who would preserve our forests and conserve our public lands we are almost convinced that this is the paramount question before the public today. A human life is something that cannot well be valued in dollars and cents, but I have seen estimates of the economic loss in the United States as a result of industrial accidents, varying from $250,000,000 to $300,000,000 per year. I will not attempt to corroborate these figures for you, as there is necessarily a large element of guesswork in such approximations. I do not believe their evidence is needed, however, to convince you that the conservation of the heads and hands of our workmen is at least equally important with any other of the conservation movements now under way.

Millions of dollars are being set aside and powerful organizations and influences are being brought to bear on the establishment of "universal peace"; but we have seen that the loss of human lives in the greatest war of recent years is outdistanced by that of 12 months' peaceful industrial activity in the United States.

The country at large is just beginning to awaken to the seriousness of the accident problem, and is turning in haste to legislation, which, to many people, is the panacea of all social evils. But I tell you the condition is not one that we can correct by mere legislation, any more than we can legislate selfishness out of the minds and hearts of mankind. Impulsiveness is a trait of human nature that is not confined to the American people, but it is one that they possess in no small measure. A theater is burned in Chicago, and many people killed. All over the country a storm of protest arises and stringent regulations are enacted for the protection of theater-goers.

A few years elapse, and a schoolhouse takes fire in Cleveland, involving an appalling loss of life among the children. Almost immediately holes are knocked in the walls of all the other school buildings of the city, in a hurried effort to improve safety conditions, and in some cases those openings in the upper walls stand for days with their added element of risk before outside fire escapes can be placed. Each of these tragedies is followed by spasmodic action of the same sort in various parts of the country.

Was there any new and acute condition in existence after the Chicago fire, and after the Cleveland fire, which made necessary the precipitous and instant application of safety measures? Absolutely none! There was no condition that could not have been foreseen and remedied by quiet, thoughtful, intelligent effort before the catastrophe occurred.

And let me reiterate, this is what is needed in treating with the problem of industrial accidents, not an outburst of strenuous but shortlived activity after each successive disaster, with an occasional act of legislation "by way of good measure," but the same careful, thorough, systematic study of conditions and overcoming of obstacles that would be used if we were building a bridge or digging a canal.

Legislation Not the Primary Need

Legislation is not the thing that is needed primarily. Most of the States already have specific legislation covering certain important classes of machinery, with general blanket clauses to comprehend the rest. Note, for example, the following quotation from the Pennsylvania laws: "All vats, pans, saws, planers, cogs, gearing, belting, shafting, set screws, grindstones, emery wheels, flywheels and machinery of every description shall be properly guarded." This is broad and comprehensive enough to cover everything now in use in the mills, or likely ever to be designed; but until some one demonstrates when a machine is "properly guarded" we cannot hope either to gain much from the present general legislation of this character, or to enact new laws that will be more specific in their provisions.

The issue is largely a moral one after all. Nowhere is the old adage about "Leading a horse to water" more fully realized than in the application of safety devices. It is possible to force a certain device into position through the agency of legislation or some other form of authority, but unless the man who has to use this device accepts it in a friendly spirit he can make it of less than no value for the accomplishment of its purpose. To bring about the highest possible perfection of safety conditions in a mill it is necessary for each person in that mill, from the superintendent down, to be in sympathy with the movement, so that he will look for the good points and not the objectionable ones in everything that is done. When this condition is attained every law might be erased from the statute books, and the cause of safety would lose not a particle. Without this condition no volume of legislation can accomplish the desired end.

Humanity at large is not hard-hearted or indifferent. I do not believe there is an official in any business enterprise today who will not favor a safety measure if he is convinced that it is practical and is of real value in reducing an actual danger.

So, in concluding, this is the thought that I would leave with you. There is an accident problem, and it is a most important one, from the social and economic standpoint, as well as that of human happiness. Much can be done to improve conditions and rapid progress is now being made in overcoming the practical, legitimate difficulties and objections that are encountered. Legislation of a mature and intelligent kind will add a certain contribution, and tend to equalize the benefits that may be obtained. But finally, and of more importance than all

the others, is the necessity for a thorough-going study of the causes of accidents, and an effective demonstration of the preventive measures which are possible in each particular industry. When this information is put before them, we can depend on the men who are responsible for carrying on these industries to do the rest.

[*The End.*]

A New High Duty Drill

A Recent Product of the Foote-Burt Company

As an addition to its line of high duty drills the Foote-Burt Company, Cleveland, Ohio, is placing on the market a new machine designated as its No. 25½ high duty drill. This machine has a capacity for high speed drills up to 3½ in. in solid steel to their fullest capacity. It is capable of drilling to the center of a 36-in. circle. This machine was brought out to fill a gap between the company's No. 25 drill with the same swing, but with a cutting capacity of only 2½ in., and its No. 26 machine with a cutting capacity of 3½ in. and built with two throats providing swings of 44 and 60 in. The latter machine was described in *The Iron Age* April 2, 1908. The general mechanical construction of the new machine is similar to that of the other sizes of high duty drills now made by this company, the line now consisting of seven sizes. Following the principle adopted in designing other sizes of high duty drills, that to get efficiency from high speed drills it is necessary to have a rigid machine, important features of this machine are the extreme rigidity of its construction, the massiveness of its frame and weight, the use of the highest grade of material for the different requirements and the powerful driving mechanism. A new feature in the No. 25½ machine is the use of Hyatt high duty roller bearings for the main driving shafts at the base and the top of the machine. All other bearings are bronze bushed. Spur gears, which are always in mesh, are used throughout, except one pair of miter gears at the driving end and one worm and worm gear for the feed.

The new machine was exhibited at the convention of the American Railway Master Mechanics' and Master Car Builders' associations at Atlantic City last month, and drilling tests at that convention, using the high speed drills of the Cleveland Twist Drill Company, attracted a great deal of interest. A drilling speed of 57½ in. per minute was obtained in cast iron, which the company believes establishes a record for drilling. All of the drills used in this series of tests were of the standard flat twist type, except No. 8, which had a milled shank, and the results obtained are given in the accompanying table:

Drill No.—	1	2	3	4	5	6	7	8	9	10
Size, in.—	1⅝	1½	1¾	2 5-16	3	1¼	1⅜	2½	3	3¼
Material, Cast iron 4 1/32 in. deep. Machine steel 4¼ in. deep. Speed, r.p.m.—	575	355	350	190	120	350	225	175	150	150
Feed per revolution of drill, in.—	0.10	0.10	0.10	0.05	0.10	0.03	0.04	0.04	0.03	0.03
In. drilled, per minute—	57.5	35.5	35.0	9.5	12.0	10.5	9.0	7.0	4.5	4.5
Peripheral speed, ft. per min.—	163.6	139.4	160.0	115.0	94.0	113.7	94.8	114.7	116.0	127.0
Metal removed, cubic inches—	70.60	62.70	84.18	39.90	84.80	12.80	18.60	34.30	31.70	37.33

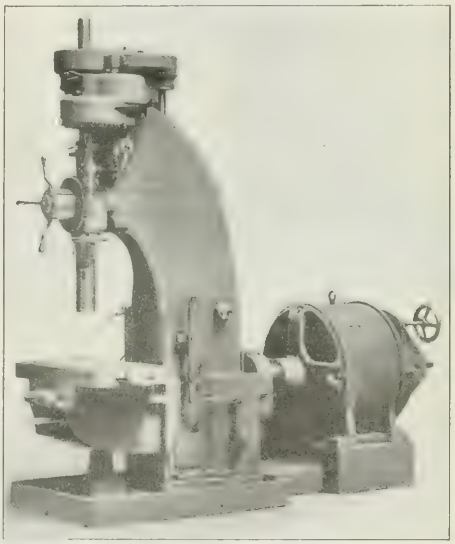
The spindle is of forged high carbon steel, 3 in. in diameter in the sleeve and 2⅞ in. at the driving end. The nose of the spindle is fitted with a No. 6 Morse taper socket. The sleeve is 24¾ in. long, 4½ in diameter and has a ball bearing thrust collar of the company's own make, which is guaranteed not to crush and to withstand hard continuous service without breakage of the balls. A power feed of 16 in. is provided for the spindle, which is 18 in. from the face of the column.

Nine changes of geared feeds are provided through the change gear mechanism located at the side of the spindle. All speed changes are through a quick change gear device operated by levers located at the front of the machine and within easy reach of the operator. These changes are made by the entering of a lock bolt through the shaft in a hole in the gears, the shaft being shifted to its various positions by a rack-and-pinion connection with the operating lever.

Power feed is provided with an adjustable automatic stop and a hand stop. Hand feed is through worm and worm gearing, and quick traverse of the spindle in either direction is accomplished through a spider hand wheel located at the front of the machine, which with either the in or the out movement of any or all of the handles engages or disengages the same.

The regular drive consists of a four-step cone pulley mounted on the base in the rear of the machine and driven from a countershaft hanging from the ceiling. Four additional changes of speed are provided by two-to-one back gears located in the base of the column and operated by a lever on the side of the machine. The speeds of the spindle range from 25 to 200 r. p. m. The motor drive, as shown in the accompanying illustration, consist of a 20-hp. four-to-one adjustable speed motor with a range of from 300 to 1200 r.p.m., geared direct with two-to-one reduction and back gears, giving a further gear reduction of four to one, and giving spindle speeds of from 37½ to 600 r.p.m.

The table is of the bracket knee type, having a large square lock bearing surface on the upright, to which it is securely gibbed. It is elevated and further supported by a square thread telescopic jackscrew located underneath. This jackscrew is set slightly back of the spindle to permit boring bars and other tools to pass through the table. The table is provided with a large oil groove and two T slots. The table has a working surface of 24 x 24 in. As an extra attachment the machine has a compound table, which has a longitudinal adjustment of 14 in. and a cross adjustment of 8 in. The top platen is fitted with two T slots, running lengthwise, and it also has a large oil groove. It has a working surface of 16½ x 30 in. The compound table reduces the maximum distance from the nose of the spindle to top of table 5¾ in.



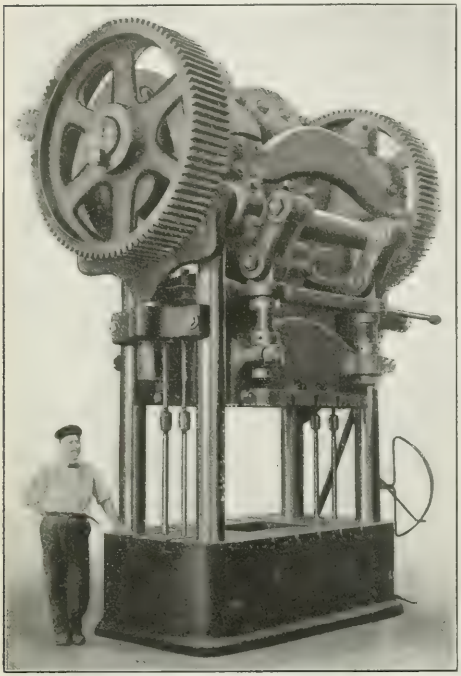
The New No. 25½ High Duty Drill Built by the Foote-Burt Company, Cleveland, Ohio.

The following table gives the principal dimensions and specifications of the drill:

Distance between spindle center and column face, in.	18
Maximum distance between spindle nose and table top, in.	31½
Length of power feed, in.	16
Diameter of spindle sleeve, in.	4½
Length of spindle sleeve, in.	24¾
Width of spindle sleeve steel rack, in.	2
Diameter of spindle, driving end, in.	2⅞
Diameter of spindle in sleeve, in.	3
Diameter of spindle nose, in.	1⅝-8
Morse taper of spindle, No.	6
Working surface of plain table, in.	24 x 24
Working surface of compound table, in.	16½ x 30
Longitudinal adjustment of compound table, in.	14
Transverse adjustment of compound table, in.	8
Vertical adjustment of table, in.	18
Number of feed changes	9
Minimum feed per revolution of spindle, in.	0.0075
Maximum feed per revolution of spindle, in.	0.1000
Minimum spindle speed, r.p.m.	25
Maximum spindle speed, r.p.m.	200
Speed of countershaft, r.p.m.	400
Number of cone pulley steps	4
Diameter of smallest cone pulley step, in.	12
Diameter of largest cone pulley step, in.	24
Face width of cone pulley steps, in.	4½
Net weight, lb.	7,000

A New Toggle Drawing Press

The substitution of steel stampings for castings and forgings in the manufacture of automobiles has led to the design of a number of new presses for producing work of this character. The Ferracute Machine Company, Bridgeton, N. J., has recently built a press from designs of its president, Oberlin Smith, which is illustrated herewith. Although it was primarily designed for deep double-action work, such as brake drums, gear cases, dust covers and other automobile parts, it is possible by disconnecting the toggles at the front and the back to convert the machine into a long stroke single-acting press. When changed in this way a greatly increased capacity is secured.



A New Double-Action Toggle Drawing Press for Automobile Parts Built by the Ferracute Machine Company, Bridgeton, N. J.

An iron casting which is internally ribbed and trussed is used for the base and projecting upward from the four corners are 9-in. steel columns. These fit into holes bored in the base and are firmly fastened in position while they are connected at the top by heavy castings, the end stays containing the journal bearings for the shaft. In addition to taking the tensile stresses set up while the press is in operation, the four columns act as slide bearings for the ram. The shaft is a heavy steel forging 12½ in. in diameter at the journals and 15 in. at the crank. Steel gears with cut teeth are keyed to the ends of the shaft and a cam-groove in one of them transmits vertical motion to the yoke at the left of the machine. This yoke imparts a partial rotary motion to the toggle shaft, which in turn drives down the ram. The plunger or inner ram to which the upper die is attached is driven by the crank at the middle portion of the shaft.

The following table gives the principal dimensions and specifications of the machine:

Overall, hight, in.	192
Depth, in.	110
Maximum distance between bed and ram, in.	48
Width, in.	200
Maximum distance between bed and plunger, in.	61
Stroke of ram, in.	13
Stroke of plunger, in.	36
Vertical adjustment of ram, in.	8
Vertical adjustment of plunger, in.	8
Pressure exerted, tons	1,000
Diameter of fly wheel, in.	50
Face width of fly wheel, in.	12
Weight of fly wheel, lb.	3,000
Total weight of press, lb.	140,000

The equipment regularly furnished with the press includes a set of wrenches and the other tools ordinarily supplied with a machine of this character.

An Example of Good Machine Shop Lighting

Good light and good ventilation are two important requirements in a machine shop and of late considerable attention has been paid to this subject by owners and shop superintendents. At the present time a large number of plants are being equipped with windows which are designed to provide a maximum of glass area with a minimum amount of supporting material. Steel is generally employed for this purpose and the Detroit Steel Products Company, Detroit, Mich., has recently installed a large number of Detroit-Fenestra solid steel window sash at the plant of the Gear Grinding Machine Company of that city.

The plant of this company is of reinforced concrete construction, is three stories high and occupies a ground area of 90 x 150 ft. It is practically fireproof in its construction and solid steel window sash are used throughout. A portion of the machine shop on the third floor is shown in the accompanying engraving and gives a very good idea of how well a machine shop can be lighted and ventilated by the use of the Detroit-Fenestra solid steel window sash. The bays are 20 ft. wide and the windows, which are 10 ft. high overall, extend from approximately 3 ft. above the floor to the ceiling. Each



A Portion of the Interior of the Gear Grinding Machine Company's New Plant, Showing the Use of Detroit-Fenestra Windows Made by the Detroit Steel Products Company, Detroit, Mich.

section is equipped with a double ventilating window hung on pivots in the center of each and operated by a peg and stay lock, each pair being joined by a connecting bar. The sash are of the standard type of the manufacturer. An abundance of air is afforded by the use of these windows as there are eight ventilators in each bay.

A Ring Grinding Wheel Chuck

Charles H. Besly & Co., 118 North Clinton street, Chicago, Ill., have recently developed a pressed steel ring wheel chuck, to which the name Helmet has been given, for holding cylinder or ring grinding wheels for roughing

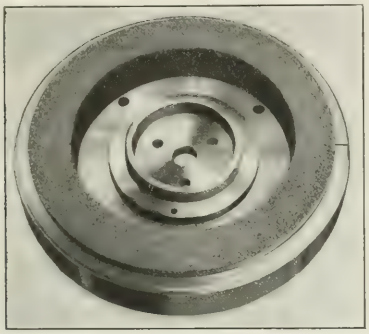


Fig. 1—The Helmet Pressed Steel Ring Wheel Chuck Made by Charles H. Besly & Co., Chicago, Ill.

off scale and excess stock when the work is too rough and rugged to be ground economically with emery cloth disks. The special advantages claimed for the chuck are safety, light weight, simplicity of operation, adjustability for wear, a minimum overhang and economy in use. Fig. 1 is a view of the chuck, while Fig. 2 shows at the left a hub or center such as would be used on any ordinary grinding spindle, while the middle view is a section showing the chuck as used on disk grinders or fastened to a collar, while the view at the right is a front view.

The chucks are light in weight and as they are designed without external projections practically all danger of their bursting in service has been eliminated. The working face of the ring wheel is always near the steel chuck body and is rigidly supported by it, thus assuring safety. The spindle bearings project into the chuck, thus obtaining a minimum overhang. Economy in use is secured as the ring wheel can be worn to within ¼ in. of its maximum depth with safety, and at the same time the cost of these wheels is approximately 25 per cent. less than cup wheels of the corresponding size. As compared with grinding on the periphery of the ordinary form of emery wheel the cylinder or ring grinding wheel mounted in a pressed steel ring wheel chuck enables a better finish to be secured where much work is being done, since the same diameter is always maintained, thus avoiding the necessity of a change in speed and the grinding is accomplished on a flat surface instead of on a curved one. Referring to the central and the right portions of Fig. 2, which show details of the chuck, A is a split clamp ring which holds the grinding ring B in place. This ring is surrounded by the chuck body C, to which the hub or center D is riveted. The grinding ring is kept in the proper position by the nut E, which sets it out.

For economical face grinding on rough stock the abrasives should run at a speed of 5000 ft. per minute and work should be forced against the grinding wheel with a pressure of approximately 50 lb. per square inch, conditions under which it is claimed a cup wheel cannot be operated with safety.

These chucks can be furnished for holding ring wheels ranging in diameter from 10 to 30 in. for use on any make of disk, face, edge, knife, side bar or vertical surface grinder, or for hubs bored for use on an ordinary emery wheel arbor, as shown at the left of Fig. 2.

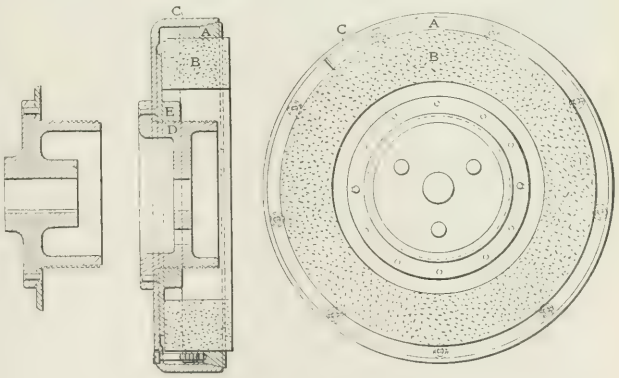


Fig. 2.—Details of the Chuck.

Powder for Ready Plating of Metals

An instantaneous electroplating powder for precipitating gold, silver, copper, tin and nickel on other metals has been developed by Arthur E. Firth, Auckland, New Zealand. A short time ago the opportunity was given at the Hotel Astor, New York City, by Holmes C. Walton and F. A. Hood of Wellington, New Zealand, to observe the application of the powder. A cloth wet with water was dipped into the powder and rapidly applied to the metal to receive the deposit, such as the blade of a steel household knife, the friction resulting from the rapid rubbing of the powder covered cloth being seemingly an essential. The process is described as electrolytic in its nature, and the plating accompanied with effervescence of the moistened powder.

It is understood that Mr. Firth has been for several years making a special study of the subject and did not reach success until December, 1909. The powder has been given the name Voltite and, of course, offers itself especially as a household article where, for example, household utensils, faucets and the like may be kept in condition with the important feature that the polishing or renovating of the articles is not accompanied by a partial removal of a deposit already on the articles but by an addition to that already existing. It is stated also that a compound has been prepared for securing a preservative deposit on iron and steel.

Aiken Hydraulic Valves.—The Pittsburgh Valve, Foundry & Construction Company, Twenty-sixth street and Allegheny Valley Railroad, Pittsburgh, has purchased all of the drawings, patterns, tools and good will of the Hydraulic Machine Company, Pittsburgh, covering that company's Aiken hydraulic valves. It had made these valves for a number of years under a royalty arrangement with the late Henry Aiken, patentee, and it will now supply the trade direct with the full line.

The Youngstown Sheet & Tube Company, Youngstown, Ohio, will at its annual meeting July 25 vote on an increase in the capital stock from $10,000,000 to $15,000,000. The new stock is to be 7 per cent. cumulative preferred, on which dividends are to be paid quarterly; it is to be redeemable for 1921 at $105 plus any arrearages in dividends, but the stock has no voting power with it. The company signed its annual wage scale with the Sons of Vulcan July 8, and the puddling department is again being operated.

The Machinery Markets

Activity among purchasers of machinery indicates the development of a buying movement in the New York market. Three automobile lists are expected to be closed shortly and some good purchasing is looked for from other sources. The automobile makers are now placing orders in Cleveland for equipment for next year's models, and machine tool builders in that territory report a generally better demand. The automobile trade is also buying liberally in Detroit, principally for replacements, and there are inquiries out for equipment for next year's output. A fair volume of scattered sales is noted in Chicago, but there is nothing new in the way of lists. Beyond an increased demand for wood-working machinery, conditions are unchanged in Cincinnati, where much interest is naturally being taken in the crop outlook. Trade is quiet in St. Louis, but the market has a good undertone. A number of new enterprises that will call for expenditures for metal-working equipment have come forward in the South and in Texas. Texas dealers are expecting some good business to result from contemplated railroad construction work in Mexico. On the Pacific coast business is growing and a good demand for heavy tools has developed. Dealers in San Francisco are also booking some good orders for wood-working machinery. In all parts of the country there seems to be a general revival of interest in projects that have been dormant for some time because of the general uncertainty of business conditions.

New York

NEW YORK, July 19, 1911.

Prospective purchasers are showing much more interest in machinery matters. A number of enterprises which have been hanging fire for some time are being revived and there are indications that several good-sized lists are to be closed out shortly. There is a better volume of new inquiries in the New York market and requests for quotations on small lots of tools are resulting in business. Purchasers show more promptness in closing out and altogether the tone of the market has improved within the last few days. There are indications that the General Electric Company will bring out a large list and the Saurer Motor Company will soon close for a good quantity of machine tools. The Public Service Corporation of New Jersey has been buying machine tools, particularly for its Newark repair shops. Some of this company's inquiries are still unfilled. Two other automobile companies are expected to buy in this territory in the near future, and the Westinghouse Electric & Mfg. Company, of Newark, N. J., is preparing to issue a list. In addition to these enterprises, all of which have been talked of for some weeks, some new projects have come forward which will result in business. This influx of new business has tended to stiffen selling terms and dealers and manufacturers all along the line are refusing concessions which in some cases were granted to induce business up until a short time ago. The jobbing foundries in this vicinity report a renewed call for machinery castings and the trade in small engines which has been slack, is picking up. New construction work on small industrial plants, factory lofts and office buildings, has increased the inquiries for small power units. The demand for engines of the heavier type is not so good.

The American Radiator Company, Chicago, Ill., whose New York offices are at 104 West Forty-second street, has awarded a contract to the Lackawanna Bridge Company, 2 Rector street, New York, for a two-story building, 270 x 287 ft., to be erected at Bayonne, N. J. It is estimated that the plant will cost $200,000. The details regarding the mechanical equipment are being worked out in Chicago.

The Westinghouse Electric & Mfg. Company, Newark, N. J., which recently acquired title to the plant of the Lauter Piano Company, is having constructed an extensive addition, joining the Westinghouse works with the old piano factory. The company is preparing a machine tool list which will be issued shortly and purchases will be made, it is understood, before the summer is out.

The Saurer Motor Company, Plainfield, N. J., which recently took over the plant of the Q. M. S. Company there, is preparing to make additional purchases to be installed in addition to the works which are now about completed. The addition included a machine shop about 75 x 125 ft. and an assembling department, 75 x 100 ft. This added manufacturing area about doubles the capacity of the original plant, and it will be equipped with a full line of machine tools used in the manufacture of industrial trucks.

The General Electric Company, through its Schenectady office, is making inquiries which indicate that it intends to spend at least $10,000 for machine tool equipment. It is understood that this machinery is to be delivered to the Schenectady works, but the company has not filled all of its immediate wants for the plant at Erie, Pa., which is operated under the name of the Pennsylvania General Electric Company.

Work has been begun on the erection of a plant on McClelland street, near Frelinghuysen avenue, Newark, N. J., for the Natural Carbonic Gas Company, which will move its present large works at Saratoga, N. Y., to Newark, on completion of the buildings. In addition to power plant equipment the company will install carbonic gas-making appartus and tank-making and filling equipment. C. E. Reid is in charge of the construction, with offices at the site of the proposed plant.

The American Cotton Oil Company, 27 Beaver street, New York, which has been purchasing metal-working equipment in this market, has acquired a plot of land at Bayonne, N. J., with riparian rights, where a large plant for the manufacture of cotton oil products is to be erected. The construction details have not been worked out as yet.

The Newark Automobile Company, Newark, N. J., has opened offices in rooms 604-5 Essex Building, that city, where details are being arranged for the purchase of the necessary equipment to begin the manufacture of the Newark industrial truck. Herman Kolberg is to superintend the new plant.

The Simplex Automobile Company, 614 East Eighty-third street, New York, will shortly buy mechanical equipment for its nearly constructed plant at New Brunswick, N. J. The company has been making inquiries, and it is understood that its list is now in course of preparation.

The Carter & Bell Rubber Company, Millburn, N. J., has begun work on a reinforced concrete factory, 60 x 150 ft., which is being erected at the boundary line of Summit and Springfield, N. J. The plant will be used for the making of fillers for automobile tires. In addition to a power plant a general line of rubber working machinery will be installed.

The Ideal Hatpin Shield Company has been incorporated at Buffalo, N. Y., with a capital stock of $30,000, to manufacture guards for hatpin points, and will establish a factory in that city. The directors are J. M. Secord and William Honecker, Buffalo, and C. Johnson, Cleveland, Ohio.

The Joseph A. Schantz Company, 115 Central avenue, Rochester, N. Y., has let contract for the erection of a six-story and basement furniture factory and storage warehouse, 44 x 100 ft., at Central avenue and St. Paul street, that city.

Maas & Walstern, Inc., Niagara Falls., N. Y., have leased two acres of land at Adams avenue and Twenty-sixth street from the Niagara Falls Power Company, and will erect thereon a fireproof electrochemical manufacturing plant. The company now operates a plant at Newark, N. J., with general offices at 100 William street, New York.

The general contract for the erection and equipment of the power plant for the Tuberculosis Hospital which is being built by the city of Buffalo at Perrysburg, N. Y., has been let to Charles A. Hager, of Perrysburg.

The Front Drive Motor Company has been incorporated at North Tonawanda, N. Y., with a capital stock of $50,000 to manufacture motor trucks, engines, machinery, electrical appliances, etc., and will arrange for a factory in that city. The incorporators are W. Christie, F. J. Adler and W. A. Fleming, New York City.

The Pratt Chuck Company, Frankfort, N. Y., will erect a one-story factory building, 85 x 350 ft. Bids are now being received.

THE MACHINERY MARKETS

Bids are being received by the Board of Water Commissioners, Suffern, N. Y., John I. Crane, president, for installing a water sterilization plant and a mechanical water filter.

The Quick & Thomas Company, Auburn, N. Y., has been incorporated to manufacture and deal in boilers, machinery, etc., with a capital stock of $50,000. C. B. Quick, C. A. Thomas and H. A. Fitzwater, of Auburn, are the incorporators.

The Maxwell Steel Vault Company, Oneida, N. Y., has plans under consideration for a factory building, 40 x 200 ft., two stories, which it expects to build this summer.

The American District Steam Company, which is concentrating its entire plant at North Tonawanda, N. Y., is completing its new machine shop and office building in that city. The building, which is of concrete and steel construction, is triangular in shape, fronting 250 ft. on Bryant street, 240 ft. on the Erie and International Railways, and is 80 ft. in width, the offices occupying space 66 x 80 ft. When the building is finished, the fore part of August, the machine shop department and the general offices of the company will be transferred from Lockport, N. Y., to North Tonawanda.

New England

BOSTON, MASS., July 18, 1911.

New England is at the height of the summer stagnation. A great many works are shut down, some of them following the annual vacation program, while more are curtailing production in this manner. Those plants which are dependent upon water power are seriously crippled by the results of the long period of drought, and in some cases, where auxiliary power is insufficient, have been compelled to cease manufacturing. Nor will they be able to start up again until protracted rains have replenished the rivers. The drought is so general and has been of so long a duration that most industrial cities and towns are threatened with a water famine. The authorities are beginning to take drastic steps to procure a minimum consumption of water.

The machine tool builders have as yet seen no important increase in demand, but in most cases there has been no serious falling off since the hot weather set in. While business is not really good with them nevertheless the average production of machinery in this territory is probably close to that when business was at its top notch four or five years ago. The difference is that producing capacity has been greatly increased in this period and a correspondingly greater market must be obtained before the shops are run at full capacity. It is an interesting fact that in spite of the rather protracted period of dull business manufacturers still regard a normal market as one that requires a rush of manufacturing in their plants. That is their standard of business, and until it has been attained a genuinely satisfied expression will not be heard.

The machinery dealers are doing some business, but their salesmen are not bringing in a volume of orders that would be considered satisfactory. Very naturally the increase in the machinery market would not follow immediately upon improvements in the iron and steel situation. It is always true that the machine tool business is one of the last to revive after depressed conditions. Most observers believe that before cold weather sets in a very marked change for the better will have been experienced.

The Boston & Maine Railroad, in a petition to the Massachusetts Railroad Commission for authority to use certain funds, makes the statement that it is inadvisable to proceed with a large part of the improvements planned for this season. The general deduction is that the statement applies in part to proposed shop facilities, including the great locomotive and car repair shops which are planned for North Billerica, Mass.

The Gilbert & Barker Mfg. Company, Springfield, Mass., manufacturer of gas apparatus, will, it is said, erect a large and completely new plant in that city. It will consist of eight buildings. The machine shop will be 63 x 105 ft., two stories; the sheet metal building 160 x 250 ft., one story; power house, 52 x 90 ft.; testing house, 25 x 30 ft.; office building, 40 x 65 ft., two stories and basement, and two storage buildings, 30 x 90 and 30 x 170 ft. respectively. All the buildings will be of brick, mill construction.

Additions to general manufacturing plants in New England include the following: The A. C. Lawrence Leather Company, Peabody, Mass., five-story building, 75 x 175 ft.; Rathbon Knitting Company, Woonsocket, R. I., spinning mill, 58 x 110 ft.; Clark Dye Works, Pittsfield, Mass., dye house; Oliver M. Dean, Worcester, Mass., broom factory, 48 x 72 ft., two stories and basement; Laviseur & Company, Salem, Mass., leather, six-story factory.

J. Spauldings & Sons' Company, Rochester, N. H., hard fiber mill at North Tonawanda, N. Y., 265 x 300 ft., one story, and 60 x 265 ft., two stories, with smaller buildings for machine shop and power plant.

The contract for the 80-mile section of the Aroostook Railroad system from Washburn, Me., west across Aroostook County, has been awarded to Arthur R. Gould, Presque Isle, Me., general manager of the Maine & New Brunswick Electric Company. This new road, which will shorten the distance between St. John, N. B., and Quebec by nearly 200 miles, by connecting existing lines, will cost $7,500,000.

The G. W. Bradley's Sons, Inc., Westport, Conn., is making inquiries as to a special machine for rolling or forming axe patterns or poles.

The Hendee Mfg. Company, Springfield, Mass., manufacturer of motor cycles, states that its plan is to occupy the building just purchased of the Otis Elevator Company immediately after the latter vacates it October 1. Only a few improvements will be necessary. No enlargement is probable for another year, the new space added to present facilities being sufficient for the immediate needs of the business.

A partnership has been formed between Ira B. Hubbard and Chester E. Williams, Worcester, Mass., under the name of the Hubbard Machine Company. The business has been conducted by Mr. Hubbard for some time. The company will make a specialty of repairing and manufacturing woolen mill machines and will do other kinds of machine repair work.

The Corona Mfg. & Supply Company has established a factory at 311 Atlantic avenue, Boston, Mass., for the manufacture of metal specialties among which are a new type of drill socket and a flexible metal hose.

The Southern New England Railway Company, which will build the Rhode Island extension of the Grand Trunk system, proposes to carry out extensive and costly engineering work in connection with the construction of the line from Palmer, Mass., to Providence, R. I. The work will include a tunnel through Capitol Hill in Providence. This road will pass through the important manufacturing centers of Pawtucket, Central Falls and Woonsocket, R. I., and the towns of Lonsdale, Berkeley, Ashton, Albion and Manville.

Philadelphia

PHILADELPHIA, PA., July 19, 1911.

Inquiries for standard lines of equipment are scattered and of small size. Occasionally a fair inquiry for tools and machinery of a special nature develops, but even in that field the demand drags. While the railroads are gradually broadening their purchases in some lines, buying of machinery equipment continues extremely light. While immediate conditions are not particularly promising in the general trade, a hopeful feeling that a betterment will not be far distant is expressed. Encouragement is taken from the improved conditions existing in the iron and steel trade, although they have not yet reached the point where any necessity for additional equipment has arisen. There has been little movement in power equipment; inquiries for boilers and engines are somewhat scattered, although occasional orders for equipment of moderate capacities are reported. The second-hand market for machinery, tools and power equipment continues to drag, reflecting the general condition of the trade.

Contractors have completed estimates on specifications for a one-story power house and laundry 77 x 92 ft. from plans by Zantzinger, Borie & Medary, architects, for the Masonic Home, Elizabethtown, Pa.

The contract for a new power house to be erected at Swarthmore College, Swarthmore, Pa., has, it is reported, been awarded to William Provost, Jr. The building will be 61 x 76 ft.

Guy King, 1513 Walnut street, architect, is asking for bids for construction and equipment of a small water works at Monuminkin Station, N. J.

J. Isaac Copeland & Bro., Clinton, S. C., hardware merchants, will erect a new store building 35 x 100 ft. and desire quotations on steel beams, hand power elevator and other equipment.

The contract for the warehouse and pipe shed to be erected for the H. B. Pancoast Company, 2243 South

THE MACHINERY MARKETS

Third street, at Front and Ellen street, has, it is stated, been awarded to F. A. Havens & Co.

Reports from Easton, Pa., state that the new plant of the Hawley Down Draft Furnace Company, Chicago, Ill., recently mentioned as having acquired a tract of nine acres in the suburbs of that city, to which it will remove on completion, will consist of a machine and boiler shop 60 x 175 ft., a foundry 60 x 97 ft. and an office building 75 x 78 ft.

The Standard Pressed Steel Company reports business very good. This company noted a decidedly better volume of business during the first six months of this year as compared with that of the same period in 1910. There has been a steady increase in the domestic demand for pressed steel hangers, while that from abroad holds up very well. Recent shipments for export have been made to Australia, Holland, Switzerland, Scandinavia, Italy and England. This company is considering an increase in its capital stock from $100,000 to $175,000 to provide additional working capital for its constantly growing business. Action in this matter will be taken by the stockholders on August 26.

Cleveland

CLEVELAND, OHIO, July 18, 1911.

The automobile manufacturers in Detroit and other Michigan points are now placing orders for their new machinery equipment for the coming season and this business has stirred up considerable activity among Cleveland machine tool manufacturers and dealers. While two or three of the automobile builders are making large plant extensions and are expected to need considerable additional machinery the business that is coming out at present from that source is for small lots of tools to replace worn out equipment or for new tools needed in the production of the 1912 models. The local situation shows very little change. Dealers are getting a moderate volume of small orders and have some new inquiries for from three to five tools. Machine tool builders generally report a better demand and an improvement in the outlook. A local company making drilling machinery reports that it has taken enough orders in the past two weeks to keep its plant running full for two months. The demand for automatic machinery shows more activity. Makers of handling machinery report an improvement in the demand for coal handling equipment. Several good inquiries are now pending from mining companies for coal tipples. The demand for power plant equipment is fairly active. In addition to new business that is coming out some orders that have been held up for some time are now about to be placed.

The fourth annual outing of the Cleveland Manufacturers' Club, composed largely of manufacturers in metal-working lines located in the St. Clair avenue district, was held at Dover Inn, west of the city, July 15. There was a good attendance and an enjoyable time was had. The programme included a dinner and several athletic events.

The Hartman Electric Mfg. Company, Mansfield, Ohio, has been incorporated with a capital stock of $10,000 by R. W. Hartman and others.

The Cleveland Railway Company is planning the expenditure of $2,500,000 for improvements during the next 12 months. This work has been held up for some time pending the enactment of an amendment to its franchise, which has finally been passed by the City Council. The money will be used for track extensions, buying from 150 to 200 new cars and for providing additional power equipment. It is expected that contracts will be placed shortly for some of the additional equipment.

W. F. Collins, 2091 East Nineteenth street, Cleveland, will build a new shop for the manufacture of dies, tools, machinery and metal stampings. New machinery equipment will be required, including presses, lathes, shapers and milling machines.

The Browning Engineering Company, Cleveland, has recently received orders for a 120-ton wrecker from the National Railway of Mexico and for a large portal crane from the American Bridge Company.

The Director of Public Service, Cleveland, will receive bids July 27 for a crane framework and track for the Kirkland pumping station of the water works department. On July 25 the same city official will receive bids for electric meters for the municipal lighting plant.

The Cleveland & Erie Machinery Company, Cleveland, has been incorporated with a capital stock of $10,000 to deal in derricks, clam shell buckets and a general line of other second hand machinery used by contractors. The company will maintain one office at 1515 Rockefeller Building, Cleveland, and another at the office of the G. H. Williams Company in Erie, Pa. The officers are: G. H. Williams, president; C. C. Williams, vice-president, treasurer and purchasing agent; E. P. Lord, secretary, and William Ruddock, general manager.

The General Foundry Company, Warren, Ohio, will enlarge its plant by the erection of an addition 40 x 80 ft. to its main building, to be used as a core department, another factory building 50 x 80 ft., of steel, brick and concrete, and an office building 39 x 40 ft.

The Findlay Motor Company, Findlay, Ohio, which recently acquired the American Motor Truck Company, Lockport, N. Y., moving that company's plant to Findlay, has been reorganized as the Ewing-American Motor company with a capital stock of $1,500,000, of which $500,000 is preferred stock. L. E. Ewing, president of the Findlay Motor Company, will be president of the consolidated companies which will engage exclusively in the manufacture of commercial vehicles.

The Lees-Bradner Company, Cleveland, maker of gear cutters, has let contracts for the erection of a new plant at 6210 Carnegie avenue. It will be of brick and steel 50 x 150 ft. and two stories. A small amount of new machinery equipment will probably be required.

The Vulcan Steam Shovel Company, Toledo, Ohio, is building at Evansville, Ind., its new $300,000 plant The Arnold Company, Chicago, is the engineer.

The Miller & Hoy Mfg. Company, Wauseon, Ohio, will build a factory 50 x 140 ft. at Kendallville, Ind., this fall for the manufacture of tanks.

Cincinnati

CINCINNATI, OHIO, July 18, 1911.

The general business outlook continues promising, but actual orders received by a number of manufacturers are still somewhat disappointing. Several local firms are keeping a close watch on crop conditions all over the country, and late reports from their traveling men and correspondents show that the situation in agricultural districts is much better than the last Government report indicated. With the machine tool builders the export trade continues to occupy considerable attention, but not much encouragement is being received from the railroads or automobile manufacturers. The demand for sawmill and woodworking machinery holds up well, and it is reported that there is an improvement with the builders and dealers in power plant equipment.

The Cincinnati Commercial Association announces that the Superior Box Company, Superior, Wis., has decided to locate a branch here, employing about 25 men at the start. The former home of the Straub Machinery Company, at Sixth and Burns streets, will shelter the local plant.

Harry Hake, architect, Provident Bank Building, Cincinnati, is drawing up plans for a large fireproof garage to be erected on Mitchell avenue, by the Jungclas Auto Company.

Architect G. W. Drach, Union Trust Building, Cincinnati, will soon ask for estimates on a combination power and laundry building to be constructed for the Good Samaritan Hospital. The power plant equipment has not yet been purchased.

The Fosdick Machine Tool Company, Cumminsville, Cincinnati, Ohio, has recently acquired additional land adjoining its plant, but announces that it was not for the purpose of adding to its factory's present manufacturing facilities.

The Cincinnati Steel Castings Company, Cincinnati, has increased its capital stock from $50,000 to $100,000, and, it is reported, will make some extensive additions to its plant on Kenyon avenue.

The new addition to the plant of the Lodge & Shipley Machine Tool Company, Cincinnati, is now under cover and work on installing the necessary equipment will be begun some time next month.

It is reported that the Scioto Valley Traction Company, Columbus, Ohio, will soon begin work on large shops to be located at Reeses, Ohio.

The Reeves-Rigling Company, Hamilton, Ohio, manufacturer of hardware and household specialties, will soon have plans made up for a factory that will have about 15,000 sq. ft. of floor space. It will be of reinforced concrete construction.

THE MACHINERY MARKETS

It is rumored that the Illinois Leather Company will make some extensive additions to its Cincinnati plant. Building plans have not yet been made up.

Kirk & Blum, Cincinnati, will move into their new sheet metal factory in the western part of the city some time during August.

The Radio Mfg. Company is a new incorporation at Columbus, Ohio, with $50,000 capital stock to make automobile radiators and other specialties. E. W. Brinker and J. C. Spangler are named among the incorporators.

It is rumored that the National Cash Register Company, Dayton, Ohio, is contemplating some additions to its plant. Plans have already been made up for an immense convention hall which will be the largest of its kind in the world.

Robert S. Mayer, Gerke Building, Cincinnati, Ohio, is the designing engineer for a heating system to be installed in a large proposed cigar factory that will be erected for the Fritz Bros. Cigar Company at Ninth street and Broadway, Cincinnati.

C. W. Moon, secretary of the Superintendents' and Foremen's Club, of Oakley, Ohio, announces that a dinner will be served the club members and their friends at Weber's café on the evening of July 20.

The Beredelli Construction Company, Fairmont, W. Va., has been awarded contract for the construction of 14 miles of the new Waynesburg & Blacksville Rail road and will start work some time next week.

Chicago

CHICAGO, ILL., July 18, 1911.

Although during the past week there has been a fair volume of miscellaneous sales of machinery, this business has been of such a scattering character as to make the general market seem quiet. Dealers report sales into Illinois and Wisconsin territory of a number of small tools and two or three instances of purchases aggregating from $2,000 to $3,000 are noted. Floor sales have been slow. Machine tool manufacturers continue to hold to their schedule of prices and departures from regular retail lists are confined to dealer's operations.

The car manufacturing plant of the Cudahy Company formerly located at Omaha is to be moved to East Chicago, Ind., where a new plant is to be built.

The Davenport Wagon Company, Moline, Ill., has been incorporated with a capital stock of $300,000 for the purpose of dealing in and manufacturing wagons, agricultural implements, etc. The incorporators are William Butterworth, W. L. Velie, G. W. Mixter and G. N. Peeke.

The Rockford Tool Company, Rockford, Ill., has prepared plans for an addition to its plant 80 x 100 ft. The plant now occupied was entered only last fall and is already inadequate to the requirements of the company's business.

J. W. Love, Joliet, Ill., who is building a new factory, is in the market for a wood working planer.

Fred J. Postel & Co., Fisher Building, Chicago, engineers, will buy for the city of Geneva, Ill., two boilers complete with furnaces. Plans and specifications can be obtained from them.

Williams, White & Co., Moline, Ill., will be represented in Chicago by R. A. S. Johnson with offices at 1705 Fisher Building.

The United Iron Works, whose plant at Springfield, Mo., was damaged by fire, will rebuild the foundry building.

The Pleasant Prairie mills of the E. I. Dupont De Nemours Powder Company, which was blown up in March last, will be rebuilt in part on the same site near Racine, Wis.

A factory for the manufacture of corrugated iron pipe will be built at Pueblo, Col., by F. C. Hess, whose present address is Emporia, Kan. The estimated cost of the buildings is $25,000 with a like amount additional for equipment.

The Elgin Metal Novelty Company, Elgin, Ill., has completed plans for a $20,000 fireproof factory building to be located in that city. The main building will be 40 x 200 ft.

The Morrison Specialty Company, Morrison, Ill., is building a new plant in that city and is expecting to install new machinery.

The Springfield Drain Tile Company, Springfield, Ill., has been incorporated with a capital stock of $30,000 with James A. Long and Chas. G. McIntosh, of Portland, Ind., and John F. Miller, of Springfield, as incorporators. A six-kiln plant will be erected for the manufacture of sewer pipe and tile and later brick will be made.

The Root & Vandervoort Engineering Company, East Moline, Ill., has just let the contract for a $25,000 addition to its foundry to be 100 x 150 ft. A new cupola and core ovens will be installed.

The city of Springfield, Ill., expects to purchase a 10,000,000-gal. pump for its water works station. Communications should be addressed to the city clerk.

The Langer Auto Castings & Foundry Company, Chicago, Ill., was incorporated with a capital stock of $7,000. The incorporators are C. P. J. Langer, Joseph Von Craenen and John Holland.

The Couch-Cole Aeroplane Mfg. and Exhibition Company, Des Moines, Ia., will build an aeroplane factory in that city. The company expects to have some of its machines ready for trial in the very near future.

The Warner Instrument Company, Beloit, Wis., is completing the erection of a brass foundry of brick and concrete construction 32 x 50 ft. The company has sought to provide every facility for making this foundry complete and its equipment will be the most modern.

The Barr Clay Products Company will build a plant at Wanamingo, Minn., for the manufacture of clay building brick, silo brick and drain tile. Charles Roe, Kenyon, Minn., is president and H. S. Swann, Wanamingo, is treasurer.

The Star Mfg. Company, Albert Lea, Minn., builder of power hammers and disc sharpeners, will move its business to Waterloo, Ia., and is now building at Logandale Heights on a tract of 16 acres its new factory buildings. The main shop will be 60 x 160 ft.

The Zenith Mfg. Company, manufacturer of a combined hay loader and stacker, will build a new plant at Albert Lea, Minn.

The Sauk Rapids Water Power Company, Sauk Rapids, Minn., will construct an electric light and power plant.

The Minneapolis, St. Paul & Sault Ste. Marie Railroad will rebuild at Waukesha, Wis., the roundhouse recently destroyed by fire at a cost of $15,000.

The Consumers Power Company, Minneapolis, Minn., placed on record a $10,000,000 mortgage the proceeds of which are to be used in the construction of power plants at points in Minnesota where the company has obtained control of water power. Mr. E. Holcomb is general manager.

The Oklahoma Harrow Company, Hutchinson, Kan., will erect a plant for the manufacture of harrows and other agricultural implements at that city in the near future.

The city of Onida, S. D., will spend $11,000 for a municipal water works system.

The city of Sylvan Grove, Kan., is to vote a bond issue of $25,000 to be used for the construction of a city water plant, and an issue of $10,000 for an electric light plant.

The Kissel Motor Car Company, Hartford, Wis., is making an addition to its plant, 100 x 200 ft., four stories, of brick and mill construction. The building will be used for assembling, finishing and shipping, and some new manufacturing equipment will be installed, including two new boilers of about 150 hp.

Detroit

DETROIT, MICH., July 18, 1911.

The local machinery market this week has been decidedly spotty in character, but the volume of business on the whole is quite satisfactory, the bulk of the buying being done by the automobile trade. Dealers report a number of floor sales which, in the main, however, are confined to single tool propositions. Inquiries are very encouraging and the closing of some fair-sized orders which have been pending for some time seem to indicate a cheerful outlook for future business. Standard lines of machine tools are rather dull, the demand for special equipment being considerably better and a good deal of this business is being placed locally. Sales of small tools have fallen off, but the depression in this line is looked upon as only temporary. The market for second-hand machinery is below the average. There will probably be a good demand for shop supplies soon, as a number of concerns recently organized are making inquiries in this direction.

Building conditions continue to be quite active, awards being made on work of the larger type of construction, mostly brick and reinforced concrete factory buildings and additions and figures are being asked on a considerable amount of new work. Reports from the

THE MACHINERY MARKETS

Saginaw Valley, the seat of the beet sugar industry, are to the effect that practically all of the 16 plants are increasing their capacity and making additions.

The Packard Motor Car Company has additions under way which will add four acres of floor space to the company's plant and greatly increase its capacity. The additions will include two new buildings for the truck factory each 60 x 320 ft., with connecting links from one building to another, a large addition to the foundry increasing its capacity 30 per cent. and an additional floor for each of the two service buildings which will permit an enlargement of the machine shop. A third floor will also be added to the foundry pattern shop. Construction work has been almost continuous since the company's establishment here in 1903.

The Peerless Crucible Steel Company is about to extend its plant by the addition of a foundry building one story of brick and steel construction.

The Timken Axle Company has awarded the general contract for a $10,000 addition to the company's storage house to Nettleton & Weaver. The company reports a good volume of business and is running to nearly full capacity.

It is announced that the Artistic Model Corset Company, Cleveland, Ohio, has secured factory quarters here and will move its entire plant to this city next month. The company is also erecting a Canadian branch plant at Windsor, across the river from Detroit. H. F. Marsh and A. F. Marsh are president and secretary, respectively, of the company.

Through the efforts of the Detroit Board of Commerce the Zenith Carburetor Company, Lyons, France, has located here. The company was incorporated last week and has now secured factory space which it will equip at once for the manufacture of an annual output of 20,000 carburetors.

The Wolverine Motor Supplies Company, manufacturer of windshields, has filed notice of an increase of capital stock from $2,500 to $10,000.

The Hanson Tool & Die Company has incorporated with a capital stock of $10,000. Frank Hanson, F. G. Morehouse and Edward Bullock are the principal stockholders.

The new Chevrolet Motor Car Company has taken over the factory plant of the Corcoran-Detroit Lamp Company which has a floor space of 75,000 sq. ft. and will begin the manufacture of motor cars as quickly as possible. The company will start with a capital stock of about $750,000 and will be headed by William Little, W. C. Durant and Louis Chevrolet.

The Hayes Mfg. Company has started the erection of several new additions to its already large plant. There will be a three-story brick factory, a power plant and office building and three dry-kilns. The company is a large manufacturer of sheet metal parts and forgings.

The Abbey-Barnum-Cartwright Company has engaged in the manufacture of wire and metal work with an authorized capital stock of $2,500.

The Best Stove Company has filed articles of incorporation with the Secretary of State, giving its capital stock as $100,000. The principal stockholders are William J. Best, Harry B. Taylor and William Mervin.

The Weber Vending Machine Company has decided to move its factory from Detroit to Sandusky, Mich. The company manufactures a patent vending machine and is constructing special new machinery for use in its new plant.

The Eagle Tanning Company, Whitehall, Mich., is making extensive improvements to its plant. Two new buildings are in the course of erection, one being a manufacturing structure three stories 80 x 300 ft. and the other a steel and concrete vat house 80 x 225 ft. and of single story construction.

The Supervisors of Osceola County, Mich., have granted to John H. Haggerty the privilege of constructing a dam across the Muskegon River in that county. It is proposed to build a $50,000 plant for the generation of electrical power.

The taxpayers of Ishpeming, Mich., have voted in favor of bonding for $40,000 for a new fire hall and equipment.

Muskegon, Mich., will vote the present week on a proposition to bond for $300,000 for the purpose of improving and extending the municipal water works system.

The Folding Fruit Box Company has been organized at Dowagiac, Mich., to manufacture a berry box recently patented by Alva West, of that city.

The Holland Printing Company with a capital stock of $30,000 has been organized at Holland, Mich. Arend Vischer is president and G. W. Mokma secretary of the new company.

The Mika Cooker Company, Saginaw, Mich., has decided to increase its capital stock from $50,000 to $100,000 to take care of rapidly increasing business.

A new industry has been incorporated at Ford River, Mich., to be known as A. W. Eddy & Co. The company has a capital stock of $20,000 and will manufacture fish cleaning machines.

The South Aerial Engine Company has been organized at Traverse City, Mich., for the manufacture of an entirely new style of engine especially designed for use in aeroplanes. The capital stock of the new company is given at $100,000.

There is a strong probability that the National Pressed Steel Wheel Company, Alexandria, Ind., will locate in Saginaw, Mich. The company has a capital stock of $750,000 and manufactures pressed steel wheels for heavy vehicles.

Following changes in the management of the Saginaw Paving Brick Company, Saginaw, Mich., it is announced that the company's capacity will be largely increased and a larger amount of new equipment installed.

The Board of Public Works of Benton Harbor, Mich., is making preparations to expend the sum of $50,000 in the enlargement and extension of the city's water works system. A large part of this amount will be used in increasing the capacity of the pumping plant.

A company with a capital stock in the neighborhood of $100,000 for the manufacture of solid copper articles is being promoted in Hancock, Mich., by S. Segall. It is planned to manufacture percolators, chafing dishes and related articles.

Work on the new buildings of the Port Huron Paper Company, Port Huron, Mich., will be started immediately. The company, which has a capital stock of $80,000, is headed by John E. Daley and will employ 300 men. It is stated that the Michigan Sulphite Fibre Company, also located in Port Huron, will consolidate with the new company.

A company has been organized at Allegan, Mich., by Henry Prichard and Ward Granger to engage in the evaporated fruit business. A large dry kiln equipment will be installed.

The lumbering interests of the northern part of the State are suffering severely from the destructive forest fires which are sweeping through that section. The immense mills of the H. M. Loud Lumber Company, Au Sable, Mich., were completely destroyed by fire which wiped out the town. Congressman Loud, president of the company, states that the mills will be rebuilt on a smaller scale. The mills of the Stevens Lumber Company at Waters and of the Mitchell Lumber Company at Millersburg were also burned. One of the largest industries at Alpena, Mich., was also seriously crippled by this fire, the tannery of Moench & Co. being partially destroyed at a loss of $150,000. The company will rebuild its plant.

The Nice Furnace Company, Pontiac, Mich., is installing a set of oil burning furnaces at the Eastern Michigan Insane Asylum and a number of other State institutions are to be similarly equipped soon, it is stated. The company reports a good volume of business.

The city of Kalamazoo has decided to install an air lift system for increasing the inflow of water at the wells at the water works and $3,000 has been appropriated for the purchase of the equipment.

Indianapolis

INDIANAPOLIS, IND., July 18, 1911.

John L. McCulloch, banker, Marion, Ind., who recently obtained a franchise for an artificial gas plant in that city, has entered into agreement with Rufus Dawes, of Chicago, controlling the gas interests of Muncie, Ind., to merge the Marion, Muncie and Hartford City companies. Gas plants will be erected at Marion and Muncie, and a gas holder erected at Hartford City. The three cities will be connected to the system by 8-in. mains.

The Elkhart Musical Instrument Company, Elkhart, Ind., has increased its capital stock from $10,000 to $25,000..

The Intermediate Lighting Company, New Albany, Ind., has been incorporated with $5,000 capital stock to manufacture acetylene gas lighting machinery. The directors are L. D. and M. Youngblood and T. E. and M. E. Hancock.

THE MACHINERY MARKETS

The South Bend Tire & Rubber Company has been organized at South Bend, Ind., and has taken an option on a site of 18 acres for $18,000. The plant will cost $25,000. Those chiefly interested are W. M. Blecker and W. A. Bentley, of Akron, Ohio, and M. G. O'Brien, of Mansfield, Ohio.

The Vincennes Sewer Association, Vincennes, Ind., has been incorporated with $25,000 capital stock to construct a sewer system for that city and to lease its service, in accordance with an Indiana law enabling cities to enter into contract with private associations for public sewer purposes. The city may buy the system. The incorporators are P. M. O'Donnell, C. C. Winkler, C. W. Adams, R. A. Young and G. W. Sturtevant.

The New Process Lighting & Heating Company has been incorporated at Laporte, Ind., with $50,000 capital stock, to manufacture and deal in gas and gasoline engines. The directors are C. F. Peterson, C. J. Nudelman, James Kolar, T. W. Steigler and H. B. Johnson.

The North Indiana Brick Company, Michigan City, Ind., has been incorporated with $40,000 capital stock to manufacture brick. The directors are J. L. Jackson, E. D. Church, R. K. Rossegule, S. S. Roby and J. C. Reinke.

The North Manchester Foundry Company, North Manchester, Ind., has been incorporated with $10,000 capital stock, to do a general foundry business. The directors are I. C. F. Martin, John Stauffer and W. J. Ranger.

The Anderson Gas Company, Anderson, Ind., has let the contract for a relief holder, oil tank, exhauster and cleaners to the Western Gas Construction Company, of Ft. Wayne, Ind. The contract for all other machinery was secured by the United Gas Improvement Company of Philadelphia. Gas will be manufactured from coke and oil.

The M. V. Cheesman Company, Mishawaka, Ind., has just added to its present plant a foundry, 52 x 130 ft. The company expects to increase its output of general castings and ornamental iron work.

The South

LOUISVILLE, KY., July 18, 1911.

Business in this market is seasonably quiet, but reports coming to manufacturers and dealers indicate that prospects for fall trade are good. Builders of refrigerating equipment report that on account of the extremely good season for ice many operators have announced plans for enlarging their factories, and orders for additional equipment will be let in the fall. There is a good demand for elevators. Manufacturers of boilers say that the demand for power equipment is only fair. Crop conditions have improved as the result of more favorable weather, and this, it is believed, is a big change for the better.

Henry R. Worthington is installing a turbine-driven centrifugal pump in the plant of the Louisville Water Company. It has a capacity of 30,000,000 gal. per 24 hours. An interesting feature in connection with the installation is that the new machinery will replace two Cornish engines which have been in operation for 50 years, having been a part of the original pumping outfit of the company. They are still in good condition, and were manufactured by the old firm of Roach & Long, Louisville, which was the nucleus of the plant of Dennis Long & Co., afterward turned over to the United States Cast Iron Pipe & Foundry Company.

Arrangements have been made to begin work in the near future on the 18-story office building of the Inter-Southern Life of Louisville, at Fifth and Jefferson streets. Brinton B. Davis, of Louisville, is the architect.

The Norton Company, Louisville, will erect a business structure on the corner of Fourth and Market streets. The new buildings will require elevators and other equipment.

The Henry Vogt Machine Company reports the demand for power machinery fair, and excellent prospects for the next ice machinery season, though actual operations along this line are seasonably quiet. The outlook for the fall is excellent.

Some of the machinery at the local plant of the Alvey-Ferguson Company will be moved to the new plant at Oakley, near Cincinnati, and a few lines which have been made heretofore in Louisville will be discontinued. Otherwise the Louisville plant will be retained without change. The offices of the company will all be at Oakley. The company expects to be handling its business there by the latter part of August.

The Crescent Mfg. Company, Louisville, said to be the largest makers of store fixtures in the South, is contemplating the erection of an addition. Definite plans have not yet been worked out.

The Adams Fire Fighting & Instrument Company has filed articles of incorporation in Louisville with a capital stock of $100,000. The purpose of the company is to manufacture fire extinguishers. The incorporators include David W. Adams, P. C. Johnson and C. M. Pate. Mr. Pate is the only Louisville incorporator, and is an officer of the Chess & Wymond Company.

The American Machine Company reports an excellent demand for elevators and good prospects in connection with ice machines. Business in the Southwest is exceptionally good, several large contracts having been secured from Dallas and other cities in that section.

The Board of Education of Louisville will shortly let a contract for the installation of a heating and ventilating plant in an annex of the Girls' High School. Sam Jones, business director, will receive bids. The estimated cost of the plant is $18,000.

E. D. Morton & Co., Louisville, have received orders for a considerable amount of conveying equipment to be installed in the plants of the Louisville Cement Company at Milltown and Speed's, Ind.

A group of Louisville coal operators, including F. M. Sackett, I. B. Barnard and M. M. Bardwell, has purchased the property of the Edgemont Coal Company consisting of about 5000 acres in the Straight Creek district, in eastern Kentucky. The company plans to develop the property in the immediate future.

The City Council of Madisonville, Ky., has voted in favor of a bond issue of $75,000 for the purpose of establishing water-works. The question will be voted on at the next election. A municipal lighting pla now in operation, and the two will be run jointly.

C. C. Hinton, Madison, Ind., is equipping a plant at Bowling Green, Ky., for the manufacture of cedar posts and lumber.

The Consolidation Coal Company, Baltimore, Md., which is building the industrial town of Jenkins, Ky., as quarters for its miners, has begun preparations to make several mine openings on its large holdings in that section. The company will be in the market for a great deal of equipment for these in the next few months. The purchases, it is understood, will be made through the Baltimore office.

The Bluegrass Fluorspar Company has been organized at Mexico, Ky., for the purpose of developing deposits of fluorspar, lead and zinc. H. C. Haase is secretary and treasurer, and in charge of the work, but the main office is to be in St. Paul, Minn.

H. E. Dickerson, Jackson, Tenn., is reported to be planning the establishment of a plant at Hickman, Ky., for the manufacture of hardwood products, including pulleys, boat oars, golf sticks, etc.

The county court at Henderson, Ky., has let contracts to the Vincennes, Ind., Bridge Company for the erection of two iron bridges at a cost of $2300. The company already has several contracts for the construction of bridges in that county.

The John P. Dale Machinery Company, Nashville, reports good sales of boilers during the past few weeks. The demand for sawmills and other woodworking equipment is also said to be excellent.

The J. F. Galbraith Mfg. Company, Shelbyville Tenn., is marketing a new double-lock metal shingle, and members of the company report that great success is being experienced in its distribution.

The Halo Gas Company has filed articles of incorporation at Nashville, Tenn. Its capital stock is $4500, and A. J. White, J. M. Williams and L. J. Rust are among the incorporators.

Reports from eastern Tennessee and western North Carolina indicate that unusual activity is in evidence in the erection of new sawmills and the development of the timber lands of that section. Among the companies which plan expenditures in this direction are the Pittsburgh Lumber Company, Pittsburgh, Pa.; Champion Lumber Company, Canton, N. C.; R. W. Cox, of Scott County, Va., and others.

The Knox Stove Company, Knoxville, Tenn., has completed the erection of its plant, which has been under construction for the past three months, and is about to begin operations. The company is incorporated with $100,000 capital stock. It took over the stove department of the Sanford-Day Iron Works, at the time it began business. The plant consists of three buildings besides the pattern shop. Hugh W. Sanford

THE MACHINERY MARKETS

is president; A. B. Day, vice-president, and C. E. Randall, secretary and treasurer.

The Austin Western Machinery Company, Chicago, has sold through its Atlanta branch an outfit of road-making machinery to the road commissioners of Hamilton County, at Chattanooga, Tenn. Good roads activity in Kentucky and Tennessee is expected to result in the purchase of much new equipment of this kind.

P. C. Prowsnitzer, who has been manager of the mill supply department of Keith, Simmons & Co., Nashville, Tenn., has been appointed manager of that department of the Livermore Foundry & Machine Company, of Memphis, Tenn. Mill supplies constitute a new branch of the Memphis house.

May Bros., Memphis, Tenn., lumbermen, have announced that they will erect a large sawmill in that territory in the immediate future. Plans are now being drawn.

The sawmill of the Tremont Lumber Company, Tremont, La., which was recently burned at Eros, La., is to be rebuilt.

Doscher, Gardner & Co. will erect a planing mill at Jacksonville, Fla., to take the place of the plant which was recently destroyed by fire.

The municipality of Perry, Ga., has decided on a bond issue of $6000 for the purpose of equipping a small lighting plant.

The Piedmont Portland Cement Company, of Portland, Ga., has decided to increase its capacity, and machinery is being contracted for. Still further extensions will be made as soon as plans in this direction are financed.

Frank Hill, Memphis, Tenn., is at the head of a company which is being formed at Mammoth Springs, Ark., for the purpose of establishing a water plant.

A gas plant is to be established at Jonesboro, Ark provided a franchise is awarded to W. W. Cate and E. E. Randolph, who have made application for it.

A. D. Adair & McCarty Bros. are to erect a fetrilizer plant at Roanoke, Va., and have purchased a tract of 28 acres for the purpose. Work of construction is to begin at once.

M. B. Bandas, Ragland, Ala., is authority for the statement that two gas plants are to be erected there. One, for the manufacture of plate glass, will cost $800,000, and the other, which will produce bottles, will require an expenditure of $125,000. Eastern capital is said to be interested.

The Virginia Bridge & Iron Company, Roanoke, Va., is to erect a new plant at Atlanta, Ga., and in addition to the structural iron shops will erect a machine shop, templet shop and power house. The material for the buildings will be supplied by the company, which has been operating a smaller plant near Atlanta for some time.

A steam turbine plant to generate about 1600 hp. is to be erected by the Anderson Water, Light & Power Company, at Anderson, S. C. The estimated cost of the new equipment is $50,000.

The municipality of Hamburg, Ark., has taken over the water plant of W. E. Kittrell & Sons, and is contemplating considerable improvements.

J. H. Harris, of Union City, Ga., is asking for prices on a gasoline engine.

Bids will be closed by the municipality of Thomaston, Ga., August 1, for the erection of a water-works plant. The J. B. McCrary Company, of Atlanta, Ga., is the engineer.

Articles of incorporation have been filed at New Orleans, La., by the Schwartz Iron & Machinery Company, which is capitalized at $10,000. The incorporators include Moses Schwartz, Walter B. Schwartz and Otto B. Schwartz.

The Gulf City Boiler Works, Mobile, Ala., has purchased buildings formerly used as a power plant and car barn by the White Line Railway, and will utilize the new structures for the manufacture of boilers and as a sheet metal working plant. The structures are being remodeled at a cost of about $5000 and about $15,000 will be spent in the purchase of new equipment.

The Smithfield Garage & Machine Company, Smithfield, N. C., has been organized to take over the plant of the Selma Iron & Machine Company of that city. The plant will be utilized for the manufacture of plumbing equipment and for making automobile repairs.

The Merrill-Stevens Company, Jacksonville, Fla., is having erected an addition to its machine shop, 45 x 50 ft., together with a 4-ft. gallery on two sides for lockers. The addition will provide room for a new horizontal boring machine, a 40-ft. lathe and other heavy lathes, all to be driven by independent motors. An overhead track and traveling hoist will also be installed in addition to handle the work.

Eastern Canada

TORONTO, ONT., July 15, 1911.

All the pores of the demand continue open, and everybody in the machinery business appears to find trade sufficient to keep all the hands obtainable at work. The forest fires that swept over the gold fields of Northern Ontario destroyed many plants that will have to be replaced, as several of the mines in the Porcupine field are much more than proved prospects. There will be no abandonment of such properties. As a result of the fire the activities in that field are sure to be greatly increased. Prospecting will be made easier and the timber will be no longer an obstacle to be removed before mine working can be begun at some of the more hopeful interior claims. The construction to the camp of the branch line of the Temiskaming & Northern Ontario Railway is also an event of interest to all who desire to do business there. It will facilitate the bringing in of machinery an thus promote mine development and increase the demand for plant. The outlook for trade in mining machinery is getting brighter and larger as the population in the extensive mineralized area of Northern Ontario goes on increasing and spreading. There is reported to be a considerable demand for manufacturing plant for replacement and extension, and some on account of new industries. Railways are keeping up a good demand for equipment and contractors' outfit. It is expected that there will be a very large opening out of the farmers' demand for electrical apparatus when the plans of the Hydroelectric Commission and of some large transmitting and distributing companies to extend into the agricultural districts of Ontario are completed.

The president of the Canada Car & Foundry Company, Montreal, says the company's works at Amherst, N. B., will shortly have their passenger car manufacturing capacity increased 50 per cent.

The ratepayers of Hull, Que., have approved bylaws to expend $158,000 on the construction of two fire stations.

The Coniagas Company's smelter plant at Harold, Ont., was badly damaged by fire on Tuesday, the smelter building and the coke building both being destroyed.

The hot rolling mill section of the Ontario Rolling Mills Company's plant, New Toronto, Ont.—a section very recently installed—was destroyed by fire this week.

Extensions and improvements are being made to the plant of the Belleville Rolling Mills, Belleville, Ont. Additional equipment is being installed and the furnaces are being rebuilt.

The Flexible Conduit Company, Penn Yan, N. Y., has decided to establish a branch plant at Guelph, Ont.

The Montrose Paper Company, St. Catharine's, Ont., is arranging to install another paper machine. For this additional power will be required, and the company will build a new power house to generate about 1000 hp. An offshoot company, called the Inter-Lake Tissue Mill Company, has been formed to carry on business in works to be constructed beside those of the Montrose Paper Company. Equipment will have to be bought for the tissue mill as well.

Letters patent have been issued by the Dominion government to incorporate the Thomas Davidson Mfg. Company, Montreal, to carry on the business of smelting, casting, etc. The capital stock is $500,000.

The Canada Flour Mills Company, Toronto, has been incorporated by the Dominion government with a capital stock of $2,000,000.

The McElwain Shoe Company, Boston, Mass., has taken over the plant of the Sable Lumber Company, Liverpool, N. S.

The Hawes-Von Gal Company's hat factory at Niagara Falls, Ont., is now ready to have the machinery installed.

Bowman & Connor, engineers, 36 Toronto street, Toronto, will receive tenders up to July 27 for an intake pipe and filter basin for the town of Southampton, Ont.

The contract has been let for the construction of a $2000 office and factory building in Montreal for the McClary Mfg. Company, London, Ont.

The Gillette Safety Razor Company has given a contract for the construction in Montreal of a five-story building to cost $112,000.

The American Cyanide Company, Niagara Falls,

THE MACHINERY MARKETS

Ont., is extending its factory and adding to its power plant. About $66,000 will be expended on electric furnaces, retorts, cranes and conveyors.

The Toronto-Niagara Power Company, Niagara Falls, Ont., will spend $500,000 on power house extension and equipment. Of this sum $300,000 will go for generators, governors, turbines, penstocks, etc.

The Brake Beam Company, Buffalo, N. Y., is putting machinery into its Canadian factory at Brantford, Ont. A large quantity of machinery has arrived from Buffalo.

The Tollman Bros. Company, Hamilton, Ont., is making an addition to its foundry.

The Canadian Tungsten Lamp Company, Hamilton, Ont., will shortly begin the construction of a five-story addition to its works.

The Public Works Department of the Ontario government, Toronto, has awarded contracts for the construction of six important bridges to the Stratford Bridge & Ironworks Company, Stratford, Ont.

The Maximilian Machine Company, which started a few months ago to manufacture pneumatic hammers at Woodstock, Ont., has decided to wind up. For one thing, it is alleged, there was trouble between the company and the patentees.

The Gilmour Company's sash and door factory at Trenton, Ont., was destroyed by fire July 11.

The contract for the construction of Montreal's filtration plant has been awarded to F. H. McGuigan & Co., Toronto, for $673,000.

The large sawmill owned by Sylvester Bent, of Belleisle, N. S., and situated at Young's Mountain, in that province, was almost completely destroyed by fire July 9. It had been burned to the ground less than two months before, and had just been rebuilt and re-equipped.

The sawmill and shingle mill on Calumet Island, in the Ottawa River, the property of the Riordan Paper Company, Montreal, were destroyed by fire July 12. The total loss was about $250,000, mostly insured.

David Dick & Sons, Welland, Ont., have obtained the contract to build the waterworks' pump house for that town.

The Preston Woodworking Machinery Company has been formed and is calling for tenders for the construction in Preston, Ont., of a factory building, 100 x 100 ft., and a molding shop, 40 x 60 ft. The capital stock is $100,000. W. S. Hudson, president of the company, is managing director of the Canadian Office & School Furniture Company, of the same town. The mayor of the town, M. H. Mullin is vice-president and managing director, and W. J. Murray, Preston, is manager of works. All are men of practical experience.

The St. Mary's Cement Company's plant at St. Mary's, Ont., will cover five acres. The plant is being constructed by the Hunt Engineering Company of Kansas.

G. E. Amyot, president of the Dominion Corset Company, whose plant at Quebec City was recently burned down, says the company will rebuild there, accepting the City Council's offer of exemption from taxation.

The Goodyear Tire & Rubber Company has decided to add to its works at Bowmanville, Ont., by the construction of a three-story building, to cost $50,000. When the new building is equipped with machinery from 300 to 500 additional men will be employed by the company.

Western Canada

WINNIPEG, MAN., July 15, 1911.

A serious question is the continuing strike of the miners in the Crow's Nest and Southern Alberta coal fields. If the mines are not soon started the West will be in a very bad plight for fuel for domestic, manufacturing and railway purposes. The money question, too, is worrying all business men who have been drawn into the real estate boom, for they have been given to understand by the banks that they must make sure to set their business affairs in order if they are to have the financial assistance that is deemed adequate by the latter for business needs. The banks have so large a commercial demand to attend to that it will be impossible for them to help customers to carry real estate. These will have to realize and bring the money into their business in many cases.

Foley, Welch & Stewart, railway building contractors, Winnipeg, are reported to have decided to join forces with the Northern Construction Company. They are both concerns of very large operations. The Canadian Northern Construction Company is under the same controlling interests as the Canadian Southern Railway Company.

Carlyle Moore, of Red Deer, Alberta, vice-president of the Alberta Central Railway Company, says that company will have 100 miles of track under construction next fall. It is now building into the Brazeau coal field.

New pumps have arrived in Victoria, B. C., for the salt water high-pressure fire system of that city. They are to take the place of machinery that was supplied by an American contractor two years ago. They were made in Manchester, England. Two of the pumps are electrically driven, and one is steam driven.

The Gordon Nail Company has obtained from the City Council of Calgary, Alberta, a site of four acres on which to erect factories.

The contract for the construction of the plant of the Port Arthur Wagon Company, Port Arthur, Ont., has been let to the Canadian Stewart Company, Montreal.

The General Storage Corporation is the name of a company that has been formed, presumably under Canadian Northern Railway auspices, to erect and operate at Port Arthur, Ont., the largest general freight storage and cold storage plant in Canada. The cost of the plant is to be about $1,000,000.

The Canadian Northern Railway Company is said to be about to establish at Fort Frances, Ont., a plant at a cost of $150,000 for the creosoting of ties.

The British Collieries, Ltd., with a capital stock of $5,000,000, has been incorporated under Dominion letters patent to carry on coal and other mining operations. The head office is to be in Winnipeg.

The Edmonton Iron Works Company, Edmonton, Alberta, will greatly enlarge its plant and go exclusively into the manufacture of breaking plows.

Gordon, Ironsides & Fares, Winnipeg, have begun the construction of a meat-packing plant at Moose Jaw, Sask., to cost $150,000.

The cities of Fort William and Port Arthur, at the head of Lake Superior, made a joint bid for the Canadian Pacific Railway Company's locomotive repair shops in the West, but Sir William Whyte, the vice-president, said it would be impossible to make advantageous use of a location east of Alberta province, as by the time the shops are built the company will have ready for them about 800 locomotives in its territory between the mountains and the Western Manitoba boundary. Sir William said, however, that he considered the company's terminal point at the head of the lakes an ideal spot for car building shops, and intimated that the company might soon be open to discuss the idea of locating car works there.

Seaman & Penniman, Fort William, Ont., have obtained the contract to construct the smelting works that the Mond Nickel Company is putting up at Sudbury, Ont.

The first two units of the Point de Bois power plant, owned by the city of Winnipeg, will be ready for operation and prepared to turn out 8000 hp. for the use of manufacturing and domestic consumers by Aug. 15. Three additional units, good for another 12,000 hp., will be ready by Dec. 1. Other units will be installed as required, and by degrees the total capacity of the plant will be raised to 100,000 hp. The generators and exciters for the units are being erected by Vickers Sons & Maxim, Sheffield, England. The Canadian Westinghouse Company, Hamilton, Ont., is putting in the transformers and the switchboards, and also the general electric auxiliary apparatus. The G. Norton Boving Company is installing the turbines.

The University of Calgary will spend $150,000 on the construction and equipment of college buildings at Calgary, Alberta.

A. C. Stielow, Milwaukee, has been negotiating with the Bull River Power Company, whose works are near Fernie, B. C., and with the Board of Trade of Fernie, concerning a proposal to erect and operate a pulp mill in that town.

It is said that the International Harvester Company's distributing plant, at Fort William, Ont., for one section of which the contract for the foundation has been let, will cost $300,000 when completed.

Alex Bruce & Co., representing a Scotch and English syndicate, has purchased a site at Fort Frances, western Ontario, and will begin the erection of a big creosote plant for treating railroad ties.

The general manager of the Hines Lumber Company has been at Fort Frances looking over the ground with a view, it is said, of building a sawmill to cut the timber on the company's holdings in that district.

THE MACHINERY MARKETS

The Carter-Halls-Adlinger Company, Ltd., Winnipeg, has secured the contract for building a roundhouse and shops at Regina, Sask., for the Grand Trunk Pacific Railway Company.

The Kerrobert, Sask., Board of Trade has arranged with the Western Farmers' Grain Company for the construction of a flour mill at that point, with a capacity of 100 barrels.

The Maple Leaf Milling Company, Ltd., Brandon, Man., has taken out a permit for the erection of an elevator there.

It is announced that the Swift Canadian Company, Ltd., headquarters Winnipeg, will establish a packing plant at Fort William.

William Hutchinson, Winnipeg, inventor and patentee of a moldboard harrow, is negotiating with the Council of Battleford, Sask., to organize a company to be known as the Battleford Iron Works Company, Ltd., for the purpose of manufacturing there. It is stated that considerable of the stock has already been subscribed for. The Council is making a grant of a site, and is submitting a by-law for a grant to cover the cost of a suitable building.

St. Louis

ST. LOUIS, MO., July 15, 1911.

The week in the machine tool market has been a quiet one. No large lists have come out for quotations and no especially large deals have been closed. There has been a fair movement along ordinary lines and dealers still doing as much business as has been the case during the past few months. Inquiries have been increasing in some quarters, while others report that there has been nothing of moment in the requests for prices which they have received. There is still an optimistic feeling among the dealers, but it seems largely to be based on a belief that it will not be possible to go much farther on the present road without coming to a turn. The increased demand for electrical equipment has dropped back to ordinary conditions now that the sharp requirements of the hot spell have been cared for.

The Rotary Washing Machine Company's manufacturing plant, employing 150 men, was completely destroyed by fire the past week and rebuilding on a larger scale has been decided upon. Complete new equipment will be required.

Ground has been broken for a new freight terminal for the Cotton Belt system at St. Louis. It is to be the largest in the city and is to be equipped with the latest of mecahnical loading and freight handling devices. About $570,000 will be spent on building and equipment.

The F. Burkart Mfg. Company has bought a site, 150 x 310 ft., and will erect an entirely new plant for the manufacture of upholsterers' supplies, large enough to enable the employment of a force double the present factory capacity.

The St. Louis Shipping Case Company has been incorporated here with $50,000 capital stock by C. K. Berg, O. K. Berg and Emil Granberg, and will equip a plant for the manufacture of knock-down shipping cases.

The Bessemer Coal Mining Company, with $121,700 capital stock, headquarters in St. Louis and mine at Marissa, Ill., has been incorporated for the equipment and operation of a mine in the soft coal district just east of St. Louis, on the Illinois side of the river.

The General Chemical Company, New York, has closed a deal for a 90-acre tract in East St. Louis, Ill., where it will establish and equip a plant for the manufacture of all its products for Western and Southwestern distribution. It will have switch connection with the Vandalia Railroad and will employ about 1500 men. It is expected to have the plant in operation in about six months.

The Stout & Parke Foundry, Carthage, Mo., has been taken over by the Standard Machine & Mfg. Company. The company manufactures tractors and drilling machines, and will add improvements to the present plant. M. S. Parsons is manager.

The city of Shelbina, Mo., has voted to install a water-works and sewage system at a cost of $84,000.

The Imperial Clock Company, St. Louis, Mo., has been incorporated with a capital stock of $100,000 to manufacture clocks. The incorporators are R. E. Hayes, Peter H. Huck and others.

The Delly Foundry Company, Pine Bluff, Ark., has been sold to the English Foundry Company, the consideration being $25,000.

The Iowa Valve Company, Oskaloosa, Mo., recently incorporated with $100,000 capital stock, has taken over the plant of the Iowa Mfg. Company at Estherville, Mo.

The Pacific Coast

PORTLAND, ORE., July 11, 1911.

A few isolated orders for heavy tools, cranes, etc., have been placed recently and business has accordingly been larger than for some time previous. There is no general activity in this class of equipment, however, as well-established plants are buying very little heavy machinery and with no new inquiries of much importance coming out there is little likelihood of any material improvement for several months. Metal working tools of a small nature continue in fair demand, but there is no great activity in any line.

Orders are coming in freely for wood working machinery, though most of the individual installations are small. Most of the logging camps along the Columbia River closed the first of the month and may remain idle for a week or two more. Meanwhile, however, considerable overhauling is being done and quite a number of donkey engines, locomotives, etc., have been sold. Other types of machinery continue in active demand, though many industrial enterprises are projected from which no business is yet in prospect.

A large double-hook Shaw electric crane has been ordered for the Colman dock, Seattle, Wash.

The Western Steel Corporation, Seattle, Wash., which has been operating on a small scale for several months, is gradually increasing its facilities and has just placed an order for a ladle crane.

The Perfection Automatic Gas Machine Company, Los Angeles, Cal., has opened an office at Vancouver, Wash., and expects to start a factory there.

It is announced that work will be started at once on the new car shops of the Portland Railway, Light & Power Company adjoining the Southern Pacific shops in this city, the estimated investment being about $400,000.

The Howard Automatic Switch Company has secured the Frazer foundry, Springfield, Ore., as the nucleus of its projected factory. Two more buildings will be erected and a lot of machinery installed.

The Wylie Bros. Company is erecting a plant for the manufacture of road building and irrigating equipment at the foot of Seventeenth street, this city.

The city of Portland has placed an order for boilers for the municipal fireboat with the Ballin Water Tube Boiler Company, this city, at $17,500.

The West Coast Wagon Company, Tacoma, Wash., has taken a contract to furnish steel bands for a 15-mile stave pipe to be built for the city of Tacoma by P. E. McHugh. The order amounts to about 2500 tons.

The city of Portland has selected a site for the municipal rock crushing plant to be erected on the Bull Run pipe line.

The Oregon & Washington Railroad is installing a cinder conveyor at Seattle, Wash.

J. H. Chambers, Cottage Grove, Ore., is preparing to replace his saw mill, which was burned recently.

The Garrow Lumber Company is preparing to rebuild its saw mill at Corvallis, Ore.

Secor Bros. are planning to install a quarry and crusher near Kelso, Wash., to be operated by electricity.

It is reported at Everett, Wash., that the Great Northern Railway interests will establish a railroad tie mill there.

The Oregon & Washington Railroad & Navigation Company will erect steel coal bunkers at Huntington, Ore.

The Jamieson Building, Spokane, Wash., is to be remodeled and an electric light and elevator power plant installed. N. R. Tooten is the manager of the building and M. S. Gilbranson is consulting engineer.

The American Forge Company, which recently leased a site on Tehama street near Second, San Francisco, expects to occupy a new building at this location about the first of the year, when the present facilities will be tripled. Joseph Eastwood, president of the company, has just placed an order with the San Francisco office of Manning, Maxwell & Moore for a special 8000-lb. double frame Chambersburg steam hammer, which will be the largest on the coast. This installation is intended to take care of the heaviest marine forgings.

The San Francisco office of Manning, Maxwell & Moore has taken an order for the principal requirements of the new Standard Oil plant at El Segundo, near Los Angeles, including a number of large machine tools and plate rolls for the tank shop.

THE MACHINERY MARKETS

The Oil Well Supply Company, Los Angeles, has placed orders for a number of large lathes.

The new buildings at the Union Iron Works, San Francisco, will be used to house some of the present shops, including the marine structural shop. No information is given out as to plans for additional equipment.

Texas

AUSTIN, TEX., July 15, 1911.

One of the notable and important features of the industrial situation in Texas is the large number of projects that will require a great amount of machinery which are on foot. These not only include important irrigation enterprises, but manufacturing plants of various kinds. It is claimed by men who are interested in bringing about the consummation of these different projects that it is now much easier to interest capital in investments of this character in Texas than formerly. The prospects are favorable for the inauguration of considerable new railroad construction both in Texas and the Southwest generally, as well as in Mexico before the close of the present year. The industrial situation in Mexico shows but slight improvement. Labor troubles continue to give the owners of mines and manufacturing plants much annoyance.

The Chamber of Commerce is promoting the erection of a new steel bridge across the Neches River, at Beaumont. The matter is now before the Board of County Commissioners.

The Gulf, Colorado & Santa Fé Railroad Company has let the contract for the installation of an engine and boiler house of Silsbee, Texas., to H. D. McCoy, of Cleburne, Tex., for $22,000. He was also awarded the contract for the construction of a power house at Cleburne for the road to cost $13,000.

The City Commission of Austin has accepted the proposition of the Hydraulic Properties Company, New York, for the construction of a dam across the Colorado River and the installation of hydroelectric plant, the agreed consideration being $1,600,000. The proposed contract will be submitted to a vote of the people of the city for ratification or rejection. The date of the election has not yet been named.

The East Texas Brown Ore Development Company has been formed with general offices at Port Bolivar. Its capital stock is $2,500,000. The incorporators named in the charter are Lewis P. Featherstone and Fox Winnie, of Galveston, and L. C. Luckel, of Houston. The company is developing large iron ore deposits in Cass County.

The Durango Land & Timber Company has been formed in Waco, Texas, with a capital stock of $570,000 for the purpose of erecting lumber mills and developing a large tract of timber in the state of Durango, Mexico. The incorporators are E. Rotan, H. H. Shear and Charles Hamilton, all of Waco.

The Commercial Club of Bryan is promoting the installation of a cold storage plant at that place.

The Miller-Brooks Mfg. Company has been formed at Jacksonville. The incorporators are F. J. Miller, A. L. Brooks and R. C. Miller. The capital stock is $25,000.

The Producers' Turpentine Company is arranging to operate in Texas and has established offices at Beaumont. It has a capital stock of $100,000.

R. L. Sparrman is erecting a corn mill at Ennis, Texas.

A committee of the City Council is investigating the different types of garbage crematories preliminary to awarding the contract for the installation of one at Temple, Texas.

H. Wunderlich, of Waco, will install a five-stand cotton gin at Belton.

James Teutsch is building a cotton gin at Nacogdoches.

The woodwork mill of the International & Great Northern Railroad at Palestine, which was recently destroyed by fire, entailing a loss of about $55,000, will be rebuilt. Considerable new machinery will be required.

The taxpayers of New Braunfels have voted to issue $67,000 of bonds for the construction of a dam across the Guadalupe River, at New Braunfels, and other improvements. A hydroelectric plant and waterworks pumping station will also be installed at the dam.

The Sadler & Czigin Light & Power Company has taken steps towards erecting an ice plant at Sour Lake.

S. H. Wadley, of Greenville, has applied to the City Council of Pecos, Texas, for a franchise to construct a sewer system. The city contemplates putting in its own plant.

The Potash & Soda Company, Monahan, is preparing to develop on a large scale the chemical deposits in Bitter Lake, in Ward County. Borax, gypsum, sulphate and sulphide of soda and other chemicals are found there in abundance, it is stated. The company will also erect a cement manufacturing plant. B. P. Bailey, of Fort Worth, is president.

Government Purchases

WASHINGTON, D. C., July 17, 1911.

The Isthmian Canal Commission, Washington, will open bids August 4, under canal circular 640, for one turbo generator unit, 500 kw., and one 15-ton road roller.

The Paymaster General, Navy Department, Washington, will open bids August 8 under schedule 3749 for two saddles for multiple drilling machines for delivery at Mare Island, Cal.

The Bureau of Yarks and Docks, Navy Department, Washington, opened bids July 8 for boilers and auxiliary power plant equipment for the United States naval station, Pearl Harbor, T. H., as follows:

Item 1, power plant equipment complete, Evans-Almirall & Co., New York, $167,000; U. L. Bayard, Philadelphia, Pa., $158,000; Benhamm Young Company, Honolulu, T. H., $169,182.57; Charles C. Moore & Co., San Francisco, Cal., $158,000; John W. Danforth Company, Buffalo, N. Y., $153,495 and $147,500.

The Bureau of Yards and Docks, Navy Department, Washington, opened bids July 8 for auxiliary power plant equipment for the United States navy yard, Mare Island, Cal., as follows:

Item 1, power plant equipment complete, Evans-Almirall & Co., New York, $108,987; C. C. Moore & Co., San Francisco, Cal., $114,100; Robert Dalziel, Jr., San Francisco, Cal., $112,600; John W. Danforth Company, Buffalo, N. Y., $103,570.

The Lighthouse Inspector, San Francisco, Cal., opened bids June 27 for lathe and tools for the machine shop, Yerba Buena Lighthouse Depot, Cal., as follows:

Pacific Tool & Supply Company, $597.65; Compressed Air Machinery Company, $583.20; C. W. Marwadel, $835.65; A. L. Young Machinery Company, $557 for lathe only; J. L. Hicks, San Francisco, Cal., $661.55; Harron, Rickard & McCone, San Francisco, Cal., $728.66; Manning, Maxwell & Moore, New York, $882.81; Dicks Compressed Air & Drill Company, $753.15; Eccles & Smith Company, San Francisco, Cal., $826.09.

The Bureau of Supplies and Accounts, Navy Department, Washington, opened bids July 11 as follows:

Schedule 3718, class 51, one engine lathe—Bidder 17, Chandler-Farquhar Company, Boston, Mass., $1,003 and $1,108; 37, Fairbanks Company, Washington, D. C., $1,667 and $1,132; 43, Garvin Machine Company, New York, $1,180.48; Griscom-Spencer Company, New York, $1,078; 58, I. H. Johnson, Jr., Company, Philadelphia, Pa., $1,163; 80, Manning, Maxwell & Moore, New York, $1,579; 88, Niles-Bement-Pond Company, New York, $1,260 and $1,443; 92, Prentiss Tool & Supply Company, New York, $1,400, $1,190; 131, Springfield Machine Tool Company, Springfield, Ohio, $1,346.

Class 52, one motor-driven plain radial drill—Bidder 17, Chandler-Farquhar Company, Boston, Mass., $859; 37, Fairbanks Company, Washington, D. C., $817; 48, Griscom-Spencer Company, New York, $896; 63, J. P. Kemp, Baltimore, Md., $894; 80, Manning, Maxwell & Moore, New York, $1,000; 88, Niles-Bement-Pond Company, New York, $855; 92, Prentiss Tool & Supply Company, New York, $892 and $930.

Class 53, one motor-driven shaper—Bidder 17, Chandler-Farquhar Company, Boston, Mass., $859; 37, Fairbanks Company, Washington, D. C., $787; Garvin Machine Company, New York, $961; 48, Griscom-Spencer Company, New York, $859; 60, R. A. Kelly, Xenia, Ohio, $791.50; 63, J. P. Kemp, Baltimore, Md., $765; 80, Manning, Maxwell & Moore, New York, $813 and $873; 88, Niles-Bement-Pond Company, New York, $975; 92, Prentiss Tool & Supply Company, New York, $810; 131, Springfield Machine Tool Company, Springfield, Ohio, $872.

Class 54, one motor-driven sensitive drill—Bidder 37, Fairbanks Company, Washington, D. C., $167; 143, Garvin Machine Company, New York, $170; 48, Griscom-Spencer Company, New York, $163; 80, Manning, Maxwell & Moore, New York, $140, $164 and $179; 92, Prentiss Tool & Supply Company, New York, $172.65 and $185.72.

Class 55, one motor-driven speed lathe—Bidder 1, American Woodworking Machinery Company, Rochester, N. Y., $305; 37, Fairbanks Company, Washington, D. C., $227; 48, Griscom-Spencer Company, New York, $199.35; 89, Oliver Machinery Company, New York, $179, $187, $222 and $230; 92, Prentiss Tool & Supply Company, New York, $130.42 and $293.30.

Class 156, one motor-driven emery grinder—Bidder, 19, James A. Clark, Jr., Electric Company, Louisville, Ky., $130; 21, Cincinnati Electric Tool Company, Cincinnati, Ohio, $146; 24, Diamond Machine Company, Providence, R. I., informal; 37, Fairbanks Company, Washington, D. C., $116; 63, J. P. Kemp, Baltimore, Md., $126.50; 80, Manning, Maxwell & Moore, New York, $171.75 and $188.80; 100, Sampson Mfg. Company, Oshkosh, Wis., $190.

Class 61, one oxy-acetylene welding plant, one acetylene generating outfit and one gas scrubber—Bidder 26, Davis-Bournonville Company, New York, $4,500 and $5,205; 90, Oxi-Carbi Company, New Haven, Conn., $4,490.60, part.

The bid of the American Tool Works Company, Cincinnati, Ohio, for one single-geared crank shaper, under schedule 3658, class 34, was $326. It was erroneously given as $236 in our issue of July 6.

Current Metal Prices.

The following quotations are for small lots, New York. Wholesale prices, at which large lots only can be bought, are given elsewhere in our weekly market report

IRON AND STEEL—

Bar Iron from Store—

Refined iron,
1 to 1⅝ in. round and square ... ₣ lb 1.70c
1⅝ to 4 in. x ¼ to 1 in. ... ₣ lb 1.70c
1⅝ to 4 in. x ¼ to 1 in. ... ₣ lb 1.80c
Rods, ⅜ and 11-16 round and square ₣ lb 1.80c

Angles:	Cts ₣ lb.
⅜ in. x ¼ in. and larger	1.90c
3 in. x 3-16 in. and ¼ in.	2.00c
1½ to 2½ in. x ¼ in.	2.05c
1½ to 2½ in. x 5-16 in. and thicker	1.95c
1 to 1½ in. x 3-16 in.	2.05c
1 to 1½ x ⅜ in.	2.10c
⅞ x ⅞ in.	2.20c
¾ x ¾ in.	2.25c
⅝ in. x ⅝ in.	3.45c
½ x 3-32 in.	3.90c
Tees:	
1 in.	2.35c
1¼ in.	2.20c
1¼ to 2½ x ¼ in.	2.00c
1½ to 2½ x 3-16 in.	2.10c
3 in. and larger	2.05c
Beams	1.90c
Channels, 3 in. and larger	1.90c
Bands—1¼ to 6 x 0.18 to No. 8	2.10c
Burden's "H. B. & S." iron, base price	2.95c
"Burden's Best" iron, base price	3.15c
Norway bars	3.60c

Merchant Steel from Store—

	per lb.
Bessemer machinery	1.90c
Toe calk, tire and sleigh shoe	2.50@3.00c
Best cast steel, base price in small lots	7c

Sheets from Store—

Black,	One pass, C. R. soft steel.	R. G. cleaned
No. 16	₣ lb 2.45c	2.75c
Nos. 18 to 20	₣ lb 2.50c	2.80c
Nos. 22 and 24	₣ lb 2.55c	2.95c
No. 26	₣ lb 2.60c	3.05c
No. 28	₣ lb 2.95c	3.20c

Russia, Planished &c.

Genuine Russia, according to assortment ₣ lb 12 @14½c
Patent planished, W. Dewees Wood ₣ lb A, 10c; B, 9c net

Galvanized

Nos. 12 and 14	₣ lb 2.75c
No. 24	₣ lb 3.10c
No. 26	₣ lb 3.20c
No. 28	₣ lb 3.60c

No 20 and lighter 36 inches wide, 25c higher

Genuine Iron Sheets—

Galvanized

Nos. 22 and 24	₣ lb 5.50c
No. 26	₣ lb 6.00c
No. 28	₣ lb 7.00c

Corrugated Roofing—

2½ in. corrugated	Painted.	Galvd
No. 24 ₣ 100 sq. ft.	$3.75	$4.75
No. 26 ₣ 100 sq. ft.	2.85	3.96
No. 28 ₣ 100 sq. ft.	2.50	3.65

Tin Plates—

American Charcoal Plates (per box)

"A A A" charcoal:
IC. 14 x 20 ... $6.65
IX. 14 x 20 ... 7.90
A charcoal:
IC. 14 x 20 ... $5.60
IX. 14 x 20 ... 5.70

American Coke Plates—Bessemer—
IC. 14 x 20 ... 107 lb ... $4.50
IX. 14 x 20 ... 5.50

American Terne Plates—
IC. 20 x 28 with an 8 lb. coating ... $8.70
IX. 20 x 28 with an 8 lb. coating ... 10.70

Seamless Brass Tubes—

List November 13, 1908. Base price, 18c

Brass Tubes, Iron Pipe Sizes—

List November 13, 1908. Base price, 18c

Copper Tubes—

List November 13, 1908. Base price, 21c

Brazed Brass Tubes—

List February 1, 1911 19½c ₣ lb

High Brass Rods—

List February 1, 1911. 14½c ₣ lb

Roll and Sheet Brass—

List February 1, 1911 14½c ₣ lb

Brass Wire—

List February 1, 1911. 14½c ₣ lb

Copper Wire—

Base price, Carload lots mill 14c

Copper Sheets—

Sheet copper hot rolled, 16 oz. (quantity lots) ₣ lb 18c
Sheet copper cold rolled, 1c ₣ lb advance over hot rolled.
Sheet copper polished 20 in. wide and under, 1c ₣ square foot.
Sheet copper polished over 20 in. wide, 2c ₣ square foot.
Planished copper, 1c ₣ square foot more than polished.

METALS—

Tin—

Straits pig ... ₣ lb 47 @47½c

Copper—

Lake ingot ... ₣ lb 14 @14¼c
Electrolytic ... ₣ lb 13¾@14 c
Casting ... ₣ lb 13¾@14 c

Spelter—

Western ... ₣ lb 6¾@ 7 c

Zinc—

No. 9, base, casks ... ₣ lb 5c Open ... ₣ lb 8½c

Lead—

American pig ... ₣ lb 5½@5.5½c
Bar ... ₣ lb 6¾@6¾c

Solder—

½ & ½, guaranteed ... ₣ lb 28¼@28¾c
No. 1 ... ₣ lb 26¾@26¾c
Refined ... ₣ lb 24¾@25¼c

Prices of solder indicated by private brand vary according to composition.

Antimony—

Cookson ... ₣ lb ..@10½c
Hallets ... @10 c
Other brands ... 9@ 9½c

Bismuth—

Per lb ... $2.00@$2.25

Aluminum—

No. 1 aluminum (guaranteed over 99% pure), in ingots for remelting ... 21c and 22c
Rods and Wire ... Base price 31c
Sheets ... Base price 33c

Old Metals—

Dealers' Purchasing Prices Paid in New York.

	Cents.
Copper, heavy and crucible	10.75 to 11.00
Copper, heavy and wire	10.50 to 10.75
Copper, light and bottoms	9.50 to 9.75
Brass, heavy	7.25 to 7.50
Brass, light	5.75 to 6.00
Heavy machine composition	9.25 to 9.50
Clean brass turnings	7.00 to 7.25
Composition turnings	8.00 to 8.25
Lead, heavy	3.75
Lead, tea	3.50
Zinc, scrap	4.00



THE IRON AGE

Established 1855 — New York, July 27, 1911 — Vol. 88: No. 4

Published Every Thursday by the

DAVID WILLIAMS COMPANY

239 West 39th Street, New York

Entered at the New York Post Office as Second-Class Mail Matter.

Subscription Price, United States and Mexico, $5.00 per Annum; to Canada, $7.50 per Annum; to Other Foreign Countries, $10.00 per Annum. Unless receipt is requested, none will be sent. Credit for payment will be shown by extending the date on the wrapper of your paper.

W. H. Taylor, - - - - - - President and Treasurer
I. A. Mekeel, - - - - - - - First Vice-President
Harold S. Buttenheim, - - - - Second Vice-President and Secretary

Geo. W. Cope, - - - - }
A. I. Findley, - - - - } Editors
W. W. Macon, - - - - }

M. C. Robbins, - - - - Manager
Charles S. Baur, - - - Assistant Manager

Branch Offices

Philadelphia, Real Estate Trust Building
Pittsburgh, Park Building
Boston, Compton Building
Chicago, Fisher Building
Cleveland, American Trust Building
Cincinnati, 807 Andrews Building

CONTENTS.

Rate Decision Disregarded 177
Increasing Railroad Traffic 178
Our Improved Foreign Trade Balance 179
Correspondence 180
Manning, Maxwell & Moore Changes 180
The Lebanon Valley Iron & Steel Company 181
New Steel Works in Japan 181
The Schlieper-Daae Company 181
The Iron and Metal Markets 182
Iron and Industrial Stocks 191
Customs Decisions 191
New Publications 192
The Revolution in Freight Claims 192
The Chattanooga Manufacturers' Association 192
Personal 193
Obituary 193
Making Machines Earn Their Living 194
Heat Treatment of Low-Carbon Nickel Steels 195
The Steel Corporation Investigation 196
United States Steel Corporation's Earnings 197
Important Freight Rate Reductions 197
East Texas Iron Ore Development 197
The Illinois Coal Report 197
Spelter Production in the First Half of 1911 197
Coke Production and By-Products Saved 198
The Swedish Iron Institute 198
German Patent Law Practice 198
Electric Power Cost 199
A Historic Kentucky Mill Dismantled 199
A New Iron and Steel Jobbing House in Cleveland 199
Welds by Different Methods 200
Old Copper and Brass Specifications 200
Judicial Decisions of Interest to Manufacturers 201
The Iron and Steel Institute's Turin Meeting 202
Steel Derricks and Drilling Rigs 202
Softening Water on a Large Scale 202
The Oil Pump House at Gary 203
Economical Sand and Stone Handling 204
The Steel Castings Trade at Chester, Pa 204
Correction 204
Gould & Eberhardt Bevel Gear Roughing Shaper 205
Experiments on 0.2 Per Cent. Vanadium Steel 205
New Jefferson Union Tee 206
Hydro-Pneumatic Radial Drill 206
Gas Engine Wastes for Factory Heating 208
The Standard Chain Company Makes Saddlery Hardware 209
A New Heavy Duty Drill Press 210
New Combination Grinder 212
Observations on Case Hardening 213
Heat-Treating Furnaces 213
A Motor-Driven Hole Grinding Machine 214
The Twentieth Century Loose Pulley Oil Cup 214
Some Recent Drilling Records 215
Credit Unions for Employees 215
The Standard Welding Company's New Addition 216
A Core Room Conveyor System 217
Poor's Manual for 1910 217
The Schedule of the International 218
New Tools and Appliances 220
The McCarroll Ideal Chaplet 231
The Corona Flexible Metallic Hose 231
Two-Stage Gas-Driven Air Compressor 231
The Machinery Markets ..... 222 to 231
Government Purchases 231

Rate Decision Disregarded

Steel Mill Operations Increase

Pig Iron Holds Its Own

From the viewpoint of the iron trade, the Interstate Commerce Commission's decision reducing Reno, Spokane and Salt Lake rates about 20 per cent. is regarded as simply another incident in the disappointing railroad situation. The iron trade has not had anything like its normal volume of business from the railroads for many months and has managed to get along after some fashion and this new decision is not likely to restrict their orders much further. In point of fact, the necessities of the railroads are steadily increasing and the ravages of wear and tear must be made up sooner or later, when the requisite funds will be secured in some way.

The reports from various trade centers show a continued slight increase in steel mill operations. At Pittsburgh the leading subsidiary of the Steel Corporation is doing considerably better than early in the month, operating in excess of 75 per cent. of its ingot capacity. At the same point a large independent is operating some important departments at better than 85 per cent., while another is doing about 80 per cent. Other mills, however, show considerably lower percentages, from which it is inferred that business is not distributed as uniformly as it was earlier in the year. Pittsburgh also reports that orders are slightly better this week than last. As both bookings and production have been better in July than in June, the augury is regarded as excellent for good business in the fall.

The United States Steel Corporation worked up to 72 per cent. of its steel ingot capacity last week and is scheduled at 71 per cent. this week. Its blast furnace operations are increasing, two furnaces having been added to the active list at Youngstown and one at Duquesne.

While the volume of business is showing a steady gain in finished products, the improved buying conditions are not sufficient to satisfy some producers, and prices on certain products are subject to more or less shading. This has been especially the case with regard to steel bars and sheets. It is worthy of note, however, that the leading manufacturers of steel bars are firmly maintaining the price of 1.25 cent, Pittsburgh. A large steel bar order, said to be 30,000 tons, was placed at Buffalo.

An order for 30,000 tons of steel rails is being rolled for quick delivery by the Illinois Steel Company for the Canadian Pacific, while the same railroad company has purchased 3000 tons from the Lackawanna Steel Company. Included in recent export business is a contract for 20,000 tons of structural shapes from bridge builders in Canada.

The pig iron market appears to be broadening, especially in the Central West. The malleable foun-

dries in the Chicago district have begun to close their agricultural implement contracts for the year and both the malleable and gray iron foundries are now increasing their consumption of pig iron. Buying has been slightly better, not only at Chicago but also at Cleveland, Cincinnati and Pittsburgh. A steel manufacturer near Pittsburgh is understood to have bought 15,000 tons of basic iron for delivery over the remainder of this year. From Birmingham a sale of 25,000 tons of iron to a manufacturer of cast iron pipe is reported, while numerous other transactions of considerable quantities have taken place. The continued heavy movement from furnace yards has somewhat strengthened the tone of Southern iron and it looks as if the $10 price might soon become a memory, as this price can no longer be obtained from four of the prominent Southern producing interests. The Eastern iron market shows continued firmness, with a slightly better movement. It is reported that an eastern Pennsylvania steel company has bought another 5000-ton lot of basic pig iron.

The scrap situation is becoming interesting. Prices of heavy melting steel scrap have advanced at both Philadelphia and Pittsburgh and there are some indications of a speculative tendency among dealers.

Increasing Railroad Traffic

Poor's statistics of the steam railroads of the United States, just issued for the calendar year 1910, furnish evidence of a sure and steady increase in railroad traffic per mile of road. This explains how the railroads have been able to maintain themselves so well financially, although meeting what they have assured the public is a most burdensome increase in their cost of doing business. It gives assurance also that their condition will improve steadily in the future. When the position of the railroads first came to be seriously studied, in the past two or three years, the almost unbroken increase in total earnings year by year attracted attention and was made the excuse for much criticism of the railroad attitude. On the part of the railroads a regular campaign was inaugurated to set forth the fact that the apparent increase in earnings was due, at least in very large part, to the increase in mileage, year by year, and for some time past a bureau has been maintained for the purpose of analyzing the monthly earnings statistics by referring them to a per mile basis. This method of comparison is the only safe one in studying traffic statistics. It means nothing by itself to observe that passenger traffic has increased 158 per cent., or freight traffic 224 per cent., in the 20 years from 1890 to 1910, for in the same period the total mileage of railroad has increased 52 per cent., and capital investment still more, because the investment per mile of line has increased.

While Poor's statistics give many details computed from the fundamental figures gathered, they do not show passenger or freight movement per mile of road —the density of traffic, in other words—and for the table given below we have therefore computed this item. There is shown below, for the 21 years from 1890 to 1910, inclusive, the total mileage of steam railroad reporting, the total freight ton-mileage (2,000 lb. moved one mile), and the ton-mileage per mile of road. The years indicated are the fiscal years of the roads, usually the year ended June 30, but in the case of several important systems the year ended December 31, Thus the statistics by nominal years are strictly comparable with each other, although a given one does not represent identical periods for all roads reporting.

Steam Roads and Freight Traffic.

Years.	Miles reporting.	Total ton-miles.	Ton-miles per mile of road.
1890	157,967	79,192,985,000	501,000
1891	164,262	81,210,155,000	495,000
1892	170,607	84,413,197,000	495,000
1893	173,361	90,552,087,000	523,000
1894	176,221	82,219,900,000	467,000
1895	179,154	88,567,771,000	495,000
1896	180,891	93,885,854,000	519,000
1897	181,065	97,842,569,000	540,000
1898	184,117	114,566,173,000	622,000
1899	186,224	126,991,703,000	684,000
1900	191,455	141,162,109,000	739,000
1901	194,455	148,959,303,000	767,000
1902	197,381	156,624,166,000	797,000
1903	204,668	171,290,311,000	837,000
1904	211,233	173,613,027,000	820,000
1905	214,836	187,373,622,000	873,000
1906	220,688	216,653,796,000	981,000
1907	224,386	233,137,508,000	1,039,000
1908	227,228	215,698,911,000	954,000
1909	236,892	227,198,933,000	960,000
1910	239,607	256,682,127,000	1,072,000

There has been, of course, a continuous increase in the mileage of road. The total freight traffic has not invariably increased, but the table giving figures for 21 years shows 20 years with which comparison can be made, and 16 out of those 20 years broke all previous records for freight traffic, while 12 of the 20 broke all previous records for freight traffic per mile of road.

In the 20 years the density of traffic has done a little better than double. It was 501,000 ton-miles per mile of road in 1890, and as early as 1907, 17 years later, it was 1,039,000 ton-miles, while in 1910 the 1907 record was broken, with 1,072,000 ton-miles. Obviously this increased density of traffic is the salvation of the railroads as a class. If there is only business enough to operate one train a week, it is necessary to lay the track in order to operate that one train, whereas the track will accommodate many trains a day without increasing the investment in it.

From the statistics it is safe to derive a general rule that density of freight traffic tends to double in somewhat less than 20 years. Our comparison between 1890 and 1910 does not do full justice to the rate of gain, for the reason that 1890 was a particularly good year, much better than its predecessors, and better even than the two following years, whereas 1910 was only a moderately good year in its day. To pick out the most favorable comparison in the whole period, we may observe that while the 540,000 ton-miles per mile of road in 1897 broke all previous records, the item 10 years later, in 1907, was 1,039,000, which is 92.41 per cent. gain in 10 years, or doubling in less than 11 years. It would not be fair to draw deductions from this, for the period was one of unusual expansion, but much study of statistics has shown that in general all variations from normal in American business are completed within 20 years, and 20-year comparisons are usually very trustworthy.

The density of passenger traffic has not increased as rapidly as that of freight traffic. Below are given the figures for three representative years, the figures representing passengers carried one mile, per mile of railroad reporting:

Density of Passenger Traffic.

1890	79,200
1900	85,700
1910	135,000

While the increase in density of passenger traffic has been much less than that of freight traffic, the density of passenger traffic is of itself of little consequence. Railroad men assure us that there is no money in passenger business, and that the public is constantly "demanding" better service, which eats up the possible

earnings. Whether it is impossible for the railroads to avoid complying with these "demands" is a question which might admit of some discussion, but that matter is not germane to the present subject. We observe from the statistics that the railroads do accede to the demands in large measure, for we find that the average number of passenger-miles per passenger train mile in 1890 was 42.12; in 1900, 43.22; and in 1910, 57.42; so that the number of train-miles per mile of road has increased almost as rapidly as the passenger traffic. If the railroads would haul more passengers per train they would, of course, make more money.

In the case of freight traffic this economy has been practiced. There has been a steady and rather rapid increase in the average train load—from 163.99 tons in 1890 to 274.79 tons in 1900 and 394.73 tons in 1910, which is 68 per cent. gain in the first decade and 44 per cent. in the second. Part of the increase is, of course, due to the increased density of traffic, whereby at one time a train must be run to accommodate the public, although it is not well loaded, while at a later time there has arisen sufficient traffic to give it a full load, while another part, undoubtedly the larger part, is due to better facilities in decreased grades and more powerful locomotives.

There is reason to expect that the cost of doing business will not increase in the next few years as it has in the past dozen years; it is more likely to decrease, and at any rate is surely will not increase with the same rapidity as formerly. The increase in density of traffic, on the other hand, is bound to continue, and the increase in freight train loads is certain to continue. There is opportunity, in an emergency, for the railroads to increase more rapidly the passenger train load, by holding the number of trains more nearly stationary while the total passenger traffic increases, and thus year by year the railroads should find themselves in better and better position.

The iron and steel industry is vitally interested in railroad prosperity, in seeing the railroads make good profits, for when such profits are being made extensions are undertaken and the trade has learned that such extensions involve large tonnages of material. A comparatively new source of railroad consumption of iron and steel, however, has appeared. A quarter of a century ago, when there occurred the heaviest railroad building, in point of mileage, railroad purchases were almost wholly for extensions. With the enormous increase in traffic the point has been reached where railroads wear out a great deal of material, and this must be replaced from time to time. The statistics show how great has been this increase. In considering this consumption, it matters not whether the traffic is over few or many miles of road; the point is simply that each ton of freight moved one mile does wear out a certain amount of material. From 1890 to 1900 the freight ton-mileage of the country increased 78 per cent., and from 1900 to 1910, 82 per cent., the increase in the whole 20 years being 224 per cent. This is an average rate of increase of a trifle more than 6 per cent., indicating a doubling in a trifle less than 12 years. Year by year, then, the railroads are certain to wear out more material, and, as this is part of the ordinary cost of operation, the demand for replacement material does not depend in any great part upon whether earnings are large or small. This species of railroad demand, while relatively new, has become very important.

Our Improved Foreign Trade Balance

Our foreign trade in the fiscal year just ended shows a gratifying return to the large favorable balance which characterized the years 1898 to 1908 inclusive. The balance averaged regularly more than $500,000,000 annually during those 11 years, there having been relatively small favorable balances prior to 1898. In the fiscal year 1909 the favorable balance dropped to $351,000,000, and in 1910 there was a further drop to $187,000,000. In the fiscal year 1911 the balance returned to $520,706,304, which is almost precisely the average of the 11 years mentioned, 1898 to 1908. The full statistics of the merchandise movement are as follows for the fiscal years:

	Imports.	Exports.	Balance.
1898	$616,049,654	$1,231,482,330	$615,432,676
1899	697,146,487	1,227,023,392	529,874,813
1900	849,941,184	1,394,483,082	544,541,898
1901	823,172,176	1,487,764,991	664,592,826
1902	903,320,948	1,381,719,401	478,398,453
1903	1,025,719,237	1,420,141,679	394,422,442
1904	991,087,371	1,466,837,271	466,749,900
1905	1,117,513,071	1,518,561,666	401,048,595
1906	1,226,562,446	1,743,864,500	517,302,054
1907	1,434,421,425	1,880,851,078	446,429,653
1908	1,194,341,792	1,860,773,346	666,431,554
1909	1,311,920,224	1,663,011,104	351,090,880
1910	1,357,819,988	1,544,984,720	187,164,732
1911	1,527,985,088	2,048,691,392	520,706,304

It will be observed that the large favorable balance in 1911 was effected by an increase in exports, which easily broke all previous records, exceeding 1907, the previous record year, by 9 per cent. The imports were the largest on record with the single exception of 1910, and fell short of that year by only 2 per cent.

The fiscal year 1910-11 opened very inauspiciously, July showing an unfavorable balance. The net favorable balance for the year was obtained chiefly through very heavy exports in the fall and winter of foodstuffs, cotton and oil. It must be remembered that our exports of foodstuffs are at best much less than they were prior to the last few years, and there is no prospect that they will ever reach the old time proportions. As was lucidly pointed out by James J. Hill in a series of articles some time ago, year by year we need our foodstuffs more at home and are trending toward being a wheat-importing nation instead of continuing as a great wheat-exporting nation, as we were for so many years.

The regaining of a large favorable balance of trade in merchandise comparable with those which obtained from 1898 to 1908 is not sufficient to restore our position, for the reason that the apparent favorable balance is not clear profit, a part of it being by common consent assumed to be made up of at least occasional undervaluations of imports and overvaluations of exports, while there are freights paid both ways when a fair basis would be to pay freight one way only. These items absorb larger and larger sums as the total commerce grows, and then there are other movements which our excess of exports must pay for, and as the country grows these adjustments may be presumed to grow. Accordingly, the maintenance of the same apparent favorable balance in merchandise trade, when the total movement greatly increases, is not as satisfactory as might appear at first glance. In the three years 1898, 1899 and 1900 the total movement, imports plus exports, averaged $2,000,000,000; in 1911 the total was $3,577,000,000, or 79 per cent. more, and there is considerable ground for arguing that merely to maintain our position the apparent favorable balance should have increased in the same ratio. On the basis of those three years and a 79 per cent. increase this would call for a balance of no less than $1,000,000,000 in 1911.

Correspondence

Ferrotitanium and Its Use

To the Editor: In *The Iron Age* of June 22, 1911, page 1538, appeared an article by the manager of sales of the Goldschmidt Thermit Company, describing the various alloy products of his company. Several paragraphs are devoted to ferrotitanium, which is described as probably the most important alloy at the present time. The writer wishes to take exception to the part of this article quoted below:

This alloy is a light grayish metal, is hard and brittle in character, and contains from 20 to 25 per cent. titanium, 3 to 5 per cent. aluminum and the rest iron. The other impurities are so small in proportion as to be negligible. The aluminum should not be regarded as an impurity, as it helps the solubility of the alloy materially when added to steel or iron. Of course, being produced by the thermit reaction, the alloy is absolutely free from carbon, which is a very great advantage, as wherever carbon is present it combines with the titanium to form titanium carbide, which dissolves with great difficulty in iron or steel, and considerable of the titanium is, therefore, wasted.

It can easily be shown that, where a ferrotitanium alloy contains as much as from 5 to 8 per cent. carbon, at least 15 to 20 per cent. of the titanium content is wasted in the form of titanium carbide. In the case of an alloy produced by the thermit reaction all this waste is entirely eliminated, while an additional advantage is gained through the higher specific gravity of the thermit product over that produced in the electric furnace, or by other methods. This higher specific gravity is of considerable importance as it permits of the alloy sinking into the iron or steel treated, and avoids any danger of its floating on top and being wasted in the slag.

The writer's experience with ferrotitanium alloy, which has been considerable, has been chiefly gained with the so-called 10 per cent. and 15 per cent. alloys of the Titanium Alloy Mfg. Company which he can thoroughly recommend. It is by wide experience with these alloys, especially the 10 per cent. one, that the demand for titanium-treated iron and steel has been created in this country, and has grown to its present large proportions. Their average analysis and specific gravity have proved to be within the following limits:

	Ten per cent. alloy.		Fifteen per cent. alloy.	
Titanium, per cent.	10.0 to	12.0	14.9 to	16.0
Combined carbon, per cent.	0.1	0.25	0.1	0.25
Graphitic carbon, per cent.	5.75	7.25	5.75	7.25
Silicon, per cent.	0.8	1.05	0.9	1.10
Manganese, per cent.	0.12	0.15	0.12	0.15
Sulphur	traces		traces	
Phosphorus, per cent	0.06	0.08	0.065	0.09
Specific gravity	6.20	6.40	6.15	6.35

As a contrast to these analyses may be given some results obtained on two samples of the Goldschmidt alloy:

	Sample 1.	Sample 2.
Titanium, per cent	23.10	21.08
Silicon, per cent.	7.82	1.88
Aluminum, per cent.	6.36	9.01

The specific gravity varied from 6.20 to 6.30.

The Presence of Aluminum

The first point to be taken up is that of the aluminum, which is unavoidably present in considerable quantities in the Goldschmidt alloy. In one sense its presence may be beneficial, but in another it is extremely harmful. It may help the solubility of the low carbon alloy, when added to the molten bath, through lowering its fusion point, and in this respect its action is necessary and helpful.

After fusion most of the aluminum will be oxidized to dry powdery alumina, which will tend to slag off, together with the oxide of titanium and other slag-making material. It will decrease the fusibility of the slag, making it liable to be held in the metal, and so tend to defeat one of the chief advantages of using ferrotitanium, namely a resultant clean solid steel or iron. With regard to the carbon, the analyses show that in the 10 per cent. and 15 per cent. alloys practically all of it is in the free or graphitic state. The amount of titanium carbide present, if any, must be very small.

Titanium Decomposes Carbide of Iron

In these alloys titanium seems to act a good deal like silicon, decomposing the carbide of iron and precipitating free carbon as graphite. This view is supported by the results of an experiment recently made by the writer. A ladle of iron for making malleable castings was treated with an addition of 10 per cent. alloy equal to 0.1 per cent. metallic titanium. The original iron gave castings showing a white fracture, with a little graphite in the center. The titanium-treated metal, when cast in a similar mold made from the same pattern, showed a gray fracture, with a white border between ⅛ and ½ in. deep round the outside.

In this case, therefore, the titanium precipitated graphite in the body of the metal, giving the gray fracture. If manganese or vanadium had been added, either would in part at least have combined with the iron carbide, giving double carbides. The titanium, however, works entirely differently, showing no tendency to form a carbide but decomposing the carbide already present, forming graphite, with which it also shows no tendency to combine.

It is extremely unlike and improbable that, even at the highest temperatures reached in the steel-making processes, this action will be reversed, and titanium carbide formed. Even if the temperature were high enough for this latter reaction, there would remain the much greater affinity of iron for carbon to be taken into consideration.

It is much more likely that, when the 10 per cent. or 15 per cent. alloy is added to a bath of molten steel, the alloy quickly dissolves because of its low melting point; part of the graphite unites with iron, forming carbide of iron, while a part rises quickly to the surface because of its low specific gravity and is lost in the slag. This opinion is supported by results in practice, for the carbon in the final steel, when the 10 per cent. or 15 per cent. alloy is used, is generally slightly raised, but not to the amount expected if all the graphite were absorbed.

The point which it is desired to bring out is that absolutely no titanium is prevented from doing its useful work through the combination of titanium and graphite, and the formation of titanium carbide.

The matter of the specific gravity is answered by the results given previously in this article. It must be remembered that the Goldschmidt alloy contains a considerable amount of aluminum and also less iron than the 10 per cent. or 15 per cent. domestic alloys, both of which facts will tend to lower its specific gravity.

G. B. WATERHOUSE, PH.D.

BUFFALO, N. Y., July 20, 1911.

Manning, Maxwell & Moore Changes

At a meeting of the directors of Manning, Maxwell & Moore, Inc., July 23, the resignation of Colby M. Chester, Jr., as secretary and treasurer was accepted and J. H. Evans was elected a director and to fill the vacant offices. Mr. Evans is the son of the late Sir Francis Evans of England, and since coming to the United States has been connected with the Guaranty Trust Company and the Central Trust Company of New York City.

Henry Evans, president of the Continental Insurance Company and the Fidelity-Phenix Fire Insurance Company, was elected chairman of the executive committee. Mr. Evans states that he assumes this responsibility at the urgent request of his friend and relative, Charles A. Moore, the president of the company, who, as the result of many years of hard work, is taking an extended rest but expects in the fall to return to America. There is absolutely no change in the ownership of the stock of the company, Mr. Moore still retaining his controlling interest. No further changes in the official force of the corporation are expected. The resignation of Mr. Chester is officially explained as resulting from Chairman Evans's insistence that, as Mr. Moore's representative, he should control the office of treasurer.

The American Steel & Wire Company, Pittsburgh, has received from the American Bridge Company, Ambridge, Pa., two new steel barges, the Donora and Duquesne, for use in transporting its products from its plants to Southern markets. The barges are 200 x 36 ft., and, when loaded, draw from 9 to 10 ft. of water. The contract calls for 10 of these vessels.

The Lebanon Valley Iron & Steel Company

The Lebanon Valley Iron & Steel Company, Lebanon, Pa., has increased its capital stock from $1,000,000 to $2,000,000. William C. Sproul, Chester, Pa.; Burrows Sloan and Felton Bent, Philadelphia, Pa., and W. A. Stanton, New York, have recently taken an interest in the company. H. H. Light will continue as president, and Felton Bent has been elected vice-president. With the increased funds available the capacity for the manufacture of bolts and nuts at the Lebanon plant will be doubled. A large number of bolt and nut machines are to be installed, and a new 8-in. mill will be added to the rolling equipment.

Under the present plan, the plant of the Duncannon Iron Company, Duncannon, Pa., will be taken over by the Lebanon Valley Iron & Steel Company and operated as its Duncannon department, and the manufacture of high-grade puddled specification iron, in all sizes of flats, rounds and squares, muck-bar and finished iron will be conducted as was previously done by that concern. Two additional finishing mills will be added to the Duncannon plant, while the cut-nail department, with a capacity of 3000 kegs per week, will be put in operation. A water course on the property, known as Sherman's Creek, will be developed later for power purposes. The proposed power plant will be of 4000 hp.

New Steel Works in Japan

A few notes regarding the recently established Nippon Steel Works, at Muroran, in the island of Hokkaido, Japan, were given by T. Haga in the Mining and Scientific Press, of San Francisco, in the issue of July 15. It appears that when Government ownership of railroads was undertaken in 1907, an effort was made to gain Government financial assistance to augment the released funds of the Hokkaido Colliery & Steamship Company for the purpose of erecting steel works and thus check the importation of iron and steel. The industry seems to be chiefly important in its relation to warships and ordnance, and the original scheme failing, the Japanese capital was combined with capital obtained through Armstrong & Co., and Vickers, Son & Maxim, Ltd., of England.

The works were established at Muroran partly because of proximity to coal mines and partly because of ample facilities "to lease the space for the navy and army departments." The plant, which it is expected will be completed in August, is being erected under the control of Vice-Admiral Yamauchi, and many of the army engineers in charge and also the mechanics were sent to England to study the operation of steel works. The capital is 15,000,000 yen (about $7,500,000), fully paid, half provided for each party. In addition about $5,000,000 in bonds were issued. Of the total of $12,500,000, about $10,500,000 is to be spent for construction work, leaving $2,000,000 for working capital.

Quite a number of the copper wire manufacturers, recently indicted in New York for a violation of the Sherman anti-trust act two or three years ago, appeared in the United States Circuit Court July 25, and, having entered the plea of nolo contendere, were each fined $1,000 on the first indictment and $100 additional for each of the other eight indictments. In imposing these fines the judge said: "Congress has declared that combinations in restraint of trade shall not exist. It seems to me I am not going out of the way when I say that just what was meant by this law has remained in considerable uncertainty up to this time. We know exactly or very nearly what it means, and from this time on there will be no excuse, but I feel justified in looking upon what has occurred in the past in this light, and therefore I certainly regard this as calling for nothing except a proper vindication of the law by a fine."

The Hopkinson Machine Company, Springfield, Mass., manufacturer of the Hopkinson drill press vise, has recently disposed of this branch of its business to the Skinner Chuck Company, New Britain, Conn. The latter company already manufactures drill press vises, but will, with the new line of vises, increase the number of sizes it has to offer.

The Schlieper-Daae Company.—John E. Schlieper and R. Daae, mechanical engineers, have organized the Schlieper-Daae Company, 714 Ferguson Building, Pittsburgh. Mr. Schlieper was formerly connected with James P. Witherow, having direct charge of steel plant and blast furnace work, then president of the Schlieper Engineering Company, and afterward general manager of the Pittsburgh Feed Water Heater Company. Mr. Daae was for some years connected with S. V. Huber as designing engineer of continuous mills, later having charge of construction of the rail mill of the Tennessee Coal, Iron & Railroad Company, and afterward taking the position of chief engineer of the Monterey Iron & Steel Company, Monterey, Mexico. The Schlieper-Daae Company will design blast furnaces, steel works, rail, continuous, merchant, sheet and tin mills, galvanizing plants, pipe mills, steam and hydraulic machinery, etc. It controls patents on soaking pit covers and a gas producer and has a machine to cast and press steel car wheels, embodying the latest ideas. The company has just completed plans and specifications for a large new sheet and tin plate mill.

The Washington Steel & Ordnance Company has purchased and taken over the steel works at Giesboro Manor, in the District of Columbia, heretofore owned and operated by the Firth-Sterling Steel Company as the Ordnance Works of that company. The officers of the Washington Steel & Ordnance Company are as follows: Lewis J. Firth, president; James W. Kinnear, vice-president; Harry F. Clark, secretary and treasurer. The directors are as follows: Lewis J. Firth, Florence, Italy; James W. Kinnear, Eben B. Clarke, James E. Porter, Pittsburgh, Pa.; William A. Burton, Sheffield, England; Alexander G. McKenna, Charles V. Wheeler, Washington, D. C. The management of the works remains unchanged and the business will be conducted without interruption.

The Metz Mfg. Company, Canton, Ohio, has been incorporated with a capital stock of $25,000 and has opened a factory on South Walnut street for the manufacture of porch swings, camp chairs, store window fixtures and other wood specialties. Officers elected are as follows: President and general manager, Charles H. Metz; vice-president, J. R. Cokgill; secretary and general salesmanager, Aaron L. Lewis; treasurer, M. V. H. Johnston. The company has taken over the business established by C. H. Metz.

The National Tube Company, Pittsburgh, reports through its president, W. B. Schiller, that, beginning August 1, the six-day-week plan will be put into effect at all the works of the concern and its allied companies. The features of the plan are that no employee shall work more than six days continuously or more than 12 hours straight a day. As to newspaper reports referring to a congressional committee investigating the working conditions at the plant of the company at McKeesport, Pa., the concern states that no such committee has called for any information.

C. M. Neeld, formerly general manager of the Rankin Works of the McClintic-Marshall Construction Company, has recently formed the C. M. Neeld Construction Company, with offices at 1418 Oliver Building, Pittsburgh. The company will handle buildings complete, erect bridges, viaducts and concrete work, making a specialty of reinforced concrete.

The Bessemer Coke Company, Pittsburgh, has commenced work at its Griffen Works, near Masontown, Pa., on 200 new rectangular coke ovens, for which Frank E. Gebhart, chief engineer of the company, prepared plans some time ago. Some of the older beehive ovens have been torn out to make room for the new. They will be ready for operation about October 1.

The American Sheet & Tin Plate Company has in the last two weeks placed in operation eight additional sheet mills, six of them being at its Ætna-Standard Works, Bridgeport, Ohio. Eight additional tin mills at its American Works, Ellwood, Ind., have also been started up.

The Iron and Metal Markets

A Comparison of Prices

Advances Over the Previous Week in Heavy Type. Declines in Italics.

	At date of this week.	One week previous.	One month previous. July 26	One year previous. July 19	June 28	July 27
PIG IRON, Per Gross Ton:	1911.	1911.	1911.	1910.		
Foundry No. 2 standard, Philadelphia	$15.00	$15.00	$15.00	$16.25		
Foundry No. 2, Valley furnace	13.50	13.50	13.50	14.25		
Foundry No. 2 Southern, Cincinnati	13.25	13.25	13.25	14.75		
Foundry No. 2, Birmingham, Ala.	10.00	10.00	10.00	11.50		
Foundry No. 2, at furnace, Chicago*	*14.50*	15.00	15.00	16.50		
Basic, delivered, eastern Pa.	**14.50**	14.25	14.50	15.50		
Basic, Valley furnace	13.00	13.00	13.00	14.50		
Bessemer, Pittsburgh	15.90	15.90	15.90	16.40		
Gray forge, Pittsburgh	13.90	13.90	13.90	14.40		
Lake Superior charcoal, Chicago	16.50	16.50	16.50	18.50		
COKE, CONNELLSVILLE, Per Net Ton, at Oven:						
Furnace coke, prompt shipment	**1.50**	1.40	1.40	1.55		
Furnace coke, future delivery	**1.65**	1.55	1.60	1.80		
Foundry coke, prompt shipment	**1.85**	1.80	1.80	2.15		
Foundry coke, future delivery	2.00	2.00	2.10	2.25		
BILLETS, &c., Per Gross Ton:						
Bessemer billets, Pittsburgh	21.00	21.00	21.00	24.50		
Forging billets, Pittsburgh	26.00	26.00	26.00	30.00		
Open hearth billets, Philadelphia	23.40	23.40	23.40	28.50		
Wire rods, Pittsburgh	27.00	27.00	27.00	29.00		
OLD MATERIAL, Per Gross Ton:						
Iron rails, Chicago	14.00	14.00	14.00	16.50		
Iron rails, Philadelphia	17.50	17.50	16.50	18.00		
Car wheels, Chicago	12.50	12.50	12.50	14.75		
Car wheels, Philadelphia	13.00	13.00	13.00	14.00		
Heavy steel scrap, Pittsburgh	**13.25**	13.00	13.00	14.00		
Heavy steel scrap, Chicago	10.50	10.50	10.25	12.25		
Heavy steel scrap, Philadelphia	**13.50**	13.35	13.00	14.00		
FINISHED IRON AND STEEL, Per Pound:	Cents.	Cents.	Cents.	Cents.		
Bessemer rails, heavy, at mill	1.25	1.25	1.25	1.25		
Refined iron bars, Philadelphia	1.27½	1.27½	1.27½	1.42½		
Common iron bars, Pittsburgh	1.25	1.25	1.25	1.50		
Common iron bars, Chicago	1.20	1.20	1.20	1.40		
Steel bars, Pittsburgh	*1.20*	1.25	1.25	1.45		
Steel bars, tidewater, New York	*1.36*	1.41	1.41	1.61		
Tank plates, Pittsburgh	1.35	1.35	1.35	1.40		
Tank plates, tidewater, New York	1.51	1.51	1.51	1.56		
Beams, Pittsburgh	1.35	1.35	1.35	1.40		
Beams, tidewater, New York	1.51	1.51	1.51	1.56		
Angles, Pittsburgh	1.35	1.35	1.35	1.40		
Angles, tidewater, New York	1.51	1.51	1.51	1.56		
Skelp, grooved steel, Pittsburgh	1.25	1.25	1.25	1.50		
Skelp, sheared steel, Pittsburgh	1.35	1.35	1.35	1.60		
SHEETS, NAILS AND WIRE, Per Pound:	Cents.	Cents.	Cents.	Cents.		
Sheets, black, No. 28, Pittsburgh	2.00	2.00	2.00	2.25		
Wire nails, Pittsburgh†	1.70	1.70	1.70	1.70		
Cut nails, Pittsburgh†	1.60	1.60	1.60	1.70		
Barb wire, galv., Pittsburgh†	2.00	2.00	2.00	2.00		
METALS, Per Pound:	Cents.	Cents.	Cents.	Cents.		
Lake copper, New York	12.75	12.75	12.87½	12.62½		
Electrolytic copper, New York	**12.60**	12.55	12.62½	12.50		
Spelter, St. Louis	**5.60**	5.57½	5.45	5.05		
Spelter, New York	**5.80**	5.75	5.65	5.20		
Lead, St. Louis	**4.45**	4.40	4.35	4.25		
Lead, New York	4.50	4.50	4.50	4.40		
Tin, New York	42.00	42.00	45.00	33.25		
Antimony, Hallett, New York	8.00	8.00	8.25	8.00		
Tin plate, 100-lb. box, New York	$3.94	$3.94	$3.94	$3.84		

* The average switching charge for delivery to foundries in the Chicago district is 50c. per ton.

† These prices are for largest lots to jobbers.

Prices of Finished Iron and Steel f.o.b. Pittsburgh

Freight rates from Pittsburgh in carloads, per 100 lb.: New York, 10c.; Philadelphia, 15c.; Boston, 18c.; Buffalo, 11c.; Cleveland, 10c.; Cincinnati, 15c.; Indianapolis, 17c.; Chicago, 18c.; St. Paul, 32c.; St. Louis, 22½c.; New Orleans, 30c.; Birmingham, Ala., 45c. Rates to the Pacific Coast are 80c. on plates, structural shapes and sheets, No. 11 and heavier, 85c. on sheets, Nos. 12 to 16; 95c. on sheets, No. 16 and lighter; 65c. on wrought boiler tubes.

Structural Material.—I-beams and channels, 3 to 15 in., inclusive, 1.35c. to 1.40c., net; I-beams over 15 in., 1.45c. to 1.50c., net; H-beams over 18 in., 1.50c. to 1.55c.; angles, 3 to 6 in. inclusive, ¼ in. and up, 1.35c. to 1.40c., net; angles over 6 in., 1.45c. to 1.50c. net; angles, 3 in. on one or both legs, less than ¼ in. thick, 1.40c., plus full extras as per steel bar card effective September 1, 1909; tees, 3 in. and up, 1.40c., net; zees, 3 in. and up, 1.35c. to 1.40c., net; angles, channels and tees under 3 in., 1.40c., base, plus full extras as per steel bar card of September 1, 1909; deck beams and bulb angles, 1.65c. to 1.70c., net; hand rail tees, 2.45c.; checkered and corrugated plates, 2.45c., net.

Plates.—Tank plates, ¼ in. thick, 6¼ in. up to 100 in. wide, 1.35c. to 1.40c., base. Following are stipulations prescribed by manufacturers, with extras to be added to base price (per pound) of plates:

Rectangular plates, tank steel or conforming to manufacturers' standard specifications for structural steel dated February 6, 1903, or equivalent, ¼ in. thick and over on thinnest edge, 100 in. wide and under, down to but not including 6 in. wide, are base.

Plates up to 72 in. wide, inclusive, ordered 10.2 lb. per square foot, are considered ¼-in. plates. Plates over 72 in. wide must be ordered ¼ in. thick on edge, or not less than 11 lb. per square foot, to take base price. Plates over 72 in. wide ordered less than 11 lb. per square foot down to the weight of 3-16-in. take the price of 3-16-in.

Allowable overweight, whether plates are ordered to gauge or weight to be governed by the standard specifications of the Association of American Steel Manufacturers.

	Cents per lb.
Gauges under ¼ in. to and including 3-16 in. on thinnest edge, extra	.10
Gauges under 3-16 in. to and including No. 8	.15
Gauges under No. 8 to and including No. 9	.25
Gauges under No. 9 to and including No. 10	.30
Gauges under No. 10 to and including No. 12	.40
Sketches (including all straight taper plates) 3 ft. and over in length	.10
Complete circles, 3 ft. in diameter and over	.20
Boiler and flange steel	.10
"A. B. M." and ordinary firebox steel	.20
Still bottom steel	.30
Marine steel	.40
Locomotive firebox steel	.50
Widths over 100 in. up to 110 in., inclusive	.05
Widths over 110 in. up to 115 in., inclusive	.10
Widths over 115 in. up to 120 in., inclusive	.15
Widths over 120 in. up to 125 in., inclusive	.25
Widths over 125 in. to 130 in., inclusive	.50
Widths over 130 in.	1.00
Cutting to lengths or diameters under 3 ft. to 2 ft. inclusive	.25
Cutting to lengths or diameters under 2 ft. to 1 ft., inclusive	.50
Cutting to lengths or diameters under 1 ft.	1.55

No charge for cutting rectangular plates to lengths 3 ft. and over. TERMS—Net cash 30 days.

Sheets.—Makers' prices for mill shipments on sheets in carload and larger lots, on which jobbers charge the usual discounts for small lots from store, are as follows: Blue annealed sheets, Nos. 3 to 8, U. S. standard gauge, 1.40c.; Nos. 9 and 10, 1.50c.; Nos. 11 and 12, 1.55c.; Nos. 13 and 14, 1.60c; Nos. 15 and 16, 1.70c. One pass, cold rolled, box annealed sheets, Nos. 10 to 12, 1.65c.; Nos. 13 and 14, 1.70c.; Nos. 15 and 16, 1.75c.; Nos. 17 to 21, 1.80c.; Nos. 22, 23 and 24, 1.85c.; Nos. 25 and 26, 1.90c.; No. 27, 1.95c.; No. 28, 2c.; No. 29, 2.05c.; No. 30, 2.15c. Three pass, cold rolled sheets, box annealed, are as follows: Nos. 15 and 16, 1.85c.; Nos. 17 to 21, 1.90c.; Nos. 22 to 24, 1.95c.; Nos. 25 and 26, 2c.; No. 27, 2.05c.; No. 28, 2.10c.; No. 29, 2.15c.; No. 30, 2.25c. Galvanized sheets, Nos. 10 and 11, black sheet gauge, 2c.; Nos. 12, 13 and 14, 2.10c.; Nos. 15, 16 and 17, 2.25c.; Nos. 18 to 22, 2.40c.; Nos. 23 and 24, 2.50c.; Nos. 25 and 26, 2.70c.; No. 27, 2.85c.; No. 28, 3c.; No. 29, 3.10c.; No. 30, 3.30c. All above prices are f.o.b. Pittsburgh, terms 30 days net, or 2 per cent. cash discount 10 days from date of invoice, as also are the following base prices per square for painted and galvanized roofing sheets, with 2½ in. corrugations:

Gauge.	Painted.	Galvanized.	Gauge.	Painted.	Galvanized.
29		$2.40	23	$2.40	$3.50
28	$1.40	2.55	22	2.60	3.70
27	1.55	2.60	21	2.80	4.05
26	1.65	2.65	20	3.05	4.35
25	1.85	3.05	18	4.05	5.70
24	2.10	3.15	16	4.90	6.50

Wrought Pipe.—The following are the jobbers' carload discounts on the Pittsburgh basing card on wrought pipe, in effect from October 1, 1910:

	Butt Weld. Steel Black.	Steel Galv.	Iron Black.	Iron Galv.
⅛ to 1¼ in.	..	..	49	43
⅜ in.	75	63	71	59
½ to 1¼ in.	79	69	75	65
2 to 3 in.	80	70	76	66
Lap Weld.				
2 in.	76	66	72	62
2½ to 4 in.	78	67	74	64
4½ to 6 in.	77	66	73	63
7 to 12 in.	75	59	71	55
13 to 15 in.	51½	..	..	..
Butt Weld, extra strong, plain ends, card weight.				
⅛, ¼, ⅜ in.	69	59	65	55
½ in.	74	68	70	64
⅝ to 1½ in.	78	72	74	68
2 to 3 in.	79	73	75	69

THE IRON AND METAL MARKETS

Lap Weld, extra strong, plain ends, card weight.				
2 in.	75	69	71	65
2½ to 4 in.	77	71	73	67
4½ to 6 in.	76	70	72	66
7 to 8 in.	69	59	65	55
9 to 12 in.	64	54	60	50
Butt Weld, double extra strong, plain ends, card weight.				
⅛ in.	64	58	60	54
¼ to 1¼ in.	67	61	63	57
2 to 3 in.	69	63	65	59
Lap Weld, double extra strong, plain ends, card weight.				
2 in.	65	59	61	55
2½ to 4 in.	67	61	63	57
4½ to 6 in.	66	60	62	56
7 to 8 in.	59	49	62	56

Plugged and Reamed.

1 to 1½, 2 to 3 in. Butt Weld
2, 2½ to 4 in. ..... Lap Weld

} will be sold at two (2) points lower basing (higher price) than merchants or card weight pipe. Butt or lap weld, as specified.

The above discounts are for "card weight," subject to the usual variation of 5 per cent. Prices for less than carloads are three (3) points lower basing (higher price) than the above discounts.

Boiler Tubes.—Discounts on lap welded steel boiler tubes to jobbers in carloads are as follows:

	Steel.
1¼ to 2¼ in.	65
2½ in.	67½
2¾ to 3¼ in.	70
3½ to 4½ in.	72½
5 to 6 in.	65
7 to 13 in.	62½

Less than carloads to destination east of the Mississippi River will be sold at delivered discounts for carload lowered by two points for lengths 22 ft. and under; longer lengths f.o.b Pittsburgh. Usual extras to jobbers and boiler manufacturers.

Wire Rods and Wire.—Bessemer, open hearth and chain rods, $27. Fence wire, Nos. 0 to 9, per 100 lb., terms 60 days, or 2 per cent. discount in 10 days, carload lots, to jobbers, annealed, $1.50; galvanized, $1.80. Carload lots, to retailers, annealed, $1.55; galvanized, $1.85. Galvanized bar wire, to jobbers, $2; painted, $1.70. Wire nails, to jobbers, $1.70.

The following table gives the prices to retail merchants on wire in less than carloads, including the extras on Nos. 10 to 16, which are added to the base price:

Fence Wire, Per 100 Lb.

No.	0 to 9	10	11	12 & 12½	13	14	15	16
Annealed	$1.65	$1.70	$1.75	$1.80	$1.90	$2.00	$2.10	$2.20
Galvanized	1.95	2.00	2.05	2.10	2.20	2.30	2.70	2.80

Market and Stone Wire in Bundles, Discount from Standard List.

Bright and Annealed:	
9 and coarser	80
10 to 18	80 and 10
19 to 26	80 and 10 and 2½
27 to 36	80 and 5
Galvanized:	
9 and coarser	75 and 10
10 to 16	75 and 10
17 to 26	75½ and 10
27 to 36	75½
Coppered or Liquor Finished:	
9 and coarser	75 and 10
10 to 26	75 and 10
27 to 36	70 and 10 and 5
Tinned:	
6 to 18	75 and 10 and 10

Pittsburgh

PITTSBURGH, PA., July 26, 1911.—(*By Telephone.*)

Pig Iron.—The pig iron market has been quiet but firm. The local foundries do not need much iron as they are running light, there being little demand for rolling mill machinery. The most important inquiry for foundry iron is that of the Westinghouse Electric & Mfg. Company. This company will possibly buy within the next week for the fourth quarter, and possibly the first quarter also. A Sharon consumer is understood to have bought 15,000 tons of basic iron for delivery over the remainder of the year, while an Allegheny Valley steel works has taken 2000 tons of basic for early delivery. The extended delivery iron is understood to have been at slightly above $13, Valley furnace, and prompt iron at a shade below. The Colonial Steel Company was inquiring for 6000 tons of basic, delivery over the last five months of the year, but yesterday afternoon its directors met and decided not to buy for the present, as the iron is not needed immediately. We quote as follows: Bessemer, $15; basic, $13 for early delivery, and $13.25 for extended delivery; No. 2 foundry, $13.50 to $13.75; malleable, $13.25 to $13.50; gray forge, $13, all at Valley furnace, the freight rate to Pittsburgh being 90c. per ton.

Steel.—Sheet bar deliveries in July on contracts promise to prove considerably heavier than in June, but billet deliveries are showing a decrease. There is no buying of moment in the open market. We quote Bessemer and open-hearth billets, 4 x 4 in., and up to but not including 10 x 10 in., $21, base, and sheet and tin bars in 30-ft. lengths, $22; 1½-in. billets, $22; forging billets, $26, base, usual extras for sizes and carbons—all prices being f.o.b. Pittsburgh or Youngstown district, with freight to destination added.

(*By Mail.*)

Steel mill operations this week are slightly heavier on an average than last week. The local subsidiary of the Steel Corporation is doing materially better than early in the month and is operating in excess of 75 per cent. of its ingot capacity, which is better than operations in June, those averaging about 72 per cent. One large independent is operating some important departments at better than 85 per cent., while another is doing about 80 per cent. Others show considerably lower percentages, from which it may be inferred that the business is not distributed as uniformly as it was earlier in the year. On the whole orders are slightly better this week than last, and operations are somewhat better, while the prospects are that when results are counted up for the month of July it will be found that both bookings and production have been better in July than in June. Considering that June showed a material improvement over April or May, while July is normally a quiet month, the augury is excellent for good business in the fall. It is pointed out that with so much uncertainty from a variety of causes, particularly the confusion of thought engendered by the investigations and prosecutions, all consumers are buying only from hand to mouth and much business must be accumulating which will be let loose as soon as a more settled state of affairs appears. The continued maintenance of the present schedule of prices on the leading steel products has become the subject of a little doubt on account of cutting which has occurred in steel bars, chiefly for the implement trade. This, however, it is believed will blow over, as the 1.25c. price on steel bars is still regarded as the market, deviations having been made only on certain agricultural implement contracts which used to go regularly at a concession, and in the case of a few lots to other buyers for prompt shipment when the tonnage and specifications were particularly attractive.

Ferromanganese.—Representatives of importers of ferromanganese have uniform instructions to quote this material at $37, Baltimore, both for prompt delivery and for delivery through the first quarter of next year, and it is intimated that offers at lower prices will not be seriously considered. These instructions have been promulgated only in the past few days and the new price has not been seriously tested. We therefore quote as the uniform asking price $37. Baltimore, for prompt and forward delivery, freight to Pittsburgh being $1.95.

Ferrosilicon.—The market has been quiet, with prices unchanged. We quote 50 per cent. at $51.50 to $52, Pittsburgh, for delivery over the second half of the year, and blast furnace ferrosilicon as follows: 10 per cent., $22; 11 per cent., $24 and 12 per cent. $25, f.o.b. cars Ashland and Jisco furnaces.

Muck Bar.—No important developments have occurred in muck bar, the market being rather quiet. We quote best grades of all-pig bar, delivered Pittsburgh, at $28.50 to $29.

Skelp.—The market continues without special development. We quote grooved steel skelp at 1.25c.; sheared steel skelp at 1.35c.; grooved iron skelp at 1.50c. to 1.60c., and sheared iron skelp at 1.70c. to 1.75c., usual terms, all for delivery at consumers' mills in the Pittsburgh district.

Wire Rods.—The market has been quiet as regards fresh sales, consumers being well covered by existing contracts. We quote Bessemer, open hearth and chain rods, at $27, Pittsburgh.

Steel Rails.—The local rail mill continues to run at a good gait in comparison with operations earlier in the year, a considerable part of the output being export rails and light rails. Prices on light rails are as follows: 12-lb., 1.25c.; 16, 20 and 25-lb., 1.21c. to 1.25c.; 30 and 35-lb., 1.20c. and 40 and 45-lb., 1.16c. These prices are f.o.b. at mill, plus freight, and are the minimum of the market in carload lots, small lots being sold at a little higher price. Standard sections are held at 1.25c. per lb. for Bessemer.

Plates.—The market is rather quiet, buying being only for immediate requirements. Some of the smaller mills continue to shade the regular price of 1.35c. by $1 a ton in order to get desirable orders, but the large mills are adhering to the 1.35c. price. No important

THE IRON AND METAL MARKETS

car orders have been booked in the past fortnight, although inquiries for nearly 15,000 cars have been hanging fire for several weeks. We quote plates, ¼ in. and heavier, at 1.30c. to 1.35c., Pittsburgh, the lower price being made only by smaller mills and on a limited range of sizes.

Bars.—The market has been somewhat irregular of late on account of cutting which started after a large part of the agricultural implement tonnage had been placed under contract at 1.25c. Several contracts have been made with agricultural implement interests at 1.20c., Pittsburgh, for the manufacturing season, and in one or two cases a limited tonnage has been offered on contract on the basis of 1.15c., Pittsburgh. These special prices were made only in the West, where the delivery price would figure out a good mill price at Western mill. Pittsburgh mills have in no case sold at less than 1.20c., and at this price only in a few instances either on desirable contracts with agricultural implement interests, to meet competition, or on small prompt lots to other buyers, when the specifications and tonnage were particularly desirable. The general price continues to be 1.25c., Pittsburgh, but it is not entirely certain that this price will hold indefinitely, a great deal depending on the volume of specifications. These have been fairly good of late, and bar mills are running better than they were. Practically all the implement business has now been placed and the fact that a part of it went at a concession is not regarded as marking down the general market, since in years past the agricultural implement interests were uniformly given a concession. Iron bars are rather quiet and remained quotable at 1.25c. to 1.30c., Pittsburgh.

Rivets.—The market shows no particular change, and we quote structural rivets at 1.70c. to 1.75c. and boiler rivets at 1.80c. to 1.85c., these prices being shaded only on the most desirable business.

Structural Material.—Specifications to the mills from the structural shops continue good, the latter being in almost full operation and doing better than at any previous time this year. We quote beams and channels up to 15-in., at 1.35c., Pittsburgh.

Wire Products.—Some of the wire mills are running a little better than formerly, but partly on stock. Prospects for the fall trade, which will open in about 30 days, are regarded as good. Prices are well maintained and we continue to quote: Galvanized barb wire, $2 per 100 lb.; painted, $1.70; annealed fence wire, $1.50; galvanized, $1.80; wire nails, $1.70, and cut nails, $1.60, all f.o.b. Pittsburgh, with full freight added to point of delivery.

Shafting.—Consumers continue to buy only from hand to mouth, and the total volume of business is only moderate, although regarded as fairly good for the season. We quote regular discounts at 60 per cent. off in carload lots and 55 per cent. in less than carloads, delivered in base territory. These prices, however, continue to be shaded on attractive business.

Spelter.—The market has continued to grow firmer, and we note sales of 50 tons to-day at 5.75c., delivered Pittsburgh, equal to 5.62½c. East St. Louis.

Hoops and Bands.—Orders for hoops have increased and are regarded as very satisfactory. The buying is entirely for immediate consumption, which is heavy, particularly in cooperage stock. The cotton tie season has been a good one, the domestic mills selling fully as large a tonnage as last year, while if the cotton crop turns out as large as expected imports are likely to be slightly heavier than last year. We quote hoops at 1.40c. and bands at 1.25c., extras on the latter as per the steel bar card.

Merchant Steel.—Buying is only of moderate volume and prices continue to be shaded, regular quotations being as follows: Iron finished tire, ½ x ½-in. and heavier, 1.40c., base; under these sizes, 1.55c.; planished tire, 1.60c.; channel tire, 1.80c., base; toe calk, 1.90c.; flat sleigh shoe, 1.55c.; concave or convex, 1.75c.; cutter shoes, tapered or bent, 2.25c.; spring steel, 2c.; machinery steel, smooth finish, 1.90c.

Sheets.—The sheet mills are operating a trifle heavier this week than last, there being close to 75 per cent. of the total number in operation. New buying is not active for forward delivery, but small orders are making up an excellent tonnage. Prices are being well maintained, except that occasionally some Ohio mills are giving away their freight advantage over Pittsburgh in selling for Western shipment.

Tin Plates.—The American Sheet & Tin Plate Company has put 25 or 30 additional tin mills in operation this week and is operating about 180 of its 235 tin mills, or more than 75 per cent. The independents are also operating to slightly better advantage, between 75 and 80 per cent. of the total being in operation. Specifications for tin plate are excellent considering the season, the demand being somewhat better than was expected. The prospect is that the mills will be able to run at the present gait for the next 30 days. The market is strictly held on the basis of $3.70, Pittsburgh, for 100-lb. coke plates.

Merchant Pipe.—The Ohio Fuel Supply Company is understood to have placed the 26 miles of 16-in. line pipe for which it has been in the market for some time, also an order for five miles of 12-in. The Philadelphia Company has taken six miles of 3-in. iron tubing. Merchant pipe buying continues to be from hand to mouth and does not make a large weekly aggregate. Regular discounts in effect on iron and steel pipe are given on a previous page.

Boiler Tubes.—Buying continues to be of a strictly hand-to-mouth character, consumers having little confidence in the market on account of the continued shading, as the regular discounts have been nominal for a long time.

Iron and Steel Scrap.—Dealers have continued to bid freely for scrap, more freely than consumers, and the market is somewhat stiffer in consequence. A great deal of scrap is being held back by producers in the expectation of higher prices. The market has not learned yet what became of the lettings early in the month of the Pennsylvania Railroad and the Baltimore & Ohio, bids at the ordinary market failing to bring out the material. Sales aggregating about 5000 tons of heavy melting steel have been made to consumers at Sharon and down the Ohio River, chiefly at $13.25, although a small tonnage was sold at $13. It is believed that considerably more material could have been sold at $13.25, but dealers find difficulty in accumulating material to sell at this rate, and would want $13.50 for any important tonnage. We revise prices slightly, as follows, per gross ton, f.o.b. Pittsburgh:

Heavy steel scrap, Steubenville, Follansbee, Sharon, Monessen and Pittsburgh delivery	$13.25 to $13.50
No. 1 foundry cast	13.25 to 13.50
No. 2 foundry cast	12.75 to 13.00
Bundled sheet scrap, f.o.b. consumers' mill, Pittsburgh district	11.50 to 12.00
Rerolling rails, Newark and Cambridge, Ohio, Cumberland, Md., and Franklin, Pa.	13.75 to 14.00
No. 1 railroad malleable stock	12.50 to 12.75
Grate bars	10.75 to 11.00
Low phosphorus melting stock	16.00 to 16.25
Iron car axles	23.00 to 23.50
Steel car axles	17.50 to 18.00
Locomotive axles	23.00
No. 1 busheling scrap	12.00 to 12.25
No. 2 busheling scrap	8.50 to 8.75
Old car wheels	13.50 to 13.75
Sheet bar crop ends	15.50 to 15.75
Cast iron borings	9.00 to 9.25
*Machine shop turnings	9.25 to 9.50
Old iron rails	15.00 to 15.25
No. 1 wrought scrap	13.50 to 14.00
Heavy steel axle turnings	10.00 to 10.25
Steel plate	10.50 to 10.75

* These prices are f.o.b. cars at consumers' mill in the Pittsburgh district.

Coke.—The market for prompt furnace coke has stiffened. Very little coke loaded on cars has been offered, and to-day there does not appear to be a car loaded and unsold. Several dealers have been bidding freely for coke required to fill their contracts and this absorption has cleaned up the market until the minimum is $1.50 at oven for prompt furnace coke of regular quality. Contract coke has not been under serious negotiation, as furnaces now running are fairly well covered or have decided not to contract but to buy from month to month. Foundry coke is in limited demand, as the foundries are rather slack of work and they are generally well covered by their contracts. We quote standard grades, per net ton at oven, as follows: Prompt furnace, $1.50 to $1.55; contracts over last five months, $1.65 to $1.75; 72-hr. foundry coke for prompt shipment, $1.85 to $2; contract, $2 to $2.25. The output of coke last week in the Connellsville and lower Connellsville region was 270,700 tons, an increase of 3600 tons, and shipments were 8260 cars, an increase of 600 cars.

Chicago

CHICAGO, ILL., July 26, 1911.—*(By Telegraph.)*

The market is looking forward with a pronounced hopefulness for the developments of the month of August. The larger business expected has already given rise to a firmer attitude, which is more particularly noticeable with respect to pig iron. While South-

THE IRON AND METAL MARKETS

ern iron may still be bought in this market on the basis of $10, Birmingham, this price is not so general. In finished steel lines the tonnage booked locally was not so large as in the week preceding, but was of a character to support belief in the steady growth of consumption requirements. Rail sales reported were less than 5000 tons while the building and structural steel contracts amounted to about 7500 tons. The week's average was largely upheld by specifications against plate and structural contracts, which were reported to be more than satisfactory. The fact that attractive steel bar business is still bringing out concessions from the price of 1.25c., Pittsburgh, seems impossible of further disguising and reveals the probability that this price has been for the most part nominal. Buying from jobbers' stocks, except in very small quantities, is light. Consumers may accurately gauge the general situation from the fact that mill shipments continue quite prompt and that jobbers are buying very lightly for their own stocks.

Pig Iron.—The melt of both malleable and gray iron foundries shows evidences of some increase. The former have begun to close their agricultural implement contracts for the year and now have in sight some tangible business against which to apply their recent purchases. A fair tonnage of both local and Southern iron was bought the past week and the impression prevails that the average buyer has covered for at least a limited period. Southern No. 2 iron was sold last week on the basis of $10, Birmingham, but an inclination to hedge on this price is beginning to be displayed by some of the furnaces. With enough iron sold to take care of customers for the next 30 to 60 days, and with all indications pointing to stronger conditions, this firmer attitude appears to be a natural one. For local iron little encouragement is offered for improvement in prices. Buyers report that iron has been and can still be obtained on the basis of $14.50 at local furnace for No. 2. Such a price would not appear to be out of line with the situation. Chicago territory furnaces still have a stock of iron and there are but four stacks in blast out of eleven. We quote for Chicago delivery, except on local irons, which are f.o.b. furnace, the following prices:

Lake Superior charcoal	$16.50 to $17.00
Northern coke foundry, No. 1	15.00 to 15.50
Northern coke foundry, No. 2	14.50 to 15.00
Northern coke foundry, No. 3	14.35 to 14.50
Northern Scotch, No. 1	16.00
Southern coke, No. 1 foundry and No. 1 soft	14.85 to 15.10
Southern coke, No. 2 foundry and No. 2 soft	14.35 to 14.60
Southern coke, No. 3	14.10 to 14.35
Southern coke, No. 4	13.85 to 14.10
Southern gray forge	13.60 to 13.85
Southern mottled	13.60 to 13.85
Malleable Bessemer	15.00
Standard Bessemer	17.40
Basic	15.50
Jackson Co. and Kentucky silvery, 6 per cent	17.90
Jackson Co. and Kentucky silvery, 8 per cent	18.90
Jackson Co. and Kentucky silvery, 10 per cent	19.90

(By Mail.)

Rail and Track Supplies.—The tonnage of rails placed here during the last week was less than 5000, indicating that all of the immediately pending rail business was included in the orders of the preceding week. It is reported that prices on track fastenings are being maintained only with some effort and that in territory where rerolling rails enter into competition the price on light rails has yielded materially under pressure. For Chicago we continue to quote standard railroad spikes at 1.65c. to 1.75c., base; track bolts with square nuts, 2.10c. to 2.20c., base, all in carload lots, Chicago; standard section Bessemer rails, 1.28c.; open hearth, 1.34c.; light rails, 40 to 45 lb., 1.16c. to 1.20½c.; 30 to 35 lb., 1.19½c. to 1.24c.; 16, 20 and 25 lb., 1.20½c. to 1.25c.; 12 lb., 1.25c. to 1.30½c.; angle bars, 1.50c. to 1.60c., Chicago.

Structural Material.—The tonnage of structural steel closed in the week was less by 2400 tons than was anticipated because of the substitution of reinforced concrete. Buildings for the St. Paul Bread Company at St. Paul and for the Fitger Brewing Company at Duluth will be of this construction. The most important letting of the week was 3720 tons of steel for transmission towers for the Nevada-California Power Company to be furnished by Milliken Bros. The American Bridge Company was awarded the contracts for 300 tons for the State Museum at Denver and for the Asylum buildings at Medical Lake, Wash. Despite the very large tonnage of steel now being fabricated for local buildings Chicago fabricators are none too busy and prices reflect this situation. Mill rolling of shapes continues active with pleasing tonnages booked ahead. We quote plain material from mill at 1.53c. to 1.58c. and from store 1.75c., Chicago.

Plates.—Specifications against bridge material contracts are bringing a satisfactory tonnage of plates to the local mills, to which is added an increasing volume of car and tank plates. This provides tonnage for both universal and sheared plate mills. Mill deliveries are quite prompt and consumers are ordering for mill shipment rather than from store. The light trade and the fact that present prices do not indicate any necessity for stocking up have reduced buying by the jobbers to a minimum. Chicago quotations for mill shipment are 1.53c. to 1.58c. and from store 1.75c.

Sheets.—The demand for sheets at present is characterized by an insistent call for exceedingly prompt shipment. The explanation is found in the very low stocks in the hands of both jobbers and manufacturers. The increasing volume of business finds them loath to cover themselves more liberally, preferring to depend upon prompt shipments. While the local mills are running in all departments in the enjoyment of gradually increasing tonnage prices apparently do not gain in strength correspondingly. We continue to quote Chicago prices as follows: Carload lots, from mill: No. 28 black sheets, 2.18c.; No. 28 galvanized, 3.18c.; No. 10 blue annealed, 1.68c. Prices from store, Chicago, are: No. 10, 1.95c. to 2.05c.; No. 12, 2.00cc. to 2.10c.; No. 28 black, 2.45c. to 2.55c.; No. 28 galvanized, 3.45c to 3.55c.

Old Material.—The local market is almost always characterized by more or less speculative buying of railroad scrap where the buyer hopes for a rise between the date of purchase and the delivery of the material. The fact that the volume of this kind of buying is materially decreased would indicate that little hope is held for higher price levels within the next five or six weeks. The current railroad offerings include 1200 tons by the Chicago, Milwaukee & St. Paul, 3800 tons by the Chicago, Burlington & Quincy and about 3000 tons by the Chicago, Rock Island & Pacific. There is practically no change in prices, with the exception of locomotive tires, for which an Indiana consumer is offering in the neighborhood of $15, Chicago. We quote below for delivery to buyers' works, Chicago vicinity, all freight and transfer charges paid, per gross ton, as follows:

Old iron rails	$14.00 to $14.50
Old steel rails, rerolling	12.25 to 12.50
Old steel rails, less than 3 ft	11.00 to 11.50
Relaying rails, standard sections, subject to inspection	24.00
Old car wheels	12.50 to 13.00
Heavy melting steel scrap	10.50 to 11.00
Frogs, switches and guards, cut apart	10.50 to 11.00
Shoveling steel	10.00 to 10.50
Steel axle turnings	8.50 to 9.00

The following quotations are per net ton:

Iron angles and splice bars	$13.50 to $13.00
Iron arch bars and transoms	13.75 to 14.25
Steel angle bars	10.25 to 10.75
Iron car axles	18.00 to 18.50
Steel car axles	16.00 to 16.50
No. 1 railroad wrought	11.00 to 11.25
No. 2 railroad wrought	10.00 to 10.50
Steel knuckles and couplers	9.25 to 9.75
Locomotive tires, smooth	15.00 to 15.50
Machine shop turnings	6.25 to 6.75
Cast and mixed borings	5.25 to 5.75
No. 1 busheling	8.75 to 9.25
No. 2 busheling	6.75 to 7.25
No. 1 boilers, cut to sheets and rings	7.50 to 8.00
Boiler punchings	12.00 to 12.50
No. 1 cast scrap	10.25 to 10.75
Stove plate and light cast scrap	9.00 to 9.50
Railroad malleable	10.00 to 10.50
Agricultural malleable	9.25 to 9.75
Pipes and flues	8.00 to 8.50

Bars.—Steel bar contracts on the books of the leading manufacturers are reported as very satisfactory, but specifications drag somewhat. It is intimated that comparatively little of the business obtained from the larger buyers was placed at the 1.25c. price because at this time such attractive business as is still being placed brings out concessions from this basis. The extent to which the nominal price has been shaded may be conjectured accordingly. Bar iron continues to be quoted in the neighborhood of 1.20c., with only a moderate tonnage offered. We quote as follows, f.o.b. Chicago: Soft steel bars, 1.43c.; bar iron, 1.20c. to 1.25c.; hard steel bars, rolled from old rails, 1.20c. to 1.25c. From store, soft steel bars, 1.70c. to 1.80c., Chicago.

Wire Products.—Local consumption of wire nails, retarded in the early summer by the delaying of building operations as a result of labor troubles, is now showing improvement. The more favorable crop reports that are now expected will, it is hoped, encourage the demand for barb wire. Woven wire fencing reflects

THE IRON AND METAL MARKETS

a growing interest on the part of manufacturers and for the summer season plain wire is fairly active. Jobbers' carload prices, which are quoted to manufacturing buyers, are as follows: Plain wire, No. 9 and coarser, base, 1.68c.; wire nails, 1.88c.; painted barb wire, 1.88c.; galvanized, 2.18c.; polished staples, 1.88c.; galvanized, 2.18c., all Chicago.

Cast Iron Pipe.—The principal letting of pipe reported for the past week was 4000 tons for the city of Flint, Mich., to be furnished by the Lynchburg Foundry Company, Lynchburg, W. Va. Minneapolis will award this week a contract for 3000 tons of 60-in. pipe. Scattering business in small lots continues good. We quote as follows, per net ton, Chicago: Water pipe, 4 in., $25.50; 6 to 12 in., $24.50; 16 in. and up, $24. with $1 extra for gas pipe.

Philadelphia

PHILADELPHIA, PA., July 25, 1911.

While no pronounced activity exists in the demand for either crude or finished materials, the volume of current business appears to be equal to that taken the previous week. A fair amount of buying continues in the pig iron market, with consumers showing a greater interest in requirements for extended delivery. The position of producers is gradually improving. In some lines of finished products a little irregularity in new business is reported, but the tone of the market remains good and the trade anticipates a gradual improvement in buying, although marked activity is hardly expected until later in the year. Orders for steel billets have not been so large, although inquiries are more numerous. More contracting in heavy steel plates for delivery over the remainder of the year is noted. Current demand for plain structural shapes has been quieter. A tendency to stiffen up prices for iron bars is evident, due to higher prices of old material. Coke has been but moderately active. Old material prices are in some instances a trifle higher, due to increasing inquiry.

Iron Ore.—There is an absence of any business of importance, either in domestic or foreign ore. Importations at this port in the week ending July 22 included 10,800 tons of Cuban, 12,630 tons of Newfoundland, 10,539 tons of Swedish and 11,119 tons of Spanish ore.

Pig Iron.—Consumers show more interest in the pig iron market, particularly in the foundry grades. While the greater part of the demand is still confined to lots ranging up to 500 tons, for both near future and extended delivery, inquiry for occasional larger amounts is reported, together with some quiet testing of the market for round lots. Sellers are decidedly more optimistic in their views and, while no direct advances in prices are to be noted, some sales have been made at the top of the market for foundry grades for delivery over the last half. The reported stiffening of prices in other districts has strengthened the market here. While individual sales of foundry grades have not been particularly large, the aggregate business is evidently greater. Transactions in eastern Pennsylvania No. 2 X foundry in lots of several hundred tons, for both third quarter and remainder of the year delivery, are reported at both $15 and $15.25, delivered. Moderate sales of No. 2 plain have been made at $14.75 and $15, and a sale of No. 3 foundry is reported at $14.75, delivered. The Delaware, Lackawanna & Western Railroad has closed for 1000 tons of No. 2 X against its recent inquiry, the order going to a Lehigh Valley producer. Some demand for low grade foundry iron continues; one Delaware River concern has not yet closed, it is said, for a round lot recently inquired for. A better movement in Virginia foundry iron is reported. Sales of 1000-ton lots of No. 2 X foundry for New England delivery, shipment extending over five months, have been made at $12.50, Virginia furnace. Quite a few sales in lots of several hundred tons at $12.25 for the remainder of the third quarter and $12.50 for more extended delivery are also reported. Another transaction is the sale of 1500 tons of pipemaking iron for local consumption, for three months' delivery, at a good price. The leading interest as well as several other Virginia producers is maintaining recent prices, although iron of less favorable analysis is to be had at slight concessions, and, it is said, off grades have been offered, to clean up stocks, at a sharp reduction. Such transactions have had no material effect on the general market. Forge iron, which has been very quiet recently, shows more movement. Sales of moderate lots of Northern forge have been made to rolling mills at $14.50, delivered. Small sales of Southern forge are also reported at $9, Birmingham, and in some cases this price has been slightly advanced, $9.50 being asked by some of the Southern producers. Little movement has developed in the steel making grades. Reports of an additional purchase of 5000 tons of this iron by a central Pennsylvania consumer lack confirmation at this time. Eastern producers are standing pretty firmly on $14, furnace, for this grade, which would represent a minimum of $14.50 delivered. Moderate sales of low phosphorus iron are reported, with standard analysis brands at $20.50 minimum, although iron of analysis close to standard is available at $20, delivered. The following range of prices is named for standard brands, delivered in buyers' yards in this vicinity:

Eastern Pennsylvania No. 2 X foundry	$15.00 to $15.25
Eastern Pennsylvania No. 2 plain	14.75 to 15.00
Virginia foundry	15.00 to 15.50
Gray forge	14.50
Basic	14.50 to 15.00
Standard low phosphorus	20.50 to 20.75

Ferromanganese.—There is still an absence of demand from consumers in this territory. Sellers report a disposition on the part of foreign producers to advance the price of 80 per cent. Ferro to a basis of $37, Baltimore, although there is little doubt that $36.50, Baltimore, could still be done should any desirable business be offered.

Billets.—While the general run of orders is again confined to small lots, considerable inquiry continues and consumers are negotiating for lots of 2000 to 3600 tons of rolling billets for forward delivery. The demand for forging steel has been quieter. Mills are running on an even basis and are encouraged with the outlook for future business. Prices are unchanged, rolling billets being quoted at $23.40, and ordinary forging billets at $28.40, delivered in this vicinity.

Plates.—Current orders covering the usual miscellaneous run of business show a trifle irregular tendency, although specifications are reported as coming out freely and mill operations continue on an unchanged basis. A greater volume of forward business is reported, contracts having been closed by mills in this district for round lots, in some cases 3000 to 4000 tons and upwards, at present prices, for deliveries running over the remainder of the year. Sales for earlier delivery usually run from small lots to upward of 500 tons. Considerable inquiry for ship material is to be noted. One builder is in the market for about 3000 tons of plates and shapes for government colliers, while another is asking prices for 700 tons of plates for government tugs. Quite a few quotations have been made against prospective requirements of builders, who are figuring on quite a large amount of general shipbuilding work. Prices for ordinary plates appear to be fully maintained at 1.50c., delivered in this territory. Rumors of weakness have been heard, but lack confirmation.

Structural Material.—A somewhat smaller volume of general business has been coming to the mills, although producers of plain shapes maintain their recent basis of output. Negotiations under way close slowly. Several new propositions are in sight in this city, including the new Stock Exchange building and the municipal convention hall, the steel requirements of which are not yet decided. Contracts for small bridges for the Pennsylvania and the Reading railroads are being figured. Inquiries are also before the trade for a fair amount of shapes for boat work. Prices of fabricated material are still low, although those for plain shapes are maintained at 1.50c., delivered here.

Sheets.—Eastern mills continue to report a good demand and are operating at full capacity. For the most part orders are small and for reasonably early delivery. More business in Western sheets is reported, with prices irregular. Makers in this district, however, hold recent quotations firmly, the following range, f.o.b. Eastern maker's mill, being named: Nos. 18 to 20, 2.30c.; Nos. 22 to 24, 2.40c.; Nos. 25 to 26, 2.50c.; No. 27, 2.60c.; No. 28, 2.80c.

Bars.—Little change in the demand is seen. Current orders are usually small. Some producers who, on extra desirable specifications, have been quietly shading 1.20c., mill, the general quotation for ordinary refined iron bars, have withdrawn lower quotations and are firm at the basis named, and owing to higher prices of old material are inclined to make a slight advance. At the present basis refined iron bars, delivered here, are quoted at 1.27½c. to 1.32½c. Rumors are still afloat that steel bars are to be had at 1.20c., Pittsburgh, al-

THE IRON AND METAL MARKETS

though the leading sellers in this territory contend that they have not shaded the recent 1.25c., base, or 1.40c. delivered here.

Coke.—A number of large consumers of furnace coke who have recently been in the market for supplies ranging over six months and a year, have not yet closed for their requirements, taking in the meantime spot coke which has been available at $1.40 to $1.50, at oven. Some moderate contracts for foundry coke for delivery over the remainder of the year are reported, sales in some instances covering lots of 1000 tons, at prices ranging from $2 to $2.35, at oven. The following range of quotations per net ton is named for delivery in this district:

Connellsville furnace coke	$3.05 to $3.90
Foundry coke	4.15 to 4.60
Mountain furnace coke	3.25 to 3.50
Foundry coke	3.75 to 4.20

Old Material.—Consumers show more interest in the market and offers at slightly higher prices than recently quoted for some grades of material have, in the majority of cases, failed to bring out any quantity of material, sellers being disposed to hold for higher prices. In some cases offers of $13.50, delivered, for strictly No. 1 heavy melting steel scrap have failed to result in any heavy sales, it is said. Yard steel is, however, available at $13 to $13.25, delivered. Wrought iron scrap is in better demand and sales have been made at an advance of 50c. a ton. Wrought iron pipe, wrought turnings and cast borings also show a slight advance. Increasing interest is expected to result in higher prices in practically all grades, and holders of material are less disposed to make sales than they were a few weeks ago. The following range of prices about represents the market for early deliveries in buyers' yards, eastern Pennsylvania and nearby points, carying a freight rate from Philadelphia, varying from 35c. to $1.35 per gross ton:

No. 1 heavy melting steel scrap	$13.50 to $13.75
Old steel rails, rerolling (nominal)	14.25 to 14.75
Low phosphorus heavy melting steel scrap	16.75 to 17.25
Old steel axles (nominal)	19.50 to 20.00
Old iron axles	24.50 to 25.00
Old iron rails	17.50 to 18.00
Old car wheels	13.00 to 13.50
No. 1 railroad wrought	15.50 to 16.00
Wrought iron pipe	13.00 to 13.50
No. 1 forge fire	11.00 to 11.50
No. 2 bcht iron (nominal)	6.75 to 7.25
Wrought turnings	9.50 to 10.00
Cast borings	9.00 to 9.50
Machinery cast	13.25 to 13.75
Railroad malleable (nominal)	11.50 to 12.00
Grate bars, railroad	10.00 to 10.50
Stove plate	10.50 to 11.00

Cleveland

CLEVELAND, OHIO, July 25, 1911.

Iron Ore.—Following a little activity noted last week, the market is again very dull. No sales or inquiries are reported. Selling firms regard the outlook as more encouraging because of the improved demand for pig iron. They expect that orders for quite a fair tonnage of ore will be placed before the close of the season and that buyers will not delay beyond the latter part of August or early in September coming into the market for their requirements. We quote prices as follows: Old range Bessemer, $4.50; Mesaba Bessemer, $4.25; old range non-Bessemer, $3.70; Mesaba non-Bessemer, $3.50.

Coke.—There is no inquiry for furnace grades and the demand for foundry coke is very light. Foundries that have not already covered do not appear to be interested in contracts for their last half requirements. We quote standard Connellsville furnace coke at $1.40 to $1.50 per net ton at oven for spot shipment and $1.65 to $1.75 for the remainder of the year. Connellsville 72-hour foundry coke is held at $1.80 to $2.15 for prompt shipment and $2.15 to $2.40 for the last half.

Pig Iron.—The market shows an improvement both in the volume of sales and inquiries. Some round lots have been booked for shipment outside of this territory and there is a fair demand for foundry grades from this immediate locality. The leading pipe interest is understood to have practically closed contracts for a round tonnage of Southern iron for shipment to its various plants. We note the sale of 1000 tons of No. 4 Southern to a local pipe plant. The same concern has been feeling the market for about 3000 tons of Northern iron, but may not buy for the present. A local foundry has just bought 1000 tons of Northern iron for the last half. A number of other sales of Northern iron in lots of 500 tons and under are reported. We note the sale of 2500 tons of No. 2 Southern iron to a leading sanitary interest for shipment to its Louisville plant during the last half. A Cleveland furnace builder is in the market for about 1500 tons of Southern iron for the same delivery. One local interest has sold its available tonnage and is out of the market. Prices on Northern grades are unchanged at $13.50, Cleveland and Valley furnace, for No. 2. The Southern market is firmer in that less iron is being offered at $10, Birmingham, for No. 2. For prompt shipment and for the last half we quote, delivered Cleveland, as follows:

Bessemer	$15.90
Basic	$13.75 to 14.00
Northern foundry, No. 2	13.75 to 14.00
Gray forge	13.25
Southern foundry, No. 2	14.35 to 14.60
Jackson Co. silvery, 8 per cent. silicon	17.50 to 17.75

Finished Iron and Steel.—The general condition of the trade in finished lines is fairly satisfactory. While no large orders or inquiries are coming out, mills are getting a good volume of small orders and specifications on contract. The demand for structural material is more active at present than other lines. Fabricators are getting a good volume of small work and are ordering material freely to replenish stocks. The steel bar market appears to be somewhat firmer. Regular prices seem to be maintained on contracts, but for desirable orders for prompt shipment a concession of $1 a ton can still be secured. While the leading producers are adhering to the regular prices on plates, some of the mills making the narrow sizes are shading prices $1 a ton. The demand for sheets is fairly good but the market is not firm. Concessions of $1 to $2 a ton are reported on heavy sheets. Local bolt and nut makers report an improvement in the demand for their products but prices are still low. No new contracts for round lots of structural material for buildings are reported, although bids are in on some work. The City Hall Commission has decided to reject all bids for the 4500 tons of steel required for the new city hall in Cleveland and to readvertise after making some modification in the specifications. This will delay the letting of the contract about 30 days. The foundations for the grade-crossing elimination work for the Pennsylvania Railroad in Cleveland, for which bids have been received, will require considerable tonnage of twisted steel bars for concrete reinforcement. A large quantity of structural steel will be required for the bridges but this will probably not come out for some time. The demand for iron bars continues light and neither of the local mills may start up until after August 1. We quote iron bars at 1.25c. to 1.30c., at mill.

Old Material.—The market has a firmer tone and prices on several grades have advanced from 25c. to 50c. a ton. There is a somewhat better volume of inquiry but it is largely between dealers. One local consumer has bought considerable steel-making scrap during the week in small lots and is in the market for additional tonnage. Yard dealers are very firm on prices and those that can are holding their stocks for a further advance. The Nickel Plate Railroad closed July 22 on a small tonnage. Dealers' prices, per gross ton, f.o.b. Cleveland, are as follows:

Old steel rails, rerolling	$13.00 to $13.50
Old iron rails	15.00 to 15.50
Steel car axles	17.50 to 18.00
Heavy melting steel	11.75 to 12.25
Old car wheels	12.00 to 12.25
Relaying rails, 50 lb. and over	22.50 to 23.50
Agricultural malleable	10.75 to 11.25
Railroad malleable	12.25 to 12.75
Light bundled sheet scrap	10.00 to 10.50

The following prices are per net ton, f.o.b. Cleveland:

Iron car axles	$21.00 to $21.50
Cast borings	6.75 to 7.00
Iron and steel turnings and drillings	7.00 to 7.50
Steel axle turnings	8.00 to 8.50
No. 1 busheling	11.00 to 11.50
No. 1 railroad wrought	11.75 to 12.25
No. 1 cast	11.25 to 11.75
Stove plate	9.50 to 10.00
Bundled tin scrap	11.00 to 11.50

Cincinnati

CINCINNATI, OHIO, July 26, 1911.—*(By Telegraph.)*

Pig Iron.—The situation shows a trifle more strength. It is rumored that a leading pipe manufacturer is about to contract for a large tonnage of iron and there are a number of inquiries from Indiana and Michigan. Several Southern furnaces that have been eager to take on fourth quarter business at $10 are

THE IRON AND METAL MARKETS

now insisting on contracts calling for shipments to begin immediately. As the majority of the furnaces in the Hanging Rock district are out, there is a steady reduction in stocks there although the melt in this vicinity shows no material increase. From northern Michigan is an inquiry for 500 to 1000 tons of Northern No. 2 foundry and a Michigan stove manufacturer is asking for a round lot of either Northern or Southern iron. Several Indiana consumers are reaching out for a future supply, and there are a few small inquiries from nearby consumers. For delivery throughout the remainder of the year, and at present market prices, one Michigan firm took 1500 tons of Jackson County silvery, 2500 tons of Northern No. 2 foundry and 1500 tons of Southern No. 2 foundry. A Western railroad purchased 1000 tons of Southern charcoal iron around $22.50 at furnace for last half shipment. For July-December shipment 400 tons of Southern No. 1 soft goes to a central Ohio manufacturer and 1000 tons of Southern No. 4 to a northern Ohio consumer. Malleable is quoted at $13.25, Ironton, and an Indiana melter took 1000 tons, shipments to run until January next. There is no demand for Southern basic, and $10, Birmingham, is the quoted price for movement this year. Both Northern and Southern furnaces are refraining from putting out any quotations on next year's business and are turning down offers for that delivery. Based on freight rates at $3.25 from Birmingham and $1.20 from Ironton we quote, f.o.b. Cincinnati, as follows:

Southern coke, No. 1 foundry and 1 soft	$13.75 to $14.00
Southern coke, No. 2 foundry and 2 soft	13.25 to 13.50
Southern coke, No. 3 foundry	12.75 to 13.00
Southern coke, No. 4 foundry	12.50 to 12.75
Southern gray forge	12.50 to 12.75
Ohio silvery, 8 per cent. silicon	16.95 to 17.20
Lake Superior coke, No. 1	14.70 to 14.95
Lake Superior coke, No. 2	14.20 to 14.45
Lake Superior coke, No. 3	13.70 to 13.95
Basic, Northern	14.45 to 14.70
Standard Southern car wheel	25.25 to 25.75
Lake Superior car wheel	19.00

(By Mail.)

Coke.—Specifications on foundry contracts previously made are coming in quite freely and in some instances there are urgent requests for 72-hr. coke to fill immediate requirements. This is not due to any increase in the consumption, but is attributable to a recently acquired habit of procrastination on the part of the foundries in making known their future wants. No activity is reported in furnace coke and inquiries for both furnace and foundry grades are very scarce. The output in all three fields has been reduced to meet present conditions and prices are unchanged. We quote prompt shipment 48-hr. coke from $1.40 to $1.55 per net ton at oven, with the usual premium of about 15c. per ton asked on contracts. Foundry coke is obtainable around $2 for immediate shipment, with a future supply available at $2.10 to $2.35. These quotations govern in the Connellsville, Wise County and Pocahontas districts.

Finished Material.—Some activity in structural material shapes is noted, but other lines are quiet. Steel bars are not in much demand, though mill prices are firm. Tin plates in this territory are sagging, and it is rumored that the regular market prices have been slightly reduced where business was in sight. Wire nails are also somewhat disappointing; while it is stated that quotations are being shaded a trifle by some manufacturers, this cannot be definitely confirmed here. The local warehouse price on steel bars is 1.70c. and on structural material 1.80c.

Old Material.—The previously reported limited demand for scrap material of all kinds continues to prevail. However, it is quite probable that a few grades will show some activity when the rolling mills in this vicinity resume operations. Railroad offerings are light and both buyers and sellers appear to be waiting on the pig iron market. Prices for delivery in buyers' yards, southern Ohio and Cincinnati, are as follows:

No. 1 railroad wrought, net ton	$10.50 to $11.00
Casting borings, net ton	4.50 to 5.00
Steel turnings, net ton	5.50 to 6.00
No. 1 cast scrap, net ton	9.50 to 10.00
Burnt scrap, net ton	6.50 to 7.00
Old iron axles, net ton	16.50 to 17.00
Bundled sheet scrap, gross ton	7.25 to 8.25
Old iron rails, gross ton	13.50 to 14.00
Relaying rails, 50 lb. and up, gross ton	21.00 to 22.00
Old car wheels, gross ton	10.25 to 11.00
Heavy melting steel scrap, gross ton	10.00 to 10.50

Buffalo

BUFFALO, N. Y., July 25, 1911.

Pig Iron.—The majority of producers report a well sustained interest on the part of consumers with a good tonnage under negotiation for foundry grades and malleable and a fair amount of business placed. One or two interests, however, report a quieting down in inquiry for the week, with fewer sales. Foundries in most lines are apparently doing business in increasing volume. One furnace interest reports the booking of 50,000 tons so far during the month of July, including foundry grades and malleable, and that shipments from its furnaces have been far heavier than usual for the month of July. Its shipments for the week just closed were over 4000 tons in excess of the amount produced in the week. Prices are unchanged, with furnacemen holding firmly to the maintenance of the slight advance in schedules recently made effective. We quote as follows for prompt and last half shipment, f.o.b. Buffalo:

No. 1 X foundry	$13.75 to $14.25
No. 2 X foundry	13.50 to 14.00
No. 2 plain	13.25 to 13.75
No. 3 foundry	13.25 to 13.50
Gray forge	13.25 to 13.50
Malleable	13.75 to 14.25
Basic	13.75 to 14.25
Charcoal	16.50 to 17.25

Finished Iron and Steel.—The volume of business in finished products is holding up to a good aggregate for midsummer and quite a number of additional contracts in steel bars and bar products have been closed in the week, including one long-time contract of large tonnage for steel bars. A good business in concrete reinforcing bars has also been done in the week. Some small contracts for wire products have also been placed. Wire business for July has been unusually good for the season. The demand for plain structural material remains active. Prices in this territory are firm at 1.25c. for steel bars and small shapes and 1.35c. for shapes and plates. In fabricated shapes the demand continues active and a good many small lots are being called for. Bids are to be received August 1 for the steel for the Erie County Lodging House, Buffalo, about 100 tons. The Buffalo Structural Steel Company was low bidder for the fabrication and erection of the steel for the St. George School, Buffalo, requiring about the same tonnage. The Eastern Concrete Steel Company, Buffalo, has received the contract for the three new buildings to be erected by Cornell University, Ithaca, taking about 500 tons of structural steel. The Lackawanna Steel Company this week received an order from the Canadian Pacific Railway for 3000 tons of steel rails.

Old Material.—The market continues strong, with a fairly active demand for all classes of material. Consumers are showing more interest in the taking on of supplies and are apparently more disposed to pay the advanced prices asked by dealers and are purchasing more freely. We quote as follows, per gross ton, f.o.b. Buffalo:

Heavy melting steel	$13.00 to $13.50
Low phosphorus steel	15.50 to 16.00
No. 1 railroad wrought	14.00 to 14.50
No. 1 railroad and machinery cast scrap	13.75 to 14.25
Old steel axles	18.50 to 19.00
Old iron axles	22.00 to 22.50
Old car wheels	13.00 to 13.50
Railroad malleable	12.50 to 13.00
Boiler plate	12.00 to 12.50
Locomotive grate bars	11.00 to 11.50
Pipe	9.50 to 9.75
Wrought iron and soft steel turnings	7.00 to 7.50
Clean cast borings	6.75 to 7.25

Birmingham

BIRMINGHAM, ALA., July 22, 1911.

Pig Iron.—The reported sale of 25,000 tons of local iron to a manufacturer of cast-iron pipe cannot be confirmed at this time, but such a sale is generally believed to have been effected during the week. Of other tonnage known to have been sold the largest single lot reported was 1500 tons of Nos. 2 and 3 foundry for shipment in the third quarter. This sale is reported at a basis of $10.50, Birmingham, as is also an aggregate of 3500 tons in lots of 500 to 750 tons each for shipment covering the remainder of the year. A lot of 1000 tons of No. 2 soft for shipment commencing immediately and extending over the remainder of the year was sold at $10, Birmingham. A lot of 500 tons of No. 3 foundry for third quarter shipment sold at $9.75, and a lot of 100 tons of No. 2 foundry for spot shipment brought $10.50, Birmingham. For comparatively small lots of No. 1 soft and silvery, which are being offered only for spot shipment, a $10.50 basis with the usual differentials has been paid readily. The same price has also been received for small lots of gray forge as is quoted for No. 4 foundry, when the last named was offered at a differential of

THE IRON AND METAL MARKETS

25 cents per ton from the price for No. 3 foundry. There has been some demand for high manganese iron with a corresponding high silicon, and for small lots of that grade $11.50 to $12, Birmingham ,has been paid. For low silicon iron with high manganese $10.75 to $11.50 is quotable. The most important development during the week was the adoption of prohibitive prices for all grades and for any delivery by one of the leading producers. As a result of the action just mentioned, it is believed that the available tonnage for delivery over the remainder of this year is left in the hands of two concerns. A third concern would probably not refuse prompt shipment at the $10 schedule, but it is reasonably certain that such a figure can no longer be had from four of the producing interests. The continued heavy movement from furnace yards has been very effective in strengthening the tone of the market. While it has been intimated that certain additional furnaces will be put in blast as a result of the increased demand, the prospects for a still closer adjustment of the output to the actual movement is the most encouraging feature at this time. There is as yet no established quotation for deliveries after January 10. The inquiry for spot and nearby deliveries pending at this time is very attractive comparatively. We quote the market as below for prompt shipment or deliveries covering the remainder of the year, per gross ton, at Birmingham furnaces:

No. 1 foundry and No. 1 soft	$10.50 to $11.00
No. 2 foundry and No. 2 soft	10.00 to 10.50
No. 3 foundry	9.50 to 10.00
No. 4 foundry	9.25 to 9.75
Gray forge	9.25 to 9.75
Mottled	9.00 to 9.50
Standard basic	10.00 to 10.50
Off basic	9.75 to 10.25
Charcoal car wheel iron	22.50

Cast Iron Pipe.—No report is made of any large lettings coming to this market the past week, but a fairly satisfactory volume of small orders was placed. The schedule of prices has not been changed, but owing to the improved condition of the pig iron market and the tonnage now on order books of pipe manufacturers it is quite likely that less shading is being done. We quote the market for water pipe as follows, per net ton, f.o.b. here, which prices are firmer than at the time of last report: 4 to 6-in., $22; 8 to 12-in., $21; over 12-in., average, $20, with $1 per ton extra for gas pipe.

Old Material.—The condition of this market has improved but little. The local mills that are in operation are taking a fairly attractive tonnage of steel grades, but the continued suspension at the Alabama City mill is felt very keenly. Dealers' asking prices are all nominal, and we continue to quote as follows per gross ton f.o.b. cars here:

Old iron axles (light)	$13.50 to $14.00
Old steel axles (light)	12.50 to 13.50
Old iron rails	12.50 to 13.00
No. 1 railroad wrought	11.00 to 11.50
No. 2 railroad wrought	9.50 to 10.00
No. 1 country wrought	7.50 to 8.00
No. 2 country wrought	7.00 to 7.50
No. 1 machinery	9.50 to 10.50
No. 1 steel	8.50 to 9.00
Tram car wheels	8.00 to 8.50
Standard car wheels	9.50 to 10.50
Light cast and stove plate	7.00 to 7.50

Coal and Coke.—Current quotations on standard Alabama 72-hour coke are apparently firm and the prices for steam coal have not suffered further decline. No transactions of particular interest were noted in this market in the past week, practically all contracts for the next twelve months having been entered. We quote 72-hour foundry coke at $3.25 to $3.50 per ton at Alabama ovens, and the best grades of run-of-mine steam coal at $1.35 to $1.50 per ton at mines.

The German Iron Market

BERLIN, July 13, 1911.—The situation in the iron trade appears to be as much involved in uncertainty as ever. The reported advance in prices for bars seems to be confined to export orders. According to a Dortmund dispatch leading manufacturers in the vicinity deny that there has been a firmer tendency for bars. That the general price situation continues weak is evident from two facts—the first that the price of band iron was reduced 2.50 marks to 125 marks several days ago, and the second that even heavy plates, which represent the best employed section of the trade, are rather inclined to weakness. According to the same Dortmund dispatch prices of heavy plates have dropped two marks below the minimum agreed upon by the convention, and the wire trade is in a most demoralized state and wire nails have dropped to 135 marks as against the convention price of 165 marks. The rivet association met this week, decided to make no change in prices for the present, and postponed the opening of business for the fourth quarter.

Weak prices but plenty of work to do seems to constitute the characteristic news from nearly all sections of the trade. In some lines orders have undoubtedly been increased in the past few weeks. The bar mills are in nearly all cases well supplied with orders, and most of them are asking about eight weeks to fill new orders. Heavy rails continue to be ordered in good amounts for export, and this is also true of grooved rails and rails for mines, but there is still an appreciable lack of work in nearly all forms of rails. In billets and blooms export business had dropped off somewhat in connection with the coronation festivities in England, but it has since then improved. It is added that American competition has hardly been felt. Nevertheless prices are rather weak. Billets f.o.b. seaport are quoted at 80 to 81 marks, and muck bars 85 to 86 marks. Beams and other structural shapes continue in good demand and conditions in the building trade seem to promise still further improvement. The export movement is increasing steadily.

June Shipments and Production.

The June shipments of the Steel Works Union in rails, structural shapes and billets amounted to 499,288 tons, being about 33,000 tons less than for May, but nearly 51,000 tons more than for June, 1910. The movement in both rails and structural shapes was exceeded this year only in March and May.

Pig iron production in June amounted to 1,262,997 metric tons. This was about 45,000 tons less than for May, but about 44,000 more than for June, 1910. Production for the first half year amounted to 7,682,639 tons, which was 480,600 tons more than last year and 1,430,000 tons more than for the like half of 1909. This year production will probably reach 15,000,000 tons.

The situation in the pig iron trade is scarcely changed. The same quiet, waiting tendency prevails. The market is still watching and waiting for the outcome of the negotiations for renewing the syndicate. The "ultimatum" against the Gutehoffnungs-Hütte was extended, and the report is that it is willing to abandon its claim for a big increase in its allotments if certain other concessions are made to it. The nature of these has not been stated, but they have been made the basis for a rather optimistic report on the outlook for the completion of the syndicate. The Siegen group of furnaces has again extended to the end of the month the period of abstention from taking orders for next year delivery, pending the outcome of the syndicate negotiations. The furnaces of that region are apparently very anxious now that the organization be completed in its extended form. A report on the results of the unattached furnaces of that district shows that only two in a list of seven paid dividends in 1909, and these two only 3 per cent. each, whereas their average dividend in 1906 was above 10½ per cent. This plainly shows that furnaces there not operated in connection with steel plants are having a hard struggle for existence.

Conditions in the hardware trade remain fairly satisfactory. In general enough work is in hand, but low prices still cause complaints. The demand for builders' hardware remains very active, and the autumn trade is expected to be brisk. At Solingen the cutlery trade is doing a rather large business, but at low prices. A report on the state of business there says that "in many countries, despite customs in use trickery," continue to buy Solingen goods.

A review of the Belgian market mentions a slight improvement since the beginning of the month, especially in bars. Orders for these are arriving in larger amounts and prices have been lifted somewhat.

The deal for the amalgamation of three important iron companies in Luxemburg and Lorrain, namely the Burbacher Hütte, the Eicher Hütte and the Düdelinger Hochofen-Gesellschaft, has now been consummated, the Düdelinger concern taking over the other two by issuing its stock to their shareholders. It is a powerful combination.

New York

NEW YORK, July 26, 1911.

Pig Iron.—The week has been rather quiet in this immediate territory. The most important sale announced was one of 1500 tons of foundry iron to a

THE IRON AND METAL MARKETS

railroad company, which was secured by Buffalo makers. On this transaction the advanced price recently noted was maintained. It is understood that some small sales of Virginia iron have been made at a concession of 25 cents, but it is not believed that this applies to standard brands, which are held at $12.25 at furnace. Inquiries are light, either from nearby consumers or from New England territory. Northern iron is quoted as follows, at tidewater: No. 1 foundry, $15.50 to $15.75; No. 2 X, $15 to $15.25; No. 2 plain, $14.50 to $15. Southern No. 1 foundry is quoted at $14.75 to $15.25, and No. 2, $14.25 to $14.75.

Finished Iron and Steel.—Business in structural lines is perhaps a little better, but it is manifested in a larger aggregate of small orders. In plates conditions have not bettered, and it is doubtful if mills are running as high as 60 per cent. In bar iron one large producer reports betterment with even a stiffening in price. The only information obtainable on steel bars was not especially encouraging. Some of the late projects requiring structural material are an apartment house in New York for the Cambridge Construction Company, involving 600 tons; building for the Manhattan Soap Company, 900 tons; 300 tons for transfer bridges, Erie Railroad, and a building for the New York Telephone Company on Thirty-seventh street, for 900 or 1000 tons, although this has probably been given to Eidlitz & Ross. Some of the week's awards are: Weil building, Greenwich and Laight streets, 1000 tons, to Hay Foundry & Iron Works; Boston & Albany bridge, 240 tons, to the Fort Pitt Bridge Company; Pennsylvania Railroad, 120 tons, in bridges, to Pennsylvania Steel Company; Pennsylvania Railroad, 100-ton bridge to the Phoenix Bridge Company; First National Bank building, Richmond, Va., 2800 tons, to American Bridge Company; McElhatan bridge, Clinton county, Pa., 450 tons, to the Massillon Bridge Company; the 2000 tons in piersheds at Norfolk, Va., to the Virginia Bridge Company; 360-ton normal school, Washington, D. C., to Barber & Ross, Washington; 300-ton building, Coenties slip, to Mulcahy & Gibson; the 1000-ton Rochester, N. Y., railroad station to Gorsline & Swan, Rochester, general contractors; the 800-ton Golden loft, Lafayette and Howard streets, to Ravitch Brothers; the Beehive, Boston, 1300 tons, to Lauer & Harper, Baltimore, and 400 tons for mill building at Benson Mines, N. Y., to Eastern Steel Company. The New York subway contracts, involving 25,000 to 28,000 tons of steel work, as mentioned in this column two weeks ago, have been formally approved. Quotations are: Plain structural material and plates, 1.51c. to 1.56c.; steel bars, 1.36c. to 1.41c.; bar iron, 1.30c. to 1.35c., all New York. Plain material and plates from store, New York, 1.80c. to 1.90c.

Cast Iron Pipe.—The demand is light throughout the East. Carload lots of 6-in. are quoted at $21 to $22 per net ton, tidewater.

Old Material.—Dealers report a moderate demand for all classes of old material. Heavy melting steel scrap seems to be the subject of speculative buying among Philadelphia dealers. Inquiries have been received here for lots of 1000 to 5000 tons, but local brokers are averse to making sales of considerable quantities at present prices, fearing that they may not be able to cover such contracts, as holders are quite firm in their views. Borings and turnings are a little stronger. Inquiries have been received for some good quantities of cast scrap, but prices offered are below the current market. Relaying rails are in better demand and prices are a little higher. Quotations are as follows per gross ton, New York and vicinity:

Old girder and T rails for melting	$10.75	to	$11.00
Heavy melting steel scrap	10.75	to	11.00
Relaying rails	20.50	to	21.50
Rerolling rails (nominal)	12.00	to	12.25
Standard hammered iron car axles	21.00	to	21.50
Old steel car axles	16.75	to	17.25
No. 1 railroad wrought	12.75	to	13.25
Wrought iron track scrap	11.75	to	12.25
No. 1 yard wrought, long	11.50	to	12.00
No. 1 yard wrought, short	11.00	to	11.50
Light iron	4.25	to	4.75
Cast borings	5.75	to	6.25
Wrought turnings	6.50	to	7.00
Wrought pipe	9.50	to	10.00
Old car wheels	11.00	to	11.50
No. 1 heavy cast, broken up	11.00	to	11.50
Stove plate	8.50	to	9.00
Locomotive grate bars	8.50	to	9.00
Malleable cast	10.00	to	10.50

Ferroalloys.—Sellers of ferrosilicon in New York continue to refuse to take business at prices quoted elsewhere and they are asking $53 a ton for 50 per cent. Some fair sized sales of ferromanganese were made at around $36.50.

Metal Market

NEW YORK, July 26, 1911

The Week's Prices

Cents Per Pound for Early Delivery.

	Copper, New York.			Lead		Spelter	
		Electro-	Tin,	New	St.	New	St.
July.	Lake.	lytic.	New York.	York.	Louis.	York.	Louis.
20	12.75	12.55	41.90	4.50	4.40	5.75	5.57½
21	12.75	12.55	42.10	4.50	4.40	5.75	5.57½
22	12.75	12.60	....	4.50	4.42½	5.75	5.57½
24	12.75	12.60	41.65	4.50	4.45	5.75	5.57½
25	12.75	12.60	41.75	4.50	4.45	5.80	5.60
26	12.75	12.60	42.00	4.50	4.45	5.80	5.60

Tin is more plentiful than it has been in many weeks and is selling fairly well. Copper is quiet, but electrolytic is slightly stronger. Lead is firm and higher in St. Louis. Spelter has strengthened.

Copper.—There is hardly enough demand for copper to test the market but electrolytic has strengthened noticeably within the last two days and is now bringing five points more than it was a week ago. This is due to the fact that whatever demand has developed is for electrolytic. Some sales of Lake copper have been made but not much. The London market is slightly weaker than it was seven days ago, but on the whole the fluctuations have been very light and but little interest has been taken in the situation. This morning spot copper was sold in London at £56 3s. 9d. and futures for £56 15s. The exports of copper so far this month have not been large, amounting to about 24,841 tons.

Pig Tin.—If the cargoes of pig tin scheduled to arrive in this country before the month is out get in port on time, the July arrivals will amount to fully 5000 tons. So far this month 4616 tons have come into port and this is fully 1000 tons more than a normal month's arrivals. This, coupled with the fact that at a Banca sale in Holland to-day 2500 tons of tin were sold at £113, which is equal to 41.25c. c.i.f., New York, has encouraged consumers to believe that pig tin will go lower in the near future. The good supplies of spot tin now in this country have resulted in bringing the price down to the import parity and although the syndicate is reported to be taking hold again in London this market is not responding very noticeably to the upward movement there. A good steady business was done this week and considerable tin was sold for September delivery. This morning pig tin was offered at 42c. but prospective buyers were holding off in the expectation of a lower market here. In London to-day spot tin was offered at £191 5s. and futures at £187 5s.

Tin Plates.—Tin plates are fairly active, the demand coming chiefly from small consumers. The price continues at $3.94 for 100-lb. coke plates. The foreign market has been more quiet this week, although the price has remained at 13s. 9d.

Lead.—Some heavy sales of lead have been made but it is generally believed that the transactions were between dealers, as consumers are taking very little interest in the market, notwithstanding that the price has been steadily advancing. Outside sellers in St. Louis are now demanding 4.45c. but the leading interest continues to hold the market in New York at 4.50c. It is very apparent that some independent sellers of lead have disposed of all their spot holdings. Many of them sold right and left in this market a few weeks ago, while the leading interest held the umbrella by keeping the price at 4.50c. when its competitors were willing to take anywhere from five to ten points below that price. Now outside sellers are obliged to ask 4.60c. in New York and the consequence is that the American Smelting & Refining Company is commanding about all the business in sight.

Spelter.—Inquiries for spelter continue to come in in good volume and the market has strengthened somewhat in the last two days. Last Friday and Saturday sellers who quoted 5.57½c., St. Louis, failed to get some good business that was in sight and were notified by the consumers that they had placed their orders at a lower figure. Attempts to find out who was underselling the market were unsuccessful and as it has strengthened since it is believed that the sales were made by parties who are not regularly dealers. To-day the St. Louis price was from 5.60c. to 5.65c. and spot spelter could not be had in New York for less than 5.80c.

Antimony.—Antimony is stagnant and unchanged. Hallett's is 8c.; Cookson's, 8.50c.; Chinese, 7.25c., and Hungarian grades, 7.30c.

THE IRON AND METAL MARKETS

Old Metals.—Quiet conditions prevail, with dealers' selling prices, New York, nominally unchanged, as follows:

Copper, heavy cut and crucible	12.00 to 12.25
Copper, heavy and wire	11.50 to 11.75
Copper, light and bottoms	10.75 to 11.00
Brass, heavy	8.00 to 8.25
Brass, light	6.75 to 7.00
Heavy machine composition	10.50 to 10.75
Composition turnings	8.75 to 9.00
Clean brass turnings	8.00 to 8.25
Lead, heavy	4.20 to 4.25
Lead, tea	3.95 to 4.00
Zinc, scrap	4.25 to 4.30

Chicago

JULY 25.—While the metal market has been fairly active prices have indicated some weakness. Lower quotations on tin obtained, and spelter was offered at some concessions. We quote, Chicago delivery, as follows: Casting copper, 12.65c.; lake, 13.00c., in carloads, for prompt shipment; small lots, ¼c. to ⅜c. higher; pig tin, carloads, 43c.; small lots, 45c.; lead, desilverized, 4.47½c. to 4.50c. for 50-ton lots; corroding, 4.72½c. to 4.75c. for 50-ton lots; in carloads, 2½c. per 100 lb. higher; spelter, 5.65c. to 5.70c.; Cookson's antimony, 9¼c., and other grades, 8¼c. to 8¾c., in small lots; sheet zinc is $7.50 f.o.b. La Salle, in carloads of 600-lb. casks. On old metals we quote for less than carload lots: Copper wire, crucible shapes, 10¾c.; copper bottoms, 9½c.; copper clips, 10¼c.; red brass, 9½c.; yellow brass, 7½c.; lead pipe, 3.90c.; zinc, 3.90c.; pewter, No. 1, 26c.; tin foil, 33c.; block tin pipe, 37c.

Iron and Industrial Stocks

NEW YORK, July 26, 1911.

Although exceedingly dull, the stock market was firm until Tuesday, when prices gave way somewhat as a result of the Interstate Commerce Commission's decision reducing freight rates on transcontinental business. Steel common touched the highest point of the year and National Enameling made a notable advance. The range of prices on active iron and industrial stocks from Wednesday of last week to Tuesday of this week was as follows:

Allis-Chalmrs., com.	8½	Railway Spgs., com.	37 - 38
Beth. Steel, com.	33½ - 34⅝	Republic, com.	30 - 30¾
Beth. Steel, pref.	62 - 63⅝	Republic, pref.	93¾ - 95
Can. com.	11 - 11¼	Sloss., com.	49 - 50
Can. pref.	86¾ - 88¼	Pipe, com.	16
Car & Fdry., com.	57 - 58¼	Pipe, pref.	51 - 55¼
Car & Fdry., pref.	118 - 118¾	U. S. Steel, com.	79 - 80½
Steel Foundries.	39⅞ - 40	U. S. Steel, pref.	118¼-119¼
Colorado Fuel.	34 - 36	Westinghouse Elec.	75 - 75⅝
General Electric	161 - 163½	Va. I. C. & C.	83¾ - 91
Gr. N. Ore Cert.	59½ - 61⅝	Am. Ship, com.	59 - 64
Int. Harv., com.	123½ - 125⅝	Am. Ship, pref.	111
Int. Harv., pref.	124½ - 125⅝	Chic. Pneu. Tool	51½ - 51⅝
Int. Pump, com.	41½ - 42¾	Cambria Steel	45¼ - 47¼
Int. Pump, pref.	88¾ - 89¼	Lake Sup. Corp.	27 - 27⅝
Locomotive, com.	40¼ - 42¼	Pa. Steel, pref.	105½
Locomotive, pref.	108	Warwick	10
Nat. En. & St., com.	19¾ - 22	Crucible St., com.	13
Nat. En. & St., pref.	96¼-100¾	Crucible St., pref.	82¾ - 83
Pressed Steel, com.	37 - 37⅝	Harb. Wk. Ref., com.	53 - 54½
Pressed Steel, pref.	102 - 103	Harb. Wk. Ref., pref.	98

Negotiations have been practically completed for the sale of $9,753,000 Illinois Steel Company 4½ per cent. debenture gold bonds of 1940, held in the treasury of the United States Steel Corporation. The financing will be done by J. P. Morgan & Co. The proceeds will be used for capitalizing new construction completed, and the redemption of $6,900,000 Illinois Steel Company 5 per cent. nonconvertible debentures maturing April 1, 1913. The Illinois Steel Company has put back into the property millions of dollars from earnings, which have never been capitalized. For several years the Steel Corporation has been issuing subsidiary bonds in connection with new construction, but the bonds redeemed have largely offset these new issues. The net decrease in bonded, debenture and mortgage debt of the Steel Corporation in 1910 was $10,447,514.

The Crucible Coal Company, Pittsburgh, organized to develop recently acquired coal holdings of the Crucible Steel Company of America, has issued 5 per cent. 25 year fund bonds to the amount of $5,000,000.

Dividends Declared

The Russell Motor Car, Ltd., quarterly, 1¾ per cent. on common and preferred, payable August 1.

The National Enameling & Stamping Company, regular annual 7 per cent., on preferred, payable in four installments of 1¾ per cent. each—October 1, January 1, April 1 and July 1.

The Buckeye Steel Casting Company, quarterly, 1½ per cent. on common and preferred, payable August 1.

The National Lead Company, quarterly, 1¾ per cent on preferred, payable September 15, and ¾ per cent. on common, payable September 30.

The United Metal Products Company, quarterly, 1¾ per cent. on preferred, payable August 10.

The McCrum-Howell Company, quarterly, 1¾ per cent. on preferred, payable August 1.

The J. G. Brill Company, quarterly, 1¾ per cent. on preferred, payable August 1.

The Chicago Pneumatic Tool Company, quarterly, 1 per cent., payable July 26.

The Computing Scale Company, quarterly, 1½ per cent., payable August 2.

The Mianus Motor Works, quarterly, 2 per cent., payable August 1.

The New York Air Brake Company, quarterly, 1½ per cent., payable July 28.

The United States Motor Company, quarterly, 1¾ per cent. on preferred, payable August 10.

The United States Bobbin & Shuttle Company, quarterly, 1¾ per cent. on preferred, payable August 1.

Customs Decisions

Sheet Iron Drums or Containers

The Board of United States General Appraisers has handed down a decision favorable to the importers in a case affecting the classification of sheet iron drums used for containing caustic potash and bleaching powder. No question was raised regarding the duty imposed on the contents, but Balfour, Guthrie & Co., and Meyer, Wilson & Co., the importers, objected to the classification imposed by the collector.

Duty was assessed at the rate of 30 per cent. ad valorem under the provision in the tariff act for "cylindrical or tubular vessels or tanks for holding gas, liquids, or other material, whether full or empty." The importers alleged that the drums are "usual" coverings as that term is used in the law. Judge Fischer, in sustaining the contention, says that the evidence shows that the metal drums used in holding the merchandise, on being emptied of their contents, cannot be used commercially for any similar use and possess no value other than as scrap metal. The Government assessment is reversed.

Ecclesiastical Cast Iron Statuary

Claims by Benziger Bros., regarding the classification under the present tariff of cast-iron statuary for churches, have been overruled. The merchandise was assessed at the rate of 45 per cent. under the provisions for "manufactures of metal." Lower rates of duty were claimed, but these the board declined to entertain.

Sewing Machines

In construing the tariff act of 1909, the board has decided that the term "sewing machines" as found in the act is not restricted to the usual domestic article, but comprehends machines of all kinds that are employed in stitching generally. The protestants before the board were the Singer Manufacturing Company and C. B. Richard & Co. Some of the machines in controversy are used for stitching gloves, while others are used for sewing together straw braids. Duty was assessed at the rate of 45 per cent. under the provision for "manufactures of metal not specially provided for." The importers on the other hand set up the contention that the machines are "sewing machines" within the meaning of the law and dutiable at 30 per cent. and they were sustained.

Needles for Embroidery Machines

The board has decided that needles for imported embroidery machines, entered at the same time as the machines, are not to be regarded as entireties, and as such free of duty. The present tariff grants free entry to the machines, but needles are specially provided for with a tax of 25 per cent. ad valorem. An importer brought in the machines in controversy, and with each machine entered 60 dozen needles. The decision is that these needles must be taken separately and charged with duty.

New Publications

Metallurgy of Tin.—By Henry Louis. Size, 6 in. x 9 in.; 138 pages; 41 illustrations. Bound in cloth. Price $2 net. Published by the McGraw-Hill Book Company, 239 West 39th street, New York, and 6 Bouverie street, London, E. C.

This interesting book, the author states in his preface, is in the main a reprint of a monograph on the metallurgy of tin, published originally in Mineral Industry for 1896. Authentic information on the subject of tin smelting is somewhat scarce, and, as the volume of Mineral Industry has long been out of print, it was decided to issue the monograph as a separate work, incorporating in it as much recent information on the subject as was obtainable. Dr. Louis states that what he terms "the small amount of new matter" is due to two reasons: First, the unprogressive character of tin smelting, which continues from decade to decade with comparatively little change, and, second, the profound degree of secrecy observed by tin smelters, who are extremely anxious to keep to themselves any modifications or improvements in the process of smelting. To what extent, the author adds, these two facts, the slow advance of the industry and the secretive habits of those engaged in it, are related as effect and cause may be left to the judgment of the reader.

The subject is handled under five general heads: Properties and occurrence of tin; principles of the metallurgy of tin; smelting in the shaft furnace; smelting in the reverberatory furnace; and tin-plate and tin-plate scrap. This book is not only of value to those who produce tin from the ore but also to the very large class of manufacturers who use tin in their processes and products. Copious illustrations, many of them line drawings, assist in a clear presentation of the subject. The author brings the history of tin production from its earliest days down to the present year.

Cost Keeping and Scientific Management.—By Holden A. Evans, Naval Constructor, United States Navy. Size, 6 in. x 9 in.; 252 pages; 44 illustrations. Bound in cloth. Price $3, net. Published by the McGraw-Hill Book Company, 239 West 39th street, New York, and 6 Bouverie street, London, E. C.

This work comes at a time of large demand from manufacturers for a highly detailed text book upon which they can base a cost keeping and scientific management system. Much that has appeared previously has dwelt chiefly on the general principles of the subject, though some volumes have had a good deal of detail along certain lines. A very great work has been accomplished in stimulating interest in this most essential element of production. Mr. Evans has gone a little farther than most of his predecessors. His book is written primarily for jobbing shops and small manufacturing plants, among which accurate cost keeping and the principles of good management have received but little attention. At the same time it contains much which cannot fail to be of interest to officials of large manufacturing establishments and shipbuilding plants.

Many owners and managers, while desiring to improve their cost systems, are deterred by the belief that this cannot be done without the aid of expert accountants who will devise an elaborate system which will require a large clerical force to maintain. The purpose of this volume is to give to a manager knowledge of a system which he can adapt to meet the requirements of his own works. Mr. Evans describes the system in practical operation at the Mare Island Navy Yard over which he has supervision. He has succeeded in improving the efficiency of that plant by adopting and following the principles of management advocated by F. W. Taylor. He is convinced that in thousands of shops marked improvement would be made if these principles were followed, and he gives them in a practical, clear-spoken way which makes his words easy of understanding.

A very important feature is the combination of the table of contents and the index. In the former each of the 15 chapters is thoroughly subdivided so that they require three solid pages. The index is exceedingly voluminous, as it should be, occupying 12 pages. The result is a handbook of ready reference as well as a valuable text book. Take for example the chapter on machine shop methods; the subdivisions include general instructions, the results to be obtained by the planning department, the planning department and the shop staff, the duties of the chief planner, of the material man, the instruction card man, the standing order board man, the shop clerk, the study man, the foreman, the gang boss, the speed boss, the inspector, the move man, the head tool maker, the repair man and the belt man; delivery of tools to machines, operation of the system, and cooperation among the planners and shop staff. This very well suggests the scope of the work.

The illustrations include many sample blanks filled out more clearly to show the matter under consideration, and half-tones to make more understandable the different methods of assembling and keeping records, and also views in the works.

Iron and Steel: Their Production and Manufacture.—By Christopher Hood. Size, 4½ in. x 7 in.; 150 pages; 25 illustrations. Bound in cloth. Price 1s. 6d. net. Published by Sir Isaac Pitman & Sons, Ltd., 1 Amen Corner, E. C., London, Bath and New York.

This volume is one of a series of books known as "Pitman's Common Commodities of Commerce." It takes up the subject of steel and iron in a manner necessarily superficial, no attention being paid to finished manufactures save those which are made directly from the raw material such as rails, girders, bars and plates, and even these are treated in a very general way. The author's endeavor has been to consider the subject on broad lines for the benefit of those readers who are in need of a primer of the industry rather than a work of diffuse or specialized details.

The Revolution in Freight Claims.—The Railway Business Association, 2 Rector street, New York City, has issued its bulletin No. 8, entitled "The Revolution in Freight Claims," which is described as a "story of how by cooperation the shippers, the railroads and the Government have transformed a national grouch into fast spreading satisfaction." The association has accomplished broad reforms in the governing of the equitable settlement of freight claims against the transportation companies, and also in the education of shippers in the safe packing and clear marking of goods for shipment. The bulletin, in its 32 pages, gives substantial examples of the good already done.

The Chattanooga Manufacturers' Association

The Manufacturers' Association of Chattanooga, Tenn., is an organization which is proving of great value to the industries of the east Tennessee community. The association occupies its own building, and one of the features of its work is the maintenance of an exhibit hall in which are displayed permanently the products of the manufacturing interest of the city.

The iron trade is well represented in the display. Among the companies which are prominent in the exhibits are the Casey-Hedges Company, Walsh & Weidner, Wheland Machine Works, Chattanooga Wheelbarrow & Truck Company, American Brake Shoe & Foundry Company, Cahill Iron Works, M. A. Hunt & Co., Chattanooga Boiler & Tank Company, Chattanooga Implement & Mfg. Company, Chattanooga Plow Company, Chattanooga Roofing & Foundry Company, Gustafson Mfg. Company, Eagle Saw Works, Converse Bridge Company, Chattanooga Saw Works, and Southern Skein & Foundry Company.

The value to those in the trade of the exhibit is said to be patent immediately, as the visitor to Chattanooga, seeking information as to its industries, usually finds in the exhibit some indication of what he is looking for. A lot of new business, which would probably never be developed otherwise, continually results from the display.

In addition to this feature of its work the association has made itself valuable by its traffic department, which is equipped with information as to rates, and handles claims against the railroads for overcharges, as well as petitions for reductions in rates, etc. The iron manufacturers who are connected with the association are enthusiastic over its work, and assert that they themselves would be willing to assure its support, even if the other industries of the city were not to continue in its membership.

Personal

Fred C. Deming has been appointed manager of sales for the Carnegie Steel Company, the Illinois Steel Company and the Tennessee Coal, Iron & Railroad Company for the Buffalo district, effective August 1. He has been assistant manager of sales for the same companies in that district for several years and now succeeds T. Guilford Smith, retired. Mr. Deming has been connected with the Carnegie Steel Company since 1892, in various capacities, at the Buffalo office. Prior to that time he was in the service of the Philadelphia & Reading Coal & Iron Company, with which Mr. Smith was also connected. He has therefore been associated with Mr. Smith in these two companies for 27 years. The Buffalo offices, of which Mr. Deming will have charge, will as heretofore be located at 203 Ellicott Square Building.

The Youngstown Iron & Steel Company, Youngstown, Ohio, held its annual stockholders' meeting July 18. The year just closed was reported as a very successful one in every particular. The following directors were elected: L. E. Cochran, John O. Pew, Mason Evans, H. W. Heedy, C. B. Cushwa, G. F. Danielson and G. A. Cochran. The directors organized by electing the following officers: L. E. Cochran, president; John O. Pew, first vice-president and general manager; H. W. Heedy, second vice-president; Mason Evans, treasurer; C. A. Cochran, secretary; C. B. Cushwa, general superintendent; C. F. Danielson, superintendent of pressed steel department. The company now has its new additions, consisting of jobbing and plate mill, operating satisfactorily.

Francis H. Love, 116 Broad street, New York City, is preparing to open a manufacturers' agency in Havana, Cuba, with the purpose of covering the West Indian territory, specializing on a few high-class hardware and metal lines. He will leave for Havana about September 1.

T. W. Guthrie, formerly president of the Republic Iron & Steel Company, has been made general manager of the Standard Welding Company, Cleveland, Ohio, succeeding the late W. S. Gorten.

Hugh P. Tiemann, Pittsburgh, Pa., has been entered as a member of the Committee on Nomenclature of Iron and Steel, Committee No. 24, of the International Association for Testing Materials.

Dr. Milton S. Hersey, City and Provincial Analyst of Montreal, has accepted the appointment as Mandatory in the Council for Canada of the International Association for Testing Materials.

S. E. Harvey, formerly with the Niles-Bement-Pond Company, has become associated as sales manager with the Rumely-Wachs Machinery Company, 121 North Jefferson street, Chicago, dealer in new and second-hand machine tools.

Ewald Killing, of the Killing Molding Machine Works, Davenport, Iowa, has just returned from a trip abroad. While there he was successful in placing agencies for Killing molding machines in Germany, Russia, Austria-Hungary and the Scandinavian peninsula.

H. W. F. Graham has been recently elected general secretary of the Butler, Pa., Chamber of Commerce, succeeding L. C. Getsinger, of Pittsburgh, who recently resigned to become general secretary of the Shenango Valley Chamber of Commerce, at Sharon, Pa., which town is to raise a large fund for the purpose of securing industries. Butler, Pa., has a fund of $600,000, which is used to further the interests of that town.

The organizing committee of the sixth congress of the International Association for Testing Materials has elected Dr. Henry M. Howe, president; Robert W. Lesley, vice-president; H. F. J. Porter, secretary, and Prof. Edgar Marburg, treasurer.

The Pelican Metal Roofing Company, New Orleans, La., having a large volume of work in the locality, has opened a branch of its sheet-metal and roofing business at 2303 Fourth street, Meridian, Miss. The company has a contract for all the metal ceiling and metal shingles on the Meridian State Fair Building, amounting to thousands of squares of sheet-metal work.

Obituary

WILLIAM R. GAULBERT, of Gaulbert & Caskey, operating the Fairhill Rolling Mills, Philadelphia, Pa., died at his home in that city July 22, of acute indigestion, aged 79 years. He was born in Passayunk Township, adjoining the old city of Philadelphia. He began his career in the iron business in 1874, when he became a member of the firm of Gaulbert, Morgan & Caskey, and while several changes have resulted in the personnel of the firm, through deaths of various members, Mr. Gaulbert continuously gave his active attention to the business, and for a long time had been senior member of the firm. He was a member of the Columbia Club and the Historical Society of Pennsylvania, and had for years been a director of the Second & Third Street Passenger Railway. He leaves three daughters.

SAMUEL H. KEEFER, a valued employee of the Niles-Bement-Pond Company, died at Plainfield, N. J., July 19, aged 30 years, following an operation for appendicitis. After graduating at Stevens Institute in 1906 he took the special apprentice course of the Niles-Bement-Pond Company, and at the time of his death was its chief electrical engineer and a recognized expert in his line. In the past few years he had designed a reversing motor planer, which is already well known to users of machinery, and other electrical improvements in machine tools which are now in process of development. He leaves a widow and a son.

GEORGE A. F. HUGHSON, president of the Hughson Steam Specialty Company, Chicago, died July 19 at his home in that city, aged 51 years. He was formerly vice-president of the John Davis Company, and when that company was sold the business was continued under Mr. Hughson's name. He leaves a widow and one son.

CLARENCE M. KEMP, president of the Kemp Mfg. Company, Baltimore, Md., died July 24, aged 58 years, following an illness of several months. He leaves a widow, two sons and a daughter.

JOSEPH K. LANMAN, Hartford, Conn., formerly treasurer of the Hartford Machine Screw Company, died suddenly July 23, aged 52 years. He was with the company for 30 years and treasurer for 15 years, until he retired six years ago, since which time he had devoted himself to other interests. He was unmarried.

A house organ devoted to the electrical industry, printed in the English language and published in Berlin, has made its way to this country under the name of A. E. G. Journal. The July issue is No. 1, of volume 1, and the singular thing is that the recipient, unless he is familiar with foreign activities in the electrical field, would not know the source of the journal. It is of course printed in the interest of the Allgemeine Elektricitäts Gesellschaft.

The Allegheny Steel Company, Pittsburgh, Pa., at a recent meeting of its stockholders voted favorably on the proposition to increase the capital stock from $3,000,000 to $3,500,000. The new stock will not be issued until later on. The company has made considerable improvements in its plant at Brackenridge, Pa., by extending its steel-casting department, adding to its sheet-mill capacity for the production of American ingot-iron sheets and electrical sheets, enlarging its plate-washer department, etc.

At the recent annual meeting of the Cleveland Engineering Society the following officers were elected for the ensuing year: President, E. P. Roberts; vice-president, R. H. Fernald; secretary, F. W. Ballard; treasurer, E. E. Ranney; librarian, G. H. Tinker; directors, the officers and G. F. Burrows, Col. John Millis, B. F. Leffler, A. H. Himes, Robert Hoffman and J. W. Frazer.

The Lackawanna Bridge Company is not to erect any plant for itself at Bayonne, N. J., as reports have it. The rumor, it is felt, arose through the fact that the company is to erect the two-story warehouse at Bayonne for the American Radiator Company, performing the entire general contract as well as erecting the steel work.

Making Machines Earn Their Living

A Correct Distribution of Costs

BY STERLING H. BUNNELL.

In the endeavor to obtain the best working efficiency from all parts of the factory organization more attention has been given to the workman and his working conditions than to the equipment with which he works. The average small shop, containing several machines of different sizes and values, having different requirements in power, floor space, light, crane service and other essentials, is operated without any conception on the part of the proprietor that some of his machines must earn more than others.

Obviously, a machine costing several thousand dollars, taking large floor space, requiring part of the time of an overhead crane to place and remove work, using much power and requiring considerable expense in connection with the cutting tools and fixtures belonging to it, should earn a much larger wage per hour than a small machine involving each of these expense items in very small measure. This is no mere theoretical question for accounting specialists.

In a jobbing shop, where there is a variety of tools, making it possible to take in moderately large and rough work or small and fine work, according to what is offered, the securing of a contract for heavy work may tie up the entire time of the larger machines and leave vacant a good part of the floor space ordinarily occupied by vise hands and fitters. On the other hand, the entering of orders for a large quantity of small work may leave the large tools standing idle. It is important to any shop, however small, to know what the several machines are worth as they stand on the floor, what it costs to operate them and what price shall be set on the services of each machine outside of the amount of wages paid the operator.

Analyzing the Elements

To analyze the various elements entering into the hourly value of the time of the machine in a large works is a task of much importance. Competent cost accountants are available to undertake the problem of any factory, and the figures produced in such an investigation may be so arranged that necessary changes may be made at any time without again calling upon the original investigator. In a small shop, however, the elements involved are so few that it is no impossible task for any competent bookkeeper or for a man with some knowledge of costs to make the necessary analysis without calling on outside help.

The elements entering into the fixed expense of a factory, and therefore into the fixed expense of each unit or machine in a factory, are interest on invested capital, depreciation, taxes, insurance, power, heat, light, superintendence and repairs. Each of these items of expense for the factory as a whole is easily computed. A fixed interest should always be provided for the invested capital, as the value of the plant represented by stock is entitled to the market rate of interest at least.

Depreciation is overlooked by many men who ought to know better. During half the lifetime of the average man interested in shop work machine tools of some types have gone out of existence and others have taken their places. Let any man who thinks that proper attention to repairs and up-keep is a sufficient substitute for a depreciation charge compare the machine shop equipped with tools made in the 90's with a shop equipped with tools made since the requirements of high-speed steel became generally known. No matter how well kept are the machines made 20 years ago, few of them can hold their own today against modern tools. The older machines might just as well have been driven to their limit and worn out in producing their quota of work in half the number of years, as saved to a time when their design is obsolete and they must be replaced by the machines of today.

List of Productive Units Required

To analyze the expenses of a shop a list of productive units is the first thing required. By "productive unit" is meant a single machine, or a single working equipment for one man, such as a vise hand, including the bench, vise and tools and the floor space in which he stands and handles his work. In some cases productive units may be formed of larger sections of the shop or factory, as where a number of machines of identical pattern are working together on the same kind of work, so that their output may be measured in one number or count. This is the case, for instance, with some of the machines used in a tannery, where three or four thousand sides of leather are handled by several identical machines, each doing part of the whole number.

Having drawn up a list of the productive units, a sketch is to be made of the floor space of the factory, dividing it among the several productive units, leaving out any large areas which do not appear to belong properly to adjacent machines, such as a space necessary for transporting material on trucks, for storing castings not required in the immediate vicinity and the like. Next, compute the floor space in square feet covered by the areas as they are marked off about each productive unit and tabulate these opposite the names of the units.

Footing up the column of floor space figures, the total gives the productive floor space of the factory and forms the basis for dividing the expense connected with the building. This is interest on the building cost. It may also include ground rent, this charge standing in place of interest on land value, or the rent paid for land and building, if the whole property is rented, and insurance and taxes on the building. The total of these items, divided by the number of square feet of floor space occupied by productive machinery, gives the annual charge per square foot of floor space. Multiplying the square foot charge by the area of the space occupied by each productive unit, the annual charge for the building space of each is obtained.

The actual value of the equipment, machinery, shafting, building and accessories directly belonging to it, and of any other shop property which may be located within the space and belong to the productive unit, is next to be taken as a basis for computing interest and depreciation on the value of the equipment. Insurance and taxes are ascertained in a similar way, dividing the annual total on the basis of value of each unit.

Dividing Up the Horse Power

The estimated horse power required by each machine, running the number of hours, is next set down in a column and the figures totaled. If the guess has been accurate the number of h.p. hrs. will agree closely with the h.p. hrs. paid for. The power may be purchased from outside or made by a power plant belonging to the factory; in either case the basis for distributing the total cost of the power is the h.p. hrs. required for the operation for each machine.

If the total of powers does not agree closely with the actual power developed the estimated figures may be changed proportionately, so as to make the total come out right. The cost of power per h.p. hr. is then multiplied by the figures opposite each productive unit and the amounts set down as an element of the burden charge for the unit. This distribution is not by any means put forth as perfectly accurate, but will give satisfactory results for the small factory which will not carry the expense of a complete cost-accounting system. It would be strictly correct to distribute power on the basis of the actual hours run by each tool each day, but this involves some extra figuring and in most cases does not appreciably affect the general result.

The cost of heat and light is divided on the basis of floor space. If the factory is heated by exhaust steam furnished by its own engine it is fair to charge half the cost of steam power against the power consumption of the tools and the other half against the cost of heat. In such cases there should be two figures carried for the purpose of distributing power charges, one consisting of the cost of power for each tool and the other of the cost of heat and light over the area covered by each productive unit.

The Non-Productive Space

The charges for the non-productive space, for the light in the office and for any other non-productive items should not be left out of the calculation, but set down separately. To any such undistributed charges should be added the expense for salaries and office supplies, miscellaneous expense not distributable to the machines and any other undistributable items. The total of these figures gives the amount of overhead burden, which is fairly distributed as a percentage over the gross cost of the work turned out.

This percentage will be very much smaller than is the case where the old erroneous method of distributing all of the factory expense as a percentage to the cost of labor is in use.

The repair charge for the plant should be considered as distributable equally over all the machines unless there are certain special machines which are likely to have a greater proportion of percentage of expense to keep them in order. The ordinary breakages and repairs from wear which occur in a plant happen on any one machine rather than another only by chance. It is therefore fair to distribute the total repair cost of the plant per year, estimated from previous years' results, as a percentage over the value of the equipment. The total cost may be found to be 5, 10 or 15 per cent. of the total value of the equipment, and the figures for the proportion belonging to each unit are computed at the percentage indicated.

Repairs to small tools, such as drills and steel cutters, including the wages of the man in charge of the tool room, can best be distributed by estimate, setting down opposite each productive unit the estimated cost of the tools required for it and then comparing the total of the estimated figures with the results of previous years or of other shops and adjusting the estimates if necessary.

The Table of Burden Figures.

The table of burden figures is now added across, combining all the items opposite each productive unit into an annual sum covering the total fixed charges and the operating expense. These figures are annual amounts and if divided by the expected working time of the factory per year give hourly rates which must be earned by each machine if it is to justify its presence in the shop.

It is true that special machines are required in some circumstances to perform operations necessary to the work of the shop, even though not enough work is on hand to keep them fully employed. This does not affect the fact that such machines do not earn their "living" and that their deficit must be made up by the extra work of other machines, just as is done by the members of a fraternal organization who contribute to the support of one of their number who is disabled.

If the actual working time of each tool is noted each week or month, as should always be done, it is easy to see whether the tool or "productive unit" is carrying its full share of the burden. The failure of any unit to earn the required amount should be a spur to the management to find some way to employ that unit more continuously and produce better results. A tool half idle is an item of loss—a space where full efficiency has not been realized. There is no surer way to increase profits than to increase the working time of tools and equipment already paid for and in place and ready for operation, but hitherto allowed to stand idle and waste their earning powers.

Schedule of Burden Rates.

The following table is computed for a small shop equipment to illustrate the correct method:

Schedule of Burden Rates Computed for a Small Shop Equipment.

Unit.	Space.	Value Bldg.	Value Mchy.	Int. 6%	Dep. 5%	Tax 3%	Ins. 2-10%	*Power	Supplies	Repairs 5%	Total.	Av. Hrs.	Hour Rate.	Rate Set.
Shaper	50	$141	$500	$38.46	32.05	19.23	3.21	150.00	15.00	32.05	290.00	2000	14½c	15c
Drill	50	141	300	26.46	22.05	13.23	2.21	125.00	35.00	22.05	246.00	2500	10	10
16-in. Lathe	75	213	450	39.78	33.15	19.89	3.32	150.00	20.00	33.15	299.29	2500	12	12
24-in. Lathe	100	284	800	65.04	54.20	32.52	5.42	240.00	30.00	54.20	481.38	2000	24	25
Miller	60	170	450	37.20	31.00	18.60	3.10	75.00	50.00	31.00	245.80	1500	16.4	20
Benches (3 men)	200	568	110	40.68	33.90	20.34	3.39	†10.00	50.00	33.90	192.21	8000	2.4	2½
Unused	100	283	...	16.98	14.15	8.49	1.42	†5.00	....	14.15	60.19	....		
Building	.635 1800	...	....	....	....	....	....	.....	....	....	.....	....		
Totals	...	$2610	264.60	220.50	132.30	22.07		755.00	200.00	220.50				
Other Expenses:		Salaries and office..... $2,200.00												
		Misc. Expense..... 150.00												
		Fixed Charges on N. P. Space.. 60.19												

$2,410.10÷$16,000 annual production = 15% overhead per cent.

*Power at 5c per hp-hour, per electric service bills.
†Allowance for light over vises and nonproductive floor space.

Heat Treatment of Low-Carbon Nickel Steels

A paper on the heat treatment of low-carbon nickel steels, under the joint authorship of Prof. Henry Fay, of the Massachusetts Institute of Technology, and John M. Bierer, was read at the evening session on June 27 of the American Society for Testing Materials, at Atlantic City, N. J. Two open-hearth steels, one containing 3.15 per cent. and the other 3.5 per cent, nickel, were studied, and as shown by the analysis herewith were steels of substantially the same carbon content. Bars ⅞ in. in diameter and 5 in. long were treated. After treatment they were cut into the standard 4-in. test specimens, the 1 in. of the end being reserved for microscopical examination.

Analysis of the Nickel Steels.

	No. 1.	No. 2.
Nickel	3.15	3.5
Carbon	0.35	0.34
Manganese	0.63	0.60
Silicon	trace	0.16
Phosphorus	0.027	0.03
Sulphur	.016	0.014

Each set of three specimens was placed in the cool furnace and finally held at desired temperature for a period of 2 hr. At the end of the time, one was quenched in oil, a second was allowed to cool rapidly in air and the third was allowed to cool slowly in the closed furnace. The oil quenched specimens were subsequently annealed 2 hr. at 600 deg. C.

The oil quenched specimens gave the highest values for tensile strength, elastic limit and reduction of area and the next highest values were found in the air cooled specimens. The exception was that the 3.14 per cent. nickel steel, heated to 700 deg. C., showed a lower tensile strength and elastic limit than the corresponding air-cooled specimen. This was explained by the fact that oil quenching from 700 deg. had practically no hardening effect.

It was noted that the maximum values were reached at a temperature considerably above the critical temperature. This was not taken to mean that heating to high temperatures was desirable, but that it was perhaps advisable to heat higher than the critical temperatures, at which some writers seemed to think best results were obtained. This did not accord with the author's experience except for high-carbon steels. The most suitable temperature for the heat treatment lay, the authors asserted, between 800 and 850 deg.

In the case of the 3.5 nickel steel, greater values for strength may, they stated, be obtained at the higher temperatures, but at the same time the structure of the steel becomes coarser, due to the higher heating. The microstructure of the steels was similar to that of carbon steels. Little or no change of the original structure was produced with 2 hr. annealing at temperatures below 750 deg. and the physical values were changed only slightly. At 800 deg. there was a change and specimens showed an extremely fine structure. At temperatures above 850 deg. the structure begins to grow coarse. In specimens oil quenched at 1000 deg., there was no granulation, but there was evidence of crystallization. Prolonged heating, it was thought, would produce a coarser grain except in specimen oil quenched between 800 and 900 deg. C.

The Pittsburgh Crucible Steel Company's engineers have completed plans and specifications for part of the equipment required in its new steel works to be erected at Midland, Pa., and bids are now being taken for the construction of six open-hearth furnaces and a 40-in. blooming mill. Plans being made up also call for a large increase in boiler and engine capacity and for finishing mills. Ground was broken some time ago for the new buildings and the steel work will shortly be started by the American Bridge Company. Foundations are also in for a second blast furnace, while the complete lay-out is made for a plant of four blast furnaces.

The Steel Corporation Investigation

Chairman Stanley Acquiring Technical Knowledge

Herbert Knox Smith, Commissioner of Corporations, appeared July 20 before the Stanley Committee at Washington, but the effort on the part of the committee to obtain some information that Mr. Smith may be supposed to have after assembling the data furnished to his bureau by the United States Steel Corporation was fruitless. Mr. Smith maintained that the law did not permit him to give any of the information to any one except the President. He said that the Steel Corporation had placed no obstacles in the way of getting information about its business, but the bureau had put nobody under oath for fear that act would grant immunity from prosecution. Only a part, he said, of the figures and data gathered had been laid before the President, and the task of arranging the rest would involve much time and labor.

Chairman Stanley asked Mr. Smith: "Will you please take this matter up with the President and learn if he is willing for this committee to have your information?" Mr. Smith promised to take the matter up with the President.

Representative Littleton declared it was "an outrage that the Bureau of Corporations is to-day responsible that all this information we seek is impounded and kept away from other branches of the government." He said the law as interpreted was a "monstrosity."

Chairman Stanley read a speech of Judge Gary, chairman of the Steel Corporation, made to the board at a meeting in 1906, relating to the government's investigation. In this Mr. Gary said:

> Our Finance Committee has been in close touch with this matter all the time. We have been in frequent and almost constant communication with Commissioner Garfield and more or less with the President himself concerning these matters. Up to date they have made no complaint of us whatever, but we do not know any better than you do what may be the future. We are trying to be frank, accommodating to the department, and we suppose we have an understanding that we will not be unnecessarily injured and that we will not wrongfully be charged without having an opportunity to show the facts.

Mr. Smith was asked about this statement and said he knew nothing about this matter. Representative Gardner, of Massachusetts, asked if Mr. Stanley meant to imply that President Roosevelt and Commissioner Garfield had been in collusion with Steel Corporation officials. Mr. Stanley replied he meant to imply "unseemly activity" of the Steel Corporation.

Chairman Stanley, who has been making some inquiries in and near Pittsburgh, told the committee that he had found that the Steel Corporation has no monopoly of coking coal, but that its absorption of the Tennessee Coal, Iron & Railroad Company had "cinched" its monopoly of ores. He said:

> I found on personal investigation that the Jones & Laughlin Steel Company controls nearly as much of the coking coal in the Connellsville district as the Steel Trust does. I am also informed that M. V. Thompson owns a greater acreage of that coal than does the Steel Corporation, and that he holds it for sale to independents as well as to the trust.

Mr. Stanley then made some statements which will amuse those who are familiar with the iron ore deposits of the country and with steel-making processes. He referred to what he termed the "act of God" to relieve the independents in the discovery of self-fluxing ores in the South, which developed the open-hearth system of making steel and opened the way for competition with the Bessemer ores of the Superior region controlled by the "trust." He said 80 per cent. of the open-hearth ores were controlled by the Tennessee Coal, Iron & Railroad Company. He then questioned Mr. Smith as follows:

Q. Is it not true in the light of the facts that when the United States Steel Corporation absorbed the Tennessee company the latter controlled the only ores that could enter into competition with Bessemer ores?

A. It controlled the most important bed of the Southern ores.

Q. If the Steel Corporation had a monopoly it practically cinched it through the absorption of the Tennessee company. Is that not true?

Commissioner Smith said he did not want to commit himself and that all of the facts in the bureau's possession would be submitted in due time.

Chairman Stanley submitted a copy of a steel plate pool agreement at the hearing July 24. This agreement was made by the manufacturers of steel plates November 9, 1900, about a year before the formation of the Steel Corporation, but the committee hopes to be able to prove that the terms were adhered to down to 1906 "and possibly in some form to this time." The agreement was obtained from F. B. Kauffman, publisher of the Chester Valley Union, Coatesville, Pa., who declares that his brother printed it. It is asserted that the agreement was sent out to the manufacturers, but that the copy in each case was returned unsigned and all later were burned for fear that they might furnish evidence of a violation of the Sherman anti-trust act; but the return of the contracts in this manner, it is alleged, was the signal that the contract had been agreed to and that its terms were then kept by a tight combination of the existence of which there was no visible proof.

According to the paper, this organization included 11 steel companies, which apportioned among themselves all shipments of steel plates. Each was required to make monthly sworn statements relating to shipments, production, etc., and any member which shipped more than its apportioned amount was required to pay a penalty on each pound of such excess, the money thus collected being apportioned among the members that did not ship up to their allotted share. The agreement showed the following apportionment of shipments allowable by the various concerns: Carnegie Steel Company, 46.25 per cent.; Jones & Laughlin, Ltd., 4.75; Illinois Steel Company, 11; Crucible Steel Company of America, 4.50; Otis Steel Company, 2.50; Tidewater Steel Company, 3; Lukens Iron & Steel Company, 7.50; Worth Brothers Company, 7; Central Iron & Steel Company, 8; American Steel & Wire Company, 5.50, and Glasgow Iron Company to the extent of sales and up to 40,000 tons, should it be able to accomplish them, prior to December 31, 1901. Debts of members of the association were required to be paid by check drawn to the order of T. Mellen & Sons, Pittsburgh, to the credit of the association.

Another provision required that "all plates shipped into States bordering on the Pacific Coast, and to be actually used in the territory into which thus shipped, and also all plates actually exported for use outside the limits of the United States, be reported to a commissioner, together with bills of lading or other evidence of exportation, for actual use abroad, satisfactory to him (said evidence to be confidential and not to be circulated among members)." Such tonnage was to be deducted from the member's report and the agreed pool tax charged. The agreement also bound the members to make sales between parties to the agreement at pool prices.

To insure rendering of statements and faithful adherence of each party to the terms of the agreement, a guarantee fund of $100,000 was provided by payment of $1,000 on each per cent. of allotment.

At the hearing July 25, the formation of the Steel Plate Association of the United States in New York in the autumn of 1900 was admitted by A. F. Huston, president of the Lukens Iron & Steel Company, one of the organizers.

"Where did you see this agreement before?" asked Representative Beall, of Texas, displaying the copy now on the official record of the inquiry.

"When it came from the printer."

"Who sent it to the printer?"

"I did."

Mr. Huston said his company participated in the discussions leading up to the agreement and of the organization of the association. "Prior to that time," he explained, "we had had a period of destructive competition. I shall never forget that time—common labor was at 90 cents to $1 a day, the price of steel was down to a cent a pound, and, in selling, the value of ore in the ground was not taken into consideration at all. The companies figured only on the cost of getting the ore out and manufacturing it. That agreement was a life-saving measure."

Further admission of the existence from November 2, 1900, to November, 1905, of an association along lines similar to the pool was made by W. C. Moreland, of Jones & Laughlin, Ltd. Mr. Moreland submitted an account of his company with the association and said his records contained actual figures of moneys paid to Willis L. King, treasurer of the pool.

United States Steel Corporation's Earnings

The statement of the United States Steel Corporation's earnings for the quarter ended June 30, 1911, makes the following showing, as compared with the corresponding period of 1910:

	1911.	1910.
April	$9,412,573	$13,314,956
May	9,590,444	13,229,289
June	9,105,503	13,526,715
Total after deducting all expenses incident to operations, including those for ordinary repairs and maintenance of plants, and interest on bonds and fixed charges of the subsidiary companies	28,108,520	$40,170,960
Less charges and appropriations for the following purposes: Sinking funds on bonds of subsidiary companies and depreciation and reserve funds	6.268,680	6,290,205
Net earnings	$21,839,840	$33,880,755
Deduct interest for the quarter on U. S. Steel Corporation bonds outstanding	$5,783,293	$5,849,363
Sinking fund for the quarter on U. S. Steel Corporation bonds: Installments	1,012,500	1,012,500
Interest on bonds in sinking funds	316,170	450,099
	$7,311,963	$7,311,962
Balance	$14,527,877	$26,568,793
Dividends for the quarter: Preferred	6,304,919	6,304,919
Common	6,353,781	6,353,781
Surplus for the quarter	$1,869,177	$13,910,093
Less appropriated on account of expenditures for property, new plants and construction	.....	7,500,000
Balance of surplus for the quarter	$1,869,177	$6,410,093

The earnings for the quarter ended March 31, 1911, were $23,519,203. For the half year the total earnings were, therefore, $51,627,723, against $77,787,837 in the first half of 1910.

Important Freight Rate Reductions

The Interstate Commerce Commission published a decision July 24 making substantial reductions in freight rates affecting practically every railroad in the United States with the exception of those operating in certain parts of Southern territory. The decision is based on what are known as the Reno, Spokane, Salt Lake and similar cases. In the Reno and related cases the carriers have until October 15 to put the reduced rates into effect. In the Spokane and related cases November 15 is the date fixed. Roughly estimated the reductions amount to 20 per cent. Hundreds of thousands of rates are involved, and the cases are of such magnitude that even members of the commission are unable to indicate precisely how many rates or the amount involved in a given group will be affected by the decisions.

In these cases the commission for the first time has established freight zones which are described. Under present conditions a commodity rate from the Missouri River to Spokane is the rate from a Missouri River point to the Pacific Ocean plus a back haul from the Pacific Coast points to Spokane. From the Missouri River to certain intermediate points eastward from the Pacific Coast the commission prohibits a back haul charge.

The territorial zones named by the commission are as follows: Zone 1 comprises all territory west of a line extending in a generally southerly direction from a place immediately east of Grand Portage, Minn., thence southwesterly to a place immediately east of Superior, Wis., thence southerly to the intersection of the Arkansas and Oklahoma state line, and thence along the west side of the Kansas City Southern Railway to the Gulf of Mexico, in which zone the commission holds that no higher charge can justly be made at any intermediate place than to a more distant place.

Zone 2 begins at the international boundary immediately west of Cockburn Island, Lake Huron, and passes westerly through the Straits of Mackinaw, southerly through Lake Michigan and south to Paducah, Ky., whence it follows the east side of the Illinois Central Railroad to the Gulf of Mexico in which zone rates to intermediate points may properly exceed by not more than 7 per cent, rates in the same places of origin to Pacific Coast terminals.

Zone 3 embraces all territory lying adjacent to the Buffalo-Pittsburgh Line running from Buffalo to Wheeling and thence following the Ohio River to Huntington, West Virginia, in which zone the commission holds that from places of origin in this territory rates to intermediate places may properly exceed those to terminal places by not more than 15 per cent.

Zone 4 embraces the Atlantic seaboard east of the Allegheny Mountains in which the commission holds that rates from places of origin within the zone to intermediate places may exceed those to terminal places by not more than 25 per cent.

It is decided that transcontinental carriers serving Reno and other points on the main line of the Central Pacific shall make no higher charge on any article carrying a commodity rate than is contemporaneously in effect from Missouri River points such as Omaha and Kansas City to coast terminal points.

East Texas Iron Ore Developments

ORE CITY, TEXAS, July 22, 1911.—Another step toward the development of the iron ore deposits of northeastern Texas has just been taken by the East Texas Brown Ore Mining & Development Company in awarding the contract for the erection of an ore-crushing and washing plant at this place. The plant will have a daily capacity of 1000 tons of ore and will cost about $50,000. Besides the ore for shipment that will be obtained by this process a large output of rock ballast for railroads will be obtained from the plant.

The company expects to have everything in readiness for beginning to ship ore to Bethlehem, Pa., via Port Bolivar, Texas, by October 1. The railroad that is being constructed by the Port Bolivar Iron Ore Railway Company to Ore City from Longview, 34 miles, will be finished by that date, as will also the ore docks which the Atchison, Topeka & Santa Fe Railroad is constructing at Port Bolivar. The Port Bolivar Iron Ore Railway Company is a Santa Fe project, and its road will connect with the latter line at Longview. The East Texas Brown Ore Mining & Development Company owns extensive iron ore deposits in this vicinity as well as in other parts of Cass County and in Marion, Gregg and Upshur counties. While Charles M. Schwab is not named as one of the incorporators of the new company, it is understood that he is the dominant factor in the project. The capital stock of the company is $2,500,000. The officers are: Lewis P. Featherstone, Galveston, president; L. C. Luckel, Houston, secretary; Fox Winnie, Galveston, treasurer. Mr. Featherstone has long been prominently identified with the Texas interests of the Santa Fe. Mr. Schwab made a personal investigation of the iron ore deposits around Ore City some time ago, and it was announced at that time that he had contracted with the Santa Fe for the transportation to Port Bolivar of an enormous tonnage of the ore. H.

The Illinois Coal Report.—The Illinois Bureau of Labor Statistics has issued the twenty-ninth annual coal report, covering the year 1910. The 537 pages go into the subject of coal mining in voluminous detail. The names, production and characteristics of each mine are set forth in tables. Much attention is given to accidents. The Cherry Mine disaster alone has 60 pages, with line drawings to make clear the character of the premises. Another interesting chapter contains an address by David Ross, secretary of the bureau, on "Laws Covering Accidents and Employers' Liability," delivered at the American Mining Congress, Goldfield, Nev., last September.

Spelter Production in the First Half of 1911.—Statistics compiled by the United States Geological Survey show that the production of spelter or metallic zinc from ore for the first six months of 1911 was 140,196 net tons, a gain of more than 5000 tons over half the record output of 1910. Of this production, 5135 tons was made from foreign ore. Spelter stocks were reduced from 23,232 tons to 17,788 tons. Imports remained about the same, but exports were nearly double those of half the preceding year. The apparent consumption of spelter was 135,497 tons, an increase of more than 12,000 tons over the half of 1910, but about the same as in half of 1909.

Coke Production and By-Products Saved

During 1909 and 1910, according to E. W. Parker, of the United States Geological Survey, there was more activity in the construction of by-product recovery coking plants than at any time since 1903. While the total production of coke in 1910 was 41,681,410 net tons, the production of coke in by-product ovens in that year amounted to 7,138,734 net tons, against 6,254,644 tons in 1909. The increase in the output of by-product coke in 1910 over 1909 was 14.13 per cent., whereas the total production of ordinary coke increased from 33,060,421 tons to 34,570,076 tons, a gain of 1,509,655 tons, or only 4.57 per cent. The coke made in by-product ovens in 1910 was 17.12 per cent. of the total production.

The efficiency of by-product ovens is shown by the fact that while the beehive ovens in 1910 produced 34,570,076 net tons of coke on a consumption of 53,559,285 net tons of coal, or 64.54 per cent., the retort ovens in the same year produced 7,138,734 net tons of coke on a consumption of 9,529,042 net tons of coal, or 74.9 per cent.

The total value of the by-products obtained from the manufacture of coke in retort ovens in 1910 was $8,479,557, or a little more than one-third of the value of the coke produced—$24,793,016. In 1909 the value of the by-products amounted to $8,073,948, and in 1908 to $7,382,299. The by-products recovered in 1910 consisted of 27,692,858 cu. ft. of surplus gas, valued at $3,017,908; 66,303,214 gal. of tar, valued at $1,599,453; 70,247,543 lb. of ammonium sulphate, or its equivalent, valued at $1,841,062; 20,229,421 lb. of anhydrous ammonia, valued at $1,725,266, and 4,654,282 gal. of ammonia liquor, valued at $295,868. In addition to these, a quantity of light and secondary oil and small quantities of coke breeze are recovered, with an estimated value of $400,000. The value of the recoverable but wasted contents of the coal made into coke in beehive ovens would, at the prices obtained in 1910, have been between $35,500,000 and $40,000,000.

If all of the coke made in the United States were produced in retort ovens, says Mr. Parker, probably not more than half of the number of ovens would be required, say, for 1910, 45,000 ovens. These would yield in gas, over and above that required for the regeneration of the ovens, without by-product recovery, approximately 1,000,000 hp. per hour for every day in the year.

The first ovens of the by-product type in the United States were built in 1893 at Syracuse, N. Y. From this one plant there has been an increase to 4078 by-product ovens in 1910, all but 27 of which were in active operation. This is an increase of 164 over the number in operation in 1909 and 399 more than were in operation in 1908.

The Swedish Iron Institute

Consul Stuart J. Fuller, Gothenburg, Sweden, furnishes the Daily Consular and Trade Reports with the following description of the scope and functions of the Järnkontoret, translated from a publication issued by the Swedish General Export Association:

The Järnkontoret, or Iron Institute, is a private institution, peculiar to Sweden, and has for its object the support and advancement of the Swedish iron industry. Most of the iron works in Sweden are partners in the institute (the partnership being confined to the works exclusive of individuals), and their shares are estimated on the output of iron each has been able to register at the time of joining.

The institute is supervised, in the first place, by the Brukssocieteten (Society of Manufacturing Estates), a general meeting of which is held once a year. Every sole or joint proprietor of a manufactory holding shares in the Järnkontoret is a member of the Brukssocieteten. At the general meetings of this organization the votes depend on the shares held in the institute.

The affairs of the Järnkontoret are managed by a council consisting of five ordinary and five vice members, the latter being called only when matters of great importance are under discussion. The current work is superintended by two of the ordinary members, one as managing director and the other as "delegate on duty."

An ordinary banking business is carried on, and members are entitled to certain privileged loans (advances, accident loans, and building advances). They also have the privilege of receiving further loans before other applicants.

The institute possesses funds amounting to $1,911,093, which have accumulated from subscriptions and entrance fees as well as from the profits made on the banking business. The subscriptions, the so-called Järnkontorsdalern, are still fixed at 2½ öre ($0.0067) per centner (93.7 pounds) of the originally registered output. No dividends are paid to the partners, but the profits obtained, when not required for technical purposes, are added to the funds. The expenditures for 1910 amounted to $139,360 and the income for the same year was $149,276.

The technical and scientific advancement of the iron industry is effected in several ways. A staff of technical specialists is employed, who give advice to members and to the industry in general and make propositions in the iron industry and kindred trades. At present six engineers, one head engineer, and two ironmasters are employed. Three of the engineers specialize in metallurgy, one specializes in matters regarding charcoal and the dry distillation of wood, another makes a special study of peat-moss litter and of electricity in the iron industry, and another is employed chiefly for mechanical engineering.

Yearly grants are made by the Järnkontoret for experiments in the iron industry, to mining schools, and to technical laboratories at home and abroad. Geological researches and technical papers and periodicals are also supported and grants are voted toward the cost of representing the Swedish iron industry at exhibitions at home and abroad. The Järnkontoret granted $67,000 for the establishment at Trollhattan of the experimental works for electric iron-ore smelting.

By means of yearly stipends opportunities are offered to students leaving the mining schools to gain further experience, preferably practical, in the mining industry, and financial support is given to engineers possessing a thorough practical knowledge of the Swedish mining industry in order to enable them to obtain foreign experience. In recent years sums have also been voted toward the expenses of workmen traveling to gain experience, and sums are granted every year for the protection of Swedish iron brands abroad. Since 1817 the Järnkontoret has issued a periodical, Järnkontorets Annaler, which is one of the oldest metallurgical papers in existence.

German Patent Law Practice

An important change has been made in German patent law practice in regard to the obligation of patentees to work the inventions covered by their patents. Hitherto the owner of a German patent was liable to have his monopoly withdrawn if it could be proved against him that he had failed to take adequate steps to bring his invention into practice within three years of the publication of the grant. The law, however, was seldom rigidly interpreted, and it was usually considered sufficient if the patentee announced his willingness by advertisement or otherwise to grant licences on reasonable terms.

Under the law, which went into effect July 1, a German patent can no longer be revoked on the sole ground that it is not being worked, but only if the working is being effected either exclusively or principally outside the German Empire or its colonies. The new act is subject to existing international treaties, and the agreement made between Germany and the United States in 1909 exonerates American owners of German patents from working the same. It is, however, expressly stipulated that the owner of a German patent cannot escape his obligations by temporarily assigning his rights to a citizen of the United States for example. A fictitious transfer of the patent without an actual and bona fide assignment of the property rights will not save the patent from revocation.

Gary, Ind., was five years old July 14. On that date, in 1906, 43 voters organized a town government, with Thomas E. Knotts as president. He has been at the head of the municipal government ever since; of recent years as mayor. The only buildings in Gary at the time of the first election were a schoolhouse, a jail, a post-office, town hall and a cottage used by the United States Steel Corporation for offices. The residents lived in tents and shacks.

Electric Power Cost

A Year's Record for Generating Power at the Colliery Mouth

Average Yearly Cost Per Kw.-Hour, 0.877 Cent.

Plans are under consideration by several large industrial companies, in Pennsylvania and in a number of Western States, for the erection of central power distributing stations in the immediate vicinity of collieries, electric current from which will be transmitted to plants at a distance. The idea is to utilize fuel which is now virtually waste, as it will not pay for transportation.

As a practical illustration of what can be accomplished in the economical generation of electric power, the accompanying record of a year's run will be of interest. It was obtained from the engineer in charge.

Annual Operating Cost of Power Plant for Railroad Shops, with Situation Equivalent to Location at Colliery Mouth. All Items Reduced to Kw-Hour Basis.

	Jan.	Feb.	Mar.	April.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
Total, kw. hrs.	271,110	239,827	221,710	177,135	177,910	172,025	195,691	208,561	183,252	176,892	168,885	250,065
Electric, kw. hrs	178,410	143,755	125,060	90,885	84,835	82,325	83,980	90,100	85,850	90,440	96,455	140,965
Compressed air, kw. hrs.	48,750	55,020	50,625	46,873	50,550	48,750	68,436	75,936	58,500	46,452	43,500	52,500
Hydraulic, kw. hrs.	21,450	20,052	22,275	20,625	22,275	21,450	22,273	22,275	20,377	19,950	18,480	18,000
Hammer line, kw. hrs.	19,500	18,000	20,250	18,750	20,250	19,500	21,000	20,250	18,525	17,550	22,400	18,600
Steam heat, kw. hrs	3,000	3,000	3,500	.....	.....	.....	.....	.....	.....	2,000	18,000	20,000
Coal consumed, tons	2,004	1,766	1,243.6	1,078.4	983.6	905.25	911.6	981.25	1,008.6	1,070.75	1,408	2,053
Coal per kw. hr., lbs.	14.78	14.72	11.21	12.17	11.05	10.52	9.3	9.41	11	12.14	14.16	16.41
Cost of coal, kw. hr.	0.59c	0.58c.	0.448c.	0.487c.	0.442c.	0.4209c.	0.37c.	0.376c.	0.4403c	0.485c.	0.566c.	0.656c.
Cost of labor, kw. hr.	0.2726	0.3069	0.3375	0.3886	0.3905	0.4033	0.3574	0.3043	[illegible]	0.408	0.4028	0.321
Cost general supplies, kw. hr.	0.0294	0.0331	0.0315	0.0394	0.0365	0.0377	0.0306	0.0287	0.0354	0.029	0.0352	0.0295
Total cost per kw. hr.	0.8938	0.92	0.817	0.915	0.869	0.8619	0.758	0.709	0.8293	0.922	1.004	1.026

This record was made at a plant of 2000 hp. capacity operated in behalf of a leading railroad company which is, or has been, interested in coal mining; and the cost of the fuel at the mouth of the colliery was only 30 cents per ton, the cheapest grade of slack being utilized.

The plant cost $250,000 to build, and for fixed charges, including depreciation, 13 per cent. on this amount was figured, in addition to the operating cost shown by the table. The average yearly cost per kw.-hour was 0.877c.

The equipment in service was of the best, including return tubular boilers, chain grate stokers and cross-compound non-condensing engines. The load factor, however, was very poor, as the plant was designed for repair shop service, and a large part of the energy of the steam had to be diverted to air-compressor, hydraulic and steam hammer work, as well as heating in winter. Therefore, even with the good showing made, it compares unfavorably with what could be accomplished in the operation of a much larger plant, the service conditions of which have been worked out along the lines usual in modern central station practice. It would seem as though such plants might be made to pay as well as hydro-electric propositions, while giving the benefit of power at low cost to numerous metal-working establishments and other industries commonly located not far from the principal coal mines.

A Historic Kentucky Mill Dismantled

Probably the oldest ironworking plant in Kentucky has been dismantled after having been inactive for the past 30 years. It is a rolling mill located in Lyon County, about 10 miles from Eddyville on the Cumberland River. Built originally in 1846, it saw long service before the Civil War, and later was taken over and operated for a considerable period by the late Louis P. Ewald, of Louisville.

The Ewald Iron Company, which was organized following the death of Mr. Ewald, decided recently to dismantle the property because of the fact that the local tax officials wanted to assess it as an operating plant. During Mr. Ewald's life it was allowed to remain by him largely for sentimental reasons, as he discontinued its operation shortly after concentrating his work in Louisville.

The old mill had a peculiar location, but one which will be readily appreciated when the situation is considered. In the first place, since charcoal was used in its operations, it was necessary to be close to a large timber supply, and the fact that the plant stood for years in the center of a thickly wooded region emphasized this feature of the location. Raw material was also plentiful, as there were then and still are active charcoal blast furnaces in Trigg County, Kentucky. As far as the operating end of the business was concerned the location was good.

The river furnished the only mode of transportation. In equipping the plant originally, the machinery was floated down the Ohio River from Pittsburgh and then up the Cumberland in a vessel of lighter draft. In turn, the bars turned out by the mill were marketed by means of the steamers which plied up and down the Cumberland. A fine harbor, formed by nature, was immediately at hand, a deep pool being formed between the island and the shore, and a double tramway was built to carry cars from the mill down to the boats.

In spite of the fact that time and the elements had had full sway and that no effort had been made to protect the equipment from their attacks, a few pieces of machinery were discovered in the work of dismantling which could be used, and these may be installed in the plant of the Ewald Iron Company, in Louisville. Though the mill was built 65 years ago, the equipment was largely such as one would find in a rolling mill today, with the exception that the specialized machines which are in use now had not been constructed then. The mill represented what might be called the primary type of rolling mill, and was an excellent example of it.

The equipment consisted of 6 single puddling furnaces, 13 knobbling fires, 6 heating furnaces, 3 trains of rolls and 1 hammer, the capacity of the plant being 3600 gross tons per annum. Before Mr. Ewald took the plant over it was known as the Tennessee Rolling Works. Later it was usually referred to simply as the Ewald plant.

While in active operation, the mill produced a large amount of railroad material, and it was said that Mr. Ewald made his greatest success in the manufacture of this product. During the time that he operated the Louisville mill he specialized in bars for use in locomotive building and other railroad construction.

Most of the material in the old mill was broken up before being loaded into a barge and floated down the Cumberland River to the Ohio. Altogether there is about 500 tons. Practically all of it, with the exception of the few pieces which were taken out whole, will be sold in the Louisville market for scrap, thus removing the last vestige of what was a fine example of the iron plant of antebellum days.

A New Iron and Steel Jobbing House in Cleveland.—A new jobbing concern has been formed in Cleveland, Ohio, under the name of the Betz-Pierce Company. The company is an Ohio corporation with a paid up capital stock of $40,000, and has established a warehouse and office at 2234 to 2240 East Ninth street. It will sell the crucible and high-grade open-hearth steels of the Colonial Steel Company, Pittsburgh; cold-rolled strip steel, high-grade sheets, Jones & Laughlin screw stock and shafting, wrought iron pipe made by the Reading Iron Company, Norway iron, Menaca polished drill rods and other products. Arthur B. Betz is president; Clifford E. Pierce, vice-president; T. L. Philpott, secretary and treasurer. The officers and J. B. Finley of Pittsburgh and James A Farrell of Cleveland comprise the board of directors. This company was organized as a result of the selling out of the Bassett-Presley Company to the Carnegie Steel Company. Mr. Betz had been connected with the Bassett-Pressley Company 20 years, the greater portion of that time representing the company as city salesman. Mr. Pierce had been with the same company 15 years, the greater portion of that time being assistant sales manager.

Otis & Squires, the Pacific coast agents of the Cutler-Hammer Mfg. Company, Milwaukee, Wis., have established a branch office in Portland, Ore. This office, which is in charge of G. L. Priest, is located at 220 Sherlock Building.

Welds by Different Methods

A paper on iron and steel welds made in various ways, compiling an extended series of microphotographs of sections through the welds, was contributed to the Iron and Steel Institute meeting some weeks ago in London by Edward F. Law, William H. Merrett and W. Pollard Digby. Studies were made of resistance welds, hot-flame welds with acetylene and water-gas and thermit welds.

Resistance Welds

The authors' investigation of resistance welds in steel commenced with some 1½-in. round bars and some 2½ x 2-in. rectangular bars, which had been welded together with plain butt joints. The welds generally may not be regarded as perfect from the point of view of fusion, but as showing traces of oxidation along the track of the weld. Two examples of resistance welds of wrought iron may be cited as typical of average practice. On etching, these showed in each case a line of oxidation at the point of juncture with large crystallization in the neighborhood of the weld.

Welds with Acetylene and Water Gas

With examples of acetylene welding the average tensile strength was 24.14 tons and the average elastic limits 17.01 tons, both fairly good. On the other hand, the low elongation and percentage reduction of area which accompany the crystalline fracture of two of the results indicate that in addition to working some further heat treatment was requisite. The authors would regard this process as a good filling method say for cavities in castings, but could not recommend it seriously for cases where mechanical strength is of prime importance.

The average tensile strengths and elastic limits of 21.47 tons and 14.69 tons respectively obtained with water-gas flame welds are lower than the results for plain butt-welded joints with acetylene-flame heating. On the other hand, whereas two of the four acetylene welds broke at the weld, only one of the four water-gas welds broke there. The elongation is much better, averaging 16.64 per cent., and the reduction of area at point of fracture is decidedly good.

For a long time certain consulting engineers have rigidly set their faces against the employment of welded flanges on steam pipes, preferring instead screwed and riveted flanges. Two cases (one a coke fire and the other an arc weld) coming before the authors, serve both to confirm and to illustrate the underlying soundness of this view. A welded pipe flange may be obviously mechanically imperfect, or may be superficially perfect and capable of passing hydraulic pressure tests. In this latter condition ignorance as to its internal condition produces a peace of mind which knowledge is liable to destroy.

Conclusion

No matter what the process is by which two metals are welded together, there must always be an area, more or less sharply defined, of altered molecular construction. Just as quenching and annealing alter steel in a manner which is quite unmistakable to those acquainted with the microstructure of steel, so it is obvious that the local heating to the high temperatures required for mechanically satisfactory welds leaves its impress upon the steel in a manner as unmistakable as the sodium band in the spectrum. The authors have shown that each of the methods to which they have referred has its own hallmark. For instance, on polishing and etching alone it is possible to say whether an electric weld has been made by an arc or by a resistance method; while, without annealing to restore the original structure, acetylene and water-gas welds have each their own marked characteristics.

Resistance welds are seemingly least prone (with the exception, perhaps, of acetylene welds) to oxidation, but the extrusion of the metal renders good working, while the metal is still plastic, of supreme importance. Arc welds are most prone to oxidation, and many will hesitate to rely upon such a process in those positions where corrosion is likely to occur. Where the welded metal is not likely to be subjected to corrosion the excellent fusion of the metal renders it commendable.

Flame welds, apart from such work as patching up castings, should receive adequate working and manipulation while in their heated condition. Of the two methods investigated, water-gas welds may be abnormal through the use of oxidizing flames, while acetylene welds certainly require annealing to break down the crystalline structure in the vicinity of the weld.

Old Copper and Brass Specifications

The following specifications for old copper and brass have been furnished by one of the most prominent dealers in old metals in New York City:

Copper, Heavy, Cut and Crucible.—This shall consist of any copper not less than 1/16 in. thick, free from foreign substances, except that a small percentage may have solder marks on it, but no lumps of solder, and shall be cut up in pieces about 5 in. wide and 10 in. long. This shall be the maximum size. If cut up in small pieces it will be considered crucible copper. This description applies also to uncrucible heavy copper, except as to its being cut up in pieces.

Copper Wire.—It shall be free from all insulation and from hair wire; also from other metals, such as brass and solder, and from other foreign substances.

Light Copper and Bottoms.—These shall consist of the bottoms of tea kettles, wash boilers, and hot water boilers.

Heavy Brass.—This material shall consist of any solid pieces of brass small enough to go into a 6-in. opening. The approximate mixture of this is 65 per cent. copper and 35 per cent. spelter. This, of course, varies; sometimes copper is a little lower, but it is usually higher. It shall be free from iron and other foreign substances.

Light Brass.—It shall consist of material like lamp tops, and may have a small percentage of iron that is not easily removed. It may also have some traces of solder on it, but not very much.

Heavy Machine Composition.—This is sometimes called red brass, and shall consist of metal that contains a greater or less percentage of tin, and is usually about 80 per cent. copper with a small percentage, sometimes, of lead and zinc. The best grade of composition is composed of copper, tin and a small percentage of spelter, but it is still composition if it has a larger percentage of spelter and a small percentage of lead. But it must always contain not less than 5 or 6 per cent. of tin; the smaller the percentage of tin, the less valuable it is. It is marketable in any form, but has greater value if in pieces that are small enough to go into a 6-in. opening. Steam valves and similar articles, also engine bearings, come under the head of composition.

The automobile testing laboratory forming a conspicuous part of the clubhouse of the Automobile Club of America, on Fifty-fourth street, near Broadway, New York City, has been made the subject of a generously illustrated pamphlet of 32 pages which can, doubtless, be had for the asking on the part of those interested in having tests made of automobile appliances or suggestions given regarding new equipment. The work of testing is in charge of a technical committee and apparatus is available for all interested in making scientific investigations of complete power units, carburetors, ignition devices and transmission devices. The pamphlet gives a very good idea of the dynamometer for determining the power of the automobile engine. Both certified and non-certified tests are made, and the pamphlet gives the rules in this connection.

The American membership in the International Association for Testing Materials, as compiled for the meeting of the council held in Munich, Germany, March 18, numbers 465 out of a total of 2508, with Germany next in numerical strength with 399, and Russia, Austria, France, Denmark and Great Britain in the order named, with membership of 293, 220, 198, 170 and 140 respectively.

Papers for the testing materials congress to be held in the United States during the first half of September, 1912, in Washington and New York, are announced already in a few instances in the proceedings of the International Association for Testing Materials. They include one on the methods of testing cast iron by Dr. Richard Moldenke; one on hardness tests by Dr. Bradley Stoughton, and one on fireproof structures by Ira H. Woolson, New York.

Judicial Decisions of Interest to Manufacturers

ABSTRACTED BY A. L. H. STREET.

Liability for Injury to Employee Caused by Defective Maul.—While an employer must use reasonable care to provide suitable tools for his workmen and renew them when they become defective, an employer who furnished a competent machinist to recast new mauls when workmen called for them, and who furnished proper material for making the mauls, discharged his duty to the men and is not liable for injury to one workman caused by a particle flying from a maul used by another. (Massachusetts Supreme Judicial Court, Cunningham vs. Blake & Knowles Steam Pump Works, 94 Northeastern Reporter 450.)

Risks of Injury Assumed by Workman.—A pipe cutter and fitter assumed the risks of injury ordinarily arising in such employment, but he did not assume risks of the more hazardous employment of repairing an elevator, they being unknown to him. (Nebraska Supreme Court, Van Horn vs. Cooper & Cole Brothers, 130 Northwestern Reporter 567.)

Liability for Injury to Employee in Unloading Boiler.—An employer is liable for injury to an employee caused by a boiler rolling upon him while he was assisting in unloading it if the employer knew or ought to have known that the method of unloading adopted was dangerous and the employee did not have such knowledge or equal means of acquiring it. (Kentucky Court of Appeals, See vs. Leidecker, 135 Southwestern Reporter 284.)

Right to Rely on Employer's Assurance of Safety.—An employer's assurance to an employee that an appliance is safe does not preclude the former from afterward claiming that the latter assumed the risk of being injured through a defect in the appliance, if the risk was actually known and comprehended by the employee. (Pennsylvania Supreme Court, Herron vs. American Steel & Wire Company, 79 Atlantic Reporter 228.)

Employee's Violation of Rules as Contributory Negligence—Duty to Warn Inexperienced Employees.—An employee cannot recover for injury resulting from his violation of a known and reasonable rule prescribed for his protection. An employer's duty to warn his workmen against dangers incident to their employment is stricter where the workman is a minor than when he is an adult, depending upon the age, experience and intelligence of the particular employee. (Alabama Supreme Court, Lewis vs. Woodward Iron Company, 54 Southern Reporter 566.)

Termination of Employment Contract.—An employee cannot be held liable as for breach of his contract of employment by quitting, if no definite term of employment has been agreed upon. (New York Supreme Court, First Appellate Division, Murphy vs. Lindstedt, 127 New York Supplement 609.)

Assumption of Risks by Laborers.—A common laborer engaged in hazardous employment assumes the risk of injury arising from the nature of his work. (Georgia Court of Appeals, Johnson vs. Alabama & Georgia Iron Company, 70 Southeastern Reporter 156.)

Liability for Injury Caused by Leaving Elevator Door Open.—An employer is not liable for injury to an employee caused by a pipe rolling through a door into an elevator shaft left partly open by another employee. (New York Supreme Court, Second Appellate Division, Deebach vs. Robert Gair Company, 127 New York Supplement 984.)

Liability for Injury Caused by Defective Tools.—An employer is not liable for injury to a workman caused by a defective tool, if it is of simple construction and was safe when placed in the latter's hands or in the hands of a fellow employee, unless the employer had actual knowledge of the defect. There is no duty resting on an employer to inspect such tools while they are in the workman's possession. A workman cannot complain of his employer's failure to inspect a tool if he negligently uses a defective tool when a safe one is at hand. (Indiana Appellate Court, Nachand vs. American Car & Foundry Company, 93 Northeastern Reporter 1083.)

Negligence of Injured Workmen.—"Due care," within the provision of a Massachusetts statute that an employee can recover for personal injury caused by certain defective conditions, if he was exercising due care, means that degree of care which an ordinarily prudent man would use in the same circumstances. It cannot be said as a matter of law that an operator of a casting-cleaning machine was guilty of contributory negligence, barring recovery for injury received by him, because he placed a stick between the cogs of two wheels to stop the machine, where he did it at the direction of his superintendent after an unsuccessful effort had been made to make the friction clutch work. (Massachusetts Supreme Judicial Court, Curren vs. Magee Furnace Company, 94 Northeastern Reporter 399.)

When No Implied Warranty Arises Under a Contract of Sale.—Notwithstanding the fact that the seller of an article knows it is bought for a particular purpose there is no implied warranty by him of its fitness for that purpose, if the buyer has inspected the article and procured what he contracted for. (West Virginia Supreme Court of Appeals, Erie City Iron Works vs. Miller Supply Company, 70 Southeastern Reporter 125.)

Place of Delivery of Articles Sold.—If a contract for a sale of articles did not provide where they were to be delivered, and the seller offered to deliver them at the buyer's place of business, and the buyer declined that offer the seller was not bound to actually carry the articles there. (Georgia Court of Appeals, W. M. Scott & Co. vs. Atlanta Wood & Iron Novelty Works, 70 Southeastern Reporter 142.)

Failure to Inspect Supporting Rope as Negligence.—That a rope used to support one corner of a platform upon which an employee was required to stand had not been inspected for a year warranted a finding of negligence of the employer in a suit for injury to the employee, caused by the rope breaking. (United States Circuit Court of Appeals, Third Circuit; American Steel & Wire Company vs. Tynan; 183 Federal Reporter 949.)

Necessity for Instructing Workmen Concerning Dangers.—It is actionable negligence to set a blacksmith at work heating a hollow piston head without instructing him to make a vent therein to permit escape of steam which is likely to be generated in the interior and otherwise cause an explosion. (United States Circuit Court of Appeals, Second Circuit; Klauder-Weldon Dyeing Machine Company vs. Gagnon, 183 Federal Reporter 962.)

Excessiveness of Recovery for Injury to Employee.—The sum of $7,000 is not excessive recovery for injury to an employee injured in an explosion, where he was badly burned and disfigured, his suffering was prolonged, his hand permanently disabled and his earning power reduced from $100 a month to laborer's wages. (Washington Supreme Court; Mrozevich vs. Western Steel Corporation, 112 Pacific Reporter 925.)

Employer's Duty to Workmen.—One is not an insurer of the safety of his employees, being merely bound to use due care for their safety. (New York Supreme Court, Appellate Term; Dean vs. Terry & Tench Company, 127 New York Supplement 305.)

Necessity for Notice of Injury to Employee.—The New York employers' liability act cannot be invoked by an employee suing for personal injury where no sufficient notice of the injury has been given. (New York Supreme Court, Second Appellate Division; Sullivan vs. Schweinler, 127 New York Supplement 290.)

Scope of Duty to Guard Dangerous Machinery.—The New York statute which requires dangerous machinery to be guarded requires guards against such dangers as ordinary prudence suggests, and is intended not only to protect the operators of such machinery but to guard all who are required to come near it. (New York Supreme Court, Kings County; Hartman vs. Berlin & Jones Envelope Company, 127 New York Supplement 187.)

Sufficiency of Proof of Shipment of Articles Sold.—Where the buyer of articles shipped to him defends suit for part of the price, on the ground that some of the articles were not shipped, it should show otherwise than by the bill of lading, that all of the articles were delivered to the carrier, where the bill of lading makes no further reference to the character or identity of the articles than the approximate weight of the shipment as a whole. (Georgia Court of Appeals, Edward K. Tryon Company vs. Hutchinson Lumber & Supply Company, 70 Southeastern Reporter 87.)

Rights in Dealing with Agents.—Persons dealing with a general agent are entitled to assume that his authority to deal with them continues until notice of revocation of the authority is given expressly or impliedly. (Georgia Court of Appeals, Bazemoore vs. A. B. Small Company, 70 Southeastern Reporter 261.)

Necessity for Compliance with Foreign Corporations Act.—It is immaterial that a foreign corporation suing in Pennsylvania on a contract made and to be performed in another State has not complied with the Pennsylvania foreign corporations act. (United States Circuit Court, Eastern District of Pennsylvania, Sloss-Sheffield Steel & Iron Company vs. Tacony Iron Company, 183 Federal Reporter 645.

The Iron and Steel Institute's Turin Meeting

For the autumn meeting of the Iron and Steel Institute at Turin, Italy, October 2 and 3, 1911, the provisional list of papers expected to be submitted for reading is as follows:

"Report on the Mineral Resources of Italy." By various authors.
"The Autogenous Welding of Metals." By Dr. Francesco Carnevali, Turin.
"The Application of Electrical Energy to the Manufacture of Iron and Steel in Italy." By Cav. Ing. Remo Catani.
"The Present State of the Iron and Steel Industries of Italy." By Signor Comm. Luigi Dompe and Cav. Francesco Saverio Pucci.
"New Industrial Processes for the Cementation of Steel." By Cav. Prof. Dr. Federico Giolitti.
"Cementation with Gas under Pressure." By Prof. Dr. F. Giolitti and Dr. Francesco Carnevali.
"The Transformation of Steel within the Limits of Temperature Employed for Heat Treatment." By Louis Grenet, Argenteuil, France.
"Basic Slag." By V. Adolphe Kroll, Jr., Frankfort-am-Main.
"The Use of Titanium in Iron and Steel." By C. V. Slocum, Pittsburgh.
"The Physico-Chemical Properties of Slags." By Prof. J. H. L. Vogt, Christiania.

The programme for the morning of October 2 provides for a welcome to the members by the civic authorities of Turin, the Chamber of Commerce, the Local Reception Committee, and the Reception Committee of the Associazione fra gli Industriali Metallurgici Italiani, in the Grand Hall of the Chamber of Commerce. After the reception, the Carnegie gold medal for research (1910) will be presented to M. Felix Robin, of Paris, and a selection of papers will be read and discussed. The afternoon will be passed in a visit to the Exposition. In the evening a reception will be held by the Chamber of Commerce at the Exchange, 28 Via Ospedale.

The morning of the next day will be devoted to the reading and discussion of papers; the afternoon to visits to places of interest in Turin and to the Fabbrica Italiana di Automobili di Torino (F.I.A.T. Company, Ltd.), and the evening to a reception by the Municipal Corporation of Turin.

A tour in Italy has been arranged, which includes visits to plants as follows: Savona, by invitation of the Societa Siderurgica di Savona; Naples, the Ilva Company (blast furnaces and steel works); Terni, Societa degli Alti Forni, Fonderie ed Acciaierie di Terni. A special excursion will be made to the Island of Elba to visit the iron mines, October 6 and 7.

Steel Derricks and Drilling Rigs

A booklet entitled "Steel Derricks and Drilling Rigs for Oil, Gas, Salt and Other Wells, Mineral Exploration Work, etc.," is published in its third edition by the Carnegie Steel Company, Pittsburgh, Pa. It is the last word on the subject, which is handled in so comprehensive a manner that the contents must possess great value to those who are interested in this class of equipment. The derricks described are of structural steel and have as the principal improvement the reduction of the hight of the panels to permit erection without any special equipment in the way of scaffolding, together with the reproduction in steel, as far as possible, of the identical features in wooden construction which have been approved by long years of use.

Three types of derrick are illustrated and described—the Woodworth Standard, the Woodworth Oklahoma and the Yorke Standard—each of which has its respective advantages. They are alike in the use of structural steel angles for the legs, in the arrangement of crown blocks and the make-up of ladders. The Woodworth Standard and the Yorke Standard have diagonal bracing of structural steel angles, while in the Woodworth Oklahoma this bracing is made of round rods. The Woodworth derricks are put together with bolts which must be put in and taken out in the process of erection and removal, whereas in the Yorke Standard the bolts are simply loosened and remain in place. The volume goes into minute details of the construction of the several types with full specifications for the complete drilling rig, including line drawings, which should make easy the installation of the apparatus in the field.

The Carnegie Steel Company last week blew in two additional blast furnaces at its Ohio works, Youngstown, Ohio, which gives it five active furnaces out of six stacks in that group.

Softening Water on a Large Scale

A cheap and effective means of softening hard water has recently come into use in Germany on a large scale, according to the Engineer. The peculiar property of zeolites—which are generally composed of varying quantities of silica, alumina, lime, soda, potash and water—whereby they can exchange their bases for others, enables them to be utilized as softening agents, and when hard water filters slowly through layers of them the lime in the water changes place with the soda in the zeolites.

In Germany there is now being produced an artificial zeolite of a uniform composition, the action of which on water is more certain. Permutit, as this substance is called, is prepared by fusing together feldspar, kaolin, clay and soda in fixed proportions, lixiviating the product in hot water and collecting the residue. In use as a softener a period must arrive when all the soda in it has been given up and when, of course, its action ceases. It can then be easily regenerated with common salt simply by washing it thoroughly with soft water and allowing a salt solution of 10 per cent. strength to flow through it for four or five hours; the layer of brine is then kept standing on the surface for another four or five hours. In the regeneration process the soda of the sodium chloride replaces the lime in the permutit and becomes converted into calcium chloride, which passes away in solution in the regeneration water.

Permutit, it is said, is capable of reducing hardness from 53 deg. to 3.7 deg. It suffers no apparent loss in working and can be kept in use for very long periods with regeneration every four days or so. In appearance, when in a moist condition, it is of a granular, flaky form with a luster resembling mother-of-pearl. It is of very porous texture and when dry can absorb 50 per cent. of water.

The Peterson Engineering Company, New York and Chicago, has taken over the exclusive sale of the Imperial elevator guide lubricant from the American Engineering & Mfg. Company, Philadelphia, Pa., its former manufacturer. This device will be known in the future as the Economy elevator guide lubricator and it is claimed that recent improvements in it enable an economy of from 10 to 15 per cent. to be effected in the power consumed by the elevators due to thorough lubrication of the guides. Other advantages claimed are reduction in fire hazard, increased lifting capacity of the elevator, a marked reduction in the oil and grease consumed and the elimination of the danger to life and limb necessitated by the old method of hand swabbing the guides from the top of the car.

The Armor Steel Foundry Company, Winton Place, Cincinnati, successor to the Steel Foundry Company of the same place, and the Armor Steel Foundry Company of Matthews, Ind., announces that it has about completed all contemplated alterations and additions to the plant. Among the additions is the installation of a side-blow converter and cupola, which will better enable small casting to be made for automobile and tool manufactures. The company is prepared to make castings up to 10 tons, either of basic or acid open-hearth or converter steel. Its staff of mechanics and metallurgists of high standing is competent to make steel castings of any desired alloy (manganese, chrome, titanium or nickel) or by the Gebhard process of surface hardening, which is its specialty.

The W. A. Rowe Vehicle & Machinery Company, 1105 Garrison street, Fort Smith, Ark., has been incorporated to carry on a wholesale and retail machinery and vehicle business and to act as a manufacturers' agent along these lines. The company is especially interested in gasoline engines, small milling machinery, well drills and vehicles. It reports that conditions in its territory for corn are for half a crop, but that cotton never looked better and recent rains cause everyone to look for a good fall business.

A. P. Munning and W. L. Loeb announce the establishment of the Munning-Loeb Company, with main offices and works at Matapan, N. J., for the manufacture and design of electroplating and buffing equipment and supplies. The products include anodes, brushes, buffs, chemicals, compositions, dynamos, lathes, nickel salts, rouges and tanks.

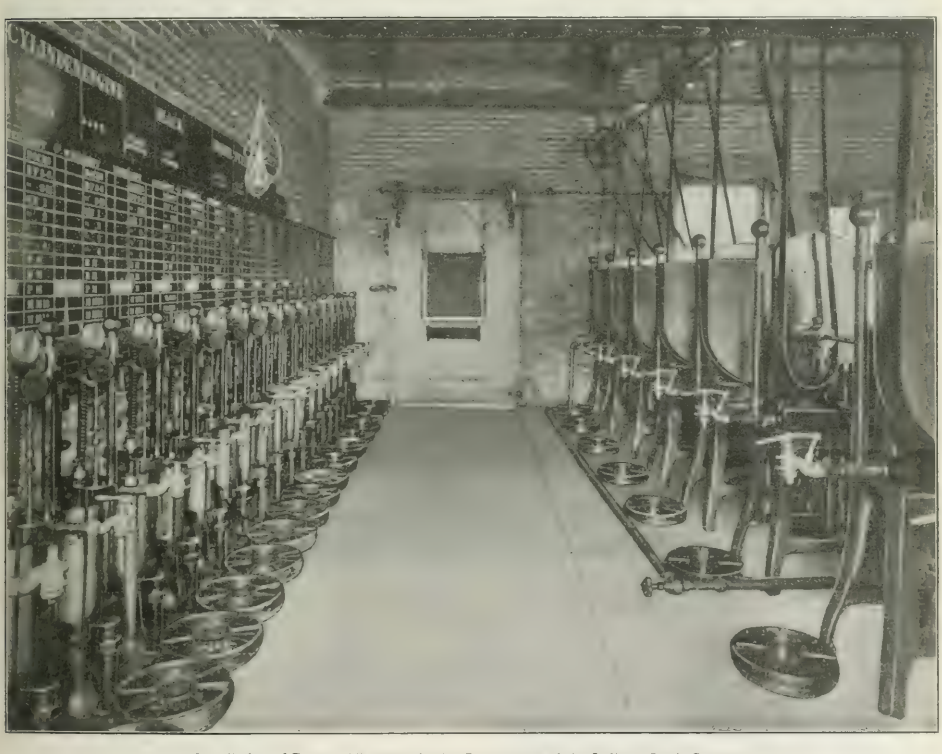
The Oil Pump House at Gary

As in all other departments of the Gary plant of the Indiana Steel Company, completeness of detail and provision for greatest economy have been incorporated in the oil pump house. This minor portion of the plant, though insignificant in a way, is none the less interesting. The accompanying illustration presents a view of the interior. The proper storage of oil involves provision for at least three essential features as embodied in this installation: 1. The retention of the original strength and purity of the oil. 2. The prevention of contamination with foreign substances, particularly with regard to lubricating oils. 3. The elimination of waste in measuring, loss of time in handling and the convenience of location. The second point is especially important with reference to the carbonizing of oil in bearings, the absence of which contributes materially to free-running bearings.

The equipment consists of 21 tanks, with a combined capacity of 127,000 gal., including eight tanks of 15,000 gal. each, 12 tanks of 5000-gal. capacity each, and one 1000-gal. tank for gasoline. To these tanks are attached 21 standard long distance self-measuring hand pumps and eight power pumps. The hand pumps serve for drawing oils, which rate can be increased for the lighter oils in proportion to their viscosity.

The eight large tanks are built of 5/16-in. soft tank steel and the smaller tanks of ¼-in. steel for the shells and 5/16 in. for the heads. Eighteen tanks are located in a concrete vault, a part of which serves as a foundation for the pump house. The remaining three tanks, including that for gasoline, are buried outside underground near the oil house. The underground tanks are filled through a "fill pipe," extending to the surface of the ground and terminating in a lock cap, so that the filling and venting of these tanks are done outside of the oil house. The large tanks in the concrete vault are filled from the pump house floor. The fill pipes are protected by a special metal fill box which is flush with the floor, thus permitting free traffic over the floor without injury to the pipes.

The system is so arranged that the oil can be emptied directly from tank cars into the storage tanks, which avoids handling and minimizes the hazards attendant thereto. The apparatus also provides a self-registering and accurate check on the receipt and consumption of the various oils, each pump being equipped with registering devices which record continuously the amount of oil



Installation of Bowser Oil Pumps in the Gary Works of the Indiana Steel Company.

oil or gasoline for use in the immediate vicinity of the pump house. The measuring device enables the operator to draw any predetermined quantity very accurately and without waste.

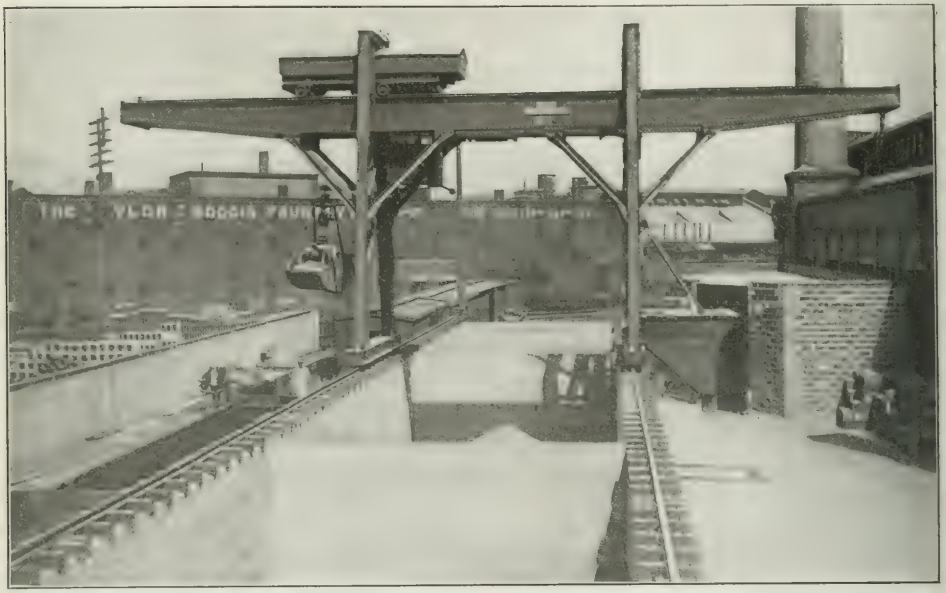
The power pumps are fitted with a pulley and are driven from a line shaft, which in turn is motor driven. These pumps are used for filling large containers or drawing oil in large quantities for whatever purpose desired. They are equipped with an arrangement which automatically registers any predetermined quantity for which they are set, and when that quantity is drawn the pump is immediately thrown out of gear. The indicator plate by which the operator sets the pump for the quantity of oil desired is placed on the front of the pump and will register up to 100,000 gal. These pumps will discharge an average of 10 gal. a minute of the heaviest drawn. The hand-pumps are fitted with locking devices so that the one in charge of the pump house can control the entire supply and be held responsible therefor. This installation was furnished complete by S. F. Bowser & Co., Inc., Fort Wayne, Ind., and handles 18 kinds of oil for the various requirements of the steel plant.

The Federal Grand Jury, New York, which investigated the American Smelting & Refining Company, has decided that the evidence was insufficient to sustain the charge of violating either the anti-trust or the interstate commerce laws. United States District Attorney Wise is reported as saying that the investigation has been closed and that the matter presented by order of Attorney General Wickersham has been dismissed by the grand jury.

Economical Sand and Stone Handling

What is said to be one of the fastest and most economical plants for handling stone, sand and gravel is located at the Wilson avenue yards of the Cleveland Builders' Supply Company, Cleveland, Ohio. This plant which was built and installed by the Cleveland Crane & Engineering Company, Wickliffe, Ohio, handles the material between the car and the storage bins or wagons or from the bins to the wagons with great speed and at very low cost.

The reason for installing this plant was that frequently contractors would demand immediate delivery of orders which might include six or eight wagon loads of stone or sand, a condition that it was almost impossible to meet with hand loading. The installation is of interest, therefore, because of its practicability. The essential part is a large reinforced concrete bin, measuring approximately 120 ft. in length, 30 ft. in width and about 15 ft. deep, divided into four compartments for assorting two grades of crushed rock and two grades of sand. On top of the two side walls of the bin are laid rails on which an electric 3-ton gantry crane equipped with a main trolley and a clamshell bucket travels. At each end of the gantry there is a cantilever, one projecting out over the cars on one side, while that at the opposite end projects over a hopper for loading the wagons, as shown at the right of the engraving. This hopper has a capacity of 3 cu. yd. and is attached to the gantry so that it is posible to load a wagon at any point along the side of the bin.



A Grab Bucket and Cantilever Gantry Crane for Handling Sand Installed by the Cleveland Crane & Engineering Company, Wickliffe, Ohio.

The savings effected by the installation are not alone in its ability to handle the stone and sand cheaply, but also to do it quickly, it being possible with this outfit to load six or eight wagons in less than 30 min. This enables the wagons to be released very soon after their arrival at the yard and it is possible for the same number of wagons to do a much larger amount of work, which, of course, cuts down the investment in horses, wagons and drivers, and results in handling the material at a lower cost. Previously the labor cost of unloading material from the car to the storage pile alone averaged $6 per car and the service was poor and somewhat irregular. With the crane equipment it is possible to unload six to eight cars per day without any difficulty and the services of only two men are required, one to operate the crane and the other to assist in filling the buckets when the cars are being unloaded. In most cases this material is handled twice, since it is first deposited in the bins, and then taken from them and loaded on the wagons.

The Steel Castings Trade at Chester, Pa.

Considerable irregularity is reported in trade conditions by steel casting manufacturers in the Chester, Pa., district, and the situation is on the whole unsatisfactory. Crucible steel casting makers are the exception, their plants running full time. The majority of the open-hearth plants have for some months not been exceeding 50 per cent. of their capacity, and, in a number of instances, have for some time been working nearer to one-third their normal rate. There is an absence of demand covering any large amount of castings, which would serve as a back log. Railroad work comes out only spasmodically. The foundries are therefore dependent, to a large extent, on the current demand, with the result that week to week operations frequently show quite a wide variation. As most of them are seeking business aggressively, competition is keen and prices suffer. Future conditions depend greatly on the railroad demand and, as there is not a great deal of business of this class being offered, the outlook for any marked betterment in the immediate future is not particularly promising.

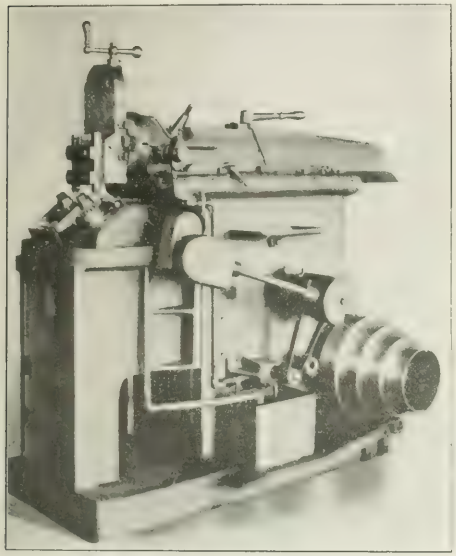
Correction.—The Foote-Burt Company, Cleveland, Ohio, corrects an error which was made in preparing the table in the article that appeared on page 163 of *The Iron Age* of July 20. The peripheral speed in feet per minute of the first item on the list, the 1¼-in. drill in cast iron, should be 188 ft. per minute instead of 163.6 ft.

The Coal Trade Bulletin, Pittsburgh, in its issue of July 1, published an interesting article on the School of Mines of the University of Pittsburgh. This institution is stated to be doing splendid work through the tireless efforts of Dr. M. E. Wadsworth, its dean, in developing technically trained young men for important responsibilities in mining. The school was established in 1895, and has become a potent factor in the development of the coal mining interests of western Pennsylvania. The summer term opened June 26 with a large attendance.

The Pittsburgh & Lake Erie Railroad Company, Pittsburgh, has broken ground for the erection of a car repair shop on Davis Island, near that city. Contracts placed call for a wood-working shop and stock house, 65 x 250 ft.; a paint shop, 30 x 70 ft., and smaller buildings. They are expected to be ready for operation the latter part of September.

Gould & Eberhardt Bevel Gear Roughing Shaper

In the manufacture of bevel gears there are two operations which are known as the roughing or stocking out and the finishing. The former consumes the greater part of the time required to complete the gear and if this operation is performed on the bevel gear planer, which is an expensive machine, the cost of the gear is very high. it is therefore apparent that the more economical way of making these gears is to rough them out on a roughing shaper and finish them in the regular way. This method would in no way impair the accuracy of the expensive finishing planer especially as the machine is relieved of the hard strains to which it is subjected in stocking out a gear. To enable this method of procedure to be



A 24-in. Shaper with Bevel Gear Roughing Attachment Built by Gould & Eberhardt, Newark, N. J.

followed, Gould & Eberhardt, Newark, N. J., have developed a bevel gear roughing shaper upon which patents are pending. This machine is designed to perform the roughing operation only and is especially adapted for roughing out automobile differential steel bevel gears which cannot be done in the ordinary simple disk cutter type of machine because of the projecting hubs on the cone or small end. These hubs interfere with the rotary cutter and prevent it from cutting the entire face of the gear. This new shaper operates at a speed of 100 cutting strokes per minute and is therefore very well adapted to that class of work. This large number of cutting strokes is made possible by the double train gear drive which in the case of this particular machine has been modified so as to allow one or two gear blanks to be held rigidly at the proper angle and indexed at every return stroke of the ram while the shaper head is fed down automatically at each stroke until the proper depth is reached. At this time the feed is disengaged automatically and the blanks are removed.

In general the construction follows that of the builders' standard high duty shaper which was illustrated in *The Iron Age*, March 4, 1909, but the regular crosshead slide and the table have been removed and a special workhead with an indexing mechanism substituted. This head can be arranged to cut either one or two gears at a time and is provided with means for holding the blanks rigidly in position and removing and replacing them when finished with new ones as well as lubricating the tools. The machine shown in the accompanying illustration is roughing out two nickel steel bevel gears having 20 teeth of 5/7 pitch simultaneously, the time required to complete the operation being 6 min. These gears have projecting hubs and to remove the chips accumulating in the groove between the projecting hub and the inner face of the gears, two hook tools are provided which are kept in this groove by spring tension and can be easily thrown out of position without removing the gear.

The indexing of the blank from one tooth to the next consecutive one takes place at every return stroke of the ram while the tool is clear of the work. In this way the indexing operation is positively controlled by the reciprocating motion of the ram and when the indexing is completed the work spindles are securely locked before the tool re-engages the work, thus insuring that the blank will be rigidly held while the cut is being taken. As the ram returns and the tool is out of the cut, the automatic vertical feed to the head takes place. This feed operates until a small trip dog located on the side of the head and controlling the depth to which the tool will feed disengages it.

The weight of the machine is 4300 lb. and its equipment includes an automatic oil pump, a large oil reservoir and a foot brake which acts on the driving pulley and will stop the shaper instantly.

Experiments on 0.2 Per Cent. Vanadium Steel

The influence of 0.2 per cent. vanadium on steels of varying carbon content was made the subject of a paper read before the Iron and Steel Institute some weeks ago, by Andrew McWilliam, assistant professor of metallurgy, and Ernest J. Barnes, associate in metallurgy of the University of Sheffield, England. The paper took up the physical characteristics of the series of steels, a thermal analysis of them and their microstructure.

Experiments were made to determine the strength, elastic limit, elongation and reduction in area of the steels as received and the steels after treatment. Specimens were normalized, by which is meant that they were heated to 900 deg. C for 30 min. and colled in air, and they were also annealed, and also quenched in water and tempered at various temperatures.

The steels as received showed an erratic nature as regards the yield point and also an extraordinarily high yield point and maximum stress as compared with the normalized steels. The decrease in maximum stress by normalizing was accompanied by an increase in elongation.

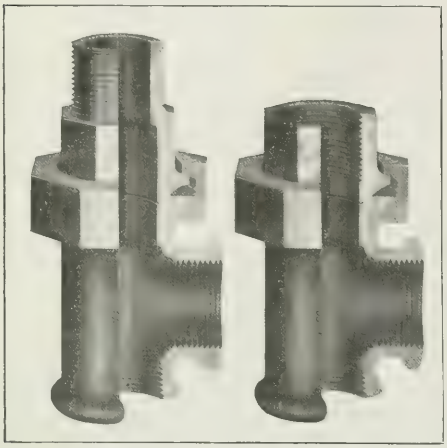
There is a general decrease noted in maximum stress in the steels with more than 0.98 per cent. carbon. With the specimens that were given heat treatment quenching in water and tempered at different temperatures, there was a regular increase in the yield point and maximum stress with increases in carbon up to the steel with 0.98 per cent. carbon.

The Atkinson-Frizelle Company is now the name of the old William H. Atkinson Company, the change having been approved by the stockholders and certified by the authorities of New Jersey on June 29. The following active officers constitute the present board of directors: Horace T. Frizelle, president; John Fuller, vice-president; William H. Atkinson, treasurer; Cleveland L. Frizelle, secretary; Charles L. Ballard, assistant treasurer. President Frizelle states that, notwithstanding the general relaxation of industrial activity, the business of the company for the past fiscal year shows an increase of over 50 per cent. The addition of new equipment and more scientific methods of production and systematic management have resulted in economies which warrant still further extensions of its facilities, which will be undertaken in due course. The company manufactures dredging machinery, buckets, forgings, structural steel and plate work, besides conducting a general machinist business and making marine repairs. The main office and works are in Hoboken, N. J., with a branch office at 50 Church street, New York.

The Brown Hoisting Machine Company, Cleveland, reports a good volume of orders in its locomotive crane department. This company has just received an order from the Algoma Steel Company, Sault Ste. Marie, for a bridge.

New Jefferson Union Tee

In addition to the regular union, the swinging union and the union elbows which were illustrated in *The Iron Age*, April 28 and September 1, 1910, and June 1, 1911,



Two New Types of Jefferson Union Tees Made by the Jefferson Union Company, Lexington, Mass.

respectively, the Jefferson Union Company, Lexington, Mass., is making a new fitting embodying the principles of its brass to iron seat and spherical ground joint. This new fitting is a tee which is made in two styles with either external or internal threads and with the union on either the outlet or the run and does away with three pipe joints and the accompanying expense.

The construction of this new fitting follows that of the other members of this line, malleable iron being employed for the body. The seat ring, which is of brass, is ground to make a ball joint, is seated in a channel cut in the iron and is set back out of the runway. Seamless tubing is used for this part, which is therefore free from the defects that it is claimed are frequently found in seats made from cast metal. The pipe ends are octagonal and Briggs standard taper pipe threads are used to insure tight joints. These threads are coated with graphite which prevents corrosion and renders it an easy matter to disconnect a fitting after long use.

Hydro-Pneumatic Radial Drill

A New Tool Possessing a Number of Special Features

The Walter H. Foster Company, 50 Church street, New York City, has recently placed on the market a new type of radial drill to which the name hydro-pneumatic has been given on account of the combination of these two means to feed the spindle. This feature together with the way in which power is applied to the tool are two special points about the drill and tend toward material economies both in operation and maintenance. As will be noticed from the engravings the principal point of difference between this new tool and the standard radial drills now on the market is the combination of the saddle which is located on the arm with a cylinder having a gearbox mounted on its upper end. Fig. 1 is a general view of the new tool, while Fig. 2 gives details of the head previously referred to and Fig. 3 shows the various positions of the valves for different operations.

The gearbox which is shown mounted on top of the cylinder in Figs. 1 and 2 contains the gears which furnish the necessary speed variation for the drill spindle in conjunction with an adjustable speed motor. Within this cylinder is an oil chamber which surrounds a second cylinder containing the spindle. A piston sliding in this cylinder is connected to the spindle that revolves within the piston and takes its thrust on ball bearings. The spindle drive is by an adjustable speed direct-current motor attached to the cylinder through a set of gears that provide two spindle speeds for each change in the speed of the motor which is shown at A, Fig. 2. The drum type controller B is of a new design with the resistance C for the various notches attached in a compact form and regulates the spindle rotation in either direction. When facing or tapping operations are being performed the movement of the spindle is controlled by a hand wheel. The high and the low speed gears in the gearbox which provide the spindle speed changes are controlled by a clutch operated by the lever D.

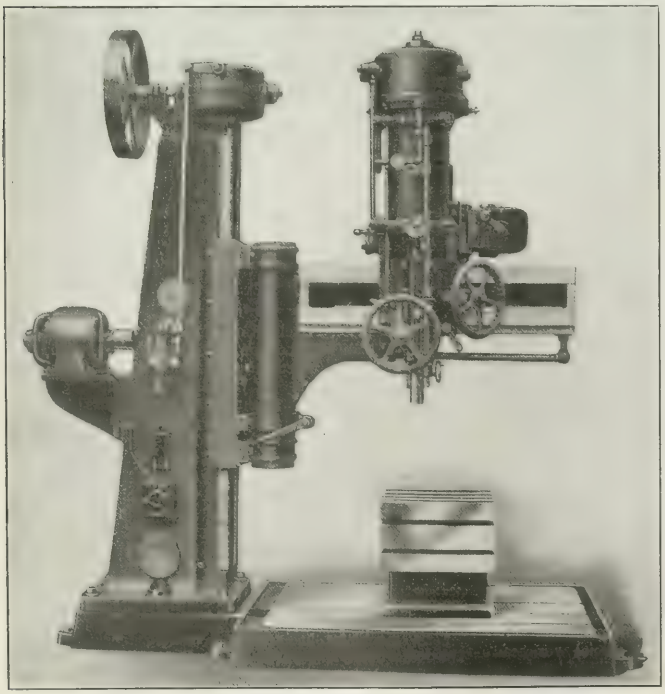


Fig. 1.—A Hydro-Pneumatic Radial Drill Built by the Walter H. Foster Company, New York City.

The feed is regulated by the valve E which has a graduated flat seat that regulates the passage of the oil from the cylinder to the surrounding oil chamber under an air pressure of 80 lb. This combination is said to give a steady feed to the spindle and also eliminates backlash with the consequent danger of the drill breaking when it strikes a hard spot or breaks through when a hole is completed. Whenever the resistance encountered by the drill point exceeds the pressure of the air upon the oil, the spindle merely revolves without feeding, thus insuring safety to the

drill at all times. As the air pressure on top of the piston in the cylinder forces the oil which is under the piston through the graduated ports in the valve seat the feed is constant at all times. A four-way valve, F, controls the passage of the air and determines whether the pressure shall be applied to the top of the piston which transmits this pressure to the oil that in turn is forced through the valve E and causes the spindle to be fed downward or whether the reverse operation shall take place and the air pressure be employed to force the oil back into the cylinder under the piston and raise the spindle. The air valve is operated by the vertical shaft G which carries adjustable trip dogs, HH. These dogs will swing out of the way when the spindle is operated by hand and not interfere with the tappet I which slides with the spindle as well as move out of the path of the stop without altering their position. An automatic device will shut off the air at any desired point and return the spindle to its original position.

The usual hand-operated rack and pinion which is controlled by the hand wheel M is provided for hand movement of the spindle. As the feed regulating valve is designed to confine the flow of the oil to a movement from the oil chamber to the space under the piston and vice versa, it became necessary to supply other communicating passages between these points that would not offer resistance to hand operation. A secondary oil valve of ample proportions which can be opened and closed at will together with an air by-pass having a valve at the top of the cylinder are provided for this purpose, the office of the latter being to open the cylinder and the chamber to the atmosphere. These valves which are indicated by J and K are controlled by the lever L through a connecting rod and permit the air and the oil to flow freely in either direction while the spindle is being operated by hand. The positions of these valves for different operations are shown in Fig. 3. When the spindle is to be operated by hand the air supply should first be shut off by turning the hand wheel M at the bottom of the spindle to save any waste of air. The four-way valve F is then closed and the by-pass valves J and K opened and the spindle can now be moved in either direction by hand. To change the control of the spindle from hand to automatic the valves J and K are closed and the four-way valve F opened. In making the changes from hand to automatic operation and vice versa it is not necessary to alter the position of the feed regulating valve except when it is desired to alter the rate of feed.

The adjustment of the head on the arm is controlled by the hand wheel N which rotates a spiral gear pinion

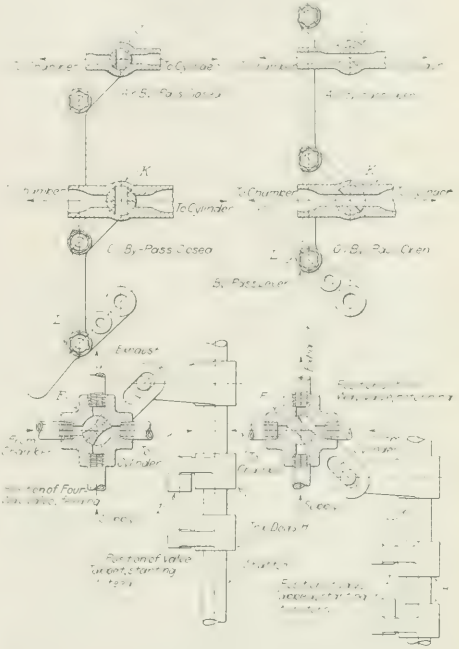


Fig. 3.—Diagram, Showing the Positions of the Valves for Different Operations.

that engages with a rack on the arm. A constant speed motor supplies the power required for raising and lowering the arm on the column but a tight and loose pulley can be substituted if desired. The oil pump which is bolted to the column is belt driven from the arm raising shaft.

Two sizes of drills having arms of 4 and 6 ft. respectively are built and the following table gives the principal dimensions and specifications of the two sizes

	4 ft.	6 ft.
Will drill to center of, in	111	161
Traverse of head on arm, in	36	56
Maximum distance from trunnion to spindle, in	48	72
Minimum distance from trunnion to spindle, in.	12	16
Distance between trunnion center and face of post, in	7	8¼
Vertical adjustment of saddle in	36	42
Maximum distance from spindle nose to base, in.	62	78
Minimum distance from spindle nose to base, in.	12	23
Travel of spindle, in	15	15
Spindle diameter, in	2 9/16	3¼
Minimum spindle speed, r.p.m.	50	26
Maximum spindle speed, r.p.m.	400	350
Maximum feed per minute, in	10	10
Morse taper of spindle	No. 4	No. 5
Power required for driving spindle, hp	3	5
Power required to raise and lower arm, hp	1	2
Overall hight, in	120	150
Maximum length, in	115	164
Maximum width, in	42	48
Working surface, in	36½x56½	42x83
Depth of base, in	7	8
Dimensions of box table, in	20x20x20	24x24x24
Net weight, including motor and table, lb	7,000	12,000

An approximate comparison of the power consumed by the larger size of drill as contrasted with a standard geared radial of the same capacity showed a friction load of 0.8 hp. when the spindle and the feed gears were running at 330 r.p.m. as against 3.5 hp. and a wroking load of 8 hp. when driving a 1-in. drill at a speed of 338 r.p.m. with a feed of 0.022 in. per revolution of the spindle and drilling 7.4 in. per minute instead of 30 hp. which was the amount required by the geared radial when operating under the same conditions.

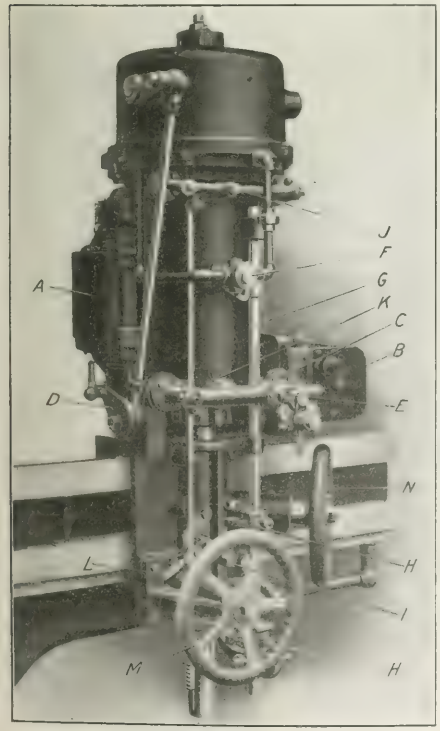


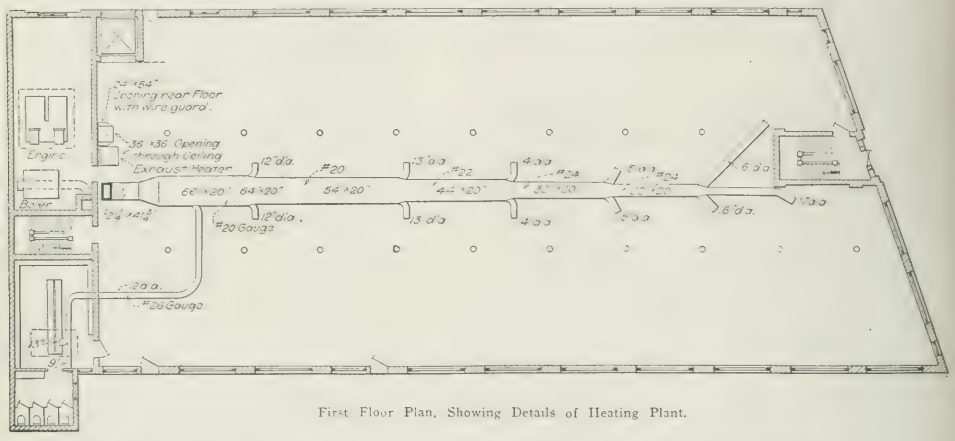
Fig. 2.—Details of the Head

Gas Engine Wastes for Factory Heating

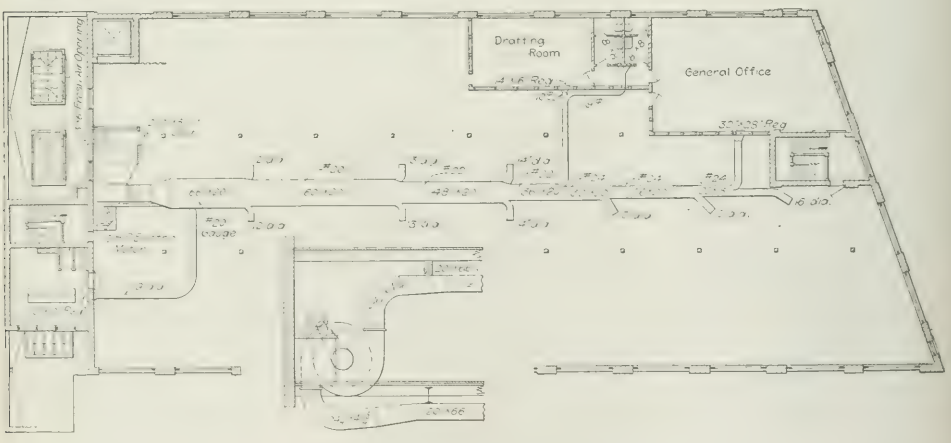
The Heat of Both the Exhaust Gases and the Jacket Water Used at Shops of the Hisey-Wolf Machine Company, Cincinnati

An unusually interesting factory heating system in that an equipment was developed to utilize the waste heat of a gas engine power plant has been installed in the electric portable drill making shop of the Hisey-Wolf Machine Company, Cincinnati. The exhaust gases from the engines are passed through a heater for heating water. The water, handled by a centrifugal pump, has itself already been warmed considerably by passage through the gas engine cylinder jackets, and it is forced from the exhaust

The Iron Age of May 4 in connection with a description of the features of the manufacturing arrangements for making grinders and portable electric drills. On the window level three-fourths of the wall space is glass. The building was erected from plans made by Harry Hake, a Cincinnati architect, and the heating system was designed by Robert S. Mayer, consulting heating engineer, Cincinnati. The heating plant was installed by Henry Niemes, Cincinnati.



First Floor Plan, Showing Details of Heating Plant.



Second Floor Plan, Showing Air Intake, Ducts, Blast Heater, Fan and Motor and Fan Connection.

gas heater to the indirect heater of a fan system of heating. In short, the shop has two floors each with a main air duct extending longitudinally through it with branch ducts to air distributing outlets. A double-discharge fan draws air in part or altogether from either out of doors or the shop interior and delivers it to the two air mains. The air before reaching the fan passes over the indirect heating surface and the heating surface is warmed by water taken cold by a centrifugal pump, and sent in turn through the gas engine jackets and through a heater designed for absorbing heat from the gas engine exhaust. A gas-fired hot water boiler serves as a relay for emergency demands.

A brief reference to the heating system was made in

Plans of the first and second floors of the shop are given in the accompanying illustrations to show the location of the heaters, fans, ducts and the main entrance at one end, with a stairway leading to the second floor, where are located the drafting room and the general offices of the company. At the rear of the first floor there is the power plant consisting of 85-hp. gas engines made by the Miller Improved Gas Engine Company, and in the engine room there is a hot-water heater with a capacity of 9400 sq. ft. of direct radiation, made by the Pierce, Butler & Pierce Mfg. Company, for use when the power plant is shut down for any reason or when the weather is sufficiently cold to make it necessary.

Just outside of the engine room is a reverse current



View of Part of Heating Plant—Pump for Circulating Water Heated in Gas Engine Jacket in Far Room; Exhaust Heater at Right of Door, Connections to Fan Blast Heater and Inlet Duct to Heater and Fan for Circulating Air in First Floor Shop Shown at Ceiling.

exhaust heater made by the Williams Tool Company, Erie, Pa. The exhaust from the gas engines passes through the heater in one direction, while water passes through the heater in the other direction. In the engine room there is a Buffalo circulating pump rated to handle from 65 to 70 gal. of water per minute against a head of 27 ft. It is driven by a Reno-Kaetker direct-current motor.

A 5-in. exhaust pipe from each of the gas engines connects with a 7-in. pipe which is insulated and connected with the exhaust heater. A 7-in. exhaust connection runs directly to the roof for use when the gas is not heating water.

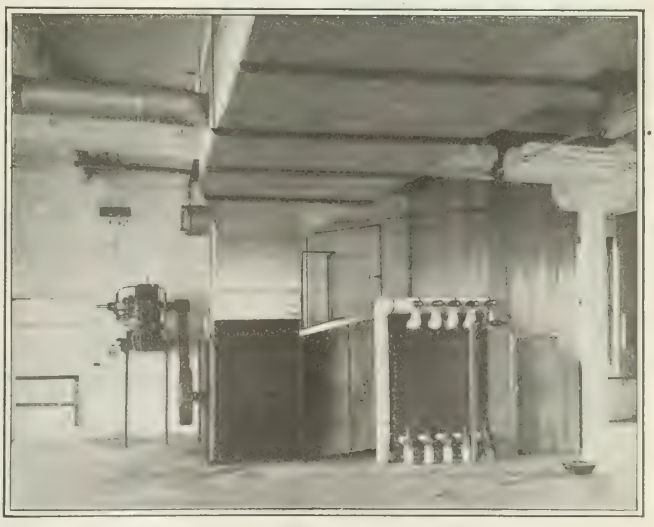
The indirect radiation of the fan heating system, comprising Vento cast-iron sections, is located on the second floor immediately above the exhaust heater and in the view showing the heater may be seen the flow header at the ceiling for the indirect heating stack. The fan is a 7-ft. Buffalo Forge blower rated to deliver 24,000 cu. ft. of air per minute and it is driven by a 10-hp. Jantz-Leist electric motor. The fan draws its air supply through the hot-blast radiators and can take it from out of doors through a 24 x 54-in. duct from the first floor, which changes to a 36 x 36-in. opening as it passes through the second floor, or from the second floor shop when the door is opened in the air shaft from out of doors. Dampers are provided to control the source of supply.

The connections of the Vento stack allow the heated water from the cylinder jacket and the exhaust heater to be circulated through the first and second row of sections without being run through the hot-water boiler, while the remainder of the sections are used in connection with the supplementary hot-water heating boiler, which is provided with a gas burner instead of a coal grate, as stated, to heat the water so that the shop can be warmed when the power plant is not in operation. This latter arrangement has been found to be most satisfactory in severe weather, due to the fact that a temperature of about 200 deg. must be carried in the water circulating through the blast heater in order to obtain the desired temperature in the air issuing from the distributing duct and to keep up a comfortable temperature in the shop.

Experiments have shown that there is a drop of about 30 deg. in the temperature of the water in the Vento stack when the outdoor atmosphere is about 50 deg. F. It was found not satisfactory to connect the supplementary heater in series with the cylinder jackets and exhaust heater, and consequently the connections are arranged so that the supplementary heater can be connected direct to the blast heater independent of the engine connections.

Tests made so far show quite a saving in the heating bill, and the water saving under the present arrangement is said to amount to about $1 per day. To effect a further saving it is the intention to install a cooling tower, through which the water must pass just before it is returned to the cylinder jackets, and by this means use the water over and over again. This is, of course, calculated to reduce the water bill very materially.

To control the system further and keep it under desirable working conditions there is a thermostat placed in the discharge from the cylinder jackets which controls a diaphragm valve admitting cold water to the circulating pump. By this means the temperature of the water is automatically maintained.



Motor for Blower Fan, Fan and Heater Connections, Air Supply Duct with Door for Circulating Air in Second Floor Shop and Overhead Air Distributing Duct.

The Standard Chain Company Makes Saddlery Hardware.—The Standard Chain Company, Pittsburgh, recently took over the following lines formerly manufactured by the P. Hayden Saddlery Hardware Company, Columbus, Ohio: Harness rings, bits, toggles, cockeyes, halter trimmings, hame staples, snaffles, hold back plates, hame back strap rings, breast rings, clips for wood hames, pinery hooks and dees, concord toggles, etc. These products it will manufacture at its plant at St. Marys, Ohio, where all the machinery and equipment have been taken, and the superintendent and foremen who had charge of these lines at Columbus are now employed. This places the Standard Chain Company in a position to take care of the saddlery end of the business of all jobbers who handle saddlery goods and enables the saddlery houses to buy, not only chains, but a more complete line from the company. The reputation of the Standard Chain Company for service and quality is such as will insure the maintenance of the high standard attained by the P. Hayden Saddlery Hardware Company.

A New Heavy Duty Drill Press

Recent Important Improvements Made by the Colburn Machine Tool Company

Some important improvements have been recently made in the line of heavy duty drill presses built by the Colburn Machine Tool Company, Franklin, Pa. The more important of these are the elimination of the right angle drive formerly employed, the addition of an entirely new type of speed box and the use of either standard or compound tables. Fig. 1 is a front view of the D-3 size, an end view showing some of the driving mechanism is given in Fig. 2 and Fig. 3 illustrates the tool equipped

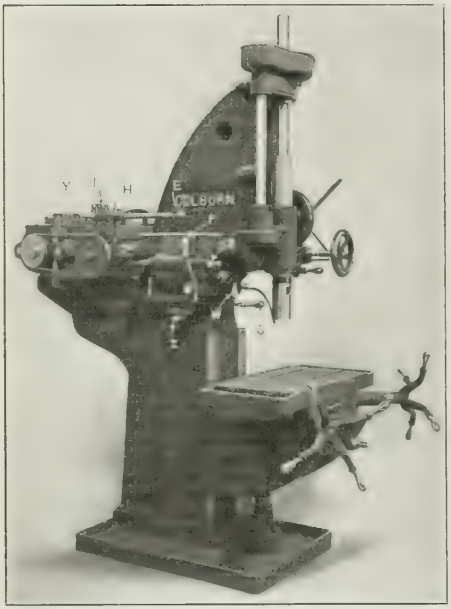


Fig. 1—The D-3 Heavy Duty Drill Press with Compound Table Built by the Colburn Machine Tool Company, Franklin, Pa.

with the standard table and a two-jaw universal chuck.

In the original machine the right angle drive was used in which the main driving shaft was placed at right angles to the line shaft, an arrangement which necessitated the use of quarter turn belts when a number of machines were set in a row and driven from the same line shaft. In the new machine the main driving shaft on which the driving pulley is mounted is placed in the speed box and is parallel with the line shaft. In this way it is possible to set any number of machines side by side in a row and belt them directly to the line shaft with single belts. The machine is driven through a friction clutch pulley operated by the lever G, Fig. 1, and the drive consists of an oil tight box containing all the gearing from which the spindle speeds are obtained. As the drill press is of the high speed type the gears in this box run at high rates of speed and it is consequently impossible to make the changes in the speed when the regular clutch pulley is driving because of the severe impact caused by the sudden engagement of the gears and the clutches. An auxiliary friction clutch is interposed between the main friction pulleys and the gears in the speed box to overcome this objection and is controlled by the lever F. In this way the gears turn very slowly and the different speed changes can be made without jar or shock.

Speed and Feed Changes

The speed box, which is of an entirely new design, is mounted upon a substantial extension or knee at the rear of the main column. Eight speed changes are available and are secured through sliding gears and positive clutches controlled by the levers E and Z which are within easy reach of the operator while standing in front of the machines. The former of these levers gives four speed changes in practically the same way as the selective transmission of an automobile and this number is doubled by a set of back gears engaged and disengaged by the other lever. All of the speed box gears are steel forgings with the corners of the teeth beveled where they slide together and in addition the gears subjected to excessive strain are hardened. As the speed box is oil tight the gears run in a continuous bath of oil, a feature which adds to the life of the gears and the bronze bushed bearings as well as eliminating practically all noise. To indicate which gears are engaged a target, I, is provided on top of the speed box in plain sight of the operator.

Positive gears running in an oil tight box provide the feed changes, which are secured by a dive key and back gears, which are operated by the pull rods W and X respectively. Like the gears in the speed box, the feed change gears run in a bath of oil. Six feed changes ranging in approximately geometrical progression from 0.009 to 0.06 in. per revolution of the spindle are available. A large diameter worm gear graduated in eighths of an inch provides a direct feed on the spindle and enables the operator to measure the depth drilled accurately. This dial has an adjustable pawl that can be set to trip the feed automatically at any point up to 14 in., while it can also be tripped by hand from the operator's position. To protect the feeding mechanism from injury a second automatic trip is provided which operates when the spindle has reached its lowest position, thus preventing possible accident on account of feeding too far down.

The different speeds and feeds and the combinations of the levers by which they are obtained are shown on speed and feed index plate attached to the feed box. The whole operation of speed and feed changing is very simple and can be quickly made. By looking at this index plate the operator can see at a glance just what is necessary to get any desired feed or speed or he can tell by noting the positions of the levers and rods and comparing them with the index plate at just what speed or feed the machine is running. If for example it is necessary to secure a

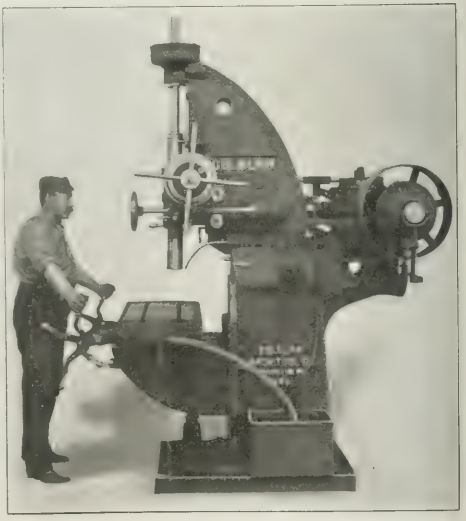


Fig. 2—Side View, Showing Details of Drive

spindle speed of 45 r.p.m., in which the lever Z is in the slow position and the rod Y at A, the operator first grasps the lever Z which controls the back gears and also operates

a positive clutch with his left hand and throws it in the proper direction. These changes should be made while the machine is at rest and if the gears are in the proper position so that the teeth will engage it will not be necessary to revolve them. If this is necessary, however, the operator can cause them to revolve slowly by pulling gently on the lever F with his right hand. This lever operates the auxiliary friction clutch and causes the gears to revolve slowly until they can be brought into engagement and also furnishes a means of regulating the speed at which they are turned very closely and avoiding damage to the mechanism. The face of the target I has four letters, A, B, C and D, and pointers traveling along the face of this target indicate the position of the two rods Y, that on the front rod indicating the positions C and D, while that on the rear rod indicates the other two. A pin on the lever E engages slots in the two rods Y, according to the way in which the lever is moved in its bearing H. When the lever is slid toward the rear the pin enters the slot in the rear rod, while motion in the opposite direction causes it to enter that in the front rod. Only one of these rods can be moved at a time and the pin cannot be moved from one to the other until both are in the neutral position, which is accomplished by a strip of metal fastened rigidly between the two rods with a single slot through which the pin will just pass. To change the pin from one rod to the other it is always necessary to bring the slot in both rods opposite that in the center strip, in which position the sliding gears are not in mesh. If the gears do not slide together in the position in which they come to rest they are revolved by operating the auxiliary friction clutch through the lever F until they can be thrown into engagement by the lever E. The actual sliding of the gears is accomplished by sidewise movements of this lever. For making changes when the machine is running at high speed it is necessary to bring it to rest, although for slow speed work it is possible to change the feed without doing so.

The compound table which is shown in Fig. 1 is furnished only when specially ordered. It is not an attachment to the regular table, but consists of a special knee with a table having a rapid movement through a spiral worm and rack, the limits being 20 in. longitudinal and 8 in. crosswise. Capstan handles are provided so that the operator can manipulate the table in both directions without moving from his position directly in front of the machine. It is claimed that these adjustments can be made so rapidly that the drill will reach any point within the area of the table surface, which is 16 x 30 in., in less time than it takes to adjust the ordinary round drill press table, while at the same time it is impossible for this table to spring as the massive knee and telescopic elevating screw effectually resist this tendency. Grooves along the edges of the table drain the lubricant from the surface into large oil pockets cast on each end, and a cored opening running entirely through the table drains the liquid from the pocket at the left side to that on the right, from which it is piped through a flexible tube back to the tank.

The standard table which is illustrated in Fig. 3 is of the bracket type and has an extra large bearing on the upright frame. A vertical adjustment of 15 in. through a large telescopic screw, operated by a crank handle in front of the machine, is provided. This screw is offset from the center of the spindle to permit the boring bar to pass through the table and does away with the necessity of cutting a hole through the floor to allow the screw to pass through when the table is dropped to its lowest position. A large oil pan is provided on both sides of the table and in front and the lubricant is drained off in the same way as in the case of the compound table. The working surface of the table, which measures 18 x 24 in., contains two large T-slots with an ample amount of metal over them.

Special chucks, fixtures, etc., can be mounted on either type of table and in Fig. 3 a two-jaw universal chuck, which is especially adapted for holding gear blank forgings and similar work, is illustrated. The jaws are detchable and special shapes can be fitted for holding irregular pieces having a maximum diameter of 12 in. Two sets of hardened steel jaws are regularly furnished with each chuck. In the engraving a 2½-in. high speed drill is shown drilling a hole in a steel gear blank at a feed of 4 in. per minute.

The machines are regularly equipped with a pump, tank and piping for supplying drilling compound when working in steel. The pump is attached to the outside of

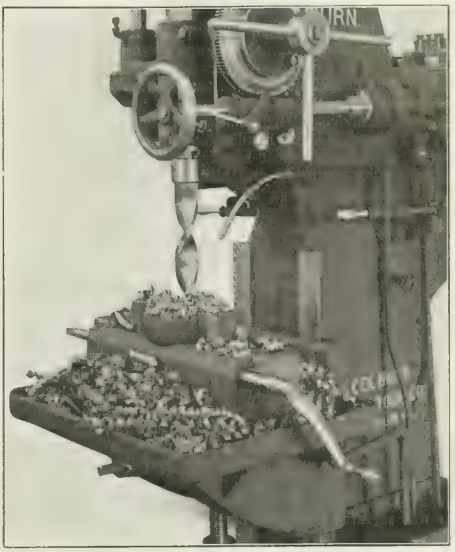


Fig. 3.—The Press Equipped with Standard Table and Two-Jaw Universal Clutch.

the speed box, and is driven by a short round belt from the pulley on the main driving shaft. The tank is placed at the lower right hand side of the frame in the most convenient position for draining compound away from the table and is entirely out of the way.

The following table gives the principal dimensions and specifications of the machines:

Drilling capacity in solid steel, in.	3
Boring capacity in solid steel, in.	8
Swing, in.	24
Distance center of spindle to face of column, in.	12½
Maximum distance spindle nose to standard table, in.	34
Maximum distance spindle nose to compound table, in.	28
Length of power feed, in.	16
Diameter of spindle sleeve, in.	3⅞
Diameter of spindle driving end, in.	2⅞
Diameter of spindle sleeve, in.	2¼
Diameter of spindle nose	3 13 16
Morse taper in spindle	No. 5
Width of steel rack in spindle sleeve, in.	1¾
Diameter of spindle driving gear, in.	10
Face width of spindle driving gear, in.	2
Working surface, standard table, in.	18x24
Working surface, compound table, in.	16x30
Vertical adjustment of table, in.	15
Number of feed changes	6
Minimum feed per revolution of spindle, in.	0.009
Maximum feed per revolution of spindle, in.	0.06
Number of spindle speeds	8
Minimum spindle speed, r.p.m.	45
Maximum spindle speed, r.p.m.	520
Diameter of driving pulley, in.	20
Face width of driving pulley, in.	6
Speed of driving pulley, r.p.m.	500
Net weight, plain table, lb.	4000
Net weight, compound table, lb.	4400
Floor space required, in.	80x34
Overall hight, in.	112

If desired the drill press can be arranged for motor drive, in which case a special bed plate having an extension for the motor is required. When this is used the motor stands directly under the clutch pulley to which it is belted, and the machine can be started or stopped by engaging or disengaging the clutch pulley without stopping the motor. A motor of from 10 to 20 hp. operating at a constant speed is required according to the kind of work to be done.

A lubricator for driving chains has been patented by Archibald W. F. Steckel, Columbus, Ohio, assigned to the Jeffrey Mfg. Company, Columbus, Ohio. The patent number is 997,586, granted July 11, and covers a lubricant cup or receptacle carried by the chain mechanism, the cup having a cover which is automatically opened as the receptacle passes under the reservoir from which the lubricating medium is received.

New Combination Grinder

A Tool Embodying Four Machines in One

The Challenge Machine Company, Inc., 5116 Springfield avenue, Philadelphia, Pa., has recently placed on the market a new kind of combination grinding machine in which it is possible to change the position of the table so as to accommodate work that can be better ground with the wheel above it than below and vice versa. In this way it is possible to handle die or other very accurate grinding where the best results can be secured with the wheel above the work and also pieces where very rapid but less accurate work is required, as is the case when the wheel is placed below. Another special feature of these machines is that a wet tool grinding arrangement gives practically three machines in one, while for rough plain dry grinding the usual work rest is supplied. In Fig. 1 the grinder is shown with the table in the raised position, while in Fig. 2 the detachable surfacing arrangement is inverted, and Fig. 3 gives details of the grinder spindle bearing.

In Fig. 1 the plain work rest has been removed from the left side of the head and a serrated plate substituted. A U-shaped supporting arm for the table, both members of which are slotted and serrated to engage with this plate, is clamped to it by a bolt and binding nut. In this way it is possible to raise or lower the table quickly to accommodate the work as the proper adjustment for the true relation of the wheel and the table is simple and always obtainable. In addition to the adjustment provided by this serrated plate and arm, the table itself has an elevating plate which is hinged at one end and operated by a hand screw for fine adjustment of the work to the wheel. The vertical adjustment of the table is 16 in. from the centre of the spindle on the smallest size of machine and the distance outward from the inner side of the wheel is 4 in. in the two smaller sizes and 6 in. in the other two.

For doing extremely fine and accurate work, such as on dies and other pieces of a similar nature, the whole surfacing arrangement is inverted for passing the work under the wheel and in this case a plain inverted plate without any wheel slot is used, as illustrated in Fig. 2. This engraving also shows the plain work rest removed from the right end and a water arrangement for wet or dry tool grinding substituted. In this attachment the water is raised by a curved piece supported by a flat spring, which when depressed forces the water to touch the wheel. As will be noticed from Fig. 3, which gives details of the construction of the grinder bearing, the spindle is of large diameter, with long ring oiling bearings. One of the special features of this bearing is the cam set collar *a* which bears against the cam hubbed pulley at the left and provides a quick and secure means for taking up end play.

In addition to the wide range of work accommodated by providing the two methods of surface grinding in connection with the plain work rest and the water arrangement, the machine can be furnished for either bench or floor use. In the latter case a plain column can be supplied or one in which the countershaft is attached to it so that the machine can be placed in the most convenient location irrespective of the overhead work or if desired it may be mounted on a column to which any type of electric motor can be attached. Four sizes of machines, accommodating wheels ranging from 12 to 18 in. in diameter are built and if desired the smallest can accommodate wheels 2 in. thick.

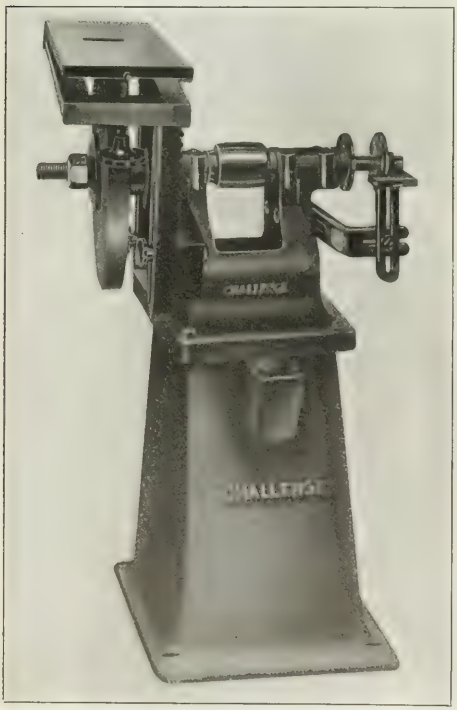


Fig. 1.—A New Combination Grinder Built by the Challenge Machine Company, Inc., Philadelphia, Pa.

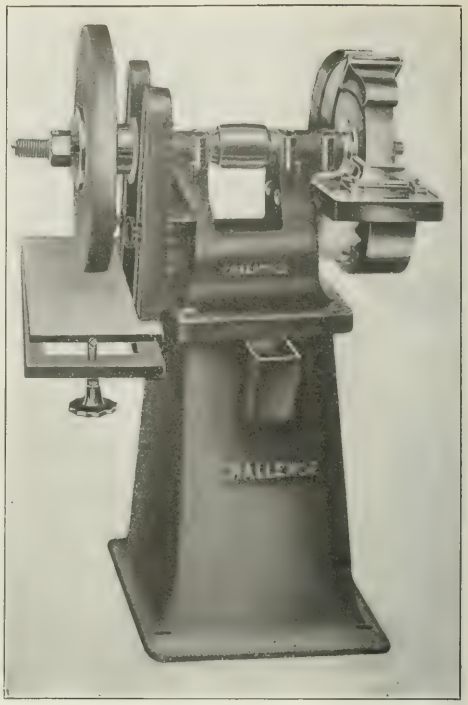


Fig. 2.—The Grinder with the Surfacing Arrangement Inverted.

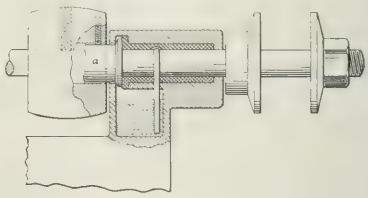


Fig. 3.—Details of the Grinder Spindle Bearing.

Observations on Case Hardening

With Special Reference to Influence of Nitrogen

In the issue of Metallurgie for February 8, 1911, appears an article by Dr. J. Kirner entitled "Observations on Case Hardening, with Special Reference to the Influence of Nitrogen." A certain case hardening mixture, which is called A1, had the following composition:

Carbon	31.5	Sulphur	0.5
Salt	41.0	Insoluble residue	18.0
Total nitrogen	9.0		

The insoluble residue, when dissolved in acid, was found to consist chiefly of oxide of iron, alumina and lime. This mixture gave an active carbonization at the low temperature of 600 deg. C., as shown by a microsection, and continued the influence up to 800 deg. C. A sample of steel held at 700 deg. C. for four hours showed a continuous outer layer of cementite that in the unannealed condition was so hard as to be cut only with a diamond.

If the temperature is raised there is a range from 870 deg. C. to about 920 deg. C., within which the samples show on the outer surface parts with high and low carbon contents. This is illustrated by microsections. The most careful mixing of the material and repeated carrying out of the tests gave no greater uniformity of results. This strange behavior of the mixture was the cause of a research, some of the results of which seem worthy of publication.

The material worked with was a soft steel with about 0.1 per cent. carbon. It was heated to 700, 900, and 1000 deg. C. in three different case-hardening mixtures, and the changes in the ordinary constituents and the nitrogen determined. The case-hardening mixtures were the A1 mentioned before; C1, another nitrogen-holding mixture made of freshly charred pieces of waste leather; B1, a nitrogen-free mixture, consisting of wood charcoal and carbonates of the alkali metals.

Preparation of the Samples

From previous experiments the depth of carbonization or case for four hours' treatment, exclusive of the heating-up and cooling period, should be 0.15 mm. for 700 deg. C., 1.00 mm. for 900 deg. C., and 1.50 mm. for 1000 deg. C. The turnings were taken in the positions shown in the diagram, the sample being originally 13 mm. in diameter, 160 mm. long. The turnings from position I were removed before the treatment, so that the samples worked upon were all of the shape shown in No. 2. This was to see if the outer layers gave any different result. The turnings at the end of the bars and at the junctions of the layers II, III and IV were thrown away.

The pieces were packed in an iron box, luted with clay, which was heated in a gas-fired muffle furnace. The muffle was brought to the desired temperature and the box introduced. As soon as the inside of the box attained the temperature of the muffle, shown by pyrometers, the time was taken. At the end of four hours, during which the temperature was not allowed to increase more than 10 deg. C., the gas was turned off and the samples cooled in the furnace.

The Results Obtained

Mixture A1, Containing 9 Per Cent. Total Nitrogen.

Layer.	Temp.	Car.	N.	S.	P.	Si.	Mn.
I	700° C	...	0.006	....	....	...	...
II	700° C	0.45	0.55	....	....	...	...
III	700° C	0.15	0.14	....	....	...	...
IV	700° C	0.58	0.56	....	....	...	...
I	900° C	0.11	0.004	0.037	....	...	...
II	900° C	0.50	0.033	0.033	....	...	...
III	900° C	0.14	0.009	0.037	....	...	...
IV	900° C	0.54	0.035	0.033	....	...	...
I	1000° C	...	...	...	....	...	...
II	1000° C	0.73	0.032	0.032	0.014	0.09	0.48
III	1000° C	0.19	0.012	....	....	...	...
IV	1000° C	0.83	0.030	0.034	0.015	0.10	0.48

Mixture C1, Charred Leather.

Layer.	Temp	Car.	N.	S.	P.	Si.	Mn.
I	700° C	0.13	0.007	0.037	....	0.09	...
II	700° C	0.27	0.40	0.036	....	0.10	...
III	700° C	0.14	0.007	0.037	....	0.09	...
IV	700° C	0.25	0.40	0.036	....	0.09	...
I	900° C	0.12	0.007	0.037	0.014	0.07	0.48
II	900° C	0.34	0.11	0.034	0.015	0.08	0.48
III	900° C	0.14	0.020	0.041	0.016	0.06	0.49
IV	900° C	0.24	0.15	0.045	0.015	0.08	0.48
I	1000° C	0.11	0.010	0.040	0.015	0.08	0.48
II	1000° C	0.55	0.050	0.039	0.016	0.08	0.47
III	1000° C	0.22	0.020	0.040	0.015	0.07	0.48
IV	1000° C	0.57	0.045	0.044	0.015	0.07	0.48

Mixture B1, Without Nitrogen.

Layer.	Temp.	Car.	N	S.	P.	Si.	Mn.
I	700° C	0.13	0.007	0.042	....	0.08	...
II	700° C	0.30	0.005	0.043	....	0.08	...
III	700° C	0.15	0.005	0.041	....	0.08	...
IV	700° C	0.27	0.005	0.044	....	0.08	...
I	900° C	0.11	0.007	0.037	....	0.06	0.48
II	900° C	0.72	0.012	0.036	0.015	0.08	0.48
III	900° C	0.18	0.007	0.038	....	0.08	...
IV	900° C	0.72	0.012	0.032	0.015	0.08	0.48
I	1000° C	...	0.006	....	....	....	...
II	1000° C	1.00	0.012	....	....	...	...
III	1000° C	0.42	0.009	....	....	...	...
IV	1000° C	1.02	0.012	....	....	...	...

The nitrogen was estimated by Braune's method, as given in his dissertation for the doctorate at Basel, 1905. From the tables it may be seen that there is no important change in the sulphur, phosphorus, silicon and manganese. For this reason they were not determined in every sample. When using mixtures containing much nitrogen, the nitrogen of the outer carbonized layers is seen to be considerably increased at certain temperatures. The results at 900 deg. C. with mixture A1 are very low, however, compared with those obtained with C1. The nitrogen-free mixture, B1, gives a more constant increase of carbonizing power with increasing temperature than the other mixtures. In the case of mixture A1, at 700 deg. C., the very hard and

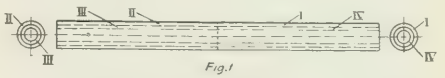


Fig.1



Fig.2

The Influence of Nitrogen in Case Hardening
Fig. 1 is the sample before position I has been removed. Fig. 2 is the sample as worked upon in the tests.

brittle outer layers, when being turned off with a diamond, showed a great tendency to fly off and be lost. Finally, the results show that the mixtures containing nitrogen are much more energetic in proportion at 700 than at 900 deg. C.

The microscope shows in the very slowly cooled steels, in the layers with a notable amount of nitrogen, a peculiar brownish yellow constituent which the author calls "flavit." This is after etching with a 5 per cent. solution of picric acid in ethyl alcohol. It appears to be a solid solution and is very similar to the structureless hardenite of properly hardened tool steels. It is very distinct from either granular or laminated pearlite. From the location of this constituent, it is fair to assume that it consists of iron, nitrogen and also some carbon.

After heating and quenching the samples show nothing unusual. The flavit appears to be soluble in martensite. The experiments give no clear explanation for the un-uniformity noticed between 870 and 920 deg. C., with mixture A1, but it appears probable that the mixture segregates at this critical temperature, and the various parts then have a different influence on the steel. G. B. W.

Heat-Treating Furnaces.—Tate, Jones & Co., Pittsburgh, Pa., have recently placed on the market three types of heat-treating furnaces. One of these, which is a pack hardening, case hardening and annealing furnace using oil or gas as fuel, is designed for handling larger pieces in greater quantities than can be done economically with the smaller sizes generally employed. Its special field is work requiring the maintenance of a high temperature for some time and for annealing automobile parts, both packed and unpacked, and long bars without packing. The second furnace is of the semi-muffle type, and is specially designed for hardening and annealing high speed and carbon steel tools, while the other is a tempering furnace which can be equipped with bath pots of various shapes and sizes to meet the requirements of each particular case. Both of these furnaces employ either oil or gas as fuel.

The National Rivers and Harbors Congress, Cincinnati office, has published in pamphlet form a monograph by S. A. Thompson, entitled "Waterways as Creators of Prosperity," which Joseph E. Randsdell, the president, says in a preface contains the clearest and most forceful presentation of the transportation subject which has yet been made. The pamphlet contains 39 pages.

A Motor-Driven Hole Grinding Machine

The Garvin Machine Company, Spring and Varick streets, New York City, has recently applied motor drive to its No. 2 hole grinder, which was illustrated in *The Iron Age*, December 29, 1910. This arrangement elimi-

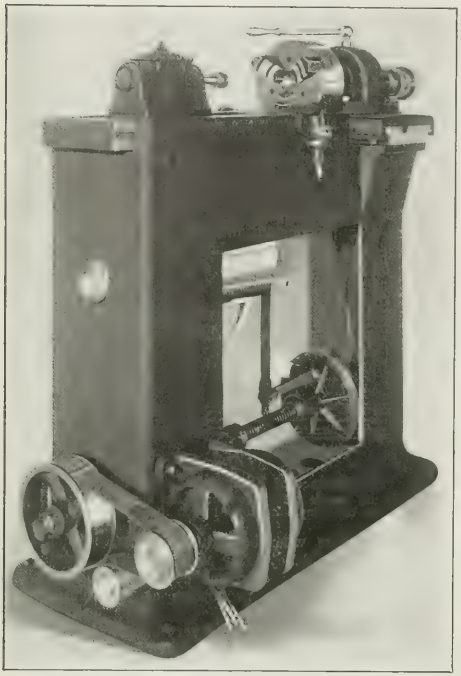


Fig. 1.—A Hole Grinding Machine with Motor Drive Built by the Garvin Machine Company, New York City.

nates all the gears and makes the outfit a self-contained unit, as illustrated in Fig 1, while a section through the spindle giving details of its construction is given in Fig. 2.

The motor is bolted to the rear of the machine and the drive is by belt to the main shaft with an idler to secure the proper tension. The machine is driven by a 1-hp. motor, which can be operated on either direct or alternating current. If desired the outfit can be furnished for grinding special shapes, such as drawing dies for brass rod or tubing, bell mouthpieces or circular grooves. This is accomplished by using adjustable cams for automatically swiveling the grinder head to the required shape which has to be ground. Where it is necessary to employ water as a cooling agent in connection with the grinding operation, a water attachment can be furnished.

The wheel spindle which is shown in detail in Fig. 2 is made of tool steel and runs in high speed DWF ball bearings. A special spindle having a long overhanging bearing that the wheel spindle runs in is furnished for some classes of work. The small wheels are mounted with a stud and a washer, while for mounting the larger sizes the end of the spindle is tapered to receive the wheel bushing which is held in place in the same way as in the case of the smaller wheel.

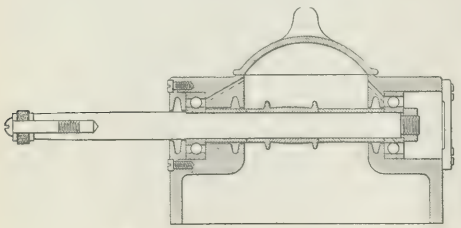


Fig. 2.—A Section Through the Spindle.

The Twentieth Century Loose Pulley Oil Cup

The principle of centrifugal force is utilized in a new automatic loose pulley oil cup which has recently been placed on the market by the American Specialty Company, 834 Monadnock Building, Chicago, Ill. The advantages claimed for this device, which is known as the Twentieth Century automatic loose pulley oil cup, are supplying the proper amount of lubricant to the bearings without waste, freedom from adjustment, absence of moving parts

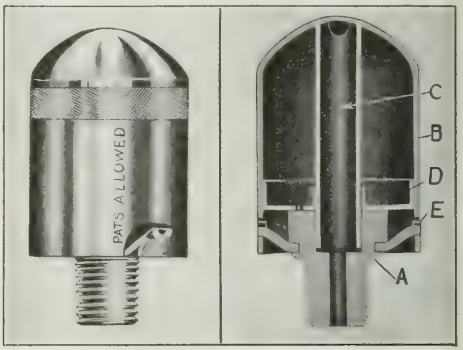


Fig. 1.—The Cup Ready to Screw Into the Pulley Hub.

Fig. 2.—A Sectional View, Showing the Feeding Tube.

Two Views of the Twentieth Century Automatic Loose Pulley Oil Cup Manufactured by the American Specialty Company, Chicago, Ill.

with a consequent elimination of wear, light weight which avoids the necessity for counterbalancing and reliability in operation. Figs. 1 and 2 are two views of the cup, the former showing it ready to screw into the pulley hub, while the latter is a sectional view showing the feeding tube. Fig. 3 illustrates the cup taken apart for filling, which can be done in any position of the pulley.

To use the device the cup B is first removed and the threaded nipple A is screwed into the oil hole in the loose

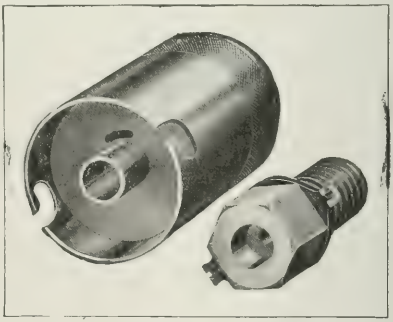


Fig. 3.—The Cup Ready for Filling.

pulley hub. The cup is then filled through the feed pipe C, the air escaping through the small vent hole in the bottom D. The cup is next placed in position on the nipple A, as shown in Figs. 1 and 2, with the feed pipe inserted therein. The cup is now rotated slightly to engage the spring E in the socket, which locks the cup in place.

When the pulley is rotating, centrifugal force carries the lubricant to the apex of the cup and forces it into the tube C until it is entirely full. This tube, which is apertured at the top, serves to measure the charge of oil to be delivered to the bearing. The rotation of the cup around the shaft draws a small quantity of lubricant to

the bearing, and thus the proper amount of oil is measured and delivered without any waste due to flooding.

When it becomes necessary to fill the cup it can be easily detached from the nipple, as illustrated in Fig 3, by hand, and as the cup can be removed, filled and replaced with the pulley in any position it is not necessary to shift the belt or turn the shaft to bring the oil hole on top. Pressed steel of a very light gauge is used in making the cup so that no necessity exists for counterbalancing it. Although of light weight, the absence of moving and wearing parts provides ample strength.

Some Recent Drilling Records

Demonstration Test of Twist Drills at Atlantic City, N. J.

At the recent joint conventions of the Railway Master Mechanics' and Master Car Builders' associations held at Atlantic City, N. J., June 14 to 21, 1911, great interest was aroused by some phenomenal results obtained in a demonstration test of twist drills. As the durability and efficiency of tools are such important factors in economical production, these results should be welcomed by all interested in this subject.

The Cleveland Twist Drill Company, Cleveland, Ohio, had a Foote-Burt No. 25½ high-duty drill press in operation in connection with its exhibit, and the results obtained from tests of Cleveland milled and flatwist drills taken from stock are tabulated below:

Complete Official Record of Tests.

Size and kind of drill.	Material.	R. P. M.	Feed per rev.	Inches drilled per min.	Peripheral Speed in Ft. per min.	Cu. in. metal removed per min.
1¼" Paragon	Cast Iron 3½" thick	500	0.050	25	163.6	30.68
1¼" "		325	0.100	32½	106	39.88
1¼" "		475	0.100	47½	155	58.29
*1¼" "		575	0.100	57½	188	70.56
1¼" "		300	0.030	9	117	15.90
1½" "		325	0.100	32½	127.6	57.43
1" "		335	0.100	33½	131.5	59.19
1⅛" "		355	0.100	35½	139.4	62.73
1⅛" "		235	0.100	23½	107.6	56.52
1½" "		350	0.100	35	160	84.19
2 5/16" "		190	0.050	9½	115	39.90
3" "		120	0.100	12	94	84.82
1¼" "	Wrought steel 4¼" thick	350	0.030	10½	113 7	12.88
1⅝" "		225	0.040	9	94.8	18.66
2 5/16" "		165	0.050	8¼	100	13.65
2 5/16" "		200	0.020	4	121	16.80
1" Milled		150	0.015	2¼	98	11.04
1¼" "		150	0.040	6	98	29.45
2½" "		125	0.040	5	114.5	34.36
1¼" Paragon		275	0.030	8¼	125	19.84
3" "		156	0.030	4½	117.8	31.81
3¼" "		150	0.030	4½	127	37.33

*This is the highest drilling speed on record.

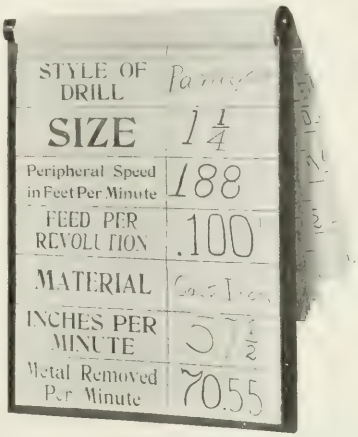
The following comments on these remarkable results are made by the Cleveland Twist Drill Company:

The first tests were made for the purpose of demonstrating what is good shop practice; that is, the drills were put through at speeds and feeds that would be economical under average shop conditions. Then, to demonstrate the reserve efficiency and durability of the drills, "stunts" which demanded extremely high rates of speed and feed were attempted.

The highest rate of speed in drilling known to machine-shop practice was attained by a stock 1¼-in. Paragon Flatwist high-speed drill in successfully removing 70.55 cu. in. of cast iron in one minute, repeatedly cutting through a heavy billet at the record-breaking rate of 57½ in. per min., nearly an inch per second. This drill ran at 575 r.p.m. with 1/10 (0.100) in. feed per revolution, successfully withstanding the terrific strain of this extreme speed and feed. Before attaining this maximum performance, which was approached gradually, numerous other Cleveland drills were put through at the rates of 25, 32½, 33½, 35 and 47½-in. per min., as can be seen from the complete record of the tests. In no case was the limit of strength of the drills reached, but the speed of 57½ in. per min. could not be exceeded on account of the inadequate capacity of the electric feed wires which brought current to the motor driving the drill press.

Drilling at such high speeds and heavy feeds is not to be recommended as economical shop practice, and this performance will in all probability not be repeated in many shops. These results were only made possible by carefully established ideal conditions, such as the following: Absolute rigidity in the machine, uniform and sufficient driving power, solid clamping of the work, perfect grinding of the tool and most expert handling. They are of value chiefly as demonstrating the power and rigidity of the machine and the exceptional reserve strength of the drills.

Another noteworthy test was made with a 2½-in. milled drill from stock. It drilled 68 holes through a billet of



Facsimile of the Bulletin which Gave the First Detailed Announcement of the Record Test in Drilling Cast Iron

machinery steel, 4¼ in. thick, without being reground. This drill was operated at 150 r.p.m. with a feed of 0.015 per revolution, removing a total of 1418 cu. in. of material. Although the drill was still in good condition the test was cut short at this point by the convention coming to a close. This test demonstrated what can be done all day long in any shop properly equipped, and is indicative of what results should be expected in economical high-speed drilling.

Credit Unions for Employees.

The retail trade board of the Boston Chamber of Commerce has issued a report on the Massachusetts statute authorizing the incorporation of credit unions, of which a number have already been established in the state. In explaining the system the board says:

Under this act, which is cooperative in principle, the workingman and employe may create his own loan company; only honest and industrious persons are admitted to membership; loans may be made to members only; a borrower may offer either property or the indorsement of one or more members as security for his loan; no loan shall be made unless the credit committee approves the object for which the money is to be used; the use of the money for any other purpose renders the borrower liable to expulsion from membership; at all meetings a member has only one vote, irrespective of the number of shares he or she owns. These credit unions are in effect associations of the lenders themselves, receiving the benefit of the money they loan. Recent data show that there are more than 25,000 of these institutions in operation in European countries, having a membership of over 3,000,000 and total assets of $1,000,000,000, and that they have been of great advantage and service to the communities in which they have been established. They constitute a medium through which farmers and small tradespeople and workmen of good character and industrious habits may join together to collect small savings and to provide loans to those of their associates whose credit is not recognized by banks of discount.

Bomb calorimeters for determining the heating value of the combustion of solids, liquids and gases have been made the subject of Circular No. 11 of the Bureau of Standards, Department of Commerce and Labor, Washington, D. C. A detailed explanation is given of the Government standardization of the manipulation and calculation practiced with calorimeters.

The Standard Welding Company's New Addition

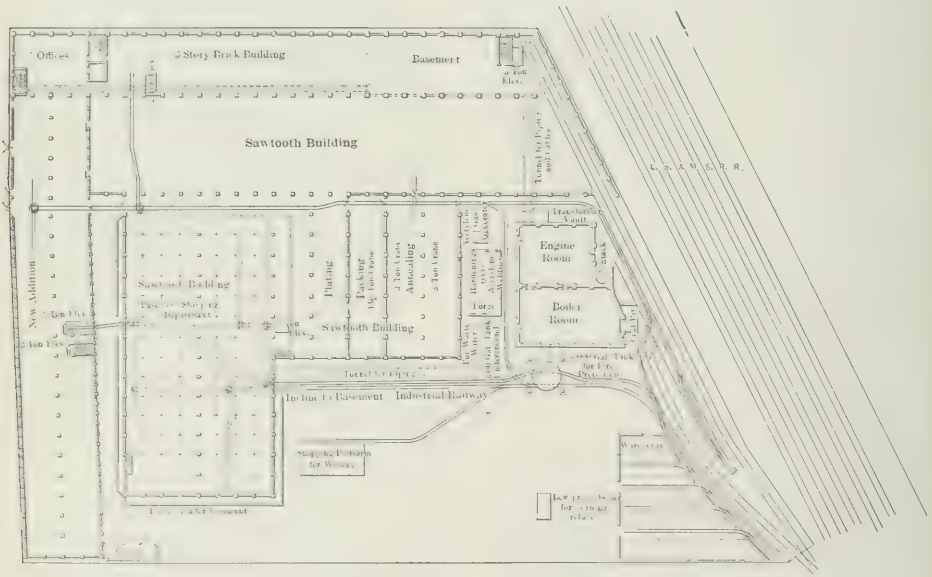
The Plant Is Now Double the Size of the Original One

Three years ago when the Standard Welding Company, Cleveland, Ohio, built a new plant it was thought that sufficient room had been provided for all the growth that could be expected in its business for a considerable length of time. The new plant had been occupied for only a short time, however, when it was found that a still larger capacity was needed. Minor extensions have since been made, and these have been followed by the erection of a large addition, which has just been completed, and which makes the company's present plant just double its original size in 1908. The Standard Welding Company was organized in 1899, its first plant having a floor space of 20,000 sq. ft. Extensions were graudally made until there was no room for further growth on the old site and a new plant was built in 1908 on a new site on West Seventy-sixth street, adjoining the Lake Shore Railroad tracks, which had a floor space of 125,000 sq. ft. The latest addition contains 80,000 sq. ft. of floor space, and together with the original plant and later extensions make a total floor space of 250,000 sq. ft.

The new extension is 350 x 60 ft., four stories high, without basement. Being joined to a section of the old plant it makes a main building 400 x 60 ft. The building is of beam and slab reinforced concrete construction, no steel being used except in the reinforcing. In the reinforcing cold-twisted reinforcing bars were used in preference to hot-twisted bars, as giving higher tensile strength and requiring less steel. Practically the only wood in the building is the window sash. The outer columns are 7 ft. 6 in. apart, the entire space between being taken up with the windows. For a distance of 50 ft. the front at either end is faced with brick. A row of concrete columns 15 ft. apart extends through the center of each floor longitudinally, allowing an open span of 29 ft. on either side. These columns measure 20 x 20 in., and for a short distance from the floor the corners are protected by angles. The floor slabs are 4 in. thick, with 1 in. additional for the finish. The girders and the beams are 12 x 20 in., the columns, beams and girders being the same size throughout the building. The spandrel walls beneath the windows are of reinforced concrete. The roof is reinforced concrete, the same as the floors, over which is a false roof covered with tar and gravel. The ground floor is of brick. The three upper stories, exclusive of the office section, have granolithic floors, making a very hard and smooth surface and regarded as better wearing than cement. An unique feature is the extension of the windows up to the floor slabs, providing an abundance of light. The factory windows have balanced sash and the office windows counterweight sash. The building is lighted throughout with Cooper-Hewitt lights. There are two freight elevators, one of 5-ton and the other of 3-ton capacity. A passenger elevator will also be installed. The stairways and elevator wells are inclosed in hollow tile partitions.

The machinery is driven by a motor on each floor, connected to a line shaft running through the center. All shaft hangers and heating and lighting hangers are suspended from castings imbedded in the floors and walls. During the erection when the concrete was being poured holes were left in the beams and girders for all necessary pipes and wires.

The first floor will be used for the tubing department, the second floor for the machine shop and welding departments, the third floor for automobile rims, and one-half of the fourth floor for the office and the remainder for the experimental department. The preliminary plans for the building were prepared by the company. The Crowell & Sherman Company, Cleveland, was the contractor.

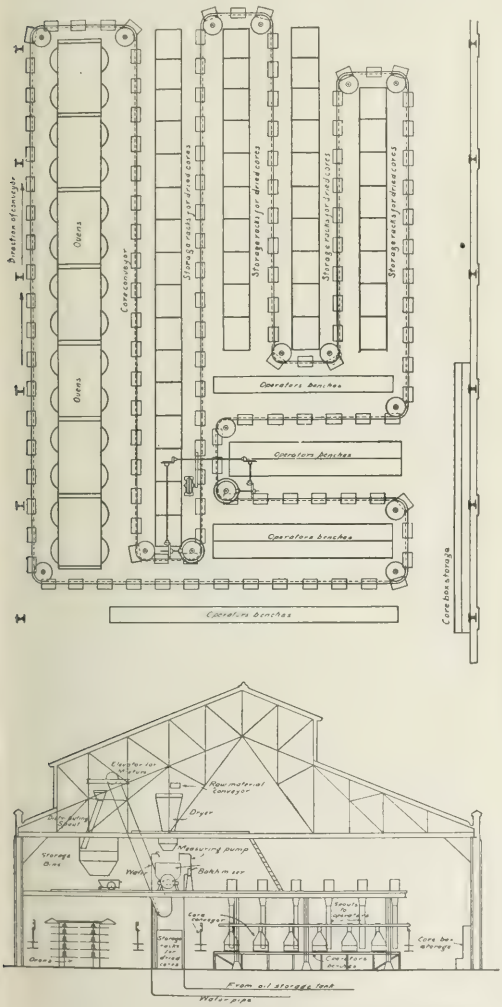


Plan of the Plant of the Standard Welding Company, Cleveland, Ohio, Showing New Addition.

The rapid growth of the electric welding industry during the past few years has largely been the result of the demand from automobile manufacturers for electrically welded rims and various automobile parts. When the Standard Welding Company started its first plant its products were confined largely to tubing and electrically welded seat posts and other parts for bicycles. The business rapidly developed with the demand for automobile rims, and various new uses for electric weldings have appeared. The company now makes seamless steel rims for automobiles, motor cycles, bicycles and all kinds of commercial vehicles and trucks, seamless steel tubes, numerous automobile parts and specialties, and a large number of electrically welded products used in other industries.

A Core Room Conveyor System

A core-making equipment which has recently been installed in the foundry of the T. H. Symington Company, Rochester, N. Y., contains some very interesting apparatus designed to reduce the large overhead cost for unproductive labor which is characteristic of the core room, a special feature being the conveyor system. The plans are by George K. Hooper, Hooper-Faulkenau Engineering Company, 165 Broadway, New York. It has already been demonstrated that satisfactory speed and economy have been obtained. The general layout of the core room and the conveyor is shown in the line drawings.



The Conveyor System for Handling Cores in the T. H. Symington Company's Foundry.

The core-makers' benches are compactly arranged close to the battery of ovens, while near at hand to both benches and ovens is a set of cooling and storage racks. Passing close to these to serve them all is a conveyor consisting of cars of two shelves each, suspended at about bench height from an overhead rail, and pulled by means of a chain above and supported by the cars. It carries green cores from the benches to the ovens; cooked cores from the ovens to the cooling and storage racks; cores from the storage racks as desired to unloading stations whence they may be carried to the molders; and finally it returns core boxes, driers and trays to the core-makers' benches. It is of simple design, consumes but about 2 hp., and after a year or more of operation is declared to break fewer green and cooked cores than hand transportation. Through its use the operative at any station does not leave his place.

The receptacles containing green cores are placed upon the carrier by the core-maker, who has merely to turn halfway around to do so. At the ovens they are received by the oven attendants and placed upon the oven shelves awaiting them, the cooked cores then being taken by the carrier to the storage racks. If necessary a station for washing and drying the trays and boxes can be established in the circuit at a convenient point ahead of the core-making benches. The laborers at the racks also load cores as desired upon the carrier for delivery at unloading points whence they are delivered to the molders.

In this foundry there are nine different shapes and weights of cores to be cooked and four different mixtures, and a total production of about 30,000 cores per day. A difference must be made in the cooking of the several kinds of cores; while at the same time the continuity of operation of the system must be retained. The oil-fired ovens, therefore, are of the independent circular shelf type, the shelves being of different sizes to accommodate the various cores. The ventilating apparatus consists of hoods over the fronts of the ovens connected with exhaust apparatus.

Poor's Manual for 1910

Poor's Manual for 1910, the forty-fourth annual number, just issued, shows that in 1910 gross earnings of the railroads increased $291,368,000, or 11½ per cent., and net earnings $66,907,000, or 8 per cent. Most of the railroads end their fiscal year June 30, but the foregoing figures include the annual reports of the railroads issued December 31, 1910.

During the year 1910 the railroads built 3751 miles of new track, against 6310 miles for 1909, 3918 miles for 1908, and 5362 for 1907. The new securities issued for the year include $350,000,000 stock, $582,000,000 bonds, and $116,000,000 notes.

Last year's new mileage, amounting to 3751 miles, and bringing the total up to 242,107 miles, compares with that of other years as follows:

	Miles.		Miles.
1910	3,751	1900	3,444
1909	6,310	1899	4,008
1908	3,918	1898	2,219
1907	5,362	1897	1,822
1906	5,425	1896	1,654
1905	4,917	1895	1,700
1904	5,059	1894	1,899
1903	4,397	1893	2,346
1902	4,185	1892	4,441
1901	4,481	1891	4,206

The rolling stock of the railroads at the end of each of the past three years consisted of the following:

	1910.	1909.	1908.
Locomotives	63,030	60,601	61,030
Cars:			
Passenger	37,985	36,245	35,601
Baggage, mail, etc.	13,173	13,449	12,341
Freight	2,297,620	2,180,324	2,176,321
Total revenue cars	2,348,778	2,230,018	2,224,263

After paying all charges, including dividends, the final surplus of the railroads for 1910 amounted to $171,709,000, against $107,861,000 for 1909, and $49,444,000 for 1908.

The Seattle Steel Company, Seattle, Wash., the rolling mill operated by the Pacific Hardware & Steel Company interests at Portland, Ore., and the Pacific Coast Steel Company of San Francisco, Cal., have been consolidated under the name of the latter concern, the present capitalization being $1,000,000. Judge Wilson of Seattle is president and D. E. McLaughlin vice-president. While many details have not been determined, it is proposed to continue rolling light bars at both the northern plants. The company's new open-hearth plant and rolling mill at South San Francisco is expected to begin operations in about 60 days.

Extract from a Pittsburgh letter to an Eastern financial paper: "The pig iron situation here is good and many furnaces are working day and night in order to keep up with demand."

The Schedule of the International

A Transition from Loss to Profit

BY CONNECTICUT.

"No, Johnson, I can't see it your way," Matlock, president of the Shelton Rolling Mills, spoke decisively. "Our policy has never permitted excessive expenditures nor the quick acceptance of new fangled notions. The report at the meeting last month showed a good dividend for 1910, and the directors, when they voted you in as superintendent, felt sure that your 10 years in the mill would give them a man who would run things as they had been run in the past."

"But it is those very 10 years," broke in the younger man, earnestly, "that have shown me the crying need there is here for a change—have pointed out to me what a better system would do and where improvements are necessary. I can only say again, we must act before it is too late; must not let our competitors get too far in advance. It might cost us too much trying to catch up." He paused a moment as though to frame his words for maximum effect.

"You have told me that you felt the future to be safe because we sell our product at the market prices set by the International Brass Company and because we have always paid dividends selling at such prices. Have you seen their schedule for 1911?"

The crisp typewritten sheets crackled in the lean hands of the younger man as he offered them to his superior.

Matlock studied the sheets with rapidly narrowing eyes. "Are these lists official?" he asked sharply, his brows furrowed. Johnson nodded and, turning slowly, stood looking down the river valley with its tall chimneys and busy factories. He felt that the mood of the other was changing.

"These prices are absurd!" the president at last found voice. "What can they be thinking of to cut prices this way! We can't pay dividends at those prices." He sat down heavily, his nervous fingers drumming on the heavy table beside him.

"Mr. Matlock," said the younger man, turning to the other, "those prices are neither absurd nor do they mean the passing of a dividend, provided"—firm accent of emphasis—"provided you support me in the changes I have urged you to make. This mill can pay dividends, and good ones, at any schedule which will bring profits to the International!"

Stung into renewed confidence by the self-reliant determination which rang in the young man's voice, Matlock hesitated but an instant. "Johnson"—his voice was sincere—"I am ready to be convinced. I believe you can do it—I'll see you through."

Planning the Campaign

Relieved now from the dispiriting knowledge that he was fighting alone, Johnson gave heart and soul to the organization of a system which should give him a definite basis on which to build a price schedule, while at the same time he was showing up what bad spots existed. Filled with a virile enthusiasm for "the game" and primed with ideas and mental notes gathered in the past, when, as caster, roller or floor-boss he had grimed his hands and bent his shoulder on the mill-floor, he laid out a comprehensive expense sheet, which classified the labor and other expenses. Kept promptly posted, this sheet gave him the average cost per pound for casting, rolling, annealing—in fact, for each of the important operations in brass mill work. More than that, it gave the amount and nature of all his overhead expenses; told him the location of all expenditures for labor and for supplies. This information he caused to be collected from the regular office and payroll records, without any blatant announcements, heralding a "new system," which always prove so demoralizing. Like a tactful physician, he chose to take the pulse of the mill under normal conditions.

A month's patience brought him a set of records which he felt indicated pretty fairly the average mill conditions. Pressure of time made him accept these as a basis; careful analysis governed him in using them. With so much to accomplish, he did not dare to wait any longer before inaugurating some of the improvements by which he hoped to snatch back the profits which the new schedule threatened to take away. When the first month's expense sheet was brought to him and he had absorbed its contents, he made up a table of the necessary operations as required for the different gauges of 6-in. high brass. The figures sprawled across the sheet, in a rough symmetry characteristic of the man that made them; impatience marked their formation, the impatience of the runner before the pistol shot, of the football "sub" on the sidelines. For when he had extended his cost columns, pound multiplied by pound-cost, and struck the total; when his racing pencil had set opposite each total the corresponding price from the International schedule, there stood out in sharp contrast before him the full measure of the task. The margin, the difference between profit and loss, was gravely negative, and meant a stern and relentless battle against heavy odds—a one-man fight!

Watching Dollars, Not Cents

His judgment warned him that his first steps must be the big ones. Confronted by such widespread losses, simple logic told him to first watch the dollars and to let the pennies take care of themselves; to stop the big leaks first. For example, having always known that the casting shop was the slowest unit of the mill, he had 20 new fires going in half as many weeks, with the result that the output from his rolls increased 50 per cent. with a reduction in gross rolling cost per pound of 25 per cent.

The addition to the casting shop developed a new weak spot, however, in the annealing muffles. Worked night and day, the piles of metal waiting to be annealed blocked the floor space, seriously hampering production. Heavy-browed and vacant-eyed with mental absorption, he spent several days on the annealing floor, watching the great iron pans, piled high with yellow metal thrust into the yawning ovens; watched the heavy door descend, to remain closed for several hours. How to save time, to anneal more quickly—on this problem he concentrated his brain. It came to him at last, as it comes to all who study a thing patiently and thoroughly, and the solution was very simple.

The metal went into the ovens cold and took a long time to rise to a proper annealing temperature. Why not, he thought, use the waste gases from each muffle to raise the temperature of the next lot of metal going into it? Quickly his mind drew for him the picture of the two-story oven which was to do this for him. This double oven, together with the substitution of crude oil burners for cordwood as fuel, cut a gratifying slice from his annealing cost.

Some measure of encouragement he took from the discovery that certain gauges of brass showed less margin of loss than others, and he gave to Matlock a list of such widths and gauges as carried the least percentage of loss. The sales on these sizes Matlock agreed to push.

Mill transportation next occupied his attention. For years an unconscious thoughtfulness for the firm's best interests had wrung from him many smothered exclamations of disgust as he watched a half-dozen men awkwardly pushing great four-wheeled trucks laden with metal from one part of the mill to another. Soon two men, one on the floor and one in the cage of an overhead crane, did the work of 25 truckmen.

Details of Development

Experience and observation had told him that maximum efficiency and consequent low costs depended not a little on constant even flow of product through the mill from raw state to completion. To fill in the idle gaps which kept coming up in the natural run of orders he instituted a semi-finished stock plan. At odd times the casting shop made up quantities of bars of standard widths and alloys, which were rolled down at other odd times to a certain gauge and stored on racks. From this stock quick deliveries could be made by working these bars down into the gauges ordered.

Johnson eagerly awaited the expense sheets as the month ends came round. As each of the problems was attacked and solved the effect became at once apparent in the figures on these sheets. He found he was rolling metal a great deal cheaper, was annealing at about half his former cost per pound, and had cut down his overhead expenses noticeably by the installation of the crane and other improvements of a similar nature. His comparative cost tables now showed a great many more orders on which the margin between his actual cost and the International schedule was no longer negative, and Mat-

lock's efforts, through Bannister, their selling agent, had increased the sales on the better paying alloys and gauges.

Yet Johnson threw the November expense sheet on his desk after he had digested its contents and paced his office for upward of an hour. The results had been good, the improvement very gratifying, but—his rugged jaw and narrowed eye spoke silently of the dogged purpose within—but the gain had not been enough. There must be greater progress still!

All that had been done during the year had come from the workings of his intellect, and from his intellect alone. And as the early darkness of this December day threw its dusk into the simply furnished office of this resolute man, he felt vaguely as so many leaders feel at such crises, that, after all, it was not a one-man's task—his must not be the only shoulder against the wheel.

How to league the working force as eager allies; how to bring to maturity the ideas for betterment and economy which should evolve from a thousand brains; how to bring a thousand lusty shoulders to bear on the wheel—this became his new problem. Human beings, not machines or furnaces were now to be his pawns; human beings with their strange whims, their innate selfishness, their ponderous inertia in the face of innovation. These beings he must so move, through whim and selfish aim, that the inertia should become impetus, until the following of whim or selfish aim should be turned into mutual benefit. No plan, Johnson felt, could succeed long which had basis in unjust or uncertain reward of effort, and he proposed to bring about conditions in which strong, continued incentive to maximum effort and efficiency existed in each part of the mill. After deliberation he broached his plan to Matlock.

"It won't do!" the latter vehemently protested. "You'll upset the whole place! Every man Jack of them will lay down the moment you try to cram your piece-work schemes down their throats. Why man, there is not a single brass rolling mill in the country to-day,"—he smote heavy fist into broad palm—"which operates on a piece-work basis! Look at the mess they got into at Stamford—men leaving them and orders canceled because of failure to deliver. Frankly Johnson"—he regarded the other with elevated brows—"I am astonished to hear you make such a proposal."

The Human Element

Fortunately good judgment and discernment fought conservatism in Matlock's makeup. In the end Johnson was again assured support. If it had not been so, then this could not have been written. Of the fact that with unwisely chosen piece-rates the worker loses efficiency, if, indeed, he does not become wholly discouraged, Johnson readily admitted the truth. With the rates set too high, "cutting" surely follows, while very low rates "wet blanket" the men from the start.

He explained to Matlock that the success of his plan called for, first, extreme care in fixing the rates; second, some added feature which should allow the effects of increased efficiency to profit both employer and employee alike, and, third, the introduction of the scheme in such a way as should make it welcomed by the mill hands. And before he left Matlock's office he had unfolded a plan of campaign at which the older man had chuckled.

"When you first put the thing up to me," he told Johnson, "I was afraid I would have to give up my month's trip west. Now I think I'll make it six weeks," he laughed. "You'll not need me here, I guess."

Gaining his desk, the young man spent the rest of the day in making up a piece-rate schedule. He used his monthly expense sheets and assumed an increase in efficiency of 25 per cent. would follow the acceptance of the schedule. To prove the wisdom of his choice of rates, he had his time clerks start a separate set of records to run a month or so as a test. These records showed how much each man would have earned if the rates had been in use.

He could hardly have chosen a better time than December in which to try out his rates. With the books full of orders and the shipping dates on the two government arsenal contracts falling due, the output of the mills was unusually high, so that a few weeks' trial showed his schedule to be, with slight exceptions, quite safe to use. So, on Christmas week the hoarse blast of the great mill whistle signalled a shutdown and gathered all the men on the mill floor a little while before noon hour. From the iron platform halfway up the side of the great engine Johnson faced them all, nodding good naturedly to some of the brawny mill bosses who stood about with folded arms.

Winning the Workmen

"It's almost New Year, men, and time for congratulations," he said, when his lifted hand had brought silence. "I'm not sure whether you know it, but you have all done so splendidly these last few months, the mill production has been so high, that you deserve congratulations; and I congratulate you." A murmur answered his smile.

"But there is one thing about the matter," he went on earnestly, "there is one side of the question which may, or may not, have occurred to some of you. It is this. You have all worked, and worked hard, to get enough metal through the mill to meet the demands of our customers. In December we shipped more metal than in any previous month since the mill was built, and, of course, that means more business and more profit to the concern." He paused a moment.

"Have you not sometimes felt,"—he spoke with incisive directness—"have you never thought that there should be some added reward to you for all this extra hard work? Would you not work with a better spirit, with more satisfaction, if you knew it meant a fatter envelope on payday?" Several heads nooded slowly in approval, yet in ignorance of what was to follow.

"I am sure a great many have felt exactly that way; I have often felt so myself and know it to be natural. This meeting I have called this noon for no other purpose than to discuss ways and means to right this matter. Your employers have formed a plan which they hope will meet with the approval of all of you. I want you to come halfway, and give it your sober consideration."

Rapidly, then, he outlined his system of piece-work, explaining the method by which he had arrived at the rates on the schedule. Flushed faces and not a few heated murmurs greeted his first words as the intent of his remarks became plain. But a faith in him, grown strong in the years he had worked among them, made them listen gravely. He explained carefully the redeeming feature which raised his system above the others; told of the company's plan to share half and half with the men all excess earned over the regular day's pay, guaranteeing no cuts in rates except where agreeable to a committee chosen by the hands from among themselves.

The Extra Wage Slip

"And now I want you all to think over the matter seriously," he concluded earnestly. "In your pay envelopes on the next Wednesday you will find a slip giving the amount of extra pay you have each earned so far in December figuring on the piece-work rates we propose to use. If you agree to the piece-work plan, the money is yours for the asking. If not," he paused—because a pause here told more than any words he could choose—"if not," he went on slowly, "I shall feel that you have made a grave mistake."

He smiled, nodded, and descended to the floor, quickly passing from among the men, who broke up into groups. Plainly the new plan had stirred them all to the core. It meant to many of them the surrender of something which the usage of generations had made almost instinctive. More than that, it asked them to intrust their future welfare to the honesty of the group of men representing their employers. Small wonder some of them hesitated, lest they drop the substance for the shadow. Some of the more stubborn protested that the scheme was merely a blind, a roundabout way of cutting wages. Others more clear-sighted saw it in an earnest endeavor by the concern to do the "square deal."

However, Johnson had neither misjudged his adversaries nor spent his ammunition on the first onslaught. His last shot, the extra payslip in the envelopes, was too much of an argument for the most stubborn to withstand. Here was something definite, something they could all grasp. So that, when they sent a committee to tell Johnson of their acceptance, it was without the feeling that they would be stepping out into the dark, as it were.

Yet who can say what motives really led the men to put faith in Johnson. Perhaps they did it through blundering stupidity. Or perhaps, after all, it might have been that intangible force which lies in the calm eyes and white hairs of the aged, or which in a leader of men wins unquestioning devotion. Perhaps it was character.

New Tools and Appliances.

This is essentially a news department for which information is invited.

Double End Disk Grinder.—The Rowbottom Machine Company, Waterville, Conn., has recently brought out a new type of 10-in. ball bearing double-end disk grinder. The tables have a rocking motion across the face of the disk or if desired can be fastened in a fixed position. A vertical adjustment, an angular adjustment to the face of the disk and an adjustable gauge for any angle or square position on the horizontal plane are provided for the table. The construction of the spindle ball bearings is such that longitudinal movement due to changes in temperature is permitted, thus avoiding any possibility of damage due to binding. The same bearing takes the end thrust in either direction and the ball races can be changed to opposite spindle ends.

Curve Rule.—For drawing irregular curves of all descriptions, such as ellipses, parabolas, hyperbolas, gear teeth, screw threads, etc., the Designers' Rule Company, Chicago, Ill., is manufacturing a rule which can be easily adjusted to the desired form and retains it until changed by the operator. Five lengths of rule ranging from 3 to 18 in. are made.

Horizontal Cylinder Boring Machine.—A horizontal machine for simultaneously boring and facing steam, gas, pump and water cylinders, as well as for boring guides and facing the ends of engine frames, has been built by the Barrett Machine Tool Company, Meadville, Pa. The boring bar which is either 2½ or 3 in. in diameter, has a continuous feed in either direction of 30 in., so that it will bore out and face both ends of a cylinder of this length at one setting. The pedestals are 18 in. from the top of the bed to the center of the boring bar, and the tail pedestal is adjustable along the top of the bed from 0 up to 30 in. A quick change feed box renders six different feeds ranging from 1/32 to ¾ in. per revolution of the boring bar available. The feed box is equipped with two facing arms of heavy construction mounted on the ends of the sleeve which are driven by friction and can be started and stopped at will. The regular equipment of the machine includes a four-step cone pulley with a corresponding pulley on the countershaft, which has two friction pulleys, thus providing eight speeds for the bar. If desired, the machine can be driven by an electric motor mounted upon a bracket bolted to the side of the frame.

Vertical Milling Attachment.—The G. R. Lang Company, Meadville, Pa., has recently placed on the market a new milling attachment in which the body of the device is held on the overhanging arm of the tool. The attachment is very rigid and will take a heavy cut, while if desired cutters can be mounted in both the milling machine spindle and that of the attachment.

Generator End Bells.—The Westinghouse Electric & Mfg. Company, East Pittsburgh, Pa., is equipping all of its alternating current generators with sheet steel end bells. Sheet metal has been substituted for the castings formerly employed since it sets well around the machinery and is not apt to break. Another advantage of this new arrangement is that it is not necessary to carry a large number of types of bells in stock for the various designs of generators, which was the case where castings were used. The sheet steel bells are securely bolted to the frame at one end and are bound together to form a continuous circle at the other.

Portable Reamer and Drill.—The Cincinnati Electrical Tool Company, Cincinnati, Ohio, has recently placed on the market a new portable electric reaming and drilling machine which, while intended primarily for drilling and reaming structural work and bridge members, can be used wherever a portable tool is required. The gearing, which is entirely inclosed, runs in grease, and there is no chance for the lubricant to work into the armature winding. The control is through a quick-acting switch operated by a corrugated sleeve, which slides back and forth on one of the handles. A series wound motor is used, and is cooled by air, small holes being left in the frame for this purpose. Three sizes of tool are made, having a maximum capacity of ½, 1 and 1¼-in. diameter drills or reamers, and spindle speeds of 200, 350 and 500 r.p.m., respectively. All three sizes are provided with holes for Morse taper shanks and the two larger sizes have screw feed for the drill spindle. If desired, the smaller size can be provided with a chuck instead of a socket for the taper shank drills.

Pneumatic Chipper Hammer.—The Dayton Pneumatic Tool Company, Dayton, Ohio, has recently brought out a new hammer, which is intended especially for use in steel foundries, where the service is more severe than cast iron foundries. In general the construction follows the maker's standard line. These hammers are made in both the Dayton and Green types, the former having an outside trigger and the latter an inside one. The special features of the new hammer are a long plunger which gives more bearing and a greater wearing service and a poppet style of throttle valve, which is guided by but is not fastened to its stem.

Boring and Reaming Attachment for Cylinders.—The Garvin Machine Company, Spring and Varick streets, New York City, has recently brought out a boring, reaming and lapping attachment for automobile cylinders. The attachment is intended to be used with the company's No. 15 plain miller and consists of an adjustable boring head with three tools which is mounted on a special horizontal head bolted to the face of the miller and clamped to the steel arm. This has a heavy projecting spindle which is threaded on the forward end to receive the adjustable boring tool and the spring adjustable lapping tool. The regular table feed is used with the automatic trips and after the boring operation is completed the lapping tool, which is made in four sections so that emery cloth can be secured to it, follows. The necessary high speed for the lapping operation is secured by a two-speed countershaft although in many cases the boring operation gives a satisfactorily finished surface. The reverse speed to the machine allows the lap to travel under power feed in both directions and the adjustment at the knee enables the consecutive cylinder holes to be located readily.

Grinder for Straight and Spiral Cutters and Mills.—The Northampton Emery Wheel Company, Leeds, Mass., has recently placed on the market a machine that is intended particularly for grinding side and face cutters. The capacity of the machine is 4 x 2½ in. and it is arranged with an adjustable rest connected to the slide which holds the cutter while the latter is being ground. This slide has an adjustable stop on the rear to regulate the amount of grinding and is gibbed to take up wear. The face grinding attachment can be tilted to any desired angle and is arranged with an adjustable stop on the slide. The mill is held in position by a plunger operated by a spring which locks it into the teeth of the mill thus holding the latter perfectly rigid while it is being ground.

Collapsible Tap.—F. W. White, superintendent of the William H. Page Boiler Company, Meadville, Pa., has recently designed a collapsible tap having no projecting levers or trips and one in which the chasers are not actuated by springs. The opening and closing of the tap is controlled by a knurled collar and when used in an automatic machine it is entirely automatic in action.

An Improved Twist Drill.—A patent has been recently granted to J. L. Osgood, 121 Erie County Bank Building, Buffalo, N. Y., covering a new type of twist drill in which the tool is made by twisting a flat steel bar. A special type of shank is used with the drill.

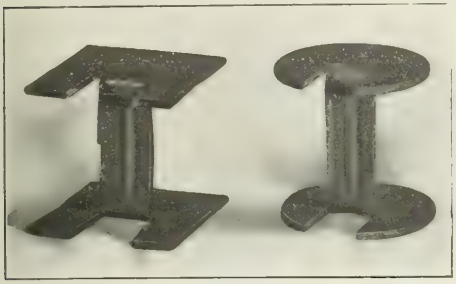
A New Ventilator.—The Swinging Top Ventilator Company, Lewisburg, Pa., has brought out a new type of ventilator with a copper top and a brass ball bearing which is said to embody in its construction all the good points of the stationary and revolving ventilators, while costing considerably less. In its normal position the gases are able to escape from the flue readily and when the wind strikes it the windward side closes at once and the gases escape from the leeward side. As soon as the wind ceases the ventilator returns to its normal position.

The Turner-Fricke Mfg. Company, Pittsburgh, builder of gas engines, making a specialty of those for direct connection to generators, where close speed regulation is necessary, has the following contracts in hand: South Side Electric & Mfg. Company, Pittsburgh, two 200 hp.; Fried & Reineman, Pittsburgh, one 150 hp.; Avondale Ice Company, Cincinnati, Ohio, one 150 hp.; Keystone Hair Insulating Company, Pittsburgh, one 60 hp.; Furnas Ice Cream Company, Columbus, Ohio, one 150 hp. The company is finding a growing field in the line of ice and refrigeration, its engines being adapted to the constant duty service.

The McCarroll Ideal Chaplet

The McCarroll patent chaplet, shown in two styles in the illustrations, differs from others in the fact that it is manufactured in one piece. The maker, the Ideal Chaplet Works, 3336-3338 Market street, Philadelphia, sought in perfecting the design to overcome a trouble sometimes experienced in three-piece chaplets, of the heads becoming loose or falling off when being set to suit the core, and also of the falling off of the stem when chipping or machining castings.

The one-piece chaplet is made of heavy sheet steel of special grade, the heads, which may be either square or round, being pressed into form and therefore always parallel and of accurate size. The metal from the slot in the heads forms the stem, the compression strength of which is materially increased by a corrugation through



The McCarroll Ideal Chaplet.

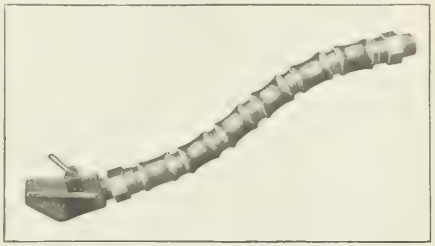
almost its entire length, giving an additional holding surface on the sand and thereby preventing washing from position in the mold. The nature of the metal enables it to be bent to any desired position without breakage. Another important feature is the method employed in coating the chaplets with tin, which obviates any hiding of loose stem troubles. The manufacturers after considerable experimenting adopted the electrolytic process, in using which it is absolutely necessary that the material be chemically clean. Therefore no rust or grease could remain between the steel and the coating. The pure tin oxidizes when it comes in contact with fluid iron and steel, leaving little or no residue, and insuring a tight joint when the metal shrinks around the chaplet, if the body of the metal is not heavy enough to cause a fusion. The chaplets are made in standard sizes ranging from ½ in. to 3 in., with special sizes to order.

An 18-lb. crankshaft for use with a four-cylinder 50-hp. engine for an aeroplane tells an interesting story of a late accomplishment with chrome vanadium steel. The metal, known as Scott's Unique alloy steel, was furnished by the Bourne-Fuller Company, Cleveland, and was forged into a solid shaft under a steam hammer, rough turned and heat treated in the regular way. It was then finished and the center bored out. In the rough state, each shaft, of which there were three altogether, for three Hadley & Blood Farnam type biplanes, weighed 82 lb. After being completely finished they weighed, as stated, 18 lb. each. The crankshaft really comprised a tubular shell ⅛ in. in thickness and tests, it is explained, developed a margin of safety of 38 per cent. over that necessary for the 50-hp. engine, working with an explosion pressure on the piston head of 1100 lb. per square inch.

The Bureau of Statistics of Massachusetts has issued in pamphlet form a memorial to Carroll Davidson Wright, the late president of Clark College, Worcester, Mass., and formerly Commissioner of Labor of the United States. The material was prepared by Horace G. Wadlin, librarian of the Boston Public Library and chief of the Massachusetts Bureau of Statistics of Labor. The life of President Wright was closely identified with the great question of American labor and the voluminous sketch contains much that will interest its readers apart from the personal side of the distinguished publicist.

The Corona Flexible Metallic Hose

The flexible metallic hose shown in the accompanying illustration is made by the Corona Mfg. & Supply Company, 311 Atlantic avenue, Boston, Mass., and is intended



The Corona Flexible Metallic Hose, Made by the Corona Mfg. & Supply Company, Boston, Mass.

especially for use between locomotives and their tenders and between cars in pass service. The hose is made up of a series of joints held in position by a specially designed, close-wound steel wire spring, thus securing tightness of joints as well as sufficient flexibility of hose. The spring pressure also tends to take up any wear which may develop between joints through excessive action of hose while in service. In case of breakages new parts can be applied. The hose is not subject to change through heat, and, therefore, maintains a constant area for the passage of steam.

Two-Stage Gas-Driven Air Compressor

A remarkably compact and unusually interesting combined air compressor and gas engine has been designed by C. E. Sargent, M. E., 136 West Lake street, Chicago, in which the annular space around the piston of a vertical gas engine is used for compressing the air. In short, there is one piston, one connecting rod and one crankshaft for both the gas engine and the compressor. The gas engine part of the combination is of the usual four-stroke-cycle type, but there is an amount of work done in air compression on every stroke of the piston. On the up stroke of the piston air is drawn into the crank case; on the next down stroke, air is compressed in the crank case and is forced through a valve into an annular chamber surrounding the piston; on the third or next up stroke the air is forced from this annular space to the storage tank or receiver for the air and of course during this stroke the crank case is again being filled. From indicator diagrams taken on the compressor, it is found that the air is compressed in the crank case to an absolute pressure of 21 lb. at the time when compression begins in the second stage.

With regard to the thermal efficiency it is emphasized that there is a large amount of surface surrounded by the cold jacket cooling water, and a short distance for the heat to travel so far as the annular space of compression is concerned. With regard to the mechanical efficiency the point is mentioned that the pressure is always down, and that a clearance of 1/100 in. for the piston is easily satisfactory. Discharge pressures for the air of 60 to 140 lb. are shown by the test indicator diagrams. An inertia governor is employed and gas, gasoline or kerosene may be used for fuel.

An official of the Baldwin Locomotive Works, Philadelphia, states that the company has never recognized the attempt of organized labor to obtain recognition and that it has not been nor is it now inconvenienced by any shortage of employees. At the time the greatest number of men was idle its requirements, owing to the small amount of orders on hand, were fully taken care of with the reduced force. The number of employees in the various departments of the plant is now given as 9200, which is all that can be handled; in fact, in some departments, where orders are being cleaned up, a decrease in working hours is contemplated. New business is still reported to be extremely light and is expected to continue so during the coming month.

The Machinery Markets

The automobile industry continues to contribute good support to the machinery markets. An unusual number of new prospects have come forward in the New York market, particularly in the motor truck industry. In Cleveland about $25,000 worth of equipment for automobile plants has been closed and good sales have been made to the automobile trade in Detroit, principally for replacements. The Chicago market is more active and the International Harvester Company continues a good customer there, having bought $20,000 worth of machinery for its Tractor shops. The Chicago & Alton Railroad is expected to place orders soon for about $14,000 worth of tools and a small list has been closed by a local printing concern. Domestic business is dull in Cincinnati, although there is a steady run of export trade. The demand for irrigating machinery is on the increase in Texas and the expectation of good crops is giving much encouragement. On the Pacific Coast the bulk of the business is for small tools for immediate delivery, but some good orders have been placed for heavy metal-working machinery. The mining machinery demand is improving in that market. Trade is better in the South, where contractors' equipment and power machinery are in good demand. In Philadelphia the buying is largely for single tools, and in New England the principal interest is centered on the export demand which is lending support to the market.

New York

NEW YORK, July 26, 1911.

A number of motor car manufacturers in this vicinity are preparing to buy equipment and several new enterprises in that line, especially in the industrial field, have come forward. Outside of a call from the automobile trade the machinery demand is not so active, although some good orders were recorded during the week for small groups of tools, principally for replacement. While new inquiries were not so plentiful, machine tool salesmen who followed up enterprises on which buying has been deferred, because of the general dullness, have been given better encouragement and there are indications that some of these requirements will be closed out in the near future. The New York Central has bought little, if anything, against the list it has out, but assurance has been given in some quarters that orders will be placed very shortly. The machinery demand is spotty. Manufacturers of contractors' equipment are doing a big business, and some excellent sales of hoisting engines and power plants for outdoor use have been made, while on the other hand the call for Corliss engines is not very good. Manufacturers of electrical units are doing a normal business and makers of wood-working machinery have nothing to complain of.

Among the machine tool makers there is a good call for some machines, principally in the line of small tools, while makers of heavy metal-working equipment find business dull. The jobbing foundries, as a rule, are not so busy as they were two weeks ago.

It appears that the requirements of the Delaware & Hudson Railroad Company for its proposed new shops at Watervliet, N. Y., will not come before the trade as soon as had been expected. Work of building the $2,000,000 shops at that point is not progressing very rapidly and a number of machine tool men have been assured that the buying of metal-working machinery for the shops will not be done until winter sets in, at the earliest. It is understood that the power needs of the new plant are to be attended to first. According to the present plans the company will build a locomotive repair shop, 275 x 300 ft., a blacksmith shop, 100 x 300 ft., and a large boiler and tank shop and wood-working shop, a 35-stall roundhouse, a general storehouse and an administration building

The Windsor Machine Company, Windsor, Vt., manufacturer of the Gridley automatics, has appointed as its Western sales manager H. W. Wells, who for a number of years was purchasing agent for the International Harvester Company. The company's line was previously handled in the Western territory through Manning, Maxwell & Moore, Inc., who were the exclusive agents. Mr. Wells will have with him several sales representatives. He is very well known to the machinery trade throughout the country, as he has purchased some of the largest installations in mechanical equipment ever bought in this country, including those for the foreign plants of the International Harvester Company at Lubertzy, Russia; Norchippening, Sweden; Croix, Germany; Norde, France; Akron, Ohio, and Tractor Works, Chicago.

Plans are nearly completed for a large plant to be erected in Phillipsburg, N. J., adjacent to the works of the Ingersoll-Rand Company, which will be occupied by the A. S. Cameron Steam Pump Works, now at 433 East Twenty-third street, New York. On the completion of the plant the mechanical equipment will be purchased so as to make the new plant about double the size of the present Cameron works. It is the intention of the Ingersoll-Rand Company to add other lines of pumping equipment to those now manufactured at the New York works.

The Tubes Realty Company, 316 Fifth avenue, New York, has filed plans for the erection of a storage warehouse building to be erected in Long Island City, at a cost of $600,000. The building will occupy one city block, and will be six stories. In addition to requiring a large amount of power equipment some heavy freight elevators and pumping machinery will be installed.

The Twombly Motors Company, 220 East Fifty-first street, New York, has about decided to locate its proposed new plant in New England, either at Bridgeport or Hartford, Conn. The company is planning to make a specialty of building a small delivery wagon, but it has patterns for other types of cars.

J. M. Lansden, Jr., who until recently was connected with the Lansden Truck Company, Newark, N. J., has opened an office at Orange and Broad streets, Newark, and is arranging to manufacture a new automobile truck of an improved type. The plant will probably be located in Newark and the machinery details are now being discussed.

The Acme Motor Company, Reading, Pa., which has been a good customer of machine tools in the New York market of late, is planning to make additional expenditures for metal-working machinery. The company has a large plant at Reading, and has ample room to add additional manufacturing equipment.

William Bal, Inc., is preparing to erect a two-story brick factory, 100 x 122 ft., on the southwest corner of Vesey street and New Jersey Railroad avenue, Newark, N. J. The company will not install any new machinery excepting a freight elevator.

The Olean Electric Light & Power Company, Olean, N. Y., has plans for the construction and equipment of an electric power station at Sears, and the building of high-tension transmission lines to Olean and other centers. The company has filed application with the Public Service Commission for permission to issue bonds to the amount of $85,000 for this purpose.

Lieut.-Col. W. W. Gibson, commanding officer of the Watervliet Arsenal, Watervliet, N. Y., is receiving bids for a large addition to be made to the gun shop.

Martin Bros., Norwood, N. Y., are having plans prepared for a pulp mill, 60 x 100 ft., one and a half stories, with a concrete flume, 60 x 200 ft., which they will build this summer.

The Central Casket Company, Buffalo, now located at Chicago and Ohio streets, has completed plans for a two-story factory building, 85 x 150 ft., to be erected at Manitoba street and Baitz avenue, with switching facilities from the Erie Railroad.

The J. Spaulding & Sons Company, manufacturer of pulp board and hard fiber materials, Manchester, N. H., has let the contract for the construction of a plant to be located at Tonawanda, N. Y., on the New York Central Railroad. The main building will be 265 x 300 ft., one and two stories, of reinforced concrete. The plant will also include a machine shop, 36 x 144 ft., one story, an acid-boiling building, 36 x 72 ft., and a power house.

The West End Paper Company, Carthage, N. Y., is having surveys made and plans prepared for the construction of a concrete dam for water power development.

The contract for the construction of a power house,

THE MACHINERY MARKETS

60 x 90 ft., four stories, for the East Creek Light & Power Company, East Creek, N. Y., has been awarded to Brown & Lowe, Schenectady, N. Y.

The extensive new plant of the National Carbon Company, now building at Niagara Falls, N. Y., which will have a floor space of nearly four acres, is rapidly approaching completion. It is expected it will be ready for operation about Sept. 1.

The Phoenix Die Casting Company, Buffalo, N. Y., has been incorporated with a capital stock of $15,000 to manufacture dies, die castings, etc. Henry Bechter, 326 Hudson street, is president.

The village of Wellsville, N. Y., is having plans prepared for a water work and distributing system estimated to cost about $200,000. Engineer Charles C. Hopkins, 343 Cutler Building, Rochester, N. Y., has the matter in charge.

New England

BOSTON, July 25, 1911.

The demand for machinery experiences little change and the market is without special feature. Export business continues to occupy an important place in business. Machine tool builders who have recently returned from Europe report that conditions there are excellent as they effect the industry. One manufacturer, who has recently visited England, France, Belgium and Germany, found the outlook bright practically everywhere. The drought continues to exert a somewhat important influence in this section. Water power is rapidly failing and mills having no auxiliary steam power are suffering accordingly. As is always the case when this condition exists interest in steam power on the part of the mill owners increases visibly and doubtless considerable buying of power equipment will eventually result from the present lack of rain.

A new New York corporation, the McCue Company, has been organized with a paid in capital stock of $700,000 to take over the business of the McCue Company, of Hartford, Conn., and the Superior Axle & Forge Company, Buffalo, N. Y., manufacturer of automobile axles and transmissions. C. T. McCue is president and general manager of the combined business. It is stated that the company will operate both works, that at Buffalo taking care of the Western trade. The McCue Company was organized as a Connecticut corporation in 1904 and has built up an extensive business. The Superior Axle & Forge Company began operations last January. It is one of the best equipped axle works in the country and has a large drop-forging plant. The directors of the company are J. W. Lansing, H. H. Bean, Ira T. Gleason and H. A. Kamman, all of Buffalo, and C. T. McCue, of Hartford. Mr. Lansing is the vice-president. Mr. McCue will make his residence in Buffalo. The company begins business with orders for 1912 totaling over $800,000.

The business of Scott & Williams, Inc., Philadelphia and Boston, manufacturers of knitting machinery, and of the Geo. D. Mayo Machine Company, Laconia, N. H., manufacturers of seamless hosiery machinery, have been consolidated. Both plants will be operated as heretofore, but the selling and plant management will be centralized. This change has been accomplished by the purchase by Scott & Williams, Inc., of a large interest in the Mayo company and a purchase by the Mayo company of an interest in the other corporation. Robert W. Scott, president of Scott & Williams, Inc., is now the president and Philip M. Reynolds is treasurer of the Geo. D. Mayo Machine Company. The official statement is made that both companies will be maintained and both plants will be enlarged and improved as business may warrant it.

Giron Frères, manufacturers of velvet ribbons at St. Etienne, France, have decided to build a large mill at Norwich, Conn., where land has been purchased for the purpose. Other additions to manufacturing industries include a brick building 68 x 80 ft., three stories, for the Berkshire Woolen Company, Pittsfield, Mass., and an addition 40 x 48 ft., three stories, for the Crane Bay State Mill in Craneville, Mass.

The McNab Company, Bridgeport, Conn., which has recently taken over the assets of the McNab Indicator Company, will not establish a factory for the present, its product being manufactured by the Automatic Machine Company, of that city.

The contract has been awarded for the new factory of the Artistic Bronze Company, Fairfield avenue, Bridgeport, Conn. The main building will be 30 x 100 ft., one story, the boiler house 22 x 35 ft., and there will be several smaller structures. The company will remove its plant from Norwalk, Conn.

The Pawtucket Foundry Company, Pawtucket, R. I., has filed a voluntary petition in bankruptcy, and Wm. H. Thornley has been apointed temporary receiver.

John R. Graham, Bangor, Me., president of the Bangor Railway & Electric Company, has purchased, according to a despatch from Bangor, the hydro-electric plant of the Bodwell Water Power Company on the Penobscot River at Old Town and Millford and will carry out extensive plans for increasing the power. The present plant was constructed some years ago at a cost of $1,000,000. The increased power will be obtained by the construction of a dam across the Stillwater branch of the Penobscot.

Irving H. Page has relinquished the managing control of the business of the Stevens-Duryea Automobile Company, Chicopee Falls, Mass. He has resigned the office of president, but will continue to serve as treasurer. The management of the business has been assumed by W. H. Whiteside, Chicago. Mr. Page will devote his attention more particularly to the J. Stevens Arms & Tool Company, of which he is president and treasurer.

The Gilbert & Barker Mfg. Company, Springfield, Mass., which is preparing for the establishment of a large factory for the building of gas manufacturing equipment, states that its plans are not ready for any detailed statement, no final decisions having been reached.

The Atwater Mfg. Company, Southington, Conn., manufacturer of hardware and forgings, has filled the vacancy caused by the death of President Norman A. Barnes by the election of Alfred M. Smith to that office. Mr. Smith has been secretary and treasurer of the corporation and will continue to hold the latter office. Bradley H. Barnes continues as vice-president. John Hemingway was elected secretary and James H. Pratt, formerly president of the company, was made a director to succeed Mr. Barnes. The board now consists of Mr. Smith, Mr. Barnes, Mr. Hemingway, Mr. Pratt and Leo Davis. The affairs of the company are in a very prosperous condition. During the year many improvements have been made, including the installation of a new boiler and engine and considerable machinery. The company is now planning to install a system for the use of oil as fuel to take the place of anthracite coal in forging.

Philadelphia

PHILADELPHIA, PA., July 26, 1911.

Reports from both merchants and manufacturers indicate that business is still very irregular. There has been little fresh inquiry and the demand has been confined almost entirely to single tools; in several instances, however, requirements appear to be along the heavier lines. The vacation period has had considerable influence on pending negotiations and prospective orders are frequently held up on this account. Industrial concerns, while slightly more actively engaged, particularly in finished steel lines, have not reached the point where additional equipment is being considered; for the most part the present tool equipment is not yet fully engaged. Railroad buying continues very light. Some fair business is under negotiation in power-plant equipment, but even in these lines there is the usual hesitancy shown in the final placing of orders. The second-hand boiler, engine and machine tool equipment market shows but little movement. The demand is irregular and but few orders for tools have come out.

The foundry trade is dull. Steel casting plants are operating on a basis of 30 to 50 per cent. and are largely dependent on week to week orders. The absence of railroad and heavy machinery business is being keenly felt. Gray iron foundries are also operating irregularly. Some of the smaller plants are pretty well engaged, but in the larger foundries, particularly those depending to some extent on the machinery trade, operations are usually at a rate considerably under normal.

The Pennsylvania Railroad has an inquiry before the trade for a small grinding machine.

The Pennsylvania Equipment Company, West End Building, is in the market for a second-hand mold board plow, left-hand side, to plow off Hart cars; also for iron or steel turntables to handle locomotives 55 ft. long and 50-tons weight.

THE MACHINERY MARKETS

The Southwark Foundry & Machine Company has recently booked orders for equipment of the new steel plant of the Laclede Steel Company, St. Louis, Mo., including one 34 x 48-in. Corliss engine, with a complement of four rope drive wheels and a Weiss condenser plant. This concern has been booking a fair amount of general engine and condenser orders in the past few months, but notes that pending business has not closed so freely during the past month.

The Chester Engineering & Machine Company, Chester, Pa., which makes a specialty of gasoline engines for automobile and marine service, is extremely busy in every department. In addition to a large number of orders for its own line of Penn motors it has recently made a contract with the American Locomotive Company to build a large number of that company's motors for Alco automobiles.

Contracts have been announced by the government under which the New York Shipbuilding Company, Camden, N. J., will build two sea-going tugs to cost $194,000 each.

Plans have been filed with the Bureau of Building Inspection for the new plant to be erected for the Adams & Westlake Company, at Twenty-second and Ontario streets, previously mentioned. The building will be about 105 x 149 ft., three stories.

The Empire Grate Company, Chester, Pa., is operating to its full capacity. In addition to its regular line of grates, the company is doing a large amount of work in general and machine castings. Plans recently referred to regarding the removal of this plant to larger quarters have not fully matured.

The Pennsylvania State Commission to erect a State Hospital for the Criminal Insane at Fairview, Pa., will receive proposals at its office in the Real Estate Trust Building, this city, until August 8, for the construction of new buildings known as dining room, kitchen, bakery and laundry buildings, power plant, ice house, reservoir, sewage disposal and equipment for the various buildings and power plant. Drawings, specifications and blank forms may be had from the architect, C. M. Shirk, 518 Philadelphia Bank Building, this city, on making a deposit of $200, of which $180 will be refunded on return of the drawings.

The Lanston Monotype Machine Company is asking for estimates on its proposed new plant to be erected on Locust street, between Twenty-fourth and Twenty-fifth streets. Plans provide for a six-story building of fireproof construction, 268 ft. on Locust street and 176 ft. on Twenty-fourth and Twenty-fifth streets. The matter of power equipment for the new plant is now under consideration, while that referring to probable additional machinery and tool equipment will not be taken up until a later date.

The Universal Sanitary Mfg. Company, New Castle, Pa., manufacturer of closets, tanks and other plumbers' specialties, suffered the loss of its plant, consisting of several brick buildings, with the stock on hand, by fire July 22. The plant was only partially insured.

Cleveland

CLEVELAND, OHIO, July 25, 1911.

The slight improvement noted in the local machine tool market during the past few weeks continues. Dealers report a moderate volume of scattering orders, largely for single tools. While little change is looked for during August it is generally believed that the market will become more active in the fall. The Michigan automobile concerns that recently came in the market for considerable equipment for extensions have made their purchases and Cleveland dealers took a share of the business, the largest order placed here amounting to about $25,000. Some business in lots of several tools has also come from automobile manufacturers in Ohio. According to announced plans for factory extensions some other automobile builders in the Central West will buy considerable machinery during the next two or three months. The outlook for the automobile and motor truck industry during the coming year is now regarded as very promising. The rubber industry continues to furnish a fair volume of single tool business. The demand for second-hand tools is only moderate and dealers' stocks of used tools have increased somewhat during the past few weeks. Lists for railroad requirements are still being held up and practically no business is coming from that source in this territory. The demand for steam engines and boilers is quite good, especially for large installations. One local selling agency reports that its sales in these lines during the first half of the year were 20 per cent. larger than during the corresponding period of 1910.

In the foundry trade the demand for both iron and steel castings continues light.

The Lake Erie Nail & Supply Company, 412 Frankfort avenue, Cleveland, in addition to its line of heavy hardware, mill and factory supplies, will hereafter handle iron and woodworking machinery. A line of the latter will be carried in stock. The machinery department after August 1 will be in charge of S. W. Sparks, who has been connected with the Osborne & Sexton Machinery Company, Columbus, Ohio.

The Adams-Bagnall-Bagnall Electric Company, Cleveland, has commenced the erection of a modern factory building on its present site. A six-story structure of brick, steel and cement construction is being erected that will provide 65,000 sq. ft. of floor space. The company does not expect to need any new machinery equipment.

The Board of Trustees of the Athens State Hospital, Athens, Ohio, will receive bids care the Osborn Engineering Company, 20 East Broad street, Columbus, Ohio, August 10, for two 125-hp. horizontal tubular boilers complete, including breeching and steam piping, and one horizontal steam-driven air compressor with steam and air pipe connections, one air receiver and two air lift wells with piping and other equipment.

The Aluminum Foundry Company, Sebring, Ohio, has been incorporated with a capital stock of $20,000 by Fred Baugh and others. Mr. Baugh is at present operating a foundry in Alliance, Ohio. The new company will build a foundry building 50 x 150 ft. for the manufacture of aluminum castings exclusively.

The Lauth-Juergens Motor Car Company, Fremont, Ohio, is planning the building of an addition to its plant during the coming fall.

The Thompson Hanger Works, A. J. Thompson, proprietor, now located at 337 Superior avenue, N. W., Cleveland, will equip a plant for the manufacture of an electric cut-out hanger for arc lamps. A drill press, grinder and a small amount of other equipment will be needed for assembling work.

The Forest City Electric Company, Windsor avenue, Cleveland, is erecting a repair shop to replace one recently destroyed by fire.

The purchase of the machinery equipment for the new West Side Technical high school, Cleveland, which has been delayed longer than expected, will be made shortly by the Board of Education. The list, which was published in *The Iron Age*, May 25, consists of about 100 tools, including machine shop, forge shop, pattern making and cabinet shop and foundry equipment. Specifications have been completed and bids will be received in about four weeks.

The Economy Stove Company, Scranton road, Cleveland, which has been doing business as a partnership, has been incorporated with a capital stock of $100,000 by Frank A. Nieberding and others. Plans will be made for increasing its output.

The Cleveland Trolley Wheel Company, Cleveland, has been incorporated with a capital stock of $50,000 by E. E. Beam, L. S. McAdams, C. H. Hartley, W. H. Thompson and others.

The Maddock Textile Company, Milford Center, Ohio, will build a new plant to replace one recently destroyed by fire.

The Bay View Foundry Company, Sandusky, Ohio, has increased its capital stock from $40,000 to $75,000.

Cincinnati

CINCINNATI, OHIO, July 25, 1911.

The usual vacation period has been extended this year and manufacturers generally are taking advantage of the present lull to get their plants in good shape for fall business. A bright spot with the machine-tool builders is the export trade, and there does not seem to be any material let-up in the number of orders that have been coming in freely for the past three months. The majority of the machine-tool shops are operating on curtailed time, and in spite of this a few of them continue accumulating stocks. However, there is a generally optimistic feeling and it is thought that September will see a decided turn for the better in the domestic trade.

The superintendents and foremen of the different shops in Oakley, a Cincinnati suburb, have organized under the name of the Superintendents' and Foremen's Club, of Oakley, Ohio. On July 20 a dinner was served at Weber's café, at which time the organization was

THE MACHINERY MARKETS

perfected and the following officers were elected: President, William H. Shaffer, superintendent and treasurer Cincinnati Bickford Tool Company; vice-president, H. M. Ramp, superintendent Modern Foundry Company; treasurer, S. E. Weir, superintendent Triumph Electric Company. The following comprise the board of governors: William Baretis, general foreman Cincinnati Bickford Tool Company; Charles W. Moon, general foreman Triumph Electric Company; Charles Herider, foreman Cincinnati Milling Machine Company; William J. Eggebrecht, foreman Cincinnati Planer Company, and William Raeder, foreman Modern Foundry Company. In addition to social features it is planned to have a number of lectures on current shop topics at the club meetings during the coming winter.

The Eureka Foundry Company, one of Cincinnati's oldest foundries, filed a voluntary petition in bankruptcy last week. The estimated assets are $125,000 and the liabilities are only $75,000. It is claimed that the company is entirely solvent, but on account of the present business recession it is not able to meet pressing obligations without having to dispose of its property at ruinous prices. William H. Merten, president of the company, has qualified as receiver and will operate the plant as heretofore.

Sealed proposals will be received by the board of trustees of the Athens State Hospital, care the Osborn Engineering Company, Columbus, Ohio, until August 10, for the following: Two 125-hp. horizontal tubular boilers, complete, including breeching; one horizontal steam-driven air compressor, complete with all steam and air-pipe connections; one air receiver; two air-lift wells, complete with all piping; concrete cisterns, etc. Specifications may be seen at the engineer's office in Columbus and at the superintendent's office, Athens State Hospital, Athens, Ohio.

The superintendents of the local machine shops visited the University of Cincinnati July 20 for the purpose of inspecting the new power plant and engineering building. Some interesting tests of machine tools were made and at an informal meeting afterward it was decided that each shop superintendent should visit the Cincinnati Continuation School once each month and deliver a short talk on some shop topic.

The Tool Steel Gear & Pinion Company, Cincinnati, is installing additional equipment in its plant in Carthage suburb. It has lately added rolled gears to its line, made from rolled blanks furnished by the Carnegie Steel Company. In addition to its excellent domestic business the company is shipping a large number of its gears to foreign street-car lines.

The Standard Steel Bottling Machine Company has been incorporated at Parkersburg, W. Va., with $6,000 capital stock. J. T. Calahan and H. B. Hogg are named among the incorporators. The company's plans have not yet been given out.

Work has commenced on the large glass plant of the Wheeling Tumbler Company, at Wheeling, W. Va.

The Mosler Safe Company, Hamilton, Ohio, has let contract for an extensive addition to its pattern shop.

The Bay View Foundry Company, Sandusky, Ohio, has increased its capital stock from $40,000 to $75,000.

Chicago

CHICAGO, ILL., July 25, 1911.

In contrast to the first two weeks of July, the past several days have been productive of some interesting business in machinery lines. The International Harvester Company, for the addition to its Tractor Works machine shop, bought machines totaling in value about $20,000. About half of this amount was placed with one Chicago dealer and in the neighborhood of $6,000 with another. A local printing concern purchased tools to the amount of $5,000. Among the machines in these two orders were five Bullard vertical turret lathes—four 36-in. and one 42-in. The Chicago & Alton Railroad expects to buy for its Bloomington shops about $14,000 worth of tools, including 36-in. x 10-ft. and 24-in. x 6-ft. lathes, 42-in. boring and turning mill, a 48 in. x 48 in. x 12-ft. planer and a 6-ft. plain radial drill, all to be motor-driven. During the convention of the American Railway Tool Foremen, to be held in Chicago this week, special demonstrations of its complete line of tools will be given at the store of the Marshall & Huschart Machinery Company, 17 South Jefferson street. This company's store is especially well equipped to display the merits of machinery in actual operation, and on this occasion factory representatives will be present to demonstrate thoroughly features of advantage. It is stated that 7000 invitations have been issued.

Floor sales in the past week have shown improvement in volume, and the scattering business made up of sales of individual tools has been more satisfactory. On some attractive orders it is reported that the temptation to shade prices has not been entirely resisted, this weakness extending even to the manufacturers. The manufacturers of machine tools are operating very generally at less than the normal rate, with builders of milling machines favored somewhat above the others.

The sale of second-hand electrical equipment is steadily growing. Time was when a used dynamo or motor was considered in the same light with a second-hand boiler—an article as uncertain as a lottery ticket. The thoroughly reliable overhauling which is now assured to the buyer of used electrical power equipment by the several concerns who are specializing in this direction is changing the situation. One may now buy such motors or generators with the same confidence as obtains in the purchase of second-hand machine tools.

The American Brake Shoe & Foundry Company is now building on the 10-acre tract recently purchased at Twenty-sixth street and South Forty-sixth avenue what will be its largest Chicago plant for manufacturing brake shoes. It will be recalled that this company formerly made brake shoes at its Chicago Heights plant, but with the development of the manganese steel operations there and subsequent sale of that plant to the Edgar Allen Manganese Steel Company its brake-shoe capacity was limited to the Maywood plant which was acquired from the Featherstone Foundry & Machine Company. At the Burnside plant of this company only castings of more general character are made.

The National Steel Tank & Mfg. Company has been incorporated with $25,000 capital stock and will build a factory at Bradford, Ill., for the manufacture of steel tanks. This company will succeed the National Steel Tank Company, Pekin, Ill. The incorporators are H. L. Ruhaak and R. D. Lackman, of Pekin, and Joseph F. Cody and Edward M. Cody, of Peoria.

The Schneider Sales Company, Chicago, was incorporated with a capital stock of $2,500 to manufacture and deal in tools, machinery and appliances. The incorporators are Caspar J. Schneider, Lester E. Lee and Sidney E. Levy.

Curtis Brick Company, Grant Park, Ill., with a capital stock of $500,000, has been incorporated by Edward C. Curtis, Bernon C. Curtis and Ernest B. Griffin to manufacture and deal in brick, tile and terra cotta.

The Clyde Machine Works, Thirty-ninth and Union streets, Chicago, is in the market for a screw-cutting bench lathe 9 in. or over.

Oelrick & Berry, Larrabee street, Chicago, Ill., machinists and type founders, are building a four-story addition to their plant.

The Winthrop Asphalt Shingle Company has arranged for a building site at Clearing, Ill., and will build a factory there.

The Rumely-Wachs Machinery Company, 121 North Jefferson street, Chicago, is now permanently organized with the following officers: President, William N. Rumely, of the M. Rumely Company, La Porte, Ind.; vice-president, Charles L. Wachs; treasurer, O. A. Wachs; secretary, E. H. Wachs, Jr. S. E. Harvey is the newly appointed sales manager. A long term lease on the premises formerly occupied by McDowell, Stocker & Co. has been secured.

The Metal Workers Company, Chicago, has been incorporated with a capital stock of $10,000 to manufacture and deal in machinery and tools. The incorporators are Albert Nathan, Robert E. Fouz and Charles E. Stifft.

The Bi-Town Brush Company has prepared plans for and is about to erect at Aurora, Ill., a factory building 100 x 200 ft., the new construction to cost $25,000.

The city of Benson, Neb., has voted a $25,000 bond issue to provide for the building of a new water-works plant. Communications should be addressed to the Mayor.

A new ice plant to cost $100,000 is to be erected at Muskogee, Okla., by G. F. Bucher.

The New Sharon Motor Company, New Sharon, Iowa, is preparing to erect an addition to its plant.

The American Equipment Company, Indianapolis, has been incorporated with $50,000 capital stock, to manufacture fire protection apparatus. The directors are H. S. Byrkit, W. F. Roembke and M. C. Spearing.

THE MACHINERY MARKETS

The Railway & Automobile Grease Cup Company has been organized at Terre Haute, Ind., with $5,000 capital stock, to manufacture automatic, dust-proof grease cups. The directors are G. J. Thomson, R. R. Armstrong and O. L. Brown.

The Hoosier Refrigerator Company, Peru, Ind., has been incorporated with $50,000 capital stock to manufacture refrigerators. The directors are W. S. Pond, H. F. Ader and W. A. Tucker.

The Forse Mfg. Company, Pendleton, Ind., has been incorporated with $26,000 capital stock to manufacture mechanical devices. The directors are W. H. Forse, Jr., R. M. Allen and Linfield Myers.

The Crescent Trunk Company has been incorporated at Evansville, Ind., with $10,000 capital stock, to manufacture trunks. The directors are Edward C. Kinkel, H. C. Becker and A. C. Hedderic.

J. J. Higgins, Clinton, Ind., and O. Martin, of Rosedale, Ind., have bought coal lands eight miles west of Clinton and have let the contract for the sinking of a shaft.

The Onyx Mining Company has been organized and incorporated at Martinsville, Ind., with $50,000 capital stock. The directors are Curtis A. Teague, Thomas A. and George R. Hudson, all of Hendricksville, Ind., near which an onyx deposit has been found.

The Anderson Cheese Cutter Company has been incorporated at Anderson, Ind., with $10,000 capital stock, to manufacture cheese cutters. The directors are E. F. Searle, F. M. Wilson and S. H. Searle.

Detroit

DETROIT, MICH., July 25, 1911

Conditions in the local machinery market are practically the same as last week. Sales if anything are fewer, although some dealers report a fair demand. Outside of the automobile trade orders seem to be mostly for necessary replacement and not a great deal of improvement is looked for until fall business opens up. The demand for small tools has noticeably improved over last week and business in this line bids fair to continue brisk. Dealers in pneumatic tools report a cheerful feeling, but the volume of orders is not large at present. More activity is noted through the small industrial centers of the State than in Detroit, as there are numerous new companies coming into the market.

Building conditions are not quite so active this week and little new work is being figured on just at present, although awards were made on some factory additions and other structures which will call for iron work.

The large new factory of the Seitz Automobile Transmission Company is practically completed. The plant is 60 x 320 ft., two stories, of brick and concrete construction. The equipment in the plant includes many machines of special design and all machines are electric motor driven.

The Hemmeter Cigar Company has plans under way for the erection of a new seven-story manufacturing building. The new factory will be equipped with modern machinery and the company's output will be greatly increased.

The Anderson Carriage Company, manufacturer of electric automobiles, will build a two-story addition to its present plant at Milwaukee Junction.

The Everett-Metzger-Flanders Company has let the general contract for the erection of a two-story brick addition to its present factory to H. R. Haberkorn.

The Michigan Sanitary Paper Cup & Milk Bottle Company has been incorporated with a capital stock of $100,000. The principal stockholders of the new company, which will manufacture paper receptacles of various kinds, are Alexander Stevenson, John Stevenson and Andrew H. Weber.

The Welch Automobile Company will move its plant from Detroit to Saginaw, Mich., and will combine with the Marquette Automobile Company of the latter city. Both companies are the property of the General Motors Company and the move is made for factory economy.

The Ross-Heaton Mfg. Company, Richmond, Va., has been purchased by Detroiters and the plant and machinery dismantled and removed to this city. A new company with $50,000 capital stock has been organized here to take over the business of Charles S. Tolsma. C. B. Whitman and C. J. O'Hara being the principal stockholders. The company manufactures automobile curtain fasteners.

Another automobile accessory company is being organized here by John W. Hubbard, F. C. Steck and Thomas F. Ahearn, to be known as the Hunter Auto Lock Company. The capital stock is given at $25,000.

The Superior Bed Springs Company has been incorporated with a capital stock of $3,000 to manufacture bed springs. The principal stockholders are William J. Klein and Charles Holland.

The board of control of Ionia Prison, Ionia, Mich., has appropriated $25,000 to erect and equip new shops at the prison, to replace those destroyed recently by fire. A sprinkler system will be installed throughout the new buildings.

The Peerless Fence Company, Adrian, Mich., has perfected plans for increasing the facilities of the factory by the installation of an electro-galvanizing plant. The new building will be one story, 90 x 100 ft. and of saw-tooth design.

The Atlas Drop Forge Company, Lansing, Mich., has increased its capital stock from $100,000 to $200,000 to take care of a steady increase in business. The company has enlarged its plant twice within the past year.

The Marshall Lumber Company has taken over the holdings of the Calumet & Hecla Mining Company at Shelldrake, Mich., and will spend a large amount in equipping a sawmill at that place.

The Michigan Sugar Company is making extensive additions to its plant at Alma, Mich., including the erection of a new dryer house. New drying, cutting and granulating equipment and a 200-hp. engine will be installed in the new buildings.

The Lowell Specialty Company, Lowell, Mich., is preparing to build an addition to the present plant. The new building will be of brick construction 32 x 100 ft. and will be used for the manufacturing of sprayers and cream separators.

The Grayling Wood Products Company, Grayling, Mich., has broken ground for a chemical plant which will be the largest in the State, it is claimed. The new company, which has a capital stock of $50,000, will manufacture wood alcohol, turpentine, acetates, tar, etc.

The Armour canning plant at Big Rapids, Mich., is to have extensive improvements in the line of motor-driven machinery, according to L. J. Stimpson, manager of the plant.

Hector MacKay, president of the Rosedale Creamery Company, Sault Ste Marie, Mich., is contemplating the erection of a large sawmill near that city.

The Board of Trade of Ithaca, Mich., has purchased the site and plant formerly occupied by the Armour Tub Company and is negotiating with a Chicago concern for the removal of its business to Ithaca to occupy the vacant factory.

The Michelson Lumber Company's mill at Michelson, Mich., was destroyed by fire at a loss of $50,000. The mill will be rebuilt because of the large tracts of timber owned by the company in the vicinity.

Ground is being broken for the erection of the new manual training high school at Saginaw, Mich. The new school will be equipped with the most modern machinery obtainable for manual training work.

The Nelson Bros.' gasoline engine and pump jack factory, now located at Alma, Mich., will be removed in the near future to Saginaw, Mich., in order to secure larger factory quarters. The firm plans to greatly increase the capacity of the plant.

The Havers Motor Car Company, Port Huron, Mich., is planning to increase its capacity and to enlarge its plant to facilitate the handling of its rapidly growing business.

The Pere Marquette Railroad Company has let contracts aggregating $75,000 for the installation of a new heating, lighting and water system on the property in Saginaw, Mich., and for the erection of a new power house in that city.

The Runyan Gas Company, South Haven, Mich., which recently secured gas franchises at Otsego, Allegan and Plainwell, Mich., is reported to be ordering supplies and equipment for its new plants.

The new Hawthorne Paper Company, which recently incorporated at Kalamazoo, Mich., with a capital stock of $200,000, has awarded the contract for the erection of its new factory to the Frank Flaitz Company, of that city. The building will be of steel with reinforced concrete and mill construction and will consist of a finishing building 52 x 200 ft., four stories, a beater building 70 x 136 ft., three stories, a bleach building 50 x 50 ft., three stories, a machine building 66 x 200 ft., two stories, and an engine house and boiler house both 46 x 56 ft. and two stories. The new company will manufacture high-grade writing paper and

THE MACHINERY MARKETS

will have one of the largest and most complete mills of its kind.

The Clarke-Carter Auto Company, Jackson, Mich., will begin the enlargement of its shops within the next few weeks and is planning the erection of another manufacturing building before long to take care of the rapidly growing business.

Fire which caused a loss of $10,000 at the Monroe Binder Board Company's plant, Monroe, Mich., damaged considerable machinery, including an electric lighting outfit consisting of an engine and generators, punch presses and calendar grinders.

The city of Menominee, Mich., has under consideration the installation of a municipal sewerage pumping station and the extension of its sewer system.

Jackson and Battle Creek capitalists have organized a company with a capital stock of $50,000 for the purpose of mining coal in Calhoun County, Mich. The company is said to have a very valuable property. C. W. Sellers, Battle Creek, and T. J. Hanlon, Jackson, are among those interested.

Coldwater, Mich., is to have a cement-products plant which is being organized by John and William Elliget, of that city. The company will be known as the Coldwater Cement Block Company.

Benton Harbor, Mich., has issued $100,000 of factory bonds, the proceeds of which will be used in financing the location of new industries in Benton Harbor, and a campaign in that direction will be started by the City Development Company.

The Commonwealth Power, Railway & Light Company, Jackson, Mich., which controls most of the electric power plants in southern Michigan, has under way the development of power from the waterflow of the Au Sable River, and is constructing a dam and plant on the lower Au Sable. The plant will have a capacity of 13,500 hp. and the current will be transmitted on the largest transmission line in the world to a substation to be erected near Saginaw for use there and in Bay City. Another dam and plant will be started farther up the river upon the completion of the present work. This project will call for a heavy expenditure for equipment.

It is reported from Milan, Mich., that the Detroit Fireless Stove Company now located in Detroit will probably remove the plant to Milan and increase its capacity.

The South

LOUISVILLE, KY., July 25, 1911.

General reports indicate that business in most lines has considerably improved. While no marked increase in the volume of trade has been noted, a larger number of inquiries is being received, and the outlook is for steadily bettering conditions. Contractors' equipment, including concrete-mixing outfits, are in excellent demand, while the call for power machinery has shown improvement of late. Refrigerating plants are being contracted for freely, and in spite of the dullness in the lumber trade there is a good call for wood-working machines.

Structural iron manufacturers are commenting upon the demand for iron fire-escapes, which are being placed in number of factories, apartment houses, etc. The increase in the demand for these is believed to be due to the general agitation following disastrous conflagrations in the East several months ago, in which there was large loss of life.

The Fiscal Court of Jefferson County, at Louisville, has ordered the purchase of a pump, which will be used in connection with the water softener in use at the county jail. Address Jailer John R. Pflanz.

It has been learned that the Adams Fire Fighting & Instrument Company, which was incorporated in Louisville with $100,000 capital stock recently, will devote its attention principally to the manufacture of appliances for fighting forest fires. Decision regarding the erection of plant has not yet been made. C. M. Pate, Louisville, is in active charge of the company's business.

S. Weber & Son, Louisville, dealers in scrap iron, have purchased the old equipment at the pumping station of the Louisville Water Company for $20,000. There is about 1500 tons of material in the station. The equipment sold included the two old Cornish engines which have been in use for 50 years.

Capt. Brinton B. Davis, architect for the Inter-Southern Life of Louisville, will ask for bids on the structural iron work involved in the new 18-story building of the company in about a month. The specifications have not yet been completed, but it is estimated that from 900 to 1100 tons of material will be required. Details regarding the power equipment for the building are also being worked out.

The demand for ornamental iron work is excellent, according to a report of the Dow Wire & Iron Works, Louisville. Besides a number of local contracts the company is manufacturing the material for use on the Hillyer Trust Building, Atlanta, and the Elks Club, Atlanta. Contracts for many-step fire escapes are also being received.

The Louisville Drying Machine Company is busy, work for distilleries which have closed for the summer being plentiful. The outlook for the fall is especially good.

Many inquiries are being received by the Henry Vogt Machine Company, and though the volume of business being booked is not abnormally large, it is satisfactory for this time of the year. Business in both boiler and refrigerating equipment lines is good.

The Crescent Ice Company, Louisville, has purchased a Houston-Stanwood & Gamble engine from the Brandeis Machinery & Supply Company. The Bauer Engineering & Contracting Company, St. Louis, is installing a cooler tower. The Reilly Pump Mfg. Company, Louisville, has been given a contract for a pump of large capacity.

The Berea Lighting Company, Berea, Ky., has added a turbine engine and dynamo of General Electric Company manufacture to its equipment. Arrangements will be made to supply nearby communities with light and power.

The Crumley Hardware Company, Atlanta, a wholesale hardware house, is erecting a warehouse. It handles bars, sheets and other finished materials. Though a comparatively young concern, it is one of the most important jobbing houses in the Southeast.

Equipment is to be purchased at once by the Pioneer Coal Company, which has been formed to take over the property of the Edgemont Coal Company, in Bell County, Ky., and C. S. Neal is in charge of the operation. A power plant of large capacity, electric mining machinery, a shaker screen and other equipment will be installed. M. M. Budwell, J. B. Speed and other Louisville men are interested in the new developments.

The Consumers' Ice & Cold Storage Company, Lexington, Ky., is to erect an ice, power and lighting plant in that city. A site is now being secured, and work will be begun early in the fall. The ice plant will have a capacity of 100 tons a day. The estimated cost of the plant is $200,000. T. B. Satterwhite is president of the company.

The Dover Pearl Button Company has been formed at Dover, Ky., and machinery will be installed in a building which has been leased for the manufacture of buttons from mussel shells.

The Webster Stone Company, Irvington, Ky., is planning the installation of equipment, including an engine, crusher, etc., in a rock quarry near that point.

An additional pump is to be installed at the station of the Catlettsburg, Ceredo & Kenova Water Works Company, at Catlettsburg, Ky. Owing to poor fire protection facilities in Catlettsburg and Ashland, which is supplied by the same plant, the insurance authorities have recommended considerable improvements in the system.

J. M. Ross, Somerset, Ky., is securing machinery for the equipment of a plant to make machines for cutting cross-ties and bridge slabs according to a new method.

The New Bluegrass Canning Company, Owensboro, Ky., is to purchase machinery for installation in its new factory, which will take the place of that recently destroyed by fire.

W. O. Nelson and C. H. O'Brien, Guthrie, Ky., are planning the establishment of an ice factory. They are now operating a flour mill and electric light plant.

The St. Bernard Mining Company, Earlington, Ky., which operates the water system there, will install a new pump in the immediate future. New mains are also to be laid down and fire hydrants installed. Frank D. Rash is the engineer in charge.

The Vincennes, Washington & Eastern Traction Company, Vincennes, Ind., which recently increased its capital stock from $100,000 to $600,000, has begun construction work on its interurban line between Vincennes and Washington. It will build its own powerhouse, but may make arrangements with the Vincennes Traction Company for the use of the latter's tracks in that city.

Contracts will be let this week by the city of Mc-

THE MACHINERY MARKETS

Kenzie, Tenn., for the construction of the water-works and electric plant in that city. C. H. Jenks, Union City, Tenn., is the engineer in charge.

The Nashville, Tenn., branch of the Ahrens & Ott Mfg. Company has installed the largest steam pump ever sold in Nashville in the city pumping station. The company has the contract for the heating plant of the West Side Hotel at Lebanon, Tenn.

Owing to the failure of a bill providing for a municipal bond issue to pass Memphis, Tenn., will not be able to construct an electric light plant.

Plans are being made at Johnson City, Tenn., for the construction of a water-works system which it is estimated will cost $375,000. The plant will be built by the municipality.

The Georgia Power Company, which is erecting a hydro-electric plant at Tallula Falls, has asked for a franchise to do business in Chattanooga, Tenn. The officers of the company state that they will be able to generate 150,000 hp.

The Nashville, Tenn., Gas & Heating Company has been incorporated with $100,000 capital stock by J. H. Fall, Edwin A. Prife, C. H. Brandon, and others, for the purpose of taking over the plant of the Nashville Gas Company, which will be improved and enlarged.

The Murfreesboro Water Works Company, Murfreesboro, Tenn., is in the market for 15,000 ft. of pipe, mostly 4- and 6-in. Other improvements in the system are to be made.

The Bluegrass Phosphate Company will erect a large mill near Centreville, Tenn., in the near future. The company, which is now in progress of organization, will have a capital stock of $200,000. A. H. Grigsby, Centreville, is one of those interested.

The power-house of the South Pittsburgh Electric Light & Power Company, South Pittsburg, Tenn., was burned recently with a loss of $6,000. The building and engine in which the plant was installed were the property of the United State Cast Iron Pipe & Foundry Company, which suffered $8,000 loss. The electric light plant is to be rebuilt at once.

McDonald Bros., Rogersville, Tenn., are to be awarded a franchise for the sale of light and power in Rogersville. They plan the construction of a power plant on Holston River, three miles from Rogersville. It is planned to construct an interurban traction line after the power plant has been built.

W. A. Voss, Columbia, Tenn., plans the establishment of a steam laundry at Lewisburg, Tenn.

David Getaz, Son & Co., Knoxville, Tenn., are in the market for electric generators, engines and other power machinery.

William R. Wiley & Co., Roanoke, Va., plan the equipment of a machine shop, and are in the market for machine tools, as well as power transmission machinery.

An electric light plant, water works and ice factory are to be built at Vivian, La., by the Vivian Ice, Light & Water Company. O. C. Jacobs, of Oklahoma City, Okla., is president of the company, which has a capital stock of $50,000.

The municipal electric light plant at Clarksdale, Miss., is to be improved as the result of the approval of a bond issue of $60,000.

The city of Hickory, Miss., is contemplating the establishment of an electric light plant.

The Boeuf River Land & Lumber Company has been formed for operations near Monroe, La. Operations, including a sawmill, shingle mill, etc., will be begun in the fall. A $100,000 capital stock has been provided for. Edward Sims is president of the company and J. S. Watson, secretary and treasurer.

The Kimball-Lacy Lumber Company, Arkansas City, Ark., contemplates the erection of a sawmill in that city, taking the place of one recently destroyed by fire.

The Laubenthal Lumber Company, Meridian, Miss., is contemplating the erection of a sawmill at Sunflower, Ala., with a capacity of 30,000 ft. a day.

The Industrial Light & Power Company, Alexander City, Ala., has been incorporated with $50,000 capital stock by Benjamin Russell, J. H. Henderson and O. C. Thomas.

Charles Henderson, Troy, Ala., is planning the erection of an electric light plant at Elba, Ala.

A bond issue of $75,000 may be approved at Clarksville, Ark., for the erection of an electric light plant and water-works system.

St. Louis

ST. LOUIS, MO., July 24, 1911.

The dullness of last week in the machine tool market continues, though the undertone of the situation is still optimistic. During the week some fair orders, in a small way, have been placed and it can truthfully be said that business has not fallen off. Nevertheless the hope of improvement is still present, though just when it will come or from what direction is not yet determinable. Considerable has been heard of plans for new equipment, etc., over the St. Louis district, but the present difficulty lies in the fact that none of this has developed into actual inquiries or the submission of lists for quotations.

The improvements and additions to the plant of the American Brake Company on North Broadway are being pushed and the buildings are nearing the point where the installations of the new machinery can begin.

The Bignall & Keeler Mfg. Company, maker of pipe machines, reports that the demand for its product is such as to keep the plant fully occupied.

The Oliver Chilled Plow Company, South Bend, Ind., has let a contract for the erection of a six-story building on North Broadway in the agricultural implement district and it will be equipped with considerable machinery in addition to that now in operation at its present plant at Twenty-second street and Scott avenue. The building is to be completed January 1.

The city of Kirkwood, a suburb of St. Louis of about 10,000 population, has determined to construct a municipal electric lighting plant as soon as the formalities preceding a bond issue can be completed.

E. J. Nugent, Louisville, Ky., in conjunction with St. Louis and Louisville capitalists, has completed arrangements for the incorporation of a $250,000 company which will build an automobile tire manufacturing plant in St. Louis. Property has been selected for the site of a plant which will employ about 400 hands. The company will be known as the Gregory-DeHart Spring Tire Company.

The Matthews-Davis Tool Company has optioned a new site upon which to erect a new factory for tool manufacture. The building will be 100 ft. front, the height not yet having been determined.

Definite plans have been completed for the construction of a $200,000 addition to the David Ranken School of Mechanical Trades in St. Louis, which will be fully equipped with modern machinery for the practical instruction of the students. The building will be 125 x 225 ft., three stories. The school graduated its first complete class this year and has already found that its graduates are acceptable to the union labor organizations as well as practical and capable to handle work in their lines of study alongside experienced workmen who have developed from apprenticeships.

J. E. Leonard, Springfield, Mo., is planning to build a $200,000 stove manufacturing plant. A site for the factory has already been secured.

William Fennel, Moberly, Mo., manufacturer of carriages and wagons, is about to erect a new factory.

The Hopkins Billing Machine Company, St. Louis, Mo., has arranged to occupy a six-story building in that city which it will equip at once.

Eastern Canada

TORONTO, ONT., July 22, 1911.

Nearly all varieties of industry are contributing to the demand for equipment. Outfit for railroad contractors is not called for very strongly on account of Eastern construction, which is not at present extensive, and such movable plant is largely imported from the United States to supply the extensive demand on Western account. For practically every other class of machinery the demand is well maintained. Assuredly there never was a time when the wear and tear of manufacturing machinery was so great in Canada as it is today. Consequently, the orders for renewal are quite a steady source of business for makers and sellers. That the demand on account of new undertakings will be much greater some months hence is extremely probable. By that time the crop movement will have been financed. The banks will have recovered the money loaned on that account, and will therefore be in a position to give more liberal assistance to commercial customers with plans for increasing their business so as to share in the fruits of the country's enhanced prosperity.

THE MACHINERY MARKETS

Tenders are called for up to Aug. 4 for lock gates and valve gates for the Holland River Division of the Trent Canal, in Ontario. They should be sent to L. K. Jones, secretary of the Department of Railways and Canals, Ottawa.

The Montreal Light, Heat & Power Company will erect a gas meter house at Hochkelego, Montreal.

Contracts have been awarded for a new factory for the Sawyer-Massey Company, Hamilton.

The Diamond Flint Glass Company, Hamilton, Ontario, is having glass prepared for a new factory 150 x 300 ft., steel frame. Two glass furnaces are required.

The bulk of the machinery required for the $75,000 mill which is being put up at Montreal for the Dominion Flour Mills Company, Brantford, Ontario, is still to be supplied.

Up to July 30 tenders will be received for the construction of offices costing $34,000 for the Montreal Locomotive Works at Longe Pointe.

It is stated to be now beyond question that the Superior Pulp & Paper Company will build its $4,000,000 plant on the Canadian side of Sault Ste. Marie. The clearing of the site has been begun. The new building will be 180 x 500 ft., and will take 18 months to erect. A new coffer dam is being erected to augment the power now supplied the pulp mill, and the output of pulp will also be increased by another 50 tons per day, to supply the paper plants. A battery of 14 boilers is also to be installed in the old power house of the sulphide mill. The plant will employ about 300 hands. Bonds to the value of about $3,500,000 were floated in London several weeks ago. The industry, when completed, will represent an investment of $8,000,000.

The National Hardware Company is making an addition to its factory at Orillia, Ont.

Contracts have been let for the erection of four buildings as additions to the plant of the Page-Hersey Tube Works at Welland, Ont.

The British Electric Plant Company, Scotland, put in the lowest tender for the pumps required for Montreal's filtration plant.

A merger has just been effected of the Perrin Plow & Stove Company, Smiths Falls; the Tudhope-Knox Company, Orillia; the Tudhope-Anderson Company, Winnipeg, and the West Lorne Wagon Company. The new concern will be known as the Tudhope Company, Ltd. The headquarters will be at Orillia, and F. J. Oliver, chief shareholder of the Perrin Plow & Stove Company, will be manager. A large addition will be made to the Tudhope-Knox Company's plant at Orillia, and work has already been begun on it. The plow plant of the Perrin Company will be transferred from Smiths Falls to Orillia, but the stove plant will remain there and will be greatly enlarged.

The Nova Scotia Car Company, Halifax, N. S., has completed the improvement of its forge department. It has 17 oil furnaces now in operation, having found crude oil to be a more economical fuel than coal. Its gray iron foundry is also in operation. Machinery for the new steel car plant has arrived and is being installed. In October the building of steel cars will be begun at the plant.

The North American Smelting Company proposes to begin next month the erection of a lead smelter at Kingston, to cost $36,000. The company has been awaiting the building of the Canadian Northern line which will run directly through its property.

The MacDonald Mfg. Company, Stratford, Ont., is preparing to increase its manufacturing capacity by providing for an enlarged output of threshers.

The Beaver Board Company, Buffalo, N. Y., is negotiating for the purchase of a site in Ottawa upon which to erect a branch factory to employ several hundred men. The company expects to obtain its power at a lower price in Ottawa than the one ruling at Niagara Falls.

The North American Furniture Company has begun the construction of its plant at Owen Sound, Ont.

The Albert Mfg. Company, Hillsboro, N. B., has awarded to the Rhodes-Curry Company, Amherst, N. S., the contract for erecting its plaster mill on the site of the one destroyed some months ago. Buildings and machinery will cost about $100,000.

Application has been made for the incorporation of the Brockville Atlas Motor Company, with a capital stock of $200,000. T. J. Storey, of the Canada Carriage Company, Brockville, Ont., has taken the leading part in the enterprise. A site for the new company's factory has been secured in Brockville.

Western Canada

WINNIPEG, MAN., July 22, 1911.

Harvest operations will be in full tide throughout western Canada by the middle of next month. The activity in the fields will have some tendency to detract from the activity in business circles until the crop is off. The West is also beginning to feel the pressure of the banks upon customers who have become unduly committed to speculations in real estate. It would not cause much surprise if money became tight enough to cause a very sharp check in that speculation, and if some business men might be embarrassed by their land holdings. The long-continued strike at the coal mines of western Alberta and of the Crow's Nest Pass is also a drawback, and it now seems hardly possible for the country to get its winter stock of fuel from those mines this fall. Save for this strike and for the possible financial stringency referred to, the condition of the Canadian West is all that could be desired.

Contracts will soon be open to tender for the construction of a dry dock at Prince Rupert, B. C., for the Grand Trunk Pacific Railway Company. The estimated cost of the work on the lines of the plans now being prepared is $2,000,000. The company's agreement with the city requires work to be begun within three months. The company will increase its round-house capacity at Edson, Alberta, by 100 per cent.

The City Council of New Westminster, B. C., is in the market for the purchase of a steam roller and scarifier, and is about to call for tender for the laying of 12 miles of sewers, manholes to be included.

The rate-payers of Nanaimo have approved by-laws providing sewerage extensions and for privileges to the B. C. Hydraulic Power Company.

Plans are being prepared for a sewerage scheme by the municipality of Prince Rupert, B. C., the cost to be about $250,000.

The municipality of Penticton, B. C., will receive tenders up to August 10 for the installations of generators. The plant is to consist of two 100 k.v.a. 3-phase, 4600-volt, 900 r.p.m. alternating current generators directly connected to impulse wheels; about one mile of 10-in. pipe, one mile of 12-in. pipe, switchboards, transformers, meters, distribution and street lighting system.

The Anglo-American Warehouse Company is about to build a warehouse in Vancouver, B. C., to cost $60,000.

The Portland Cement Company, with a capital stock of $1,500,000, proposes to build a manufacturing plant on the Grand Trunk Pacific Railway line, 150 miles west of Edmonton. J. Clossosskil, Edmonton, Alberta, is the engineer. Specifications for the following have been prepared: Boilers, electric lights and power plant consisting of one 1000-kw. engine or turbine driven set, one 500-kw. engine or turbine driven set, two 40-kw. driven exciters.

Gordon, Ironsides & Fairs, of Winnipeg, have begun the construction of their large abattoir at Moose Jaw, Sask. The estimated cost is $2,000,000.

It is announced that the Pacific Electric Heating Company, whose headquarters are at Ontario, Cal., will establish a plant at Vancouver, B. C.

The B. C. Electric Railway Company has begun the erection of car repair works at its Chilliwacks Terminal point, near Vancouver.

MacDonald & Godson have established a structural ironworks plant at Barnet, B. C. They have obtained from the Vancouver City Council a contract to supply steel pipes for water mains amounting to $283,000.

The Morrison Mill Company, of Billingham and Blain, has purchased the plant and assets of the B. C. Mfg. Company, on Lulu Island, B. C. The company will erect a large new plant for the manufacture of lumber, boats, veneers and baskets.

The Cockshutt Plow Company has informed the City Council of Regina, Sask., that it will build a $50,000 warehouse in that city.

The Canadian Western Lumber Company is planning extensions of its plant at Fraser Mills, near New Westminster, B. C. A new sash and door factory and a shingle mill are to be added, the cost of construction and equipment to be $300,000.

The Inland Revenue Department of Canada has granted a license to the Western Power Company of Vancouver, B. C., to export 6500 hp. of electrical energy, in fulfilment of a contract with the Whatcom County Railway & Light Company, which supplies light and power to Bellingham and other towns in the State of Washington.

THE MACHINERY MARKETS

The Gordon Nail Company expects to have its plant for Calgary completed by September.

The McLaughlin Carriage & Automobile Company, Oshawa, Ont., has purchased a large site in Saskatoon, Sask., upon which it will erect a distributing warehouse for the portion of Canada west of Winnipeg.

The British Collieries, Ltd., with a capital stock of $5,000,000, and head office at Winnipeg, has been incorporated to carry on coal and other mining operations at Brazeau River, near Edson, Alberta. The provisional directors are: Edward Brown, chairman; H. W. Hutchinson, D. E. Williams, D. C. Cameron, J. S. Hough, D. R. Dingwall and F. S. Harstone, all of Winnipeg; James W. Haywarst and U. J. Tobin, of Vinton, Iowa.

At the annual meeting of the Saskatchewan Farmers' Elevator Company, held in Moose Jaw last week, it was decided to build at once a number of elevators at different points, to be ready for handling this fall's crop.

Consideration is now being given by the Commissioners of Calgary, Alberta, to the question of providing additional water supply for that city and another gravity line will be built up the Elbow River.

Chipman & Power, engineers, Toronto, are preparing a report on the installation of a water works system at Humboldt, Sask.

The city of Vancouver has passed a bylaw for water works extension to the amount of $1,000,000.

Prince Albert, Sask., has voted to spend this year $32,000 on its water works system.

The South Kootenay Power Company is putting in a sub-station near Grand Forks, B. C., and will construct four or five miles of transmission line for the purpose of supplying ranchers and orchardists in that district with power.

The City Council of Victoria, B. C., has appointed Wynn Meredith consulting engineer in charge of the Sooke Lake scheme of water supply.

The town of Kamloops, B. C., is preparing to spend $200,000 in developing power on the Barrier River, a tributary of the North Thompson River. The power will be conveyed 40 miles to Kamloops, where it will be utilized in connection with the water works system, and for industrial purposes.

The board of trade of Red Deer, Alberta, is securing an engineer to report on the water power that may be developed at a canyon on the Red Deer River, at a point six miles from the town.

Tenders are about to be called for to erect a foundry building for the Edmonton Iron Works, Edmonton, Alberta.

The Canadian Northern Railway Company has decided to erect its western shops at MacLeod, Alberta.

The Canadian Timber Investment Company, Ltd., Vancouver, B. C., has been incorporated to carry on business as saw and shingle mill owners, timber manufacturers, etc.

The Fort Fraser Land Company, Ltd., Vancouver, B. C., has been incorporated with a capital stock of $500,000 to build and operate pulp and paper mills, factories, etc.

Texas

AUSTIN, TEXAS, July 22, 1911.

Cotton crop prospects in Texas could hardly be brighter. Generous rains in the past week have practically insured a large production in all of south and central Texas. In north Texas the drouth is completely broken. Business conditions are improving and the outlook for a record-breaking fall development in all industrial lines is very promising. In Arizona and New Mexico the demand for mining and irrigation machinery shows a good increase. The situation in Mexico remains chaotic and little will be done in that country in the matter of industrial development until after the October elections.

The Memphis Steel Company has the contract for the erection of a large steel standpipe at the White Rock reservoir for the municipal water-works plant at Dallas. The standpipe will have a capacity of 163,000 gal.

The City Commission of Fort Worth now has the plans and specifications for the proposed dam that is to be constructed to form a reservoir for the city's water supply and a pipe line to run from the reservoir to the city ready. It is estimated that the cost of the improvements will be approximately $1,000,000.

Plans are being arranged by local capitalists for the development of a natural gas field near Leuders, and the piping of the fuel to Abilene, a distance of 25 miles. The Commercial Club of Abilene is interested in the proposition.

J. P. Collier, of Amarillo, and associates, are promoting the organization of a company that will have a capital stock of $150,000 to build a plant for the refining of salt that they will mine near Adrian. The salt stratum is said to be 170 ft. thick and to cover a large area of territory.

Henry M. Wallace and associates, of Detroit, Mich., have let the contract for the erection of a gas plant and the construction of a distributing system at Temple, Texas, to cost $100,000.

The Farmers' Gin Company is erecting a cotton gin at Mount Pleasant to cost $5,000.

The Mission Land Improvement Company has promoted the construction at Mission of a system of water works and the installation of an ice and electric-light plant. For the water works system a 50,000-gal. reservoir will be constructed and a 50,000-gal. steel standpipe erected. A pumping plant will also be installed.

The People's Ice Company will install an ice factory and cold storage plant at Bowie.

The City Council of Cuero contemplates the erection of a second steel standpipe for reservoir water for fire protection.

J. S. McKinley will establish a broom factory at Orange.

The Fort Worth Power & Light Company that was recently formed with a capital stock of $3,540,000, has formally taken over the holdings of what was known as the J. R. Nutt syndicate in Fort Worth, embracing electric-light plant, street railway and valuable franchises. Among the directors of the new company are J. R. Nutt, of Cleveland, Ohio; George T. Reynolds, T. B. Yarbrough, W. C. Stripling, John P. King and A. J. Duncan, of Fort Worth.

Maurice Clark, of Oaxaca, Mexico, is promoting the installation of a large hydroelectric plant in the Tomellin canyon, in the State of Oaxaca. He has already secured a large number of provisional contracts for power in the mining districts within a radius of 100 miles of the proposed plant. In these contracts he agrees to commence furnishing power not later than the beginning of 1914.

Andrew Mackenzie, of Pachuca, Mexico, has his plans well advanced for the installation of a large hydroelectric plant in the State of Hidalgo. He will utilize the waters of the Tula and Moctezuma rivers for generating the electric power. The particular purpose of the proposed plant is to provide power for the operation of the machinery of the mines and mills of the Zimapan district.

An election of the taxpayers of Nogales, Ariz., will be held October 10 for the purpose of determining whether or not bonds shall be issued for the construction of municipal water works and sewer systems. It is estimated that the proposed water works system will cost about $100,000 and the sewer system $60,000.

J. H. Bell, of San Antonio, will install an ice factory and electric-light plant at Floresville.

E. C. Clark, of Chicago, is arranging to install an electric-light plant and ice factory and a water works system at Menard.

The Cameron Lumber Company will rebuild its lumber mill at Saron that was recently destroyed by fire. The mill will be equipped with modern machinery of a single-circle saw type, and will have a cutting capacity of 75,000 ft. per day.

The Magnolia Oil Company is preparing to erect at Galveston four storage tanks each of 15,000 gal. capacity, and also a distributing station. M. C. Bowedn has the contract.

The Farmers' Gin Company has been formed at Donna with a capital stock of $5,000. The incorporators are J. C. Hardison, S. J. Smallwood and Hill Hooks.

The Frenka-Kickler Gravel Company has been formed at Houston with a capital of $16,000. The incorporators are Joseph V. Frenka and Henry Kickler, of Fayetteville, and Millia Kneblik, of Houston.

The American Rio Grande Land & Irrigation Company, of Mercedes, is extending its irrigation canal system for the purpose of bringing an additional tract of 6000 acres under cultivation. Three miles of main canal and 35 miles of laterals will be constructed at a cost of about $100,000.

THE MACHINERY MARKETS

Preliminary steps have been taken looking to forming the Llano Grande Improvement district in Hidalgo County. The district will embrace about 90,000 acres of land, which will be drained by means of ditches that will be dredged. The cost of the work will be about $125,000. George B. Merriweather, engineer, Donna, was appointed by the Board of County Commissioners to investigate the project and make a report on same.

Richard Honey, Pachuca, Mexico, who is negotiating for the purchase of the plant of the Mexica Car & Foundry Company at Hutchinson, Mexico, now in the hands of a receiver, is promoting the erection there of a large iron and steel works in connection with the car manufacturing plant. A number of Americans and Mexicans are associated with Mr. Honey in the proposed enterprise. They have acquired large iron ore deposits in southern and central Mexico and development work is now in progress upon some of these properties. Mr. Honey is also owner of the iron works at Zimapan, Hidalgo, which is operated under the name of Negociacion Manufacturera de Fierro.

Dr. F. S. Pearson, of New York, head of the British syndicate which owns lumber mills at Madera and Pearson, state of Chihuahua, and a tract of 3,000,000 acres of timber land in that state, as well as the Mexico & Northwestern Railroad and a large electrical enterprise in Mexico, announces that he and his associates have adopted plans for the erection of paper mills, a box factory, sash and door factory and interior finish factory in El Paso. The proposed industrial plants will cost about $2,500,000. Hiram Smith, manager of the lumber department, with headquarters at Madera, Mexico, will attend to the details of the work.

The federal government of Mexico will soon begin the construction of an important extension of the drainage system of Mexico City.

The Pacific Coast

SAN FRANCISCO, CAL., July 18, 1911.

Orders for large tools are being placed with increasing frequency, and in some cases of late a considerable number of tools has been taken by one concern. New inquiries are still of a rather scattering nature, however, and no very steady demand can be counted on. The bulk of the business is made up of small orders for immediate delivery out of stock, and the merchants who cater to this trade regard conditions as about normal. Considerable buying is being done by oil well supply firms, one of them having recently placed an order for eight oil-tool lathes. The Corliss Gas Engine Company, recently reorganized, has ordered quite a lot of tools for shipment from the factories, and the Judson Mfg. Company, which recently took the structural contract for the Oakland city hall, has purchased a number of punches and other structural tools. Railroad inquiries which have been expected have not materialized, though it is known that new equipment is badly needed at several of the coast railroad shops.

Woodworking machinery is not in much demand. A few machines are being installed in local cooperage shops, in preparation for the wine season, but this business is of a small nature. Several substantial orders have been placed for mining equipment, and continued activity is expected in this line. Power pumps of the stock designs of local shops are in strong demand, and gas engine manufacturers are getting a good volume of export, as well as local business.

The Pacific Light & Power Company, San Francisco, G. O. Newman, chief engineer, will have prepared in the near future plans and specifications providing for a 300,000-hp. hydro-electric plant.

W. S. Heger, who has been manager of the San Francisco and Los Angeles offices of the Allis-Chalmers Company for about two years, has tendered his resignation and has been succeeded by Fred L. Webster. Mr. Heger is a pioneer in the coast machinery business, having opened a local office for the predecessor of the General Electric Company in 1880. He also established the San Francisco office of the Westinghouse Electric & Mfg. Company, in 1895, and was coast manager for that company until 1905. His successor has been manager of the Seattle office. The territory hereafter covered by the San Francisco office of the Allis-Chalmers Company will extend from the Mexican boundary to Alaska. M. C. Miller, assistant to the president of this company at the Milwaukee office, arrived here a few days ago.

The Union Iron Works is doing considerable marine work at present. Oil burners are being installed in a number of steamers plying between Pacific ports, and the army transport Sheridan will be placed on this company's dry dock next week.

The California Harbor Board has purchased a pile driver hoist from the Joshua Hendy Iron Works, and a compressor and pneumatic drill outfit from Harron, Rickard & McCone.

Considerable machinery is being shipped east from the Balaklala Copper Company's smelter at Coram, Cal., which has been closed for an indefinite period.

An electric air compressor has been installed at the Tightner mine in Sierra County, Cal., and an order for a 10-stamp mill has been placed with the Miners' Foundry, Nevada City, Cal.

The Edison Electric Company will shortly begin work on a new power plant at Colton, Cal.

The United Engineering Works, this city, has just completed a steel steamer for the immigration service.

The contemplated improvements at the pottery plant at Gladding, McBean & Co., Lincoln, Cal., includes a 3-ton traveling crane with a 75-ft. span,

The Halifax-Tonopah Company, Tonopah, Nev., is preparing to install a large electric hoist at its mine.

The Stevenson Ladder Company, Riverside, Cal., is installing a plant for the manufacture of ladders and fruit growers' supplies.

The Fulton Marine Construction Company and the Brundage Paint Company of Los Angeles have consolidated as the San Pedro Marine Construction Company, and will increase the capacity of the boat shops.

The American Gas Engine Company is negotiating for a factory site at Ventura, Cal.

The Vulcan Iron Works, San Francisco, is installing a lot of compressors and general refrigerating machinery in the precooling plant of the Pacific Fruit Cooling & Vaporizing Company, Lodi, Cal.

The Backus Automatic Gas Machine Company has been incorporated at Los Angeles, with a capital stock of $25,000, by H. Brocker, L. T. Mayo, E. F. Hammel, V. Myers and F. E. McNamee.

The St. Gothard Consolidated Gold Mining Company, North Columbia, Cal., is planning to install a hydro-electric plant.

The Standard Brass Casting Company of Oakland is taking figures on the erection of a new foundry building.

Arrangements are being made for the erection of a large mill for the Inspiration Copper Company, near Globe, Ariz.

The Pacific Gas & Electric Company has let contracts for a new gas plant at Sacramento, Cal.

The Atlas Shoe Company is preparing to install a factory at Bay Point, Cal.

New machinery is to be installed at the Union Oil Company's refinery at Port Harford, Cal., the old equipment of which is being shipped to a new plant in the oil fields.

The town of San Mateo, Cal., has taken bids on a centrifugal pump for a high-pressure fire protection system.

The North Arizona Gas Company, Los Angeles, will put in a new gas plant shortly at Kingman, Ariz.

Government Purchases

WASHINGTON, D. C., July 24, 1911.

The Bureau of Yards and Docks, Navy Department, Washington, will open bids August 12 for one 12-in. electrically driven suction dredge for the United States Navy Yard, Charleston, S. C.

The Quartermaster, Madison Barracks, N. Y., will open bids August 16 for furnishing and installing one pump in the pumping plant.

The Department of the Interior, United States Reclamation Service, Fallon, Nev., will open bids August 1 for furnishing and delivering f.o.b. shipping point one revolving type drag line scraper excavating machine, built and fully equipped for electric operation, with 3-phase, 60-cycle, alternating current at 440 volts. D. W. Cole, project engineer.

The bids received June 15 for furnishing six 1,000,000-gal. pumps have been rejected by the Chief Quartermaster, Chicago, Ill. The purchase will not be made at this time.

A patent on a delivery mechanism of a billet-heating furnace was granted July 11 to Jerome R. George, Worcester, Mass., and assigned to the Morgan Construction Company, Worcester. The patent number is 997,494.

Current Metal Prices.

The following quotations are for small lots, New York. Wholesale prices, at which large lots only can be bought, are given elsewhere in our weekly market report

IRON AND STEEL—

Bar Iron from Store—

Refined iron.
1 to 1⅝ in. round and square ... ₤ lb 1.70c
1¼ to 4 in. x ⅛ to 1 in. ... ₤ lb 1.70c
1¼ to 4 in. x ¼ to 3/8 in. ... ₤ lb 1.80c
Rods, ⅜ and 11-16 inches and square ₤ lb 1.80c

Angles:
	₤ lb
⅜ in. x 1 in. and larger	1.90c
⅜ in. x 3/16 in. and 1 in.	2.00c
1¼ to 2½ in. x ⅛ in.	2.05c
1¼ to 2¼ in. x ¼ in. and thicker	1.95c
1 to 1¼ in. x 3/16 in.	2.05c
1 to 1¼ x ⅛ in.	2.10c
⅞ x ⅛ in.	2.20c
¾ x ⅛ in.	2.25c
⅝ in. x ⅛ in.	2.45c
½ x 3/32 in.	3.00c

Tees:
1 in.	2.35c
1¼ in.	2.20c
1¼ to 2½ x ¼ in.	2.00c
1¼ to 2½ x 3/16 in.	2.10c
3 in. and larger	2.05c
Beams	1.90c
Channels, 3 in. and larger	1.90c
Bands—1¼ to 6 x 6-16 to No. 8	2.10c
Burden's "H. B. & S." iron, base price	2.95c
"Burden's Best" iron, base price	3.15c
Norway bars	3.60c

Merchant Steel from Store—

per lb

Bessemer machinery ... 1.90c
Toe calk, tire and sleigh shoe ... 2.50@3.00c
Best cast steel, base price in small lots ... 7c

Sheets from Store—

Black

	One pass, soft steel	C.R. annealed	R. G.
No. 16	₤ lb 2.45c		2.75c
Nos. 18 to 20	₤ lb 2.50c		2.85c
Nos. 22 and 24	₤ lb 2.55c		2.95c
No. 26	₤ lb 2.60c		3.05c
No. 28	₤ lb 2.95c		3.30c

Russia, Planished &c.

Genuine Russia, according to assortment ₤ lb 12 @14½
Patent planished, W. Dewees Wood ₤ lb A. 10c; B. 9c net

Galvanized

Nos. 12 and 14	₤ lb 2.75c
No. 24	₤ lb 3.15c
No. 26	₤ lb 3.30c
No. 28	₤ lb 3.60c

No 20 and lighter 36 inches wide, 25c higher.

Genuine Iron Sheets—

Galvanized

Nos. 22 and 24	₤ lb 5.50c
No. 26	₤ lb 6.00c
No. 28	₤ lb 7.00c

Corrugated Roofing—

	Painted.	Galvd
2½ in. corrugated	₤ 100 sq. ft.	
No. 24	$3.75	$4.70
No. 26	2.85	3.90
No. 28	2.50	3.65

Tin Plates—

American Charcoal Plates (per box)

"A.A.A." charcoal:
IC. 14 x 20 ... $6.65
IX. 14 x 20 ... 7.90

"A" charcoal:
IC. 14 x 20 ... $5.60
IX. 14 x 20 ... 6.70

American Coke Plates—Bessemer—
IC. 14 x 20 ... 107 lb ... $4.50
IX. 14 x 20 ... 5.50

American Terne Plates—
IC. 20 x 28 with an 8 lb. coating ... $8.70
IX. 20 x 28 with an 8 lb. coating ... 10.70

Seamless Brass Tubes—

List November 13, 1908. Base price, 18¢

Brass Tubes, Iron Pipe Sizes—

List November 13, 1908. Base price, 18¢

Copper Tubes—

List November 13, 1908. Base price, 21c

Brazed Brass Tubes—

List February 1, 1911. 19½c ₤ lb

High Brass Rods—

List February 1, 1911. 14⅜c ₤ lb

Roll and Sheet Brass—

List February 1, 1911. 14⅜¢ ₤ lb

Brass Wire—

List February 1, 1911. 14⅜c ₤ lb

Copper Wire—

Base price, carload lots mill 14c

Copper Sheets—

Sheet copper hot rolled, 16 oz. quantity lots ₤ lb 18c
Sheet copper cold rolled, 1c ₤ lb advance over hot rolled.
Sheet copper polished 20 in. wide and under, 1c ₤ square foot.
Sheet copper polished over 20 in. wide, 2c ₤ square foot.
Planished copper, 1c ₤ square foot more than polished.

METALS—

Tin—

Straits pig ... ₤ lb 46 @47 ¢

Copper—

Lake ingot ... ₤ lb 14 @14¼ ¢
Electrolytic ... ₤ lb 13¾ @14 ¢
Casting ... ₤ lb 13¼ @14 ¢

Spelter—

Western ... ₤ lb 6⅝@ 7 ¢

Zinc—

No. 9, base, casks ... ₤ lb 8¢ Open ... ₤ lb 8¼¢

Lead—

American pig ... ₤ lb 5¼ @5⅝¢
Bar ... ₤ lb 6⅜ @6¾¢

Solder—

½ & ½, guaranteed ... ₤ lb .28¼@28¾¢
No. 1 ... ₤ lb 26¼@26¾¢
Refined ... ₤ lb 24¾@25¼¢
Prices of solder indicated by private brand vary according to composition.

Antimony—

Cookson ... ₤ lb ..@10¼¢
Hallets ... @10 ¢
Other brands ... 9@ 9½¢

Bismuth—

Per lb $2.00@$2 25

Aluminum—

No. 1 aluminum (guaranteed over 99% pure), in ingots for remelting ... 21c and 22¢
Rods and Wire ... Base price 31¢
Sheets ... Base price 33¢

Old Metals—

Dealers' Purchasing Prices Paid in New York.

	Cents.
Copper, heavy and crucible	10.75 to 11.00
Copper, heavy and wire	10.50 to 10.75
Copper, light and bottoms	9.50 to 9.75
Brass, heavy	7.25 to 7.50
Brass, light	6.75 to 6.00
Heavy machine composition	9.25 to 9.50
Clean brass turnings	7.00 to 7.25
Composition turnings	8.00 to 8.25
Lead, heavy	5.75
Lead, tea	3.50
Zinc, scrap	4.00

NICHOLSON U.S.A.

SUCCESS

NICHOLSON U.S.A.

Send for Catalog

IN YOUR SHOP-WORK

Ask for File Filosophy

depends on good mechanics. A good mechanic's success depends a great deal on the tools he uses. Give him a

NICHOLSON FILE

and you have a combination that cannot be equaled.

Nicholson File Company
PROVIDENCE, R. I.

THE IRON AGE

Established 1855 — New York, August 3, 1911 — Vol. 88: No. 5

Published Every Thursday by the
DAVID WILLIAMS COMPANY
239 West 39th Street, New York

Entered at the New York Post Office as Second-Class Mail Matter.

Subscription Price, United States and Mexico, $5.00 per Annum; to Canada, $7.50 per Annum; to Other Foreign Countries, $10.00 per Annum. Unless receipt is requested, none will be sent. Credit for payment will be shown by extending the date on the wrapper of your paper.

W. H. Taylor, - - - - - - President and Treasurer
I. A. Mekeel, - - - - - - - First Vice-President
Harold S. Buttenheim, - - - - Second Vice-President and Secretary

Geo. W. Cope, - - - -
A. I. Findley, - - - - } Editors
W. W. Macon, - - - -

M. C. Robbins, - - - - Manager
Charles S. Baur, - - - Assistant Manager

Branch Offices

Philadelphia, Real Estate Trust Building
Pittsburgh, Park Bulding
Boston, Compton Building
Chicago, Fisher Building
Cleveland, American Trust Building
Cincinnati, 807 Andrews Building

CONTENTS.

International "Co-operation" in the Steel Trade 234
British Iron and Steel Exports Stationary 235
The Intermountain Railroad Rate Decision 235
Two Problems of Factory Building 236
Half-Yearly Pig Iron Statistics 237
The Standard Oil Company's Dissolution 237
Obituary 237
The Iron and Metal Markets 238
Vismera Steel Sheets 248
American Iron Trade Statistics for 1910 249
International Exposition of Inventions 251
Personal 251
The Inland Steel Company's Annual Report 251
International Iron and Steel Association 252
The Mammoth Potrero Gusher 258
Lake Superior Mining Notes 264
Pig Iron Mixers 265
The Swedish Iron & Steel Corporation Hunts Swindlers 265
The British Iron and Steel Market 266
New Publications 266
German Pig Iron Production 266
Two Motor-Driven Garvin Grinders 267
The Youngstown Sheet & Tube Company's Annual Meeting 267
Shop System for Greater Output 268
Aluminum Pulleys for the American Planers 271
An Improved Barb Wire Machine 272
The Platt Iron Works Company's Affairs 273
The Simonds Lockport Steel Mill 274
Air Cylinders for the Pyramid Pumps 276
Autographic Transverse Testing Machine 277
Safety Measures May Be Too Thorough 277
A Steel Transformer Car 278
Efficiency of Pipe Line Carrying Superheated Steam 278
Accident with the Metal Press 279
New Landis Threading Machines 280
Industrial Lighting 281
Percentage of Production of the United States Steel Corporation for 1910 281
The Columbia Chuck 282
The World's Production of Pig Iron 282
Railroad Equipment Orders 282
Baltimore Industrial Notes 283
The Westinghouse Electric & Mfg. Company's Meeting 283
The International Railway General Foremen's Association 284
The Appalachian Exposition 284
The Machinery Markets ..... 285 to 293
Government Purchases 293
British Columbian Mining in 1910 293

Production Keeps Up Well

Generally Favorable Reports from Steel Centers

More Activity in Pig Iron

The tenor of reports from steel selling and producing centers is still favorable. With no lines showing marked activity in new demand, production goes on at a good rate, and some producers have courage enough to look not only for a continuance of the pace reached in the second half of July, but even for an increase in the fall months.

The statistics of production by the leading interest indicate either that the steel trade is in better condition than has been appreciated, or that the Steel Corporation has of late had a slightly larger share of current shipments than was the case two or three months ago. For the present week it scheduled 76 per cent. of its ingot capacity for operation, and for a part of the past week produced 48,000 gross tons of steel ingots a day. This is at a yearly rate of 14,300,000 tons, whereas the record production of the corporation was 14,179,000 tons in 1910.

The pig iron production of two large independent companies has increased and the Steel Corporation continues to operate about two-thirds of its blast furnace capacity. It has been drawing upon its pig iron stocks lately at a rate which points to the blowing in of a few more furnaces if specifications keep up as in the past fortnight.

It is interesting to note that of the total of 11,666,000 tons of pig iron produced in the country in the first half of this year the Steel Corporation, with an output somewhat over 5,000,000 tons, contributed 42.9 per cent., against 43.3 per cent. in 1910 and 43.2 per cent. in 1901, the year of its formation.

The orders of the Carnegie Steel Company in July for billets, sheet bars and track material apart from rails were greater than those for June. Ingot production of the Steel Corporation for each of the two months was around 1,040,000 tons, but July had one less working day than June, owing to the extra holiday on Monday, July 3.

Reports do not agree entirely as to the extent to which prices of certain finished products have yielded where attractive business has come up. In steel bars, wire products and galvanized sheets variations have been reported and latterly there have been similar intimations concerning plates. Following the recent steel bar contracts by implement and wagon manufacturers, the 1.25 cent basis at Pittsburgh is more generally held.

Few noteworthy contracts in finished lines have been placed in the past week, but sellers still comment on the way in which moderate orders have come in for material for early use, showing that consumption is closely abreast of the output of the mills.

The Ensley and Chicago district rail mills have

booked 26,000 tons of rails in the past week, the two largest lots being 5500 and 3000 tons.

Wrought pipe and wire have been the two laggard lines of late, but the former gives a better acount of itself this week in contracts for about 100 miles of oil and gas pipe, with an inquiry for 60 to 80 miles of 12-inch pipe for Oklahoma.

An Indiana wire company is in the market for 40,000 to 50,000 tons of rod billets for delivery over the next six months.

The foundry pig iron market is more active at Buffalo, and Chicago reports some good inquiry for foundry and malleable irons. Southern producers ask $10.50 for No. 2 iron where deliveries run into 1912, but melters are not entering on that ground, though some of them have evidently bought iron at lower prices which will last into the new year, though shipment will be made in 1911. A large Pittsburgh interest has come into the market for 12,000 tons of foundry iron for delivery in the Pittsburgh and Cleveland districts in the last quarter of 1911 and the first quarter of 1912.

A St. Louis inquiry for 10,000 tons of basic iron for the first half of 1912 has come out, but the trade is quite at sea as to the prices to be asked. At Pittsburgh 1500 tons of Bessemer iron has sold at somewhat under $15 at Valley furnace.

International "Co-operation" in the Steel Trade

We publish this week the stenographer's report of the iron and steel manufacturers' conference at Brussels last month, as officially given out. It makes possible some deductions as to the purposes of the proposed international organization. What it does not bring out is the reason for the adjournment of the conference with nothing more definite accomplished than the appointment of a committee to consider whether an international association on commercial lines is feasible and to report its conclusion to another convention which the committee has power to call. It will be seen that the representatives of European countries who took the floor after Judge Gary's address spoke in favor of an association; also that they regarded Judge Gary as its sponsor, and credited the steel industry of the United States with pioneering in the lines which they hoped the association would follow. In so saying they must be understood as advocating in the main the form of "co-operation" practiced by the steel manufacturers in this country since the panic of 1907.

That there were differences of opinion among the various European delegates as to the desired form and scope of the international organization was evident. But the chief obstacle to action is doubtless to be found in what has developed in the United States since the international conference in New York in October, 1910. The questions involved in the decision in the anti-trust cases and the more recent judicial and legislative — shall we also say political?—proceedings affecting the steel industry have given special significance to the government's attitude toward a movement likely to affect prices or to put any restraint upon competition. It was the steel manufacturers of the United States who gave the first impulse to the proposition for an international association. They were likewise the ones to suggest to their competitors in Europe that until the situation in this country is clearer it were better to make haste slowly in the plans set on foot last year. The delegates to Brussels from other countries, prominent among them men who said at New York last year that they favored an international association, had reason to expect that some form of permanent organization would take shape at the meeting. That expectation was apparently well founded, at least up to the preliminary conference held the week previous, on the arrival of the American delegates in London.

There have been differences of opinion at times as to the economic soundness of the market policy followed by American steel manufacturers in the past few years. No serious question has been raised until recently, however, as to the legality of such co-operation; nor has it been doubted that the manufacturers have regarded their action as entirely within their rights and beneficial to the iron trade at large, as well as to collateral industries. Now that the effort to extend the Gary idea to the foreign trade in iron and steel has been postponed for an indefinite time, the question comes up, How are the leaders in the movement to get the light they are seeking?

After years of non-interference by the government with the plans of large combinations, followed by a period of prosecution and investigation, we have now the rule of the Supreme Court that to all acts alleged to be in restraint of trade is to be applied the test of their reasonableness. Now that some of the acts of large steel companies have been called in question, it is desirable that some branch of the government be constituted an authority whose direction may be sought in advance as to the policy to be followed by large manufacturing interests. The railroads have the Interstate Commerce Commission as the supervisor of their acts. It is a question whether the steel industry, in which the manufacturers have virtually been deciding for some years what is a reasonable market price for their product, may not now expect to have their decisions subjected to closer government scrutiny than heretofore. Undeniably, the great size and influence of the United States Steel Corporation, as well as the commanding importance of the steel industry itself, will make the latter a constant subject of Congressional attention. Federal incorporation, with its accompanying supervision, may be the ultimate solution of the problem. But failing that, some extension of the functions of the Bureau of Corporations may not unreasonably be expected. Thus far the call for greater publicity concerning the acts of large corporations has meant publicity after the fact. It may yet turn out that the combines themselves, including those in the steel trade, will prefer publicity in advance of taking a debatable step — publicity at least to the extent of having a decision from some officer of the government as to the legality and propriety of what is proposed. In the case of the Tennessee Company purchase of 1907, the President of the United States was consulted; but, as is well known, his acquiescence had no legal sanction.

What has been written above is suggested by the reading of the proceedings at Brussels in the light of a question raised at one of the Stanley Committee's sessions. The Brussels conference was referred to by the chairman of that committee as part of a plan for an "international steel trust" controlling the export trade and regulating competition between the steel making countries. He even suggested that the scheme was designed to nullify any reductions that might be made in American duties on steel products. The impossibility of any such arrangement is perfectly well known to anyone at all familiar with the foreign trade

in iron and steel. What was said at Brussels by the representatives of Germany and Great Britain indicates that they would not favor a division of markets, and that they do not understand that any such idea is entertained by the American manufacturers. It is equally plain, however, from a reading of the proceedings, that the proposed association will be no mere social and educational affair, but is intended to have a definite influence upon prices in international markets. The scheme of organization suggested from Austria points strongly that way.

In so far as American manufacturers participate in such an association, their acts will be judged by the same standards that apply at home. It would be no surprise, therefore, if no further action is taken as the result of the Brussels conference without the full knowledge of the Department of Justice at Washington or of the Bureau of Corporations. That may seem quite advanced to manufacturers of the old school, but it is plainly in line with the latest interpretation of government oversight of large corporations.

British Iron and Steel Exports Stationary

While our iron and steel exports increased suddenly last November and have since been averaging 175,000 tons a month, against 100,000 to 125,000 tons formerly, it is interesting to observe that British exports are proceeding at practically an unchanged rate. As is generally understood, the increase in our exports was not due in any great measure to increased demand in the international markets. Had such been the case, British exports would presumably have undergone a somewhat similar increase. If, on the other hand, our increased exports are at the expense of other iron and steel exporting countries, England is evidently not the sufferer, for we find British exports in this recent period have been at substantially the old rate. The following table, compiled from the returns of the British Board of Trade, shows the total tonnage of iron and steel exports from the United Kingdom, covering scrap, pig iron, rolled iron and steel, and cast, forged and drawn material, but not machinery:

British Iron and Steel Exports—Gross Tons.

Months.	1910.	1911.
January	422,166	376,457
February	339,297	333,987
March	386,838	398,446
April	459,436	391,614
May	388,824	421,093
June	374,078	403,151
July	426,670	.....
August	366,178	.....
September	391,446	.....
October	404,503	.....
November	359,298	.....
December	387,471	.....
Total	4,741,905	2,347,748

It will be observed that the monthly average in 1910 was a trifle less than 400,000 tons, while the same is the case in the first six months of this year. Exports by years are shown in the table below, beginning with 1905, when a slight rearrangement was made in the system of compiling the statistics:

British Exports by Years—Gross Tons.

1905	3,721,512	1908	4,220,508
1906	4,688,846	1909	4,373,381
1907	5,152,227	1910	4,741,905

In the years indicated above our exports have fluctuated in much the same manner as British exports, being very heavy in 1907, light in 1908 and heavier in 1909, but not as heavy as in 1907. Here the parallelism stops, for in 1910 we easily made a new record, passing the 1907 exports by nearly 20 per cent., while British exports did not break the previous record. Again, our exports this year have been at a rate 63 per cent. in excess of the average of the preceding three years, whereas British exports in the first six months of this year—2,347,748 tons, or at the rate of 4,700,000 tons a year—are only 6 per cent. in excess of the average in the preceding three years.

Even with our recent increase, our tonnage figures are small compared with the British figures, for our exports this year have been at the annual rate of only 2,200,000 tons, or somewhat less than half the British exports. A large part of this British preponderance is found in pig iron and the manganese metals, as British exports of pig iron, ferromanganese, spiegeleisen and ferrosilicon have been running quite steadily in the past three years at the rate of about 100,000 tons a month, whereas our own pig-iron exports have been averaging only 13,000 tons a month, and we import the manganese metals instead of exporting them. In unfinished steel, on the other hand, we have the advantage, for we export when England imports, both from us and from Continental makers. In rails we usually fall somewhat behind, but not much, while in a number of descriptions of rolled steel we are ahead, as we conspicuously are in all wire products. We fall behind again when it comes to sheets and tin plates, in which England has enjoyed a supremacy which we have only lately come to question, and that very quietly. England's lead in total tonnage, it is thus seen, is due largely to her exports of pig iron and to her exports of products which involve a great deal of labor. In products whose manufacture we have reduced largely to a mechanical basis we have been able to take the lead.

The Intermountain Railroad Rate Decision

The possibility is strongly apparent that Eastern manufacturers may find themselves as deeply interested as the railroad companies in the recent decision of the Interstate Commerce Commission ordering a readjustment of railroad rates to intermountain points. A great deal of business is transacted between manufacturers and merchants east of Illinois with consumers and distributers on the Pacific coast and in the Rocky Mountain section. This business had been established on apparently permanent lines, so that its growth has for many years been within well-defined boundaries. This arrangement now bids fair to be completely upset by the decision. The establishment of zones with different rates in each, diminishing from east to west, introduces a completely new element in rate making.

Up to this time the rates to Pacific coast points and the Rocky Mountain region have been so arranged by the railroad companies as to enable Eastern manufacturers and merchants to compete for such trade with those established a thousand miles further west. Geographical location, therefore, gave the Central Western business men no advantages over their competitors in the East in endeavoring to reach the Pacific slope trade. If the decision of the commission meets with the approval of the courts on appeal, the business for intermountain delivery originating in the Atlantic seaboard east of the Alleghany Mountains will pay a much higher freight rate than that originating in the zones which have been laid out in the part of the country lying further west, being allowed to exceed the freight rate to the Pacific coast not more than 25 per cent.

The Pittsburgh district will be allowed to exceed the freight rate to the Pacific coast by not more than 15 per cent. The district known as Chicago territory will be permitted to make a rate not exceeding the rates to Pacific coast terminals by over 7 per cent. In the St. Paul-Minneapolis district no higher charge can be made to any intermediate place than to Pacific coast terminals. It will be seen that this arrangement will give quite important advantages to manufacturing establishments located in the interior of the country, and the closer they are to the intermountain region the greater those advantages will be.

The railroad companies are stated to be completely at sea in endeavoring to figure their possible loss in receipts which would be caused by the rate reduction imposed by the commission. They are unable to decide whether or not the reduced rate may so increase their traffic as to make up to a great extent the loss by the reduction in the rate. Eastern manufacturers are confronting a less complicated problem and it will perhaps take but little time after the new rates shall have been put in effect to determine precisely what the result will be in the volume of business handled by them. It seems clear that an important readjustment of the intermountain business in relation to the Eastern section of the country is threatened if the commission's decision is permitted to stand.

The opening of the Panama Canal three or four years hence will bring about another important readjustment. The manufacturing establishments which will then be located on the Atlantic coast will be able to reach the Pacific coast by water in much shorter time than is now the case. It is expected that shipments wholly by water from New York to San Francisco and other Pacific coast ports will then be made within two weeks. Undoubtedly at that time railroad rates will be named from the Pacific coast cities to intermountain points which will make the through rate from the Atlantic coast considerably lower than the all-rail rates to be made under the recent decision.

Two Problems of Factory Building

Every day new manufacturing enterprises are being incorporated. A large proportion of these are inaugurated by men who are for the first time "going into business for themselves." Immediately the new company is likely to be confronted with at least two questions of prime importance: 1. What kind of factory buildings? 2. Where shall the plant be located? Experience indicates that these two problems are handled unwisely with a frequency beyond apparent excuse. Moreover, the complaints one hears on every hand disclose that "going" concerns that have thriven and prospered, grievously err at some period of expansion in the solution of the same two problems. The mistakes of the wealthy corporation are not of so much concern, but most of the others begin business with too little rather than enough money, so that what may be saved to them is saved to good purpose.

The first mistake usually arises from a failure to realize that a new business should be proved to be a "good" business before one dollar is permanently invested in buildings. This may be termed a principle rather than a hard and fast rule, for in some instances buildings already erected and perhaps suitably equipped can be obtained at bargain prices. At the same time, it may be stated without any exception that a factory building project should not be entered into on an ownership basis before the merits of a projected business as a money-making proposition have been thoroughly demonstrated. Much too frequently the proposed factory looms up as the biggest thing in the new company's horizon, when it should be only incidental to the great problem of building up a business. Where a new and untried business may easily cripple its prospects seriously, through too great an investment in plant, leaving too little of its original capital for working purposes, the "going" business has surprisingly greater resiliency under stress, and, moreover, offers an infinitely better basis for financing and for planning the new plant. Therefore, beginners should establish their business temporarily in any quarters that will do, and then wait until the business proves that a plant is necessary before building.

Deciding upon a location is scarcely less important. While many concerns succeed in spite of their location, a mistaken choice is a source of continual annoyance and ordinarily is possible of change only at great cost. The new company is the prey—and, strange to say, is often flattered thereby—of the enterprising "improvement associations" of a dozen towns, to say nothing of the now numerous "land associations." It is indeed unfortunate that so many too energetic folks in suburbs and villages are inspired to make manufacturing towns of these hamlets, wholly regardless of their qualifications therefor. The tendency to boom towns that never should be anything but farming or residence communities, by enticing unwary enterprises to locate, has resulted in no end of harm to those industries and no ultimate good to the community. There are now for sale hundreds of abandoned plants all over the country that stand as a striking condemnation of such incongruous and ill-advised endeavor.

Before considering the question of a building site a company should have available sufficient resources to acquire ownership of the land without fear or favor. So situated, the company is not likely to be influenced to forego really necessary facilities in order to take advantage of the tempting concessions offered. More often than otherwise the new company starts out with too little money. It follows that the cash bonuses, free sites and building material, easy taxes, etc.—the common bait held out—come to be reckoned upon as a part of the company's available capital and as necessary to the inception of the enterprise. To so consider these inducements is unqualifiedly wrong. Thus, the most liberal offer becomes the most attractive, while considerations having to do with operating conditions, in the particular locality, are made secondary or entirely submerged. It may be accepted as almost axiomatic that the most liberal offer will emanate from the least desirable location. It cannot be too strongly emphasized that no such inducements, however liberal they may be, are sufficient to justify the permanent handicapping of operating economy. The merits of every location should first be considered wholly apart from the terms of acquisition, and the unsatisfactory site should be rejected regardless of the gifts which are handed out with it. This may seem an extreme ruling, but if a business is worth the building of a plant it may be expected to continue for many years, and the earnings of the business will dwarf original considerations into insignificance. On the other hand, the disadvantages of location that at first may seem trifling will roll up into mountains of annoyance as they are accentuated by the growth of the business and the passing of time.

Half-Yearly Pig Iron Statistics

The statistics of the American Iron and Steel Association, just completed by General Manager James M. Swank, show that the production of pig iron in the United States in the first half of 1911 was 11,665,796 gross tons, against 12,324,829 tons in the same half of 1910 and 14,978,738 tons in the first half. These totals include spiegeleisen, ferromanganese and ferrosilicon. The decrease in production in the first half of 1911 from that of the second half of 1910 was 659,033 tons, and from that of the first half of 1910, 3,312,842 tons.

The production of Bessemer and low-phosphorus pig iron in the first half of 1911 was 4,704,424 tons, against 4,921,759 tons in the last half of 1910 (a decrease of 217,335 tons) and 6,323,883 tons in the first half of 1910.

The production of basic pig iron in the first half of 1911, not including charcoal of basic quality, was 3,935,487 tons, against 4,140,666 tons in the last half of 1910 (a decrease of 205,179 tons) and 4,943,942 tons in the first half.

The production of charcoal pig iron in the first half of 1911 was 160,847 tons, against 176,854 tons in the last half of 1910 (a decrease of 16,007 tons) and 219,653 tons in the first half.

The production of spiegeleisen and ferromanganese in the first half of 1911 was 77,595 tons, against 93,484 tons in the last half of 1910 and 130,947 tons in the first half. The production of spiegeleisen alone in the first half of 1911 was 43,429 tons, and of ferromanganese alone the production was 34,166 tons.

The Standard Oil Company's Dissolution

The Standard Oil Company has made public part of its plan of reorganization under the decree of the Supreme Court. There is to be a thorough segregation. The Standard Oil Company of New Jersey will distribute ratably to its stockholders shares of stocks of 33 companies which it owns directly or through its ownership of stock of the National Transit Company. The distribution will be made to the stockholders of the Standard Oil Company of New Jersey of record September 1, 1911. Books will close August 31 and be kept closed until the date that the stocks are ready for distribution, which will be about December 1.

From reliable sources the Wall Street Journal learns that the decimal of distribution will be five shares of Standard Oil Company of New Jersey. On a basis of five shares of the stock of the Jersey corporation, a holder of that amount of stock will receive fractional shares in each of 30 subsidiary companies and one full share or more in each of three constituent properties. A holder of, say, one, two, three or four shares will receive a full share in any one company of the 33 subsidiaries that must separate themselves from the parent concern. The distribution of the shares of the 33 subsidiaries will range from 1-100 part of a share to a full share in exchange for five Standard Oil Company of New Jersey shares.

Obituary

George Capwell Avery

George C. Avery, president of B. F. Avery & Sons, Inc., Louisville, Ky., died in France July 24, aged 59 years. He was a son of B. F. Avery, the founder of the company. Born in Louisville, he was a graduate of the ward and high schools of that city and of the Massachusetts Institute of Technology, Boston, and had taken special courses in classical and mechanical branches in several of the leading European universities. Thus, thoroughly equipped, in 1873 he entered the plow manufactory which had been established by his father in 1825, obtaining practical experience in every department of the works. He soon became the superintendnt of the factory and gradually extended his field of usefulness in the business until he was made president of the corporation in 1892, which office he held continuously until his death.

Mr. Avery was a thorough mechanic and mechanical engineer and was a designer and inventor of many improved devices and complete implements in the field of agricultural machinery and of machinery used in the production of plows and agricultural implements. Throughout his 38 years' connection with the plow manufactory he gave especial attention to the manufacturing department. Under his administration the business and the works gradually enlarged until the ground space available at the old factory location proved insufficient and he planned for the erection of an entirely new plant on a 35-acre tract of ground partly within the city limits of Louisville, the construction of which was begun in 1909 and completed in 1910. This new plant, which is conceded to be one of the most complete, modern and extensive in its line in the whole country, was designed, erectd and equipped in every particular by Mr. Avery, who survived one year to direct and observe its operations to his entire satisfaction and gratification. He succeeded his brother, Samuel L. Avery, in the presidency of B. F. Avery & Sons in 1892, and was preceded in death by him and his only other brother, William Sidney Avery, both of whom were long connected with the business. From the establishment of the business, a period of 86 years, either the parent founder or one of his sons was in unbroken charge of it, a record probably unexcelled in this country for direct control of one business by members of an immediate family. Mr. Avery leaves a widow and an only daughter. His venerable mother, Mrs. Susan Look Avery, is still vigorous at 94 years of age.

Mr. Avery was methodical and systematic in the conduct of his business and found time for reading and study. He was one of the best read men in Louisville, a lover and patron of art and music, and had traveled extensively. When heart failure suddenly terminated his life, he was on his annual summer vacation of several months at his Chateau St. Michel, Gaillefontaine, Seine Inferieure, France.

A note from the company, accompanying a biographical sketch, from which the above obituary was abstracted, says: "Mr. Avery was a regular reader of *The Iron Age* throughout the 50 years covered by his school days and business life. Upon his return from his summer vacations he would systematically scan the issues of *The Iron Age* which had come to his desk during his absence. He esteemed it as the model trade journal."

HYATT S. HASELTON, secretary in charge of the iron ore mining department of Pickands, Mather & Co., Cleveland, died in that city July 27 of a stroke of apoplexy. He had been in rather poor health for some months, although attending to his office duties as usual, but his demise was entirely unexpected. He had entered the Union Club at lunch time when he sank upon a sofa and before medical aid could be summoned had expired. He was 52 years old. When a youth, Mr. Haselton was a stenographer in a Michigan iron ore mining company's office, invested his savings in the shares of a rather unpromising mine but reaped the reward of his shrewdness later when the mine became a dividend payer. About 30 years ago he became connected with the North Chicago Rolling Mill Company, at Milwaukee, and later became secretary of the Metropolitan Iron & Land Company which operated the Norrie mine at Ironwood, Mich. When the Oliver-Carnegie interests took over the Norrie mine, Mr. Haselton became connected with Pickands, Mather & Co. in their Cleveland offices. He leaves a widow and five children.

HENRY CLAY LARRABEE, Baltimore, Md., president of the iron foundry company in that city which bears his name, died July 29, aged 82 years. He left no family, his wife and children having died some years ago.

L. G. Fiscus, of Apollo, Pa., advises us that he is organizing a company to erect two 50-ton open-hearth furnaces and eight hot-sheet and tin-plate mills, together with a blooming mill, at Apollo, Pa. The new company proposes to make galvanized barrels, tin cans, shovels and graniteware. Mr. Fiscus states that the new company will be capitalized at $600,000 and he expects to start work on the new plant as soon as sufficient money has been raised. He further says that citizens of Apollo will invest $150,000 in the new enterprise.

The fourth annual convention of the Atlantic Deep Waterways Association will be held at Richmond, Va., October 17 to 20. An elaborate programme of business and pleasure has been arranged. Hotel Jefferson will be headquarters.

The Iron and Metal Markets

Comparison of Prices

Advances Over the Previous Week in Heavy Type. Declines in Italics.

At date, one week, one month and one year previous.

	Aug. 2, 1911.	July 26, 1911.	July 5, 1911.	Aug. 3, 1910.
PIG IRON, Per Gross Ton:				
Foundry No. 2 standard, Philadelphia	$15.00	$15.00	$15.00	$16.00
Foundry No. 2, Valley furnace	13.50	13.50	13.50	14.25
Foundry No. 2 Southern, Cincinnati	13.25	13.25	13.25	14.50
Foundry No. 2, Birmingham, Ala.	10.00	10.00	10.00	11.25
Foundry No. 2, at furnace, Chicago*	14.50	14.50	15.00	16.50
Basic, delivered, eastern Pa.	14.50	14.50	14.50	15.25
Basic, Valley furnace	13.00	13.00	13.25	14.25
Bessemer, Pittsburgh	15.90	15.90	15.90	16.15
Gray forge, Pittsburgh	13.90	13.90	13.90	14.40
Lake Superior charcoal, Chicago	16.50	16.50	16.50	18.50
COKE, CONNELLSVILLE.				
Per Net Ton, at Oven:				
Furnace coke, prompt shipment.	*1.45*	1.50	1.45	1.55
Furnace coke, future delivery.	*1.60*	1.65	1.60	1.80
Foundry coke, prompt shipment.	1.85	1.85	1.85	2.15
Foundry coke, future delivery.	2.00	2.00	2.10	2.25
BILLETS, &c., Per Gross Ton:				
Bessemer billets, Pittsburgh	21.00	21.00	21.00	24.50
Forging billets, Pittsburgh	26.00	26.00	26.00	30.00
Open hearth billets, Philadelphia	23.40	23.40	23.40	27.50
Wire rods, Pittsburgh	27.00	27.00	27.00	28.50
OLD MATERIAL, Per Gross Ton:				
Iron rails, Chicago	14.00	14.00	14.00	16.50
Iron rails, Philadelphia	17.50	17.50	16.50	18.00
Car wheels, Chicago	**12.75**	12.50	12.50	14.50
Car wheels, Philadelphia	13.00	13.00	13.00	14.00
Heavy steel scrap, Pittsburgh	13.25	13.25	13.00	14.50
Heavy steel scrap, Chicago	**10.75**	10.50	10.25	12.25
Heavy steel scrap, Philadelphia	13.50	13.50	13.00	13.75
FINISHED IRON AND STEEL,				
Per Pound:	Cents.	Cents.	Cents.	Cents.
Bessemer rails, heavy, at mill	1.25	1.25	1.25	1.25
Refined iron bars, Philadelphia	1.27½	1.27½	1.27½	1.42½
Common iron bars, Pittsburgh	1.25	1.25	1.25	1.45
Common iron bars, Chicago	1.20	1.20	1.20	1.40
Steel bars, Pittsburgh	1.20	1.20	1.25	1.40
Steel bars, tidewater, New York	1.36	1.36	1.41	1.56
Tank plates, Pittsburgh	1.35	1.35	1.35	1.40
Tank plates, tidewater, New York	1.51	1.51	1.51	1.56
Beams, Pittsburgh	1.35	1.35	1.35	1.40
Beams, tidewater, New York	1.51	1.51	1.51	1.56
Angles, Pittsburgh	1.35	1.35	1.35	1.40
Angles, tidewater, New York	1.51	1.51	1.51	1.56
Skelp, grooved steel, Pittsburgh	*1.20*	1.25	1.25	1.50
Skelp, sheared steel, Pittsburgh	*1.30*	1.35	1.35	1.60
SHEETS, NAILS AND WIRE,				
Per Pound:	Cents.	Cents.	Cents.	Cents.
Sheets, black, No. 28, Pittsburgh	2.00	2.00	2.00	2.25
Wire nails, Pittsburgh†	1.70	1.70	1.70	1.70
Cut nails, Pittsburgh†	1.60	1.60	1.60	1.65
Barb wire, galv., Pittsburgh†	2.00	2.00	2.00	2.00
METALS,				
Per Pound:	Cents.	Cents.	Cents.	Cents.
Lake copper, New York	12.75	12.75	12.87½	12.75
Electrolytic copper, New York	**12.62½**	12.60	12.62½	12.50
Spelter, St. Louis	**5.70**	5.60	5.60	5.05
Spelter, New York	**5.90**	5.80	5.80	5.20
Lead, St. Louis	4.45	4.45	4.35	4.25
Lead, New York	4.50	4.50	4.50	4.40
Tin, New York	42.00	42.00	45.40	33.20
Antimony, Hallett, New York	8.00	8.00	8.12½	8.00
Tin plate, 100-lb. box, New York	$3.94	$3.94	$3.94	$3.84

* The average switching charge for delivery to foundries in the Chicago district is 50c. per ton.

† These prices are for largest lots to jobbers.

Prices of Finished Iron and Steel f.o.b. Pittsburgh

Freight rates from Pittsburgh in carloads, per 100 lb.; New York, 16c.; Philadelphia, 15c.; Boston, 18c.; Buffalo, 11c.; Cleveland, 10c.; Cincinnati, 15c.; Indianapolis, 17c.; Chicago, 18c.; St. Paul, 32c.; St. Louis, 22½c.; New Orleans, 30c.; Birmingham, Ala., 45c. Rates to the Pacific Coast are 80c. on plates, structural shapes and sheets, No. 11 and heavier; 85c. on sheets, Nos. 12 to 16; 95c. on sheets, No. 16 and lighter; 65c. on wrought boiler tubes.

Structural Material.—I-beams and channels, 3 to 15 in., inclusive, 1.35c. to 1.40c., net; I-beams over 15 in., 1.45c. to 1.50c. net; H-beams over 18 in., 1.50c. to 1.55c.; angles, 3 to 6 in. inclusive, ¼ in. and up, 1.35c. to 1.40c., net; angles over 6 in., 1.45c. to 1.50c. net; angles, 3 in. on one or both legs, less than ¼ in. thick, 1.40c., plus full extras as per steel bar card effective September 1, 1909; tees, 3 in. and up, 1.40c., net; zees, 3 in. and up, 1.35c. to 1.40c., net; angles, channels and tees under 3 in., 1.40c., base, plus full extras as per steel bar card of September 1, 1909; deck beams and bulb angles, 1.65c. to 1.70c., net; hand rail tees, 2.45c.; checkered and corrugated plates, 2.45c., net.

Plates.—Tank plates, ¼ in. thick, 6¼ in. up to 100 in. wide, 1.35c. to 1.40c., base. Following are stipulations prescribed by manufacturers, with extras to be added to base price (per pound) of plates:

Rectangular plates, tank steel or conforming to manufacturers' standard specifications for structural steel dated February 6, 1903, or equivalent, ¼ in. thick and over on thinnest edge, 100 in. wide and under, down to but not including 6 in. wide, are base.

Plates up to 72 in. wide, inclusive, ordered 10.2 lb. per square foot, are considered ¼ in. plates. Plates over 72 in. wide must be ordered ¼ in. thick on edge, or not less than 11 lb. per square foot, to take base price. Plates over 72 in. wide ordered less than 11 lb. per square foot down to the weight of 3-16-in. take the price of 3-16-in.

Allowable overweight, whether plates are ordered to gauge or weight to be governed by the standard specifications of the Association of American Steel Manufacturers.

	Cents per lb.
Gauges under ¼ in. to and including 3-16 in. on thinnest edge, extra	.10
Gauges under 3-16 in. to and including No. 8	.15
Gauges under No. 8 to and including No. 9	.25
Gauges under No. 9 to and including No. 10	.0 .30
Gauges under No. 10 to and including No. 12	.40
Sketches (including all straight taper plates) 3 ft. and over in	10
Complete circles, 3 ft. in diameter and over	.20
Boiler and flange steel	.10
"A. B. M. A." and ordinary firebox steel	.20
Still bottom steel	.30
Marine steel	.40
Locomotive firebox steel	.50
Widths over 100 in. up to 110 in., inclusive	.05
Widths over 110 in. up to 115 in., inclusive	.10
Widths over 115 in. up to 120 in., inclusive	.15
Widths over 120 in. up to 125 in., inclusive	.25
Widths over 125 in. to 130 in., inclusive	.50
Widths over 130 in.	1.00
Cutting to lengths or diameters under 3 ft. to 2 ft. inclusive	.25
Cuttings to lengths or diameters under 2 ft. to 1 ft., inclusive	.50
Cuttings to lengths or diameters under 1 ft.	1.55

No charge for cutting rectangular plates to lengths 3 ft. and over TERMS—Net cash 30 days.

Sheets.—Makers' prices for mill shipments on sheets in carload and larger lots, on which jobbers charge the usual discounts for small lots from store, are as follows: Blue annealed sheets, Nos. 3 to 8, U. S. standard gauge, 1.40c.; Nos. 9 and 10, 1.50c.; Nos. 11 and 12, 1.55c.; Nos. 13 and 14, 1.60c; Nos. 15 and 16, 1.70c. One pass, cold rolled, box annealed sheets, Nos. 10 to 12, 1.65c.; Nos. 13 and 14, 1.70c.; Nos. 15 and 16, 1.75c.; Nos. 17 to 21, 1.80c.; Nos. 22, 23 and 24, 1.85c.; Nos. 25 and 26, 1.90c.; No. 27, 1.95c.; No. 28, 2c.; No. 29, 2.05c.; No. 30, 2.15c. Three pass, cold rolled sheets, box annealed, are as follows: Nos. 15 and 16, 1.85c.; Nos. 17 to 21, 1.90c.; Nos. 22 to 24, 1.95c.; Nos. 25 and 26, 2c.; No. 27, 2.05c.; No. 28, 2.10c.; No. 29, 2.15c.; No. 30, 2.25c. Galvanized sheets, Nos. 10 and 11, black sheet gauge, 2c.; Nos. 12, 13 and 14, 2.10c.; Nos. 15, 16 and 17, 2.25c.; Nos. 18 to 22, 2.40c.; Nos. 23 and 24, 2.50c.; Nos. 25 and 26, 2.70c.; No. 27, 2.85c.; No. 28, 3c.; No. 29, 3.10c.; No. 30, 3.30c. All above prices are f.o.b. Pittsburgh, terms 30 days net, or 2 per cent. cash discount 10 days from date of invoice, as also are the following base prices per square for painted and galvanized roofing sheets, with 2½ in. corrugations:

Gauge.	Painted.	Galvanized.	Gauge.	Painted.	Galvanized.
29	....	$2.40	23	$2.40	$3.50
28	$1.40	2.55	22	2.60	3.70
27	1.55	2.60	21	2.80	4.05
26	1.65	2.65	20	3.05	4.35
25	1.85	3.05	18	4.05	5.70
24	2.10	3.15	16	4.90	6.50

Wrought Pipe.—The following are the jobbers' carload discounts on the Pittsburgh basing card on wrought pipe, in effect from October 1, 1910:

	Steel		Iron	
Butt Weld.	Black.	Galv.	Black.	Galv.
1 to 1¼ in.	75	63	49	43
1½ in.	75	63	71	59
2½ to 1½ in.	79	69	75	65
2 to 3 in.	80	70	76	66
Lap Weld.				
2 in.	76	66	72	62
2½ to 4 in.	78	67	74	64
4½ to 6 in.	77	67	73	63
7 to 12 in.	75	59	71	55
13 to 15 in.	51½	..	..	..

THE IRON AND METAL MARKETS

Butt Weld, extra strong, plain ends, card weight.				
¼, ⅜, ½ in.	69	59	65	55
⅝ in.	74	68	70	64
¾ to 1¼ in.	78	72	74	68
2 to 3 in.	79	73	75	69
Lap Weld, extra strong, plain ends, card weight.				
2 in.	75	69	71	65
2½ to 4 in.	77	71	73	67
4½ to 6 in.	76	70	72	66
7 to 8 in.	69	59	65	55
9 to 12 in.	64	54	60	50
Butt Weld, double extra strong, plain ends, card weight.				
¼ in.	64	58	60	54
¾ to 1¼ in.	67	61	63	57
2 to 3 in.	69	63	65	59
Lap Weld, double extra strong, plain ends, card weight.				
2 in.	65	59	61	55
2¼ to 4 in.	67	61	63	57
4½ to 6 in.	66	60	62	56
7 to 8 in.	59	49	62	56
Plugged and Reamed.				
1 to 1¼, 2 to 3 in. Butt Weld 2, 2½ to 4 in. Lap Weld	{ will be sold at two (2) points lower basing (higher price) than merchants or card weight pipe. Butt or lap weld, as specified.			

The above discounts are for "card weight," subject to the usual variation of 5 per cent. Prices for less than carloads are three (3) points lower basing (higher price) than the above discounts.

Boiler Tubes.—Discounts on lap welded steel boiler tubes to jobbers in carloads are as follows:

	Steel.
1¾ to 2¼	65
2½ in.	67½
2¾ to 3½ in.	70
3½ to 4½ in.	72½
5 to 6 in.	65
7 to 13 in.	62½

Less than carloads to destination east of the Mississippi River will be sold at delivered discounts for carload lowered by two points for lengths 22 ft. and under; longer lengths f.o.b. Pittsburgh. Usual extras to jobbers and boiler manufacturers.

Wire Rods and Wire.—Bessemer, open hearth and chain rods, $27. Fence wire, Nos. 0 to 9 per 100 lb., terms 60 days, or 2 per cent. discount in 10 days, carload lots, to jobbers, annealed, $1.50; galvanized, $1.80. Carload lots, to retailers, annealed, $1.55; galvanized, $1.85. Galvanized bar wire, to jobbers, $2; painted, $1.70. Wire nails, to jobbers, $1.70.

The following table gives the prices to retail merchants on wire in less than carloads, including the extras on Nos. 10 to 16, which are added to the base price:

Fence Wire, Per 100 lb.

No.	0 to 9	10	11	12 & 12½	13	14	15	16
Annealed	$1.65	$1.70	$1.75	$1.80	$1.90	$2.00	$2.10	$2.20
Galvanized	1.95	2.00	2.05	2.10	2.20	2.30	2.70	2.80

Market and Stone Wire in Bundles, Discount from Standard List.

Bright and Annealed:	
9 and coarser	80
10 to 18	80 and 10
19 to 26	80 and 10 and 2½
27 to 36	80 and 5
Galvanized:	
9 and coarser	75 and 10
10 to 16	75 and 10
17 to 26	75 and 10
27 to 36	70 and 5
Coppered or Liquor Finished:	
9 and coarser	75 and 10
10 to 26	75 and 10
27 to 36	70 and 10 and 5
Tinned:	
6 to 18	75 and 10 and 10

Pittsburgh

PITTSBURGH, PA., August 2, 1911.—(*By Telephone.*)

Pig Iron.—The local pig iron market has quieted down in demand, the only large inquiry out being that of the Westinghouse Electric & Mfg. Company, which is asking prices on 12,000 tons of Nos. 1, 2 and 3 foundry, comprising 2500 tons for its Cleveland works for the last four months of this year, 3500 tons for the same plant for the first three months of next year, 2500 tons for its Allegheny works for the last quarter of this year, and 3500 tons for the same works for the first three months of next year. A local consumer has bought 1500 to 2000 tons of Bessemer iron for delivery over the next three months at a price somewhat under $15, Valley furnace. This iron, however, does not come from the Valley but from an outside furnace. We also note a sale of 300 tons of standard Bessemer iron made by a local dealer to a steel casting concern at about $14.75, Valley furnace. The average price of Bessemer iron in July was nominally $15, Valley, but the few sales made in that month were at prices ranging from $14.75 or lower up to $14.90, Valley furnace. The average price of basic iron in July was about $13, Valley furnace. We quote as follows: Bessemer, $15; basic, $13 for early delivery, and $13.25 for extended delivery; No. 2 foundry, $13.50 to $13.75; malleable, $13.25 to $13.50; gray forge, $13, all at Valley furnace, the freight rate to Pittsburgh being 90c.

Steel.—Specifications for sheet and tin bars for August delivery are coming in very freely, and it is believed that shipments of steel this month will be heavier than in July. The Carnegie Steel Company is operating this week 73 per cent. of its ingot capacity. We note a sale of 500 tons of open-hearth sheet bars in random lengths for August and September delivery at $22, Pittsburgh. The Kokomo Steel & Wire Company, Kokomo, Ind., is reported to be in the market for 40,000 to 50,000 tons of rod billets for delivery over the next six months. We quote Bessemer and open-hearth billets, 4 x 4 in., and up to but not including 10 x 10 in., $21, base, and sheet and tin bars in 30-ft. lengths, $22; 1½-in. billets, $22; forging billets, $26, base, usual extras for sizes and carbons—all prices being f.o.b. Pittsburgh or Youngstown district, with freight to destination added.

Structural Material.—The city of Pittsburgh is asking bids on 5000 to 7000 tons of steel for a new bridge to be built by the city across the Allegheny River at the Point. Bids must be in by August 11.

(By Mail.)

That conditions in the iron trade are steadily improving is shown by the continued expansion in operations among the leading steel companies. This week the Carnegie Steel Company is operating to between 73 and 75 per cent. of ingot capacity, its Youngstown, Duquesne and Bellaire plants being in full operation, while New Castle, South Sharon and Homestead are running nearly full. The Republic Iron & Steel Company is operating its Bessemer steel works at Youngstown to full capacity and is running six out of eight furnaces in its new open-hearth plant, and is now making bottoms for the other two which will be started in the latter part of this month; it has in blast three out of four of its blast furnaces at Youngstown, No. 2 having been blown out about July 1 for relining, and will be blown in again about August 15, while its Atlantic furnace at New Castle and Hall furnace at Sharon are also in blast. The Youngstown Sheet & Tube Company is said to be operating at upward of 90 per cent. of capacity, while the Jones & Laughlin Steel Company is running at heavier capacity than for some time and will probably blow in two of the four blast furnaces at Aliquippa this month. It is the belief in some quarters that when October is reached the leading steel companies will be operating to nearly normal capacity, and it is the expectation that the last quarter of this year will be the best of the year from every point of view. Consumers still continue to place orders largely to cover actual needs, and so far there is no disposition to buy ahead. Stocks all over the country are light, and this is shown by the fact that on nearly all orders placed requests are made for prompt shipment. In July the billet and rail sales department of the Carnegie Steel Company showed an increase in actual orders for billets, sheet bars and track material with the exception of rails, which showed a slight falling off as compared with June.

Ferromanganese.—A sale of two cars, or about 60 tons, of foreign ferro has been made at $37, Baltimore, for shipment to a point outside the Pittsburgh district. A uniform price of $37, Baltimore, is now being quoted on 80 per cent. foreign, the freight for delivery in the Pittsburgh district being $1.95 a ton.

Ferrosilicon.—In spite of the absence of sales or new inquiry, prices on 50 per cent. ferrosilicon are much firmer, and it is quoted to-day at $53 to $54, Pittsburgh, some sellers refusing to shade the higher price. We quote blast-furnace ferrosilicon as follows: 10 per cent. $23; 11 per cent. $24 and 12 per cent. $25, f.o.b. cars, Ashland and Jisco furnaces.

Muck Bar.—The market continues quiet but a sale is reported of 300 tons at about $28.50, Pittsburgh. We quote best grades of muck bar made from all pig iron at $28.50 to $29 delivered in the Pittsburgh district.

Skelp.—No recent new sales are reported, the market being rather quiet. Prices are slightly lower and we now quote: Grooved steel skelp, 1.20c.; sheared steel skelp, 1.30c.; grooved iron skelp, 1.45c. to 1.55c and sheared iron skelp, 1.65c. to 1.70c., all for delivery at consumers' mills in the Pittsburgh district.

Wire Rods.—There is a fair amount of new inquiry for rods but mostly for small lots. Specifications against contracts are reported as coming in a little better lately and shipments by the mills are heavier. We quote Bessemer, open hearth and chain rods at $27, Pittsburgh, but on some recent sales it is reported this price was slightly shaded.

Steel Rails.—No important contracts for standard sections have been taken by the Carnegie Steel Com-

THE IRON AND METAL MARKETS

pany recently but it has entered several fair-sized orders in the past week for export shipment, and has received new orders and specifications for about 2500 tons of light rails. The three Edgar Thomson rail mills at Bessemer are reported as operating to about 50 per cent. of capacity. Prices on light rails are as follows: 12-lb., 1.25c.; 16, 20 and 25-lb., 1.21c. to 1.25c.; 30 and 35-lb., 1.20c. and 40 and 45-lb., 1.16c. These prices are f.o.b. at mill, plus freight, and are the minimum of the market in carload lots, small lots being sold at a little higher price. Standard sections are held at 1.25c. per lb. for Bessemer.

Plates.—The Philadelphia Company has placed an order with the Riter-Conley Mfg. Company, of this city, for a large tank for storing natural gas, and the plates, about 3000 tons, will be rolled by the Carnegie Steel Company. No important orders for cars have been placed but a number of the important roads have inquiries out for a considerable number of cars as follows: Atlantic Coast Line 1000, Canadian Pacific 1000, Missouri Pacific 1500 to 2000, Illinois Central 1000 to 2000, Cincinnati, New Orleans & Texas 1000, and the Erie about 3800. The Pennsylvania and Baltimore & Ohio railroads are also reported to be figuring on the purchase of from 7000 to 8000 cars but have not yet sent out inquiries. The Carnegie Steel Company has received orders for about 11,000 tons of plates and structural shapes for two colliers to be built by the United States Government. We quote ¼-in. and heavier plates at 1.35c., Pittsburgh, but in some cases 1.30c. is being named on narrow plates.

Structural Material.—The McClintic-Marshall Construction Company, of this city, is the lowest bidder on about 3400 tons of structural steel work for the Panama Canal, amounting to about $300,000. It has also taken 200 tons for a new station for the Southern Pacific at Oakland, Cal., and 125 tons for a post office building in New Mexico. A good deal of new work is in sight and will likely be placed in the near future, including the Barr Building in St. Louis, about 11,000 tons, and the Hell Gate Bridge for the Pennsylvania and New Haven railroads, about 36,000 tons. New inquiries are more active and as the structural concerns are getting to be better filled up, slightly better prices are being realized. We quote beams and channels up to 15 in. at 1.35c., Pittsburgh.

Sheets.—Conditions in the sheet trade are being referred to as very satisfactory, several mills reporting that they are two or three weeks behind in deliveries on steel sheets and three to four weeks on iron sheets. New orders being placed are fairly heavy and specifications against contracts continue to come in freely. The American Sheet & Tin Plate Company and other leading sheet interests are steadily increasing operations, due to the heavier demand. Prices on black and roofing sheets are being fairly well maintained but on galvanized sheets are being shaded, notably at some Western points, about $1 a ton. The full schedule of prices on black, galvanized and roofing sheets is given on a previous page.

Tin Plate.—While new orders for tin plate are light, specifications against contracts are coming in more freely than usual at this season, and more tin plate capacity is in operation at this time than for some months. The American Sheet & Tin Plate Company has recently started up 35 to 40 additional hot tin mills, and is now operating close to 80 per cent. of capacity. The independent tin plate mills are also increasing operations and as a whole are running from 80 to 85 per cent. of capacity. The tin plate mills expect to be able to run at the present rate of operations for several months at least. Prices are firm and we quote 100-lb. cokes at $3.70 per base box, f.o.b. Pittsburgh.

Bars.—A very heavy tonnage of steel bars has been placed on contracts by the implement makers and wagon builders; in exceptional cases the most desirable of this tonnage was placed on the basis of 1.20c., Pittsburgh. The leading steel bar makers—the Carnegie, Jones & Laughlin and Republic companies—are now reported as being pretty well booked up and are not disposed to take on additional tonnage except at the full price of 1.25c. Several of the leading steel bar makers report their order books so well filled up and specifications coming in so freely that they are getting slightly behind in deliveries. The market on iron bars continues quiet, new orders being for small lots and specifications against contracts not very satisfactory. We quote steel bars at 1.25c., with the possibility that 1.20c. might be done by one or two makers on very desirable contracts. We quote common iron bars at 1.25c., Pittsburgh.

Hoops and Bands.—A material increase in new demand for both hoops and bands is reported, and orders are usually accompanied by the request for prompt shipment. The mills rolling hoops and cotton ties are now operating at fuller capacity than for some months. We quote steel hoops at 1.40c. and bands at 1.25c., extras on the latter as per the steel bar card.

Merchant Steel.—A slight increase in new orders is reported and specifications against contracts are coming in a little better. One leading maker reports that its shipments in July were slightly heavier than in June. Regular prices, which however have been more or less shaded for some time, are as follows: Iron finished tire, ½ x ½ in. and heavier, 1.40c., base; under these sizes, 1.55c.; planished tire, 1.60c.; channel tire, 1.80c., base; toe calk, 1.90c.; flat sleigh shoe, 1.55c.; concave or convex, 1.75c.; cutter shoes, tapered or bent, 2.25c.; spring steel, 2c.; machinery steel, smooth finish, 1.90c.

Rivets.—Several makers report that new orders are showing an increase and that consumers are specifying more freely on contracts placed some time ago. We continue to quote structural rivets at 1.70c. to 1.75c. and boiler rivets at 1.80c. to 1.85c., but in very exceptional cases and for desirable business these prices are slightly shaded.

Wire Products.—The new demand for wire and wire nails at present is very dull, being only for small lots to cover actual needs. The fall trade is expected to open up about September 15. It is stated that the recent flurry in prices, during which a good many contracts for wire nails were entered at $1.65 per keg, is about over and that regular prices are now being fairly well maintained. We quote: Galvanized barb wire, $2 per 100 lb.; painted, $1.70; annealed fence wire, $1.50; galvanized, $1.80; wire nails, $1.70, and cut nails, $1.60, all f.o.b. Pittsburgh, with full freight added to point of delivery.

Spelter.—The market is firm this week, and we quote prime grades of Western at 5.65c., East St. Louis, equal to 5.77½c., Pittsburgh. A sale of 100 tons for August and September is reported at this price.

Merchant Pipe.—Some contracts for gas lines have been placed and two or three good lines are in the market. The Ohio Fuel Supply Company has placed 26½ miles of 16 in. with the National Tube Company and Spang, Chalfant & Co.; about 14 miles of 8, 10 and 12 in. for delivery at Ashland, Ohio, with an Ohio mill, and about 19 miles of 3 to 6 in. with other mills. The Natrona Pipe Line Company is reported to have placed 35 miles of 16 in. for delivery at Casper, Wyo., with a local mill, and the Southwestern Gas Company of Oklahoma is reported in the market for 60 to 80 miles of 12 in. The new demand for merchant pipe during July was as large as expected, and leading pipe mills are operating to greater capacity than for some time. Prices are regarded as being well maintained, but on several large lines placed recently they are said to have been slightly shaded. Regular discounts in effect on iron and steel pipe are given on a previous page.

Boiler Tubes.—This trade continues in a very unsatisfactory condition, prices being low and new demand dull. Some fairly large contracts for boiler tubes were placed by a number of railroads a month or two ago, but specifications against these contracts are coming in quite slowly. Regular discounts on boiler tubes are purely nominal and are given on a previous page.

Coke.—A slight improvement in new demand and also in prices on both furnace and foundry coke is reported. Two leading Eastern steel companies have recently increased their blast furnace operations and are buying some furnace coke in the open market. We note a sale of 6000 tons of blast furnace coke for August delivery at $1.50 and 5000 tons for August delivery at $1.55 per net ton at oven. A contract for blast furnace coke involving 6000 to 8000 tons is also reported at $1.80, the coke being of exceptionally fine quality. Two or three large consumers of foundry coke have recently closed for their requirements, aggregating 15,000 to 18,000 tons, at $2.10 to $2.15 per net ton at oven for strictly 72-hr. foundry coke. We quote standard makes of furnace coke for prompt shipment at 1.45 to $1.50 and for the remainder of the year $1.60 to $1.65. We quote 72-hr. foundry coke for prompt shipment at $1.85 to $2, and on contracts from $2 up to $2.50, the latter price being for several makes of foundry coke that always command the very highest prices. The output of coke in the Upper and Lower Connellsville regions last week was 282,663 tons, an increase over the previous week of about 12,000 tons.

THE IRON AND METAL MARKETS

Iron and Steel Scrap.—Consumers of heavy steel scrap, borings and turnings now seem more anxious to buy at present prices than dealers are to sell. It is the firm belief of scrap dealers that prices will be higher in the near future, and they are not disposed to part with their stock unless they obtain good prices for it. We note sales in the past week of 6000 to 8000 tons of heavy steel scrap for western Pennsylvania and eastern Ohio delivery, mostly at $13.25 per gross ton. On any large tonnage of heavy steel scrap for delivery ahead most dealers are quoting $13.50 and in some cases higher. The tone of the whole scrap market is firmer and if the increased operations among steel mills continue higher prices are expected. Dealers quote, per gross ton, f.o.b. Pittsburgh, as follows:

Heavy steel scrap, Steubenville, Follansbee, Sharon, Monessen and Pittsburgh delivery	$13.25 to $13.50
No. 1 foundry cast	13.25 to 13.50
No. 2 foundry cast	12.75 to 13.00
Bundled sheet scrap, f.o.b. consumers' mill, Pittsburgh district	11.50 to 12.00
Rerolling rails, Newark and Cambridge, Ohio, Cumberland, Md., and Franklin, Pa.	13.75 to 14.00
No. 1 railroad malleable stock	12.50 to 12.75
Grate bars	10.75 to 11.00
Low phosphorus melting stock	16.00 to 16.25
Iron car axles	23.00 to 23.50
Steel car axles	17.50 to 18.00
Locomotive axles	23.00
No. 1 busheling scrap	12.00 to 12.25
No. 2 busheling scrap	8.50 to 10.75
Old car wheels	13.50 to 13.75
Sheet bar crop ends	15.50 to 15.75
Cast iron borings	9.00 to 9.25
*Machine shop turnings	9.25 to 9.50
Old iron rails	15.00 to 15.25
No. 1 wrought scrap	13.50 to 14.00
Heavy steel axle turnings	10.00 to 10.25
Stove plate	10.50 to 10.75

*These prices are f.o.b. cars at consumers' mills in the Pittsburgh district.

Chicago

CHICAGO, ILL., Aug. 2, 1911.—*(By Telegraph.)*

Pig Iron.—During the month of July this market witnessed a liberal buying of pig iron. At the present rate of consumption melters generally are supplied well into the fourth quarter, but if the signs of increasing melt forecast a return to normal business more buying for third quarter shipment would not be unlikely. As a result of the extensive movement the Alabama pig iron interests have in the last few days of the month assumed a distinctly firmer attitude on last half delivery, and $10.50 is the asked price. The bulk of the iron bought even in the last week was placed on the basis of $10, Birmingham, for No. 2, and buyers have hardly acknowledged the advance as yet with actual purchases. A few Southern furnaces will still take $10 for immediate shipment. Northern irons do not present quite so strong a front. In recognition of the improved situation, however, melters are inquiring actively, one car builder being in the market for a maximum of 10,000 tons of malleable. The tonnage of malleable bought has been an important feature of the market, and evidences seem to indicate that developments will not enhance the advantage of the buyers' position. Northern iron prices remain unchanged. We quote for Chicago delivery, except on local irons, which are f.o.b. furnace, the following prices:

Lake Superior charcoal	$16.50 to $17.00
Northern coke foundry, No. 1	15.00 to 15.50
Northern coke foundry, No. 2	14.50 to 15.00
Northern coke foundry, No. 3	14.25 to 14.50
Northern Scotch, No. 1	16.00
Southern coke, No. 1 foundry and No. 1 soft	14.85 to 15.10
Southern coke, No. 2 foundry and No. 2 soft	14.35 to 14.60
Southern coke, No. 3	14.10 to 14.35
Southern coke, No. 4	13.85 to 14.10
Southern gray forge	13.60 to 13.85
Southern mottled	13.60 to 13.85
Malleable Bessemer	15.00
Standard Bessemer	17.40
Basic	15.50
Jackson Co. and Kentucky silvery, 6 per cent	17.90
Jackson Co. and Kentucky silvery, 8 per cent	18.90
Jackson Co. and Kentucky silvery, 10 per cent	19.90

(By Mail.)

An indication of the continually growing strength of the finished steel market may be found in the fact that the local mills of the Steel Corporation are booking a practically normal tonnage. This is applicable especially to structural shapes, bars and plates. The rail tonnage placed the past week was not important, but intimations point to important contracts under consideration. Prices of finished materials show greater firmness, with the exception of sheets, in which some concessions are being forced. The unsatisfactory condition of the bar iron trade remains in statu quo and the price of 1.20c. continues to be a mean between high and low quotations. Contracts for fabricated steel placed during the week aggregated close to 5000 tons, of which the principal item was the city waterway bridges at Tacoma, Wash., requiring 3210 tons. Prices for fabricated structural material show a wide variation with rather low limits for desirable work. The market for old material is somwhat firmer in sympathy with the strength shown in Eastern and Southwestern markets, as well as in response to the improvement in finished lines.

Rails and Track Supplies.—The railroads are reported to be specifying liberally against their rail contracts. A number of orders for small lots of rails are also noted among the current transactions. Indications are that certain liberal contracts still remain unplaced, but which may be expected to go to the local mills. Track fastenings are being taken out freely. The light rail business is quiet and prices are irregular. We quote standard railroad spikes at 1.65c. to 1.75c., base; track bolts with square nuts, 2.10c. to 2.20c., base, all in carload lots, Chicago; standard section Bessemer rails, 1.28c.; open hearth, 1.34c.; light rails, 40 to 45 lb., 1.16c. to 1.20½c.; 30 to 35 lb., 1.19½c. to 1.24c.; 16, 20 and 25 lb., 1.20½c. to 1.25c.; 12 lb., 1.25c. to 1.30½c.; angle bars, 1.50c. to 1.60c., Chicago.

Structural Material.—Tenders are being asked for the structural steel required for the new Field Museum, about 8000 tons. The new Continental & Commercial National Bank Building plans, which are estimated to call for 15,000 tons of steel, are still in the hands of the architects, D. H. Burnham & Co., but are expected to be submitted for figures in the very near future. A number of fabricating contracts were placed during the week, including a battery of coke ovens by H. Koppers, requiring 350 tons; a machine shop addition to the plant of the M. Rumely Company, La Porte, Ind., 250 tons, let to the Kenwood Bridge Company, which company also took the contract for the addition to the Quincy, Ill., plant of the Otis Elevator Company, 200 tons. The largest item of the week was 3210 tons for city waterway bridges at Tacoma, Wash., taken by the American Bridge Company. This company was also awarded the 259 tons for the San Diego, Cal., postoffice. The Milwaukee Bridge Company was low bidder on 175 tons for a Denver, Col., bridge, and the Judson Mfg. Company, Sacramento, Cal., will fabricate 150 tons for a bridge in that city. While reports have it that the Kansas City Terminal contract is likely to be placed either with the Noelke-Richards Company, Indianapolis, or the Geo. A. Fuller Company, general contractor, it is believed that the actual award has not been made. The tonnage is close to 10,000. Competition continues very keen for desirable work, and to gain this business some low prices are made. It is understood that Canadian bridge inquiries pending have not been closed. Notwithstanding inferences that prices on plain material have been shaded in connection with some of the low bids for fabricated steel, we continue to quote plain material from mill at 1.53c. to 1.58c. and from store, 1.75c., Chicago.

Plates.—Plate tonnage is being booked in practically normal volume in this territory. Specifications covering bridge girders are largely responsible for this and are augmented by an increasing tonnage of car steel. Business of this kind bids fair to show a decided increase in the near future with contracts pending, previously mentioned and otherwise, including over 4000 cars for the Missouri Pacific, nearly as many for the Erie, 2000 for the Illinois Central, 1500 for the Chicago, Burlington & Quincy now in the shops of the American Car & Foundry Company, 300 from the Havana Central and 150 for the Manufacturers' Railway of St. Louis. The Llewellyn Iron Works, Los Angeles, will fabricate 104 tons of tank plate for the Copper River & Northwestern Railway, Katella, Alaska. Chicago quotations for mill shipment are 1.53c. to 1.59c. and from store 1.75c.

Sheets.—Tonnages of sheets booked during the week show increasing volume and include some buying by jobbers. It is still difficult, however, for makers to avoid some concessions from ruling prices but shading is seldom in excess of 50 cents a ton, even for very desirable business. We continue to quote Chicago prices as follows: Carload lots, from mill: No. 28 black sheets, 2.18c.; No. 28 galvanized, 3.18c.; No. 10 blue annealed, 1.68c. Prices from store, Chicago, are: No. 10, 1.95c. to 2.05c.; No. 12, 2.00c. to 2.10c.; No. 28 black, 2.45c. to 2.55c.; No. 28 galvanized, 3.45c. to 3.55c.

Bars.—The steel bar situation is assuming a set-

THE IRON AND METAL MARKETS

tled and increasingly satisfactory aspect in most quarters. Specifications on recently placed contracts are beginning to come in. Open market orders are still scattering, and mills not having large contracts from which to obtain an aggregate tonnage of specifications find their rolling schedules more or less cut up. There seems to be less occasion for shading of steel bar prices except in specific instances for immediate shipment and we quote as follows, f.o.b. Chicago: Soft steel bars, 1.43c.; bar iron, 1.20c. to 1.25c.; hard steel bars, rolled from old rails, 1.20c. to 1.25c. From store, soft steel bars, 1.70c. to 1.80c., Chicago.

Wire Products.—Such activity as does exist in wire products gives evidence of greater firmness based on improved crop prospects. Jobbers are evincing a slightly more liberal disposition in specifying for barb wire, and wire nail sales show small gains. Fence wire trade is satisfactory considering the prolonged spring buying. Indications of an early fall are expected to hasten the return of trade volume. Jobbers' carload prices, which are quoted to manufacturing buyers, are as follows: Plain wire, No. 9 and coarser, base, 1.68c.; wire nails, 1.88c.; painted barb wire, 1.88c.; galvanized, 2.18c.; polished staples, 1.88c.; galvanized, 2.18c., all Chicago.

Cast Iron Pipe.—There were no lettings of importance reported as placed during the past week. Minneapolis is still holding its contract for 3000 tons open. The number of small orders continues to aggregate a liberal tonnage. We quote as follows, per net ton, Chicago: Water pipe, 4 in., $25.50; 6 to 12 in., $24.50; 16 in. and up, $24, with $1 extra for gas pipe.

Old Material.—The scrap market displays a firmer and more hopeful tone as a result of the improvement in the pig iron and steel markets. Iron scrap, however, is in little demand. Reflecting the improved situation in the Eastern scrap market, heavy melting steel is quoted at an advance of 25c. a ton and old steel rails are bringing slightly higher prices. Cast borings are also firmer. A recent sale of 2000 car wheels by the Chicago, Burlington & Quincy Railroad brought a price said to be $12.75, f.o.b. connecting line. Railroad offerings of scrap are being absorbed promptly and at prices generally above the market quotations. Lists now awaiting offers include about 3000 tons from the Chicago & Northwestern and a tonnage, not specified, from the Erie. We quote below for delivery to buyer's works, Chicago and vicinity, all freight and transfer charges paid, per gross ton, as follows:

Old iron rails	$14.00 to $14.50
Old steel rails, rerolling	12.25 to 12.50
Old steel rails, less than 3 ft.	11.25 to 11.75
Relaying rails, standard sections, subject to inspection	24.00
Old car wheels	12.75 to 13.25
Heavy melting steel scrap	10.75 to 11.00
Frogs, switches and guards, cut apart	10.50 to 11.00
Shoveling steel	10.00 to 10.50
Steel axle turnings	8.50 to 9.00

The following quotations are per net ton:

Iron angles and splice bars	$13.50 to $13.00
Iron arch bars and transoms	13.75 to 14.25
Steel angle bars	10.75 to 10.75
Iron car axles	18.00 to 18.50
Steel car axles	16.00 to 16.50
No. 1 railroad wrought	11.00 to 11.25
No. 2 railroad wrought	10.00 to 10.50
Steel knuckles and couplers	9.25 to 9.75
Locomotive tires, smooth	15.00 to 15.50
Machine shop turnings	6.25 to 6.75
Cast and mixed borings	5.25 to 5.75
No. 1 busheling	8.75 to 9.25
No. 2 busheling	6.75 to 7.25
No. 1 boilers, cut to sheets and rings	7.50 to 8.00
Boiler punchings	12.00 to 12.50
No. 1 cast scrap	10.25 to 10.75
Stove plate and light cast scrap	9.00 to 9.50
Railroad malleable	10.00 to 10.50
Agricultural malleable	9.25 to 9.75
Pipes and flues	8.00 to 8.50

Philadelphia

PHILADELPHIA, PA., Aug. 1, 1911.

No large buying has been reported in either crude or finished products, but the total for the week is fairly satisfactory. The pig iron market continues to broaden and prices, though unchanged, have a decidedly stronger tone. In finished products the market still shows irregularity. While a fair volume of business is being done, mills have in instances shown a smaller relative output for July than was generally anticipated; in other instances moderate gains are reported. Rumors of price uncertainties in some lines of rolled products have a tendency to make consumers hesitate in placing orders. The trade is more encouraged with the railroad situation. Sellers in this district will share in the 20,000-ton order for steel rails placed by the Southern Railway. Some steel car orders have been placed and more business of this character is in sight. Less business is reported by sheet and billet makers. Refined iron bars, while not active, are firm. Steel bars are fairly active, with the leading producers adhering to old quotations. The old material market has been quiet, with prices firm.

Iron Ore.—The market drags; buyers are pretty well covered for early requirements and await further developments before coming into the market. Importations at this port for the week ended July 29 include 11,548 tons of Spanish and 6559 tons of Swedish ore.

Pig Iron.—Transactions, while confined to moderate sized lots, principally foundry grades, have aggregated a very fair total and indicate that the volume of business is gradually becoming larger. In a number of instances consumers are reported to be urging delivery on iron already purchased, which is taken to indicate that, notwithstanding the increased buying, stocks in foundry yards are still relatively low. Sellers feel that their position is gradually becoming stronger, and while there has been no advance in prices lower quotations available a few weeks ago in some particular instances have practically disappeared. There is a fair amount of inquiry for the higher grades of foundry iron for delivery ranging from prompt to the remainder of the year. In some instances the demand for No. 2 plain is better than the supply. Cast iron pipe makers in this district are quietly looking around for low grade iron; one consumer has an old inquiry for several thousand tons still before the trade, while another would likely take a round lot if sellers would meet ideas as to prices, but at the present stage of the market producers will not make concessions. Sales of eastern Pennsylvania foundry grades have been comparatively good in quantities running from 50 to 250 tons at both $15 and $15.25 for standard analysis No. 2 X foundry, with delivery covering varying portions of the next five months. The movement in Virginia foundry grades has not been quite so active, the largest transaction in this district being a lot of 500 tons for shipment over the remainder of the year at $12.50 at furnace. Sales of moderate lots at $12.25 for both prompt and near future shipment are also reported. Price shading recently reported in Virginia iron appears less pronounced. Less interest is being taken in the higher Southern grades of foundry iron, with $10.50, Birmingham, asked as a base price for No. 2 foundry. Southern iron is less of a factor in this territory. Forge iron shows but little activity and prices are pretty generally accepted at $14. furnace, or $14.50 delivered to this immediate district. The demand for steel-making grades continues light. Basic is practically on a $14.50, delivered, basis as a minimum, with both inquiry and offerings light. Low phosphorus iron has been quiet, prices ranging from $20 to $20.50, delivered here, according to analysis. The following range of prices is named for standard brands, delivered in buyers' yards in this immediate district:

Eastern Pennsylvania No. 2 X foundry	$15.00 to $15.25
Eastern Pennsylvania No. 2 plain	14.75 to 15.00
Virginia foundry	15.00 to 15.25
Gray forge	14.50
Basic	14.50 to 15.00
Standard low phosphorus	20.00 to 20.50

Ferromanganese.—Sellers in this district are now all holding flatly at $37, Baltimore, for 80 per cent. ferro, but the market has not been tested, there being no inquiry sufficient to arouse interest in the market in this territory.

Billets.—Bookings the past week have been a trifle smaller. There is the same general run of small orders, but inquiries recently before the trade for round lots of rolling billets have failed to develop into contracts. Recent quotations appear to be fully maintained, makers naming $23.40 for rolling billets and $28.40 for ordinary forging billets, delivered in this territory.

Plates.—Orders for delivery in July showed a decline from the previous rate and some producers averaged not much over 50 per cent. of normal capacity. As to the future, plate makers are optimistic; a large amount of business is in sight, but it develops slowly. It is reported that the contract for 300 tons of plates for government colliers, as well as smaller orders for government tugs, has been placed, but the business went to Western mills. While rumors of shading continue to be heard, and may be the cause of quieter conditions, it is generally contended that the recent level of 1.50c. for ordinary plates, delivered here, is being firmly maintained.

Structural Material.—The placing of the contract for

THE IRON AND METAL MARKETS

the structural work, 1600 tons, for the addition to the Du Pont Building, Wilmington, Del., with the Cambria Steel Company is announced. No other large orders have been placed, although several are in sight. Plans for the new Stock Exchange Building have not yet been completed. Several small contracts for bridges have been placed and fabricators have taken some small building work. Sharp competition and low prices for fabricated work continue to be reported. A fairly good demand exists for plain shapes and mills have been able to maintain an average output, representing about 60 per cent. during July. The Pencoyd plant of the leading interest has been operating at practically full capacity. Prices of plain shapes are firm at 1.50c. minimum, delivered in this territory.

Sheets.—A falling off in the demand is reported by Eastern mills, due perhaps to some extent to weak prices in the West. Plants are operating slightly under full capacity. Makers in this district are maintaining recent quotations, which range as follows f.o.b. Eastern mill: Nos. 18 to 20, 2.30c.; Nos. 22 to 24, 2.40c.; Nos. 25 to 26, 2.50c.; No. 27, 2.60c.; No. 28, 2.80c.

Bars.—Producers of refined iron bars have been quietly testing the situation, with a view of slightly advancing prices, but so far the recent quotation of 1.20c. at Eastern mill stands. No concessions appear available. The demand has not been active and such business as is offered usually goes at the above base, which represents 1.27½c. to 1.32½c., delivered here. Considerable talk of low prices for steel bars is noted, but Eastern sellers contend that they have not shaded 1.40c., delivered in this district.

Coke.—Some little contracting in foundry coke, covering upward of 50 to 100 cars for extended delivery, at $2 to $2.30 at oven, is reported, but the bulk of the buying is in small lots. Furnaces still confine their purchases to lots for prompt delivery, which can be had at prices ranging from $1.40 to $1.50 at oven. The following range of prices, per net ton, is named for delivery in this vicinity:

Connellsville furnace coke	$3.65 to $3.90
Foundry coke	4.15 to 4.60
Mountain furnace coke	3.25 to 3.50
Foundry coke	3.75 to 4.20

Old Material.—There has been no pronounced movement. Consumers occasionally come into the market for small lots, frequently paying higher prices, but the general situation shows a waiting tendency. No. 1 yard heavy melting steel has been sold at $13 to $13.25, while No. 1 railroad heavy melting steel has been sold at $13.50, in one instance 1000 tons being taken. Purchases made direct by some consumers are reported at $13.50, delivered. The trade is awaiting the railroad lists, bids against which will, it is expected, show which way the market will go. No. 1 railroad wrought shows an advance of 25c. on moderate purchases. Turnings and borings are in better demand, and while no higher in price are decidedly strong. Scrap merchants are optimistic in their expressions regarding the future and in the majority of instances are holding for higher prices. The following range of prices about represents the market for early deliveries in buyers' yards, eastern Pennsylvania and nearby points, carrying a freight rate from Philadelphia varying from 35c. to $1.35 per gross ton:

No. 1 railroad heavy melting steel scrap	$13.50 to $13.75
No. 1 yard heavy melting steel scrap	13.00 to 13.25
Old steel rails, rerolling (nominal)	14.25 to 14.75
Low phosphorus heavy melting steel scrap	16.75 to 17.25
Old steel axles (nominal)	19.50 to 20.00
Old iron axles	24.50 to 25.00
Old iron rails	17.50 to 18.00
Old car wheels (nominal)	13.00 to 13.50
No. 1 railroad wrought	13.75 to 14.25
Wrought iron pipe	13.00 to 13.50
No. 1 forge fire	11.00 to 11.50
No. 2 light iron (nominal)	6.75 to 7.25
Wrought turnings	9.50 to 10.00
Cast borings	9.00 to 9.50
Machinery cast	13.25 to 13.75
Railroad malleable (nominal)	11.50 to 12.00
Grate bars, railroad	10.00 to 10.50
Stove plate	10.50 to 11.00

Cleveland

CLEVELAND, OHIO, Aug. 1, 1911.

Iron Ore.—The aggregate of sales having become almost inconsequential and immediate prospects not being very promising, Cleveland vesselmen declare that an early closing of the lake season appears now inevitable. Whereas blast furnacemen had been confidently expected to come into the market the past two weeks, to-day finds shippers ahead of their schedules and the movement from mines exceeding the present demand. The next two weeks will decide definitely the length of the season. We quote prices as follows: Old range Bessemer, $4.50; Mesaba Bessemer, $4.25; old range non-Bessemer, $3.70; Mesaba non-Bessemer, $3.50.

Coke.—One local blast furnace is closing on its remainder of the year requirements at about the market, but this is the only transaction in furnace coke recorded here for some days. Foundries have pretty well covered in this territory and inquiries are small and for immediate needs. We quote standard Connellsville furnace coke at $1.40 to $1.50 per net ton at oven, for spot shipment, and $1.65 to $1.75 for remainder of the year. Connellsville 72-hr. foundry coke is held at $1.80 to $2.15 at oven for prompt shipment and $2.15 to $2.40 for remainder of the year.

Pig Iron.—The slight improvement noted in the pig iron market recently has abated somewhat and few sales have come to the surface in the past week. Foundries have been covering in small quantities for immediate needs, few in this entire district buying ahead in anything like noticeable quantities. Despite the low price of Southern grades, the aggregate tonnage of Southern iron that has come into the Cleveland territory in the last six months has been surprisingly small, and in this respect the present era of low prices has differed from every other like period for some years. Much of this difference, undoubtedly, is due to the number of merchant furnaces now operating here, thus enabling attractive prices on the various grades of Northern iron to be made right in this city or its immediate vicinity. The tentative inquiry from a cast iron pipe works here has not brought about a sale. The Valley quotation on basic has hardened to $13 flat on both prompt and remainder of the year business, while No. 2 foundry appears to have settled to the Valley basis of $13.50. However, for Cleveland delivery, we quote as follows for prompt shipment and for last half:

Bessemer	$15.00
Basic	$13.75 to 14.00
Northern foundry No. 2	13.50 to 13.75
Gray forge	13.25
Southern foundry No. 2	14.35 to 14.60
Jackson Co. silvery, 8 per cent. silicon	17.50 to 17.75

Old Material.—Although the local market has shown a firmer tendency in some grades, yet the general list is about unchanged. The buyers of heavy melting steel are purchasing in such a manner as to discourage any notion of a runaway market, it being possible to obtain outside material at slight advances over city quotations. Turnings are in somewhat better demand but the quantity available is not large. Dealers' prices, per gross ton, f.o.b. Cleveland, are as follows:

Old steel rails, rerolling	$13.00 to $13.50
Old iron rails	15.00 to 15.50
Steel car axles	17.50 to 18.00
Heavy melting steel	11.75 to 12.25
Old car wheels	12.00 to 12.25
Relaying rails, 50 lb and over	23.50 to 23.50
Agricultural malleable	10.75 to 11.25
Railroad malleable	12.25 to 12.75
Light bundled sheet scrap	10.00 to 10.50

The following prices are per net ton, f.o.b. Cleveland:

Iron car axles	$21.00 to $21.50
Cast borings	7.25 to 7.50
Iron and steel turnings and drillings	7.00 to 7.50
Steel axle turnings	8.00 to 8.50
No. 1 machinery	11.50 to 11.50
No. 1 railroad wrought	11.75 to 12.25
No. 1 cast	11.25 to 11.75
Stove plate	9.50 to 10.00
Bundled tin scrap	11.00 to 11.50

Finished Iron and Steel.—More satisfaction is expressed this week over the general iron and steel trade conditions than in some months. New business in small tonnages is coming out from day to day and the daily run of specifications is reported improving. In fact, one of the difficulties that local mill agents are facing with considerably increasing disappointment is the inability of mills to make deliveries. This is especally true of bars and light structural material. Regular prices appear to be maintained for the most part on structural material, but some 1.20c. steel bar business is being taken from desirable customers; yet right alongside the 1.20c. specifications come along those taken at 1.25c. About the only large tonnage of steel bars under active negotiations aggregates 800 tons and is for delivery at Toledo. Local mills have hardened slightly their price for bar iron, the general quotation being more nearly 1.25c. than the 1.20c. formerly prevalent. The Empire mill will resume operating to-

THE IRON AND METAL MARKETS

day but the Union mill is still idle. The steel sheet market is still weak on some grades. Steel bids for the proposed East Side market house are still being considered by the projectors. It is now said that the reason why all bids for the steel were rejected by the City Hall Commission was that none of them came within the appropriation. New business in quantity is slow in coming out. We quote iron bars at 1.25c. to 1.30c., at mill.

Cincinnati

CINCINNATI, OHIO, Aug. 2, 1911.—*(By Telegraph.)*

Pig Iron.—The inquiry is light, but there is considerable buying to cover fourth quarter requirements. The sales now being made are principally the result of personal solicitation by salesmen. In this immediate vicinity foundries have a sufficient stock to cover nearby needs and it is probable that much of the iron now contracted for is to take advantage of the present low price for use the first part of next year. Furnacemen are beginning to realize the actual situation, in that the production of foundry iron especially is now below consumption, and there is an effort to advance quotations. Several Southern producers are asking $10.50 at furnace for No. 2 foundry, and, while there is considerable $10 iron still obtainable for delivery through the remainder of the year, the Southern situation shows considerably more strength. Recent sales include 500 tons each of Southern Nos. 1 and 2 foundry for last quarter shipment at $10.75 and $10.25, Birmingham, respectively, for a central Western melter. Indiana manufacturers have contributed a few orders for No. 2 foundry for last half delivery based on $10, Birmingham. A nearby consumer took 500 tons of Southern No. 4 foundry for August shipment at $9 at furnace. Illinois territory furnished an order for approximately 2000 tons each of malleable and Southern No. 2 foundry at prevailing minimum quotations, and a firm in the Pittsburgh district bought through a local office 500 tons of Southern charcoal for last half delivery at $22.50, Birmingham. For the same shipment a St. Louis consumer took 1000 tons of malleable at a price slightly below $13.25, Ironton. Basic is active, although following foundry grades, and the Southern basic prices are firmer. No 1912 quotations are being made on any grades. Based on freight rates at $3.25 from Birmingham and $1.20 from Ironton we quote, f.o.b. Cincinnati, as follows:

Southern coke, No. 1 foundry and 1 soft	$13.75 to $14.00
Southern coke, No. 2 foundry and 2 soft	13.25 to 13.50
Southern coke, No. 3 foundry	12.75 to 13.00
Southern coke, No. 4 foundry	12.50 to 12.75
Southern gray forge	12.50 to 12.75
Ohio silvery, 8 per cent. silicon	16.95 to 17.20
Lake Superior coke, No. 1	14.70 to 14.95
Lake Superior coke, No. 2	14.20 to 14.45
Lake Superior coke, No. 3	13.70 to 13.95
Basic, Northern	4.45 to 14.70
Standard Southern car wheel	25.50 to 25.75
Lake Superior car wheel	19.00

(By Mail.)

Coke.—A few orders are reported for Connellsville foundry coke, and there has also been some light contracting on Wise County grades. Furnace coke, so far as new business is concerned, is stagnant, and no immediate improvement is anticipated. In both the Pocahontas and Wise County fields a tendency has been shown to take on business a shade below market quotations, and 72-hr. coke is quotable all the way from $2 to $2.35 per net ton at oven for any shipment this year, with some producers willing to take on 12 months' contracts around these figures. For prompt shipment a few brands are available at $1.90. Furnace coke in all three fields is unchanged at $1.40 to $1.50 for nearby movement, with a premium generally asked of about 15c. on future contracts. Both furnace and foundry coke show more firmness in the Connellsville district than in any other field.

Finished Material.—Diligent inquiry fails to reveal any steel bar business being taken on in this territory below 1.25c. Pittsburgh basis, though there are many rumors afloat of this price being shaded. On authority that is considered reliable it is reported that a number of offers, for small tonnages, at 1.20c. have been turned down. Structural material continues in fair demand, but sheets are not so active. Hoops are firm at 1.40c. base at mill, and so far as can be ascertained here bands are not obtainable below 1.25c. The local warehouse price on steel bars is unchanged at 1.70c. and on structural material 1.80c.

Old Material.—Railroad offerings are a trifle heavier, but buyers are generally indifferent about taking on any large tonnages just now. The demand from the rolling mills shows some improvement. Borings and turnings are scarcer than usual, but there has been no change in previous quotations. The approximate prices paid by buyers for delivery in their yards, southern Ohio and Cincinnati, are as follows:

No. 1 railroad wrought, net ton	$10.50 to $11.00
Casting borings, net ton	4.50 to 5.00
Steel turnings, net ton	5.50 to 6.00
No. 1 cast scrap, net ton	9.50 to 10.00
Burnt scrap, net ton	6.50 to 7.00
Old iron axles, net ton	16.50 to 17.00
Bundled sheet scrap, gross ton	7.25 to 8.25
Old iron rails, gross ton	13.50 to 14.00
Relaying rails, 50 lb. and up, gross ton	21.00 to 22.00
Old car wheels, gross ton	10.25 to 11.00
Heavy melting steel scrap, gross ton	10.00 to 10.50

Birmingham

BIRMINGHAM, ALA., July 31, 1911.

Pig Iron.—All quotations are being made with some reluctance by local selling agents, and with four of the producing interests practically out of the market for any deliveries, either from the condition of order-books or prohibitive asking prices, the situation is considered decidedly stronger. The sales of the past week consisted mainly of comparatively small lots for prompt shipment, which is accounted for by the refusal of the majority of the producers to accept a $10 Birmingham schedule. The extent of the tonnage still available at the $10 basis is not definitely known, owing to the variance in quotations that are elicited, but it is thought that such iron can be had of only two concerns and for certain grades. The scarcity of low grades and high silicon iron is more pronounced than formerly, while complaint has been made of the rate at which No. 2 soft and No. 2 foundry are being delivered on contracts now in effect. The movement from all furnace yards increases gradually, and a further reduction in the output has just been made by the blowing out of the furnace of the Southern Iron & Steel Company at Alabama City, Ala., which has been operated on foundry grade for some three weeks. The extent to which shipments are now being made against contracts that were entered at higher prices than those prevailing is very noticeable and is taken as a further indication of improvement in the foundry trades. Among inquiries of the past week lots of 1200 tons, 1000 tons and 700 tons respectively were the principal considerations, which lots are understood to be still pending at this time. It is stated that quotations on the business just mentioned, all of which is for shipment over the remainder of the year, vary from $10.25 to $11, Birmingham. This last price was received for a lot of 100 tons, and 500 tons brought $10.50, both lots being for delivery during the remainder of the year. No transactions of importance involving basic iron were reported and the charcoal iron market remains unchanged, with the output represented by the operations at only one plant. We quote the market as very strong for deliveries covering the remainder of the year at the following schedule, per gross ton, f.o.b. cars at Birmingham furnaces:

No. 1 foundry and No. 1 soft	$10.50 to $11.00
No. 2 foundry and No. 2 soft	10.00 to 10.50
No. 3 foundry	9.50 to 10.00
No. 4 foundry	9.25 to 9.75
Gray forge	9.25 to 9.75
Mottled	9.00 to 9.50
Standard basic	10.00 to 10.50
Off basic	9.75 to 10.25
Charcoal car wheel iron	.... 22.50

Cast Iron Pipe.—Local interest is largely centered on the requirement of approximately 3000 tons of water pipe for the city of Portland, Ore., which will be placed August 1. By reason of the sizes specified, it is understood that the competition will be very keen, although the condition of the raw material market is such as to prohibit material shading. A round tonnage of 24-in. water pipe is soon to be placed for requirement at the South Omaha, Neb., stock yards and a small lot of 16-in. has just been submitted from McAlester, Okla. A municipality in south Texas is soon to enter the market for material to construct an entirely new waterworks system, and a lot of some 500 tons of small-sized pipe has just been added to the contract recently awarded the United States Cast Iron Pipe & Foundry Company. There have been no developments to indicate the extent of requirement for gas mains in this city, with the addition of natural gas from the Fayette field. We continue to quote water pipe as follows, per net ton, f.o.b. cars here: 4 to 6-in., $22; 8 to 12-in., $21;

THE IRON AND METAL MARKETS

over 12-in., average $20, with $1 per ton extra for gas pipe.

Old Material.—Dealers' asking prices are unchanged but the trading is light and the general condition of the market unsatisfactory. But little additional tonnage has been added to the holdings on local yards and consumers are ordering out all grades very sparingly. We continue to quote dealers' asking prices as follows, which are only nominal, per gross ton, f.o.b. cars here:

Old iron axles (light)	$13.50 to $14.00
Old steel axles (light)	12.50 to 13.50
Old iron rails	12.50 to 13.00
No. 1 railroad wrought	11.00 to 11.50
No. 2 railroad wrought	9.50 to 10.00
No. 1 country wrought	7.50 to 8.00
No. 2 country wrought	7.00 to 7.50
No. 1 machinery	9.50 to 10.50
No. 1 steel	8.50 to 9.00
Tram car wheels	8.00 to 8.50
Standard car wheels	9.50 to 10.50
Light cast and stove plate	7.00 to 7.50

Preparations are being made for the relighting of the Alice furnace of the Tennessee Coal, Iron & Railroad Company, which is located in this city.

Ward W. Jacobs, president of the Shelby Iron Company, has returned to his home at Hartford, Conn., after having inspected the holdings of his company in this district. It is announced that the charcoal-iron furnace of that company will not be relighted until about September 1, owing to the extensive repairs that are now under way.

Buffalo

BUFFALO, N. Y., Aug. 1, 1911.

Pig Iron.—The market shows gradual improvement; prices are slightly firmer and there is a better feeling with regard to the immediate future. Inquiry is being maintained in fairly good volume, and there has been considerable buying. One furnace interest reports bookings aggregating about 12,000 tons of foundry and malleable from New York State and New England points for the week. The total sales for July make a very good showing for a month that is usually dull. Shipments on contracts are going forward in heavy volume. Prices exhibit a hardening tendency. Some furnace interests are quoting $14 as a minimum for No. 1 X foundry and $13.75 for No. 2 X. Other furnaces are still quoting 25c. per ton less on these two grades, but all are maintaining a minimum of $13.50 for all lower grades. We quote as follows, f.o.b. Buffalo, for prompt and last half delivery:

No. 1 X foundry	$13.75 to $14.25
No. 2 X foundry	13.50 to 14.00
No. 2 plain	13.50 to 13.75
No. 3 foundry	13.50 to 13.75
Gray forge	13.50 to 13.75
Malleable	13.75 to 14.25
Basic	13.75 to 14.25
Charcoal	16.50 to 17.25

Old Material.—The market continues strong with an active demand in a good many lines, particularly for heavy melting steel, steel turnings and cast iron borings, and mills are taking shipments against contracts very freely. We quote as follows, per gross ton, f.o.b. Buffalo:

Heavy melting steel	$13.00 to $13.50
Low phosphorus steel	15.50 to 16.00
No. 1 railroad wrought	14.00 to 14.50
No. 1 railroad and machinery cast scrap	13.75 to 14.25
Old steel axles	18.50 to 19.00
Old iron axles	22.00 to 22.50
Old car wheels	13.00 to 13.50
Railroad malleable	12.50 to 13.00
Boiler plate	12.50 to 13.00
Locomotive grate bars	11.00 to 11.50
Pipe	9.50 to 9.75
Wrought iron and soft steel turnings	7.00 to 7.50
Clean cast borings	6.75 to 7.25

Finished Iron and Steel.—Most selling agencies report business in general lines as keeping up well, the demand being good in all with the exception of plates. Several orders for good tonnages of steel bars have been received in the week, but most of the sales were of small lots. A Canadian buyer is reported to have taken 400 tons of sheet piling. Inquiries for some good tonnages in steel bars are still under negotiation. While there are rumors of lower than regular prices having been made, they cannot be substantiated, and the fact that large business is being placed at regular prices—1.25c. Pittsburgh for steel bars and 1.35c. for plates and shapes—would indicate that in this district prices are not being lowered. The demand for fabricated material is well sustained and most of the local fabricating shops have a large number of orders in hand and are running full. There is also a good deal of work on architects' boards. Lupfer & Renwick, construction engineers, Buffalo, have been awarded Erie Canal contract No. 85 for a lift highway bridge at Phoenix, N. Y., taking about 100 tons of steel; also the operating machinery. Lathrop, Shea & Henwood, construction engineers, Buffalo, have received Erie Canal contract No. 86 for a highway bridge near Canajoharie, requiring 200 tons. Three additional buildings for Cornell University—an auditorium, a veterinary college building and a power house—are to be figured soon, besides the three buildings for which bids have just been received.

San Francisco

SAN FRANCISCO, July 25, 1911.

Notwithstanding some favorable indications the Pacific coast market remains in a condition of general stagnation. The movement in several lines has been smaller for July than for June and is hardly normal, even for midsummer. The number of inquiries from which any immediate results can be expected is limited and no great improvement is expected before the end of August, though considerable business is likely to come out in September. The local market on sheets is somewhat demoralized. Some change in the general situation will be brought about by the installation of a large and fairly complete stock of Carnegie products in San Francisco. The initial shipments have already been dispatched and the material will be carried at the former site of the Risdon Iron Works. The business will be handled entirely through the regular jobbing trade and the ability of merchants to secure material at short notice is expected to eliminate much of the foreign material which has been a feature of this market for several years.

Bars.—As usual at this season the jobbing trade in soft steel bars is confined to narrow limits, and orders placed by the larger manufacturing interests are of little importance, being confined mainly to requirements of the near future. Several good orders have been placed for reinforcing bars, the total movement being fully equal to that of last month. There is a fair amount of new inquiry, though few large individual orders are in sight. Merchants show no disposition to enter the market on a larger scale than for some time past. Bars from store, San Francisco, are quoted at 2c. for steel and 1.90c. for iron.

Structural Material.—Very little movement has been noted in the last fortnight, large fabricating contracts being entirely absent. Nothing of much importance is being figured at other coast points, and while contracts are expected shortly on several local buildings the amount of work actually in sight is not very large. Considerable work of a very small nature, 100 tons and less to the job, is coming out in the interior, including numerous steel bridges, jail cells, etc. Milliken Bros., Inc., have taken an order for towers for the Portland Railway, Light & Power Company, Portland, Ore., amounting to about 600 tons, and the Southern California Edison Company has ordered two 182-ft. transmission towers. The contract for the Union Iron Works marine shop building will be withheld for a few weeks. An award on the Knights of Columbus building is expected next week. The York Safe & Lock Company has the contract for vault work in the D. O. Mills bank building, Sacramento. C. E. Freeman, architect, is drawing plans for a 6-story class A apartment house to be erected on California street. An inquiry is expected shortly for the Standard Oil Company's local building. Plans have been drawn for a new theatre at Los Angeles, to cost about $600,000, and there is some talk of a large building to be erected by the Los Angeles Investment Company. Competitive plans will be submitted shortly for a hall of justice for the State of Washington. G. H. Cobb, Seattle, Wash., is planning to erect an 11-story class A building. Figures are being taken on a small hospital in Oakland, Cal. A large lot of steel for bridge work was recently sent to Japan via Seattle.

Rails.—The tonnage ordered in this territory of late has been comparatively light. There is some activity in the construction of logging roads in the north coast district, and there are a number of inquiries from California concerns for from 500 to 4000 tons, but buyers are very slow to close the transactions. In some ways, however, the outlook is encouraging, as several of the projected lines have obtained strong support, and their inquiries are taking fairly definite shape. There is very little demand for light rails.

THE IRON AND METAL MARKETS

Sheets.—Open market conditions prevail in the local distributive trade on black, galvanized and blue annealed sheets, owing to price cutting by merchants who have large stocks brought in by sea at considerably less than the rail rates. Some small buyers are taking advantage of this condition to lay in supplies, but on the whole the movement is only moderate. Merchants are fairly well supplied and are buying sparingly.

Plates.—Considerable small marine work is coming up along the coast, and more demand than usual is noted for marine plates, though the tonnage is never very large. Scattering orders for tank plates are coming from the oil fields, and the Standard Oil Company is starting work on its new plant at El Segundo, which will require a heavy tonnage. Some business is coming from gas companies. The Honolulu, T. H., Gas Company is planning to erect a new gas tank of 200,000 cu. ft. capacity, and the Pacific Gas & Electric Company is building a gas tank at Petaluma, Cal. The Dundon Iron Works has submitted a low bid on a water tank for the city of San Francisco, requiring about 160 tons. No important penstock jobs have materialized of late.

Merchant Pipe.—The tonnage taken by some of the more important interests has been considerably smaller for July than for June, and business appears to be quieter now than early in the year. The jobbing trade is confined to unusually narrow limits, and while some improvement is expected in September merchants are not greatly increasing their stocks. A few fair inquiries have come from the oil fields, but no transactions of any significance are being closed, and the tendency in that district is to limit operations as closely as possible. Santa Clara County, Cal., is taking figures on 26,000 ft. of 2 and 4-in. pipe, and the city of Los Angeles will take bids about the end of the month for 35,000 ft. of casing and 60,000 ft. of 2-in. pipe.

Cast Iron Pipe.—The business actually booked is still rather light, but there is plenty of business in prospect, and renewed activity is expected within a week or two. Inquiries for water-works in small towns are more numerous than for some time and figures will be taken soon by Alturas, Orland, Tracey and a number of other towns. Porterville, Cal., will be in the market for a considerable tonnage in about a month. Long Beach, Cal., will also place a substantial order shortly. The city of Los Angeles is in the market for 310 tons, and Portland, Ore., will receive bids August 1 for about 3600 tons of 6 to 12-in. pipe and 200 tons of specials.

Pig Iron.—Local business continues on a very moderate scale, as few of the foundries are especially busy and most of them have considerable material on hand. Southern No. 2 foundry iron is quoted nominally at $20. Very little is used locally, but some No. 1 Southern iron is used at other coast points, being priced at about $21. Prices of foreign iron vary considerably, according to brand as well as conditions of sale, the present range being $20 to $24, the lower figure being for brands about equal to No. 2 Southern.

Old Material.—So far there has been no general demand for cast iron scrap. There has been no pressure to sell among the dealers, however, and ordinary material is steady at $16 per net ton, while heavy machinery scrap is held at $18 and some has recently been sold at that figure. A considerable tonnage of rerolling rails is being delivered on old contracts. The city of Los Angeles will receive bids July 31 for 15,000 ft. of 16-lb. relaying rails. Buyers of melting scrap are still keeping out of the market and wrought iron scrap is extremely dull. Quotations are as follows: Cast iron scrap, per net ton, $10 to $18; steel melting scrap, per gross ton, $10.50 to $11; wrought scrap, per net ton, $11 to $15; rerolling rails, per net ton, $11.

The rolling mill of the Rudgear-Merle Company in this city will start up about July 31. The company has purchased a large quantity of rerolling rails. It manufactures bedsteads and other metal furniture and uses large quantities of hard steel.

The San Francisco Iron & Metal Company is considering the installation of one or two additional shears and some small machine tools. A shed will be built over its equipment during the fall.

C. H. Snyder, San Francisco representative of Milliken Bros., Inc., has patented a system of construction for the use of steel or cast iron columns with flat concrete slab floors, by which the weight of the floor is transmitted directly to the columns. This system will be used in the Bankers Investment Company building in this city and a small hospital building in Oakland.

St. Louis

ST. LOUIS, Mo., July 31, 1911.

The iron and steel market is developing indications of activity in the near future, this being made apparent by increasing inquiries which bear ear-marks of greater sincerity than some of those put forth in recent weeks. At the moment no especially large sales are being closed, but there is a comfortable aggregate to the small orders and to the specifications on contracts. The shipments on the latter have been better for July than for June, which in turn was the best month since last February.

Pig Iron.—The efforts to hold up pig iron in the St. Louis market have been to some extent successful, though there is still evidence that an attractive order would be accepted at a figure below the generally quoted price. The larger producers are the firmest in their attitude. The most interesting inquiry of the week has been that of the Scullin-Gallagher Steel Company for prices on 10,000 tons of basic, for delivery in the first half of next year, the company having enough on hand to cover immediate requirements. Small inquiries in the market from Iowa for Northern and Southern No. 2 iron aggregate about 1000 tons, while there is also an inquiry for about 1000 tons of charcoal. A sale of 1000 tons of malleable was made the past week, but details are withheld. On Southern No. 2 the quotation remains nominally at $10.50, Birmingham, but this is not the minimum, when it comes to actual dealing. The news from the foundries is not particularly enthusiastic at present, some being reported closed indefinitely.

Coke.—One inquiry of the week was for 500 tons per month of furnace coke for 12 months. The general run of inquiries continues good with no especially large contracts closed. Nevertheless the tone of the market is distinctly better, doubtless due to the approach of the more active season. Shipments on specifications on contracts are holding up fairly well for the season of the year.

Finished Iron and Steel.—Generally satisfactory conditions have prevailed in the finished product market. No large orders were placed, though the totals will run up pretty well. In standard rails two orders of 500 tons each were closed and a third, held up, was released for the same amount; orders for smaller amounts ran in all to about 1000 tons. Another prospective order for a quantity of considerable moment, considering the time of the year, is in sight and may be closed this week, while quite a number of minor inquiries are in the market. In light rails the coal mining companies are buying well, but the lumber companies are not doing anything of consequence. The structural business for the week will run about 2000 tons in small lots, with good requisitions on contracts.

Old Material.—The feature of the market the past week has been the decided activity in steel, the mills having shown considerable anxiety to buy at advancing prices. The market here is completely cleared of stock and dealers are inclined to make the prices even higher than they are. The only list out so far is that of the Missouri Pacific, about 1500 tons. Those of the other roads will be out during the week and the prices made will then indicate the tendency of the market. In other lines than steel the market shows no particular change, though dealers are rather stiff in their attitude toward prices. Dealers' prices per gross ton, f.o.b. St. Louis, are as follows:

Old iron rails	$12.50 to $13.00
Old steel rails, rerolling	11.25 to 11.75
Old steel rails, less than 3 ft	11.50 to 12.00
Relaying rails standard section, subject to inspection	23.00 to 23.50
Old car wheels	13.00 to 13.50
Heavy melting steel scrap	11.50 to 12.00
Frogs, switches and guards cut apart	11.50 to 12.00

The following quotations are per net ton:

Iron fish plates	$11.00 to $11.50
Iron car axles	18.50 to 19.00
Steel car axles	17.50 to 18.00
No. 1 railroad wrought	10.75 to 11.25
No. 2 railroad wrought	9.75 to 10.25
Railway springs	9.75 to 10.25
Locomotive tyres, smooth	14.50 to 15.00
No. 1 dealers' forge	8.50 to 9.00
Mixed borings	5.50 to 6.00
No. 1 busheling	9.25 to 9.75
No. 1 boilers cut to sheets and rings	8.00 to 8.50
No. 1 cast scrap	10.00 to 10.50
Stove plate and light cast scrap	8.00 to 8.50
Railroad malleable	8.00 to 8.50
Agricultural malleable	7.00 to 7.50
Pipes and flues	8.00 to 8.50
Railroad sheet and tank scrap	8.00 to 8.50
Railroad grate bars	8.00 to 8.50
Machine shop turnings	6.50 to 7.00

THE IRON AND METAL MARKETS

New York

NEW YORK, August 2, 1911.

Pig Iron.—Business in this immediate vicinity has not been large, founders continuing to buy in small quantities for immediate delivery. A little better movement is taking place in New England, with occasional purchases of 500 tons or more. Northern iron is still quoted as follows at tidewater: No. 1 foundry, $15.50 to $15.75; No. 2 X, $15 to $15.25; No. 2 plain, $14.50 to $15. Southern No. 1 foundry is quoted at $14.75 to $15.25 and No. 2, $14.25 to $14.75.

Cast Iron Pipe.—Some small New England lettings are advertised. Bidders on the 11,000 tons asked for by Detroit have been notified that no award will be made but that the letting will be readvertised. General business is quiet. Carload lots of 6 in. are quoted at $21 to $22 per net ton, tidewater.

Old Material.—From the point of sales made, dealers report conditions somewhat less encouraging, except in foundry grades, which are in rather better demand. Fair-sized sales of cast scrap have been made for deliveries running over the next six months, on which a slightly higher price was obtained than current quotations. A better inquiry is observed for old car wheels. Holders of all kinds of scrap are firm in their views, influenced by the steady gain in steel works operations. Quotations are as follows, per gross ton, New York and vicinity:

Old girder and T-rails for melting	$11.50 to $11.75
Heavy melting steel scrap	11.00 to 11.25
Relaying rails	20.50 to 21.50
Rerolling rails (nominal)	12.25 to 12.50
Standard hammered iron car axles	22.50 to 23.00
Old steel car axles	17.50 to 18.00
No. 1 railroad wrought	13.75 to 14.25
Wrought iron track scrap	12.75 to 13.25
No. 1 yard wrought, long	11.75 to 12.25
No. 1 yard wrought, short	11.00 to 11.50
Light iron	4.75 to 5.25
Cast borings	7.00 to 7.50
Wrought turnings	7.50 to 8.00
Wrought pipe	11.00 to 11.50
Old car wheels	11.25 to 11.75
No. 1 heavy cast, broken up	11.25 to 11.75
Stove plate	8.50 to 9.00
Locomotive grate bars	9.00 to 9.50
Malleable cast	10.50 to 11.00

Finished Iron and Steel.—Confidence in the promise of general conditions is the only favorable feature of business in finished lines. It is not based on an increase in sales. Less new projects of size in structural shapes came to light this week than has been the case for some time. The structural awards include: 1500-ton addition to Du Pont Building, Wilmington, Del., to Cambria Steel Company, which also took a 90-ton bridge for the Pennsylvania Railroad, and 1000 tons for a high school building, West Philadelphia, to American Bridge Company. The Wells Brothers Company has the general contract for the Brigham Hospital, Boston, requiring 1000 tons. The work for the piersheds at Norfolk, it appears, has not yet been given to the Virginia Bridge Company. The Central Railroad of New Jersey is to build a 1500-ton Scherzer bridge; bids will shortly be asked for a two-story building, Clinton & Russell, New York, architects, for the Essex County National Bank, Newark, and the Bartholomay Brewing Company is to erect a brewhouse in Rochester. Quotations remain: Plain structural material and plates, 1.51c. to 1.56c.; steel bars, 1.36c. to 1.41c.; bar iron, 1.30c. to 1.35c., all New York. Plain material and plates from store, New York, 1.80c. to 1.90c.

Ferroalloys.—Some sellers of ferrosilicon are out of the market in New York, as they are demanding what it would cost to import foreign ferrosilicon at this time, which is around $59, delivered at Pittsburgh. Ferromanganese is very quiet and quoted at $36.50 to $37, Baltimore.

The Associated Foundry Foremen of Philadelphia have decided to hold an outing at Central Park, in that city, on Saturday, September 16. Several meetings of a special committee have been held and President C. R. Brown now announces the following general committee: C. J. Krayer, John Alexander, C. S. Muir, J. Whitehead, T. Connelly, J. Butterworth, G. W. Moore, H. B. Taylor, Jr., H. Freiler, T. Livezey, Thomas C. Smith, W. Elkins, Charles Goldman, A. Carr, H. Bing and E. F. Lovell. Plans are being made for a number of athletic events, for which prizes will be awarded. Tickets for the outing will be obtainable from any member of the committee.

Metal Market

NEW YORK, August 2, 1911.

The Week's Prices

Cents Per Pound for Early Delivery.

	Copper, New York.		Tin.	Lead (New York).		Spelter (New York).	
July.	Lake.	Elec'tro lytic.	New York.	New York.	St. Louis.	New York.	St. Louis.
27	12.75	12.60	41.70	4.50	4.45	5.85	5.65
28	12.75	12.60	41.85	4.50	4.45	5.85	5.65
29	12.75	12.60	. . .	4.50	4.45	5.80	5.70
31	12.75	12.62½	41.75	4.50	4.45	5.80	5.70
Aug.							
1	12.75	12.62½	41.50	4.50	4.45	5.80	5.70
2	12.75	12.62½	42.00	4.50	4.45	5.80	5.70

Deliveries of tin into consumption during July were larger than in any other month in the year. The month's exports of copper surpassed the record of any other month this year by fully 10,000 tons. Lead continues firm. Spelter has advanced 10 points.

Copper.—While there is not a great demand for copper the market has strengthened very decidedly in tone as a result of custom house returns on the exports of copper which were made public yesterday afternoon. They showed that during July 34,955 tons were sent abroad and this was far in excess of the exports of any other month of the year. The total exports of copper from January 1 have been fully 41,000 tons more than were exported in the same period of last year. While domestic consumers seem to take very little interest in the copper situation the heavy exports have strengthened the market and electrolytic copper has been advanced slightly and it is now 12.62½c. The price of Lake copper is unchanged at $12.75c. The London market is experiencing the usual summer dullness and prices fluctuated very little during the week. This morning spot copper was sold in London at £56 2s. 6d. and futures for £56 15s. Judging from the shipments under way the exports of copper will continue heavy. L. Vogelstein & Co. give the following figures of German consumption of foreign copper from January 1 to June 30: Imports, 90,281 tons; exports, 4093 tons; consumption, 86,188 tons, as compared with consumption during the same period in 1910 of 79,488 tons. Of the above quantity 78,454 tons were imported from the United States.

Pig Tin.—The feature of the pig tin market during the week has been the somewhat surprising reports of deliveries of pig tin into consumption during July, as compiled by C. Mayer, secretary of the New York Metal Exchange. The figures show that deliveries into consumption during the month were 4300 tons, which is considerably above a normal month's arrivals. The arrivals were heavy, however, and they amounted in all to 4837 tons. In anticipation of a good report there was a fair amount of buying on Monday for tin for early delivery. Yesterday there was some good trading, but principally between dealers. While spot tin is fairly plentiful, most of the tin delivered during July was sent to the interior and this has tended to strengthen the New York market in the face of a slight decline in London. Pig tin in New York this morning was sold for 42c. and the market showed signs of advancing, while in London spot tin sold at £191 and futures at £188 5s.

Tin Plates.—There is a steadily increasing demand for tin plates and it comes principally from small manufacturers. The can manufacturers seem to be out of the market at present. The price is unchanged at $3.94 for 100 lb. coke plates. The demand for foreign tin plates is not so heavy as it has been and the quotation is unchanged from last week at 13s. 9d. at Swansea, Wales.

Lead.—Lead continues strong and shows signs of further advancing. There is not a great demand from consumers but many independent sellers of lead in this market have disposed of their holdings and their customers are looking to the leading interest to fill their wants. Regardless of the fact that outside sellers and the American Smelting & Refining Company are getting 4.45c. for lead in St. Louis, quotations in this market are unchanged at 4.50c. As a rule this market is 15 points higher than the St. Louis market. The American Smelting & Refining Company is in control of the situation and has practically shut out other sellers here, excepting those who control special brands.

Spelter.—The spelter market is very uncertain. Although average quotations have advanced 10 points there seems to be a wide difference of opinion among sellers as to what they should ask and inquiries have resulted in quotations ranging from 5.70c. to 5.90c., East St. Louis. Some carload lots have been offered in this market at slightly lower prices than 5.70c., but

THE IRON AND METAL MARKETS

most of this spelter has been bought, according to information obtained this morning. Consumers are shopping about a great deal and shrewd purchasers may be getting concessions under 5.70c. St. Louis, but that is the average price. This makes the market 5.90c. in New York, but very few orders are being placed at that figure, as most buyers are closing for spelter f.o.b. at East St. Louis.

Antimony.—Antimony is attracting very little attention and the market is weak with Hallett's at 8c.; Cookson's, 8.50c.; Chinese brands, 7.25c., and Hungarian grades, 7.30c.

Chicago

AUGUST 2. (*By Telegraph*).—Trade in metals locally has been light, with little evidence of strength except in spelter. Tin is slightly lower. Interest in copper is dull, but prices apparently are well maintained. We quote, Chicago delivery, as follows: Casting copper, 12.65c.; Lake, 13c., in carloads, for prompt shipment; small lots, ¼c. to ⅜c. higher; pig tin, carloads, 42.50c.; small lots, 44.50c.; lead, desilverized, 4.47½c. to 4.50c. for 50-ton lots; corroding, 4.72½c. to 4.75c. for 50-ton lots; in carloads, 2½c. per 100 lb. higher; spelter, 5.65c. to 5.70c.; Cookson's antimony, 9¼c., and other grades, 8¼c. to 8¾c., in small lots; sheet zinc is $7.50 f.o.b. La Salle, in carloads of 600-lb. casks. On old metals we quote for less than carload lots: Copper wire, crucible shapes, 10¾c.; copper bottoms, 9½c.; copper clips, 10¼c.; red brass, 9½c.; yellow brass, 7½c.; lead pipe, 3.90c.; zinc, 3.90c.; pewter, No. 1, 26c.; tinfoil, 33c.; block tin pipe, 37c.

St. Louis

JULY 31.—The metal market continues to show a firm tendency, and prices of lead and spelter are especially strong on advances. Lead, Missouri brand, is quoted 4.47½c. to 4.50c., with the demand good. Spelter is quotable at 5.67½c. to 5.70c. and in good request. Tin is 42c., a slight drop from last week, while copper is up, Lake being quoted at 13.10c. and electrolytic at 12.95c. Cookson's antimony is unchanged at 8.85c. Reports from the Joplin district are that heavy rains flooded the mines, cutting the production heavily during the past week. The zinc ore market stands at $38 to $41.50 per ton despite the advance in spelter. Lead ore is stronger at $58 to $60 per ton. Calamine continues steady at $21 to $24 per ton on a 40 per cent. basis, choice lots going as high as $25. The surplus blende has decreased more than one-half in the bins. Old metal prices are as follows: Light brass, 5c.; heavy brass and light copper, 8c.; heavy copper and copper wire, 9c.; zinc, 3c.; lead, 3¼c.; pewter, 20c.; tinfoil, 29c.; tea lead, 3c.

Iron and Industrial Stocks

NEW YORK, Aug. 2, 1911.

The iron and industrial stocks have not shown much change since the last report, except Bethlehem Steel, both common and preferred, which advanced sharply, and American Shipbuilding common, which declined heavily with the passing of the dividend. In quite a number of stocks no transactions were noted. The range of prices on active stocks from Wednesday of last week to Tuesday of this week was as follows:

Allis-Chalm., pref.	28 - 28⅝	Pressed Steel, pref.	101½-103
Beth. Steel, com.	34½- 36⅛	Railway Spring, com.	36½- 37½
Beth. Steel, pref.	63⅜- 66⅜	Republic, com.	29½- 30½
Can, com.	11 - 11½	Republic, pref.	94½- 94⅝
Can, pref.	87 - 88¾	Sloss, com.	49½
Car & Fdry, com.	56¾- 57½	Pipe, com.	15⅜
Steel Foundries	39	Pipe, pref.	53
Colorado Fuel	33 - 34⅝	U. S. Steel, com.	78⅜- 80
General Electric	162½-163½	U. S. Steel, pref.	119⅛-120
Gr. N. Ore Cert.	57 - 59	Westinghouse Elec.	72½- 75
Int. Harv., com.	122½-124½	Va. I. C. & C.	85⅛- 89
Int. Pump, com.	40¼- 41	Am. Ship, com.	55 - 62
Int. Pump, pref.	88¾	Chi. Pneu. Tool	51½- 51⅝
Locomotive, com.	39¾- 40½	Cambria Steel	45⅝- 47½
Locomotive, pref.	105	Lake Sup. Corp.	27
Nat En. & St., com.	20½- 20¾	Crucible Steel, pref.	82 - 82¾
Nat. En. & St., pref.	98½- 99¾	Harb. Wk. Ref., pref.	99 -100
Pressed Steel, com.	36½- 37		

Dividends Declared

The United States Steel Corporation, regular quarterly 1¾ per cent. on the preferred, payable August 30, and 1¾ per cent. on the common, payable September 29.

The Standard Sanitary Mfg. Company, Pittsburgh, regular quarterly 1¾ per cent. on the preferred; regular quarterly 1 per cent., and extra 1 per cent. on the common, paid July 25.

The International Harvester Company, regular quarterly 1¾ per cent. on the preferred, payable September 1.

The Inland Steel Company, Chicago, quarterly, 1¾ per cent., payable September 1.

The Pressed Steel Car Company, regular quarterly, 1¾ per cent. on the preferred, payable August 23.

The Ashton Valve Company, quarterly, 2 per cent., payable August 15.

The Peck, Stow & Wilcox Company, regular quarterly, 2½ per cent.

The American Shipbuilding Company has passed the dividend on the common stock.

Vismera Steel Sheets.—A new line of steel sheets is being placed on the market by the Inland Steel Company, Chicago, Ill., to be known by the trade name Vismera, meaning purity and strength. Vismera, the company states, is a pure homogeneous dense metal which possesses all the qualities necessary to stand trying exposure above or below ground. The metal is tough, ductile, strong, pliable and easy worked, and the manufacturer places much emphasis on its lasting qualities. Vismera sheets are furnished in the following grades and sizes: Blue annealed, ⅜ in. to No. 16 gauge, widths up to 48 in., lengths up to 180 in.; box annealed, Nos. 18 to 26 gauge, widths up to 48 in., lengths up to 144 in.; galvanized, Nos. 10 to 18 gauge, widths up to 48 in., Nos. 20 to 28 gauge, widths up to 36 in., and lengths up to 144 in. They are made either corrugated or plain and are offered for all uses met with in a sheet metal business. A descriptive pamphlet about this new metal has been prepared by the company.

The Standard Steel Company, Bedford, Ohio, which recently increased its capital stock from $40,000 to $100,000, will add to its plant by installing one or two additional stands of cold rolls and an annealing and pickling outfit. Further extensions may be made a little later. The company makes a specialty of polished stove plates. At the recent annual meeting officers for the year were elected as follows: President and general manager, C. R. Williams; vice-president, C. R. Curtis; secretary, W. A. Green; treasurer, G. A. Curtis. The officers, with R. W. White, W. M. Mills and A. F. Pav, make up the board of directors.

A device which prevents a trolley car from being started when a passenger is mounting or dismounting is being tested on the line of the Portland Railway, Light & Power Company, Portland, Me. It consists of a hinged step which is depressed about ½ in. when a weight of from 5 to 10 lb. is placed on it. This breaks an electric circuit connected with the contractor, so that the contractor fails to close. The device is arranged, however, so that the motorman is able to reverse the car regardless of the condition of the step.

The Aluminum Company of America, New Kensington, Pa., recently contracted with the Pittsburgh office of the Hooven, Owens, Rentschler Company for a large cross compound Hamilton-Corliss engine for direct connection to two outside packed pumps which are to work against an accumulator with a pressure of 1500 lb.

The foundry business of the late Henry Clay Larrabee, Baltimore, Md., has been taken over by William I. Krause and S. E. Wollett, who have severed their connection with the Maryland Steel Company. Mr. Krause has been identified with the steel business for about 20 years.

On July 19 the net surplus of idle cars on the railroads of the United States and Canada stood at 149,072, as compared with 163,621 two weeks before, a reduction of 8.8 per cent. The number of idle cars, or the gross surplus, was 150,433, as compared with 165,508. The surplus of coal cars decreased from 70,363 to 62,689, and of box cars from 52,875 to 46,675.

Monel metal in sheets, small rods and wire is now being produced by Shimer, McGlyn & Co., Nineteenth and Washington streets, Philadelphia.

American Iron Trade Statistics for 1910

Statistics of the American Iron and Steel Association

The annual statistical report of the American Iron and Steel Association, 261 South Fourth street, Philadelphia, Pa., containing the statistics of iron and steel production for 1910, is now ready for distribution. It comprises 120 pages, and the price is $5 per copy. The information given is more comprehensive than usual, indicating the indefatigable energy of James M. Swank, the veteran general manager of the association, who, for more than 38 years has been collecting and publishing these statistics. Some of the figures have already been presented in our columns, having been taken from the Bulletin of the association, in which they were given publicity as soon as the information was in shape to be announced. The report now gives a complete record of the American production of iron and steel in 1910. Extracts from it are as follows:

Production of Pig Iron

The production of pig iron in 1910, classified according to the fuel used, was as follows compared with the three preceding years.

Fuel Used—Gross Tons.	1907.	1908.	1909.	1910.
Bituminous, chiefly coke	23,972,410	15,331,863	24,721,037	26,257,978
Anthracite and coke	1,335,286	353,315	682,383	628,579
Anthracite alone	36,268	1,694	16,048	20,503
Charcoal	437,397	249,146	376,003	396,507
Total	25,781,361	15,936,018	25,795,471	27,303,567

Small quantities of pig iron made with charcoal and electricity are included in the charcoal figures. Small quantities of ferroalloys made with electricity are also included in the totals for each year.

The following table gives the production of Bessemer and low-phosphorus pig iron by States in late years:

States—Gross Tons.	1907.	1908.	1909	1910
Pennsylvania	5,736,301	3,069,015	3,851,606	4,393,905
Ohio	3,711,001	1,907,529	3,628,046	3,460,736
Illinois	1,782,740	1,367,283	1,804,402	1,826,407
New York and New Jersey	929,519	483,900	628,426	834,632
Maryland and Virginia	421,958	183,879	284,356	326,614
West Va., Tenn., and Kentucky	324,323	121,703	293,837	267,577
Mich., Wis., Minn., Colo. and Cal.	325,778	83,667	66,697	135,771
Total	13,231,620	7,216,976	10,557,370	11,245,642

The following table gives the production of basic pig iron by States since 1907:

States—Gross Tons.	1907.	1908.	1909.	1910.
New York and New Jersey	215,197	110,167	466,919	414,228
Penna.—Allegheny County	1,812,007	1,854,327	3,187,687	2,807,551
Penna.—other counties	1,772,401	843,535	2,068,558	2,439,514
Virginia and Alabama	542,256	450,753	402,903	697,377
Ohio	451,378	278,386	845,956	1,155,434
Ind., Ill., Mo., and Col.	581,980	472,976	1,278,202	1,570,504
Total	5,375,219	4,010,144	8,250,225	9,084,608

The production of spiegeleisen and ferromanganese in 1910 was 224,431 tons, against 225,040 tons in 1909, a decrease of 609 tons. The production of ferromanganese alone in 1909 was 71,376 tons, against 82,209 tons in 1909. Of spiegeleisen alone the production was 153,055 tons, against 142,831 tons in 1909. The spiegeleisen and ferromanganese produced in 1910 were made by Pennsylvania and Illinois. The total production of both products since 1899 is given in the following table:

Years	Gross Tons.	Years	Gross Tons.
1899	219,768	1905	289,983
1900	255,977	1906	300,500
1901	291,461	1907	339,348
1902	212,934	1908	152,018
1903	192,661	1909	225,040
1904	219,446	1910	224,431

In addition to the above 47 tons of ferrophosphorus were produced in 1902, 946 tons in 1904, 1243 tons in 1905, 142 tons in 1906, 1273 tons in 1908, 3385 tons in 1909, and 3471 tons in 1910. In 1903 and 1907 this grade was not reported.

Consumption of Iron Ore in Blast Furnaces

We estimate the total consumption of domestic and foreign iron ore, not including mill cinder, scale, scrap, etc., in the manufacture of pig iron in 1910 at 51,563,000 tons, as compared with 48,660,000 tons in 1909. The average consumption of iron ore in 1910 per ton of pig iron made was 1.888 tons, as compared with 1.886 tons in 1909. In addition over 500,000 tons of ore are annually consumed by rolling mills and steel works.

In addition to the 51,563,000 tons of iron ore consumed in 1910 by blast furnaces in the manufacture of pig iron, about 2,800,000 tons of mill cinder, scale, scrap, slag, zinc residuum, etc., were also used as compared with about 2,535,000 tons in 1909. Adding these figures to the ore reported gives a total for 1910 of about 54,363,000 tons, or an average of about 1.99 tons of iron ore and other metallic material used per ton of pig iron made, as compared with about 51,195,000 tons, or an average of about 1.98 tons, in 1909.

In the following table the production of pig iron by grades is given from 1907 to 1910:

Grades—Gross Tons.	1907.	1908.	1909.	1910.
Bess. and low-phos.	13,231,620	7,216,976	10,557,370	11,245,642
Basic (mineral fuel)	5,375,219	4,010,144	8,250,225	9,084,608
Forge pig iron	683,167	457,164	725,624	564,157
Fdy. and ferrosil.	5,151,209	3,637,622	5,322,415	5,260,447
Malleable Bessemer	920,290	414,957	658,048	843,123
Spiegeleisen	283,430	111,376	142,831	153,055
Ferromanganese	55,918	40,642	82,209	71,376
White, mottled, direct castings, etc.	80,508	47,137	56,749	81,159
Total	25,781,361	15,936,018	25,795,471	27,303,567

Production of All Kinds of Steel

The production of all kinds of steel ingots and castings in 1910 amounted to 26,094,919 tons, against 23,955,021 tons in 1909, an increase of 2,139,898 tons, or almost 9 per cent. Of the total production in 1910 25,154,087 tons were ingots and 940,832 tons were castings, as compared with 23,298,779 tons of ingots and 656,242 tons of castings in 1909. The production in 1910 was much the largest in our history. The year of next largest production was 1909. The following table gives the production of all kinds of steel ingots and castings by processes in 1910 and four previous years:

States—Gross Tons All Kinds of Steel.	Bessemer.	Open-hearth.	Crucible and All Other.	Total Ingots and Castings.
Maine, Mass., R. I., and Conn.	2,592	223,158	23,751	249,501
New York and New Jersey	740,529	713,245	34,856	1,488,630
Pennsylvania	2,975,750	10,153,816	77,973	13,207,539
Del., Md., Dist. of Col., Va., West Va., Ky., Ga., Ala. La. and Tex.	589,949	897,219	.....	1,487,168
Ohio	3,314,053	1,733,409	3,146	5,050,608
Indiana and Illinois	1,693,053	2,302,140	31,247	4,026,440
Mich., Wis., Minn., Missouri, Iowa, Col., Ore., Wash and California	96,846	481,522	6,665	585,033
Total for 1910.	9,412,772	16,504,509	177,638	26,094,919
Total for 1909.	9,330,783	14,493,936	130,302	23,955,021
Total for 1908.	6,116,755	7,836,729	69,763	14,023,247
Total for 1907.	11,667,549	11,549,736	145,309	23,362,594
Total for 1906.	12,275,830	10,980,413	141,893	23,398,136

Of the total production of ingots in 1910 50,821 tons were made by the electric and various minor processes.

The following table gives by States the production of all kinds of steel castings in 1910, included in the totals given in the previous table:

States Gross Tons of Castings Only.	Bessemer.	Open-hearth.	Crucible and All Other.	Total Castings.
Mass., Conn., New York and N. J.	13,585	110,808	2,910	127,303
Pennsylvania	10,674	327,896	2,502	341,072
Del., Md., Dist. of Columbia, Va., W. Va., Ala., La., Texas and Ohio	12,256	165,158	3,146	180,560
Indiana, Illinois and Michigan	10,722	185,973	5,539	202,234
Wis., Minn., Iowa, Missouri, Colorado, Oregon and California	11,098	73,516	5,049	89,663
Total for 1910.	58,335	863,351	19,146	940,832
Total for 1909.	33,814	601,040	21,388	656,242
Total for 1908.	20,559	311,777	13,884	346,220
Total for 1907.	33,273	746,525	23,319	803,117
Total for 1906.	32,601	719,891	21,213	773,705

Included in the 26,094,919 tons of steel ingots and castings made in 1910 there were about 567,819 tons of alloyed steel, of which about 538,462 tons were ingots and about 29,357 tons were castings.

Production of All Kinds of Rails

The production of all kinds of rails in the United States in 1910 amounted to 3,636,031 tons, against 3,023,845 tons in 1909, an increase of 612,186 tons, or over 20.2 per cent. The maximum production was reached in 1906, when we made 3,977,887 tons. The year of next largest production was 1910. Rails rolled from purchased blooms, crop ends, scrap, seconds, and rerolled and renewed rails are included. In the following table the production of all kinds of rails in 1910 and the four preceding years is given:

States—Gross Tons.	Bessemer.	Open-hearth.	Iron.	Total.
New York, New Jersey and Md.	568,353	143,622	...	711,975
Pennsylvania	591,473	395,229	...	986,702
West Virginia, Alabama and Ohio.	19,550	477,166	...	496,716
Ind., Ill., Col., Wash. and California	705,066	735,342	230	1,440,638
Total for 1910	1,884,442	1,751,359	230	3,636,031
Total for 1909	1,767,171	1,256,674	...	3,023,845
Total for 1908	1,349,153	571,791	71	1,921,015
Total for 1907	3,380,025	252,704	925	3,633,654
Total for 1906	3,791,459	186,413	15	3,977,887

Included in the total of steel rails rolled in 1910 are about 261,534 tons of alloyed and electric rails, as compared with about 50,724 tons in 1909. About 234,145 tons of such rails were rolled from Bessemer steel in 1910 and about 27,389 tons from basic open-hearth steel, while in 1909 about 35,699 tons were rolled from Bessemer and about 15,025 tons from open-hearth steel.

Production of Wire Rods

The total production of iron and steel wire rods in 1910 amounted to 2,241,830 gross tons, against 2,335,685 tons in 1909, a decrease of 93,855 tons, or over 4 per cent. In 1910 the steel wire rods rolled amounted to 2,241,203 tons and the iron rods to 627 tons. In 1909 no iron wire rods were reported. Small quantities of steel copper-clad wire rods are included in the totals for the two years. The maximum production of wire rods was in 1909. The production since 1907 was as follows:

States—Gross Tons.	1907.	1908.	1909.	1910.
Mass., Conn., R. I., N. Y. and N. J.	233,687	200,113	280,101	246,669
Penna., Ky., Ga., Ala. and Ohio.	1,176,278	1,047,243	1,388,237	1,412,352
Indiana, Illinois and Colorado	607,618	569,593	667,347	582,809
Total.	2,017,583	1,816,949	2,335,865	2,241,830

Production of Structural Shapes

Our statistics of the production of iron and steel structural shapes embrace forms which are rolled for strictly structural purposes, but they do not include plates, girders made from plates, concrete bars, or small angles, channels, etc., for use in the manufacture of bedsteads, agricultural implements, safes, fences, etc. For 1910 the figures are carefully limited to such forms of iron and steel as are well known to the iron trade for use in the erection of buildings, the building of bridges, viaducts, and ships, and like important uses.

The total production of strictly structural shapes in 1910 was 2,266,890 tons, against 2,275,562 tons in 1909. Of the total production in 1910 about 426 tons were rolled from iron against about 44,814 tons rolled from iron in 1909. The maximum production of structural shapes was in 1910, allowance being made for the omission in that year of the tonnage of small shapes which we now class with miscellaneous rolled products. The production since 1907 by States was as follows:

States—Gross Tons.	1907.	1908.	1909.	1910.
New York and New Jersey	181,677	86,044	177,488	1,853,407
Pennsylvania	1,458,807	810,146	1,642,074	
Alabama, Tennessee and Ohio.	47,074	31,287	60,213	40,433
Indiana, Illinois, Wisconsin, Colorado and California	253,094	155,704	395,792	373,050
Total.	1,940,352	1,083,181	2,275,562	2,266,890

Production of Plates and Sheets

The production of iron and steel plates and sheets in 1910, excluding nail plate, amounted to 4,955,484 tons, against 4,234,346 tons in 1909, an increase of 721,138 tons or over 17 per cent. The maximum production was reached in 1910. The following table gives the production by States of plates and sheets in each year since 1907, excluding nail plate:

States—Gross Tons.	1907.	1908.	1909.	1910.
New Eng., N. Y., and N. J.	126,403	88,867	119,642	141,999
Pennsylvania	2,651,166	1,531,066	2,384,185	2,808,883
Del., Md. and Virginia	38,420	27,000	29,038	23,863
West Virginia	133,899	159,714	211,012	225,649
Kentucky and Alabama	54,631	45,473	70,639	69,610
Ohio.	851,987	603,213	938,185	1,052,414
Ind., Ill., Wis., Mo., Wyoming and California	382,626	226,660	481,645	633,066
Total.	4,248,832	2,649,693	4,234,346	4,955,484

In 1910 the production of iron plates and sheets was 91,118 tons, against 76,202 tons in 1909 and 54,033 tons in 1908.

Separating the production of iron and steel plates of No. 12 gauge and thicker from the production of iron and steel sheets of No. 13 gauge and thinner, total production of plates in 1910 was 2,807,728 tons, as compared with 2,379,098 tons in 1909, and the total production of sheets in 1910 amounted to 2,147,756 tons, as compared with 1,855,248 tons in 1909.

The production of black plates, or sheets, for tinning in 1910, included in the above, amounted to 712,137 tons, against 606,482 tons in 1909.

Production of Tinplates and Terne Plates

From reports received from the large producers and from estimates we have made for a few other producers we find that the production of tinplates and terne plates in 1910 amounted to 1,619,005,000 lb., or 722,770 gross tons, as compared with 1,370,788,000 lb. or 611,811 tons, in 1909, an increase of 248,217,000 lb., or 110,811 tons. Of the total in 1910 647,688 tons were tinplates, as compared with 526,722 tons in 1909, and 75,082 tons were terne plates, as compared with 85,237 tons in 1909. The total production of tinplates and terne plates in 1910 was much larger than in any other year.

All the tinplates produced in 1910 were made of steel, but of the 168,184,000 pounds of terne plates about 5,765,000 pounds were made of iron, as compared with about 8,054,900 pounds of iron in 1909.

Production of Miscellaneous Rolled Products

The production of merchant bars, skelp, spike rods, bolt rods, splice bars, hoops, bands, cotton-ties, strips, rolled axles rolled armor plate, and other forms of finished rolled iron and steel is given in the following table: rolled forging blooms and forging billets are included, but forged armor plate, hammered axles, and other forgings are not included.

Articles—Gross Tons.	Iron.	Steel.	Total.
Merchant bars.	1,074,163	2,711,568	3,785,731
Bars for reinforced concrete work.	4,648	236,464	241,109
Skelp, flue, etc.	350,578	1,477,616	1,828,194
Splice bars.	14,382	208,670	223,022
Hoops.	...	262,214	262,214
Bands and cotton-ties.	...	424,979	424,979
Rolled forging blooms and forging billets.	202	459,731	459,933
Sheet piling.	...	26,598	26,598
Railroad ties.	...	49,048	49,048
Spike and chain rods, bolt and nut rods, etc.	192,449	982,473	1,174,922
Total for 1910.	1,636,389	6,839,361	8,475,750
Total for 1909	1,572,491	6,139,015	7,711,506

Production of Cut and Wire Nails

Cut Nails.—Our statistics of iron and steel cut nails and cut spikes embrace only standard sizes of nails and spikes cut from plates. They do not embrace railroad and other forged spikes, wire nails of any size, machine-made horseshoe nails, cut tacks, or hob, clout, basket, shoe, or other small sizes of cut nails. Cut spikes are always included with cut nails.

The production of cut nails and cut spikes in 1910 amounted to 1,005,233 kegs of 100 lb. each, against 1,207,597 kegs in 1909, a decrease of 202,364 kegs, or over 16.7 per cent. The following table gives the production by States in 1909 and 1910, iron nails being separated from steel nails for 1910:

States—Kegs of 100 Pounds.	1910. Iron.	1910. Steel.	1910. Total.	1909. Total.
Pennsylvania	210,364	326,754	537,118	666,792
West Virginia, Massachusetts and Ohio		275,352	275,352	364,947
Kentucky and Illinois	45,123	147,640	192,763	175,858
Total	255,487	749,746	1,005,233	1,207,597

The maximum production of iron and steel cut nails and cut spikes was reached in 1886, when 8,160,973 kegs were made.

The following table gives the production by States of cut nails and cut spikes from 1907 to 1910 in kegs of 100 pounds:

States—Kegs.	1907.	1908.	1909.	1910.
Pennsylvania	664,998	525,169	666,792	537,118
West Virginia and Indiana	175,549	285,554	364,947	275,352
Massachusetts and Ohio	102,333			
Kentucky, Illinois and Cal.	166,258	145,459	175,858	192,763
Total	1,109,138	956,182	1,207,597	1,005,233

Wire Nails.—The production of wire nails in 1910 amounted to 12,704,902 kegs of 100 lb., as compared with 13,916,053 kegs in 1909, a decrease of 1,211,151 kegs, or over 8.7 per cent. Steel wire nails only were made in both years. The maximum production was reached in 1909. The following table gives the production by States from 1907 to 1910 in kegs of 100 lb.:

States—Kegs of 100 Pounds.	1907.	1908.	1909.	1910.
Mass., R. I. and Connecticut	263,487	134,170	195,298	175,730
New York, N. J. and Pa.	4,787,311	4,214,681	6,113,353	5,457,099
Ky., Ga., Alabama and Ohio	3,537,629	2,782,340	3,440,101	3,365,433
Indiana and Illinois	2,941,216	2,812,105	3,449,106	2,906,274
Wis., Colorado and Cal.	681,410	714,876	688,295	662,366
Total	11,731,044	10,662,972	13,916,053	12,704,902

The following table gives the total production of cut and wire nails from 1901 to 1910:

Years.	Kegs.	Years.	Kegs.
1901	11,346,062	1906	12,675,886
1902	12,616,008	1907	12,891,192
1903	11,005,554	1908	11,619,154
1904	13,210,023	1909	15,123,650
1905	12,212,441	1910	13,710,135

International Exposition of Inventions

America's first International Exposition of Inventions will be held in St. Louis the week beginning September 11, 1911, in the new Coliseum Building. This building is specially adapted for the handling of large expositions. Manager F. W. Payne states that the interest manifested by manufacturers and business men throughout the country indicates that this exposition will be a pronounced success.

It will give inventors an opportunity of bringing their new inventions directly before the general business public for their mutual benefit. A visit to the exposition will disclose to a manufacturer many new ideas and devices, some of which, perhaps, may prove to be the very thing he has long searched for.

Such an exposition is one of the annual events in England, but has never before been held in this country. When the matter was first discussed, the selection of the city in which it should be held was a problem, but after carefully investigating the advantages and disadvantages of different cities it was decided that St. Louis was preferable on account of the central location. The exposition will be international in its scope. Several entries have already been made from foreign countries and many visitors are expected to come from abroad to study the new devices which will be shown.

No. 2 furnace of the Warwick Iron & Steel Company, Pottstown, Pa., was blown in July 27. For a little time the furnace will be run on foundry grades.

The Munning-Loeb Company, manufacturer and designer of electroplating and buffing equipment supplies, is located at Matawan, N. J., instead of Matapan, as incorrectly printed in *The Iron Age* of July 27.

Personal

A. I. Findley, editor of *The Iron Age*, arrived in New York from Europe on Tuesday and has resumed his duties.

W. P. Snyder, president of the Shenango Furnace Company, Pittsburgh, Pa., will sail for Europe August 10, to be gone two months.

William S. Pilling, of Pilling & Crane, Philadelphia, Pa., returned August 1 from a three weeks' vacation. T. I. Crane, of the same firm, sailed August 2 for a six weeks' trip abroad.

P. S. Smith, secretary of the J. D. Smith Foundry Supply Company, Cleveland, Ohio, has taken charge of the company's Eastern offices, 378 Ellicott Square Building, Buffalo, N. Y., from which point all Canadian and Eastern trade business will be handled.

W. H. Whiteside, who recently resigned the presidency of the Allis-Chalmers Company, has been elected president of the Stevens-Duryea Company, Chicopee Falls, Mass., to fill the vacancy caused by the resignation of Irving H. Page who has been elected chairman of the board of directors and treasurer of the company. The official statement is made that the company does not contemplate the purchase of nor consolidation with any other automobile interests.

The Inland Steel Company's Annual Report

Stockholders of the Inland Steel Company, Chicago, held their annual meeting July 25 and received the report of the operations of the company, showing that the net profit for the year, after deductions for depreciation and for the exhaustion of minerals, was $1,598,624. The financial statement for the year ended June 30, 1911, is as follows:

Net earnings from operations after deducting $714,452 for maintenance and repairs of plants		$1,798,437
Other income		1,981
Total profit for year		$1,800,419
Less—		
Provision for depreciation and renewal of plants	$150,000	
Provision for exhaustion of minerals	51,795	
		201,795
Net profit for year		$1,598,624
Deduct—		
Interest on bonds	$515,750	
Dividends paid	528,344	
		754,094
Surplus, year ended June 30, 1911		$844,529
Add premium on capital stock paid for		112,000
Add previous surplus		2,416,417
Total surplus per balance sheet June 30, 1911		$3,372,947

The H. C. Frick Coke Company, Pittsburgh, will not erect coke ovens on the coal property recently purchased by the United States Steel Corporation from the Monongahela River Consolidated Coal & Coke Company. This property is located in Washington County, Pa., adjacent to coal properties owned by the Jones & Laughlin Steel Company, Lackawanna Steel Company and Pittsburgh & Westmoreland Coal Company. Thomas Lynch, president of the H. C. Frick Coke Company, states that the coal lands recently purchased in that territory will probably not be opened up for some years.

The Chamber of Commerce of the State of New York, 65 Liberty street, New York City, has established a system of commercial arbitration which will be conducted by a Committee on Arbitration, of which Charles L. Bernheimer is the chairman. The purpose is to offer the means to both members and non-members for a proper and satisfactory adjudication of commercial controversies, thus eliminating the many tedious and vexatious delays incident to trials at law. The report of the special committee has been issued in pamphlet form and gives in full the details of the plan.

The Cincinnati Steel Castings Company, 948 to 960 Kenyon avenue, Cincinnati, Ohio, is erecting a new foundry at Queen City avenue and Spring Grove for the manufacture of light and medium weight castings by the converter process.

International Iron and Steel Association

The Proceedings of the Conference at Brussels, as Reported by Stenographer—Views of European Manufacturers as to the Sort of Agreement Possible

As was indicated in our report of the Brussels iron and steel conference of July 5 and 6, given in *The Iron Age* of July 20, representatives of the press were not admitted to the sessions. A press committee consisting of one representative from each country was instructed by the convention to give to the press, after each day's session, "such information as should be deemed wise." It was also decided that later a full stenographic report of the proceedings be prepared for publication. The press committee's perfunctory bulletin of the action taken was duly given out, together with Judge Gary's address on taking the chair. The secretary of the convention, Wm. B. Peat, of a London firm of accountants, has made public in the past week the full report of the conference. We publish it verbatim, with the exception of the portions already given in these columns; namely, the address of Judge Gary, the names of delegates and the names of representatives from the various countries appointed on the committee to frame and report a plan of international organization, if such association is decided advisable.

We reprint the stenographer's full report—in spite of the redundant and rather tiresome expressions of compliment and protestations of high ethical purpose contained in some of the addresses—as best affording an idea of what actually took place at the Brussels meeting. So many erroneous statements have appeared as to the purpose of its promoters and such unwarranted construction has been put upon the action taken that readers of *The Iron Age* are entitled to put their own interpretation upon the motives of those who participated and draw their own conclusions as to the figure any association likely to be formed on the lines indicated would cut in international iron and steel markets.

The report, after referring to the election of Judge Gary as chairman of the convention and of Wm. B. Peat as secretary, and after giving the names of the Credentials and Press Committees, together with their reports, which were adopted, presents in full the address of Judge Gary. Following the address the proceedings were as given below:

THE CHAIRMAN.—Gentlemen, I should now like to call upon a few of the gentlemen whom I know and whom I may designate to address themselves to this subject. Without previous consent and acting with what I may call arbitrary spirit, knowing that Sir John Randles has to leave us very soon, and having a great desire to hear from him on the general subject, I am going to ask him to speak. I now have pleasure in calling on Sir John Randles to speak on behalf of England.

Sir John Randles

I can only respond to the call by trying for a moment or two to speak. One of the factors in the situation to-day is this: I take it that, while we are gathered from many countries and in one sense may be representative of many interests, I am only entitled to speak for myself. Thus I am not entitled to speak for any group or any body of men, so that what I say must be regarded as coming solely from myself. I had the pleasure of being in the United States on the occasion to which Judge Gary has referred. On that occasion I had the advantage of listening more than once to the enunciation of the views which Judge Gary has laid before us to-day, to which I, at any rate, am absolutely a convert. I believe that in the foreshadowing of the principle of live and let live much may be done in relation to our industry. It would be vain and futile for any individual manufacturer, or any section of manufacturers, to think that he could, with advantage to himself, monopolize the industry in his own sphere or any other sphere without regard to his competitors in the business.

The principle that I take Judge Gary as laying down is this: There will always be competition in the world—our interests are diverse—but so far as we can come together—there is no danger in meeting to consider and to discuss the commercial and the mercantile side of our industry—we should continue to gather together for the common good. I may illustrate that possibly by saying when I was in the United States I saw many and various improvements in manufacture on what I was familiar with in my own concern. I could not adopt all those suggestions of improvement; but Judge Gary allowed me to go into the office of his company and there I was shown and had explained to me how those who are more or less competitors come together. I was shown how, once a month, the various managers of the different blast furnaces, for instance, belonging to the United States Steel Corporation, were gathered together in New York and they had laid before them cost sheets, particulars of all that appertains to the manufacture of pig iron. There was a full and free and ample discussion between those who were particularly interested in the blast-furnace management—nobody else—but that particular section met together and discussed with great advantage to all concerned. When I got home the managers asked me if I had any improvements that I could bring before them, and I told them that I thought they would mostly require a very large amount of capital which was not at our command. But I said perhaps one of the most advantageous things I could bring over was to tell them exactly how to deal with different questions referring to blast-furnace management. I introduced this system and brought all the departmental managers together, who met monthly now to compare notes and help the more backward to attain the standard of the best. I can assure this gathering that there has been a very perceptible advantage in the percentage of reduced cost in the manufacture from the gathering together of those men who are interested in blast-furnace manufacture at our works. It had a beneficial effect which was measurable in pounds, shillings and pence; and that is how it appeals to me, because, after all, our object is to make profits.

I thought to myself, if this plan of bringing together the men who are engaged in that particular limited branch of the industry is so beneficial, surely we may have greater advantage by bringing together those who have to do with the control of these large concerns represented here to-day.

Let me give another illustration. It is not only a question of economy of manufacture, it is largely a question of the disposal of our product in the most economical manner possible. It is quite possible, for instance, it might cost to make a ton of any commodity you like—pig iron, rails or plates, or any material—in the United States or in England, exactly the same amount of money to produce your article. There might be a market to which it would cost to get our material—6 shillings a ton, we say—$1.50 a ton to get our material to the market. It might cost Judge Gary 10 shillings a ton to get to that market—$2.50. Surely, it would be common sense if I were meeting Judge Gary in an assembly of the description he wishes to establish, it would be a very reasonable thing for me to say: Judge, it only costs me $1.50 to get to the market, it costs you $2.50. Why should you seek

to come into my market? There is another market over there where you can get for $1.50 your goods carried where it costs me $2.50. You go and sell your commodity in that market and let me sell my commodity in this market. In that way there is an absolute saving to the industry of $1 a ton if they meet together and talk common sense to each other in that manner. There is no obligation on me to tell the Judge to accept my proposal; and surely if we talked together and exercise commonsense we shall find no danger in the gathering which is contemplated.

These are to my mind, the results which I should look for as the outcome of our association to-day. There must be a practical good come of it or it will eventuate in smoke. But I take it, if such an association of manufacturers, which is world-wide in its range is formed and established by our meeting together we may possibly find some very material advantage, and if we do nothing else, we shall lessen the friction and we shall be able to pour oil on to the disturbed parts, and shall meet with common respect for our common industry, feeling at any rate we are no worse friends, and that we are indeed better neighbors. I take it that those were the objects that Judge Gary thought it worth while to seek to lay before us, and so far as I can understand, they give me an opportunity of meeting my fellow manufacturers without any obligation or binding agreements, which face me and deprive me of my perfect liberty or my individuality. I look forward to the time when there shall be a diminution of the friction—when there shall be access of good neighborly feeling, and when we all shall be able, as the Judge told us the other night, not to take each other by the throat but to take each other by the hand and wish each other Godspeed.

THE CHAIRMAN.—I call upon Baron von Bodenhausen to address the convention on behalf of Germany.

Baron von Bodenhausen

I am asked to respond to the words which Judge Gary has addressed to us, and I am very happy to do so, the more so as I have been acquainted with Judge Gary for several years. I have had frequent opportunity of meeting him and I may say that I fully and wholly share the views he has laid before you in trying to promote friendship between all of us. Before I go on to say exactly what we think about the proposition which the Judge has laid before you, I want to make a very formal statement in the name of my German friends in order to prevent from the very beginning any misunderstanding that might spring up, and this statement is as follows: The newspapers have written a good deal of stuff about our meeting to-day and they have spoken about dividing up the world between us all; I therefore think that we ought from the very beginning to state as formally as possible that this is not the object of our meeting to-day. I may go further. I may say that if my friends and I had known that this was not to be the case to-day I am pretty sure wo should have asked you to excuse us from being present on this occasion. And the very reason for this is that our Verband is to expire next year in the early spring, so that if any resolution of that sort of agreement should be laid before us we would simply have to tell you, We are very sorry, but we cannot.

After having made this statement in a negative sense, I want to come to positive facts. The first fact I want to point out is how very glad we are that in this movement of promoting friendship between us, it is our actual chairman, Judge Gary, who has taken the leadership. It was in the fall of last year, when we were in New York and had our last meeting, that Judge Gary raised the question whether we would like him and the American group to take this leadership and I immediately got up and said: I do not think there is any man more suitable to do it than Judge Gary, and I want to repeat it on this occasion, and I want to say to Judge Gary that the whole German group entirely trust him, and we will be ready to follow his leadership in the way he has pointed out to us. Now, to come to the point. Judge Gary suggested that we should appoint a committee that would act by itself and report later on to all of us, and see whether we could convoke a meeting. We are entirely willing to follow this advice and to adhere to this proposition; and even without giving this committee any certain line of going on, we think that the committee can come to a very remarkable and very useful work, useful to all of us. It was in New York that I once formulated that very short sentence of the idea which I had got of our coming together on days like this one; and, although I repeated that sentence again in London the other day, I think that, as I believe it to be right, I will repeat it again to-day to you. It is that, according to my opinion, to know your customer personally is one-half of your business, and, as we are learning to know now, that to learn to know your competitor personally and to make friends with him is the other half of your business.

I think that if we take this short sentence as the leading sentence and spirit of our meeting to-day, that will keep us all right and show us the right way. We do not know what may come out of the deliberations of the committee we are going to appoint to-day; but never mind, it is sure that something must come out of it. It is somewhat the same as the Court of Peace at The Hague. You do not know what is to come out of that wonderful organization, but you are quite sure something must come out of it in the way that misunderstandings springing up as they might do every day between the different nations will, by-and-by, and more and more from day to day, be settled by the Court of Peace. Let us look at our committee as a Court of Peace, and I think we shall do very well in doing so. Judge Gary, in sending out invitations to the different delegates, you ended your very kind and friendly letter with the words that you and your American friends wanted to grasp the hands of your brethren across the seas. Well, I suppose that our being present here to the number of 20 shows you how very heartily we have taken up this proposition of yours. You tender us your hand—we take it—and we shake it most heartily and we hope that it will help to make us all as we are here together, friends. Let me finish my short remarks with this wish: let us all, as we are round these tables, be good friends, and you may be assured, more, you may be absolutely certain, that it will be to the benefit of all of us.

THE CHAIRMAN.—I call upon Sir Hugh Bell, on behalf of England, to address the convention.

Sir Hugh Bell

I cannot claim quite the position Sir John Randles had, the advantage of taking to himself when he addressed the meeting, and I am very glad, sir, that you chose him to speak first on behalf of the English group, since it enabled him to express as he did in most excellent terms the desire which has also been reiterated from the other end of the table, that we should be understood in the main to be proceeding on our individual opinions and that we did desire—and it was upon this point that Baron von Bodenhausen dwelt—to retain as largely as possible our independence. Sir, I have not quite that position of independence because I am charged by the meeting of the English group to lay before this meeting the resolution which they passed yesterday evening on considering the question, and that resolution is couched in the following terms: "This meeting of the English group views with sympathy the attempt to establish a more friendly commercial basis between the iron and steel manufacturers of the world." The meeting which I am addressing will see that that is exactly on the lines of the address which your honor has just delivered to the meeting here assembled. You have proposed to us that we should consider what co-operation ought to be established in this great and most important—I venture to say, the most important—of the world's industries. In support of that proposition I venture to urge on this assembly one or two rather more general considerations than even you have touched upon or have been mentioned by either of the other delegates. I would like to remind the meeting that the tendency of commerce over our time has been steadily toward larger aggregations. In every branch of industry that is found to be the case. The blast furnace is four or five times as big as it was when I was a boy. The rolling mill is much more important than it was then; and if I turn to the other industries I find the same principle is obtaining. It is impossible for us to abstract ourselves from the conditions under which we live. It is our duty therefore to guide these irresistible forces rather than to attempt to stem them.

You have alluded, sir, I think, with very great aptitude and tact, to the fact that already in other directions the great industries of which we are the representatives have found it desirable to form association on the technical side of their work. The Iron and Steel Institute, which claims for itself not a British title but an international title, a title which its membership shows it richly deserves; the similar German technical institution; and your own American institution of a like character, are three notable examples of the necessity in which we have found ourselves as technical men for interchange of opinion where it is possible. It has occurred to you, sir, and we thank you for it, to say that that principle which we have applied to the technical side of our business ought also to be applied to the commercial side. I think no one can doubt if we conduct ourselves in the reasonable and proper spirit indicated by your observations, we shall not only find no opposition to our proposed association, but on the contrary the world will thank us as much as it is bound to thank us for those other technical institutions. It is in no spirit of selfish aggrandizement that we, any of us, approach this question. We all of us look to it, I imagine, entirely from the point of view of improving those relations which we have established with the outer world. I cannot refrain from congratulating Baron von Bodenhausen for the admirable way in which he has expressed himself in a tongue which I am bound to call foreign to him but in which he expresses himself almost as an Englishman. And I especially congratulate him on the admirable aphorism with which he has presented the iron and steel industries of the world, that it is one-half of the battle to know our customer and the other half to know our competitor. The more we get to know them the more we get to esteem them. We find that the persons with whom we had been in an attitude of hostility and opposition become our intimate friends, and that we are able to exercise that discrimination to which you have referred and to which others have also referred in a manner which is of advantage to us and to the world at large. The other evening, in London, speaking entirely from my heart, I said that I had never been able to view with jealousy or hostility the prosperity of my neighbor, even though he was my competitor. If that is so, I need hardly say, and now I speak entirely for myself, and I ask you to couple no one with me, that I hope everyone will agree with me that that is so—it is obvious. I for one approach such an organization as that which you are approaching here with the fullest sympathy and I can give my entire personal adhesion in the resolution which I was asked to lay before the meeting this morning. I sincerely hope when the time has elapsed to which you have referred, when the committees which I trust will be formed have had time to consider the question, they may report to us that they see (amid no doubt many difficulties which we must not undervalue or disguise), no reason why we should not on the commercial side of our industry establish the same sort of organization which exists on the technical side. I should be the last to underestimate those difficulties. In my own country they are of a very remarkable character and will require the very greatest tact and care in their handling. But, sir, if it were not a difficult world in which we live we should not be occupying the position—you, gentlemen, let me say, would not be occupying the position in which your intelligence and skill have placed you. Another difficult problem is presented to you for solution. I feel sure you will tackle it with the same skill and industry which have characterized you in what has gone before. I would like in conclusion to remind the meeting—I hope, sir, I am quite in order in what I am going to remind the meeting of—that this committee can only be regarded as a sort of constituent authority to consider whether the suggestions you have made to us can be followed, and if so, how they should be formulated, and what measures should be taken to make the plan effective.

Till that report has been presented we shall be no more committed to anything than we are now—namely, to what on behalf of the English group I commit myself, a sincere sympathy with the objects which you have expressed to us, and entire readiness to the best of our ability to come within the conditions which are going to be laid down. I have to thank you for permitting me on behalf of the English section to make this statement.

THE CHAIRMAN: I call upon Mr. Greiner, of Belgium.

A. Greiner

I will be very brief, because what I have to say at present is only that we agree with the views expressed by the chairman, by Baron von Bodenhausen and Sir Hugh Bell. After that, I have to say that as I have to make a speech to-night I will not repeat it at present, because it would be to-night a very bad ricochet speech! I only wish to thank the Judge and our American friends and all that are present here, that you have chosen Brussels, the capital of this small industrial country, as being the city of your to-day's meeting, and I hope you will enjoy yourselves and profit by it.

Mr. Trasenster (Belgium)

As it is very difficult for me to express myself correctly in English, I ask our chairman, Judge Gary, to be good enough to allow me to say a few words in French, which will afterwards be translated into English. The speech of our esteemed chairman we have just listened to and the very cogent arguments he has put forward have convinced us of the necessity of seeing each other, of meeting, and of the possibility of arriving at a result which, at first sight, as he said himself, appears somewhat ideal and difficult to put into practice. It is certain that the idea, so broad and so vast as that which Judge Gary has put before us, will encounter many difficulties, but I do not believe, nevertheless, that it is impossible to realize. With the good will we observe here, on the one hand, in the presence of the representatives of the industries of all countries, and on the other in the feeling with which each of us is animated, I think that however difficult this result may be to achieve we shall nevertheless reap some fruit from this gathering.

The understandings of twenty years ago were very difficult to realize, even in each particular country, but the enormous development of industry, of each of our industries, makes it almost our duty to co-operate in order to avoid the disasters which would follow if a fight to the death were to take place between us.

It is this feeling, I think, which has prompted us all to gather to-day in such numbers around Judge Gary. Certainly the task is a difficult one, but it is not impossible, and I think we should take our example from what is happening in the United States. For a long time past we have had our eyes directed toward the United States which has taught us many new methods and has effected great progress in many industries, and especially in the iron and steel industry. First it was technical progress, but for some years past they have realized a thing we have never been able to secure, that is the *entente cordiale* among their works. It is this *entente cordiale* which enabled them at a certain moment during the crisis to reduce the output by one-half, and maintain the prices at a reasonable rate, while maintaining the workmen's wages likewise at a paying rate.

True, in order to arrive at this result, the *entente cordiale* referred to by Judge Gary was necessary; but his perseverance also was needed, because in a great country like America this task was as difficult to realize as that with which we are confronted to-day.

Gentlemen, if we desire to succeed in our work it will suffice for us to follow the example set us by Judge Gary in creating the corporation which produced such happy results in the United States. I trust that we may realize the same thing here.

[Mr. Trasenster's remarks are given in French in the report. The translation is ours.—EDITOR.]

THE CHAIRMAN: Mr. Dreux will address the Convention on behelf of France.

A. Dreux

We came to this meeting only with a general idea as regards its object, and we have not been able to confer between each other as regards the proposition that has been put forward by the president, Judge Gary. I have listened with pleasure to his speech with regard to the question of the organization of the association and the friendship which exists between the iron and steel makers. On that basis I may say that the French group will agree willingly to such an organization so well defined by Judge Gary and by the gentlemen who spoke after him. In fact, the French point of view is not very different from that

of the German representatives. I might refer to what fell from Baron von Bodenhausen, as it just expresses the point. I must ask only to reserve the decision of my colleagues until the commission is constituted, on the rule and basis of this agreement. But on the principle we quite agree and we are most thankful to Judge Gary for the valuable initiative he has taken by introducing this important subject for our discussion.

W. Kestranek (Austria-Hungary)

I think I would best follow the advice of Judge Gary not to compete in an unfair manner when speaking in English. Then, I shall not make unfair competition with the English language. But we are not so far—our agreement is not settled, and so may I make unfair competition! Gentlemen, I think I have to say first that there are many difficulties in our way, but remember the words: "Rome was not built in one day," and so I think our Rome, the Pope of which is Judge Gary, will not be reached in one day. I think we are in a situation like the first Christians—we have to avoid now the public. We gather at the beginning like the first Christians in the catacombs, because the public believes that we wish to do something which is unfair; but when we are in the position of the first Christians—I dare say the customers are the Romans; they are cruel—and when Judge Gary says we must have very much more patience and courage, then also I have the courage to lay before you a proposition. I am afraid I shall be a martyr whose suggestion may not have some echo here, and in spite of that I venture to lay before you a suggestion. Austria is not so much interested in these questions as other countries, but, as you know, the smallest dogs bark the loudest; and so I will tell you we have to come to a more practical basis, and I think it will not be sufficient to appoint a committee. I think we have to outline something for this committee—to sketch the outlines—and so I venture to add some sentences. I think the nucleus of the solution is given here in this program, which nominates this meeting the meeting of the International Iron and Steel Association. Gentlemen, there is no International Iron and Steel Association but we will settle this association, and so I think it will be best to give this committee an outline of what the meeting wishes, and I have the courage to do it. Let me read a little sketch which I made about this thing. I think in that sketch the constitution of this new Iron and Steel Institute will be as follows:

I. The society shall be designated "INTERNATIONAL IRON AND STEEL INSTITUTE."

II. The object of the Institute shall be to serve as a communication between members of the iron and steel trades of all countries, concerning all matters bearing upon their interest.

III. The Institute shall consist of active members and honorary members, who shall be more than 24 years of age. Active members shall be persons who are practically engaged in undertakings of the iron and steel industry; it may be as owner, partner, member of the board of directors, manager or in any other leading position. The membership of an active member expires when the member retires from his practical activity. The number of honorary members shall not exceed fifty.

IV. The Institute shall be managed and controlled by a Council consisting of members elected from the list of active members of the different countries, in proportion to the export trade of the respective country. Every two million tons annual export of iron and steel and manufactured iron shall give the right to the election of one delegate of the respective country. A surplus of at least one million tons gives the power of the election of one delegate more. Countries having less an annual export than one million tons shall have likewise the right to elect one delegate, if this country's annual production of pig iron is at least 500,000 tons. In such a way all countries of some importance in the iron trade shall be represented in the Council.

V. The Council elects one president, three vice-presidents, one treasurer and a secretary. These officers of the Institute, like the members of the Council, shall be elected for two years and are eligible for re-election. The president and the vice-presidents are also president and vice-presidents of the Institute. These officers have to belong to different countries. The Council has the power to elect from its members standing or temporary committees for the treatment of special matters. The president shall be *ex officio* chairman of all these committees.

Sir HUGH BELL.—Mr. Chairman, I hope you will not think I am out of order if I ask your permission to move on a point of order. It seems to me that Mr. Kestranek, whose observations are of a most valuable character, is rather too far ahead, and the matter which he has submitted to us would be better referred to the committee, of which I hope he will be a member, than to this rather larger meeting, and therefore I suggest that this portion of the proceedings should be adjourned.

JUDGE GARY.—The chair will have to rule that the point of order is not well taken. I think it is quite right on the part of anyone to make comments as part of his address and suggestions as to what he thinks ought to be done. I doubt whether that would be at all in contradiction to our general plan. Certainly what was being said is very interesting. (Applause).

Mr. KESTRANEK.—Gentlemen, you see, I am the first martyr!

Sir HUGH BELL.—But struck by a friendly hand!

Mr. KESTRANEK.—Yes, at the end! But I wish only to tell you some words more. I think what Baron von Bodenhausen said, and the other gentlemen, was rather too much on the commercial part of the question—the mercantile part. But, please, gentlemen, we have other mutual interests than commercial and mercantile. Please let me exemplify: The question of the specifications where there is no commercial interest, and it is a very different and a very important question, because the cruel consumers nail us with these specifications—or, as Judge Gary said, the welfare of the employees or the sociological question. They are not commercial questions, but they are questions of importance, and it is of the greatest importance to us to know the opinions of our colleagues about these questions. We do not come together only for the commercial question, but we come here to speak about these questions. Please think about that, and you will find less difficulties than you see now.

Count de Zubiria (Spain)

Excuse my inability to speak in your language, and I only desire to say that I quite approve of what has been expressed here to-day. I am a representative of a country small in its production, and I must therefore be very short in words, too. I desire to state that we agree entirely with the conclusion contained in Judge Gary's address, and that we are quite willing to give our co-operation, and as Baron von Bodenhausen, of the German group, said, that there were two parts in this question—business and friendship—I offer now our friendship to all of you.

Mr. Witmeur (Russia)

Gentlemen, it would be difficult for me to speak in the name of the Russian group, because it does not exist, from the point of view of export at least. But from a general point of view it is perhaps of interest to say that the Russian metallurgical industry is concentrated chiefly in the south of Russia, and that this industry in the south is to some extent the offspring of the Belgian industry. Several godfathers of the industry in the south of Russia, however—in particular Messrs. Greiner, Trasenster and Lacanne—have already expressed their approval of the idea put forward by Judge Gary. Gentlemen, Russian industry is young, and the seeds sown by Judge Gary being good and the earth fruitful it is certain that the tree will one day be strong and flourishing.

Charles M. Schwab

It would seem superfluous, Mr. Chairman and gentlemen, and quite unnecessary for any member of the American group to express any opinion here, after listening to Judge Gary, who very fully expressed all our views, with whom we have been in close association for some years, and in whom we have the greatest confidence. He expounded the principles in America a few years ago that have brought forth results that few of us accustomed to the older methods of business ever believed possible. I personally was brought up in a school that had a widely different manner of doing things, as many of you know, and it was with a good deal of reluctance that I was brought to believe the fulness of this theory could be realized. But the results of American manufacture have been such that I am probably one of the strongest American advocates of Judge Gary's theories with regard to this matter. There is little left to me to say beyond that we

are in hearty accord with this suggestion to appoint a committee for the consideration of these questions. I believe that with patience and co-operation very great good will ultimately come. We think the prosperity of our great industry beyond the Atlantic is sufficient proof of the good of working out this theory. Speaking for myself, personally, and those of my American associates who cannot speak here, I can come to no other conclusion, and we are in hearty accord with the entire proposition.

T. J. Drummond (Canada)

As I have seen the growth of the Judge's theories and the principles broadening out in the United States and working to the general good, I can only give the heartiest approval to the proposition and say that as far as we are concerned we are ready and willing to co-operate and wish the movement Godspeed.

James A. Farrell

I wish to embrace the occasion to congratulate the Belgian delegates for their hospitable reception and particularly to felicitate our distinguished friend, Monsieur A. Greiner, of the great works of Cockerill, on the effective position held by the Belgian steel industry in the world's markets. I cannot refrain at such a moment as this from testifying to the esteem in which he is held for his uniform courtesy to his colleagues in the steel industry which has left an impression which time will not eradicate.

The importance of this meeting can hardly be overestimated; it meets for the discussion of scientific, economic and ethical subjects, for the dissemination of information, for the interchange of ideas, and it is believed that the organization of an International Iron and Steel Association to supplement the general work of the various iron and steel institutes and associations which exist in all of the steel-producing countries would tend to stimulate international intercourse. The educational value of gatherings such as this, where matters pertaining to the industry may be discussed in their various aspects, is very great and conducive to universal welfare. For upon the shaping of the relations obtaining between the members of the great iron and steel industry depend to a large extent its destinies, and these relations are seldom strained but almost without exception improved by mutual acquaintance; for as soon as we become convinced that there is no elemental antagonism of interests, but that on the contrary their interests are reciprocal, a co-operation along the line of the whole development of the industry will be the natural result.

The assembling of this congress, comprising as it does delegates from the great steel-producing countries of Great Britain, Germany, France, Belgium, Austria-Hungary, Russia, Spain, Italy and the United States, takes place at a time when the mind of the world is occupied with the great movement for promoting international peace and conciliation, and relations of comity and good fellowship between nations. The Hague Conference has gravely declared that the maintenance of peace is the supreme duty of nations. In his address last December before the American Society for the Judicial Settlement of International Disputes, President Taft said:

If we now negotiate and put through a positive agreement with some great nation to abide the adjudication of an international arbitral in every issue which cannot be settled by negotiation, no matter what it involves, whether honor, territory or money, we shall have made a long step forward by demonstrating that it is possible for two nations at least to establish as between them the same system of due process of law that exists between individuals under a government.

In response to the demands of public opinion, governments and public-minded citizens of all countries are advocating plans for international peace and arbitration, which not long ago were regarded as impractical and visionary. Concurrently, momentus changes have taken place in the steel industry, and the belief now prevails generally in that industry throughout the world that commercial peace is as necessary to the success and stability of the industry as the practice of settling international controversy by the sword is costly.

The movement for industrial harmony and conciliation goes hand in hand with the world-wide effort being made for political peace, since whatever may be the vocal professions of those contending for political peace and arbitration, it would indeed be a fallacious belief if it were not conceded that one of the greatest and most important essentials to co-operation between nations is the establishment of commercial peace and comity and good fellowship through the efforts of such assemblages as this, representing as it does influential people of many nations, engaged in one of the most important industries of the world, who believe that the fundamental principles which should regulate the rights and duties of nations in their mutual intercourse are those of evolution, which can best be broadened by the same application of those principles to the rights and duties governing the economical processes of production, distribution and consumption of their products.

The prime object of this international congress assembled here to-day is, as I understand it, to consider economic conditions, and to study the fundamental principles underlying co-operation among the steel manufacturers of the world. Such a convention pre-supposes a belief that industrial peace and co-operation are just and profitable both to the consumer and producer alike, and that the world at large would gain more from the exercise of a constructive policy that protects trade and develops commerce than from militant trade rivalry in the world's markets. Such a policy is, of course, diametrically opposed to the erroneous notion which has been suggested in some quarters, that it is proposed to control prices or hamper commerce.

The cultivation of amicable personal as well as co-operative relations is a step towards industrial peace. Thus this Brussels Conference may be regarded as the inauguration of a new era in industrial and commercial history, and if it is recognized that war between nations is obsolete and moribund then it must be recognized that destructive competition in trade channels is like war, and dislocates the economic processes of production, distribution and exchange the world over. Extremes are to be avoided in the business world as they are to be avoided between nations, in order to obtain the greatest good to the many, and if war is a pathological process so also is destructive competition, which brings about cyclical fluctuations of trade and periods of unemployment.

The export commerce of the world in the steel trade now amounts to some 14,000,000 tons per annum, of which the United States is doing about one-seventh, and with a total annual production of some 30,000,000 tons of pig iron her shipments of finished material to export markets is now at about the rate of 2,000,000 tons.

In more respects than one this gathering of the International iron and steel trade presents an interesting, not to say unique, spectacle. Americans come here with the most friendly spirit. We consider it a privilege to be invited to take part in your deliberations, to exchange opinions and to cultivate a friendly intercourse.

To people who are unfamiliar with the present-day economics of the steel industry, the supposition is that most of our time is occupied in trying to make money out of the consumer. Such things as the development of friendly co-operation with our competitors with a view to creating stability of trade, to study the great changes, both scientific and economic, which have come over iron and steel manufacturing conditions throughout the world are of minor importance to the doctrinaires. Such an inference disregards the great increase in the cost of manufacture. It matters not whether these changes are the result of one condition or another, the vital point is that, due to many factors, among which are the decrease in the average iron content of the ore from year to year, the rise in transportation charges to many markets, the maintenance of a fair rate of wages, the decrease in the effectiveness of a day's work—these and other considerations, such as the evolution of new processes requiring the dismantling of costly plant to keep up with the times, render it natural under all of these circumstances that the steel manufacturers of all countries should consider the establishment of an International Iron and Steel Association for the purpose of exchanging information.

No single business and no single country can make any progress unless the business of all advances. A recognition of the dependence of each man's business and each country's business for its prosperity and progress upon the prosperity and progress of the business of all is necessary in order to make real progress; and we must recognize the fact that great commercial and industrial organizations increase the efficiency of people as well as of countries.

Senator Root, of the United States, in addressing the Pan-American Congress at Washington, on February 17, 1911, said:

The basis of all intercourse, commercial as well as social, necessarily lies in a genuine good understanding that cannot be simulated; people trade with those with whom they have sympathy; their disposition is to trade with their friends. The basis of all permanent commercial intercourse is benefit to both parties—not that cut-throat relation which may exist between enemies, where one is trying to take advantage of the other—and a relation based upon mutual respect, good understanding, sympathy and friendship; and the way to reach the condition which is thus essential is in personal contact and acquaintance between the men of all nations.

The change which has come with our modern system is to some extent in the material improvement of plant and machinery; but business the world over as it is conducted to-day does not lead to the extinction of competitors, and there are many moderately prosperous concerns in the steel industries to-day that would be swept away if the old methods of destructive competition and survival of the fittest were to obtain. There has followed a clearer conception of the relationship of the public, the wage-earner and the investor. Intelligent management appreciates that profits, if they are to be sustained, must be subrogated to justice and humane treatment, co-operation with one's competitors, pension funds for the superannuated, systematic endeavor for the prevention of accidents, voluntary compensation for the injured, recognition of faithful service, elimination of Sunday work, profit sharing, sanitary surroundings, hospitals. All these are manifestations of a humane and efficient policy. This proposed association will consider and develop these questions, and its decisions and example will have a widespread and lasting influence.

Willis L. King

I desire to express my appreciation of the opportunity I have of meeting so many of the iron and steel masters of Europe face to face. It is not only a great pleasure but an education for me, which I freely acknowledge. I have come to know you better, as we have in recent years in the United States of America come to know each other better. In other words, we have demonstrated that competitors there can be friends as well as competitors, and it is therefore not impossible here, although there may be difficulties which I do not know of, but I believe that all of us can be equally good friends. We have been accustomed in our country to look upon Judge Gary as our leader as well as our friend. I shall carry home with me a new title for him, suggested by Mr. Kestranek, who has called him the "Pope of the steel industry." He is therefore progressing. And as the Pope has spiritual authority, I am well convinced, when you know the Judge better, you will be willing to concede the same authority to him in business affairs.

E. A. S. Clarke

I think it is quite needless for me to say I am in entire and hearty accord with the views expressed by Judge Gary. Of course, we Americans have had the greatest pleasure in following his leadership and in benefiting by the results which have come therefrom. I feel that I want to say but one word to this meeting, and that is that I take it there is no doubt that we are going to try to have these friendships and these intimate relations and these business dealings in fairness and in the same spirit of friendship which have come to us in our country. But they have not come to us in one day. No great movement of reform comes full born and efficient. No reform ever attained a full one hundred per cent. of efficiency. I believe I am justified in saying that we have now 90 per cent. and perhaps more in our country. But we did not have that to begin with. There are many who are among our strongest co-operators to-day who were doubters at first. But seeing the belief and courage of others, and seeing particularly the courage and sincerity and the frankness and fairness of Judge Gary, they have become enthusiastic converts, and in turn they help others to be of their number. Therefore, if our committee be appointed and lay down some rules for the association, and if it should seem that what is proposed is impossible, that it is attempting the millennium, please kindly remember to give it a fair chance. Be patient with it, and if there are some lapses at first be confident that they will be corrected and that success must finally come.

Fritz Thyssen (Germany)

I ask your kind permission to address a few remarks to you just to say a few words of excuse to you. And in order to make this excuse more clear to you I should like to compare the activity of each country where there is a certain amount of steel produced. Each line of activity is represented by a pipe-line. There are countries which have big colonies, there are countries which have free countries to develop, and other countries again which have no colonies and no land to develop. It is natural that the countries with large colonies and where this kind of activity runs through must be very big, and other countries which have not this pipe-line must have a bigger pipe-line in order to have an outlet for their surplus of steam. I think your committee should try to come to an arrangement so that there never should be any undue pressure in any pipe-line representing the different nations. Then you will have a perfect result; and my wish is that you may also in the committee take into consideration the fact that there is always enough room for the steel of each country.

The CHAIRMAN.—The Chair was greatly impressed with the remarks of Mr. Kestranek. I am not sufficiently familiar with what he said in detail to express any opinion of it as a whole, but certainly any suggestions which were made are valuable and important to consider. It was rather suggested by Sir Hugh Bell in making a point of order that it is quite possible and quite probable all these questions could be carefully considered in detail by such committee as had been suggested, and certainly from that standpoint I should say that the gentlemen would be one of the most valuable members of a committee such as has been proposed. Gentlemen, I recognize that Sir Hugh Bell has a suggestion to make.

Sir HUGH BELL.—Gentlemen, I think we must almost regard the labors of this meeting as drawing to a conclusion, and that conclusion may be expressed in the resolution which I have ventured to draft and which I have submitted to you, sir, (though I have added some words which I did not lay before you because they were in relation to yourself, and I do not want your approval of them), and which I have further submitted to Baron von Bodenhausen, to Mr. Greiner and to Mr. Kestranek. It is conceived in the following terms: "That this meeting thanks his honor, Judge Gary, for his address and approves the views therein expressed and"—(this is the operative and substantial part of the resolution)—"the meeting accepts the suggestion that a committee should be appointed to consider in what manner practical effect can be given to those views, such committee to consist of not more than five representatives from each country, to be empowered to consider the whole question and to report the result of its labors to a subsequent meeting to be convened by the committee." I beg to move that resolution, and I believe Mr. von Bodenhausen is prepared to second it.

BARON VON BODENHAUSEN.—I have only two words to say. I fully concur in the proposition as laid before you and I want to second it.

The CHAIRMAN.—Gentlemen, you have heard the resolution. Will those of you in favor kindly say "Aye?"

The resolution was put to the meeting and carried unanimously.

The CHAIRMAN.—The respective delegations will meet at such times as seem convenient for the purpose of recommending members of the committee proposed by the resolution which you have adopted. At the next meeting, to-morrow morning, which I suggest to be at ten o'clock, if that is agreed to, we will receive reports from the different delegations recommending names for the general committee, and act upon that report.

SECOND DAY'S PROCEEDINGS.

The CHAIRMAN.—Gentlemen, the first thing in order is to receive the reports from the respective delegations concerning their recommendations for the General committee. The Secretary will call upon the different delegations for these reports.

The delegations in turn reported that they had elected the following members to act upon the committee:

(The names were given in the report printed in our issue of July 20.—EDITOR)

The CHAIRMAN.—The motion is to adopt the reports

of the different delegations and to appoint as the committee of this convention the gentlemen whose names have been mentioned. Those in favor of the motion will vote "Aye"; those against the motion, if any, will vote "No."

The motion was carried unanimously.

The CHAIRMAN.—There is a resolution before the meeting to the effect that each delegation be authorized by this convention to fill vacancies and to make substitution from time to time as the delegations respectively may determine. Those in favor will kindly vote "Aye"; those against, if any, "No."

The motion was carried unanimously.

The CHAIRMAN.—Before we adjourn, I should like to extend the privilege to any who are present to speak concerning our deliberations. No one has been designated, no one is required to say anything, but everyone is given the opportunity of expressing his opinion, if and as desired. For myself, I should like to say that the result of this convention is most satisfactory. No one can tell what will be the final benefits which may be derived; everything depends upon the disposition of the gentlemen present. We have it in our power to do something for ourselves which is worth our while. I hope and believe we shall never regret coming together on this occasion. Certainly, if nothing more comes of it hereafter, we shall have reason to be very grateful that we have come together and enjoyed one another's society, and that we have increased and cemented the bonds of business friendship between us. I hope it will aid in materially extending our pecuniary welfare, and, more than that, will assist in placing the iron and steel industry on a basis which is worthy of any man or any company of men, or any organization. It remains entirely for us to say what the future of the iron and steel business shall be. If we have sufficient intelligence to know that a bushel measure cannot be filled with a half bushel of any quantity, we have begun to see that by careful consideration of one another's interest we shall all be benefited without injury to anyone. But I think we should all be particularly anxious that of all the questions growing out of, or appertaining to, the iron and steel industry, outside the mere matter of dollars and cents, the most important is that we shall reach and hold a position which entitles us to exert the influence in the great commercial world, and even in the political world, we ought to have.

Gentlemen, for myself I beg to express my profound gratitude for your consideration, and I express the hope that all of you may prosper; that you may have long life and happiness and that we shall have the inestimable privilege of meeting you often—looking you in the face and taking you by the hand and counting upon you as our friends—as our great business allies—and that you will assist us as we shall assist you. Gentlemen, you have the thanks of the chairman, and unless someone else has something to say, I declare the convention adjourned.

BARON VON BODENHAUSEN.—Before we adjourn, and before we go out of this room, I think it is due to us to thank our chairman for all the trouble he has taken and for the immense work he has done for us all. We have not come to a definite result to-day—we knew that we would not—but we have come to that which Judge Gary pointed out a few minutes ago, that we have learned to know each other better and to get better acquainted with each other. It is entirely due to the great work of Judge Gary that this has been possible. We do not know what may come out of it, but we are sure that something very good will come out of it, and so I think I speak in your name, gentlemen, when I say we thank the Judge for his work, and that we must heartily congratulate him on the success of these days.

Sir HUGH BELL.—I desire to second the motion made by Baron von Bodenhausen, and to associate myself and my colleagues here with the thanks which he has expressed. Your applause sufficiently testifies how entirely you concur in the motion which has been made. I venture to offer to Judge Gary my very sincere congratulations upon the admirable way in which his efforts have resulted. A meeting so diversely constituted as the present might easily have contained in itself elements of dissension which would have entirely frustrated the good that we have in view. Those sentiments, if they exist, have been subordinated (and I think wisely subordinated) by those persons who may have entertained any different opinions.

I think, your honor, we ought to proceed in the same spirit in which we have originally met, the spirit, namely, of being prepared for that subordination. In speaking in the Abbey at Westminster, the Archbishop of York in his sermon pointed out that it is only by means of sacrifice that improvement can be reached. Any change means a difference from the situation which may be satisfactory to some, though unsatisfactory to others; and it is that spirit of sacrifice which I venture to commend to this meeting as the thing which ought to guide us in endeavoring to give effect to the admirable sentiments expressed by the Judge. In this spirit, gentlemen, I second the vote of thanks, and since your honor is unable to put it to the meeting yourself, I venture from this chair to put it to the meeting, and to invite you to carry it—not by cries of "Ayes" and "Noes," not by show of hands—but by acclamation which will testify how entirely we concur with the thanks which have been offered to our president. Judge Gary, we present you the hearty thanks of this meeting.

Mr. SCHWAB.—Gentlemen, I think it is only fair of me to say one word for the American group, and that is, to say how highly we all feel honored by the confidence you have placed in Judge Gary, the man in whom we have placed all our confidence during the past few years, and we can assure you that that confidence and esteem which you have shown will not be misplaced nor misjudged. We, the American group, feel highly honored and very pleased that you, the representatives of the great foreign manufacturers, should place so much confidence and esteem in our fellow countryman, which, as I have before asserted, has been fully appreciated by ourselves. We cannot lose this opportunity of again thanking all the foreign friends whom we have met here for their uniform courtesy, hospitality and their good faith, and to express the hope for the American group that we may soon have an opportunity of showing you, in some slight manner at least, our appreciation of all this and our endeavor to reciprocate. We thank you, gentlemen, in the name of the American group, very much for all these attentions and courtesies.

The Mammoth Potrero Gusher

The mammoth gusher of the Pearson oil interests in the Potrero de Llano field, State of Vera Cruz, Mexico, was recently allowed to perform for 20 minutes for officials of the Texas Company and the Gulf Mining Refining Company, according to the Mining and Scientific Press. The gate valve was opened for the first time since the well was brought under control, and a column of oil shot into the air to a hight of 490 ft. The flow was estimated at 100,000 bbls. daily. With the possible exception of the Dos Bocas gusher, which burned out, the Potrero is the greatest in the history of the oil industry.

The well came in on December 26 last and before it was brought under control the flow was estimated at as high as 170,000 bbls. daily. The surrounding country was flooded and an enormous quantity of oil was sent down the Tuxpan River to the Gulf of Mexico. Weeks were consumed in accomplishing the herculean task of bringing the gusher into control. With the object of saving the production, earth storage was hurriedly provided and a stream of oil was directed into the reservoir, which constituted a petroleum lake fully a mile around and in places 30 ft. deep, estimated to contain 3,000,000 bbls. The pressure of the well is estimated at not less than 1000 lb. per sq. in. and the valve holding it has a strength of 2400 lb. per sq. in.

The Standard Underground Cable Company, Pittsburgh, has started work on the new plant which it will erect at Hamilton, Ontario, Canada, at a cost of $500,00 to $600,000. A site with a frontage of 400 ft. on Sherman avenue in the manufacturing district in that city has been secured. The first set of buildings will consist of a three-story brick and steel frame building, 64 x 335 ft. one-story saw-tooth building, 60 x 224 ft. one-story saw-tooth building, 60 x 250 ft.; two other one-story buildings, 64 x 90 ft. and 30 x 70 ft. respectively and an office building. These will be of the latest type of factory construction, designed by Prack & Perrine, who will superintend their construction. The structural steel for the buildings will be supplied by the Hamilton Bridge Works Company. All the contracts for the buildings, boilers, engines, etc., have been placed.

The Steel Corporation Investigation

The Testimony Increasingly Favorable

At the hearing before the Stanley Committee at Washington, July 26, John W. Boileau, an expert on coal deposits in Pennsylvania, appeared and demolished the theory heretofore entertained by many of the members of Congress that the United States Steel Corporation had acquired a monopoly of coking coal lands. He illustrated his remarks by a large colored map. He said the Steel Corporation owned 54,000 acres of Connellsville coking coal, Jones & Laughlin Steel Company 30,000 acres, Lackawanna Steel Company 15,000 acres, and John W. Thompson 25,000 acres, besides a number of smaller holdings which in the aggregate equaled or exceeded those of the Steel Corporation.

International Harvester Company Dragged In

At this hearing the committee sought to establish that the International Harvester Company and the Steel Corporation are one and the same, and charges were made by Chairman Stanley that the government failed to prosecute the Harvester Company, although evidence sufficient for criminal action was laid before the Department of Justice under Attorney-General Bonaparte. The report of the inquiry into the International Harvester Company made by Burdette C. Townsend, a special investigator for the Department of Justice, which was submitted to Attorney-General Bonaparte in 1908, was identified by Senator Kenyon and made a part of the record. This report showed that the Steel Corporation allowed rebates of $3 a ton on steel used in machines made for export.

Chairman Stanley, after calling attention to the fact that five members of the Finance Committee of the United States Steel Corporation were directors of the International Harvester Company, called on Commissioner of Corporations Smith to get permission from the President to furnish the committee with all data as to arrangements by which the Steel Corporation was to furnish the Harvester Company with finished products and raw material at reduced rates, and in return the Harvester Company agreed not to purchase from the Lackawanna or other independent companies, together with other data showing close relations between the two concerns. Counsel Lindabury called attention to the fact that all this information was on the minutes of the Steel Corporation, already in the hands of the committee. Commissioner Smith told the committee that the department had been investigating the International Harvester Company for several years and still had men in the field at that work.

Attorney-General Wickersham on the stand said that he had never seen the report of B. C. Townsend on the International Harvester Company and its relations with the United States Steel Corporation until it had been shown to him a few months ago. The reason that no action had been taken against the alleged Harvester Company was, he thought, because of the desirability of waiting for the decision of the Supreme Court in the Standard Oil and American Tobacco cases.

An official statement given out in Chicago on the same day as the Washington hearing by Clarence S. Funk, general manager, declares that the International Harvester Company is unwilling to believe that the alleged report of 1908 to the Department of Justice contained charges which the most superficial investigation would not have shown to be unfounded. "It is hard to believe that any responsible person could make the charge," it says, "for instance, that the Harvester Company was selling its export machines at less prices than are charged in this country, when the contrary has been shown to be true, not once, but many times." It also states that little steel is bought from the Steel Corporation, the company getting most of its material from its own mill, the Wisconsin Steel Company, and a large part of the remainder needed from the Jones & Laughlin Steel Company. It was said that practically nothing but sheet steel was purchased from the United States Steel Corporation.

More Steel Plate Makers Heard

C. B. Shoemaker, president, and J. P. Roe, general superintendent of the Glasgow Iron Works, told the committee about the participation of that concern in the steel plate agreement which existed up to 1904. They testified that the association was formed to maintain prices, but insisted that there was not now in existence any such agreement or understanding as then prevailed. N. W. Nolan, of the Crucible Steel Company of America, testified to the same effect.

Leonard C. Hanna Examined

The committee next met in New York City July 28, and examined Leonard C. Hanna, of Cleveland, one of the managers of the syndicate controlling the Tennessee Coal, Iron & Railroad Company at the time of the panic of 1907. Although Mr. Hanna was kept on the witness stand all day, nothing was obtained from him that in any way discredited the assertion by Judge Gary and others that the United States Steel Corporation took over the Tennessee Company for the purpose of saving the firm of Moore & Schley from being forced into failure and thus greatly intensifying the financial disturbance. Members of the committee took turns in questioning Mr. Hanna, but all were unsuccessful in drawing from him any statement or expression of opinion that would support the theory that certain interests brought about the merger by inducing the banks from which Mr. Schley had obtained loans to bring pressure to bear on him to substitute other collateral for the Tennessee stock, resulting in action by Mr. Schley which brought about the transfer.

Lewis Cass Ledyard Gives Important Testimony

At the hearing in New York July 29, more light was thrown on the circumstances connected with the purchase of the Tennessee Coal, Iron & Railroad Company than had previously been obtained from any source either in the course of this investigation or at any other time. Lewis Cass Ledyard, one of the most prominent financial lawyers of the metropolis, took the stand, and, with graphic details, swept aside the curtains to the library of J. Pierpont Morgan and gave the committee and the public a view of the conferences that were being held there in the fall of 1907 for the purpose of bringing order out of the financial chaos. He stated that Colonel Oliver H. Payne was the man who first suggested the absorption of the Tennessee Coal, Iron & Railroad Company by the United States Steel Corporation.

Where Mr. Ledyard Came In

Mr. Ledyard, at the beginning of his testimony, explained his professional position. He said:

"I want that clearly understood, as otherwise it might seem strange that I should appear as a witness. I know that Mr. Hanna testified yesterday that I acted as counsel for the managers of the Tennessee Coal & Iron syndicate, but I never understood that I was acting for them. In fact, I did not know at the start that there was a syndicate or syndicate managers, although I had learned from Colonel Payne in a general way that some of the stock was pooled. Neither was I the attorney for Moore & Schley, who were represented by Thomas Thatcher.

"When I learned that I was likely to be called as a witness in this inquiry I called Mr. Schley's attention to the fact that I had not acted in a professional capacity for him, to which he agreed. I have never acted for Mr. Morgan or the Steel Corporation. I was, however, counsel for Colonel Payne, and had been for years. It was through him that I came into the matter. I asked him what he wanted me to do as to pleading professional privilege, and he declared that he would release me from any such relation. I am here to tell all I know, and am ready to do so.

"In the last week of October, 1907, Colonel Payne told me that Moore & Schley were largely indebted to him, and that he was concerned over their condition. He said they had a great quantity of Tennessee Coal & Iron stock out among the banks as collateral, and that the banks had asked for the substitution of other collateral because it was a pegged stock, and there were practically no transactions in it on the market. He said he

could see no way for Moore & Schley to be saved except by the acquisition of the stock by the Steel Corporation. That concern was named because it was in the same business, and the acquisition of the Tennessee Company would be an extension of it. In other words, it was a probable purchaser of the stock.

Mr. Ledyard Was Told to Consult Mr. Morgan

"Colonel Payne said the matter could best be brought to the attention of the Steel Corporation through Mr. Morgan, who, he knew, was an intimate personal friend of mine, although I had no professional relations with him. He said he intended to suggest to Mr. Schley that he ask me to see Mr. Morgan about it. Colonel Payne didn't say anything at the time about a syndicate. I supposed, then, that the mass of the stock was held by Moore & Schley as brokers.

"Soon after, I think on the Friday before the purchase was made, Mr. Schley asked me to come to his uptown office, where I met him with his partner, W. B. Dickerman, and Mr. Tierney, their chief bookkeeper. Mr. Schley said Colonel Payne had made the suggestion of which he had spoken to me, and that he was now ready to avail himself of it. I stayed several hours that night, going over the financial condition of the firm. Its loans among the banks amounted to $33,000,000, perhaps $35,000,000. It also had other loans which did not figure in the acute conditions. I don't know the amount of these, but I do know that one of their creditors was Colonel Payne. He had loaned them securities of a nature that could be used as collateral readily with the banks, taking in exchange uncurrent securities on which money could not be borrowed at the time. The securities loaned amounted to several millions, perhaps $7,000,000 or $8,000,000.

The Interview with Mr. Morgan

"Well, after I went over matters with Mr. Schley and the others that Friday night I went to see Mr. Morgan the next morning. I had asked Mr. Schley what would pull him out, and he had said that nothing less than par for the Tennessee stock would provide enough money to do it. When I told Mr. Morgan the situation he expressed great concern. He said it was the most serious thing that had been brought to his attention in connection with the panic. Mr. Schley's loans were spread out not only in Wall Street, but in Boston, Philadephia, Chicago and elsewhere. Some other houses were already on the brink of failure. If one went, others would go. The banks also were involved. The trouble with Moore & Schley was not only because of the Tennessee stock, but because of the general character of a good many of their securities, such as American Tobacco common, Guggenheim Exploration, and some mining stocks. The most aggravated case was Tennessee, but that was not the only one.

"Mr. Morgan said he would see what could be done about it. He telephoned for Judge Gary and Mr. Frick. Mr. Frick was out driving, but Judge Gary was at home and came over to Mr. Morgan's house at once. Mr. Frick arrived a little later. After the matter had been laid before them I went into another room, and they talked it over together. Other members of the Steel Corporation's Finance Committee, I believe, were brought into consultation with Messrs. Gary and Frick through Saturday and Sunday, but I was not present. There were one or two conferences at which I was present with Messrs. Gary and Frick.

"Judge Gary was the reluctant one. He didn't think the stock was worth what I understood was necessary in order to save the situation; namely, par. He said it was not worth more than 60. I told him I knew nothing about its value, but I had no doubt the corporation could get it at 25 by waiting, if by that time it was in a position to buy anything, which I didn't believe it would be.

Judge Gary Willing to Lend $5,000,000

"Up to that time the position of two trust companies—the Trust Company of America and the Lincoln Trust—had not been determined, and Mr. Frick came to me and said he didn't know whether the Tennessee deal would go through or not, and he thought it ought to be arranged at the same time that the two trust companies should be saved. I told him it was impossible to make any conditions of that kind and that we were doing all we could for the trust companies. Judge Gary suggested that they lend Mr. Schley $5,000,000, as he has testified. I told Mr. Schley of this, and he said it would be useless, that it wouldn't be enough to be effective.

"The relief he needed was much more than $5,000,000 or $6,000,000. As an indication of this let me say that after the deal was made and the bonds exchanged for the stock Colonel Payne turned over to Mr. Schley the bonds he received for 25,000 shares of Tennessee stock. He had 10,000 shares of his own and 15,000 shares which he had taken from Mr. Schley in exchange for more marketable collateral. The bonds he received for this stock, amounting to about $2,500,000, he also exchanged with Mr. Schley for other uncurrent securities.

"Those interested wanted some verification of the facts stated to me by Mr. Schley and Mr. Joyce. A confidential man in the employ of Morgan & Co. and a representative of the Steel Corporation were turned loose on Mr. Schley's books. They worked for two days and most of the night, and when Mr. Joyce came up to Mr. Morgan's library I told him what Mr. Schley had said, that it would take par for the stock to pull him through and leave $3,000,000 or $4,000,000 in his box. Mr. Joyce said he though it would work out just about that way. This, I believe, was on Sunday night. I was with Mr. Morgan until about 5 o'clock in the morning. There were other conferences on at that time, and probably 100 persons were concerned in them and visited the library that day and night. Mr. Morgan told me he was very much afraid the deal wasn't going through. He said if it didn't there was no knowing what would happen. If Moore & Schley failed nobody could say what would follow.

Mr. Morgan Refused to Urge the Deal

"I asked Mr. Morgan if he would urge the deal on the Steel people. He said he would not; that he had submitted it to them, and that was all he could do.

"I didn't know Messrs. Gary and Frick were going to Washington until after they had gone. They disappeared about midnight, and when I was leaving Mr. Morgan about 5 o'clock in the morning he said they had gone to Washington to tell the President the situation, and that they didn't want to go on with it if they were to be attacked for doing it.

"Mr. Morgan told me to go home, get some sleep, and come back at 8:30. I didn't sleep much, but when I got back Mr. Morgan was up and had had a good breakfast. He thought we would hear from Washington by 9, but we didn't, and the message finally came through his office later in the day. The result, as I understood, was that no objection would be made to the transaction. I never talked with Messrs. Gary and Frick, either before or after their visit, concerning its object."

In reply to a question Mr. Ledyard said that "to practical men there was nothing very strange, when these men were about to make this exchange for a praiseworthy object, knowing how political capital is made out of such things, that they should tell the President the situation and that they would not carry it out if it was to be made the subject of an attack on them by the government."

Asked what he thought of an administration that would make such attacks, Mr. Ledyard said: "I don't think my opinion would help much, and, anyway, I am a Democrat."

No Pressure by Mr. Morgan or the Corporation

Mr. Ledyard declared that the imputation that Mr. Morgan, the banks he controlled or the officers of the Steel Corporation had made a drive against the stock of the Tennessee Coal, Iron & Railroad Company for the purpose of buying its control was cruel, unjust and not warranted by any of the facts. When asked if the pressure on Moore & Schley came especially from the Morgan banks, he said:

"It is pretty hard to say just what is meant by Morgan banks. Mr. Morgan is not president of any bank, and, so far as I know, is a director in only one, the First National. The reason Mr. Morgan has the great influence he possesses is because people believe in his character and the worthiness of his motives. However, none of those that are called Morgan banks was exerting pressure on Mr. Schley. His own banking house was one of the

largest creditors of Mr. Schley and one of the largest holders of Tennessee stock as collateral.

"Morgan & Co. never called these loans nor asked Mr. Schley to shift the collateral. The First National Bank, which is called a Morgan bank, was another large creditor. It exerted no pressure, and as a matter of fact, Mr. Baker, its president at that time, is a brother-in-law of Mr. Schley's, and was one of the most anxious of those who were trying to pull him through. He was one of the two men, in addition to Colonel Payne, who arranged to put up $3,000,000 more to be used in saving Moore & Schley, if the exchange of Steel bonds for Tennessee stock did not prove sufficient. This fund was put at the discretion of Mr. Morgan personally to be used as he saw fit in giving further assistance to Moore & Schley. It did not become necessary, however, to use any of it.

"Judge Gary was in error when he testified that these men agreed to loan Mr. Schley $3,000,000 in addition to the loan of $5,000,000 or $6,000,000 the Steel Corporation offered to make. This fund was a matter that came up afterward. It was my own idea, and my own suggestion, and applied only to the situation that would be created by the purchase of the Tennessee stock."

Mr. Ledyard was examined at length concerning the details of the negotiations, but declared at all times his belief that in no other way but by the purchase of the Tennessee Coal, Iron & Railroad Company could the financial situation have been saved at that time.

Earl W. Oglebay Examined

Earl W. Oglebay, of Cleveland, one of the members of the Tennessee Coal & Iron syndicate, who came to New York with L. C. Hanna, when the negotiations took place, testified briefly concerning his interest. He was taken over much the same ground as Mr. Hanna had been as to the value and condition of the property. He said he knew nothing of any conspiracy for the purpose of forcing the sale of the Tennessee Company to the Steel Corporation and that no commissions had been paid to J. P. Morgan & Co., or anybody else for negotiating the deal.

Fuel Oil Specifications

The success which has attended the use of heating-value specifications in buying and selling coal has caused a demand for similar specifications, based on careful tests, to govern the purchase of fuel oils and the refined products of petroleum. The Bureau of Mines, Washington, D. C, has therefore issued Technical Paper No. 3, by Irving C. Allen, on "Specifications for the Purchase of Fuel Oil for the Government," with directions for sampling oil and natural gas. Mr. Allen says:

"These specifications, to be satisfactory, should establish not only the heating value of the oil, and thus show, like the specifications for coal, the number of heat units the purchaser obtains for a given price per unit quantity of fuel, but also the physical character of the oil, its flash point and burning point, and the quantity of extraneous matter it contains. It is evident that an essential feature of any such plan of purchasing oil in bulk is an equitable method of sampling deliveries; that is, a method that insures the taking of representative samples."

General specifications for the purchase of fuel oil are given as follows:

Fuel oil should be either a natural homogeneous oil or a homogeneous residue from a natural; if the latter, all constituents having a low flash point should have been removed by distillation; it should not be composed of a light oil and a heavy residue mixed in such proportions as to give the density desired.

It should not have been distilled at a temperature high enough to burn it, nor at a temperature so high that flecks of carbonaceous matter began to separate.

It should not flash below 60 deg. C. (140 deg. F.) in a closed Abel-Pensky or Pensky-Martens tester.

Its specific gravity should range from 0.85 to 0.96 at 15 deg. C. (59 deg. F.); the oil should be rejected if its specific gravity is above 0.97 at that temperature.

It should be mobile, free from solid or semi-solid bodies, and should flow readily, at ordinary atmospheric temperatures and under a head of 1 ft. of oil, through a 4-in. pipe 10 ft. in length.

It should not congeal nor become too sluggish to flow at 0 deg. C. (32 deg. F.).

It should have a calorific value of not less than 10,000 calories per gram (18,000 btu per lb.); 10,250 calories to be the standard. A bonus is to be paid or a penalty deducted, as the fuel oil delivered is above or below this standard.

It should be rejected if it contains more than 2 per cent water.

It should be rejected if it contains more than 1 per cent sulphur.

It should not contain more than a trace of sand, clay or dirt.

Each bidder must submit an accurate statement regarding the fuel oil he proposes to furnish. This statement should show: 1. The commercial name of the oil. *2. The name or designation of the field from which the oil is obtained. 3. Whether the oil is a crude oil, a refinery residue, or a distillate. 4. The name and location of the refinery, if the oil has been refined at all.

Copies of the paper may be obtained by addressing the director of the Bureau of Mines, Washington, D. C.

Mechanical Plant Auxiliaries on Fourth Floor of Lofty Building

The Municipal Building at the Manhattan terminal of the Brooklyn Bridge, New York City, which is being erected to house the different city departments that are now scattered through several buildings, has a unique arrangement of boilers and distributing system, the center of the system being about 100 ft. above the boilers. This was due to a subway station in the basement of the building on the same level as the boiler room. It was important on account of the heavy passenger traffic to have the station as large as possible; consequently the boiler room was made correspondingly small, with the result that all the usual equipment could not be paced in it and the fourth floor, having an area of nearly 43,000 sq. ft., was selected for the auxiliaries.

In the basement are six Babcock & Wilcox boilers having a total of 1600 hp., which supply steam for heating, and for running the ice machine and the pumps. The steam pipes from the boilers pass over the top of the subway between it and the street level, and then enter a vertical shaft leading to the fourth floor. From this floor, which is the distributing center of the building, the usual risers of the heating system extend.

At first electricity for lighting will be purchased from an outside company, but provision has been made for installing engines and dynamos should occasion require.

The Illinois Steel Company's Operations

From a letter issued by President James A. Farrell, president of the United States Steel Corporation, referring to the new issue of bonds of the Illinois Steel Company, the following statement is taken:

The manufacturing plants comprise 19 blast furnaces, 6 Bessemer steel converters, 25 open-hearth furnaces, 6 blooming, billet and slabbing mills, 2 rail mills, 3 plate mills, 1 structural mill, 2 wire rod mills, 9 merchant mills and sundry other departments for the production of finished steel. All the plants are modern and in excellent physical condition.

The company also operates under lease the steel plant of the Indiana Steel Company, generally known as the Gary plant of the United States Steel Corporation. The conditions of this lease impose no fixed charge whatsoever upon the Illinois Steel Company, the amount of rental being based entirely upon the net receipts obtained by the Illinois Steel Company from the operation of said plant.

The output of the plants operated by the Illinois Steel Company during the year 1910 was as follows: 2,774,700 tons of pig iron and other blast-furnace products, 3,129,700 tons of steel ingots and 2,476,000 tons of finished steel products of various classes, being about 23 per cent. of the aggregate finished steel output in 1910 of all the steel manufacturing companies controlled by the United States Steel Corporation.

Due to the dullness in the iron trade, the employees of Witherbee, Sherman & Co., Port Henry, N. Y., have had their wages reduced 10 per cent., beginning August 1.

Selling American Machinery in Europe

Establishing Trade and Cultivating It

BY C. A. TUPPER, MILWAUKEE

Impatience for quick returns, ignorance of conditions in the foreign field and the lack of sustained effort are the greatest hindrances to the successful building up of export trade. Particularly is this true of a selling campaign in Europe, where Americans are not, in any sense, dealing with inferiors, but come into direct competition with men of very keen business acumen, in whom both the instinct and the ability for merchandizing have been developed through generations of trading ancestors.

The tendency has, unfortunately, been to commence at the wrong end. The sale of American machine tools to European users does not begin in Europe; it begins at home. There the preparations must be made; there the organization must be effected, and there the policy must be determined upon which is to win success. Until these things have been accomplished, the preliminary scouting, mentioned in this and previous articles, and the establishment of representation abroad has very little practical value. With hit-or-miss methods and fairly good selling agents considerable business may, of course, be done. Some American tools almost sell themselves. But we are here considering the development of a steady, profitable trade, which will bring its increase with the years. To secure this, a definite, well-laid system is essential. The best illustration of my meaning can probably be given in a concrete case, showing how such a system would be evolved.

Experience of a Sagacious Manufacturer

Some years ago, when *The Iron Age* published considerable matter concerning opportunities abroad as reported by an agent of the Bureau of Manufactures and its own correspondents, a manufacturer of the Middle West might have read and pondered. He and his partner, say, had started in less than a decade previous to build an ingenious special tool, which had been steadily improved and the merits of which had won general recognition. Domestic trade, however, was experiencing a series of ups and downs which compelled the firm frequently to run on short time or else accumulate an unmanageable surplus, so that their production was anything but economical. Would it not be possible by cultivating foreign trade, to use it as a balance wheel to equalize manufacturing and selling conditions? They decide to see.

One of the partners, who speaks German fluently, as many in this section of the country do, takes an early steamer to Europe, after securing letters of introduction to people whose acquaintance may assist him abroad, including plant owners, managers of selling agencies, correspondents of technical papers, American consuls, bankers and others. Many of these he does not need, but those that he can use come in very handy.

Arriving in Liverpool he goes first to London, where visits are paid to the branch offices and central agencies for European trade located there. One or two of the managers are a bit standoffish, but the majority greet him very cordially and advise him in considerable detail just what he ought to do and see on the Continent. Further letters of introduction are also tendered and accepted. These prove the most useful, probably, of any he carries.

From London he travels, via Flushing, to Düsseldorf and goes through the plants there, including the Schiess, the De Fries and the Haniel & Lueg shops, which are among the largest and best known, with a look-in at others such as those of Hartung, Kuhn & Cie, Wellman, Seaver & Head, Ltd., etc., and works in the suburbs like the Stahlwerk Oeking, Akt. Ges., Lierenfeld; the Eschweiler-Ratinger Maschinenbau, Akt. Ges., Ratingen, or the Akt. Ges. Oberkilker Stahlwerk and the Hein, Lehmann & Co., Akt. Ges., at Oberbilk. Then he makes Düsseldorf his headquarters for short trips to surrounding cities and towns, including visits to typical plants like the Deutsche Maschinenfabrik Akt. Ges., the Duisberger Mas. Fab. J. Jaeger and the Gebrüder Scholten, at Duisburg; the Rud. Meyer Akt. Ges. and Thyssen & Company, at Mülheim-am-Ruhr; the Maschinenbau Akt. Ges. Balcke, at Bochum; the Wilhelm Breitenbach Maschinenfabrik, at Unna; Basse & Selve, at Altena; Otto Froriep, at Rheydt; the Maschinenfabrik Sürth, Gas Motoren Fabrik Deutz, Kölnische Maschinenbau Akt. Ges., the J. Pohlig Akt. Ges. and Maschinenbau Anstalt Humboldt, in Köln (Cologne) and vicinity; the great machinery-building plant at Oberhausen, called the Gutehoffnungshütte—a name that is said to be derived from the iron works at Sterkrade where the founder of the Krupp works learned his trade, and other establishments along the route.

His Progress in Industrial Europe

He would still like to visit Essen, Dortmund, Gelsenkirchen, Hagen, Hamm, Horde, Remscheid, Müchen-Bladbach, Solingen, Eberfeld-Barmen, Neues, Mülheim-am-Rhein and perhaps Aachen; but this would take too much time. I have, however, mentioned the Düsseldorf district in some detail in order to give some idea of the range of the metal-working industries, from cutlery and grinders to the heaviest machine tools, steel-mill equipment, blast furnaces, gas engines, etc., to be found there. If the American manufacturer's trip ended in this district he would already have seen enough to give him a good conception of German requirements in the way of operating machinery. Wishing to know more, however, he proceeds to Berlin, stopping on the way at Hanover to see the large locomotive works there.

In Berlin the Ludwig Loewe plant is visited, as well as the works of the Allegemeines Electricitats Gesellschaft, Carl Flohr, Bergmann Elektricitäts-Werke Akt. Ges., etc., with side trips to the Borsig shops at Tegel, the Siemens & Halske-Siemens-Schuckert Werke, at Nonnedam; the Condensationsbau-Gesellschaft, at Grunewald, and the group of industries at Oberschönweide on the Spree, which includes the German branch of the Niles-Bement-Pond Company

The next stop is Chemnitz, where he is cordially received, for the most part, at the Werkzeugmaschinenfabrik Union, the Wanderer Fahrradwerke, the J. E. Reinecker Werke, the shops of Biernatzki & Cie and of Schubert & Salzer, and the Sächsische Maschinenfabrik. Then, after a few hours spent at Leipsic, during which the Leipziger Werkzeugmaschinenfabrik is visited, he goes on via Brünn and the Erste Brünner Maschinenfabrik, to Pragre in Bohemia, one of the provinces of Austria. Here he finds a number of excellently equipped plants, including, in the suburb of Karolinenthal, the Maschischenbau-Akt. Ges., formerly Breitfeld, Danek & Company, and the Elektrizitäts Akt. Ges. From Prague, the traveler proceeds to Vienna, where he finds the Vulkan Maschinenfabrik Akt. Ges., the Oesterreichische Dampf-Turbinen Ges. and the Ernst Dania Werke among the most interesting plants. Other shops not far distant are worth visiting, but he feels that he must be getting on.

Through Italy and Switzerland

A trip to Trieste and across north Italy, with inspection of machinery-building plants and other establishments on the way, including the great Franco Tosi shops, near Milan, and the Fiat automobile works, at Turin, follows. Then comes a journey through Switzerland, the features of which center in the plants of Escher-Wyss & Cie, at Zurich; the Maschinenfabrik Oerlikon and the Werkzeugmaschinenfabrik Oerlikon, at Oerlikon, a suburb of that city, and the Brown-Boveri & Cie's works, at Baden, only an hour distant.

Proceeding via Munich to Nuremburg, the investigator finds himself in another important industrial district, where the Maschinenfabrik Augsburg-Nürnberg, of Nuremberg, representing a consolidation of large machinery-building concerns, is most prominent in the metal-working line. Next comes Frankfort-am-Main, where the fine plants of the Voigt & Haeffner Akt. Ges. and the Felton

& Guilleaume-Lahmeyerwerke Akt. Ges., are the points of attraction.

Thence making a detour to Cannstatt, near Stuttgart, to inspect the Daimler automobile works, and avoiding the seductions of other places on the way, the American manufacturer travels on to Paris. Up to this point, it will be observed, he has, with the exception of his Italian experiences, been in German-speaking countries exclusively and had no difficulty in conversing freely with the people whom he met.

The views with which he set out for Europe have undergone many radical revisions. He has lost the notion that Americans, and American only, build the best machine tools; that our methods of plant operation are far superior to those of Europeans. He knows now that this is a matter of individual efficiency. During the journey he has seen shops which would be a credit to any country in the world, and tools produced both in England and on the Continent that equalled if in some instances they did not surpass—the best American examples of their type. He has also rid himself of the conception that, in modern machine-tool building, Continental designers are merely aping American practice. It is evident to him, on the contrary, that they are progressing rapidly along lines of their own, from which our manufacturers will in future have much to learn. At the same time he is gratified to discover that American tools deservedly stand high in the favor of European users, that the service they render is admittedly efficient, and that many have made a place for themselves in every industrial district visited from which only the neglect of their own builders can dislodge them.

Impressions of Foreign Industry

He has been impressed, far more than he ever supposed he would be, with the so-called European conservativeness. There are, he discovers, reasons for practices and preferences which had formerly seemed to him absurd. His admiration for American "speed" diminishes somewhat as he observes the slower but often surer methods used by many of his hosts in reaching carefully planned results, and he concludes that, on the whole, two steps forward, with none back are better than three forward and one or two back.

He has been charmed with the courtesy everywhere shown him and is interested to learn what a large part it plays in all business relations abroad. American brusqueness lack of punctiliousness, tactlessness and disregard of the amenities of life lose for him the guise of rugged, sterling qualities with which he had unconsciously invested these relics of savagery. What he has thought of as native "independence" he sees now is nothing of the kind, but merely boorishness and poor business policy. On the other hand, he finds among his entertainers admiration for American directness and spontaneity and a leaning towards American simplicity. He finds everywhere a liking for the genuine things of American life, an emulation of our industrial efficiency and a desire to trade with us that has been strangely persistent in view of the rebuffs and indifference manifested on our side.

Europe Wants the Best Machinery

The traveler is quick to perceive, however, that Europe is not a dumping ground for surplus American products, but that any tool offered for sale must have sufficient merit to justify its choice, as compared with competing apparatus. In line with this, he notes that installations of American tools represent the leading products of our shops and are generally such as he would himself select for the same character of service. From repeated inquiries he also learns, not altogether to his surprise, that a large percentage was purchased not as the result of solicitation, but on the users' own initiative. Many proprietors of large shops, he is told, have sent men to the United States to look up the best tools, and they as well as others have been regular or intermittent readers of the American technical papers in which the leading tools are advertised and described. In the great iron and steel districts, where a majority of the shops is located, he finds *The Iron Age* habitually consulted by their managers and quoted in all the local papers. This is a factor in the introduction of American machinery the extent of which surprises him, for he has not thought of it before.

The manufacturer, as he goes along, is surprised to hear the smiling comments, which soon turn into serious condemnation, on American methods of packing and shipment and carelessness in meeting terms of delivery. He is shown examples of such negligence or stupidity that make him swear under his breath; and American consuls, some of whom have been of great assistance to him enroute, are almost tearful in their complaints. They have tried so hard in their published reports, in letters and on visits home to make exporters here understand the follies committed by their employees; but no one seems to pay any attention to what they say, except manufacturers such as he, who have been abroad and made observations for themselves.

He sees letters, catalogues, etc., that were mailed in the United States at domestic rates of postage and is informed that this happens not only occasionally but is almost the regular thing. He is shown goods so interpacked that the entire consignment takes the highest possible rate of duty, notwithstanding specific instructions given by the purchaser; and he sees for himself other blunders that make him blush for his countrymen.

Getting Personally Acquainted

With it all, however, our traveler has had the "time of his life." He feels tolerably familiar with Europe and Europeans; with their methods, tendencies and preferences; and he realizes how much better it is to try to meet their views than to vainly and stubbornly combat or ignore them. Friends have been made and acquaintances formed that will be of incalculable value in the firm's export campaign. His signature at the bottom of a letter will recall to any one of dozens of shop proprietors, managers or superintendents, as well as others met on the way, that genial, unaffected American who took so much interest in what he saw and gave such sympathetic attention to what they had to say; while he, on his part, will find in future correspondence many memories of the pleasant, eventful days he spent in their company. In the shops visited he has, too, picked up numbers of valuable hints and had suggested to him improvements which he can make in his own manufacturing operations, by the elimination of waste and in the handling of the men employed by the firm, which will be put to practical use when he returns.

Meanwhile he has left behind him a long line of plant managers interested in his own machine, all the more from the fact that he has talked about it only incidentally; and he has noted their recommendations for slight alterations which will enable it to better suit the purposes of shops such as theirs. These vary somewhat but can all be embodied in comparatively simple changes at very little expense. One or two, perhaps, will be of advantage in the home trade by giving the machine additional flexibility or economy. But most important of all is the interest created; and when his European representatives approach these prospective customers later on, they will find sales more than half made where the demand for such a machine exists.

Looking Up Agencies

Throughout the route the American manufacturer has taken occasion to look up agencies at every possible opportunity. He is now more or less personally acquainted with their characteristics and has them pretty shrewdly "sized up." With some he closes tentative arrangements, to be confirmed by correspondence after his return home. Also, he has their ideas of selling, of the preparation and distribution of advertising literature, of the use of the metric systems for scales on the machine, measurements, weights, etc., in correspondence; of shipment and routing, customs requirements, use of screws for boxes instead of nails to facilitate examinations, preparation of manifests, delivery terms, collections, banking arrangements, etc.—all of which will be confirmed in letters from them—and is prepared to co-operate with them on a basis of mutual understanding. Furthermore, the matter of commissions, both on direct sales and on other orders taken in their territory, has been fully gone into, thus tending to do away with future misunderstandings.

Returning to America, with France, Belgium and other countries—except as to some work in Paris and vicinity—left for another time or for his partner, the manufacturer sums up his experiences. He is amazed to recognize what a wealth of detail has been gathered, without undue crowding or hurry, in so short a period.

Then follows the most important part of the undertaking, viz.: the conferences with and the enthusing of his

partner and the organization of an export department which shall be something more than a side issue.

System to Cultivate European Trade

It is decided (1) that they will systematically cultivate European trade and concentrate, in the beginning, on the districts that have just been visited; (2) that a certain part of their output, as a minimum, will be held subject to foreign sale; (3) that various minor changes will be made in the standard machines set apart for export; (4) that the preliminary arrangements for foreign representation shall be closed; (5) that a stock of repair parts is to be kept in one of the cities of Germany for immediate shipment to customers as needed; (6) that descriptive literature in German shall be prepared with the aid of a Berlin agency and printed in that place, but with the use of American half-tone engravings and paper equal to American catalogue stock; and (7) that all detail work in their shop, shipping department and offices shall be looked after only by mature, careful employees who can be absolutely trusted to guard against repeated blunders.

Finally, when those who are to assist in carrying on the export trade, whether giving their entire time to it or in connection with other duties, have been selected, a conference with all of them is held. They too are enthused, instructed and given to understand that they are entering upon most important work. Then, and not until then, is the firm prepared to start its campaign abroad.

Adhering to a Policy

This, however, is not yet all. The seed sown must be allowed time to grow, the ground must be cultivated with regularity and the harvest should be awaited in patience. This probably constitutes the most trying period for the firm's interest, but there is worse danger ahead for the plan itself, viz.: when the domestic demand becomes so brisk, as it always does at intervals, that the firm falls behind on home deliveries. Then it will be difficult not to raid the export stock, not to let the supply of repair parts in Europe become depleted without renewal, and not to discourage or hold off orders from abroad. But, so surely as these things are done, the trade which has been built up with effort in European countries passes into other channels and is hard to recover when needed again. Particularly fatal is the neglect of repair orders, which renders customers bitterly resentful.

If American manufacturers cannot make up their minds to adhere steadfastly to their export policy under any and all circumstances, no matter what large, quick profits are sacrificed at home, it would be better not to enter upon a foreign campaign but merely to fill orders, when convenient, that come without effort in the usual course, as some few are almost certain to do.

In writing the above I have had particularly in mind a firm which, throughout the boom times of two to three years ago when the automobile companies were heavy buyers of machine tools, remained loyal to its European connections. In these dull days of slack domestic buying it is extremely thankful for the large foreign trade that the partners had the foresight to retain and which, with what home orders there are coming in, keeps the shops working practically to capacity.

The circumstances related are, however, typical of the experience of American machine-tool men who investigate conditions abroad, and they form the surest basis for a successful selling campaign, which then is founded on personal knowledge, acquired at first hand, rather than upon vague, erroneous impressions.

Lake Superior Mining Notes

Another Mesaba Concentrating Plant

DULUTH, MINN., July 29, 1911.—Work will soon start on the second Mesaba concentrating plant, to be erected by the International Harvester Company, in order to treat its ores of the Hawkins mine and perhaps for others as well. While this work will be planned in a general way like that of the Oliver Iron Mining Company, now in successful operation at Coleraine, it will differ in several important features. The liver plant is equipped with Overstrom tables for handling the fines and for taking out what ore may be left in the material after it has passed the turbine washers and the jigs. The Harvester plant will do away with tables altogether. By this means the cost of washing and of construction will be considerably reduced, but there will be no such close saving. This is a matter that affects fee owners chiefly, and in the case of the Oliver company it seemed to be a necessity of the situation that tables be included in the works. Ore will be brought to the Harvester plant by train and dumped at the foot of the works, then elevated to the head of the building by belt conveyors. In the Oliver plant it is brought by train directly into the top of the building and dumped into the bins from which it is fed to the machines. Some consider that belt conveyors will clog with the class of ore mined at these western Mesaba properties, but no doubt Mr. Sellwood and his associates have satisfied themselves that conveyors will be suitable, or they would not put them in.

Another metallurgical operation that will be watched with considerable interest is that of the Jones step furnace, which is now going up at the old Kloman mine in the Marquette country. This furnace will be ready for business, it is now expected, the coming autumn. A similar furnace is under construction for the nodulizing of flue dust at the works of the Zenith Furnace Company, Duluth, and this would appear to be a most rational utilization of the Jones idea. There is wide diversity of opinion as to the practicability of this process so far as its application to the direct reduction of iron ores is concerned.

Concrete Shaft Work

Recent concrete shaft work at the new property of the North American Mining Company, Vermilion range, presents several interesting features, and a brief description of operations may be interesting. The shaft was sunk in a swamp of considerable area, resting upon a quartz porphyry rock, with a stratum of gravel above the rock, quicksand next, clay next and the muskeg above to the surface. The swamp receives drainage from a territory of considerable size and was liable to be very wet at all times; for this reason it was decided to sink a concrete shaft, and a contract was given the Foundation Company of New York to sink a rectangular shaft, 6 by 14 ft. in the clear, to the ledge. The walls of this structure are 42 in. thick at bottom and it is heavily reinforced with steel rods. It was sunk 94 ft., but the junction between shaft and ledge was not closely made.

It became necessary before operations could proceed that a better joint should be had, and this was provided by cement. Some 12 carloads of neat cement were dumped into the shaft, filling it from the rock ledge to several feet above the bottom of the shaft lining. This was then cut out by blasting sufficiently to set 12 x 12 in. timbers solid from the concrete shaft lining to the ledge and four feet into it, the timbers being flush with the sides of the shaft and carrying it down.

Further sinking was almost immediately stopped by an overloaded blast that shook up the ledge. Holes were then bored through these timbers, on all sides, and pipes were inserted in the holes running out into the space behind the timbers. These pipes were carried to the surface, on which the shaft was permitted to fill with water. Liquid cement was then forced down under a pressure of about 250 lb. until the spaces back of the timbers, and the interstices of the gravel and quicksand, had absorbed all they could hold. As the shaft was full of water there was no current, and it is expected that the material pumped down has remained and set where intended.

Trial of the water level since then seems to prove that the seal is complete and perfect, but the company is anxious to have no further mishaps, and is now sinking a drill hole, 3 in. in diameter, outside the shaft and quite near it, which will reach the ledge, when more cement will be pumped down to complete the sealing. When the water has been pumped out the company expects to break out space in the solid ledge below the concrete and insert bearing beams on all sides of the shaft. While driving the drill hole, it was found that the cement pumped down through the timbers had set in the quicksand, transforming it to concrete.

D. E. W.

The Lake Shore & Michigan Southern Railway Company has adopted the design of the Strauss Bascule Bridge Company, 901-904 Fort Dearborn Building, Chicago, for a 125-ft. single leaf double track span over Buffalo Creek.

Pig Iron Mixers

Their Use in Iron and Steel Plants

In the issue of Stahl und Eisen for March 9, 1911, appeared the last of a series of articles on pig iron mixers by Prof. O. Simmersbach of Breslau. The previous articles gave details of design and construction, but the last article is especially interesting because it presents the metallurgical results obtained.

Desulphurization

The most important of these is probably the desulphurization, which is effected equally well in heated or unheated mixers. A considerable removal of sulphur, however, is brought about in the ladle, while coming from the blast furnace. For example, in a 750-ton mixer, that was not heated, to which good basic pig iron containing 1.1 to 1.3 per cent. manganese was brought over a considerable length of track, the following results were shown:

	Per cent.
Average sulphur at blast furnace	0.254
Average sulphur entering mixer	0.100
Average sulphur entering converter	0.081
Average sulphur of finished steel	0.052

The average analysis of the mixer metal over four days was:

Silicon	0.49	Manganese	1.06
Sulphur	0.085	Phosphorus	1.98

It was used in the basic Bessemer converter. This shows that 76.24 per cent. of the sulphur removed was taken out during transportation; 7.29 per cent. in the mixer, and the rest in the vessel. Another test gave 0.25 per cent. in the original iron, 0.122 on entering the mixer, 0.113 on entering the converter, and 0.058 in the finished steel. When the iron contained less manganese, less sulphur was removed during transportation, the same amount in the mixer, and therefore more had to be removed in the vessel.

Heated Mixers

In the case of an English 200-ton mixer, in which preliminary refining was done, the following results were obtained:

The mixer was heated with producer gas and air, the air alone being preheated. The incoming pig iron had about:

Silicon	1.4	Manganese	1.00
Sulphur	0.14 to 0.17	Phosphorus	0.81

Ore and lime were added; slightly less than ½ per cent. ore and 1½ per cent. lime. The average temperature on entering was 1245 deg. C, and on leaving 1350 deg. The average removal of silicon over a period of five weeks was 30.29 per cent. and of sulphur 50.54 per cent. The desulphurization was brought about by the high temperature and also 3 per cent. manganese contained in the ore. The manganese in the iron remained the same, or slightly increased, which was also true of the phosphorus.

In the case of another heated mixer, so much ore, roll scale, and lime were added that the silicon was completely removed, and the manganese and phosphorus to a large extent. The pig iron and mixer metal had the following composition:

	Pig iron	Mixer metal
Carbon	3.50	3.07
Manganese	2.66	0.54
Silicon	0.36	.....
Sulphur	0.10	0.04
Phosphorus	0.125	0.062

After a discussion of the part played by manganese in the removal of sulphur comes a series of curves giving the results obtained for a year with a mixer heated with blast furnace gas and hot air. No slag-making materials whatever were added. The phosphorus in the pig iron varied from 1.92 to 2.13 per cent. Only a very small amount was removed, and sometimes a slight increase could be noticed. The silicon varied from 0.56 to 0.77 per cent. in the pig iron. A considerable part was removed, amounting in some cases to 15 per cent. The manganese in the pig iron varied from 1.48 to 2.11 per cent. It showed a consistent decrease, amounting in some cases to 9 per cent. Finally, the sulphur in the pig iron varied from 0.059 to 0.085 per cent., and was lowered in every case. The removal varied from 21.4 to 38.1 per cent.

The thorough mixing and preliminary refining that may be brought about in a mixer make it applicable to all steel making processes and also to foundry work. For acid Bessemer work its chief usefulness is as a collector, and often iron is needed to recarburize a charge. The silicon in the iron is necessary for the operation, and so should not be lowered.

Open-Hearth Work

There is a wider sphere of usefulness in the acid open hearth. Here the excess of silicon may be removed in the mixer which prevents too stiff a slag in the later process. The phosphorus also can be lowered. In these ways the time of the operation is shortened, and less iron is lost in the slag. In the basic Bessemer its importance has been widely recognized and is well known. In the basic open hearth the mixer could serve as a desiliconizing apparatus, and at the same time large amounts of sulphur, phosphorus and manganese would be removed. This would furnish a very suitable material for the open-hearth furnace, shortening the time of the operation.

If the mixer process was so carried on that only a small amount of phosphorus was removed, then the open-hearth slag would be correspondingly richer in this element and more valuable as a fertilizer. This also follows because of the absence of the other metalloids. If, on the other hand, most of the phosphorus was removed in the mixer, then the pure open-hearth slag could be used in the mixer together with the lime and ore necessary. The greatest thing, however, is that the life of the open-hearth furnace would be increased, for the foaming and boiling of the metal would not be so lively or continuous. In this way much less basic slag would be thrown up and carried by the gases against the acid walls, roof and ports, and into the slag pockets and regenerators.

The paper closes with a very complete list of the mixer installations in the German steel works, showing a total of 66. It also gives the details of the capacity, kind, method of heating if any, and the way the tilting or rolling is effected.

G. B. W.

The Swedish Iron & Steel Corporation Hunts Swindlers

A circular, of which the following is a copy, is being distributed throughout the country:

$5,000 REWARD.

For evidence that will convict the parties who have been selling steel throughout the country, using the name of the undersigned without our authority. Their methods vary, but one is to solicit orders for small quantities of samples, then dictate to some assistant of the purchaser an order on the purchaser's forms for a large quantity, and by various methods to induce the purchaser to sign without careful examination of the order.

In the interest of mutual protection, we ask full particulars of those who may have been victimized.

SWEDISH IRON & STEEL CORPORATION,
12 Platt street, New York, N. Y.; 428 Race street, New Orleans, La.

It is announced by the corporation that crooked transactions aggregating at least $500,000 have been perpetrated in the steel trade in the last seven years. For about five years the scheme was worked intermittently by two Frenchmen, operating in the names of French companies. The recent activities have been in the names of domestic companies, and whether they emanate from the same sources or are the work of imitators is a matter of conjecture.

The victims chosen were always of first financial rating. Sometimes they used only small quantities of steel in machine shops that were adjuncts to their business. Their names include candymakers, furniture firms, automobile manufacturers, weavers and spinners, mining companies, the tool trade, machine shops and countless others in New England (especially Providence, R. I.), Cincinnati, Cleveland, Columbus, Indianapolis, Brooklyn, New York, Buffalo and other large cities. Now the range has been extended to Arizona, at one end, and many Michigan cities, including Lansing, Detroit and Grand Rapids, at the other.

One effect of these operations has been to bring under suspicion salesmen seeking legitimate business. Some of them have found great difficulty, even with the best of credentials, in convincing manufacturers who had been victimized that they were what they represented themselves to be.

The British Iron and Steel Market

The condition of the British iron and steel trades, according to the Iron and Coal Trades Review of July 21, is as follows:

There is a slightly better tone in the pig-iron market, which has taken a somewhat more favorable turn again. Whether the change will prove to be merely one of the fluctuations experienced so often of late, or whether it is of a more permanent character, it is difficult to predict in view of the past experiences this year.

There is certainly a more sanguine feeling in the market now, however, and buyers are coming forward more readily. No doubt the news from the United States has exercised a stimulating influence upon the trade. Moreover, it is certain, in view of the activity in most branches of the finished branches of the trade, that the actual consumption of pig iron in this country must be increasing, and but for the failure of the Continental demand to expand to the extent which was hoped, the stocks in Connal's stores would probably be decreasing. As it is, they are not increasing so rapidly as they were some little time back. It has also to be considered that what is usually the quietest time of the year is past, and next month should see a strong demand set in. Autumn needs, it is expected, will be heavier than usual, so many orders having been withheld of late owing to the uncertain state of the market.

In the finished branches of the iron and steel industries, the position continues to be of an encouragnig character. Works are well employed generally, and the outlook is regarded as favorable, while, although prices have undergone no marked change, they are well maintained all round, and as a rule have an upward rather than a downwrd tendency. In regard to finished iron, the majority of bar makers in the Midlands are busily engaged. The heat has resulted in a curtailment of the output. A number of makers hold out for the top price for unmarked bars, although it is difficult to obtain more. Galvanized sheets have weakened somewhat in price.

The export demand continues good, and better than last year, but so many additional mills have been laid down that competition for orders is rather keen. The black sheet trade is dull, but makers of gas strip have a lot of work in hand. The demand for steel is active generally, and particularly so for shipbuilding material, the requirements for which are large in view of the flourishing state of the shipbuilding industry and the heavy tonnage under construction. Prices show no change. A distinctly stronger tendency is noticeable, however, and would doubtless take the shape of an actual advance were it not checked in some measure by the imports of German and Belgian material.

The strike of the machinists employed at the works of R. Hoe & Co., New York City, was declared off, July 29, following a conference between representatives of the company and of the workmen. The settlement provides that the work day be shortened from nine to eight hours, a quarter of an hour at a time, during given periods which shall expire July 1, 1913.

The International Harvester Company is preparing to establish a system of studying employees for evidences of incipient tuberculosis. The work will be carried through all the 19 branches of the company, and will affect 30,000 workmen. Experts will be employed whose duty it will be to study the individual employees until the plants are relieved of every possibility of contagion. The effort will be made to put the system upon the highest scientific plane.

The Riter-Conley Mfg. Company, Pittsburgh, has been awarded the contract for a steel and reinforced concrete pattern storage building, 75 x 100 ft., for the Pittsburgh Steel Foundry Company, Glassport, Pa.

S. H. Wheelhouse, Frick Building, Pittsburgh, sales representative for the Hooven, Owens, Rentschler Company, Hamilton, Ohio, manufacturer of Hamilton-Corliss engines, will also hereafter represent the interests of A. J. Lee & Sons, Springfield, Ill., manufacturers of Ideal high speed engines. This arrangement will permit him to sell a complete line of engines from 50 hp to the largest mill type.

New Publications

General Foundry Practice.—By William Roxburgh. Size, 5½ in. x 8½ in.; 240 pages; 101 illustrations. Bound in cloth. Price, $3. Published by the D. Van Nostrand Company, 23 Murray and 27 Warren streets, New York City.

The author embodies in this book a knowledge obtained by many years' experience as a molder and foundry manager. The treatise goes into the many sides of foundry work, not only for iron but for the non-ferrous metals. As his experience has been in British foundries, the practice, as he describes it, differs somewhat from that established in this country, a fact which, in a certain way, adds to the interest. He handles the subject in several divisions: 1. General iron founding. 2. Jobbing loan practice. 3. Molding and casting the finer metals. Other chapters are devoted to practical metallurgy in the foundry, general pattern making from a molder's point of view, foundry ovens and their construction, fuels, and foundry tools. Carefully prepared tables of contents and index add vastly to the usefulness of the volume and copious illustrations make clear the details of descriptions of apparatus and methods.

Principles of Industrial Engineering.—By Charles Buxton Going. Size, 6 in. x 9 in.; 174 pages. Bound in cloth. Price, $2. Published by the McGraw-Hill Book Company, 239 West 39th street, New York, and 6 Bouverie street, London, E. C.

The subject matter of this book is substantially the text of a series of lectures prepared under the auspices of the department of mechanical engineering of Columbus University, for delivery to senior students, and takes the form evolved from three years' experience in the class room. It is adapted to meet the need for more general study as discovered by contact with non-technical audiences at Harvard and New York universities, and by inquiries addressed to the Engineering Magazine, of which Mr. Going is the managing editor.

The volume affords a standpoint from which to view the principal factors in the industrial problem, their relations and influences, and the properties and efficacies of the more important solutions so far proposed. Therefore the subject is handled in a broad and somewhat general way. A great many employers of labor stand in pretty much the same position with regard to a knowledge of these subjects as does the university student. Whatever thought they have given to industrial engineering has been so superficial as to be of little value. To such as these, as well as to students of the subject, Mr Going's work has undoubted value.

Handbuch der Mineralchemie.—Edited by Prof. Dr. C Doelter, director Institute of Mineralogy, University of Vienna. Part I of Volume I. Size, 7 in. x 10 in.; 160 pages illustrated. Price 6½ marks. Published by Theodor Steinkopff, Dresden, Germany.

An ambitious work calculated to interest students of inorganic chemistry, metallurgy and mining as well as of mineralogy and geology is being edited by Dr. Doelter with the coöperation of authorities in all parts of Europe and of one in America, Dr. Ing. R. Amberg, Pittsburgh. It is to be divided into four volumes, embracing all told over 3,200 pages, with numerous illustrations, charts and tables. The first issue of the work now at hand covers Part I of Volume I, and is given over largely to carbon and carbonates of calcium, magnesium, sodium and iron, with chapters devoted to the diamond and to graphite, part of the latter subject being discussed by Dr. Amberg. The succeeding issues are promised to appear promptly, and the second and third parts of Volume I are to continue the carbon compounds, with chapters on magnesite, dolomite, etc.

German Pig Iron Production.—The production of pig iron in Germany in the first half of the present year was 7,682,000 metric tons, as compared with 7,202,000 tons in the same period of 1910, being an increase of 480,000 tons. This half year's output constitutes a record and corresponds with an annual production of 15,360,000 tons, while the quantity of pig iron made in 1910 only reached 14,227,455 tons.

Two Motor-Driven Garvin Grinders

Motor drive for machine tools is an advantage in a number of cases, and especially is this true in the case of grinding machines, which are not infrequently located in isolated places where the regular line shaft drive cannot be employed. In applying motor drive to the two grinders which are illustrated herewith, the Garvin Machine Company, Spring and Varick streets, New York City, has endeavored to utilize standard machines so as to give the advantages of prompt delivery and economical production cost without curtailing in any way the adjustments and the utility of the machines. Fig. 1 shows a surface grinder to which this form of drive has been applied, while Fig. 2 is a view of the company's standard No. 3 universal cutter and surface grinding machine.

The surface grinder illustrated in Fig. 1 is a standard type of machine with the motor mounted on two steel arms bolted to the side of the column. Interposed between the motor and the steel arms is a track upon which the motor can be shifted to provide the necessary tension for the power driving belt. This belt transmits power to the shaft under the machine table and this shaft drives the spindle through a looped belt running around the inner pulley on it and the one at the top of the machine. A compensating device provides the tension for the spindle driving belt. The capacity of the machine is surfaces 7 in. wide and 9½ in. long and varying in thickness from ⅛ to 6 in. The power is supplied by a ½-hp. motor operating at a constant speed of 1650 r.p.m. and the domestic shipping weight including the motor is 450 lb.

The other machine is the builder's No. 3 universal cutter and surface grinding machine and will grind all forms of milling cutters from those having a diameter of 14 in. and a face width of 6 in. down to the smallest or surfaces measuring 6 in. in width and 9½ in. in length with equal facility. The 1/6-hp. motor employed with this tool is also of the constant speed type and makes 1800 r.p.m. It is bolted to the side of the column of the machine and has the required tension adjustment. The spindle, which is of hardened and ground steel, runs in boxes having an adjustment to compensate for wear and fully protected against the entrance of flying particles from the emery wheel. The weight of this machine is 435 lb.

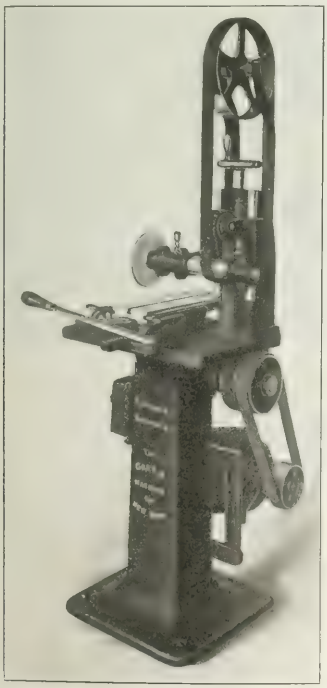


Fig. 1.—A Motor-Driven Surface Grinder Built by the Garvin Machine Company, New York City.

Both of these machines are portable and can be set in any desired position, while, as they have no countershafts, discoloration of the walls and the ceiling in their immediate vicinity is avoided. The power for operating them is secured from the nearest electric outlet and the expense for power is low, as it is only required when the machines are at work.

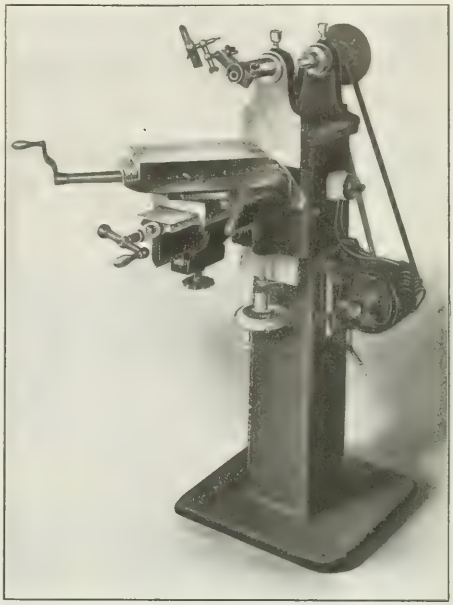


Fig. 2.—The No. 3 Universal Cutter and Surface Grinding Machine.

The Youngstown Sheet & Tube Company's Annual Meeting

The annual meeting of stockholders of the Youngstown Sheet & Tube Company was held in Youngstown, Ohio, last week at which the old board of directors was reelected and an increase in the capital from $10,000,000 to $15,000,000 was authorized. This increase of $5,000,000 is 7 per cent. cumulative preferred stock. It was also decided to continue the profit-sharing plan for employees for another year, and those participating last year in the profit sharing will receive 5 per cent. of their wages for the fiscal year. The preferred stock will be issued as needed, and the improvements contemplated at this time by the company, and practically decided upon, are an open-hearth plant of six furnaces and another blooming mill. There will be additional finishing capacity added, plans for which are now under way. Directors reelected by the company are as follows:

James A. Campbell, H. G. Dalton, E. L. Ford, C. D. Hine, George D. Wick, H. H. Stambaugh, John L. Severance, J. G. Butler, Jr., Robert Bentley, William Wilkoff, Richard Garlick. The directors will reelect the present officers as follows: James A. Campbell, president; H. G. Dalton, first vice-president; C. S. Robinson, second vice-president; George E. Day, secretary; Richard Garlick, treasurer.

At Johnstown, Pa., a reunion of the old-time steel workers, who were employed at the Cambria Works in 1871, when the Cambria Iron Company rolled its first rail of steel made by the Bessemer process, will be held in September. Some of these men are now located in Braddock, Homestead and other mill towns in the Pittsburgh district. An interesting programme is being arranged for their entertainment.

Shop System for Greater Output

Some Changes in Handling of Work and in Shop System in Order to Use Modern Machine Tools to Best Advantage

BY HENRY M. WOOD, CINCINNATI, OHIO.

It is not uncommon to find a modern machine tool which will give several times the output of one constructed a few years ago. In order to utilize to the fullest extent the possibilities of increased production when replacing old machinery with new, it is frequently necessary to make corresponding changes in former shop systems. It is the purpose of this article to describe briefly some features of works management and shop systems in use by the Lodge & Shipley Machine Tool Company, Cincinnati, which are of much assistance in keeping this shop as a whole keyed up to the pace set by modern high-speed machine-tool equipment.

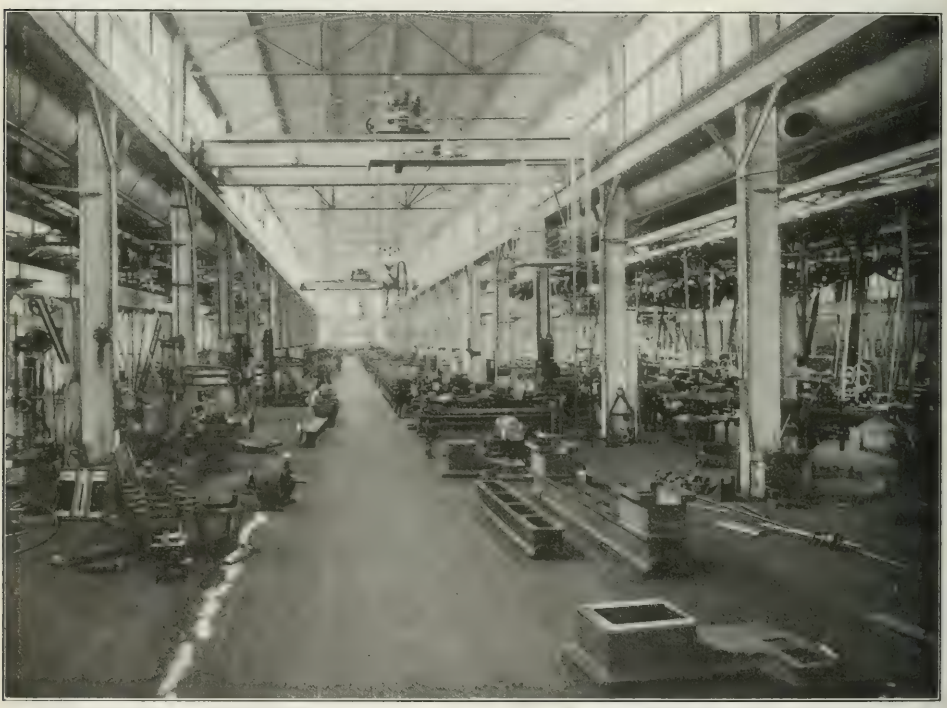


Fig. 1. View in Main Shop, Lodge & Shipley Machine Tool Company, Showing Aisle Reservation.

Keeping Machines Busy

The ultimate aim of nearly all revised shop methods is to keep the machine tools operating as continuously as possible. The reason for this is evident when we consider that the greater the productive capacity of a machine the greater will be the loss in output if that machine stands idle. In addition to the loss of output it is more than likely that the new machine represents a greater first cost, so that somewhat heavier interest and depreciation charges would have to be met before the machine would show a profit.

Machine operators should never spend their time looking for work or waiting for work. We, therefore, have a shop rule that each operator shall be supplied with work for one day in advance. To insure that this rule is carried out and to prevent side-tracking of needed material, a complete system of routing has been worked out covering all of the shop departments through which each piece must pass from the receipt of the raw material to the assembling of the finished machine. Tags which accompany the material indicate the correct schedule of routing. To check up the work and see that the various pieces are promptly moved as scheduled, special trace clerks are continually making the rounds of the factory.

A graphic record of the progress of all parts through the shop is kept on a large blackboard in the superintendent's office. This blackboard lists all parts entering into the construction of our lathes by piece number, and opposite the piece number is painted prominently on the board a series of letters, one corresponding to each department through which that piece must pass while it is "in process." As soon as a lot of parts is moved from one department to another the letter corresponding to the department which the pieces have just left is chalked off on the board. Thus a glance at the blackboard shows anyone just where in the shop all pieces are located, and if certain pieces are falling behind the schedule the fact stands out prominently.

The former time-keeping system required each machinist to fill out his own time ticket. We now find it more economical to have special time-keepers periodically make the rounds of all machines and note all of the data, which heretofore each workman had recorded for himself. This new method of taking the time is used partly for the convenience of the cost department and partly to prevent an idle machine tool while its operator might make out his own time ticket.

Another important factor toward keeping the machines running is our errand-boy system, which has already been fully described in *The Iron Age*. Briefly stated, a number of boys do nothing but run errands for the ma-



Fig. 2.—Racks for Holding Bar Stock.

chinists (when called by push-button) to and from the tool room, etc. Thus a $20 man is not occupied by work which a $5 boy can do just as well. But it is of even more importance that the operator is thus kept at his machine so that the output is not even temporarily stopped.

Handling of Material

Adequate crane service in a factory building with a modern or heavy line of machinery becomes more and more essential with the introduction of more powerful machine tools. In Fig. 1 are shown two 12-ton overhead traveling cranes, which serve the center bay of the main shop. As this shop is over 800 ft. long, a series of signal lamps has been installed above the crane runway so that when one of the assembling hands needs the service of a crane he can easily make his wants known.

For moving the lighter pieces from one department to another tote boxes and trucks are used. We formerly had a narrow-gauge industrial railway for the trucking, but have since found it more economical to use an asphalt-paved courtyard where outside trucking has to be done and to keep the shop floors in good condition so that the trucks have equally smooth paths inside the buildings. This requires definitely marked-out aisles through the shops. The borders of the aisles are marked by white paint lines on the concrete floors and by iron strips nailed to the wooden floors. It is a strict shop rule that no material can ever be stored even temporarily within the limits of the aisles as marked by these "dead lines." Fig. 1 illustrates the clear aisle through the center of the shop.

Six laborers formerly did the trucking work. Recently we introduced an electric industrial truck, which we made ourselves for doing this hauling. The truck itself is loaded with material to be moved and also hauls a trailer. These trailers are loaded in the different departments before the arrival of the motor truck, so that usually it is only necessary to unhook one trailer and couple on a different one, without delaying the truck. The motor truck makes the rounds of all of the departments on a regular schedule and with its aid two men are now doing the trucking which the six formerly did.

Study of the Machinist's Motions

Greatest output per machine demands, first, the absolute elimination from the operator's work of every duty, except that of running his machine continuously; and second, the study of the art of running that machine as efficiently as possible.

The study of the machine operations involves the setting of "standard time" for each job; that is, the shortest space of time in which the job should be finished complete. This rate setting should not be left to the foreman. It requires a full knowledge of the nature of the stock, the capacity of the machine and the efficiency of the cutting tool. A stop-watch analysis of the separate operations is a great assistance.

All machine tools, even automatics, require more or less of an operator's attention. Since the earning power of the machine is lost while it is not running, it is important to study the motions the operator has to make in handling work in and out of his machine with a view of reducing the time thus lost to the smallest possible amount. The set of motions which the operator goes through in tending his machine should also be carefully investigated, as well as the motions necessary for preparing his tools.

As an illustration, the time required for changing the lathe dog on work turned between centers can be saved by providing the operator with two dogs. While one piece with dog attached is in the lathe and under cut the operator removes the second dog from the piece last finished and attaches it to an unfinished piece so that the new piece is ready to put between the centers immediately when his cut is finished on the job already in the lathe.

Never compel the operator to stoop continually to pick up small parts from the floor. His work should be placed by the laborer, who unloads the truck on racks within convenient reach and arranged in regular order. Fig. 2 shows a number of cast-iron racks used for holding bar stock of various lengths. Any length of stock can be accommodated by merely placing the stands the proper distance apart. Where machine work is being done on parts for which these racks are suitable the rack is placed within convenient reach of the operator.

On another class of work the operator may have to change his tools much more frequently than he has to change the work. It then becomes of first importance to arrange his tools conveniently. Fig. 3 illustrates a case of this sort. The part being machined is a 30-in. lathe apron which is clamped in the box jig shown on the base of the radial drill. All of the holes in this apron are drilled, bored, reamed and tapped at the one setting in the jig which, of course, requires frequent change of the tool in the drill spindle. The tools are, therefore, arranged in consecutive order on a bench close to the workmen, as seen in the illustration. The tool first used is the one at the left and after each one in turn has been put through the jig the drilling of the apron is completed. Note the advantage of placing these several tools within easy reach so that when the operator lays down one tool he can pick up the next in the same motion.

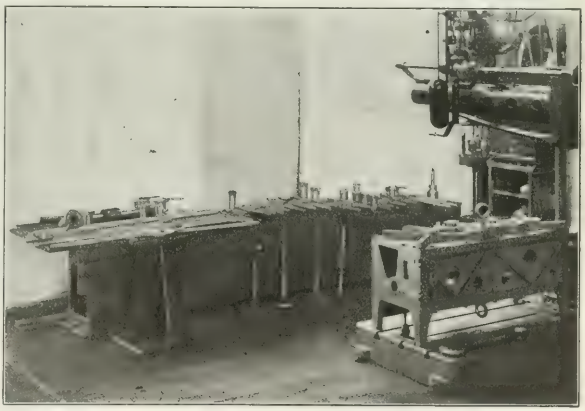


Fig. 3.—Tools Arranged in Consecutive Order Convenient for Workman.

Assembling Department Economies

Special stands suited to particular operations in the individual shops can often be introduced to good advantage; for example, we use for holding lathe carriages in the assembling department an especially constructed stand with a tilting top; thus at one setting of the carriage the operator can work at its top by having the table of his stand horizontal or with equal convenience can get at the front of the carriage by tipping it on edge.

Benches and racks should be arranged conveniently to

hold the small parts used in assembling as well as the assembled units. Fig. 4 is a general view of that portion of the assembling department where the compound rests, carriages, aprons and certain other small parts are put together. Running along the back of each bench is a rack for holding studs, screws, gears and such other small parts as are required in the making up of the completed unit. The stand at the right of each bench is used either for an additional supply of small parts or for a stock of the finished units. A detailed view of one of these same benches and stands is shown in Fig. 5.

Selecting the Men

An important point in successful management is to select men with especial reference to their fitness for performing the work expected of them. Operations are becoming more and more specialized in their character. The demand to-day in manufacturing plants is not so much for all-around machinists as it is for men who



Fig. 4.—General View of Small Parts Assembling Department.

are expert in some one branch of machine-shop work. It is expected that some men will be more apt at one line of work and others at another.

Most modern machine tools do not require all-around machinists for their operation. There is a tendency in design toward single purpose machines. Just as in the assembling department each man can best specialize on one line of work, so in the machine department it makes for greater accuracy, increased production and general economy to have each machine operator become expert in his particular line.

When a man of fair intelligence has just been selected for work which is satisfactory to him and to which he is suited, he will in most cases make good. Much depends, however, upon the foreman, whose duty it is to carefully instruct the men under him. We have found it advantageous to increase the number of foremen in proportion to operators so as to give better opportunity for the foremen to instruct the workmen under them.

In our opinion the foreman's most important work is to see that the men under him understand how to do their tasks in the most efficient manner. To simplify the foreman's work along this line we use instruction cards, on which the separate operations on a given job are explicitly stated. This card is continually before the workman. If for any reason he cannot perform the work in the manner or in the time specified on the instruction card he must report to his foreman at once.

Wage System

A successful wage system must offer increased compensation for the increased effort necessary to get out a greater output and must at the same time have the confidence of the men. We use a variation of the Halsey premium system with very satisfactory results to the men and to the firm. Each job in the shop is given a time limit. Each workman has his regular hourly scale of wages. If the workman completes his job in less than the time limit he is paid for half of the time saved in addition to his regular hourly rate.

After the premium system had been in operation for some time we found that some of the foremen were dissatisfied because a few of the men under them were making more than they themselves. We accordingly put the foreman also on premium plan. We now allow to each foreman personally 2 cents premium for each hour gained by every man in his department over the time limit. This gives the foreman an incentive to see that all of the men under him are not only kept busy but also are doing their work in the most efficient manner. The shop superintendent and his assistant also gain in the premium gain, each one of them receiving a fraction of a cent for ever hour gained in the whole shop.

Another portion of the company's share of the premium gain is laid aside to form a workmen's pension fund.

The straight bonus system does not give any incentive to do the work faster than the "bonus time." The straight premium plan does not give enough incentive to get the work out in what would under the other system be "bonus time." We have, therefore, adopted what amounts to a combination of the good points of both systems. On the instruction cards for a given job we state three times: First, "premium allowance," which is

the time upon which premium saving is based; second, "time consumed," which is a record time to show the workman that it is possible to very materially beat the premium allowance for working time; third, "time limit," which is placed midway between the two. No premium is paid unless the man makes the time limit, but if he does make the time limit his premium is based upon the premium allowance time. Thus he receives a considerable premium for equalling the time limit and more premium the more he exceeds the time limit.

So much has been written concerning the premium system as applied to other shops that we will not enter into details here. The ways in which our plan differs from those generally used are briefly mentioned because we have found that our broad application of premium payment is satisfactory to the men on pay-day and satisfactory to the company in shape of increased output.

Workmen's Attitude Toward New Systems

Co-operation of the employees is essential to the success of any shop system. The usual prejudice to be overcome in introducing new systems calling for more output is the workman's idea that greatly increased output will eventually result in throwing some men out of

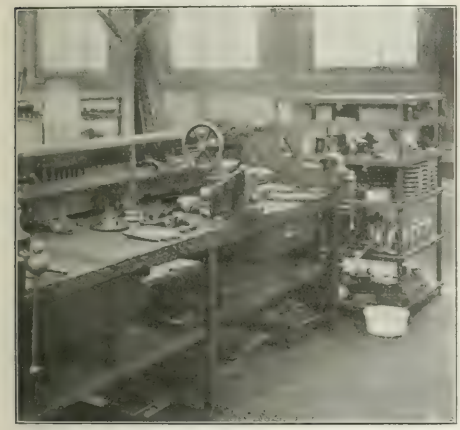


Fig. 5 Details of Assemblers' Bench and Rack.

work. This is the objection the men offer to most labor-saving machines and to most forms of scientific management.

The workmen should be shown that increased output means lower cost and greater demand. Greater production means greater total wealth for the community with correspondingly greater opportunities even if the field for some may be thereby changed to other lines. The more a man produces the more he is worth, and the most successful way of proving this fact to him is the premium system or the bonus system of wage payment.

The wage system and the nature of the premium or bonus must be governed to some extent by the character of the business and the wage system already in use. It is poor policy to try to force any new system upon the workmen without regard for the "human element." Habits are hard to break. Often a modern shop systematizer has made radical changes in old shop organizations, with the result that after he left the old practices were in many cases resumed, resulting in a confused state of affairs worse than the conditions which formerly existed.

If, before any new system is introduced, the men are consulted and shown why it is just as much to their advantage as to the company's, the chances of failure are very much reduced.

The Richard-Phenix Company, Milwaukee, Wis., manufacturer of appliances for lubrication, has opened a new engineering sales office in the Real Estate Trust Building, Philadelphia, Pa., under the management of J. F. McIndoe.

Aluminum Pulleys for the American Planers

Aluminum driving pulleys have been adopted by the American Tool Works Company, Cincinnati, Ohio, for use on its 36, 42, 48 and 60 in. heavy pattern planers. While this is a somewhat new departure in planer construction, pulleys of this metal have been applied to a number of machines in the company's shops to overcome certain conditions existing there. It was not the intention at first to make these pulleys part of the standard equipment, but the results obtained were so satisfactory and so much better than were expected that it was decided to use them on the large planers instead of the regular cast-iron pulley. Some of the advantages derived from the use of this metal are light weight, longer life of the belts and the development of less momentum.

Ordinary aluminum is about one-half as heavy as cast iron, but in constructing these pulleys a special aluminum alloy has been employed which reduces the weight still further since its specific gravity is only about one-third that of cast iron, the actual figures for the driving pulley used on a 36-in. planer being 105 and 35 lbs. respectively for the new and the old types of practically the same dimensions. This lighter weight results, it is felt, in an increase in the life of the belts used with the tool on account of the relatively small momentum developed. On a planer with a high countershaft speed the driving pulley acts to some extent as a flywheel and time is lost at each end of the stroke by the table overrunning. To overcome this the belts are made as tight as possible and the experience is they soon wear out because of the friction and the resultant heat produced in overcoming the pulley momentum at the instant the speed is reversed. As momentum is in direct proportion to weight, it is apparent that for the same dimensions and speed the American aluminum pulley will develop about one-third as much momentum as a cast-iron pulley with a corresponding decrease in the force which the belts have to overcome and maximum elimination of all overrunning as the belts can pick up more quickly.

It might be thought that the momentum of the table is responsible for the overrunning rather than that of the pulley, but as the amount of this energy stored up in a moving body is in proportion to the weight and the square of its speed, it has been calculated that the momentum of the pulley is 56 times that of the table when a cast-iron pulley is used and only 15 times when an aluminum pulley is substituted. Thus the substitution of aluminum for cast iron in the construction of the pulley has effected a reduction in the momentum of more than 70 per cent. It is stated that with the new pulley it is possible to make the planer belts 2 in. longer and secure much more satisfactory results, while the reduction in belt tension does away with the burning of the belt formerly experienced.

A test of one of these pulleys on one of the planers in the company's shop was recently made. A locomotive frame drilling machine table measuring 26 ft. 4 in. in length, and 30 in. in width and depth was planed on a 48 x 48 in. x 26 ft. quadruple-head multi-speed planer, having a cutting speed of 40 ft. and a return of twice that figure; the power was supplied by a 25-hp. electric motor. The total weight of the casting was 21,300 lb. The cutting stroke was 26 ft. 10 in. or 6 in. more than the length of the table to permit the tools used to lift and drop. As the table travel was only 27 ft., only three teeth of the table rack were in mesh with the bull wheel at the end of the stroke, and if there had been any over run the table would have run off the bull wheel.

The construction of the new aluminum pulley is very similar to the cast-iron one that is superseded, the only marked difference being in the design of the arms, which are made in the shape of an S. This form is used to provide enough elasticity to prevent the pulley from breaking on account of the arms shrinking away from the rim.

The stockholders of the Youngstown Foundry & Machine Company, Youngstown, Ohio, have reelected the old directors, who reelected the former officers as follows: W. J. Wallis, president; F. A. Williams vice-president and manager of sales, and B. G. Parker, secretary and treasurer. The company recently declared a dividend of 5 per cent.

An Improved Barb Wire Machine

Increased Production and Economy in Space and Labor Characterize the New Blashill & Gray High-Speed Rotary

Improvements resulting in the development of a new machine for the manufacture of barb wire have been made by Blashill & Gray, London, Canada, in the rotary machine which was illustrated in *The Iron Age*, January 5, 1911. This new model differs from its prototype in being a vertical machine instead of a horizontal one. Like the earlier machine the product of this new type is a single-strand coiled spring wire with the barb coiled around it instead of the ordinary two-strand twisted pattern where the barb is held in place between the strands. Among the advantages claimed for this machine are increased production at a lessened cost and a reduction in the amount of floor space and labor required. Fig. 1 is a general view of the machine, while Figs. 2 and 3 illustrate some of the details, the former being an enlarged view of the entire mechanism and the latter showing the barb adjuster which is the distinguishing feature. Fig. 4 gives the appearance of the barb after each operation in forming it.

The product of this machine differs from that of the other types now on the market in the method of manufacture of the barb. The common practice is to insert the barb between the strands and then cut it off. Here, however, the length of wire required for the barb is first cut off. The barb is formed as it passes through the machine afterward and is pressed solidly into position between rollers of a special form. Thus the quantity of wire used for the barb is greatly reduced since it is made with one wrap only and is pressed into shape to hold it solidly on an oval provided on the strand.

The advantages of the single strand as compared with the two twisted strands weighing the same are a reduction in the cost of production, including the material of 10 per cent.; a smaller surface to galvanize, quadrupling the output of the machine, increased strength and a reduction in weight of the finished product of 100 lb. in the amount of barbing wire required per ton of fence for barbs 3 in. apart, which is the spacing generally used. This reduction in the amount of barbing wire per ton is not secured by sacrificing the number of barbs and is due solely to the way in which they are made. The wire when coiled can be shipped without being placed on spools, which reduces the expense of production and the freight charges on shipments. The only protection required for the coil is afforded by three or four 6-in. bands of light tin or sheet iron.

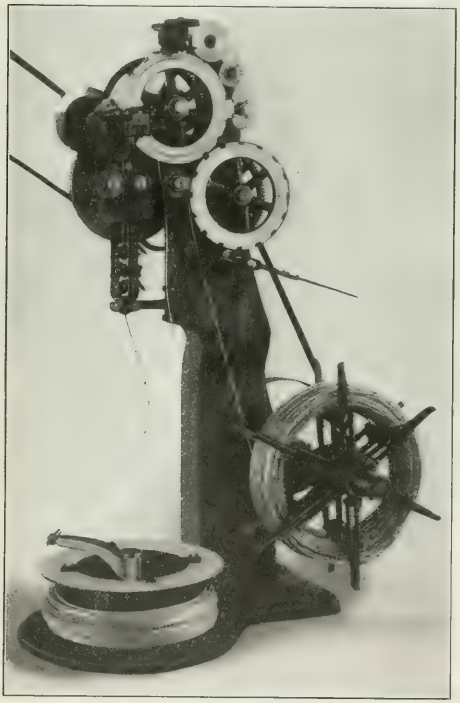


Fig. 1.—A New Type of Rotary High Speed Machine for Making Barb Wire, Built by Blashill & Gray, London, Canada.

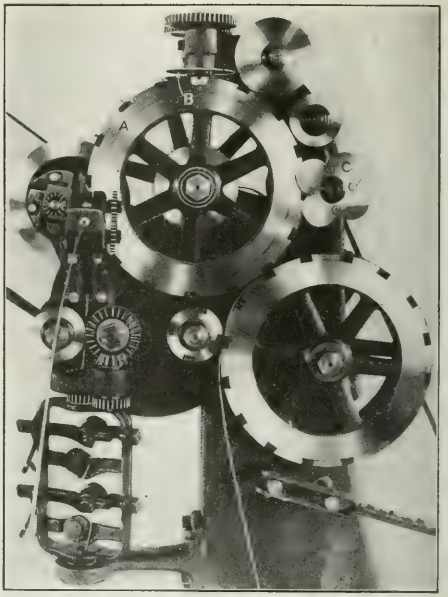


Fig. 2.—View of the Mechanism.

The Operation of the Machine

In operation the wire is taken from the reel shown on the base of the machine in Fig. 1, and passes through the coiler which is almost directly above it in this engraving

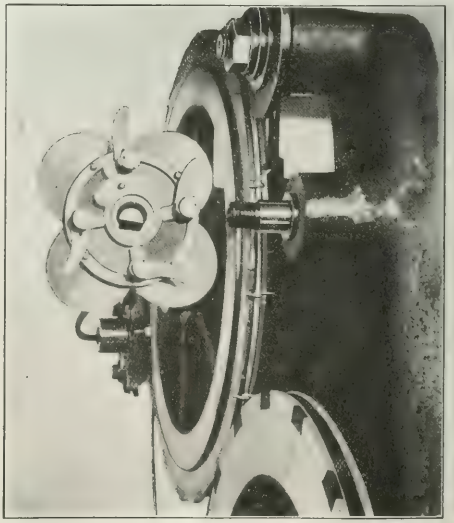


Fig. 3.—The Barb Adjuster.

and is shown enlarged in the lower left corner of Fig. 2. This device straightens the wire and takes out all kinks. From here the strand passes through a set of rolls provided with concave dies of hardened steel at regular intervals for forming the oval seats for the barbs on the wire. These dies compress the wire about 0.012 in. and widen it approximately 0.007 in. for a distance of 0.375 in. It will thus be seen that the reduction in the wire is very slight and can be made still less if desired as a compression of 0.008 in. is generally sufficient. An eccentric sleeve in its bearing enables the outer of these two wheels to be readily adjusted and the dies are easily replaced.

Leaving this set of rolls the strand next passes between the cutter roll at the left and the large disk wheel or roll A, Fig. 2, in the center and continues around in a groove in the circumference of the latter. The barbing wire is fed by rolls in between this strand and the large center roll and the required length is cut off by revolving cutters acting against a stationary cutter. This short piece of wire, A, Fig. 4, is carried upward by projections or fingers on these rolls and the center is forced by the strand into sockets in the dies of the large center roll where it assumes the form of a staple, B, and is carried to the crossing roll B, Fig. 2, at the top of the machine. The office of this disk is as its name indicates to cross the legs of the staple and wrap them lightly around the wire as shown at C, Fig. 4. The wrapping process is continued by the two plain hardened steel disks and is completed by the barb adjuster C, Fig. 2. The form assumed by the barb after these three operations is illustrated at D, E, F and G, Fig. 4, the last being an end view of the barb as it leaves the adjuster. An enlarged view of this part is

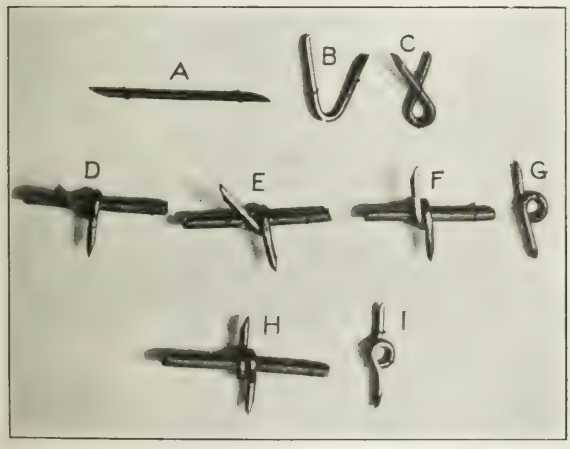


Fig. 4.—Successive Stages in Making the Barb.

given in Fig. 3 and its operation is clearly shown in the engraving by comparing the position of the ends of the barb above and below the threaded shaft projecting from the machine frame upon which it is mounted. The adjuster measures 4 in. in diameter and is made of hardened tool steel. In conjunction with its dogs and cams it forms the only departure from a simple rotary motion to be found in the entire machine.

The strand next passes over the large lower roll which is shown directly underneath the barb adjuster in Fig. 2. This wheel is so adjusted that the barbs are under sufficient tension when they pass under the dies with which it is equipped to maintain their position. The grooves in the circumferences of this roll and the smaller one to the left are of equal dimensions and between them the barb is pressed into position on the oval barb seat and the points project radially from the center of the strand as shown at H and I, Fig. 4, the former being a front view and the latter an end view of the barb in its final position. All the advantages of a double wrap are secured while at the same time a saving of 11/16 in. of wire per barb is effected.

The rotary motion can be utilized on account of the form of the barb and the way in which it is wrapped around the strand and provides a smooth and continuous motion at the rate of 1000 to 1500 barbs per minute. This high rate of production is secured by the absence of reciprocating parts while the machine is very convenient to operate. The amount of power consumed is moderate and is concentrated on the work.

The accompanying table gives the principal dimensions and specifications of the machine:

Diameter of heavy strand wire, in.	0.144
Diameter of heavy barbing wire, in.	0.092
Diameter of light strand wire, in.	0.104
Light wire produced at 800 r.p.m., lb.	15
Heavy wire produced at 600 r.p.m., lb.	25
Diameter of driving pulley, in.	18
Face width of driving pulley, in.	4½
Minimum speed of driving pulley r.p.m.	500
Maximum speed of driving pulley r.p.m.	800
Power required, hp.	9
Barbs produced per minute, spaced 3 in. apart, minimum	1,000
Barbs produced per minute, spaced 3 in. apart, maximum	1,500
Overall hight, in.	81
Floor space required, in.	42 x 72
Net weight, lb.	1,800
Export shipping weight lb.	2,100
Contents of case, cu. ft.	40

If desired the manufacturer will equip the machines for handling both gauges of wire although this is not recommended, the better practice being to employ separate machines for the two sizes.

The Platt Iron Works Company's Affairs

The creditors' committee of the Platt Iron Works Company, Dayton, Ohio, has prepared a plan for the readjustment of its affairs, which is substantially as follows:

The committee shall acquire the property and good will of the company from the receivers or trustees, subject to a mortgage dated November 1, 1904, securing $800,000 par value of first mortgage 40-year gold bonds, of which $798,500 par value will be outstanding. The property thus acquired shall be conveyed to a corporation to be organized under the laws of Ohio having a name as similar to the old name as possible. The new company will then have approximately $450,000 in actual value of inventory, material on hand, etc., and approximately $180,000 of good collectible accounts and bills receivable, in addition to which the committee plans to secure $150,000 cash capital for which the new company shall issue some form of comparatively long-term securities. The floating debt of the present company, aggregating approximately $1,368,000, will be converted into securities of the new company, but the stock of the present company shall be eliminated completely.

The plan assumes that the receivers will have sufficient cash to meet the expenses of the receivership and of the committee. The committee reserves the full discretionary right to depart from the plan in any respect and to exercise all powers conferred by the creditors' agreement of March 30, 1911. The receivers now in charge of the property are George R. Young and Dixon Boardman, who have authority to run the plant for 30 days, with possibly longer extension if advisable. The company manufactures pumping machinery, air compressors, oil mills, turbine pumps, waterwheels, etc.

The Chicago Pneumatic Tool Company announces an important change in the trade designation of its air compressors. These have been known as the Franklin compressors, the company's compressor works being located at Franklin, Pa. Because of the fact that its pneumatic tools, electric drills, rock drills and other articles of manufacture are invariably identified with the name of the company, the decision has been made to use the trade name Chicago Pneumatic as applying also to its air compressor product.

The Homestead Valve Mfg. Company, Inc., Pittsburgh, Pa., has appointed the McMaster-Carr Supply Company, 166-168 West Lake street, Chicago, its agent for Illinois and parts of Wisconsin and Iowa.

The Simonds Lockport Steel Mill

The Simonds Mfg. Company's New Plant for Producing Crucible Steel for Saws and Machine Knives

The Simonds Mfg. Company, maker of saws and machine knives, with manufacturing plants at Fitchburg, Mass., Chicago, Ill., and Montreal, Canada, has during the past year built and equipped at Lockport, N. Y., an extensive plant for the production of its own special quality of high-grade crucible steel. Sheets, shapes and bars will be furnished to the several finishing plants for the manufacture of saws of all kinds—band, circular, cross-cut and hand—and machine, planer, paper and woodworking knives of all descriptions. The principal portion of the new plant has been in operation for several months, the first steel having been rolled on January 2 of this year.

In 1900 the Simonds Company first entered the steel-making business by building a plant in connection with its Chicago factory. Inability to secure from the then existing crucible plants steel possessing the special qualities required by the company for its high-grade saws made necessary this expensive move. In 10 years its steel requirements had outgrown the capacity of the original Chicago mill and it was decided by the directorate to establish an entirely new plant in a suitable location, conveniently accessible from all three of the factories.

Lockport, N. Y., a thriving manufacturing city with a population of 25,000 people, was selected as the location for the reason that it is about midway between the three finishing plants and possesses exceptional transportation facilities by rail and canal and practically unlimited Niagara electric power procurable under contract for a long term of years. The city is also a good labor market on account of its large number of varied industries. There are 80 acres in the site acquired by the company, which is just west of the limits of the city, contiguous to the Erie Canal and on the lines of the New York Central and Erie railroads, and the Buffalo, Lockport & Rochester electric line.

Buildings Covering 14 Acres

The buildings of the plant as they exist at present cover, with the immediate yards, approximately 14 acres. The accompanying general view shows the arrangement. The buildings are seven in number, comprising a gas house, melting shop or furnace building, rolling mill, finishing mill, band-saw mill, a transformer and electric power building and a laboratory and office building. The office building which is outside the general inclosure, is not shown on this plan.

All of the mill buildings proper are of structural steel construction with heavy galvanized corrugated iron siding and cement tile roofs, and have ample windows. The gas house has brick for a portion of its exterior walls and the transformer and power house is entirely of brick, with steel girder and concrete roof and concrete floor. The office building is of structural steel and brick with concrete floors and concrete roof. All the finishing mills have saw-tooth roofs with northern exposure for the glass side, providing the lighting necessary in order to insure the extra fine finish and strict inspection which every saw plate must receive before it leaves the steel mill.

Building No. 1, designated as the gas house, is 30 x 178 ft. and contains the gas producing system, which is composed of six Swindell-Siemens gas producers, and the necessary coal storage bunkers and conveyors. Pittsburgh gas coal of high heating quality is used. The gas is fed to the furnaces in the melting shop by pipes with suitable regulating apparatus. The building also houses a 250-hp Cahall boiler for heating the plant, driving the hydraulic pumps and serving the oil burning apparatus.

Adjacent to the gas building is the system of fuel oil storage, consisting of three 10,000 gal. tanks, located in a completely separate fire-proof building, which is partly below the surface of the ground. The tanks were designed and constructed by the Hydraulic Oil Storage Company, Detroit, Mich., and embody a system of storing oil floating on water, whereby the fuel is cleaned of all impurities by sedimentation. This system, which is comparatively new, has proved very successful in obtaining satisfactory heat regulation because of the absence of dirt in the burners. From the tanks the oil is delivered to the lines leading to the furnace burners by means of a motor-driven triple plunger single-acting pump, which maintains a pressure of 60 lb. at the burners. The lines are carried underground in steam logs with the steam pipes to insure fluidity, a method developed by the American District Steam Heating Company, Lockport, and used largely for its underground heating system.

The Melting Shop

The melting shop, 65 x 125 ft., Building No. 2, contains three 30-pot Swindell crucible furnaces of the Siemens type. In this building the making of the steel begins. Each crucible is prepared for melting by being filled carefully and accurately with the several ingredients, according to formula. The crucibles are of graphite composition, each holding about 100 lb. of metal. An ingot from each heat is sent to the laboratory for testing, and upon approval the product of the heat is passed to the cogging mill in Building No. 3, or put in stock to be used as required. Building No. 2 also contains a small electric furnace of the Girod type, which is now being run experimentally.

The north end of Building No. 2 is served by a 5-ton Alliance electric crane, covering the space between the bins and furnaces, where are located the scrap shears and muck iron shears and the storage scrap bins for the melting iron or muck bar, a large percentage of which is high-grade Swedish stock imported direct from the makers in Sweden, for it has an important part in the requirements of this steel.

The Cogging Mill and Circular Saw Plate Mill

In Building No. 3, 110 x 314 ft., are the cogging mill, in which, after the heating, the ingots are rolled into sheets; the circular saw finishing mill; and the shears for cutting the cogged sheets to length for finishing. The cogging mill consists of one stand of 24-in. roughing rolls and one 30-in. edging stand. The mill is gear driven by a 300-hp. General Electric 3-phase, 440-volt motor. This drive, as well as those of the other mills, was built by the Mesta Machine Company. The cost of power throughout the mill is $18 to $19 per year per hp.

The mill is served by two heating furnaces built by William Swindell & Bros., the hearth of each being approximately 6 x 18 ft. They are of the regenerative type, similar to the open hearth, and use crude oil as fuel. The cogging mill has a special lifting table operated by hydraulic power at a line pressure of about 600 lb. The screw down mechanism is of simple design and is motor-driven. It is controlled by a master switch located at a point convenient to the operator, the automatic motor controlling apparatus being situated in the power house.

The circular saw plate finishing mill consists of two stands of 24-in. rolls driven by a 300-hp General Electric motor. The mill has two Swindell furnaces. After leaving the cogging mill the sheets go to the blocking-out shear, where they are cut to length for finishing into various sized saws. The building has a 15-ton electric crane built by the Cleveland Crane Company.

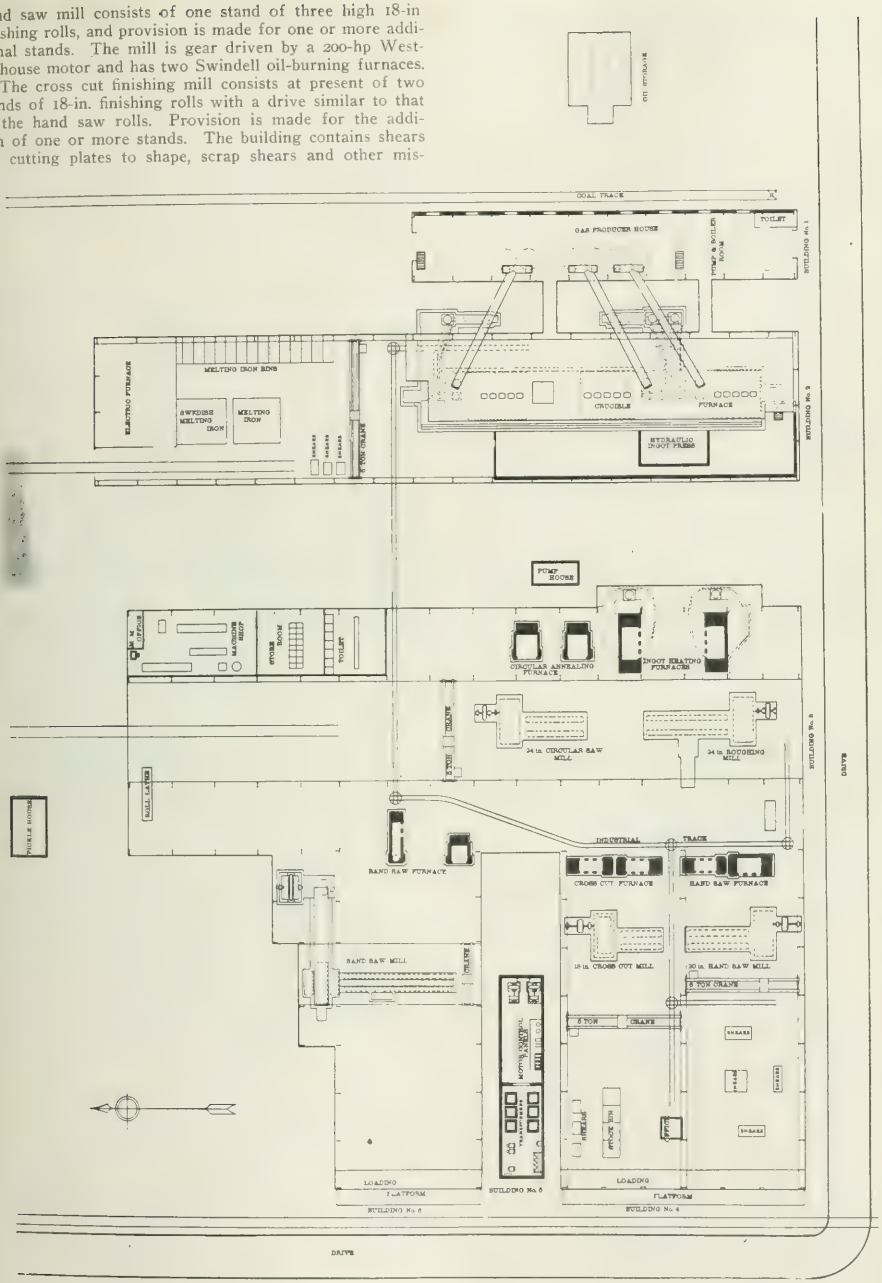
In this building are also the machine shop and roll turner shop, where necessary repairs of shop mchinery are made; store rooms for the mill supplies, and toilet rooms for the shop employees fitted up with ample and convenient facilities, including shower baths and hot and cold water and having a locker department. The company, at all of its factories, has done everything possible for the comfort of employees. An artesian well has been driven which furnishes an excellent quality of clear and cold drinking water, which is delivered at various points in the mills and office by a motor-driven pump.

Other Finishing Mills

The hand saw finishing mill and the cross cut finishing mill are in Building No. 4, which is 110 x 154 ft. The

hand saw mill consists of one stand of three high 18-in finishing rolls, and provision is made for one or more additional stands. The mill is gear driven by a 200-hp Westinghouse motor and has two Swindell oil-burning furnaces.

The cross cut finishing mill consists at present of two stands of 18-in. finishing rolls with a drive similar to that of the hand saw rolls. Provision is made for the addition of one or more stands. The building contains shears for cutting plates to shape, scrap shears and other mis-



General Plan of the Simonds Lockport Steel Mill.

cellaneous equipment. The two 5-ton floor-operated cranes were furnished by the Alliance Machine Company.

Building No. 6, containing the band saw mill, is 65 x 105 ft., with a bay about half its length on the north side in which are located the rope drive, motors, etc. The mill is of special design and together with its rope drive was furnished by the Mesta Machine Company. The special motor was built by the Allis-Chalmers Company, Milwaukee. Two Swindell furnaces are installed and a 5-ton Alliance crane serves the building.

The Power System

The transformer sub-station building and power house, Building No. 6, is 22 x 98 ft. Electric power at 12,000 volts is brought into the plant from the transmission lines of the Ontario Power Company from a sub-station located about a mile southwest of the plant. This voltage is stepped down through six 500-kw transformers to 440 volts. The station is equipped with the usual lightning arresters, high tension oil switches, recording meters, etc.

In the operating end of the power station is placed all

the automatic motor controlling apparatus, under the supervision of an operator. It is governed by a master switch at each of the mills whereby the mill operator can start, stop or reverse the mill at will.

The motor controls for the hand-saw, cross-cut and band-saw mills were built by the Cutler-Hammer Mfg. Company, Milwaukee, while the controls for the cogging mill, circular saw finishing mill and cogging mill screw down motor were furnished by the General Electric Company. Most of the meter equipment, including the graphic recording meters, ammeters, voltmeters, frequency and power efficiency meters, were supplied by the Westinghouse Electric & Mfg. Company.

In this building are also two 100-kw rotary transformers built by the Allis-Chalmers Company, each consisting of one three-phase 440-volt synchronous motor and one 100-kw direct-current generator furnishing current to a three-wire system at 220 volts between the two outside wires for the operation of cranes, a few small motors, and at 110 volts for lighting the works, etc. All of the electric wiring is in underground conduits.

The Laboratories

The office and laboratory building is 45 x 85 ft., two stories. The lower east half is used for office purposes and the lower west half for the experimental department. The latter is equipped with the requisite machine tools for the purpose, a 50-ton automatic and autographic Riehlé testing machine and numerous other special testing devices, and several gas furnaces fitted with pyrometers, etc., for experiments in the hardening and tempering of the various steels used in making saws, knives and files.

The west end of the second floor of this building is occupied by the laboratory which is at present running night and day. Its equipment is complete in every detail, the possibilities for making changes in equipment and improvements in methods afforded by the moving of the plant from Chicago having been taken advantage of so that everything is up-to-date. The greater part of the laboratory tables and fittings was put in by the Kewaunee Mfg. Company, Kewaunee, Wis. Adjoining the main laboratory is a small room 12 by 15 ft., used as a "balance" room and office for the chief chemist. Electric heating appliances are employed quite extensively in this department, including electric combustion furnaces for the determination of carbon in iron and steel by the direct combustion method; electric heating rings for crucibles, and electric drying ovens and hot plates.

The east end of the second story is taken up partly by the drafting room and office of the company's metallurgist and partly by a private laboratory for research and special work only, which is equipped on the same lines as the larger one and is very complete in its appointments.

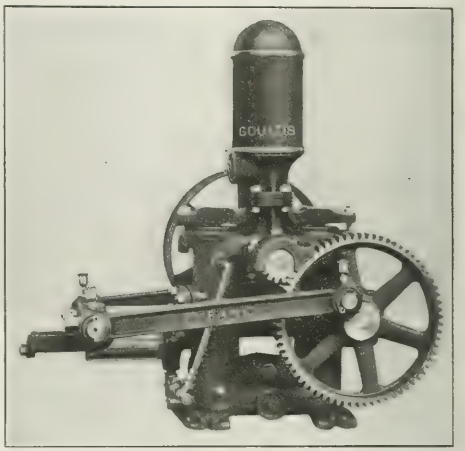
All of the sewers in the mills are of concrete, open type, to permit of ready cleaning and are covered with iron floor plates of special construction. The sewer system converges to a central dump pit, where the waste water is brought from the low sewers to the high level and discharged to the city sewer with a 5-hp Worthington electric-driven centrifugal pump and a 1000-gal. steam-driven centrifugal pump. Provision has been made for the installation of a second motor-driven unit should it be found necessary. The cement tiling required for the roofs of the plant was supplied by the American Cement Tile Mfg. Company, Wampun, Pa.

The complete plans for the Simonds plant include a bar mill, and it is likely that definite steps for the erection of this additional building will be taken shortly. While increasing its steel manufacturing facilities, the company spared neither expense nor effort in making use of modern scientific methods for the production of the various kinds of steel required for use in making Simonds saws, knives and files. The management therefore prides itself on having secured a model plant among crucible steel mills of its size.

Statistical tables of lead, copper, zinc, tin, aluminum, nickel, mercury and silver have been published by Metallbank und Metallurgische Gesellschaft, Frankfurt-am-Main, Germany. It is a book of 154 pages, giving the production and consumption of different countries and the prices prevailing over a term of years in various centers for different metals.

Air Cylinders for the Pyramid Pumps

To enable its Pyramid double-acting piston pump which was illustrated in *The Iron Age*, October 6, 1910, to be used for pneumatic water system pumping the Goulds Mfg. Company, Seneca Falls, N. Y., is placing on the market a special air cylinder that is intended to be attached to the 3 x 5 and 4 x 5 in. sizes. A special feature of the attachment is its compact construction. The use of this cylinder does away with the necessity of a separate pump for maintaining the air pressure required by these systems to force the water from the storage tank through the distribution piping connected thereto, and makes it possible to have a



A New Type of Air Cylinder for Use in Connection with Pneumatic Water System Pumping on a Pyramid Pump, Built by the Goulds Mfg. Company, Seneca Falls, N. Y.

supply of running water for fire protection and other purposes.

The cylinder is designed to withstand a pressure of 75 lb. per square inch, which is the maximum pressure against which the pump will operate satisfactorily. When pressure is not required the pump is relieved of all pressure by opening the air cock with which the cylinder is equipped and which prevents the air from entering the tank. Brass is employed in the construction of the cylinder and the suction and the discharge valve. The piston rod of the pump operates the plunger, which is packed with leather cups. One set of bolts serves to hold the cylinder head and the cylinder bracket rigidly in place. The pipe leading from the air attachment is connected to the drain plug opening or the discharge chamber of the pump.

A 600-hp blower of the so-called free diffusion type has been put in operation at Great Falls, Mont. The characteristics of the type were referred to at the Pittsburgh meeting of the American Society of Mechanical Engineers by R. N. Ehrhart of the Westinghouse Machine Company, East Pittsburgh, Pa. He explained that in a blower with radial vanes the air leaves the rotor at an angle of about 14 deg. with the tangent at normal delivery; that at 50 per cent normal delivery the angle is about 7 deg. and at 10 per cent normal delivery it is about 1½ deg. It is held that if the receiving ends of the diffusion vanes of the so-called forced diffusion blower are set for normal delivery they are 12½ deg. from the correct position for 10 per cent normal delivery, or 7 per cent from the correct position for 50 per cent normal delivery.

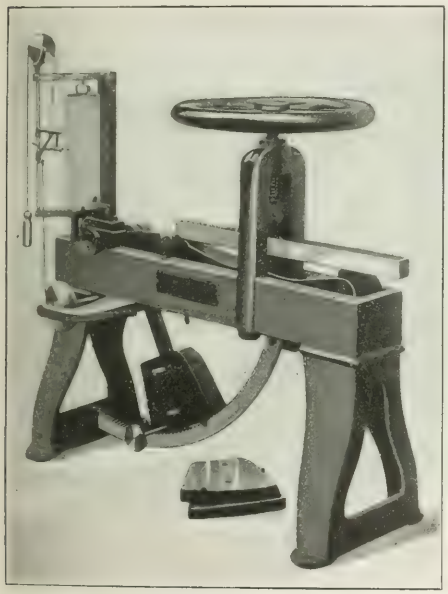
The Chester Steel Casting Company, Chester, Pa., recently shipped for export a heavy cast steel field ring, the net weight of which was 36,091 lb. The inside diameter of the ring was 12 ft. 7⅛ in., its face was 34 in. and it was 8 5/16 in. thick.

Autographic Transverse Testing Machine *

A New Type for Research Testing or Regular Foundry Practice

BY THORSTEN Y. OLSEN, PHILADELPHIA, PA.

It is customary in general foundry practice to apply the transverse test to cast iron to determine its physical characteristics. The tension test is also largely used, but this requires a much heavier and more expensive machine and, owing to the brittleness of cast iron, the specimen must be specially prepared and special care taken in holding same in the machine to obtain the best results. The transverse specimen requires no machining, and as most generally used is either 1 x 1 in. in section, with 12 in. between supports, or 1 x 2 in. in section with 24 in. between supports. The former size has most generally been adopted and the transverse breaking load is then approximately 1/10 of the tensile load of the same cast iron. The dimensions of these specimens are very good, they are easily cast, and machines for testing them transversely are very small, compact and inexpensive, so that they are well within the reach of any foundry interested in the quality of its daily output.



A New Type of Autographic Transverse Testing Machine for Research Testing or Regular Foundry Practice, Built by Tinius Olsen & Co., Philadelphia, Pa.

The foundry testing machines as made up to the present time give very accurately the transverse breaking load as well as automatically note the deflection of the bar by a pointer moving in the arc of a circle over a graduated scale. The results so obtained are very good as far as they go, but today we see a desire for a more complete machine for this purpose, one that will automatically trace the stress strain diagram of such magnification in deflection and of such scale in noting the load applied, that the curve will show the deflection for any given load readable to 0.001 in. to the breaking point of the specimen. Any slight variation in the strength, stiffness or behavior of the test sample, due to varying the mixture or in the treatment thereof, can thus be quickly and conclusively determined.

To make an autographic transverse tester successful, it is essential that it be adapted to a test bar as used in general practice in this country today and that it must be arranged so as to automatically trace the stress strain diagram, also be simple in construction and of moderate cost. To cover these various points in a machine of this kind, a pendulum balance system of weighing was adopted as being the most sensitive and accurate automatic device available. The illustration shows the general appearance of a completed machine of 5000-lb. capacity for testing the 1 x 1 x 12 in. specimen, and a larger machine of 5000-lb. capacity for 1 x 2 x 24 in. specimen is similar in all respects to the smaller machine.

The specimen is placed in the machine as shown, and pressure applied by the screw and hand wheel, thus deflecting the bar. The pressure on the specimen is transmitted through a lever system to the weighted pendulum, and raises the pendulum, thus automatically weighing the load on the graduated arc as shown beneath the bed of the machine. The pendulum is arranged so its weight may readily be changed by the addition of side pieces as shown, so that the machine may be used with a capacity of either 2500 or 5000 lb., depending upon the strength of the sample being tested. The pendulum, in its motion, rotates the autographic drum shown, so that the load on the specimen is traced as the abscissæ of the diagram card. The deflection is measured by the motion of a follow pin placed directly beneath the center of the specimen and which is connected to the recording pencil in such manner that its motion up and down, i.e., the ordinates of the curve, measure the deflection up to ¼ in. magnified twenty times.

The curve sheet is 5 in. square, the abscissae reading to a maximum of either 2500 or 5000 lb., and the ordinates reading to a maximum of ¼ in. so that 0.001 in. may easily be approximated. The pen is held against the recording drum by a very light torsion on the cord attached to the pen carriage, and the curve sheet is held on the revolving drum by clips, and both the drum and the pencil may be adjusted so that the pencil will commence to trace the curve at the zero point of the curve sheet. A series of pawls operate so as to catch the pendulum in the rack on breaking the specimen and the pendulum is released and returned to the initial point of rest by turning the knob as shown.

This machine is so easy to operate that it takes very little more time to make a test obtaining the autographic record than it does to operate a plain machine determining only the maximum load and corresponding maximum deflection. The machine is also more accurate than a plain lever machine as the load may be applied uniformly, without stopping to weigh the load, which, if accomplished on a lever machine, requires two operators, whereas only one is required in the use of the autographic machine. The curve, as obtained, is very even and uniform, and makes a record which can readily be filed away for future reference.

*Paper presented at the annual meeting of the American Society for Testing Materials held at Atlantic City, N. J., June 27 to July 1.

Safety Measures May Be Too Thorough

The extremes of safeguarding life in manufacturing plants were referred to in an extended discussion on the subject in the July Journal of the American Society of Mechanical Engineers by W. W. Alexander, of the General Electric Company, West Lynn, Mass. Half-way measures, he admits, are worse than none at all, but he submits a word of caution that there is also the danger of going too far. Some men have endeavored to cover up every little crack or open space about a machine into which a man might be able to put his finger while the machine is in motion. We are in danger, he says, of making workingmen fools as far as looking out for their own safety is concerned. If a man is trained to consider every machine on which he works so safe that he can sleep all over it, so to speak, without getting hurt, he is surely bound to be caught and injured sooner or later when he is called upon to work on some other machine that is not so fully safeguarded; and there are thousands of machines in daily operation now which can only be safeguarded in time, and even then perhaps not as completely as new ones built with a view to proper safeguards.

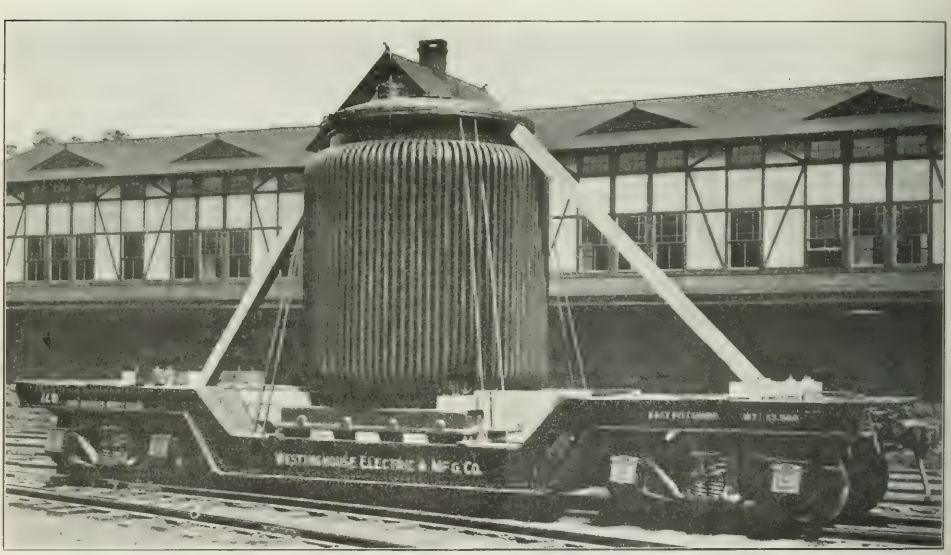
The H. W. Johns-Manville Company will occupy its new 12-story building at Forty-first street and Madison avenue, New York, May 1, 1912, for the general offices and the New York salesrooms. The structure will be unique in its early Italian Gothic architecture, and will be known as the Johns-Manville Building.

A Steel Transformer Car

Wherever possible it is the practice of the Westinghouse Electric & Mfg. Company, East Pittsburgh, Pa., to ship its large transformers completely assembled and ready for installation and immediate use upon arrival at their destination. The steady increase in the capacity, size and weight of these transformers has rendered this mode of shipment more and more difficult and some time ago special steel cars with a strong central floor suspended on a level with the axles from heavy side frames were built for this company. These cars could accommodate a load of 70,000 lb. in the well, but were totally inadequate for the 2000-kva. tubular transformers which this company is now building.

To meet the demand for a larger car the engineers of the Westinghouse Company and those of the Atlas Car & Mfg. Company, Cleveland, Ohio, held a consultation with the result that the car, which is illustrated herewith, was built. The design of this car was approved by the engineers of the Pennsylvania Railroad before work was commenced. The car is built entirely of steel, measures 35 ft. 5 in. in length and has capacity in the well of 75 tons. Where it is possible to distribute the load over the end platforms as well as in the center the capacity is 205,000 lb. In spite of this great capacity the level of the floor in the well is only 26 in. above the top of the rail, thus giving a maximum clearance under bridges spanning the right of way. The car frame is of heavy built up steel girders and the trucks are of 205,000 lb. capacity with 6 x 11 in. journals, 33-in. rolled steel wheels and M. C. B. springs of extra large capacity. Wrought steel center plates are used and the journal boxes, riders, brasses, etc., all conform to the M. C. B. requirements for 205,000-lb. capacity journals. The equipment of each car includes Westinghouse air brakes and friction draft gear and M. C. B. automatic couplers. The weight of the car is 53,000 lb.

Three of these cars have already been delivered and the accompanying illustration shows one of them loaded with an oil-insulated tubular self-cooling, 2000-kva. transformer. These transformers are to be installed on the 60-cycle high tension lines of the Southern Power Company at Newberry, S. C., 15 in all being used. When the transformer was loaded on the car, the extreme hight above the rail was 16 ft., and on account of limited clearance in tunnels in the Allegheny Mountains and at Baltimore the shipment was routed in a round about way which included portions of New York, Pennsylvania, Maryland, Delaware and Virginia to Pinner's Point near Norfolk, Va. From here it was shipped over the regular railroad lines to its destination.



A New Type of Steel Freight Car for Transporting Transformers Used by the Westinghouse Electric & Mfg. Company, East Pittsburgh, Pa.

Efficiency of Pipe Line Carrying Superheated Steam

High efficiencies with superheated steam transmitted over long distances are shown in the case of a steam pipe line at the plant of the Joseph Schlitz Brewing Company, Milwaukee, where a 4-in. pipe line 11,700 ft. in length is in use, designed to carry steam at 120 lb. pressure, and 250 deg. superheat. The steam is for use in a pumping plant of 18,000,000 gal. capacity. The steam is taken from Babcock & Wilcox boilers with superheaters, and the equipment also includes a Foster separately fired superheater. The pipe line was designed by J. C. White for D. W. Mead, consulting engineer, Madison, Wis., and the tests with the pipe line are reported in Bulletin No. 347 of the University of Wisconsin by Halsten Joseph Thorkelson, associate professor of steam engineering. The piping is covered with 2½ in. of 85 per cent. magnesia covering, and is enclosed in a 3 x 4-ft. concrete tunnel. The average per cent. drop in pressure was about 5 per cent., and the average loss per square foot of pipe surface per hour was 160 B. t. u. per hour. With the moderate degree of superheat, the loss in temperature was about 1 deg. for every 20 ft. of pipe, while when the Foster superheated was in use the loss in temperature was about 1 deg. for every 9 ft. of pipe. From the test it was concluded that the efficiency of the pipe line at full load, that is the amount of heat delivered at the end of the pipe line, was 96 to 97 per cent. of the amount of the heat delivered at the beginning of the pipe line.

A development of considerable importance in its bearing upon large central station work is to be noted in a recent order placed with the Westinghouse Machine Company, which included a No. 20 twin type LeBlanc condenser. This unit, which is simply a combination of two No. 20 standard Westinghouse LeBlanc outfits, is equipped with two sets of air and circulating pumps mounted on a common shaft. Couplings at each end of the latter provide for either turbine or motor drive. The condenser is designed to handle approximately 8,000,000 lb. of water per hour, and will operate in connection with a 12,000 kw. turbine in the Manchester street plant of the Rhode Island Company, Providence, R. I.

Accidents with the Metal Press

Interesting Explanation of Their Cause—Methods of Prevention

In an extended discussion of the field of the mechanical engineer in the prevention of accidents, in the July issue of the Journal of the American Society of Mechanical Engineers, Oberlin Smith, president of the Ferracute Machine Company, Bridgeton, N. J., participated in respect to the special problem of the metal press. He spoke of the semi-involuntary method of machine operation acquired by the worker and the ease of its temporary disturbance and outlined the desirable modifications in feeds to presses. His discussion is, nearly in full, as follows:

Disturbing Rhythm of Operator's Movements

A frequent kind of accident pertaining to a power press is the contusion or shearing off of fingers and hands by being between the dies when they come together. This often occurs through pure carelessness on the part of the operator. In cases where he lets the ram of the press run continuously, trusting to luck and to a certain acquired automatic rhythmic movement of his hands, any mental disturbance of the rhythm, as a sudden movement or noise in his vicinity, or a desire to look round for something happening in the street, may prove disastrous. Of course this cannot occur if the machine is arranged as it should be, so that his fingers cannot possibly go between the dies.

A more frequent accident occurs when the ram of the press is allowed to stop between each stroke by the action of the automatic stop-clutch generally embodied in these machines. Each operation consists in placing the work between the dies and then depressing the treadle, or in some rare cases a handle, which throws the clutch into mesh so that the continuously revolving flywheel operates the shaft through one revolution and then stops it. This performance is safe even if the fingers have been between the dies, providing they are taken out before the treadle is depressed and not put in again until the ram is surely stopped in up-position. It often happens, however, especially with piece work, that the treadle is depressed almost immediately after the ram is stopped so that again there is needed a certain rhythm common to the finger motions and the halting continuity of the ram motion. Under these conditions it is probable that most of the accidents happen because the treadle is not allowed to rise entirely to its upper position, that is, far enough to insure positively the stopping of the ram. In such a case it comes down a little sooner than is expected, and an injury to the hand is the result. A remedy for this evil has been devised by the writer and some other press makers in the shape of a device by which the clutch-lever detaches itself from the treadle action, each time the latter is depressed, by means of a cam upon the main shaft, which itself performs the stopping action of the clutch. This, if kept in order, will provide safety and is a valuable device.

Accidents Caused by Dirt or Lack of Lubrication

A similar trouble may happen by the clutch's being out of order so that the treadle and tripping device, often known as a clutch lever, do not rise as promptly as they should, owing to the binding of some parts, or the weakening of springs which, perhaps, have not been kept in proper adjustment. An occasional trouble causing the ram to descend unexpectedly is the cutting or seizing of the flywheel or gear upon the shaft. This, of course, is due to the lack of oil, or the presence of dirt, or metal between the wheel and the shaft. Nothing but perfect automatic lubrication would seem to be a sure remedy, and this is not usually applied to presses.

Types of Feed to Presses

Considering first, primary operations, as the working of cutting, punching or shearing dies, all of which may easily be protected, the most usual feeds are:

(*a*) Single or double roller-feeds, where the flat strips or bars of metal or other material are held by spring pressure between intermittently revolving rollers.

(*b*) Reel-feeds, where flexible metal or other material, in strips, is pulled through the dies from one reel with a brake upon it by another intermittently revolving reel upon which it is rewound.

(*c*) Grip-and-push or pull-feeds, generally made with a pair of stationary grippers and a pair of reciprocating sliding grippers, these latter alternately gripping the edge of the material and carrying it through the dies any desired distance at each stroke of the press.

(*d*) Gravity-feeds, where the press ram axis is inclined at an angle to the vertical, perhaps even to a horizontal position, and the material descends by gravity against a let-off gauge, placed back of the dies, working automatically.

Concerning feeds for seconding operations the most usual kinds are:

(*e*) Dial feeds for redrawing, forming, curling or repunching work. A common well-known form consists of an intermittently rotating disk in the respective apertures of which the work is put by hand at the front of the press, far away from the dies, and is carried around until it reaches them, in some cases a group of dies performing successive operations upon it.

(*f*) Friction-disk feeds, where the articles are pushed from a table on to a flat revolving disk which carries them by friction between certain fences or guides and which delivers them under the dies. They are stopped by a let-off device to limit the motion of each one as it arrives in final position.

(*g*) Push-feeds, where a sliding carrier comes forward to receive the work and then carries it back between the dies again, coming forward for another piece.

(*h*) Tube-feeds, used especially for small articles like coins, medals, etc., which are piled upon each other in a tube and allowed to descend by gravity so as to be fed to the dies by any one of the methods, *e*, *f* and *g*, usually, however, with the last.

Feeds *f* and *h* are practically safe against hurting the fingers, while with *e* and *g* there is some little danger of getting the fingers in the feeding device itself, if they are not removed quickly enough before it starts; they cannot, however, be easily carried back to the dies. When devices of this sort are used, by stopping the press at each stroke while the work is being placed in the dial, or carrier, absolute safety is assured.

Safety Device for Hand Feeding

Returning to the consideration of hand feeding: With thin metals, mere cutting operations can be made entirely safe by using a proper stripper surrounding the punch. This should fit very close to the punch and come down as close to the top of the die as possible to allow the metal to go between, and it should be quite thin so as not to obstruct the view of the work outside the limits of cutting. It should also be so high that the punch at the top of its stroke never comes entirely out of it, thus giving no chance for fingers to be put in above it. With thick metals, the stripper has obviously to be placed so high that fingers can be put in under it.

In the case of forming, repunching, etc., where small objects must be located between the dies and sometimes a considerable distance in from the front thereof, it is nothing but criminal to allow the operator's fingers ever to go between. The inserting and removing of the work should always be done with a stick of pine wood, or some other soft material, which will not damage the dies if they happen to come down at the wrong time.

Extra Cost of Automatic Guards and Feeds

In general, where hand feeding is resorted to, there is no universal panacea for the evils in question. Careful attention to all of the points above mentioned, however, will reduce the percentage of danger to a very small figure, especially if there is any such rigid discipline, backed both by altruistic and financial motives, as will absolutely prevent fingers being put between dies. It may be stated that in any ordinary press shop where thousands of different kinds of work are to be done, and perhaps only small batches of a few thousand, or a million or two, of pieces are to be made, it is very expensive to provide all of the different kinds of automatic feeds and guards that would be needed for the varying kinds of work. If, however, we should get our much-desired uniform state laws providing reasonable penalties for the carelessness and parsimony that produce our present numerous ac-

cidents it is probable that the volume of them will greatly decrease.

The writer has frequently had inquiries for safety apparatus for a room full of presses, but has always been obliged to reply that each press and each pair of dies must be considered separately, and that much expert designing would have to be done for special devices to suit each varying condition. Some of these would, of course, be simple, but others would have to be automatic in their character and, on the whole, quite expensive. Hence, not many press manufacturers have gone into the matter thoroughly, principally because they know that their competitors would not be obliged to do the same.

New Landis Threading Machines

Three Recently Developed Motor-Driven Machines for Bolt Work

Many novel and distinct features as compared with the threading machines now on the market and those which the Landis Machine Company, Waynesboro, Pa., has formerly built characterize the new types of motor-driven threading machines which this company has recently developed. Some of the special features of these new machines are the employment of steel guides instead of cast iron ones, a wide speed range and the provision of a large space for taking care of the chips. Fig. 1 illustrates the company's 1½-in. double head staybolt cutter equipped with an adjustable speed motor, while Figs. 2 and 3 show two of the smaller sizes, namely the ½-in. double head bolt cutting machine and the 1-in. double head bolt threading machine.

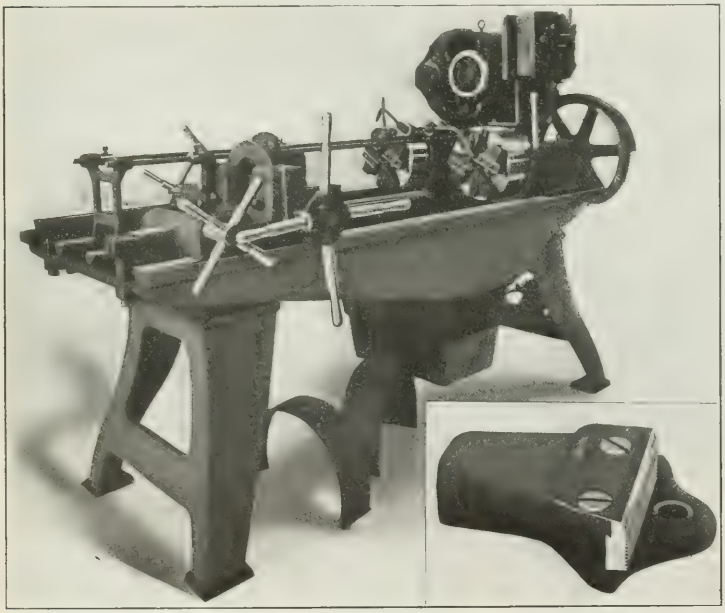


Fig. 1.—A 1½-In. Staybolt Cutter Equipped with an Adjustable Speed Motor, Built by the Landis Machine Company, Waynesboro, Pa

The staybolt cutter shown in Fig. 1 has a motor which has a speed variation of 4 to 1 mounted on top of the machine, the motor being directly connected to it. The wide range of speed adjustment provided enables either carbon or high speed steel dies to be used as the circumstances of each particular piece of work may require and any speed between the maximum and the minimum can be secured at any time without stopping the machine. One or both heads can be furnished with a lead screw attachment as may be desired and it is possible to cut any pitch and diameter within the range of the machine without employing an extra lead screw, the necessary changes being secured by changing gears. All of the main spindles have recesses which return the lubricant to the oil tank and prevent it from being spattered or thrown on the floor.

The ½-in. double head bolt threading machine which is illustrated in Fig. 2 is equipped with steel guides instead of cast iron ones as has been the common practice with builders of this type of machine in the past. Steel guides possess the advantages of being made to conform accurately to the desired size and maintain perfect alignment at all times unless affected by wear after long continued usage. Wear when it takes place can be easily overcome by supplying new guides at a slight expense while in the case of a machine having cast iron guides the wear cannot ordinarily be compensated for especially if it is not equal on all portions of the guide. With this type of guide also there is no tendency for the chips to collect and cause wear. The machine is built with a wide body and an ample space for chips, the latter being separated from the oil tank in the base by a fine screen. The oil pump used in connection with the lubricating system is of the rotary type and is mounted on the rear of the machine. While the carriage is light, it is nevertheless of very strong construction and can be easily operated for rapid production. On account of the high speed for which this machine is designed the dies furnished are almost exclusively of the high-speed steel pattern.

The standard 1-in. double head bolt threading machine shown in Fig. 3 is equipped with a constant speed motor driving through a silent chain. The motor is mounted on top of the machine out of the way of dirt and oil, an arrangement which makes the equipment very compact and takes up the minimum amount of room. Speed changes are secured through a mechanical speed changing device having a range of 3¼ to 1 and any of these can be obtained while the machine is in operation without loss of time. Like the double head bolt cutter this machine is also adapted for high speed work. The carriages on this machine which are either of the rack and pinion or lever operated type have vertical and horizontal adjustments for centering to the die.

All of these machines are equipped with the maker's standard type of die which is held in various ways to meet the requirements of different classes of work. In the lower portion of Fig. 1 one of the chasers is shown in a die held by a clamp which comes flush with the front edge of the die. This is the type of holder used for regular bolt work or for cutting close to shoulders, as the arrangement enables cutting close to shoulders or heads of bolts to be done at any time. The dies used have either very short throats or none at all and as when they are sharpened, no grinding is done in the throat of the die this remains permanent and is a very great advantage on many classes of work. These machines can also be furnished with a holder having the mill type of clamp which was illustrated in *The Iron Age*, September 1, 1910. This clamp is used as it affords a rigid support to the die and is of a special advantage when threading pipe as it comes over the chaser in such a way as to protect the latter when

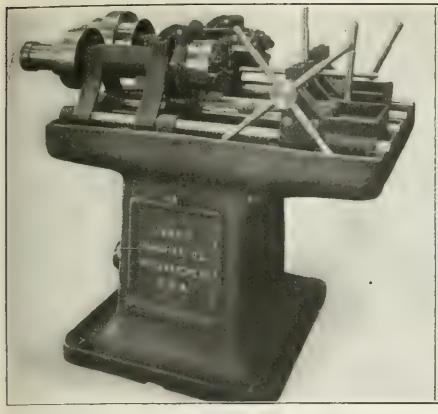


Fig. 2.—The 1½-In. Double Head Bolt Cutter.

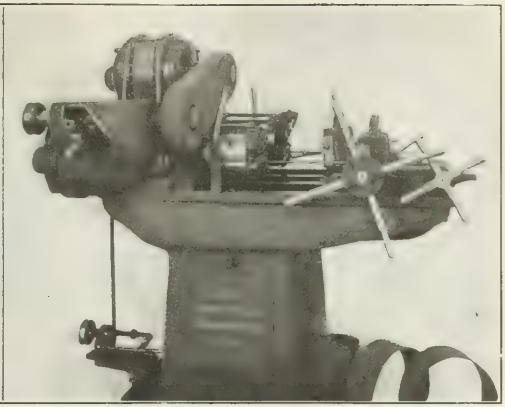


Fig. 3.—The 1-In. Double Head Bolt Threader.

Two Other New Landis Machines.

the pipe splits or catches in the chaser. Both of these types of holders are made entirely of steel as well as the die heads on all these machines. Either constant or adjustable speed motors can be used for driving these machines as may be desired.

Industrial Lighting.—Night production costs 20 per cent. more than production in the daytime in an Eastern silk mill, according to F. B. Allen, in a paper devoted largely to the Cooper-Hewitt mercury vapor lamp. He regards the condition as largely due to inferior illumination. He adds that a mercury vapor lamp can be run for 5 hr. at a power expenditure of 1 kilowatt-hour, and that if the factory produces power at the cost of 1 cent per kilowatt-hour, 5 hr. of use of a mercury vapor lamp, therefore, costs but 1 cent. On an average in industrial lighting one mercury vapor lamp is provided, he says, for at least two men. At 40 cents per hour for employment, the expense of $2 for employing the two men for 5 hr. is compared with the lighting service for the same time at a cost of 1 cent. With improved illumination, he asserts that it is not difficult to imagine that 20 machines will do the work that 25 have done heretofore. The value of the investment has been increased 20 per cent. or probably ten times the value of the lighting unit to produce the result.

The Pittsburgh-Buffalo Company, Pittsburgh, Pa., has recently repaired some of its coke ovens at Marianna, Pa., and is again operating all ovens there, aggregating 150 in all.

The annual report of J. G. White & Co., Ltd., engineers, London, Eng., formed some years ago to take over the foreign business of J. G. White & Co., Inc., of New York, shows net profits for the year of £91,466, as against £64,801 the previous year. The directors recommend that £15,000 be allocated to writing off the balance of purchase of business account and a further £15,000 be placed to the credit of a new reserve account for the equalization of future dividends. This total sum of £30,000 having been set aside, the directors recommend a dividend of 7 per cent. for the half-year on both the preferred and ordinary shares, making, with the interim dividend of 5 per cent. paid January 1, a total distribution of 12 per cent. for the year. They further recommend an extra dividend of 10s. per share, or 50 per cent. on the ordinary shares, making a total of 62 per cent. for the year, leaving the balance of £19,812 to be carried forward to next year's accounts. This venture by an engineering firm of American origin has been a phenomenal success.

The McKeesport Tin Plate Company, McKeesport, Pa., resumed operations in full July 17. The plant, which is at Port Vue, near McKeesport, had been shut down for two weeks, during which necessary repairs were made and some needed improvements were finished.

The McClintic-Marshall Construction Company, Pittsburgh, was last week awarded another Panama Canal contract, calling for spill way gates, caissons, foot bridges, numerous valves, bulk head gates, screens, etc., amounting to $339,190.

Percentage of Production of the United States Steel Corporation for 1910

The following table, showing the percentage of total production of the United States attained by the United States Steel Corporation in 1910, is taken from the Annual Statistical Report of the American Iron and Steel Association:

Iron ore shipments from Lake Superior and the iron ore production in 1910; also coke production in the same year.	By U. S. Steel Corporation.	By independent companies.	Total shipments and production.	Percentage U. S. Steel Corporation.	Its percentage in 1909.
Shipments of iron ore from the Lake Superior region in 1910, gross tons	22,185,972	21,256,425	43,442,397	51.0	51.4
Total production of iron ore in 1910, gross tons	25,245,816	*	*	*	45.7
Production of coke in 1910, net tons	13,649,578	28,059,232	41,708,810	32.7	34.6
Iron and steel actually produced in the calendar year 1910. Gross tons.	**Production U. S. Steel.**	**Production all others.**	**Total production.**	**Percentage U. S. Steel.**	
Spiegeleisen and ferromanganese	173,636	50,795	224,431	77.4	72.5
Bessemer, basic, low-phosphorus, foundry, forge, ferrosilicon, etc.	11,657,762	15,421,374	27,079,136	**43.0**	**44.8**
Total pig iron, including spiegeleisen, ferromanganese, ferrosilicon, etc.	11,831,398	15,472,169	27,303,567	43.3	45.
Bessemer, open-hearth, crucible, electric, and all other steel ingots and castings	14,179,369	11,915,550	26,094,919	54.3	55.8
Bessemer steel rails	1,134,381	750,061	1,884,442	60.2	**57.3**
Open-hearth steel rails	1,004,565	746,794	1,751,359	57.4	57.5
Structural shapes	1,163,490	1,103,590	2,266,899	51.3	47.1
Plates and sheets, including black plates for tinning	2,380,106	2,575,378	4,955,484	48.0	**49.8**
Wire rods	1,508,294	733,536	2,241,830	67.3	69.7
Bars, skelp, nail plate, iron rails, and other finished rolled products	3,203,279	5,317,995	8,521,274	37.6	39.4
Total finished rolled, including rolled forging blooms and rolled forging billets	10,393,925	11,227,354	21,621,279	48.1	48.9
Wire nails ....kegs of 100 pounds	7,041,692	5,663,210	12,704,902	55.4	60.7
Tinplates and terne plates....gross tons	440,694	282,076	722,770	61.0	61.9

*The total production of iron ore by the United States in 1910 had not been ascertained by the Geological Survey in July, 1911.

The Columbia Chuck

A new type of self-centering chuck which is known as the Columbia high speed universal chuck has been brought out by Schuchardt & Schutte, West Street Building, New York City. This chuck is especially adapted for heavy work with high speed steel and its construction embodies features of strength and gripping power to answer this special purpose. Fig. 1 is a view of the chuck assembled and unassembled, while Fig. 2 shows one of the 8-in. chucks mounted in a lathe and gripping a piece of 0.20 per cent. carbon steel in which a cut 7/16 in. deep is being taken.

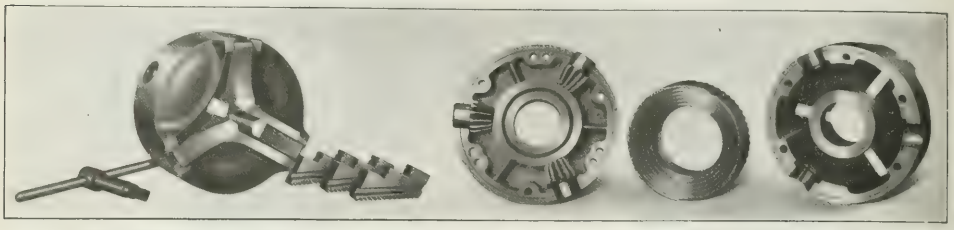


Fig. 1.—Assembled and Unassembled Views of the Columbia Chuck, Made by Schuchardt & Schutte, New York City.

As will be noticed from Fig. 1, the chuck is constructed along lines that are radically different from those

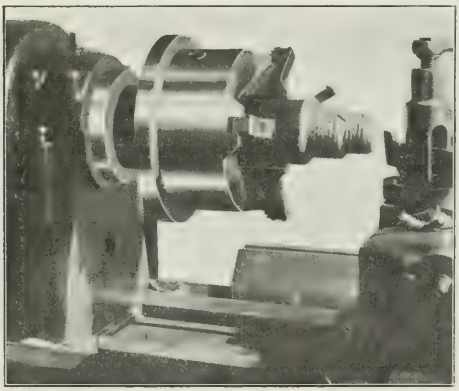


Fig. 2. The Chuck in Use.

of the old design of scroll chuck. The essential part of the chuck is the hardened steel ring which is shown between the other two parts of the body. The spiral thread which is cut in this ring on its sloping inner surface has a considerably finer pitch than that of the ordinary scroll chuck, it is explained, an arrangement calculated to increase the area of the wearing surface and the gripping power. This ring is first hardened and is subsequently ground to secure a perfectly true running chuck. By a sloping inner surface of the body against which the jaws bear, greater resistance to any tendency to spring upward and out of the body when the jaws are tightened is secured, as the jaws have more teeth in contact with the body than is the case with the ordinary scroll chuck and the pressure is directly against solid metal.

Ten different sizes of chucks are made and the principal dimensions and specifications are given in the accompanying table

No. of chuck	1	2	3	4	5	6	7	8	9	10
Gripping capacity, in.	3	5	6	7	8	9	10	12	14	16
Outside diameter, in.	3	5 5/16	6 1/16	7 1/16	8 1/16	9 7/16	10 3/8	12 13/16	14 15/16	16 15/16
Diameter of hole, in.	1 1/16	1	1 1/16	1 1/16	1 1/16	1 1/16	1 1/16	1 1/16	1 1/16	1 1/16
Depth of body, in.	2 1/4	3 5/32	3 5/32	3 5/32	3 15/16	3 15/16	4 11/32	4 9/16	5 3/32	5 5/16
Net weight, 1 set of jaws, lb	7	13	20 1/2	29 1/2	42 1/4	46 1/2	61	118	159 1/4	230 1/2
Net weight, 2 sets of jaws, lb	8 1/4	13 1/2	23 1/4	32 1/2	48 1/4	53	69	119	174	238

The three jaws with which the chuck is equipped are of either the step or the cut-off type, and sets of one or both kinds can be supplied as desired. The design of the body is such that the jaws are almost entirely covered by it. This minimum protrusion reduces the possibility of accident to the operator from the hands or the clothing catching in the jaws.

The World's Production of Pig Iron

James Watson & Co., of Glasgow, Middlesborough, Liverpool and Swansea, have issued their compilation of statistics of the world's production of pig iron. The figures cover the year 1910, the years 1908 and 1909 being included for purposes of comparison. They are as follows:

	1908. Tons.	1909. Tons.	1910. Tons.
United States	15,936,018	25,795,471	27,298,545
Germany	11,813,511	12,917,653	14,793,325
Great Britain	9,289,840	9,664,287	10,216,745
France	3,344,145	3,544,638	4,032,459
Russia	2,751,000	2,817,000*	2,956,000*
Austria & Hungary	1,952,750	1,947,300	1,990,684
Belgium	1,182,311	1,632,850	1,883,500
Sweden	563,300	443,000	604,300
Spain	430,000	420,000	425,000
Canada	563,672	677,090	740,210
Italy	80,000	147,000	343,600
Japan	147,217	161,020*	162,000*
India	38,000	39,350	35,933
China	66,409	74,000	120,000
Mexico	66,409	58,859	45,000
New South Wales	....	26,762	40,487
Totals	48,174,788	60,365,780	65,407,788

*Estimated.

The total for 1910 shows an increase of 5,242,008 tons as compared with 1909, and an increase of 17,433,000 tons compared with 1908.

Railroad Equipment Orders.—The following orders have been placed for railroad locomotives and cars: Illinois Central, 2000 box cars; Wabash, 1000 box cars and 200 hopper cars; Atlantic Coast Line, 900 box cars, 100 steel underframe flat cars and 8 all steel postal cars; Missouri Pacific, 2000 all steel gondola, 500 steel flat, 1000 steel underframe box, 400 steel underframe automobile, 18 baggage and 17 steel postal cars; Manufacturers' Railway, St. Louis, preparing specifications for 100 all steel 50 ton coal cars and 50 steel furniture cars; Canadian Northern, 20 consolidation locomotives; Baltimore & Ohio, 10 Mallet locomotives; Cold Blast Transportation Company, Chicago, in the market for 100 tank cars; Chicago, Memphis & Gulf, 100 freight cars; Erie Railroad, 3675 cars and 60 locomotives, orders for which will be placed after August 1; St. Louis & San Francisco, 62 miscellaneous cars; Wabash, 1000 steel underframe box cars and 200 all steel hopper cars.

The issue of the Gazette Times, Pittsburgh, of July 26, celebrates the 125th anniversary of the establishment of that paper. An illustrated supplement gives many interesting details of the greatness which Pittsburgh has attained in various branches of industry and commerce. The leading article in this supplement, which is written by B. E. V. Luty, treats of the "Rise and Growth of Iron and Steel, Pittsburgh's Big Industry." It is a most interesting historical presentation of this subject.

Baltimore Industrial Notes

The Municipal Factory Site Commission, acting under municipal ordinance, in the development of factory sites in Baltimore, Md., has been formally organized with the following members: J. Barry Mahool, chairman, representing the Chamber of Commerce; Henry F. Baker, Merchants' & Manufacturers' Association; Jacob W. Hook, Old Town Merchants' & Manufacturers' Association; George W. Rollman, Federation of Labor; William Merriken, Real Estate Exchange; Herbert J. West, Builders' Exchange; Samuel O. Malin, Northern Central Railway; Austin Gallagher, Western Maryland Railroad; Francis Lee Stuart, Baltimore & Ohio Railroad, and A. S. Goldsborough as secretary. The commission is now in active operation and has plans under way for the acquiring of desirable sites for several industries. A plot of about 17 acres of the old quarantine station will be sold to J. S. Armstrong, on which a large fertilizer plant is to be built. Factory sites are also being sought by a Camden, N. J., interest.

The State Roads Commission has, it is stated, awarded the contract for the construction of a bridge over the Nanticoke River at Sharpstown, Md., connecting Wicomico and Dorchester counties, to the Roanoke Bridge Company, Roanoke, Va., at a bid of something over $25,000.

Parker Thomas & Rice, architects, Baltimore, have completed plans for two additional hospital buildings for the Springfield State Hospital at Sykesville, Md. Each will be two stories, of brick and stone, with concrete foundations. Electric lighting and steam heating will be installed. A number of local contractors are estimating.

Lauer & Harper, Baltimore, have been awarded the contract for the structural steel, fabrication and erection of the new building for the Industrial Building Company, aggregating 1170 tons. General business conditions with this firm have not been particularly active, especially during the early part of July, but were more favorable during the closing weeks. Considerable inquiry for buildings of moderate size are being figured on both in this vicinity and in the South.

The Chesapeake Iron Works reports a substantial gain in the volume of business taken. July orders show an increase of 50 per cent. over those for the previous month, and the company's plant is more fully engaged. The bulk of the orders have been small, but the total business continues to increase gradually. Among recent contracts is one for a steel roof for the Government Printing Office, Washington, D. C. An extension to the generator house of the Consolidated Gas Electric Light & Power Company, of this city, will be fabricated and erected, and several good contracts have been booked for buildings to be erected at various Southern points. Inquiries are reported as more numerous, and the business outlook is believed to be improving.

The Monarch Engineering & Mfg. Company notes a fair business in heating and melting furnaces, particularly the former, for use in connection with the heat treatment of steel, case hardening and tempering work. Low temperature melting furnaces are being furnished to railroads, and several furnaces of the pre-combustion cross-blast low air-pressure melting and heating furnaces have recently been shipped to various customers. Considerable business of a general nature is in sight and being figured on.

A number of plans are reported to be under consideration for the extension of the electric car service in the territory surrounding this city. While these are largely tentative plans at this time, their ultimate development is generally believed likely. Some of these plans include the extension of certain lines as far as Havre de Grace, Md. The improvement of state roads has opened up the possibilities of greater suburban and interurban trolley-line traffic, and extensions in several directions are quite probable.

The matter of additional water supply has been under discussion by city officials for some time, and it is stated that an agreement has practically been reached which will involve the construction of a dam on Lock Raven Run, at an estimated cost of $1,500,000, which will have a storage capacity of 3,000,000,000 gal. Funds from an authorized loan of $5,000,000 will take care of this project and also permit the erection of a filtration plant at Lake Montebello.

The Industrial Building Company, having under construction what is generally known as the Beehive Mfg. Building on Preston street, the contracts for the erection of which have already been announced, has filed incorporation papers with the Superior Court. The capital stock of the company has been fixed at $300,000, and its business will be to acquire lands and erect manufacturing and other buildings. The incorporators named are Thomas S. Anderson, W. H. Cassell, William J. Chapman, Charles M. Cohn, A. B. Evans, Isaac O. Harper, Alexander Harvey, H. B. Lohmeyer and James E. Kane.

Contracts were awarded during the month by the Board of Awards for the first section of the three-tube storm water drain, to be laid in the bed of Jones Falls, to M. M. Elkan, Macon, Ga. This section extends from tidewater, about 200 ft. south of Baltimore street, to Center street, and marks the beginning of the closing of Jones Falls from the Union Station of the Pennsylvania Railroad to the river front. A streetway will be constructed over the drains.

Dietrich Brothers have taken a number of small contracts for fabricated iron and steel work, and are estimating on considerable work, both in this vicinity and the South, on buildings involving each from 200 to 500 tons of material. No large contracts have recently been secured by the firm, which is quite busy, however, on work in hand, which includes the structural work for the Baltimore Bargain House and the addition to the Maryland Casualty Company's building, which is now going through its shops. A very good demand for plain structural shapes and for concrete bars is reported.

The plant of the Baltimore Gas Appliance & Mfg. Company, Hamburg and Bayard streets, is rapidly approaching completion. Nine buildings comprise the plant. Machinery and equipment is now being installed, practically all that will be required having already been purchased. It is expected that the new plant will be in full operation in October. Gas ranges, gas water heaters and other gas appliances will be manufactured.

Morrow Brothers, Inc., engineers, have, it is stated, been awarded the contract for the erection of a large warehouse and manufacturing building at 603 North Calvert street, for the Independent Casket Company. The same engineers have prepared preliminary plans for a new warehouse to be erected on Howard street, near Mulberry, for M. E. McCormick. A four-story L-shaped building is being considered. Final plans are not expected to be ready for estimate for at least a month.

The Baltimore & Virginia Railroad Company has made application to the Public Service Commission of Maryland for permission to begin the construction of a railroad line extending from Millersville, Md., to Drum Point, Md.

Among various projects being figured on by contractors and fabricators in this district are to be mentioned the new Y. M. C. A. Building, Charleston, S. C., a new station for the Southern Railway at Lynchburg, Va., the Confederate Home, Richmond, Va., and the Caswell Theatre, Norfolk, Va.

The Westinghouse Electric & Mfg. Company's Meeting.—The administration of the Westinghouse Electric & Mfg. Company won every contention at the adjourned meeting held at Pittsburgh, Pa., July 29. The directors elected were James S. Kuhn, Edwin M. Perr, Pittsburgh; Edwin F. Atkins, Boston; Charles F. Brooker, Ansonia, Conn. Harrison Nesbit, Pittsburgh, was elected director to fill an unexpired term. The resolutions by the Westinghouse party providing for the election of all directors annually and for cumulative voting were defeated.

David D. Lamond & Co., 702 Ferguson Building, Pittsburgh, consulting and contracting engineers for blast furnaces, and patentees of the Foote-Lamond firebrick stoves, has recently secured the sales agency in Pittsburgh and vicinity for the open and closed type feed water heaters, water purifiers, separators, and steam specialties made by E. G. T. Collis & Co., Chicago, Ill., whose business was established 32 years ago, and whose products are in use on important railroad systems, in large iron and steel plants, etc

---

The Parkesburg Iron Company, manufacturer of genuine charcoal iron boiler tubes, has removed its New York office to 30 Church street, room 1023.

The International Railway General Foremen's Association

The annual meeting of the International Railway General Foremen's Association was held at the Hotel Sherman, Chicago, July 25 to 27. The papers and discussions before the meeting were largely along the lines suggested by topics prepared by F. C. Pickard, master mechanic of the Cincinnati, Hamilton & Dayton, under the general heading, "How Can Shop Foremen Best Promote Efficiency." Shop organization, methods of supervision, handling of material and shop kinks and methods were made the subjects of thorough discussion. A long list of practical questions had been prepared for this purpose.

The entertainment programme included a visit to the plant of Joseph T. Ryerson & Sons, where lunch was served and where the machine tool demonstrating room was thrown open. A number of machine and boiler shop tools were operated.

On Wednesday and Friday evenings the Marshall & Huschart Machinery Company entertained about 135 men at its store. A working demonstration was given of a number of machines on the floor. The representation of machine tool builders included S. H. Bullard, vice-president Bullard Machine Tool Company, with an operator for demonstrating a 42-in. vertical turret lathe; S. H. Reck, president Rockford Drilling Machine Company, with two operators running a 24-in. four-spindle gang drill on pump chamber work and a 20-in. drill on general manufacturing; William H. Schaefer, secretary Cincinnati Bickford Company, and operators showing a 36-in. new pattern radial drill and a 24-in. tapping drill on high-speed drilling; A. J. Baker and John Kliber of the Cincinnati Milling Machine Company, the former being an expert on the new design of milling cutters which were shown on both roughing and finishing work on vertical and horizontal millers; Mr. Grove of the Landis Machine Company who showed a 1½-in. bolt cutter; Mr. Kellar of Gould & Eberhardt, demonstrating a 44-in. electrically-driven shaper and a 12-in. gear generator; Emil Von Wick of the Von Wick Machine Company, Cincinnati; Mr. Thompson, secretary of the Gardner Machine Company, Beloit, Wis., with two assistants, showing a pattern-making machine and a double-disc grinder; Mr. Wood of the Lodge & Shipley Machine Tool Company, in charge of the patent head lathe display; Charles Meiers, sales engineer Cincinnati Planer Company, demonstrating a 36-in. planer having three heads and a two-speed countershaft; Mr. Pierson, secretary Acme Machine Tool Company, Cincinnati, showing a 2¼-in. screw machine fully equipped, and Morley Hitchcock, president Reliance Electric Machine Company, Cleveland, with Mr. Engle, Chicago manager, who presented a type of motor for machine-tool drive in which the armature may be moved laterally in and out of the field of the motor. A vaudeville entertainment followed the demonstration.

Among the features to which attention was called in the course of the above demonstrations were two of a general character that appeared with some prominence. The one had to do with the development of each feature of the modern machine tool up to the high duty efficiency limit of every other part of the tool. For example high-speed tool steels with their larger metal cutting possibilities required the designing of stiffer heads. Stiffer heads permitted increasing the number of simultaneous operations and thus reducing the ratio of the time of handling material to the time of actual machining. This increase in capacity brought about stronger and more freely lubricated drives, especially with regard to the speed change and driving gears. These gears are now largely made from alloy steels, particularly nickel chrome steel, and are immersed in oil from continuous feed systems. Emphasis was thus laid upon that design which provided throughout uniform possibilities for severe service. The improvement in the electrical control of tools having reciprocating motions likewise was a matter of interest. Geared drive motor control is now possible, as illustrated on a 44-in. shaper, permitting instantaneous stopping and starting at operating speed. It was likewise shown to be possible on a short stroke to run the speed of this machine up to 120 strokes per minute without exceeding apparently the operating efficiency of the tool.

The convention elected F. C. Pickard, Indianapolis, master mechanic Cincinnati, Hamilton & Dayton, president and re-elected L. H. Bryan, Two Harbors, Minn., general foreman Duluth & Iron Range, secretary-treasurer.

The Appalachian Exposition

The Appalachian region is one of the richest sections of the country in its deposits of minerals, both metallic and non-metallic. On the west, in the Cumberland Mountains, the coal deposits are flanked on both sides by fluxes necessary to the reduction of ores: on the east, in the valleys and extending through the Allegheny Mountains, as far as the Blue Ridge, are found enormous deposits of about all the varieties of iron ores that are necessary in iron and steel production.

At Knoxville, Tenn., the Appalachian Exposition is an annual event. Its first year (1910) was a decided success, when there were approximately 400,000 paid admissions. This year it promises to be greater in value and extent, as well as in attendance. It will open September 12.

A great feature of the exposition is found in its mineral and forestry display, though other departments are exceedingly important. The exhibit of minerals is under the control of a committee on minerals and forestry, composed of men who have a thorough knowledge of the resources of the Appalachian region.

In coal will be shown coking, steam, domestic, gas, splint, cannel and semi-anthracite, with their value at Knoxville or at other points. Steam coal is now delivered in Knoxville for $1 to $2 per ton, dependent upon size and heat value. It is required that these coals be shown, with analyses, tests, and other information desirable to manufacturers.

In iron ore will be exhibited hematite, magnetic, limonite, both red and brown ores, and buckwheat, which is sometimes called shot ore. Some of these ores are fossiliferous, with layers of 6 to 10 in. of fossiliferous shells. This latter ore is mined with steam shovels, and is 6 to 10 ft. in thickness, with hard ore underneath. The great valley between the Cumberland and the Appalachian mountains contains enormous deposits of limestone running 99 per cent. carbonate of lime, other with a large percentage of magnesia. Near Rockwood, Tenn., a shaft passes through a deposit of coal, then through limestone and next into iron ore, making it practicable to furnish the three necessary minerals for the production of pig iron through one mine outlet.

Other important local metals forming part of the exhibit will be copper, zinc, gold, manganese and such rare minerals as rutile, titanium, tungsten, cobalt, zirconium and molybdenum.

Non-metallic minerals will be represented by kaolin, ball clay, shale, fire clay, brick clays, cement rock, barytes, silex, tripoli, rotten stone, lithographic stone, salt, gypsum, talc, soap stone, saltpeter, alum, arsenic, copperas, limestone of many grades, fluorspar, calcite, silica, etc. The building stone display will of course be a fine one, as the marbles of Tennessee, Georgia and North Carolina are well known. In sand stones will be shown red, brown, blue, gray, dull and yellow in many shades. The fineness of the grain is such in some that they are used for the highest class of honeing stones and ranging upward one-thirty-second of an inch in grain. Others are so soft that when quarried they yield to the tool with extreme ease, but after exposure for a short time are hardened to such a degree that it is almost impossible to cut them. Included in the display will be granite of many shades, colors and degrees of texture: slate for roofing or for ornamental and structural purposes, and onyx, of which large deposits are found near Knoxville, in a solid and compact mass, from which stones can be taken out in any size. Every opportunity for information will be furnished by the committee on minerals and forestry of the exposition.

The American Car & Foundry Company is stated to be now running its own risk against damage suits from its employees. According to officials of the company, it is expected that more than $200,000 yearly will be saved. Last year the losses were nearly $500,000, and the premiums paid the insurance companies for carrying the risk approximated $700,000.

The Machinery Markets

A better volume of business, principally for miscellaneous machinery for replacement, is reported from a number of machinery selling centers. In the East the trade is bidding on an $80,000 list which is to be purchased by the General Electric Company for the Pennsylvania General Electric Company at Erie, Pa., and the Ontario & Western Railroad is closing out on a large list for Middletown, N. Y. The automobile interests continue active purchasers, especially in the Detroit market, where the makers are buying tools to manufacture their 1912 models. The Ford Motor Company is buying heavily in that market for plant additions. In Cincinnati the automobile manufacturers are purchasing to replace obsolete machinery. The buying in Chicago is of a miscellaneous character, and principally in small lots. A moderate increase in inquiries is reported from Philadelphia, and the books of machinery houses there show that business improved during July. The Oregon lumber camps are contributing some good business to the machinery trade on the Pacific Coast. An increasing demand for mining and irrigating machinery has developed in Texas and in the South the call for quarrying machinery is commanding the attention of the trade.

New York

NEW YORK, August 2, 1911.

July was a better month than June with most of the large machinery houses in New York, although the business done was largely in small lots of tools. This month opens with some good prospects in sight. The General Electric Company has bids in for about $80,000 worth of machinery to be delivered to the Pennsylvania General Electric Company at Erie, Pa. This is one of the largest lists of the year, and the business will be closed out within the next four weeks, according to assurances which have been given to some of the bidders. The New York, Ontario & Western Railroad placed a few orders during the week which about closes out the requirements called for in its large list of machinery which was sent out last February. This equipment is for the Middletown shops. Most of the machine tools were closed for several weeks ago and this week the contracts were placed for the blacksmith shop tools, including upsetting and forging machines, bulldozers and shears. There are indications that the Maryland Steel Company, Sparrows Point, Md., will soon be in the market for some heavy metal working machinery. This company is now planning for a good-sized addition to its plant which will be devoted to manufacturing purposes.

Makers of contractors' equipment, such as excavating machinery and hoisting engines, are looking for some good business from the constructors of the additions to the New York subway system. Ground was broken on Monday for an extension to the Lexington avenue route, and other contracts covering the extensive additions planned will be let as soon as possible. The Bradley Contracting Company has the Lexington avenue work under way and although it has a large amount of contractors' machinery more will be needed as the work progresses. It will be several months before makers of ventilating machinery and other equipment used in the subway system will benefit from the enterprise.

The Pennsylvania Equipment Company, West End Trust Building, Philadelphia, Pa., is in the market for a second hand mould board plow and several iron or steel turntables to accommodate locomotives 55 ft. long and 50 tons in weight.

The American Locomotive Company, 30 Church street, New York, has a contract to build two of the largest dredges ever made for delivery to the Cape Cod Construction Company, which is building the Cape Cod Canal. The dredges are to be made at the Rogers plant, in Paterson, N. J., and they will be erected at the site of the canal operations. The American Locomotive Company will probably require considerable manufacturing equipment to fit the Rogers plant for this class of work. Much of the equipment in the Rogers plant is obsoltete, according to those who are familiar with the works, and inquiries made in the trade of late indicate that some buying is to be done shortly.

The Hartford Suspension Company, Jersey City, N. J., has acquired a tract of land, 200 x 200 ft., in the Marion section of the city and is planning the construction of an auxiliary plant there. The company expects to move into its new plant, now nearing completion at 145 Bay street, about September 15. The building is six stories, 86 x 100 ft., of reinforced concrete construction. The equipment now at 150 Bay street, its present quarters, will be moved and much additional machinery, all to be electrically driven, will have to be provided after the company has moved.

The Board of Education, Bayonne, N. J., is asking for bids on one 150-hp. boiler, with the necessary appurtenances, for school No. 3. W. J. Tomlin is secretary of the board.

The Buffalo Aluminum & Bronze Company has been incorporated at Buffalo, N. Y., with a capital stock of $25,000 to manufacture manganese ingots and aluminum brass and manganese castings. The company has taken over and will continue the business of the Lundhaven Brass Company at its plant, 41-45 Letchworth street. The officers of the new company are George W. Morris, president; E. G. Northrop, vice-president and general manager, and J. G. Keppell, secretary and treasurer.

The MacDonald & Sons Mfg. Company, Buffalo, has been incorporated with $100,000 capital stock to manufacture machinery and tools, including patent wrenches, for which a factory will be established in Buffalo. The incorporators are Peter E., Colin C. and Alexander L. MacDonald, Toronto, Ont., and Henry J. Wood and William A. Hyde, Buffalo. The company has temporary office at 1411 Main street.

The Bicalky Fan Company, Buffalo, manufacturer of blowers and ventilators, is building an addition to its sheet metal works on Prospect avenue.

The Jewell Steel & Malleable Company, Buffalo, is building a one-story addition to its foundry at Hertel avenue and the New York Central Railroad.

Wannenwetch & Co., Buffalo, have been incorporated with a capital stock of $100,000 to manufacture and deal in machinery. The directors are A. C. and E. A. Lembke and R. T. Liesenger, of Buffalo. The company will make a specialty of machinery for garbage and refuse destructor and fertilizer manufacturing plants and will act as mechanical and construction engineers for the erection of such plants. The offices of the company are at 563 William street.

The Beaver Company, Buffalo, manufacturer of Beaver board, has purchased seven acres that adjoins its present plant at Beaver and Military roads and the New York Central Railroad. Plans are being made for four new buildings, the first of which, 70 x 350 ft., of concrete and brick, will be commenced at once, the others to be erected later.

The International Fritchie Company, Warwassing, N. Y., has been incorporated with a capital stock of $500,000 to manufacture motor vehicles. The incorporators are D. O'Connor, A. Sheard and H. A. Fluckiger, New York City.

The Security Reliner Company, Montgomery, N. Y., has been incorporated with $50,000 capital stock to manufacture and deal in automobile supplies. The incorporators are E. I. Emerson, G. A. Emerson and O. T. Darbee, of Montgomery.

The Delaware & Hudson Railroad Company is having plans prepared for a roundhouse to be built at Binghamton, N. Y., at an estimated cost of $40,000. George H. Burgess is chief engineer at Albany, N. Y.

Bids are being received by the city clerk, care of the Board of Public Works, Ithaca, N. Y., for two hydraulic turbines of 100 hp. each, with governors; three Gould's triplex pumps, with shafting clutches and transmission apparatus for connecting the turbines to pumps; one steel standpipe of 600,000 gal. capacity, and one steel standpipe of 150,000 gal capacity, and two water meters, one for 24-in. and one for 20-in. pipe and a quantity of 8-in. and 6-in. cast-iron pipe.

The American Standard Auto Car Lift Company has been incorporated with $25,000 capital stock at Elmira, N. Y., to manufacture a device for supporting wheels of automobiles, motorcycles, etc. The incorporators are R. Webster, M. E. Saefuse and P. C. Thompson, all of Elmira.

The Rochester Thread Company, Rochester, N. Y., has been incorporated with a capital stock of $30,000, and will establish a factory for the manufacture of linen and cotton thread. The incorporators are T. Schelling, B. Schelling and M. L. Schelling, Rochester.

The Navoe Auto Company has been incorporated at Norwich, N. Y., with a capital stock of $500,000 to manufacture patented articles. The incorporators are L. M. Foster, J. H. White and H. A. Clark, of Norwich.

THE MACHINERY MARKETS

W. H. Sample & Son, Albany, N. Y., will build an addition to their manufacturing plant at Beaver and South Pearl streets.

The F. A. Austin Pattern Company, Syracuse, N. Y., has let the contract for a two-story addition to its factory on Wallace street.

Business Changes.

The National-Acme Mfg. Company, Cleveland, Ohio, has purchased the building occupied for the past four years by its Eastern headquarters, at 77 White street, New York, and has made extensive alterations. The structure is 25 x 100 ft. in size and six stories. The basement and first floor are used by the products department, and a full line of cap and set screws and screw machine products is kept there for serving the jobbing trade. The second floor is occupied by general offices, including a reception room and a large demonstrating room in which is shown a full line of National-Acme automatic machines. The third floor is used for storing screw machine products in cases ready for delivery to large consumers. The company will rent the upper lofts to other manufacturers.

The Prentiss Tool & Supply Company, one of the oldest houses in New York dealing in metal working machinery, which has been located at 115 Liberty street for the last 24 years, will move its offices August 14 to the twelfth floor of the Singer Building, 149 Broadway. The company will continue to use its present quarters for storage purposes for a time and later on will extend its present storage warehouse on Communipaw avenue, Jersey City, N. J.

New England

BOSTON, MASS., August 1, 1911.

The Boston dealers report that there has been some slight improvement in the demand for machine tools, but as yet the change is so slight as to be of little importance. The feeling exists, however, that everything is tending toward a sharp change in the autumn. Connections in the Middle West report that dealers there are very much encouraged on account of a noticeable increase in business.

The head of an important machinery house has the following to say of market conditions: "The early part of this month appeared to be decidedly dull, but during the last week or 10 days there has been quite a little change for the better, and we have succeeded in closing a number of quite fair deals, and have information in hand of several other medium-sized lots that will be wanted in the near future. We do not expect to see any very great improvement before September 1, but believe that there will be a gradual improvement in the next six weeks and there are signs pointing toward quite an increase a little later."

Vacation season in the mills is at its hight, many large works being shut down as is their custom. In a few instances these periods have been shortened as compared with the original announcement of the manufacturers, because of unexpected improvement in business. The heavy rains which fell in parts of New England have relieved the water situation somewhat, but their area did not extend to the northern sections and consequently the rivers have not assumed a normal flow.

The textile machine manufacturers expect a very good business this fall, as compared with their experience during the last year. Some improvement is already noted, but business is very uneven, some departments being busy while others are not so prosperous. The general opinion is that both the cotton and woolen business will improve to such an extent that textile machinery will be in active demand.

The Artistic Bronze Company, South Norwalk, Conn., manufacturer of cabinet and builders' hardware, will be in the market for new equipment for its new factory, the erection of which has begun at Bridgeport, Conn. No list has been prepared. The company will require a number of small electric motors for use with two-phase double-alternating current from the city power plant, and some other new machines and tools which will be purchased by the company's engineer, H. B. Close, 326 Colorado avenue, Bridgeport, Conn., who has entire charge of building and equipping of the factory.

N. R. Davis & Sons, Assonet, Mass., manufacturers of guns, are making extensive alterations and additions to their factory, increased manufacturing facilities having become necessary owing to the growth of the business.

The Heald Machine Company, Worcester, Mass., is erecting an addition to its shops, 10 x 120 ft. The company has plans for extensive enlargements, and the new section will constitute a part of a very much larger addition which will be erected in the future. The company manufactures grinding machinery, the demand for which is growing so rapidly that the large increase in manufacturing capacity in the last two years has already proven inadequate.

The Hollander Bros. Company, Inc., Bridgeport, Conn., has been incorporated with a Connecticut charter to manufacture light metal stampings and wire-forming specialties. The incorporators are Henry Hollander and Samuel Hollander, Bridgeport, and Adolph Hollander, New York City. The factory is at Spruce street and Wordin avenue, Bridgeport.

Additions to general manufacturing plants in New England include the following: Interlaken Cotton Mills, Harris, R. I., addition to contain a large amount of new machinery; Fisk Rubber Company, Chicopee, Mass., additions to provide 35,000 sq. ft. of new floor space; Yale University, New Haven, Conn., a large central heating and lighting plant.

The important announcement is made that the Crown Mfg. Company, Pawtucket, R. I., a newly organized corporation for the manufacture of cotton goods, will erect an entirely new factory at a cost of $100,000. It will consist of a main building, 138 x 340 ft., three and two stories, and a power house 40 x 56 ft., one story.

Philadelphia

PHILADELPHIA, PA., August 2, 1911.

The volume of business coming to industrial plants in July showed an increase over that for the previous month. Builders of machinery and special equipment in this district report, with few exceptions, a slight increase in plant operations, and note a more general inquiry, which in quite a few cases has led up to business. The increased share of business has not been very freely distributed between machine tool builders. Users of such equipment still have a fair share of their plant idle and, until they become more fully engaged, buying of new tools is expected to drag. Machinery merchants report a moderate increase in inquiries, the major portion of which is still confined to single tool propositions. Occasionally a small list comes out, but no buying on an extensive scale is in immediate sight. Inactivity on the part of the railroads in this district is still to be noted. In the boiler and engine trade the demand continues somewhat irregular, with inquiries usually for small power equipment. Conditions in the second-hand machinery market are unchanged; buying is scattered, and covers, in a small way, the general range of metal and wood-working tools and machines. The foundry trade shows but little improvement.

The Howard W. Read Company, Third and Arch streets, is in the market for a 15-ton, 40-ft. span, three-motor traveling crane.

The Pennsylvania Equipment Company, West End Trust Building, is in the market for several hundred 30-ton hopper-bottom coal cars to pass M. C. B. inspection.

The Director of Safety, city of Philadelphia, announces the award of a contract to the Pusey & Jones Company, Wilmington, Del., for a new fire and police boat. The vessel will be 80 ft. long, 17 ft. beam and draw 6½ ft. of water.

The R. S. Newbold & Son Company, Norristown, Pa., is very well supplied with orders, both in its machine and boilermaking departments. Inquiries are coming in quite freely and the outlook for business during the next few months is reported as being very favorable.

The Elwood Ivins Tube Works, manufacturer of seamless steel tubing, reports orders as coming in quite satisfactorily. Considerable new machinery equipment is being built by this concern, which when completed and installed, will materially increase its productive rate.

J. G. Speidel, Reading, Pa., manufacturer of elevators, cranes, hoists, etc., considers the prospects for the remainder of the year as being very good. Quite a marked increase in business is to be noted during the past month. A large demand is reported for the Speidel direct-connected type of electric elevator machines.

The Hilles & Jones Company, Wilmington, Del., has recently secured contracts for equipment for the new shop of the Cincinnati Car Company, at Winton Place, Cincinnati, and another for the boiler-shop equipment

THE MACHINERY MARKETS

for the new plant of the New York Central Iron Works at Hagerstown, Md. This latter job includes three vertical and horizontal punching machines, one set of 14-ft. plate bending rolls, one set of 12-ft. flange clamps and a 60-in. throat stake riveter, all being motor driven. The company is operating at about 75 per cent. of normal capacity, and while business during July has not been particularly heavy there has been a fairly satisfactory amount of orders for single tools.

The Ferracute Machine Company, Bridgeton, N. J., manufacturer of presses for cutting and forming sheet and bar metals, reports a steady improvement during the past six months, the orders booked each month since December, 1910, being in excess of the previous month. The company is running full time and conditions are practically normal. Orders are widely distributed; the foreign business, which was good during the depression, is still good, the increase, however, being particularly noticeable in the home trade. New presses are being added to the company's already large list from time to time and improvements made in older styles as occasion demands.

Baltimore

BALTIMORE, MD., August 1, 1911.

Improved business conditions reported pretty generally by machinery manufacturers, merchants and industrial concerns during June have been supplemented by reports of further gains in many directions in the past month. The rate of increase is small, but the steady gain is very encouraging to the trade, which looks forward to more active business conditions in the near future. In the majority of instances plant operations show an improvement, although in but few cases have they reached normal proportions. Manufacturers of machinery note a better run of orders, largely, however, for special equipment; inquiry has also improved, and the outlook is more encouraging. The bulk of the demand has been confined to metal-working tools. A very fair business in contractors' tools is reported, while the demand for small tools and shop supplies is, as a rule, reported as being somewhat better. Business in the boiler and engine lines has been rather spotty, although some fair contracts are being figured on and more business is in sight.

Several good-sized contracts for building and bridge work have been given out in the South, and iron and steel fabricators are still figuring on some fairly large work. Few of the large projects have, however, been awarded local concerns. Nevertheless, fabricators in several instances report sharp increases in the volume of business booked during the month. In the majority of cases the business has been made up of numerous small orders, although one for over 1000 tons, for the Beehive Building, was taken by a local concern. Railroad buying still continues light. The Baltimore & Ohio has placed orders for motive power and is inquiring for rolling stock; but additions to shop equipment, particularly in the way of machine tools, are very light. Some extensions to railroad lines are planned and trolley line extensions are contemplated. Little new municipal work of interest to the trade comes out. Further contracts in connection with the water supply and sewage disposal work are, however, contemplated. Contracting engineers are figuring on a fair amount of heating and ventilating work. The general demand for castings is still irregular and foundries are not very fully engaged.

Sealed proposals will be received by the Board of Awards, city of Baltimore, on August 9, for the installing of electric generators and a switchboard for the municipal sewage pumping station. Plans may be obtained at the office of the Sewerage Commission, 914 American Building.

Plans are under way for the establishment of another fertilizer plant in the Curtis Bay district. An option has been taken on 40 acres of land and architects are at work on preliminary plans, which will provide for a large and most modern plant. Southern capital, it is said, is interested in the project.

The Aumen Machinery & Supply Company reports business for July as being a shade better than in June. While orders have been largely confined to machine tools for metal-working purposes, some fair business in wood-working tools is in sight. The bulk of the trade in machinery lines has been confined to single tools, although a contract covering a list of eight tools was received from a Washington, D. C., customer. Machine shop supplies and small tools have been in fairly good demand. Inquiry, while still confined to single tool propositions, has been more promising.

Wallace Stebbins & Sons have recently booked an order for a 200-hp. Fitzgibbons boiler and for the pipe work in connection with a heating installation for the National Park Seminary, Washington, D. C. The engine and boiler trade is reported to have been spotty during July, although estimates are now being made on a number of moderate capacity installations. The supply trade has been fairly active. The various departments of this concern's plant have continued fairly active.

J. D. Adt has recently booked considerable business in special machinery for export, included among which was tobacco-working machinery for export to Mexico, Manilla, P. I., and to England. Orders have also been taken for additional elevating machinery, including a 2500-lb. electric elevator for the packing plant of Charles G. Kriel. All departments of the Adt plant are being operated at full capacity. July business in small tools and supplies has also shown an appreciable gain over the preceding month.

The T. C. Bashor Company has had a rather quiet month, as far as new business is concerned. Orders have been plentiful, but individually small and will not aggregate as large a total as those for the preceding month. Both boiler and tank work are reported less active. Several small orders for engines and compressors have, however, been booked. This company is about finishing up extensive installations for which it had contracts with the Simpson-Doeller Company, and the Crown Cork & Seal Company in connection with the new plant for the former and Highlandtown additions of the latter.

Louis N. Rancke, who, for a number of years was general manger of the Baltimore Retort & Fire Brick Company, and recently connected with the Gas Engineering Department of the Laclede-Christy Clay Products Company, St. Louis, Mo., has been appointed general manager of the Vulcan Fire Brick Company, Knickerbocker Building, this city. The plant is located at Wilmot, Va., and plans are under consideration for considerable improvements with a view of increasing the productive capacity.

The Middleton & Mead Gas Engine Company is the style of a new company which has commenced business at 11 East Lee street, Baltimore, to manufacture gas engines. The officers of the company are A. K. Middleton, president; G. B. Middleton, treasurer; James K. Q. Mead, secretary, all of whom were for many years connected with the White-Middleton Company.

The Patterson-Parsons Electric & Elevator Repair Company is a new concern with offices at 318 South Sharp street, Baltimore. Charles A. Patterson, formerly with Guy K. Mitchell, is at the head of the company.

Cincinnati

CINCINNATI, OHIO, August 1, 1911.

Machine tool orders from the automobile trade are confined almost entirely to replacements, and consequently are not coming in in any great volume. The railroads also seem to have adopted a stricter retrenchment policy, although when the crops begin to move they will doubtless be compelled to make some heavy purchases of shop tools and supplies.

As mentioned in *The Iron Age* about a year ago, a number of machine tool manufacturers adopted the policy of refusing to ship consignment stocks to agents. This plan is now in force with practically every tool builder in this section, and as a consequence warehouse stocks are much heavier than formerly; however, due to the excellent export demand and a curtailment in production, they are increasing very slowly.

The foundries making a specialty of machine tool castings are operating at about 50 per cent. of capacity, but the stove makers are faring better. Small electrical machinery is still in good demand, and power plant equipment is also holding up well.

The Cincinnati Foundrymen's Club will hold an outing at Elkwood Park, August 3. The Dean Mfg Company, Newport, Ky., has placed at the club's disposal one of its large power boats on which a trip will be made to the newly completed Fernbank Dam. William Goodman, manager of the Laidlaw-Dunn-Gordon Company, and Paul Gosiger, a local foundryman, have charge of the entertainment features.

In spite of rather inclement weather the regular annual outing for employees, given by the Cincinnati Branch, National Metal Trades Association, July 29,

THE MACHINERY MARKETS

was very largely attended. The different shop teams entered into the athletic contests with more than ordinary enthusiasm. The programme was arranged by Secretary J. M. Manley.

The Union Central Life Insurance Company has selected Cass & Gilbert, of New York, and Garber & Woodward, Cincinnati, as architects to draw up plans for a proposed 20-story office building that will be erected on the old Chamber of Commerce site. Building operations may commence before the end of the present year.

The structural work of the new jobbing mill for the Portsmouth Steel Company, Portsmouth, Ohio, is practically finished, and work on foundations for the machinery will be commenced within the next two weeks.

The Ohio Top Company, Cincinnati, manufacturer of automobile tops and other specialties, will soon move from its present quarters to a three-story brick building, 911-913 Broadway, now being remodeled. Some extra equipment will be needed.

The Heilman Automobile Company, Cincinnati, was recently incorporated with $15,000 capital stock, and is erecting a modern fireproof garage and repair shop at Northside. The mechanical equipment, consisting of a lathe, drill press, motor, etc., has not yet been purchased. John C. Heilman is manager of the new company and M. W. Jennings secretary and treasurer.

The Hamilton Brewing Company is a new incorporation at Hamilton, Ohio, with $100,000 capital stock, and it is reported that work on a brewery and ice factory will be commenced at an early date. Max Heman and Louis F. Morner are named among the incorporators.

H. Harig & Co., Cincinnati building contractors, have been awarded contract for an addition to the plant of the Globe-Wernicke Company, in Norwood. The building will be of concrete construction, 75 x 365 ft., seven stories, and will be used for the manufacture of office furniture.

The Kaps-Brehm Company, Cincinnati, has been awarded contract for the superstructure of the proposed Gilbert avenue viaduct. The amount of the contract is nearly $150,000, and considerable structural material will be required in the work.

Some power plant equipment will be required for the new combination power and laundry building for the Good Samaritan Hospital, Cincinnati. Architect G. W. Drach drew up plans for the building, which will be 70 x 100 ft., two stories.

The Fosdick Machine Tool Company, Cincinnati, has decided to enlarge its plant at Northside, but no building plans have as yet been made up. The company reports an excellent export business, with the domestic demand only fair.

Bids have been closed for a four-story addition to the lamp factory of the Corcoran Brothers Company, Cincinnati, previously mentioned.

The Ironton Punch & Shear Company, Ironton, Ohio, has prepared plans for the erection of a modern steel building at Hecla and Aetna streets. Contract has been let to the Riverside Bridge Company, and work will be commenced at an early date. The Ironton Company recently purchased the equipment of the Cincinnati Punch & Shear Company, at a receiver's sale, and will make a specialty of punching and shearing machinery of all kinds.

The South

LOUISVILLE, KY., August 1, 1911.

The South is preparing to market one of the largest cotton crops in the history of the section. The tremendous wealth represented by the crop is expected to result in stimulation in every line of business, and machinery manufacturers and dealers are arranging to share in it.

The demand for equipment, while not heavy, is good, and prospects are excellent. A somewhat better call for machine tools has been noted, this item being usually draggy in the local market. Quarry machinery is in good demand.

The Dow Wire & Iron Works, Louisville, has purchased an air-compressing outfit from the Ingersoll-Rand Company through the Brandeis Machinery & Supply Company. It will be used in the foundry and structural iron departments.

The Louisville Lead & Color Company has filed plans for an additional building. It will install some paint mills and other special machines, but will require no additional power equipment.

The Omaha Packing Company is erecting a two-story brick addition at its Louisville branch. A 10-ton refrigerating plant will be installed, together with another 30-hp. boiler. The purchases will probably be made through the Chicago office.

The Art Brass & Plating Works, which was recently incorporated for the purpose of taking over the business of the Apex Mfg. Company, has elected the following officers: Otto Seelbach, president; Carl Rindt, vice-president, and Louis Rindt, secretary and treasurer. The company will purchase a monitor immediately and will add some additional equipment later on. It expects to develop the manufacture of plumbers' supplies particularly.

The building inspector of Louisville has ordered the owners of 51 buildings, including factories and apartment houses, to equip them with fire-escapes. This is expected to make business for the structural iron manufacturers.

An official statement from the general offices of the Louisville & Nashville Railroad Company denies a press report that the company has in contemplation the removal of its shops from Louisville to Madison, Tenn., near Nashville.

The Brinly-Hardy Company, Louisville, has recently made a number of changes in its plow manufacturing plant, looking to the enlargement of its department for making steel beam plows and cutting down the space devoted heretofore for the manufacture of wooden beams. Robert R. Freer, business economist of Cincinnati, Ohio, is installing, for the company, a series of factory organization, including scientific management and cost accounting.

Alvis Combs and Henry Baker, Hazard, Ky., are planning the establishment of a canning plant.

The Livermore Chair Company, Livermore, Ky., has been incorporated with $20,000 capital stock and is now purchasing equipment for the manufacture of chairs. K. J. Myers is president and W. E. Render, secretary and treasurer of the company.

The Winchester Lumber & Mfg. Company, Winchester, Ky., is building an addition to its sawmill and planing mill. The company manufactures interior finish principally.

The garbage reduction plant of Covington, Ky., was destroyed by fire July 26, the loss being $20,000. It has been announced that the plant will be rebuilt in the immediate future.

H. S. Mitchell, Cadiz, Ky., is erecting a building and will install machinery for the operation of a modern steam laundry.

A. P. White & Co., Cadiz, Ky., have begun the erection of a large flour mill. Power will be secured by the erection of a dam and the installation of a hydro-electric power plant. The buildings to be used, as well as the dam, will be of reinforced concrete.

The Home Milling Company, Greenville, Ky., is installing machinery in a flour mill with a capacity of 75 bbls. a day. George E. Johnson is general manager.

C. P. Perin, New York, has organized the Kentenia Mining Company, which has leased the coal lands of the Kentenia Corporation in southeastern Kentucky. Charles H. Davis, New York, is president of the latter company, which has a capital stock of $10,000,000. Development work, which will require the purchase of a large amount of machinery, will begin in the near future.

The Fairbanks-Morse Company is installing two engines and two dynamos in the State Penitentiary at Eddyville. The engines have capacities of 125 and 225 hp., respectively.

An ice factory is to be established at Perryville, Ky., and a company for the purpose has been organized. C. E. Powell, W. V. Martin and W. J. De Baum are among those interested.

James P. Goodrich, Winchester, Ind., has purchased the electric-light plant at Mitchell, Ind., one of the conditions of the sale being that he install water-works system. Work in this direction is to begin at once.

The city of Anchorage, Ky., is contemplating the laying of water mains from Lakeland, Ky., to that point and the equipment of a pumping station. Addrss Eugene Straus.

Greeneville, Tenn., which was recently authorized to make a bond issue for improvement purposes, has in contemplation the erection of a hydro-electric power plant on the Molachucky River, five miles distant. Water is to be pumped into the town from a large spring a short distance away. Surveys are now being made.

The Chattanooga Iron & Wire Works, Chattanooga, Tenn., has been reorganized and dismissed from litigation in which it has been involved. It has a capital

THE MACHINERY MARKETS

stock of $25,000 and has the following officers: T. C. Green, president and treasurer; R. C. Lieb, sales manager, and J. E. Morelock, secretary.

The Georgia Power Company, which is planning the construction of a transmission line from Tullulah Falls, Ga., for the service of several cities in eastern Tennessee, announces that it expects to have its hydro-electric plant in operation by July 1, 1912.

R. B. Cassell and W. A. Rockwell, Harriman, Tenn., have purchases 4000 acres of timber land and have incorporated the Lone Mountain Company for the purpose of developing the property. The land has an outlet on the Queen & Crescent Railroad.

New knitting machinery is to be installed by the Rockwood Mills, Rockwood, Tenn. Power and woodworking machines for a box factory will also be required.

The Chattanooga & Tennessee River Power Company has about completed its plant on the Tennessee River, near Chattanooga, where it will develop 56,000 hp. The company plans to serve several cities, including Chattanooga, Huntsville and Stevenson.

New power equipment, in addition to shears, punches and other metal-working machinery, have been installed in the plant of the Gadsden Car Works, Gadsden, Ala., which will resume operations this week after a shut-down of a month. The plant is operated by the Queen & Crescent Railroad.

Four Georgia towns now have plans under way for the establishment of systems of water-works. They are Colquitt, Maysville, Flowery Branch and Zebulon.

The Anniston Electric & Gas Company is in the market for a boiler of large capacity. It is also planning the erection of an additional gas tank.

W. A. Guenther & Sons, Owensboro, Ky., are asking for prices on a 50-kw alternating-current generator.

The Guildford Foundry Company has filed articles of incorporation at Greensboro, N. C. George F. Newman, W. W. Smith and W. A. Cooke are the incorporators.

The Thomas Grate Bar Company, Birmingham, Ala., has purchased a plant and is preparing to secure equipment for the manufacture of grate bars.

The Morrison Frogless Switch Company has been incorporated at Birmingham, Ala., and will manufacture a patented railroad switch. H. W. Morrison is reported to be promoting the company.

A gas tank is to be erected by the Birmingham Railway, Light & Power Company, Birmingham, Ala.

Six turbine-driven generators will be purchased by the Birmingham Water, Light & Power Company, Birmingham, Ala., on Warrior River. The company plans to transmit electricity to several towns in the central Alabama district.

The Columbus Electric Company, Columbus, Ga., is floating a $1,000,000 loan, the proceeds of which are to be used in the construction of a new power-house with a capacity of 3000 kw. The lines of the company are to be extended to several neighboring communities. The Stone & Webster Engineering Corporation, Boston, is in charge of the improvements.

The Stephens Sub-Soil Plow Company has been organized at Little Rock, Ark., and will manufacture plows. It has $25,000 capital stock. H. W. Hennegin, W. A. Stephens and G. W. Hendricks are among those interested.

C. B. Morris is manager of the Noiseless Wheel & Truck Company, Cedartown, Ga., which is capitalized at $100,000. New buildings are to be erected at once, a site having been secured.

Chicago

CHICAGO, ILL., August 1, 1911.

The machinery business continues to be so inconsistent that a week of reasonable activity is usually followed by a like period of dullness. While a moderate volume of miscellaneous orders were received during the past week, no individual sales of note are reported Local machinery dealers and machinery supply interests gave considerable attention during the week to the railroad foremen in attendance here at the convention of the International Railway General Foremen's Association. Demonstrations of a number of recent machine tools were made.

The American works of the American Bridge Company at Chicago is to have a new boiler plant. The present boiler plant is antiquated and has been operated to a considerable extent from heating furnace waste heat. The number of boilers in the old plant in operation has been gradually cut down until but one has been on for some time. This has reduced the operations of the plant, and now when it is to be run more fully new boilers are required to be installed.

The Bull's Eye Mfg. Company, Chicago, has been incorporated with a capital stock of $15,000 as a general manufacturing and merchandise business. The incorporators are George A. Chitton, William T. Jones and L. Heislar.

The Industrial Engineering Company, Chicago, has been incorporated with a capital stock of $1,000 for the designing of machinery and special appliances. The incorporators are William Eichhoff, Herman Banzenmacher and Benjamin L. Matthews.

The Mechanical Machine & Tool Works, Chicago, has been incorporated for the manufacture of machinery, patterns and general hardware, with a capital stock of $6,000. Henry S. Jewell, F. L. Rissling and Fred C. Jewell are the incorporators.

The Mid-Western Car Supply Company Chicago, has been incorporated with a capital stock of $25,000 for the manufacture of railway material and supplies. The incorporators are G. A. Chritton, J. G. Anderson and R. A. Raymond, all of Chicago.

The Chicago Octagon Rotary Engine Company has been incorporated with a capital stock of $100,000. This company will engage in the manufacture of engines, pumps and accessories. Frederick J. Ratsch, Frank B. Echlin and George F. Leiger are the incorporators.

The capital stock of the Green Engineering Company, Chicago, has been increased from $300,000 to $500,000.

The Otis Elevator Company will move its Moline plant to Quincy and is preparing plans for the erection of an additional $50,000 building at that place to be 160 x 250 ft.

Harry M. Schriver, at the mayor's office, Rock Island, Ill., will receive bids for two boilers, in accordance with plans and specifications at that office.

The Bradley Polytechnic Institute, Peoria, Ill., is about to erect a power house to cost $25,000 and the building contracts are already placed.

The Allith-Prouty Company, which has arranged to locate at Danville, Ill., expect to begin the erection of its new factory buildings within a few weeks.

The Springfield Mattress Company, Springfield, Ill., will erect an addition to its plant to cost $24,000.

The United Cold Storage Company, Milwaukee, Wis., is planning to build a six-story warehouse, 140 x 150 ft., and an adjoining power house for refrigerating. An expenditure of several hundred thousand dollars is contemplated.

The Federal Engineering Company, Milwaukee, Wis., will erect a machine and blacksmith shop, to be one story and 60 x 150 ft., at Scott avenue and Thirty-sixth street.

City Engineer J. A. Mesiroff, Milwaukee, Wis., recommends the appropriation of $40,000 from the sewerage funds to build an electric plant at the refuse incinerator, to utilize the waste steam in operating the Milwaukee River and Kinnickkinnic River flushing tunnel pumping engines.

According to articles of incorporation filed by the LaPlant Tool Company, Marshalltown, Iowa, the company will manufacture implements and machinery of all kinds. The capital stock authorized is $25,000. The officers of the company are: President, G. W. LaPlant; vice-president, J. C. Williams; secretary, E. L. Williams; treasurer, J. J. McGuire.

A charter has been granted for the incorporation of the Collinsville Mill & Elevator Company, Collinsville, Okla., with a capital stock of $14,000.

The Hart-Parr Company, Charles City, Iowa, expects to add during the present summer a foundry to its plant.

The American Steel Tie Company, Salt Lake City, Utah, has been incorporated to manufacture a patented steel tie. The capital stock of the company is $100,000, and the officers are Joseph R. Murdock, president; John T. Clark, vice-president; J. W. Musser, secretary and treasurer.

W. C. Gibbs, at the office of the State Board of Control, Topeka, Kan., will receive bids covering two tubular boilers.

The Cole Motor Company, Indianapolis, has bought the ground upon which its present plant stands, and will build a four-story concrete and steel addition, 100 x 190 ft., to cost $60,000. In the past this company's operations have been confined to assembling automobiles, but in the future much of the machine work will be done for which new machinery will be required.

THE MACHINERY MARKETS

The Muncie Brass & Aluminum Castings Company has been organized at Muncie, Ind., and will occupy a part of the foundry of Patrick Murphy. J. E. Evans is the secretary and treasurer.

The city of Fort Wayne, Ind., is to build a new 4,000,000-gal. pumping station, plans for which are in the hands of J. F. King, architect.

Detroit

DETROIT, MICH., July 31, 1911.

The machinery market has been considerably more active this week than for some time past, and there is a very cheerful feeling, both among dealers and manufacturers. Automobile manufacturers are now beginning the production of their 1912 models and are placing orders for considerable new machinery equipment. The Ford Motor Company is actively in the market, and is reported to have placed some good-sized orders for machinery to be installed in the new additions now being erected at its plant. While the demand for special equipment continues to be relatively more brisk than for standard lines, still sales of the latter are picking up in a marked degree, and will probably continue to grow now that the fall season has really opened up. Dealers report a good volume of small orders, both in the small tools and heavier machinery, and that a good deal of business which has been pending for some time is now being closed up. Inquiries also are very encouraging. Several points in the State, notably Saginaw, are experiencing industrial booms, and traveling salesmen are bringing in good orders.

Reports from the mining centers in northern Michigan indicate that considerable activity is in evidence in the installation of new mining machinery and that a large amount of new work in the mines is being pushed. Many of the lumber companies which suffered losses during the recent forest fires are contemplating the erection of new sawmills, and a strong demand for equipment along this line is looked for. A good many Michigan counties are carrying out a good roads' programme this year, and considerable road-making machinery is being purchased in small lots. To summarize conditions, there seems to be general resumption of industrial activity in almost all lines, and the outlook for general business, both in Detroit and throughout the State, seems very bright indeed.

The Continental Motor Mfg. Company, Muskegon, Mich., has purchased a factory site embracing 25 acres in this city and will immediately begin the erection of a plant comprising eight buildings. There will be an assembling building, an administration building, a machine shop, a forge shop motor testing and heat-treating buildings and a power plant with a capacity of 1000 hp. The principal contract has been awarded to the Ferro Concrete Construction Company, Cincinnati, Ohio. The company does not intend to abandon the Muskegon plant, but will continue it as a branch factory. Detroit offices have been opened at 505 Ford Building.

A fire which nearly destroyed the Burtenshaw Building in this city caused losses to the Eelik Bros. Tool, Die & Stamping Works, Weber Vending Machine Company and Capewell Horsenail Company. Considerable machinery and equipment were damaged.

The Eckliff Automatic Boiler Company has been organized with a capital stock of $5,000 by James C. Eckliff and James R. Postal.

Following changes in the management of the Kelsey-Herbert Company, manufacturer of automobile bodies, the name of the company has been changed to the Herbert Mfg. Company.

The Midland Machine Company has filed articles of incorporation, giving its capital stock as $100,000. George L. Grimes is the principal stockholder.

The Detroit Oval Mfg. Company, manufacturer of picture frames, has increased its capital stock from $7,000 to $21,000.

The National Gas Water Heater Company has been incorporated with a capital stock of $25,000 by Joseph M. Madigan and Matthew Mayer, and will manufacture a gas heater of new design.

The National Motor Truck Company has been organized at Bay City, Mich., and has acquired a site of six acres, upon which buildings for its new plant will shortly be erected. The manufacturing building will be 60 x 208 ft. and three stories, the machine shop 50 x 60 ft. and the motor-test shop 60 x 80 ft., both one story. Henry B. Smith and Henry C. Finkenstaedt, president and secretary respectively of the new company, are also officers of the National Cycle & Mfg. Company, which will make the motors for the new trucks.

The Standard Oil Company will shortly commence construction work on a large storage plant at Alpena, Mich.

Fire destroyed the plant of the Northern Foundry Company, Alpena, Mich., last week, causing a loss of about $5,000. The foundry will be rebuilt at once.

The Standard Pure Food Company, Owosso, Mich., which recently suffered the loss of its plant by fire, has been reorganized under the name of the Standard Flaked Food Company. The construction of a new building for the company will be begun in the near future.

The Snyder & Fuller Furniture Mfg. Company, Grand Rapids, Mich., has filed notice of an increase of capital stock from $10,000 to $15,000.

The city of Flint, Mich., is planning the construction of a municipal filtration plant and accessory buildings in connection with the water-works system.

The Shaw-Walker Company, Muskegon, Mich., is making an addition to its plant, consisting of a machine shop and engine house 30 x 60 ft. and one story. Two new dry kilns, each 36 x 76 ft., are also being constructed.

The P. Ernewein Wagon Company, Muskegon, Mich., has under construction a new machine shop 33 x 83 ft.

The Board of Public Works of Escanaba, Mich., has awarded the contract for the construction of the new municipal gas plant to F. W. Freese, of Fort Wayne, Ind. The plant will cost approximately $25,000.

The Jackson, Mich., plant of the American Fork & Hoe Company, Cleveland, Ohio, will soon be enlarged by the addition of a new building 60 x 196 ft., three stories. The addition will be used as a machine shop and for electric welding and polishing departments. It is also stated that a new forge shop will be erected soon. The contract for the erection of the structure has been awarded to Crowell & Sherman, Cleveland.

The Owosso Mfg. Company, Owosso, Mich., manufacturer of screens and screening, is erecting a considerable addition to its plant.

Agnew & Ritchie, manufacturers of berry boxes, are contemplating the removal of their factory from Dowagiac, Mich., to Niles, Mich., with a view of increasing the capacity of their plant.

Hastings, Mich. has voted in favor of bonding for $120,000 for the erection of a municipal hydro-electric plant. It is expected that contracts for the construction of the plant will soon be awarded.

A. J. Randall, of Caro, Mich., is organizing a company for the purpose of developing a tract of coal land near that city.

The Escanaba Traction Company, Escanaba, Mich., is constructing a large power dam and pulp mill on the Escanaba River. Considerable equipment will be required.

The Owosso Canning Company, Owosso, Mich., has been incorporated with a capital stock of $40,000 and is rapidly getting the plant into shape for operation.

The Korff Mfg. Company, Lansing, Mich., manufacturers of metal specialties, has broken ground for a large addition to its factory, to provide for its rapidly increasing business. The new structure will be of brick construction 66 x 90 ft. and one story, and will house the company's oxidizing and plating department.

Construction has been begun on a large addition to the plant of the Estey Mfg. Company, Owosso, Mich. The new building will be about 64 x 80 ft. and four stories. Charles E. Ridgley, president of the company, reports an excellent volume of business and states that another and larger addition will probably be erected in the spring. The company is a large manufacturer of furniture.

It is announced that Niles, Mich., has been selected as a division terminal point by the Michigan Central Railroad Company. The company's shops, now located at Michigan City, Ind., will be moved there. A site has been secured and work on the erection of the shops will be commenced within the next thirty days.

St. Louis

ST. LOUIS, MO., July 31, 1911

The quietude which has been prevailing in the machine tool market continues, with no definite indications as to when there will be a change. The undertone of the market is good and the dealers believe that when the fall activities open up there will be a good deal

THE MACHINERY MARKETS

doing. They assume this from the tentative inquiries which have been received, but which have not assumed the characteristics of lists sent out for actual bids on equipment. Several local manufacturing concerns are known to be contemplating enlargement this fall.

The Ludlow Saylor Wire Company, St. Louis, has taken out a permit for the construction of a four-story addition to its factory, and will increase its equipment and capacity for the manufacture of all grades and classes of wire cloth by about 50 per cent.

The Bucyrus Lead & Zinc Mining Company, Joplin, Mo., has been incorporated with $60,000 capital stock and will put in a complete mining plant on its land near Joplin.

The Penton-Dowden Mfg. Company, Columbia, Mo., with $100,000 capital stock, has been incorporated by W. P. Dowden, E. E. Penton and E. E. Moreland.

The Excelsior Tool & Machine Company, East St. Louis, has been awarded the contract for supplying steel castings, bolts and nuts to the United States Government for the Panama Canal. It amounts to about $25,000.

The Widemann-St. Louis Cigar Box Mfg. Company, St. Louis, with $90,000 capital stock, has been incorporated to take over and consolidate the manufacturing business of three cigar box companies, the St. Louis Cigar Box Company, St. Louis; the J. J. Widemann Cigar Box Company, St. Louis, and the A. G. Widemann Cigar Box Company, Kansas City, Mo. A new factory will be built and equipped in St. Louis.

The American Compound Door Company, Chicago, Ill., is understood to be planning the erection of a branch plant in St. Louis.

J. W. Wright & Co., dealers in machinery, have leased new quarters in a building at 1221-1223 North Broadway, and will remove as soon as the building is completed. The company is now situated at 801 North Second street.

The St. Louis Truck & Mfg. Company has been incorporated with $50,000 capital stock by Frank G. Koehler, R. A. Koehler and George H. Martin to manufacture trunks. A plant will be equipped at once.

The Edgar Roberts Mfg. Company, with $130,000 capital stock, has been incorporated by Edgar Roberts, H. Converse and George Supernowski, and will establish a plant in St. Louis for the manufacture of drugs and chemicals.

The W. R. Colcord Machinery Company, 821 North Second street, will remove to 1225-27 North Broadway as soon as the building can be completed for its occupancy.

The F. Burkhart Mfg. Company, St. Louis, manufacturer of excelsior and upholsters' supplies, will remodel its present plant and build an addition, for which it has just purchased a plot of ground 150 x 310 ft. New machinery will be installed.

Eastern Canada

TORONTO, ONT., July 31, 1911.

The dissolution of Parliament, just announced, means that political excitement will run high for the next seven weeks. That and the work of harvesting the crops, which this year will occupy the attention of the farmers, bankers and railroad people more than in any former year, cannot but detract somewhat from the activities in factories and warehouses. Up to the present, business has been all that could be desired. The enactment of the Canadian reciprocity legislation at Washington has been followed by a large exportation of Canadian pulp and paper to the United States, the provisions of the act coming into immediate effect so far as pulp and paper made from Canadian wood not subject to export restrictions are concerned. The expectation that the measure would become law gave a great stimulus to the pulp and paper-making enterprise of Canada. Within the last month six pulp and paper companies have incorporated in Canada with a total capital stock of $11,500,000. There is every prospect that when the elections are over, and the crops are being marketed, Canada will have business activity in all lines far exceeding any it ever had before.

The ratepayers of Hamilton, Ont., voted on Tuesday on a by-law to spend $505,160 on the construction of a municipal power-distributing plant and to enter into a contract to take power from the Hydro-Electric Commission. The construction of the system will, it is expected, be begun early next year.

John M. Garland & Sons are putting up a seven-story warehouse in Ottawa.

The ratepayers of Ottawa are to vote, September 6, on a by-law to provide the installation of an electric booster system for supplying the high buildings with fire protection. The cost of this is to be $60,000. In Ottawa South $50,000 is to be expended on water works extension.

The National Bridge Company's works at Longue Pointe, Montreal, are to cost $100,000. N. A. Timmens is building a factory in Montreal to cost $64,000. The following other factory buildings and extensions are in progress in Montreal: Pierre Brault, rebuilding factory after fire, $35,000; A. Ramsay & Son Company, Ltd., paint factory, $27,000; J. C. McLaren Belting Company, factory, $17,000; St. Lawrence Flour Mills (3000 barrel) and elevator (350,000 bushels); Dominion Flour Mills (2000 barrel) and elevator, costing about $1,000,000 each; the Montreal Terra Cotta Lumber Company's plant, $150,000; James Strachan, bakery, $25,000; Stuart's, Ltd., bakery, $25,000; coal storage and handling plant for the Montreal Light, Heat & Power Company, $70,000; Canada Paint Factory, $16,000; United Shoe Machinery Company, factory, $195,000; die factory, J. Dupre, $25,000; Shawinigan Water & Power Company's power house, $60,000; Wind Mill Point, elevator for Grand Trunk Railway, $125,000.

Plans are being prepared for three sedimentation tanks for the town of North Toronto.

Up to August 12 tenders will be received by the Waterworks and Electrical Department, London, Ont., for the supplying of 3300 ft. of 18-in., 1600 ft. 12-in. and for 1000 ft. 12-in. c.i. pipe, with valves and special.

The city of Quebec will shortly issue a call for tenders for waterworks construction to cost $700,000. Five miles of cast-iron pipe will be required, including a 40-in. main. W. D. Baillarge is city engineer.

The city of Toronto has awarded to Miller, Cummings & Robertson, Toronto, the contract for the new water intake, to cost $259,900.

For the Grand Trunk Pacific Railway Company's roundhouse at Grand Falls, N. B., the supplies will cost about $100,000.

Dick & Son, Welland, Ont., have begun the construction at Niagara Falls, Ont., of an addition to the American Cyanide Company's plant.

The Gorton Pew Fish Company, Gloucester, Mass., is about to proceed with the construction of its projected fish dryer and cold storage plant at Louisburg, N. S.

The Town Council of Tillbury, Ont., will submit to the ratepayers a by-law providing for the granting of a $5,000 bonus to the W. C. Crawford Company, which is to build a factory.

Earl B Douglas, Allentown, Pa., is under contract to build a large wire mill for the Dominion Steel Company. The contract provides that he shall construct and operate a wire mill to cost not less than $1,500,000. The plant is to have a capacity of 400 tons of finished wire products a day. The company's decision to construct a wire mill is only one feature of a comprehensive plant whereby $15,000,000 is to be expended in improvements and enlargements in the next two years.

The Lachine Gas Company, Montreal, has just put in a 45-hp. gas engine of the Tangye type, made in Birmingham, England.

It is stated that the Nashwaak Lumber Company which is being organized in St. John, N. B., will be the Canadian branch of the Farnsworth & Jardine Company, Liverpool, England. It will take over the control of the Alexander Gibson Railway & Mfg. Company's lumber property in New Brunswick.

A by-law to raise $80,000 for enlarging the municipal power and light plant of Orillia, Ont., has been approved by the ratepayers.

Officials of the Shawinigan Water & Power Company expect to have its new transmission lines between Shawinigan and Montreal in place and to be delivering power in the latter city over its own right-of-way by October 1. This line, in emergency, could deliver up to 100,000 hp.

A storm July 24 blew down the building which the Page Hersey Company is putting up at Welland, Ont., for its galvanizing plant.

The Crown Plaster Company's gypsum mill at Lythmore, Ont., was completely destroyed by fire July 27. Loss, $75,000.

A contract has been signed between the Dominion Government and the Canadian Vickers, Ltd., Montreal, for the construction of a dry dock at Montreal and the payment of a subsidy by the government to the company. The dock is to be completed and ready for operation by December 31, 1913. It is to be a floating one, which will be built by Vickers Sons & Maxim, of

THE MACHINERY MARKETS

England, for the Canadian branch of the firm, of which F. O. Lewis is the head.

The Smith Mfg. Company, Toronto, Ont., manufacturer of cotton batting, glazed cotton wadding and shoddy, is erecting a new mill in that city to accommodate its increasing business.

The Lowe Bros. Company, Dayton, Ohio, manufacturer of paints and varnishes, is having plans prepared for a Canadian branch factory at Toronto, which will be operated by Lowe Bros. Company, Ltd. The plans call for a building five stories and basement, 40 x 140 ft.

The Montrose Paper Company, Thorold, Ont., is having plans completed for an addition to its manufacturing plant, which will be made this summer.

The Diamond Flint Company, Hamilton, Ont., will erect a one-story and basement factory, 150 x 300 ft., steel frame, concrete and tile, to cost $40,000. Considerable equipment will be required, including two glass furnaces.

The Pacific Coast

PORTLAND, ORE., July 25, 1911.

The machine tool business is of a scattering nature and comparatively quiet. Very few new orders for large tools have appeared, and while there is some demand for shop equipment of a general order, individual sales are of little importance. Some improvement in the line of small tools is expected within a few weeks, but so far there is no indication of any general movement of heavy equipment. General conditions, however, are encouraging. Grain crops in general through Oregon and Washington are in good shape, and unusually good returns are realized from the fruit crops, while there are some indications of revival in the lumber industry.

Most of the logging camps and mills along the Columbia River have resumed operations, and while some plants in other parts of the territory are still idle, there is a steady demand for both logging and woodworking machinery. A feature of this trade is the increase of electric and internal combustion power units, the latter finding a considerable field in connection with logging. Shops at Portland and Seattle, Wash., have had considerable marine work at this season, and numerous new inquiries of a small nature are coming out. The implement trade is well sustained in eastern Oregon, Washington and Idaho, and the demand for implements for the Orient is still a prominent feature, one of the largest shipments of the season having left Tacoma, Wash., last week.

The Holmes Machinery Company has been incorporated at Tacoma, Wash., with a capital stock of $20,000, by H. Hussey, H. J. Hill and others.

The General Machinery Company has been incorporated at Spokane, Wash., with a capital stock of $10,000, by E. Simons and Daniel Brown.

Thomas J. Shea has taken a contract for installing an oil-burning system in the Government dredge Clatsop.

Following the consolidation of the Seattle Steel Company and the rolling mill of the Pacific Hardware & Steel Company in this city with the Pacific Coast Steel Company, San Francisco, it is reported that the Portland plant is to be materially enlarged.

The St. John's Shipbuilding Company, Portland, has taken a contract for a large dredge hull for the Standard American Dredging Company, to be operated at Los Angeles harbor. The machinery will be installed at San Francisco.

The Kent-Marvin Company, operating a machine shop at Bellingham, Wash., has been incorporated with a capital stock of $12,000, by W. R. Marvin, C. E. and H. W. Kent.

A large Mershon resaw has been installed in the Weyerhaeuser Lumber Company's mill at Everett, Wash., and the Sumner Iron Works is installing a large steam engine in the same plant.

The Ebey Logging Company, operating near Arlington, Wash., is equipping all its engines and locomotives with oil burners.

The Great Northern Railway Company is putting up a new brick machine shop building in its yards at Everett, Wash.

The business of the Pacific Blow Pipe Company, Tacoma, Wash., has been purchased by A. Carlson and S. E. Young.

The Railway Equipment Company, Portland, has taken the agency for wire rope manufactured by the Trenton Iron Company, Trenton, N. J.

The Ferry-Baker lumber mill at Everett, Wash., has installed an Allis-Chalmers power outfit, including a 1000-kw. steam turbine generator and individual motors for various parts of the mill. A similar outfit is being installed for the Vancouver Lumber Company, Vancouver, B. C.

The Chehalis River Logging & Shingle Company is preparing to install a sawmill at Centralia, Wash.

New equipment will soon be required for the Gilt Edge Shingle Mill, Bellingham, Wash., which is preparing to rebuild the plant burned a few weeks ago.

The Northwestern Plow Mfg. Company has been incorporated at Spokane, Wash., with a capital stock of $200,000, by C. E. North, R. Peyton and others.

The S. P. Hicks Wire Rope Company, Seattle, Wash., is preparing to install equipment for the manufacture of wire rope on a large scale.

J. A. Sidney has been appointed trustee for the Henshaw-Bulkley Machinery Company, San Francisco. Announcement of the failure of this company was made some time ago.

The Globe Iron Works, Stockton, Cal., is about to move its plant to a site of eight acres at Sacramento, Cal. The new plant will include a foundry, machine shop, forge shop, car shop, pattern shop and storage, warehouse and office building. The buildings will be of steel and concrete construction and will be ready about January 1, 1912. The company will specialize on mine cars, centrifugal pumps, dredger machinery and power-transmission appliances in addition to doing a general foundry and machine business.

Western Canada

WINNIPEG, MAN., July 29, 1911.

The telegram received by the Minister of Labor at Ottawa yesterday from the president of the Western Coal Operators' Association to the effect that the latter would accept the recommendation of the Board of Investigation and Conciliation for the settlement of the strike, gives great satisfaction to all consumers of fuel in the prairie provinces, where the coal shortage was beginning to cause alarm. Another state of affairs that has become more cheering for the Westerners is the prospect for harvest labor. It looks now as if the field force would be sufficiently recruited from the United States and the United Kingdom. The crop reports grow brighter as the time for harvest approaches. The question of money is causing some uneasiness and until after the crop movement is in a forward state there is likely to be a shortage of funds for all but the most necessary business.

The contract for the installation of a waterworks system for Penticton, B. C., has been awarded to Macdougall & Co., Vancouver. The contract included the laying of 20 miles of steel and cast-iron pipe, and the construction of a reservoir, intake chambers, etc. The cost will be about $65,000.

The Canadian Mineral Rubber Company, Victoria, B. C., has installed part of the machinery for its new asphalting plant.

The municipality of Chilliwack, B. C., has under consideration the purchase of a cement pipe-making plant. T. B. Croly is the city engineer.

It is expected that tenders will soon be called for the construction of a bridge across the Columbia River at Trail, B. C. The Department of Public Works of British Columbia, Victoria, B. C., has the letting of the contract, which will amount to about $50,000.

Tenders are soon to be called by the Great Northern Railway Company for the construction of a wharf and freight shed at Vancouver, B. C., to cost $400,000.

A. G. Langley & Co., Vancouver, B. C., have received the contract to build the suspension bridge which the Provincial Government of British Columbia is putting over Churn Creek, in the Lilloet district of that province. The cost is to be about $80,000.

The contract for the addition to the New National Transcontinental Railway car shops at Transcona, near Winnipeg, will be awarded to Haney, Quinlan & Robertson, who are the lowest tenderers and the contractors for the first shop built. The contract price is $2,500,000 and the addition will be built to the north and west of the present structures and is to be finished within one year.

The City Commissioners of Edmonton, Alberta, awarded the order for a steam-driven centrifugal pump of 6,000,000 gal. daily capacity, to cost $18,000, to the Canadian Boring Company, Montreal, but as the company failed to comply with the guarantee terms the contract was given to the Moran Company, Seattle.

THE MACHINERY MARKETS

The B. C. Electric Railway Company has turned out a 30-ton freight locomotive from its shops at New Westminster, B. C.

The Canadian Northern Railway Company will send to its Port Mann terminal point in British Columbia locomotives built by the Canada Foundry Company, Toronto, costing about $300,000.

Texas

AUSTIN, TEX., July 29, 1911.

The splendid cotton prospects and other favorable crop conditions are stimulating business activity in various lines. If the present indications for an extraordinarily large cotton production are verified it is certain that Texas will enter upon a wonderful era of development and improvement this fall. Already tentative plans are under consideration for the inauguration of large industrial enterprises that will require big amounts of machinery. In New Mexico and Arizona there is an increasing demand for mining and irrigation machinery. Mexico is still an unsettled market for American machinery, but hopes are entertained that conditions in that country will soon improve.

Surveys are being made for the proposed extension of the irrigating canal system of the Harlingen Land & Water Company in the lower valley of the Rio Grande. The main canal will be extended five miles, and several miles of laterals will also be excavated. The work will be done by means of dredges.

The Commercial Club of Pecos is promoting the establishment there of a broom factory that will have a daily capacity of 100 dozen brooms and will give employment to 60 people.

The recent election held at Greenville resulted favorably on the proposition of issuing $85,000 of bonds for improvements to the water-works system. This amount will be added to the recent bond issue of $50,000 that was voted.

The Commercial Acid Company, St. Louis, Mo., will establish a large sulphur factory at Texarkana. It has acquired a site for the proposed plant.

The O'Neal Engineering Company, Dallas, has been awarded the contract by the City Council of Chillicothe for the construction of the new municipal water-works plant and distributing system.

Tucker & Newman are building a new cotton gin at Cleburne. Another cotton gin is also being equipped there by Winfield Scott, of Fort Worth.

The Magnolia Petroleum Company will install a large distributing plant at Amarillo. It has purchased the site for the proposed improvement.

An election of taxpayers of Paducah will be held on August 14 for the purpose of voting on the proposition of issuing $27,000 of bonds for the construction of a water-works plant and distributing system and $10,000 for street improvement. The city recently granted a franchise for the installation of an electric-light plant.

The City Council of Lubbock has let the contract for a complete sanitary sewer and water-works plant and distributing system to E. L. Dalton and Eugene Campbell, Dallas.

The Farmers' Gin Company is installing an electric-light plant at Stockdale.

H. D. Brown is promoting the establishment at El Campo of a peanut mill. There is a considerable acreage of peanuts being grown in this section this year.

The Commercial Club of Bryan is promoting a cotton-seed oil mill at that place. A syndicate of Eastern men has the proposition under consideration.

The Texas Central Railroad will install new machine shops at Cisco and will make other improvements to its property.

The City Council of Waco has under consideration the proposition of issuing $350,000 of bonds for improving the municipal water-works plant and distributing system.

Johnson & Morgan will build a large broom factory at San Marcos.

The Mexia Light, Water & Sewerage Company is preparing to install additional machinery in its lighting plant at Mexia.

H. A. Smith has prepared plans for the construction of a large dam across a deep canyon near Noria, State of Sonora, Mexico, and the installation of a hydro-electric plant. This plant will have a capacity of about 1000 hp. and the electrical energy will be transmitted to the mines and smelters in that section. The dam will be 150 ft. high and from 15 to 100 ft. wide. Besides providing power for the hydro-electric plant it will give a water supply for irrigating about 15,000 acres of land.

C. M. Dollins and associates have organized the Farmers' Electric, Gin & Ice Company, which will build a large cotton gin and ice factory at Greenville.

Charles Jones is arranging to construct a 15-ft. dam across the Colorado River near Delvalle, near Austin, and to install an irrigation system that will water about 8000 acres of land.

R. B. Batton, of El Paso, and associates, who own a large marble deposit in the Portrillo Mountains near Las Cruces, N. M., will install a stone-cutting and quarry plant to cost $250,000.

The Southern Steel Products Company has been organized at Dallas. The incorporators are C. H. Marguess, Owen Hughes and W. E. Wethered.

The Farmers' & Merchants' Gin Company has been formed at Sherman, with a capital stock of $10,000. The incorporators are George F. Murphy, W. R. Brents and Edward Kidd.

W. M. Reed, district engineer of the United States Reclamation Service, has prepared specifications and will soon advertise for bids for the installation of steam-heating plants in the Government building at the site of the Elephant Butte dam in New Mexico. Bids will be opened at Elephant Butte August 15.

The Compania Jabonera of Torreon, Mexico, which recently increased its capital stock from $1,500,000 to $2,000,000, will install a large amount of additional machinery for the purpose of enlarging the capacity of the plant.

Government Purchases

WASHINGTON, D. C., July 31, 1911.

The Bureau of Yards and Docks, Navy Department, Washington, will open bids August 12 for one 14-in. suction dredge with a capacity of not less than 100 cu. yds. of mud or sand per hour. The machinery shall be electrically operated by three-phase 60-cyle 220-volt induction motors.

The United States Engineer's Office, Portland, Ore., will open bids September 6 for one steel seagoing suction dredge.

The Commissioners of the District of Columbia, Washington, opened bids July 24 for replacing two condemned boilers in the Eastern High School, as follows: G. W. Forsberg, Washington, $1,694; Eubank Bros., Washington, $2,075; Coberth, Haines & White Company, $1,427.64; A. D. Granger Company, New York, $2,668; J. E. Hurley, Washington, $1,570.

The Bureau of Supplies and Accounts, Navy Department, Washington, opened bids July 25 for material and supplies for the navy yards, as follows:

Schedule 3748, Class 21—One centrifugal sand mixing machine—Bidder 74, Federal Foundry & Supply Company, Cleveland, Ohio, $325 and $425; 134, Manning, Maxwell & Moore, New York, $164 and $174; 179, J. W. Pascoe Company, Philadelphia, Pa., $380; 199, William Sellers, Philadelphia, Pa., $380.

Class 22—Three small pneumatic tripod sand shakers—Bidder 74, Federal Foundry & Supply Company, Cleveland, Ohio, $60; 96, Hanna Engraving Works, Chicago, Ill., $60.75; 103, International Steam Pump Company, New York, $62.50; 134, Manning, Maxwell & Moore, New York, $58.50; 165, S. Obermayer Company, Cincinnati, Ohio, $60; 242, Drew Machinery Agency, Manchester, N. H., $60.

Class 23—One core-making machine—Bidder 74, Federal Foundry & Supply Company, Cleveland, Ohio, $144; 165, S. Obermayer Company, Cincinnati, Ohio, $165; 233, Wadsworth Core Machine & Equipment Company, Akron, Ohio, $144; 242, Drew Machinery Agency, Manchester, N. H., $165.

Schedule 3738, Class 121—Six motor generators and six spare parts for Boston, Brooklyn, Mare Island and Puget Sound—Bidder 31, Crocker-Wheeler Company, Ampere, N. J., units; 58, Diehl Mfg. Company, Elizabethport, N. J., $2,244; 77, Fort Wayne Electric Works, Fort Wayne, Ind., $1,903.50; 91, Holtzer-Cabot Electric Company, Brookline, Mass., $2,549.88.

British Columbian Mining in 1910.—The annual report of the Minister of Mines of the province of British Columbia for the year ending December 31, 1910, has been received, being an account of mining operations for gold, coal, etc. The production of coal was 3,139,235 gross tons, the greatest in the history of the Province; of gold, $540,000; of silver, 2,450,241 oz.; of lead, 34,658,746 lbs.; of copper, 38,243,934 lbs., a decrease of over 7,350,000 lbs. as compared to 1909, and of zinc, 4,184,192 lbs. No iron ore was mined. A sketch map showing mining divisions in colors is included.

Current Metal Prices.

The following quotations are for small lots, New York. Wholesale prices, at which large lots only can be bought, are given elsewhere in our weekly market report

IRON AND STEEL—

Bar Iron from Store—

Refined iron.
1 to 1½ in. round and square ..... ₤ lb 1.70¢
1½ to 4 in. x ⅝ to 1 in. ..... ₤ lb 1.70¢
1½ to 4 in. x ¾ to 6-4 ..... ₤ lb 1.80¢
Rods, ⅜ in. and 11-16 round and square ₤ lb 1.80¢

	Cts ₤ lb
Angles.	
¼ in. x ½ in. and larger	1.90
⅜ in. x ⅜ in. and ½ in. x ½ in.	1.90
1½ to 2½ in. x ⅝ in.	1.65
1½ to 2½ in. x 5-16 in. and thicker	1.65
1 to 1¼ in. x ⅜ in.	1.70
1 to 1¼ in. x ½ in.	1.70
⅝ x ⅝ in.	2.00
¾ x ¾ in.	1.90
1 x 1 in.	1.75
⅛ in. x ⅛ in.	3.00
¼ x 3-32 in.	3.00
Flats.	
1 in.	2.25
1¼ in.	2.20
1½ to 2½ x ¼ in.	2.00
1½ to 2½ x 5-16 in.	2.10
⅜ in. and larger	2.05
Bands	1.90
Clinkers, ⅜ in. and larger	1.90
Binns, 10, to 6 x 6-10 to No. 8	2.10
Burden's "H. B. & S." iron base price	2.95
Burden's "Best" iron base price	3.15
Norway bars	3.60

Merchant Steel from Store—

	per lb
Bessemer machinery	1.90¢
Tire, sk. tire and Scotch shoe	2.50@3.00¢
Best cast steel, base price in small lots	7¢

Sheets from Store—

Black

	One pass, soft steel.	C.R. cleaned	R G
No. 16	₤ lb 2.45¢	2.55¢	
Nos. 18 to 20	₤ lb 2.50¢	2.85¢	
Nos. 22 and 24	₤ lb 2.55¢	2.95¢	
No. 26	₤ lb 2.60¢	3.05¢	
No. 28	₤ lb 2.95¢	3.30¢	

Russia, Planished &c.

Genuine Russia, according to assortment ₤ lb 12 @14½
Patent planished, W. Dewees Wood ₤ lb A, 10¢; B, 9¢ net

Galvanized

Nos. 12 and 14	₤ lb 2.75¢
No. 24	₤ lb 3.10¢
No. 26	₤ lb 3.30¢
No. 28	₤ lb 3.60¢

No. 20 and lighter 36 inches wide, 25¢ higher.

Genuine Iron Sheets—

Galvanized

Nos. 22 and 24	₤ lb 5.50
No. 26	₤ lb 6.00
No. 28	₤ lb 7.00

Corrugated Roofing—

	Painted.	Galvd.
2½ in. corrugated		
No. 24 ₤ 100 sq. ft.	$3.75	$4.50
No. 26 ₤ 100 sq. ft.	2.85	3.50
No. 28 ₤ 100 sq. ft.	2.50	3.05

Tin Plates—

American Charcoal Plates (per box)

"A A A" charcoal.	
IC, 14 x 20	$6.65
IX, 14 x 20	7.90
A. charcoal.	
IC, 14 x 20	5.60
IX, 14 x 20	5.70

American Coke Plates—Bessemer—

IC, 14 x 20 ..107 lb.	$4.50
IX, 14 x 20	5.50

American Terne Plates—

IC, 20 x 28 with an 8 lb. coating	$8.70
IX, 20 x 28 with an 8 lb. coating	10.70

Seamless Brass Tubes—

Last November 13, 1908. Base price, 18¢

Brass Tubes, Iron Pipe Sizes—

Last November 13, 1908. Base price, 18¢

Copper Tubes—

Last November 13, 1908. Base price, 21¢

Brazed Brass Tubes—

Last February 1, 1911. 19½¢ ₤ lb

High Brass Rods—

Last February 1, 1911. 14¾¢ ₤ lb

Roll and Sheet Brass—

Last February 1, 1911. 14¾¢ ₤ lb

Brass Wire—

Last February 1, 1911. 14¾¢ ₤ lb

Copper Wire—

Base price. Carload lots mill 14¢

Copper Sheets—

Sheet copper hot rolled, 16 oz. (quantity lots) ₤ lb 18¢
Sheet copper cold rolled, 1c ₤ lb advance over hot rolled.
Sheet copper polished 20 in. wide and under, 1c ₤ square foot.
Sheet copper polished over 20 in. wide, 2c ₤ square foot.
Planished copper, 1c ₤ square foot more than polished.

METALS—

Tin—

Straits pig ₤ lb 46 @47 ¢

Copper—

Lake ingot ₤ lb 14 @14¼¢
Electrolytic ₤ lb 13½@14 ¢
Casting ₤ lb 13½@14 ¢

Spelter—

Western ₤ lb 6¾@ 7 ¢

Zinc—

No. 9, base, casks ₤ lb 8¢ Open.. ₤ lb 8½¢

Lead—

American pig ₤ lb 5½@5¾¢
Bar ₤ lb 6¾@6¾¢

Solder—

½ & ½, guaranteed ₤ lb 28½@28¾¢
No. 1 ₤ lb 26½@26¾¢
Refined ₤ lb 24½@25½¢
Prices of solder indicated by private brand vary according to composition

Antimony—

Cookson ₤ lb. @ 9¾¢
Hallets @10 ¢
Other brands 9@9½¢

Bismuth—

Per lb $2.00@$2.25

Aluminum—

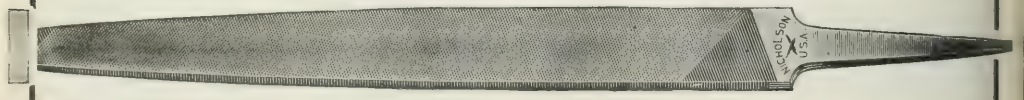
No. 1 aluminum (guaranteed over 99% pure) in ingots for remelting 21¢ and 22¢
Rods and Wire Base price 31¢
Sheets Base price 33¢

Old Metals—

Dealers' Purchasing Prices Paid in New York.

	Cents.
Copper, heavy and crucible	10.75 to 11.00
Copper, heavy and wire	10.50 to 10.75
Copper, light and bottoms	9.50 to 9.75
Brass, heavy	7.25 to 7.50
Brass, light	5.75 to 6.00
Heavy machine composition	9.25 to 9.50
Clean brass turnings	7.00 to 7.25
Composition turnings	8.00 to 8.25
Lead, heavy	3.75
Lead, tea	3.50
Zinc, scrap	4.00

NICHOLSON U.S.A. **Honesty Is The Best Policy Even In a FILE** NICHOLSON U.S.A.



YOU WILL ALWAYS FIND THE NICHOLSON HONEST ALL THROUGH. IT HAS WON ITS FAMOUS REPUTATION BECAUSE OF ITS KEEN, SHARP BITE AND LASTING QUALITIES

ASK FOR CATALOG ASK FOR FILE FILOSOPHY

Nicholson File Company, Providence, R. I.

THE IRON AGE

Established 1855 — New York, August 10, 1911 — Vol. 88: No. 6

Published Every Thursday by the
DAVID WILLIAMS COMPANY
239 West 39th Street, New York

Entered at the New York Post Office as Second Class Mail Matter.

Subscription Price, United States and Mexico, $5.00 per Annum; to Canada, $7.50 per Annum; to Other Foreign Countries, $10.00 per Annum. Unless receipt is requested, none will be sent. Credit for payment will be shown by extending the date on the wrapper of your paper.

W. H. Taylor, - - - - - President and Treasurer
I. A. Mekeel, - - - - - - - First Vice-President
Harold S. Buttenheim, - - - - Second Vice-President and Secretary

Geo. W. Cope, - - - - }
A. I. Findley, - - - - } Editors
W. W. Macon, - - - - }

M. C. Robbins, - - - - Manager
Charles S. Baur, - - - Assistant Manager

Branch Offices

Philadelphia, Real Estate Trust Building
Pittsburgh, Park Bulding
Boston, Compton Building
Chicago, Fisher Building
Cleveland, American Trust Building
Cincinnati, 807 Andrews Building

CONTENTS.

Steel Production Increasing 295
Relative Tonnages of Finished Products 296
Correspondence 297
The Industrial Campaign Against Sickness 297
Ventilation in Factory Heating 297
Railroad Equipment Orders 298
Death of John W. Gates 298
Obituary 299
July Pig Iron Production 300
The Lake Superior Mining Institute 301
The Iron and Metal Markets 302
The Steel Corporation Investigation 313
A Scottish Tube Works Consolidation 317
June Iron and Steel Exports and Imports 317
New Officers of Westinghouse Electric & Mfg. Company 318
July Copper Production and Stocks 318
Labor Notes 318
Personal 319
New Scheme for Storing Exhaust Steam 319
Pig Iron Cost at One Southern Plant 319
Production of Pig Iron in the United States in the First Six Months of 1911 320
A Special Coal Handling Crane 321
The General Refractories Company 323
Another Italian Steel Combination 323
The Wire and Horseshoe Pool Cases 323
Papers on Fuel Oil 323
Acid and Basic Open-Hearth Steel 324
Nickel Steel 326
A Grinder for Planer Cutters 327
The Knight Gasoline Engine 328
New Thomson Electric Welder 329
Pattern Handling in a Steel Foundry 330
The Newton Combination Portable Boring, Drilling and Milling Machine 331
Minnesota Steel Company Blast Furnaces 331
A Replaceable Unit Electric Furnace 332
Growth of Engineering Societies 332
New Model of O'Kelly Speed-Reducing Gear 333
The Corona Drill Socket 333
A Corporation Recipe 333
The Caterpillar Traction Engine 334
An Electrically Operated Stop Valve 335
Official List of Machine Tool Builders 335
New Brace Miller 336
Hours and Wages in the Iron Industry 336
The Machinery Markets 337
Government Purchases 345
Judicial Decisions of Interest to Manufacturers 345

Steel Production Increasing

A Gain in Unfilled Orders

Merchant Pig Iron Stocks and Output Reduced

While the market for steel products cannot be called active, the fact remains that the large steel companies, with perhaps one or two exceptions, are operating a larger percentage of finishing capacity than at any time this year. The Steel Corporation, which, as already intimated, may be doing a little better than some of its competitors, is now producing ingots at an 80 per cent. rate. Its shipments and new orders in July exceeded those for any other month of the year and it is expected that the tonnage statement of August 1, to be published August 10, will show a net gain of 250,000 tons in orders on the books.

Our pig iron statistics show that the July production, apart from charcoal iron, was 1,793,068 gross tons or 57,841 tons a day, against 1,787,566 tons, or 59,585 tons a day, in June. The banking of many furnaces on both July 3 and 4 accounts for the falling off last month. Thus August, with daily active capacity of 59,990 tons at the opening of the month, against 59,979 tons on July 1, should show a considerable gain over last month.

Standing alone the figures do not give the real story of what is going on in pig iron. It needs to be said that while 197 furnaces were active August 1, or 1 less than on July 1, the list of steel works furnaces in blast made a net gain of 5 in the month, while the merchant list had a net loss of 6. Merchant stocks were reduced in eastern Pennsylvania, Virginia, the South and in most other districts last month, so that the situation in foundry iron is veering toward the seller's side.

The firmer attitude of Southern furnaces has resulted in an advance of 25c. in some markets on deliveries running through the year, though the $10 price for prompt shipment has not entirely disappeared.

In the central West the chief transaction was the buying of 12,400 tons by a large Pittsburgh interest for its foundries in the Pittsburgh and Cleveland districts. The prices reported were on a Valley basis of $13.50 for No. 2 for the last quarter of this year, and $13.75 for the first quarter of 1912.

The position of Eastern pig iron producers has stiffened in view of declining stocks and production both in Virginia and eastern Pennsylvania. Some sales from both districts have been made to pipe makers, who are ready to take more if it can be had at recent prices, but sellers are not anxious for such business. As a rule, also, they are staving off inquiry for 1912, which is occasional and scant.

Some business has been done in basic in the East and at Pittsburgh. A sale of 10,000 tons was made to a foundry in the Shenango Valley at $13 delivered, the freight being 40c., but $13 is now regarded as

the Valley price. An Eastern steel company is sounding the market on 25,000 tons of basic iron for the first quarter, but sellers will not consider $15 delivered.

A 2000-ton sale of ferromanganese has just been made at $37, Baltimore, delivery through most of 1912, and a 500-ton inquiry is pending. The total movement in recent weeks, including the tonnage closed before the advance in price, is put at 6000 to 8000 tons.

An inquiry for 5000 tons of billets for a railroad supply company has come up in the East and may at least serve to test that market.

Railroads continue to succeed well in deferring car and rail buying. The Atlantic Coast Line has placed 1000 cars and various inquiries are still out on 12,000 to 14,000 freight cars. One sale of 20,000 tons of rails was virtually closed this week.

The structural situation is more promising. In New York 16,000 tons of steel for the subway extension has been closed on the Bradley contracts. For the Filene Building at Boston 6000 to 8000 tons will be required. The Point bridge at Pittsburgh, 5000 to 7000 tons, will probably be let this month. For several Western roads 3000 tons of bridge work has been taken at Pittsburgh.

In metals the features are the more favorable showing of the copper statistics, the more marked shortage in pig tin, resulting in a premium of ¾c. on sales of spot in New York, and the advance in spelter to 6c., New York, the high point of the year.

Relative Tonnages of Finished Products

It is often remarked that since 1907 the railroads have been very light buyers of iron and steel products and that in consequence the distribution of tonnage among the different rolled forms has been materially altered. A study of the detailed statistics for 1910, which have become available in the past fortnight, supports this conclusion only in slight degree. While it is undoubtedly true that since 1907 the railroads have taken a much smaller proportion of the total product of the iron and steel industry than they did in the years of heavy expansion, 1905-6-7, the distribution of the tonnage among the different rolled products has not greatly altered. There have been, however, a number of cross currents of considerable interest.

One may well take the year 1906 as representing the crest of the wave of railroad demand. There had been heavy buying of rails, cars and locomotives in 1905, and this buying continued through 1906, while buying in that year was very heavy. In 1907 buying was not so heavy but orders were still being filled, as the mills entered the year with much rail tonnage booked and the car and locomotive shops were very well filled with orders. Comparing the years 1906 and 1910, the percentages work out as shown in the table herewith. This covers the total of rolled iron and steel, weighed, generally speaking, in the form in which it left the last hot rolling, so that structural shapes are represented rather than finished structural work, black plates for tinning rather than tin plate, rolled forging blooms and billets rather than finished forgings, rods rather than rod billets or drawn wire, skelp rather than pipe, and so on.

Of the total of rolled material in 1906, 11.2 per cent. was rolled iron and 88.8 per cent. rolled steel. In 1910 8.1 per cent. was rolled iron and 91.9 per cent. rolled steel. There was an increase in total rolled iron and steel from 1906 to 1910 of 11.1 per cent., there being an absolute as well as a relative decrease in the tonnage of rolled iron.

Production of Rolled Iron and Steel, Gross Tons and Relative Percentages.

	1906		1910	
	Tonnage.	Per cent.	Tonnage.	Per cent.
Rails	3,977,887	20.4	3,636,031	16.8
Structural shapes	2,118,772	10.8	2,266,890	10.5
Plates	2,531,552	13.0	2,807,728	13.0
Sheets	1,074,325	5.5	1,435,619	6.7
Black plates	576,079	2.9	712,137	3.3
Nail plate	54,211	.3	45,294	.2
Wire rods	1,871,614	9.5	2,241,830	10.3
Forging blooms, etc	206,110	1.0	459,933	2.1
Merchant bars	3,992,200	20.4	3,785,731	17.6
Reinforcing bars	.....*	...	241,109	1.1
Skelp, flue, etc	1,528,585	7.8	1,828,194	8.5
Splice bars	224,911	1.1	223,022	1.0
Hoops	172,332	.9	262,214	1.2
Bands and cotton ties	408,018	2.1	424,979	2.0
Sheet piling	.....†	...	26,598	.1
Railroad ties	.....†	...	49,048	.2
All other	851,672	4.3	1,174,922	5.4
Total	19,588,468	100.0	21,621,279	100.0

*Included in merchant bars.
†Included in structural.

From the increase in the total in the four years it follows that any line which showed unchanged percentage in the two years compared increased its tonnage by 11.1 per cent. Comparing the percentages, as shown in our table, it appears that rails dropped from 20.4 to 16.8 per cent., decreasing absolutely as well as relatively. This loss has been generally recognized. The railroads were wearing out rails faster in 1909 and 1910 than in 1906, because freight traffic increased slightly, and the laying of new track showed no decrease, but in 1906 there was considerable replacement of old light rails with modern heavy sections, calculated to bear the much heavier trains and greater speeds involved, as compared with conditions when the light rails had been laid many years earlier, and it is this which has made the decrease in tonnage.

Structural shapes apparently decreased from 10.8 per cent. in 1906 to 10.5 per cent. in 1910, but in the latter year sheet piling, one-tenth of 1 per cent., and railroad ties, two-tenths of 1 per cent., were separated, whereas in 1906 they were included with structural shapes. If those percentages be added for 1910 the proportion of structural shapes is found unchanged, so that there was an increase in tonnage substantially the same as the increase in all rolled steel from 1906 to 1910.

Plates are found to be unaltered in proportion, while both sheets and black plates for tinning show a material increase in the proportion. Rods show an increased percentage. It is of interest here to note that the 1910 rod tonnage was less than the 1909 rod tonnage, whereas the total rolled iron and steel increased from 1909 to 1910. Accordingly, rods showed a still larger percentage of the total in 1909 than in 1910, even though 1910 shows a material gain over 1909.

Contrary, perhaps, to what is usually assumed, merchant bars have shown a relative decrease. In 1906 concrete reinforcing bars were included with merchant bars, while in 1910 they were segregated. In 1910 the proportion of merchant bars alone was 17.6 per cent. and of concrete reinforcing bars 1.1 per cent., the total being 18.7 per cent., which compares with 20.4 per cent. in 1906. Skelp shows a slightly increased proportion, splice bars a slight decrease, quite natural considering the decrease in rails, while hoops show a slight increase and bands and cotton ties a slight decrease.

On the whole, there have been no decreases in the proportions worth mentioning, except in rails and merchant bars. The losses in these lines have been made up by increases in sheets and black plates, rods and skelp, other lines being practically unchanged.

The Industrial Campaign Against Sickness

The British government, under its proposed national insurance act, plans to carry out a universal campaign against sickness, doing in a thoroughly organized manner what many American manufacturers have been accomplishing as individuals. The act will establish in every county a local health committee, the duty of which will be to carry on a campaign of education through lectures and publications on hygienic topics, and also to exercise a general supervision over sanitary conditions as they exist in the various communities. Medical attendance in sickness for the entire body of the working classes will be provided. At present a very large number of these people enjoy this benefit through membership in the so-called friendly societies, which have their counterpart in a great many industrial establishments in this country, but a very large class exists outside of such associations. Free medical treatment, which may be compulsory, should play no inconspicuous part in increasing efficiency through minimizing the percentage of producers who are incapacitated.

Especially important is the provision which has to do with tuberculosis. Millions of dollars a year will be set aside for the maintenance of sanatoria where cases of consumption will be isolated and the victims treated, in many cases successfully, no doubt, which will be in sharp contrast to the impossible conditions which usually surround them at the present time.

The movement against tuberculosis in American factories has made enormous progress since its inception a few years ago. From a beginning in a few cities it has spread all over the country. Though by no means universal, the promise is that it will be practically so even without the assistance of governmental compulsion. In hundreds of large establishments free expert medical examination is given in every case where suspicion of the disease exists. If the individual manifests unwillingness to submit to the examination, he is generally compelled to follow the rule on penalty of dismissal. When the disease is found the effort is made to place the patient where recovery may be hoped for. If there is a sanatorium in the territory the means are usually provided for placing the patient there, and, at least, outdoor employment is substituted for that within the shop, to the probable improvement of the victim and the freedom from contagion on the part of his associates in the works.

The most essential element in combating disease is striking at its inception by making conditions sanitary in every possible way. The strides taken toward this end have been almost unbelievable. One has to go back but a few years to see almost the opposite extreme, that of indifference and ignorance as to means of maintaining the health of working people. Ventilation, lighting, plumbing, the handling of dangerous gases and materials, all these and other elements of sanitation were given hardly a thought. Coupled with wise laws compelling the enforcement of sanitary regulations, the enlightenment of employers has been rapid, one may say spontaneous. The motive is a dual one. Most owners feel an increasing responsibility toward their employees, but they also realize more thoroughly than of yore that working people can produce much more efficiently in surroundings that are conducive to good health and good spirits.

Ventilation in Factory Heating

The widespread use of the fan system of factory heating has doubtless often suggested that it was selected for its seeming potentialities in ventilation. As a matter of fact the ventilating feature has been a secondary consideration, heating by the circulation of air proving attractive from the standpoints of first cost and of satisfactory performance. It is not uncommon to find such heating systems arranged to accept air from the shop interior, this air to be forced by the fan through the distributing duct system over and over again. The premeditated attempt to circulate the air within the shop has undoubtedly caused many a shock to students of the humanitarian side of shop conditions. It has its parallel in the housewife who is very much exercised on one's suggesting a recirculation of air even for a part of the time in a warm-air furnace heating system and who is yet not concerned if a room is warmed by means of direct radiators without apparent means for the replenishment of the air.

It is reasonable to believe that ventilation may be defined before long, in terms not of the pure air supplied per indiviual or per unit of time, but of capacity to maintain a freshness of indoor atmosphere and thus a condition of atmosphere calculated to make the subject comfortable. It is obvious that this means that the temperature shall not be so low that one is chilly nor so high that he is overheated; that there shall be a water vapor content not so low as to superinduce excessive evaporation from the skin nor so high as to interfere with the evaporation necessary to dissipate the heat developed by the human body. To these desirable requirements has lately been added the notion that freshness is obtainable by movement or currents of air and is not realized with air in a stagnant condition, no matter how well the temperature and humidity limitations are met. Naturally, air contaminated with disease germs or with odors of a disagreeable sort is not to be permitted. But if the manufacturing processes do not develop obnoxious odors, if the workers are not excessively crowded, if the general conditions are attractive and if there is abundant sunlight illumination, propagation of disease is minimized notwithstanding recirculation; and there is the added feature that the fan system permits of maintaining temperature and humidity and of providing the degree of freshness regarded so important.

Of course, it must always be recognized that building materials have a high degree of porosity, particularly those used for industrial works, and there is always a large dilution of indoor air by leakage. It may be added that where conditions are unusually trying it is possible to install filtering arrangements, such as air washers, which may be made to catch bacterial and dust impurities and control humidity. In short, if the present knowledge of the subject shows anything, it is that the recirculating system is nothing to be feared.

Correspondence

Bonuses and the Location of Industries

TO THE EDITOR: Your editorial "Two Problems of Factory Building" in the August 3 number of *The Iron Age* is exactly right. You are not laying down an "extreme ruling" when you say that the only thing to be considered in choosing the site of a manufacturing enter-

prise is its adaptability to the enterprise, all things considered, regardless of so-called inducements. Of course, as between two or more cities where all other things are equal, such as proximity to raw materials and selling markets, transportation facilities, labor supply, banking accommodations and residential advantages, the enjoyment of a free site, or a building, tax exemptions or the like, would be influential; but that does not in the slightest degree alter the principle which you lay down, because in such cases the "inducements" do not displace the more essential factors.

Commercial secretaries of experience almost without exception agree unqualifiedly with your proposition. The American Association of Commercial Executives in its convention at Grand Rapids, Mich., last October debated a resolution condemning the giving of bonuses and, to the extent that it expressed the personal convictions of the members present, it was adopted without a dissenting vote. The association has a standing committee whose duty is to promote the adoption of a uniform policy for all commercial organizations upon this matter.

Leaving out companies promoted either by their originators or, more frequently, by professional business brokers, for the sole purpose of obtaining a bonus (and the number of such is vastly greater than is suspected by the average man who is not directly connected with town development work), the concern whose originators can be induced to choose a location solely or largely by gratuities is on the road to quick disaster. That sort of judgment is not of the caliber required for business success. Indeed, most of these enterprises are undertaken by men of so little experience in administration that they are apt to make no inquiries whatever about freight rates and other fundamental and essential factors. Any commercial secretary's files are full of letters (if he encumbers his files with them at all) in which the only query is, "How much will you give us?" without a question for information about commercial possibilities.

On the other hand there is similar inexperience or lack of judgment on the part of the town boomers. The bonuses are offered in every instance by town booming organizations which are very new and very short-sighted and which are totally ignorant of the experience of other localities and of the true principles of industrial expansion. Neither do they realize that nothing on earth makes citizens "sore on the town" and discourages them from lending proper encouragement to a legitimate enterprise like an empty factory building or two standing as a constant witness to ill-advised attempts at booming. Such organizations are the prey of the professional business brokers. Better have no factories at all and remain a rural community than to be a rural town with a few gaping buildings and smokeless stacks cluttering up the landscape.

ERNEST H. ROWE,
Secretary, Chamber of Commerce.
Uniontown, Pa., August 4, 1911.

Railroad Equipment Orders.—Contracts for cars and locomotives have recently been placed as follows: The Grand Trunk, 10 compound consolidation locomotives; Chilean State Railways, 288 freight cars; Havana Central, 360 60-ton box cars. There are inquiries in the market for 100 refrigerator cars for the Atlantic Seaboard Dispatch; 15 consolidation and 5 switching locomotives for the Wabash; 25 steel underframe coaches and 25 express cars for the Grand Trunk and 1,000 box cars, 500 stock cars and 400 automobile cars for the Missouri Pacific.

The new furnace testing laboratory of the Electric Furnace Company, Alliance, Ohio, will be completed about August 15. The building is located on a tract of land secured from the Stark Electric Railroad Company, near Alliance, and power for testing purposes will be received direct from the railroad company's busbars. The plant will be supplied with a 200 k.v.a. Westinghouse special regulating transformer, a complete set of electrical recording and indicating instruments, pyrometers for temperature determinations, a small chemical laboratory, and equipment for microscopic examination of metals. The Electric Furnace Company has developed a line of electric heating furnaces for forge shops and similar plants, and the new laboratory is to enable it to test new types of furnaces that are being called for.

Death of John W. Gates

After battling for weeks against a serious complication of diseases which at the last developed pneumonia, John W. Gates died in Paris early Wednesday morning, August 9. A strong constitution and his courageous resistance, backed by every resource of medical science, prolonged his life for days after his case had been considered critical. His death removes one of the most prominent figures in the American iron and steel trade of the past 25 years. The fields of his operations have been much broader than the iron industry, but it was in the latter and particularly in that branch of it taking in all forms of wire manufacture that his influence was most conspicuous. As is well known, Mr. Gates was also a figure of national importance in railroad and security operations, and in more recent years he has been prominently connected with oil developments in Texas. One of the most daring, and in many respects one of the most capable, business men the country has ever known, his rise to prominence was largely based upon his remarkable equipment for salesmanship.

He was born May 8, 1855, in Du Page County, Ill., and was the son of a farmer. He was educated in district schools, attended Wheaton College at Wheaton, Ill., and



JOHN WARNE GATES.

graduated from Northwestern College, Naperville, Ill., in 1873. He first embarked in the grain business at Turner, now West Chicago, Ill. Selling out in 1875 he opened a hardware store there, this early business venture showing him to be a man of keen business sense with an unusual capacity for trading and an ambition for large operations. Feeling that he had little chance in so small a town, he decided to become a traveling salesman and went to Texas to sell the newly invented barb wire, then being placed on the market by Isaac L. Elwood, of De Kalb, Ill. His success in inducing the ranchmen to make large purchases of barb wire was remarkable. He decided to engage in barb wire manufacture on his own account, and established at St. Louis the firm of J. W. Gates & Co., which became, in 1881, the Southern Wire Company, of which he was president. Others connected with this company were Alfred Clifford and William Edenborn, who also became prominent in the wire trade. He and his associates formed the Braddock Wire Company in 1884 and built a plant near Pittsburgh. He was less than 30 years of age when he organized the Southern Wire Company. The Braddock plant gave the company its own wire, whereas previously it had purchased wire and barbed it. About the time of the building of the Braddock plant, Mr. Gates bought the Iowa Barb Wire Company, which had a plant at Allentown, Pa., and became vice-president. Then he secured an interest in the St. Louis Wire Mill, of which he also was made vice-presi-

dent. Later he and his associates bought into the Baker Wire Company, Lockport, Ill. In 1891, through Mr. Gates's efforts, the Columbia Patent Company was formed. It sold about 95 per cent. of the entire barb wire product of the country under his direction as general manager. However, a few of the smaller makers withdrew after several months.

In December, 1892, Mr. Gates was prime mover in forming the Consolidated Steel & Wire Company, capital $4,000,000, taking over the St. Louis Wire Mill Company, the Iowa Barb Wire Company, the Lambert & Bishop Wire Fence Company, the Braddock Wire Company, the Baker Wire Company and the Freeman Wire & Iron Company. In this consolidation John Lambert became prominent. Mr. Gates held the position of general manager until April 6, 1893, when he resigned.

In 1894 he was active in forming the American Steel & Wire Company of Illinois. In 1895 he was asked by the principal owners of the Illinois Steel Company to become its president. Its operations had for some years been on a large scale, but showed little or no profit. Under his management the company was put on a much better footing. He retired from it a few years later when the Federal Steel Company was formed, consisting of the Illinois Steel Company, the Minnesota Iron Company, the Lorain Steel Company and the Chicago, Lake Shore & Eastern Railroad Company

On retiring from the Ilinois Steel Company he again assumed the management of the American Steel & Wire Company of Illinois, out of which grew, in 1898, the American Steel & Wire Company of New Jersey, of which he was made chairman. This was the company taken over by the United States Steel Corporation. It included, in addition to the wire properties originally consolidated, the Washburn & Moen Mfg. Company, the Cleveland Rolling Mill Company and the Shoenberger Steel Company. Its operations grew so large that it seemed necessary to have its own raw material and it acquired ore properties, built lake vessels and took other steps which made it entirely independent of steel companies from which some of its constituents had been buying billets. This was one of the complications leading to the strained relations which were the precursors of the United States Steel Corporation.

Mr. Gates, in the late '90s, conceived a plan for an international iron and steel trust. He went to Germany and laid before manufacturers there a proposal for an agreement which would have kept them out of the markets naturally tributary to the United States or to Great Britain. On the other hand, steel manufacturers in the two latter countries were not to attempt to take away from German steel manufacturers the markets they had held. The proposition, however, did not find favor in Germany.

While Mr. Gates was not active in the negotiations which resulted in the formation of the United States Steel Corporation, except so far as the American Steel & Wire Company was concerned, of which he was chairman, he had been an early advocate of what was commonly styled a "billion dollar consolidation" of the steel interests of the United States. Prominent as he was in the steel industry at that time, he was denied the honor of election as a director or an officer of the great corporation.

In 1901 the year the Steel Corporation was organized, Mr. Gates and his associates became active in the Colorado Fuel & Iron Company. They put a large amount of money into that corporation, but their connection lasted only about two years, when they sold their interests to others. In 1905 Mr. Gates, with Charles S. Guthrie, L. C. Hanna, E. J. Berwind and others, bought a controlling interest in the Republic Iron & Steel Company, which they proceeded to develop into a strong factor in the iron trade. Soon after they acquired control of the Tennessee Coal, Iron & Railroad Company, and so far as Southern operations were concerned the two companies were developed on lines mutually profitable. The relinquishment of control of the Tennessee Company to the United States Steel Corporation in 1907 is quite prominent in the public mind at present.

Mr. Gates took much interest in stock speculation from about the time he became connected with the Illinois Steel Company and his operations steadily grew in magnitude until, in the period from about 1898 to 1907, he was ranked among the leading operators in Wall Street His coup in securing control of the Louisville & Nashville Railroad will long be remembered as one of the most audacious and successful operations ever carried out in Wall Street. In 1904 the stock brokerage house of C. G. Gates & Co. was established, in which the senior partner was the son of John W. Gates, and this house for several years was the largest speculative house in the street, largely through the operations of the latter.

The panic of 1907 apparently satisfied Mr. Gates that the time had come for him to retire from leadership in the stock market and he turned his attention to the development of oil and other properties in southern Texas, building up an important business center at Port Arthur. He established the Texas Company, which is an important competitor of the Standard Oil Company.

Mr. Gates leaves a widow and one son, Charles G. Gates.

Obituary

Ironton A. Kelly

Ironton A. Kelly, president of the Ashland Steel Company, Inc., Ashland, Ky., died in that city August 6, aged 62 years. He was born in Ironton, Ohio, and was educated in the public schools of that city. In 1884 he and others organized the Kelly Nail & Iron Company, of Ironton, of which he was vice-president and general manager until 1891. He then removed to Ashland, Ky., and with his associates organized the Ashland Steel Company, of which he was made president and general manager and had held this position continuously from its organization. The company operated a Bessemer steel plant and manufactured billets, sheet bars and wire rods. Mr. Kelly retained his interest in the Kelly Nail & Iron Company, of which he was vice-president and a director at the time of his death. He was also vice-president and director of the Merchants Bank & Trust Company, Ashland, which he and others organized in 1906. For some years he was a member and president of the City Council of Ironton, Ohio.

IRVING E. INGRAHAM, vice-president of the E. Ingraham Company, Bristol, Conn., died Aug. 2 at his home, Los Angeles, Cal., aged 52 years. He was the son of Edward Ingraham, who established the clock manufacturing business which bears his name. The son's younger life was passed in the factory, and he was the superintendent from 1890 until 1895, when he retired. He leaves a widow.

JOHN R. MITCHELL, president of the machine company bearing his name at Baltimore, Md., died Aug. 3 of pneumonia. Mr. Mitchell was the head of one of the oldest machine firms in the city. He learned his trade with Flynn, Emerich & Mitchell and later was with John Ives & Son.

COL. W. C. GREEN, for many years prominent in copper mining operations in the Southwest, died at Cananea, Mexico, August 6, of pneumonia, aged 58 years. His original venture in copper was at the old and practically abandoned La Cananea mines, purchased from the widow of Governor Pesquiera, of Sonora, Mexico. These he developed until they reached a productive capacity of 100,000,000 pounds of copper a year. He was forced in the panic of 1907 to give over the control of the Cananea properties, but he still retained large interests.

HENRY G. TROUT, president of the H. G. Trout Company, Buffalo, a pioneer in the manufacture of power boat propellers, died July 22, in Brooklyn, N. Y., where he was visiting while *en route* to Nova Scotia. He had suffered from penumonia during the past year.

The West Penn Steel Company, Brackenridge, Pa., has received a contract for 100 tons of pickled and cold rolled deep stamping sheet steel for export to England. The business was secured direct, after a sample lot had been submitted for tests.

The Pittsburgh Steel Company, Frick Building, Pittsburgh, will soon commence the erection of four more 60-ton open-hearth furnaces at its plant at Monessen, Pa., which will give it a total of 12 60-ton furnaces. It is also understood that work on the building of two or more blast furnaces, plans for which have been under way for some time, will be started in the near future.

July Pig Iron Production

Slight Falling Off from the June Rate

Active Capacity August 1 the Same as on July 1

Our blast furnace statistics show that the production of coke and anthracite pig iron in July was 1,793,068 gross tons, against 1,787,566 tons in June. The daily rate in July was 57,841 tons as against 59,585 tons in June. The steel works companies in many cases banked their furnaces on July 3 and July 4, so that last month, with 31 days, only slightly exceeded the total for the 30 days of June. The great heat and humidity in July also had their effect upon production.

At the opening of August, 197 furnaces were in blast, with a daily capacity of 59,990 tons, as compared with 198 furnaces July 1, with a daily capacity of 59,979 tons. It thus appears that production is stationary. The merchant furnaces further reduced their output in July, their daily average production being 15,360 tons as against 16,877 tons in June. Steel works furnaces entered August with an active capacity somewhat greater than that of July. Two new stacks were blown in last month. One of these was Furnace D of the Central group of the American Steel & Wire Company, at Cleveland, Ohio, this being one of the largest and best equipped of the Steel Corporation's blast furnaces. The other was Furnace G of the Bethlehem Steel Company, which is of the same size as the large furnace this company blew in in March of this year.

Daily Rate of Production

The daily rate of production of coke and anthracite pig iron by months, beginning with July, 1910, is as follows:

Daily Rate of Pig Iron Production by Months—Gross Tons.

	Steel works.	Merchant.	Total.
July, 1910	47,183	22,122	69,305
August	46,534	21,429	67,963
September	47,007	21,536	68,542
October	45,744	21,726	67,520
November	41,427	22,232	63,659
December	39,809	21,440	57,349
January, 1911	36,401	20,351	56,752
February	42,349	21,741	64,090
March	49,047	21,066	70,036
April	47,805	21,031	68,836
May	42,270	18,809	61,079
June	42,728	16,877	59,585
July	42,472	15,369	57,841

Capacity in Blast August 1 and July 1

The following table shows the daily capacity of furnaces in blast, August 1 and July 1:

Coke and Anthracite Furnaces in Blast.

Location of furnaces.	Total number of stacks.	August 1. Number in blast.	August 1. Capacity per day.	July 1. Number in blast.	July 1. Capacity per day.
New York:					
Buffalo	17	8	3,297	12	4,054
Other New York	5	2	368	2	468
New Jersey	2	1	283	1	283
Pennsylvania:					
Lehigh Valley	5	3	1,382	3	1,476
Spiegel	1	1	200	1	145
Schuylkill Valley	3	1	1,354	1	1,468
Lower Susquehanna	3	1	957	1	911
Lebanon Valley	2	1	716	1	780
Pittsburgh district	50	33	13,467	35	14,367
Spiegel	1	1	332	1	340
Shenango Valley	20	9	2,752	7	2,368
West Penn	5	2	425	2	520
Maryland	2	1	732	1	706
Wheeling district	5	3	1,135	3	1,120
Ohio:					
Mahoning Valley	24	17	6,660	17	6,615
Central and North	5	3	3,342	3	3,350
Hocking Val., Hanging Rock and S.W. Ohio	3	1	407	1	407
Illinois and Indiana	7	5	5,742	5	5,480
Spiegel	1	1	60	1	255
Mich., Wis. and Minn.	3	1	744	1	752
Colo., Mo. and Wash.	4	2	1,050	2	1,117
The South:					
Virginia	1	1	300	1	350
Kentucky	2	1	50	2	245
Alabama	15	7	4,775	10	4,148
Tenn. and Georgia	5	2	578	3	825
Total	197	107	57,890	198	59,979

Chart of Pig Iron Production and Prices

The fluctuations in pig iron production from January, 1907, to the present time are shown in the accompanying chart. The figures represented by the heavy line are those of daily average production, by months, of coke and anthracite iron. The two other curves on the chart represent monthly average prices of Southern No. 2 foundry pig iron at Cincinnati and Southern No. 2 foundry iron at furnace at Chicago. They are based on the weekly market quotations of *The Iron Age*. The two sets of figures are as follows:

Daily Average Production of Coke and Anthracite Pig Iron in the United States by Months Since January 1, 1907—Gross Tons.

	1907.	1908.	1909.	1910.	1911.
January	71,140	33,718	57,975	84,148	56,752
February	73,985	37,103	60,976	83,616	64,090
March	71,821	39,619	59,232	84,459	70,036
April	73,885	38,289	57,962	82,792	68,836
May	74,048	37,603	60,753	77,102	61,079
June	74,486	36,444	64,656	75,516	59,585
July	72,763	39,287	67,793	69,305	57,841
August	72,594	43,851	72,546	67,963	.....
September	72,283	47,300	79,507	68,476	.....
October	75,386	50,554	83,856	67,520	.....
November	69,857	51,595	84,917	63,659	.....
December	59,815	56,158	83,022	57,349	.....

Monthly Average Prices in Dollars of Southern No. 2 Foundry Pig Iron, Cincinnati, and Southern No. 2 Foundry at Chicago, District Furnace, Since January, 1907.

	1907.		1908.		1909.		1910.		1911.	
	Sou. No. 2, Cin.	Sou. No. 2, Chi.	Sou. No. 2, Cin.	Sou. No. 2, Chi.	Sou. No. 2, Cin.	Sou. No. 2, Chi.	Sou. No. 2, Cin.	Sou. No. 2, Chi.	Sou. No. 2, Cin.	Sou. No. 2, Chi.
Jan.	26.00	25.00	16.15	18.10	16.26	17.00	17.25	18.50	14.25	15.00
Feb.	26.00	25.50	15.75	17.81	16.13	16.40	17.06	18.50	14.25	15.00
Mar.	26.00	25.75	15.50	17.50	15.05	16.15	16.30	17.80	14.25	15.00
Apr.	25.06	26.00	15.20	17.38	14.25	16.15	15.37	17.00	14.25	15.00
May	24.25	26.50	14.75	17.28	14.50	16.15	15.00	16.56	14.00	15.00
June	24.10	26.25	15.25	17.38	14.70	16.15	14.85	16.25	13.50	15.00
July	23.85	25.20	15.00	17.20	15.75	16.65	14.75	16.06	13.25	14.87
Aug.	23.00	24.50	15.25	17.00	16.38	16.78	14.31	16.00	.....	.....
Sept.	21.50	23.75	15.65	16.70	17.35	18.35	14.25	15.90	.....	.....
Oct.	20.95	22.10	15.75	16.50	17.88	18.50	14.25	15.56	.....	.....
Nov.	19.50	20.31	16.00	16.75	17.75	18.50	14.25	15.50	.....	.....
Dec.	17.00	18.55	16.25	17.00	17.45	18.50	14.25	15.50	.....	.....

The Record of Production

Production of Coke and Anthracite Pig Iron in the United States by Months Since January 1, 1907. Gross Tons.

	1907	1908	1909	1910	1911
Jan.	2,205,007	1,045,250	1,797,560	2,608,605	1,759,326
Feb.	2,045,068	1,077,740	1,707,340	2,397,254	1,794,509
Mar.	2,226,457	1,228,204	1,832,194	2,617,949	2,171,111
Apr.	2,216,558	1,149,602	1,738,877	2,483,763	2,064,086
May	2,293,503	1,165,688	1,883,330	2,390,180	1,893,456
June	2,234,575	1,092,131	1,930,866	2,265,478	1,787,566
July	2,255,660	1,218,129	2,103,431	2,148,442	1,793,068
Aug.	2,250,410	1,359,831	2,248,930	2,106,847	.....
Sept.	2,183,487	1,418,998	2,385,206	2,056,275	.....
Oct.	2,336,972	1,567,198	2,599,541	2,093,121	.....
Nov.	1,828,125	1,577,854	2,547,508	1,909,780	.....
Dec.	1,234,279	1,740,912	2,635,680	1,777,817	.....

Production of Steel Companies

Returns from all plants of the United States Steel Corporation and the various independent steel companies show the following totals of product month by month. Only steel making iron is included in these figures, together with ferromanganese, spiegeleisen and ferrosilicon. These last, while stated separately, are also included in the columns of "total production":

Production of Steel Companies—Gross Tons.

	Pig.—Total production.—			Spiegeleisen and ferromanganese.	
	1909	1910	1911	1910	1911
January	1,117,825	1,773,201	1,128,448	19,538	8,360
February	1,073,363	1,620,539	1,185,782	21,396	12,821
March	1,140,553	1,739,212	1,518,063	25,591	11,784
April	1,093,092	1,669,898	1,434,142	22,304	10,657
May	1,236,448	1,619,283	1,310,378	26,529	13,641
June	1,265,527	1,549,112	1,281,241	27,680	22,611
July	1,408,782	1,462,689	1,316,646	22,924	17,067
August	1,591,991	1,442,572	.....	25,756	.....
September	1,666,839	1,410,221	.....	15,151	.....
October	1,769,094	1,419,624	.....	8,500	.....
November	1,689,994	1,242,804	.....	9,032	.....
December	1,768,799	1,113,174	.....	12,178	.....

Output by Districts

The table below gives the production of all coke and anthracite furnaces in July and the four months preceding:

Monthly Pig Iron Production—Gross Tons.

	March (31 days)	April. (30 days)	May. (31 days)	June. (30 days)	July. (31 days)
New York	157,624	139,672	130,927	130,395	124,347
New Jersey	5,866	5,510	9,788	3,600	1,386
Lehigh Valley	69,265	73,182	79,731	72,787	66,404
Schuylkill Valley	67,034	55,305	46,827	44,039	45,859
Lower Susquehanna and Lebanon Val.	46,980	44,537	44,179	41,751	40,084
Pittsburgh district	531,521	488,447	422,000	415,519	419,248
Shenango Valley	109,299	109,239	88,170	78,196	79,571
West. Penn.	120,464	100,593	61,892	60,047	73,177
Maryland, Virginia and Kentucky	71,665	60,978	53,271	48,969	52,583
Wheeling district	135,775	119,489	115,213	93,617	93,973
Mahoning Valley	203,006	189,822	187,748	188,187	184,402
Central and North. Ohio	170,914	161,742	152,909	141,973	116,953
Hocking Valley, Hanging Rock and S. W. Ohio	35,173	37,184	37,185	20,245	11,321
Mich., Minn., Mo., Wis., Col., Wash.	69,745	76,379	71,938	54,391	57,661
Chicago district	213,638	235,550	238,424	249,666	272,817
Alabama	143,751	149,737	134,386	117,015	126,200
Tenn., Georgia and Texas	28,331	22,178	28,868	27,169	27,082
Total	2,171,111	2,065,086	1,893,456	1,787,566	1,793,068

Among furnaces blown out in July were Lackawanna No. 1 and New York State Steel at Buffalo, Oxford in



Diagram of Daily Average Production by Months of Coke and Anthracite Pig Iron in the United States from January 1, 1907, to August 1, 1911; Also of Monthly Average Prices of Southern No. 2 Foundry Iron at Cincinnati and Local No. 2 Foundry Iron at Chicago [illegible] Furnace.

New Jersey, Keystone in the Schuylkill Valley, Robesonia in the Lebanon Valley, one Schoenberger in the Pittsburgh District, Perry in Western Pennsylvania, West End and Radford Crane in Virginia, Ashland in Kentucky, Struthers and No. 2 Haselton in the Mahoning Valley, Lawrence in the Hanging Rock District, Missouri at St. Louis, the Detroit Iron & Steel Company's furnace in Michigan, and Alabama City in Alabama.

The list of furnaces blown in last month includes the new Bethlehem Furnace G in the Lehigh Valley, No. 2 Warwick in the Schuylkill Valley, No. 6 Duquesne in the Pittsburgh District, Atlantic and Hall in the Shenango Valley, No. 2 and No. 4 Cambria and Josephine in Western Pennsylvania, Alleghany in Virginia, No. 1 and No. 3 Ohio in the Mahoning Valley, one Columbus in Ohio, two Ensley in Alabama. The blowing in of the new Central Furnace D at Cleveland, Ohio is balanced by the blowing out of another furnace of the same group.

The Lake Superior Mining Institute

The sixteenth annual meeting of the Lake Superior Mining Institute will be held on the Menominee Range August 22 to 24. The meeting point is Crystal Falls, Mich., but mines in the Iron River and Dickinson County districts will also be visited. The programme as just announced by Secretary A. J. Yungbluth provides for the arrival and reception of visitors at Crystal Falls Tuesday forenoon, August 22. In the afternoon visits will be made to the Tobin, Bristol and Hollister mines, a new ore dryer being inspected at the last named. The Crystal Falls Commercial Club will entertain the institute at 6 p. m., and at 8 p. m. a business session will be held in the court house.

The members will leave Crystal Falls Wednesday morning in automobiles for the Iron River district, visiting Chicagoan Lake, Swanson, Baltic, Caspian, James, Davidson and other mines. Concrete shaft sinking will be seen at the Swanson. The Iron River Commercial Club will entertain the visitors at 6 p. m. and at 8 o'clock a session will be held at the Opera House with election of officers for the ensuing year. Thursday will be spent at Dickinson County mines the Loretto mine being reached at 9 a. m. Changes in the river's course and mining in the old river bed will be the features inspected. The hydro-electric plant at Sturgeon Falls will be seen on an automobile trip, also the electric equipment and concrete lined shaft at Vulcan. The visitors will be taken from Vulcan to Norway and Iron Mountain by automobiles, visiting the Chapin mine and inspecting the construction of a dam at Twin Falls. The list of papers prepared for the meeting includes the following:

"Accidents in the Transportation, Storage and Use of Explosives," by Charles S. Hurter, Duluth, Minn.

"Some Safety Devices of the Oliver Iron Mining Company," by Alexander M. Gow, Duluth, Minn.

"Tobin Mine Sub and Caving System," by Fred C. Roberts, Crystal Falls, Mich.

"Top Slicing and Caving System in the Stambaugh District," by W. A. MacEachron, Iron River, Mich.

"Square Set Mining," by Floyd L. Burr, Vulcan, Mich.

"Clock System of Time Keeping," by James D. Vivian, Crystal Falls, Mich.

"Boiler Setting and Coal Handling," by J. S. Jacka, Crystal Falls, Mich.

"Electrical Operating Plants of the Penn Iron Mining Company," by Frank H. Armstrong, Vulcan, Mich.

"Social Surroundings of the Mine Employee," by Charles E. Lawrence, Iron Mountain, Mich.

"A Diamond Drill Core Section of the Mesaba Rocks—No. IV.," by N. H. Winchell, Minneapolis, Minn.

"Block Caving on the Menominee Range," Author to be assigned.

"Surveying and Sampling Diamond Drill Holes," by Edwin E. White, Ishpeming, Mich.

"The Relation of Mining Interests to the Prevention of Forest Fires," by Thos. B. Wyman, secretary-forester, Munising, Mich.

Other papers are to be presented, including one on the "Time Keeping System at the Newport Mine" and a description of the "Salt Shaft at Detroit" by E. F. Bradt.

The Iron and Metal Markets

A Comparison of Prices

Advances Over the Previous Week in Heavy Type, Declines in Italics.

At date, one week, one month and one year previous.

	Aug. 9, 1911.	Aug. 2, 1911.	July 12, 1911.	Aug. 10, 1910.
PIG IRON, Per Gross Ton:				
Foundry No. 2 standard, Philadelphia	$15.00	$15.00	$15.00	$16.00
Foundry No. 2, Valley furnace	13.50	13.50	13.50	14.25
Foundry No. 2 Southern, Cincinnati	**13.50**	13.25	13.25	14.25
Foundry No. 2, Birmingham, Ala.	**10.25**	10.00	10.00	11.00
Foundry No. 2, at furnace, Chicago*	14.50	14.50	15.00	16.50
Basic, delivered, eastern Pa.	14.50	14.50	14.25	15.25
Basic, Valley furnace	13.00	13.00	13.25	14.25
Bessemer, Pittsburgh	15.90	15.90	15.90	16.15
Gray forge, Pittsburgh	13.90	13.90	13.90	14.40
Lake Superior charcoal, Chicago	16.50	16.50	16.50	18.50
COKE, CONNELLSVILLE, Per Net Ton, at Oven:				
Furnace coke, prompt shipment	*1.40*	1.45	1.40	1.60
Furnace coke, future delivery	**1.65**	1.60	1.55	1.80
Foundry coke, prompt shipment	1.85	1.85	1 80	2.15
Foundry coke, future delivery	**2.10**	2.00	2.05	2.25
BILLETS, &c., Per Gross Ton:				
Bessemer billets, Pittsburgh	21.00	21.00	21.00	24.50
Forging billets, Pittsburgh	26.00	26.00	26.00	30.00
Open hearth billets, Philadelphia	23.40	23.40	23.40	27.50
Wire rods, Pittsburgh	27.00	27.00	27.00	28.00
OLD MATERIAL, Per Gross Ton:				
Iron rails, Chicago	14.00	14.00	14.00	16.50
Iron rails, Philadelphia	17.50	17.50	16.75	18.00
Car wheels, Chicago	12.75	12.75	12.50	14.50
Car wheels, Philadelphia	13.00	13.00	12.75	14.00
Heavy steel scrap, Pittsburgh	13.25	13.25	13.00	14.25
Heavy steel scrap, Chicago	10.75	10.75	10.50	12.25
Heavy steel scrap, Philadelphia	13.50	13.50	13.00	13.75
FINISHED IRON AND STEEL, Per Pound:	Cents.	Cents.	Cents.	Cents.
Bessemer rails, heavy, at mill	1.25	1.25	1.25	1.25
Refined iron bars, Philadelphia	1.27½	1.27½	1.27½	1.42½
Common iron bars, Pittsburgh	1.25	1.25	1.25	1.45
Common iron bars, Chicago	1.20	1.20	1.20	1.40
Steel bars, Pittsburgh	1.20	1.20	1.25	1.40
Steel bars, tidewater, New York	1.36	1.36	1.41	1.56
Tank plates, Pittsburgh	1.35	1.35	1.35	1.40
Tank plates, tidewater, New York	1.51	1.51	1.51	1.56
Beams, Pittsburgh	1.35	1.35	1.35	1.40
Beams, tidewater, New York	1.51	1.51	1.51	1.56
Angles, Pittsburgh	1.35	1.35	1.35	1.40
Angles, tidewater, New York	1.51	1.51	1.51	1.56
Skelp, grooved steel, Pittsburgh	1.20	1.20	1.25	1.50
Skelp, sheared steel, Pittsburgh	1.30	1.30	1.35	1.60
SHEETS, NAILS AND WIRE, Per Pound:	Cents.	Cents.	Cents.	Cents.
Sheets, black, No. 28, Pittsburgh	2.00	2.00	2.00	2.20
Wire nails, Pittsburgh†	1.70	1.70	1.70	1.70
Cut nails, Pittsburgh†	1.60	1.60	1.60	1.65
Barb wire, galvanized, Pittsburgh†	2.00	2.00	2.00	2.00
METALS, Per Pound:	Cents.	Cents.	Cents.	Cents.
Lake copper, New York	12.75	12.75	12.75	13.00
Electrolytic Copper, New York	12.62½	12.62½	12.55	12.62½
Spelter, St. Louis	**5.80**	5.70	5.60	5.05
Spelter, New York	**6.00**	5.90	5.80	5.20
Lead, St. Louis	4.45	4.45	4.35	4.30
Lead, New York	4.50	4.50	4.50	4.40
Tin, New York	**43.00**	42.00	43.50	33.37
Antimony, Hallett, New York	7.75	8.00	8.12½	8.00
Tin plate, 100-lb. box, New York	$3.94	$3.94	$3.94	$3.84

* The average switching charge for delivery to foundries in the Chicago district is 50c. per ton.

† These prices are for largest lots to jobbers.

Prices of Finished Iron and Steel f.o.b. Pittsburgh

Freight rates from Pittsburgh in carloads, per 100 lb.; New York, 16c.; Philadelphia, 15c.; Boston, 18c.; Buffalo, 11c.; Cleveland, 10c.; Cincinnati, 15c.; Indianapolis, 17c.; Chicago, 18c.; St. Paul, 32c.; St. Louis, 22½c.; New Orleans, 30c.; Birmingham, Ala., 45c. Rates to the Pacific coast are 80c. on plates, structural shapes and sheets, No. 11 and heavier; 85c. on sheets, Nos. 12 to 16; 95c. on sheets, No. 16 and lighter; 65c. on wrought boiler tubes.

Structural Material.—I-beams and channels, 3 to 15 in., inclusive, 1.35c. to 1.40c., net; I-beams over 15 in., 1.45c. to 1.50c., net; H-beams over 18 in., 1.50c. to 1.55c.; angles, 3 to 6 in., inclusive, ¼ in. and up, 1.35c. to 1.40c., net; angles over 6 in., 1.45c. to 1.50c., net; angles, 3 in. on one or both legs, less than ¼ in. thick, 1.40c., plus full extras as per steel bar card effective September 1, 1909; tees, 3 in. and up, 1.40c., net; zees, 3 in. and up, 1.35c. to 1.40c., net; angles, channels and tees under 3 in., 1.40c., base, plus full extras as per steel bar card of September 1, 1909; deck beams and bulb angles, 1.65c. to 1.70c., net; hand rail tees, 2.45c.; checkered and corrugated plates, 2.45c., net.

Plates.—Tank plates, ¼ in. thick, 6¼ in. up to 100 in. wide, 1.35c. to 1.40c., base. Following are stipulations prescribed by manufacturers, with extras to be added to base price (per pound) of plates:

Rectangular plates, tank steel or conforming to manufacturers' standard specifications for structural steel dated February 6, 1903, or equivalent, ½ in. thick and over on thinnest edge, 100 in. wide and under, down to but not including 6 in. wide, are base.

Plates up to 72 in. wide, inclusive, ordered 10.2 lb. per square root, are considered ¼-in. plates. Plates over 72 in. wide must be ordered ¼ in. thick on edge, or not less than 11 lb. per square foot, to take base price. Plates over 72 in. wide ordered less than 11 lb. per square foot down to the weight of 3-16-in. take the price of 3-16-in.

Allowable overweight, whether plates are ordered to gauge or weight, to be governed by the standard specifications of the Association of American Steel Manufacturers.

	Cents per lb.
Gauges under ¼ in. to and including 3-16 in. on thinnest edge, extra	.10
Gauges under 3-16 in. to and including No. 8	.15
Gauges under No. 8 to and including No. 9	.25
Gauges under No. 9 to and including No. 10	.30
Gauges under No. 10 to and including No. 12	.40
Sketches (including all straight taper plates) 3 ft. and over in length	.10
Complete circles, 3 ft. in diameter and over	.20
Boiler and flange steel	.10
"A. B. M. A." and ordinary firebox steel	.20
Still bottom steel	.30
Marine steel	.40
Locomotive firebox steel	.50
Widths over 100 in. up to 110 in., inclusive	.05
Widths over 100 in. up to 115 in., inclusive	.10
Widths over 115 in. up to 120 in., inclusive	.15
Widths over 120 in. up to 125 in., inclusive	.25
Widths over 125 in. to 130 in., inclusive	.50
Widths over 130 in	1.00
Cutting to lengths or diameters under 3 ft. to 2 ft., inclusive	.25
Cutting to lengths or diameters under 2 ft. to 1 ft., inclusive	.50
Cuttings to lengths or diameters under 1 ft.	1.55

No charge for cutting rectangular plates to lengths 3 ft. and over.

TERMS—Net cash 30 days.

Sheets.—Makers' prices for mill shipments on sheets in carload and larger lots, on which jobbers charge the usual discounts for small lots from store, are as follows: Blue annealed sheets, Nos. 3 to 8, U. S. standard gauge, 1.40c.; Nos. 9 and 10, 1.50c.; Nos. 11 and 12, 1.55c.; Nos. 13 to 14, 1.60c.; Nos. 15 and 16, 1.70c., one pass, cold rolled, box annealed sheets, Nos. 10 to 12, 1.65c.; Nos. 13 and 14, 1.70c.; Nos. 15 and 16, 1.75c.; Nos. 17 to 21, 1.80c.; Nos. 22, 23 and 24, 1.85c.; Nos. 25 and 26, 1.90c.; No. 27, 1.95c.; No. 28, 2c.; No. 29, 2.05c.; No. 30, 2.15c. Three pass, cold rolled sheets, box annealed, are as follows: Nos. 15 and 16, 1.85c.; Nos. 17 to 21, 1.90c.; Nos. 22 to 24, 1.95c.; Nos. 25 and 26, 2c.; No. 27, 1.90c.; Nos. 22 to 24, 1.95c.; Nos. 25 and 26, 2c.; No. 27, 2.05c.; No. 28, 2.10c.; No. 29, 2.15c.; No. 30, 2.25c. Galvanized sheets, Nos. 10 and 11, black sheet gauge, 2c.; Nos. 12, 13 and 14, 2.10c.; Nos. 15, 16 and 17, 2.25c.; Nos. 18 to 22, 2.40c.; Nos. 23 and 24, 2.50c.; Nos. 25 and 26, 2.70c.; No. 27, 2.85c.; No. 28, 3c.; No. 29, 3.10c.; No. 30, 3.30c. All above prices are f.o.b. Pittsburgh, terms 30 days net, or 2 per cent. cash discount 10 days from date of invoice, as also are the following base prices per square for painted and galvanized roofing sheets, with 2½-in. corrugations:

Gauge.	Painted.	Galvanized.	Gauge.	Painted.	Galvanized.
29	....	$2.40	23	$2.40	$3.50
28	$1.40	2.55	22	2.60	3.70
27	1.55	2.60	21	2.80	4.05
26	1.65	2.65	20	3.05	4.35
25	1.85	3.05	18	4.05	5.70
24	2.10	3.15	16	4.90	6.50

Wrought Pipe.—The following are the jobbers' carload discounts on the Pittsburgh basing card on wrought pipe, in effect from October 1, 1910:

	Steel Black.	Steel Galv.	Iron Black.	Iron Galv.
Butt Weld.				
1 to 11 in.	..	..	49	43
½ in.	75	63	71	59
¾ to 1½ in.	79	69	75	65
2 to 3 in.	80	70	76	66
Lap Weld.				
2 in.	76	66	72	62
2½ to 4 in.	78	67	74	64
4½ to 6 in.	77	67	73	63
7 to 12 in.	75	59	71	55
13 to 15 in.	51½	..	..	..

THE IRON AND METAL MARKETS

Butt Weld, extra strong, plain ends, card weight.				
⅛, ¼, ⅜ in.	69	59	65	55
½ in.	74	68	70	64
¾ to 1¼ in.	78	72	74	68
2 to 3 in.	79	73	75	69
Lap Weld, extra strong, plain ends, card weight.				
2 in.	75	69	71	65
2½ to 4 in.	77	71	73	67
4½ to 6 in.	76	70	72	66
7 to 8 in.	69	59	65	55
9 to 12 in.	64	54	60	50
Butt Weld, double extra strong, plain ends, card weight.				
½ in.	64	58	60	54
¾ to 1¼ in.	67	61	63	57
2 to 3 in.	69	63	65	59
Lap Weld, double extra strong, plain ends, card weight.				
2 in.	65	59	61	55
2½ to 4 in.	67	61	63	57
4½ to 6 in.	66	60	62	56
7 to 8 in.	59	49	62	56

Plugged and Reamed.

1 to 1½, 2 to 3 in. Butt Weld
2, 2½ to 4 in. Lap Weld

} will be sold at two (2) points lower basing (higher price) than merchants' or card weight pipe. Butt or lap weld, as specified.

The above discounts are for "card weight," subject to the usual variation of 5 per cent. Prices for less than carloads are three (3) points lower basing (higher price) than the above discounts.

Boiler Tubes.—Discounts on lap welded steel boiler tubes to jobbers in carloads are as follows:

	Steel.
1¾ to 2¼ in.	65
2½ in.	67½
2¾ to 3¼ in.	70
3½ to 4½ in.	72½
5 to 6 in.	65
7 to 13 in.	62½

Less than carloads to destination east of the Mississippi River will be sold at delivered discounts for carload lowered by two points for lengths 22 ft. and under; longer lengths f.o.b. Pittsburgh. Usual extras to jobbers and boiler manufacturers.

Wire Rods and Wire.—Bessemer, open hearth and chain rods, $27. Fence wire, Nos. 0 to 9 per 100 lb., terms 60 days, or 2 per cent. discount in 10 days, carload lots, to jobbers, annealed, $1.50; galvanized, $1.80. Carload lots, to retailers, annealed, $1.55; galvanized, $1.85. Galvanized bar wire, to jobbers, $2; painted, $1.70. Wire nails, to jobbers, $1.70.

The following table gives the price to retail merchants on wire in less than carloads, including the extras on Nos. 10 to 16, which are added to the base price:

Fence Wire, Per 100 Lb.

No.	0 to 9	10	11	12 & 12½	13	14	15	16
Annealed	$1.65	$1.70	$1.75	$1.80	$1.90	$2.00	$2.10	$2.20
Galvanized	1.95	2.00	2.05	2.10	2.20	2.30	2.70	2.80

Market and Stone Wire in Bundles, Discount from Standing List.

Bright and Annealed:	
9 and coarser	80
10 to 18	80 and 10
19 to 26	80 and 10 and 2½
27 to 36	80 and 5
Galvanized:	
9 and coarser	75 and 10
10 to 16	75 and 10
17 to 26	72½ and 10
27 to 36	72½
Coppered or Liquor Finished:	
9 and coarser	75 and 10
10 to 26	75 and 10
27 to 36	70 and 10 and 5
Tinned:	
6 to 18	75 and 10 and 10

Pittsburgh

PITTSBURGH, PA., August 9, 1911.—*(By Telephone.)*

Pig Iron.—The market is showing betterment in demand and prices are firmer. Some large lots of basic iron have recently been sold at low figures, but these sales have pretty well cleaned up the available supply and basic is now firmer at $13 to $13.25, Valley furnace; most sellers ask the higher figure and it is doubtful if any large lots of basic could be had under $13.25. Bessemer iron is still held under agreement at $15, Valley furnace, but dealers are selling small lots at $14.75 to $14.85. The large purchase of foundry iron by the Westinghouse Electric & Mfg. Company for this and next year's delivery has made prices on that grade somewhat firmer. There has also been some movement in forge iron. We note a sale of 2000 tons and another sale of 1000 to 1200 tons for forward delivery at $13, Valley furnace. We quote as follows: Bessemer, $15; basic, $13 for early delivery, and $13.25 for extended delivery; No. 2 foundry, $13.50 to $13.75; malleable, $13.25 to $13.50; gray forge, $13, all at Valley furnace, the freight rate to Pittsburgh being 90c.

Steel.—There is not much new demand for steel, but specifications against contracts for billets and sheet and tin bars are coming in in excellent shape. We note several small sales of forging billets at the full price of $26, Pittsburgh, for base sizes and carbons. We quote Bessemer and open-hearth billets, 4 x 4 in. and up to but not including 10 x 10 in., $12, base, and sheet and tin bars in 30-ft. lengths, $22; 1½-in. billets, $22; forging billets, $26, base, usual extras for sizes and carbons, all prices being f.o.b. Pittsburgh or Youngstown district, with freight to destination added.

Structural Material.—The McClintic-Marshall Construction Company, Pittsburgh, has received an order for 1750 tons of steel for new paper mill buildings for the Lake Superior Power Company at Saulte Ste. Marie, Ont.

Steel Rails.—The Carnegie Steel Company has sold 1750 tons of standard sections for prompt delivery to the Baltimore & Ohio Railroad.

(By Mail.)

Excellent reports on the present condition of the iron trade are being given out this week by the heads of sales departments of several of the larger steel interests, and there seems to be no doubt that conditions are somewhat better, with the outlook for remainder of the year very hopeful. The pig iron trade is showing improvement. The Westinghouse Electric & Mfg. Company bought 12,500 tons of Northern foundry iron, about half of it for delivery in the last quarter of this year at its Allegheny and Cleveland works, and the other half for delivery in the first quarter of next year in equal amounts at the same plants. A Valley furnace operator sold in the early part of last week 10,000 tons of basic iron to a malleable casting concern in the Shenango Valley at $13, delivered; there being a freight rate of 40c., the iron netted the seller $12.60 at furnace. This sale of basic and the recent trade of 60,000 tons of basic which was made by the Struthers Furnace Company to the Republic Iron & Steel Company for ore have pretty well cleaned up the basic market and prices are firmer. It is doubtful if any basic could be had to-day in large quantities under $13, and most sellers ask $13.25 at furnace. Bessemer iron remains nominally at $15 at furnace, but the few sales being made, mostly by dealers, are at $14.75 to $14.85 at furnace. Prices on billets and sheet bars are being well maintained, the largest inquiry in the market being that of the Kokomo Steel & Wire Company, Kokomo, Ind., for 30,000 to 40,000 tons of rod billets, which will likely go to a Youngstown mill. The coké and scrap trades, which have been dragging for some time, are showing some betterment in new demand and prices.

Ferromanganese.—Consumers are pretty well covered on their requirements over the remainder of this year, but owing to the low prices ruling are interested in the market for next year delivery, and a number of inquiries are out for 1912 shipment, several of these being for 500 tons each. Importers are not disposed to sell into next year at present prices of $37, Baltimore, but are asking premiums of $1 to $2 a ton over the present price. Some concerns are refusing to quote on such business, preferring to wait until later in the year. It is not believed that much ferromanganese can be bought to-day for 1912 shipment at $37, Baltimore, but this price is still ruling for delivery over the remainder of this year, the freight rate to Pittsburgh district being $1.95 a ton.

Ferrosilicon.—Prices continue very strong, having advanced $2 a ton in the past two or three weeks. The demand is quiet, as consumers are covered for remainder of this year, but some inquiry is out for 1912 delivery. We quote 50 per cent. ferrosilicon at $53 to $54, Pittsburgh, most sellers asking the higher figure. We quote blast furnace ferrosilicon as follows: 10 per cent., $23; 11 per cent, $24; 12 per cent., $25, f.o.b. cars Ashland and Jisco furnaces.

Muck Bar.—No recent sales have been made, but prices are firmer and one seller is refusing to sell at less than $29. We quote best grades of muck bar, made from all pig iron, at $28.50 to $29, delivered in the Pittsburgh district.

Skelp.—A sale of 1000 tons of wide sheared iron plates for September and October delivery is reported on the basis of 1.70c., delivered at buyer's mill, Pittsburgh. The new demand is quiet, most consumers being covered for some time ahead. We quote: Grooved steel skelp, 1.20c.; sheared steel skelp, 1.30c.; grooved iron skelp, 1.45c. to 1.55c., and sheared iron

THE IRON AND METAL MARKETS

skelp, 1.65c. to 1.70c., all for delivery at consumers' mills in the Pittsburgh district.

Wire Rods.—The new demand for wire rods is quiet, most consumers being covered, but makers report that specifications on contracts have been coming in a little more freely in the past three or four weeks. The new Morgan continuous rod mill of the Jones & Laughlin Steel Company at Aliquippa, Pa., has not been completed, as reported in the daily press, and will probably not be ready for operation before October. This will give the company two Morgan rod mills at Aliquippa with a combined daily capacity of about 700 tons, and it is adding some new finishing mills to take care of the increased rod output. We quote Bessemer, open hearth and chain rods at $27, Pittsburgh.

Steel Rails.—In the past week the Carnegie Steel Company took several fair-sized orders for standard sections for export and some scattering small lots for export. It also booked new orders and received specifications against contracts for about 3000 tons of light rails. A good part of the business in standard section rails that have been rolled by the Edgar Thomson rail mills for some time has been for export. Prices on light rails are as follows: 12-lb., 1.25c.; 16, 20 and 25-lb., 1.21c. to 1.25c.; 30 and 35-lb., 1.20c., and 40 and 45-lb., 1.16c. These prices are f.o.b. at mill, plus freight, and are the minimum of the market in carload lots, small lots being sold at a little higher price. Standard sections are held at 1.25c. per lb. for Bessemer.

Plates.—As yet none of the large inquiries for steel cars noted in this report last week has developed into actual orders, but it is believed that this will occur in the near future, as it is known positively that a number of the Western roads are badly in need of equipment to move the crops. The Atlantic Coast Line has placed a contract with the Standard Steel Car Company for 900 box cars and 100 flat cars. The leading plate mills in the Pittsburgh district are now operating to about 75 per cent. of capacity, which is a heavier rate of operation than for some time. We continue to quote ¼-in. and heavier plates at 1.35c., Pittsburgh, but in some cases 1.30c. is being named on specially desirable orders on both narrow and wide sizes.

Structural Steel.—The McClintic-Marshall Construction Company has taken about 3000 tons of bridge work for several Western roads and the American Bridge Company has taken some very large contracts in the East, one involving some 16,000 tons. Local work coming up includes the new Harris Theater on Diamond street, about 1000 tons, and the Point bridge, 5000 to 7000 tons, both of which will likely be placed this month. Inquiries are reported as heavier, and some of the structural concerns state they are getting slightly better prices on fabricated work. We continue to quote beams and channels up to 15 in. at 1.35c., Pittsburgh.

Sheets.—The new demand for black, galvanized and roofing sheets continues quite heavy, and the mills are receiving specifications against contracts very freely. As a result shipments by the mills are heavier now than at any time for some months and operations are also on a larger scale. The American Sheet & Tin Plate Company is operating this week close to 70 per cent. of its hot sheet mill capacity, while the independent mills are running at the same rate or slightly heavier. Prices are fairly well maintained, but on galvanized sheets are being shaded in some cases and in certain sections about $1 a ton. The full schedule of regular prices is printed on a previous page.

Tin Plate.—Present conditions in the tin plate trade are quite satisfactory, the new demand being as large as expected at this season, while specifications against contracts from the can makers are coming in quite freely. The American Sheet & Tin Plate Company has started up additional tin mills and this week is operating very close to 80 per cent. of capacity, the independent tin plate mills running at about the same rate. Prices are being firmly held.

Bars.—The leading makers of steel bars have quite a heavy tonnage on their books for forward delivery and as a result prices are slightly firmer, one leading mill stating that it is holding firmly for 1.25c. at mill on new orders. We quote steel bars at 1.20c. to 1.25c., Pittsburgh, the lower price being named only by one or two mills on very desirable orders. Common iron bars are quiet and are held at 1.25c. to 1.30c., Pittsburgh.

Hoops and Bands.—New orders for hoops and bands have been much better in the past three or four weeks, and specifications against contracts are also coming in more freely. Shipments by the mills against new orders and contracts are heavier than for some time. We quote steel hoops at 1.40c. and bands at 1.35c., extras on the latter as per the steel bar card.

Merchant Steel.—New orders are coming in more freely and specifications against contracts so far this month have been heavier than in the same period in July. Prices are reported as slightly firmer. Regular prices, which are more or less shaded, are as follows: Iron finished tire, ½ x ½ in. and heavier, 1.40c., base; under these sizes, 1.55c.; planished tire, 1.60c.; channel tire, 1.80c., base; toe calk, 1.90c.; flat sleigh shoe, 1.55c.; concave or convex, 1.75c.; cutter shoes, tapered or bent, 2.25c.; spring steel, 2c.; machinery steel, smooth finish, 1.90c.

Rivets.—Current new business and specifications are heavier than for some time, and the condition of the rivet trade is referred to as more satisfactory than for some months. We continue to quote structural rivets at 1.70c. to 1.75c. and boiler rivets at 1.80c. to 1.85c., but in very exceptional cases and for desirable business these prices are slightly shaded.

Wire Products.—There is a moderate amount of new buying in wire and wire nails, but jobbers and retailers are still inclining their orders to small lots to cover actual needs, there being no desire on the part of the trade to contract ahead. Prices are being better maintained than for some time, but in some cases wire nails and wire are still being shaded $1 a ton. Regular prices are as follows: Galvanized barb wire, $2 per 100 lb.; painted, $1.70; annealed fence wire, $1.50; galvanized, $1.80; wire nails, $1.70, and cut nails, $1.60, all f.o.b. Pittsburgh, with full freight added to point of delivery.

Spelter.—The market continues very firm and a scarcity is reported in the supply of spelter for prompt shipment. We quote prime grade of Western at 5.80c., East St. Louis, equal to 5.92½c., Pittsburgh. We note that some sellers are asking 5.85c., East St. Louis, and refuse to shade this price.

Merchant Pipe.—An inquiry is in the market from Chicago for 30 miles of 6 to 8-in. pipe for a gas line. Leading mills report that the new demand for merchant pipe is heavier than usual at this season and shipments by the mills in July were a little larger than in June. It is stated that prices are being fairly well maintained. Regular discounts on iron and steel pipe are given on a previous page.

Boiler Tubes.—There has been no improvement in any way in the market on boiler tubes, which has been very unsatisfactory for some months. The railroads are not specifying freely against contracts and current new demand is light. Discounts continue to be more or less shaded.

Coke.—General conditions in the coke trade are referred to as being slightly better, the supply of blast furnace coke for prompt shipment having been cut down materially in the last month or two and slightly better prices are being maintained. A local concern reports a sale of 100 cars of standard grade furnace coke for prompt shipment for which it secured $1.50 per net ton at oven. The General Electric Company has recently placed some fairly large contracts for foundry coke, deliveries running over the next six months. No large inquiries are in the market for furnace coke, as most consumers are covered. We quote standard makes of furnace coke for prompt shipment at $1.50 to $1.55 and for the remainder of the year $1.60 to $1.65 per net ton at oven. We quote 72-hr. foundry coke for prompt shipment at $1.90 to $2 and on contract from $2.10 up to $2.25 per net ton at oven. One local concern reports that it recently secured contracts for 72-hr. foundry coke for delivery over the next six months at $2.40 per net ton at oven. The coke made by this concern has a very high reputation in the trade and always commands the highest prices ruling. The output in the Upper and Lower Connellsville regions last week was 284,297 tons, an increase over the previous week of about 2400 tons.

Iron and Steel Scrap.—Conditions in the scrap trade are better, the demand for steel scrap being heavier, and dealers report they are able to obtain slightly better prices. Bids closed Tuesday on about 15,000 tons of old material held by the Pennsylvania Railroad, of which about 5000 tons is heavy steel scrap. Other railroads have sent out their monthly scrap lists, and bids made by dealers on these lists are in nearly all cases slightly higher than last month. Heavy steel

THE IRON AND METAL MARKETS

scrap is now firm at $13.25 for delivery in the Pittsburgh and nearby districts, and for forward delivery $13.50 is asked. We have advanced prices on some grades of scrap and now quote as follows:

Heavy steel scrap, Steubenville, Follansbee, Sharon, Monessen and Pittsburgh delivery	$13.25 to $13.50
No. 1 foundry cast	13.25 to 13.50
No. 2 foundry cast	12.75 to 13.00
Bundled sheet scrap, f.o.b. consumers' mill, Pittsburgh district	11.50 to 12.00
Rerolling rails, Newark and Cambridge, Ohio, Cumberland, Md., and Franklin, Pa.	13.50 to 13.75
No. 1 railroad malleable stock	12.50 to 12.75
Grate bars	10.75 to 11.00
Low phosphorus melting stock	16.00 to 16.25
Iron car axles	23.00 to 23.50
Steel car axles	17.50 to 18.00
Locomotive axles	23.00
No. 1 busheling scrap	12.00 to 12.25
No. 2 busheling scrap	8.50 to 8.75
Old car wheels	13.50 to 13.75
Sheet bar crop ends	15.25 to 15.50
Cast iron borings	9.00 to 9.25
*Machine shop turnings	9.50 to 9.75
Old iron rails	15.50 to 15.75
No. 1 wrought scrap	13.50 to 14.00
Heavy steel axle turnings	10.00 to 10.25
Stove plate	10.50 to 10.75

* These prices are f.o.b. cars at consumers' mills in the Pittsburgh district.

Chicago

CHICAGO, ILL., August 9, 1911.—*(By Telegraph.)*

While it may be noted with satisfaction that manufacturing capacity in this district and elsewhere is apparently mounting slowly to higher percentages of activity it is also possible to discern disappointment because of the very small proportions of bookings for future delivery. Current business, with the possible exception of steel bars, is essentially of the hand-to-mouth variety, and orders which cannot be entirely filled within 30 days are the exception. Whatever may be the reason buyers apparently are not satisfied with the present situation or with present prices as a basis for buying freely to cover their future needs. In this respect Southern pig iron is slightly improved, but sheet and plate mills do not find their bookings amenable to a very satisfactory rolling schedule, hence the prevalence of price shading where desirable filling-in orders are available. Prompt shipment orders for structural shapes are among the most prominent factors in the improvement, but expectations beyond the immediate future are based on general conditions rather than contracts. The narrow limits beyond which current business seems impossible of extension constitute the principal weakness of the situation. It is possible that the great increases in manufacturing capacity which now permit the filling of orders much more rapidly will cause a readjustment of opinion as to what status of the mill order books constitutes good business.

Pig Iron.—Sales of high phosphorus iron to stove manufacturers have been a feature of interest in the market of the past week in which Southern furnaces and a Wisconsin interest have participated. The inquiry for malleable iron continues active, and it is understood that the northern Indiana car builder's requirement of 10,000 tons remains unsatisfied. The reason for this is perhaps typical of the market situation, in that furnaces apparently are unwilling to concede the present prices for extended delivery such as would be involved in the sale of such a tonnage, while the buyer presumes that the desirable character of his business should bring out this concession. Standard Birmingham iron is selling at $10.25, Birmingham, for prompt shipment, with some sales at $10.50 for the fourth quarter. Numerous inquiries are being received for first quarter and first half shipment, but furnaces generally are not quoting for this delivery. Northern iron is still considerably weaker than Southern, and prices are unchanged on the basis of $14.50 f.o.b. local furnace, although some orders are being taken at $15, delivered. An inquiry for 10,000 tons of basic is reported from St. Louis. One of the Mayville furnaces was blown in last week. We quote for Chicago delivery, except on local irons, which are f.o.b. furnace, the following prices:

Lake Superior charcoal	$16.50 to $17.00
Northern coke foundry, No. 1	15.00 to 15.50
Northern coke foundry, No. 2	14.50 to 15.00
Northern coke foundry, No. 3	14.25 to 14.50
Northern Scotch, No. 1	16.00
Southern coke, No. 1 foundry and No. 1 soft	15.10
Southern coke, No. 2 foundry and No. 2 soft	14.60
Southern coke, No. 3	14.35
Southern coke, No. 4	14.10
Southern gray forge	13.85
Southern mottled	13.85
Malleable Bessemer	18.00
Standard Bessemer	17.40
Basic	15.50
Jackson Co. and Kentucky silvery, 6 per cent	17.90
Jackson Co. and Kentucky silvery, 8 per cent	18.90
Jackson Co. and Kentucky silvery, 10 per cent	19.90

(By Mail.)

Rails and Track Supplies.—Sales of rails during the past week as reported by local mills were of very moderate tonnage. Specifications for track fastenings continue about normal. At Gary the rail mill is running on a slightly heavier schedule this week. Light rail business fails to show promise of any marked activity. We quote standard railroad spikes at 1.65c. to 1.75c., base; track bolts with square nuts, 2.10c. to 2.20c., base, all in carload lots, Chicago; standard section Bessemer rails, 1.28c.; open hearth, 1.34c.; light rails, 40 to 45 lb., 1.16c. to 1.20½c.; 30 to 35 lb., 1.10½c. to 1.24c.; 16, 20 and 25 lb., 1.20½c. to 1.25c.; 12 lb., 1.25c. to 1.30½c.; angle bars, 1.50c. to 1.60c., Chicago.

Structural Material.—The largest item of the week among the 14 awards of structural contracts reported was 1200 tons for track elevation for the Chicago & Western Indiana. The Mt. Vernon Bridge Company will fabricate this steel. Several viaducts to be built at East St. Louis will require 819 tons to be furnished by the American Bridge Company. The balance of the contracts placed were small, aggregating about 1850 tons. They included molasses storage tanks for the Amalgamated Sugar Company, Ogden, Utah; two bridges for the Ottawa & Peoria Railway Company; repairs for the Twelfth Street viaduct, Chicago, for the Chicago, Rock Island & Pacific; a building for the Northwestern Iron Company, Mayville, Wis.; Sharples Building, Chicago; a sub-station for the Commonwealth Edison Company, Chicago; Lowry Boiler Works, St. Paul, Minn.; post office and court house, Sioux Falls, S. D.; school building, Gary, Ind.; power station for the Suburban Light & Power Company, Oak Park; a store building for H. F. Schaller, Watertown, S. D., and three steel-faced dams for the Boston-Colorado Power Company, Denver. The run of mill tonnage in structural material continues heavy. Prices are quite firm and are well maintained on the basis of 1.35c., Pittsburgh. The large number of inquiries for cars now in the market is an encouraging feature of the structural situation. We continue to quote plain material for mill shipment at 1.53c. and for shipment from store 1.75c., Chicago.

Plates.—Plate tonnage shares with structural material an encouraging degree of activity. With the hoped for placing of orders for several thousand cars to supplement the sustained specifications against bridge contracts, mill bookings of plates are expected to continue very satisfactory. In view of these conditions the prices of plates are not being subjected to much pressure and we quote, for Chicago delivery, mill shipment 1.53c. and from jobbers' stock 1.75c.

Sheets.—While the local sheet mills are running in all departments and it is reported that instructions have been issued urging the rapid placing in operation of the new American Sheet & Tin Plate Company's mills at Gary, makers of this product are far from satisfied with the orders received. Buying apparently is absolutely restricted to current needs, and mills are not only forced to roll a wide variety of sizes in small quantities, but also lack future business. Users of sheets do not seem disposed to contract ahead. We continue to quote Chicago prices as follows: Carload lots, from mill: No. 28 black sheets, 2.18c.; No. 28 galvanized, 3.18c.; No. 10 blue annealed, 1.68c. Prices from store, Chicago, are: No. 10, 1.95c. to 2.05c.; No. 12, 2.00c. to 2.10c.; No. 28 black, 2.45c. to 2.55c.; No. 28 galvanized, 3.45c. to 3.55c.

Bars.—One steel bar interest reports that sufficient tonnage has been placed on the books to provide, together with such incidental business as may be received from time to time, practically enough tonnage to carry it into midsummer of next year. There still remains, however, a considerable steel bar tonnage to be placed. For routine business the price of 1.25c., Pittsburgh, seems to be well maintained but for an attractive order this price could doubtless be shaded. There does not seem to be much improvement in the demand for bar iron but the mills apparently are considerably less willing to accept business at a loss and indications point to the price of 1.20c. as a minimum. We quote as follows, f.o.b. Chicago: Soft steel bars, 1.43c.; bar iron, 1.20c. to 1.25c.; hard steel bars, rolled from old rails, 1.20c. to 1.25c. From store, soft steel bars, 1.70c. to 1.80c., Chicago.

THE IRON AND METAL MARKETS

Wire Products.—Reassuring reports regarding crop prospects have had a beneficial effect on the barb wire trade and manufacturers using fence wire are preparing more liberally for fall business. Improvement is also noted in the movement of wire nails, although some shading of prices is reported. Jobbers' carload prices, which are quoted to manufacturing buyers, are as follows: Plain wire, No. 9 and coarser, base, 1.68c.; wire nails, 1.88c.; painted barb wire, 1.88c.; galvanized, 2.18c.; polished staples, 1.88c.; galvanized, 2.18c., all Chicago.

Cast Iron Pipe.—No very considerable tonnage of pipe was purchased the past week, but it is expected that 3600 tons will be awarded at Portland, Ore., at once. A sale of 1400 tons of 24-in. to the Union Stock Yards Company, Omaha, is noted. We quote as follows, per net ton, Chicago: Water pipe, 4 in., $25.50; 6 to 12 in., $24.50; 16 in. and up, $24, with $1 extra for gas pipe.

Old Material.—Although no change of moment is apparent in the market for old material, the upward trend of business in finished steel products has shown its influence. Shipments from Chicago to Eastern markets, particularly of borings, have caused a slight advance here. Steel scrap is also firmer and shows a tendency to move at higher prices. The railroad scrap offerings of the week include 11,500 tons by the Baltimore & Ohio, in which are 3000 tons of rails, 1000 tons of car wheels, and 1500 tons of No. 1 wrought. The Great Northern is offering 10,000 tons, of which the principal items are 1800 tons of rails, 800 tons of malleable scrap, and 1500 tons of Nos. 1 and 2 wrought. The Chicago, Milwaukee & St. Paul offers 1500 tons; the Soo Line 600 tons, and the Chicago & Eastern Illinois 800 tons. We quote below for delivery to buyer's works, Chicago and vicinity, all freight and transfer charges paid, per gross ton, as follows:

Old iron rails	$14.00 to $14.50
Old steel rails, rerolling	12.25 to 12.50
Old steel rails, less than 3 ft.	11.25 to 11.75
Relaying rails, standard sections, subject to inspection	24.00
Old car wheels	12.75 to 13.25
Heavy melting steel scrap	10.75 to 11.25
Frogs, switches and guards, cut apart	10.75 to 11.25
Shoveling steel	10.25 to 10.75
Steel axle turnings	8.50 to 9.00

The following quotations are per net ton:

Iron angles and splice bars	$12.50 to $13.00
Iron arch bars and transoms	13.75 to 14.25
Steel angle bars	10.25 to 10.75
Iron car axles	18.00 to 18.50
Steel car axles	16.00 to 16.50
No. 1 railroad wrought	11.00 to 11.25
No. 2 railroad wrought	10.00 to 10.50
Steel knuckles and couplers	10.00 to 10.50
Locomotive tires, smooth	15.00 to 15.50
Machine shop turnings	6.25 to 6.75
Cast and mixed borings	5.50 to 6.00
No. 1 busheling	8.75 to 9.25
No. 2 busheling	6.75 to 7.25
No. 1 boilers, cut to sheets and rings	7.50 to 8.00
Boiler punchings	12.00 to 12.50
No. 1 cast scrap	10.25 to 10.75
Stove plate and light cast scrap	9.00 to 9.50
Railroad malleable	10.00 to 10.50
Agricultural malleable	9.25 to 9.75
Pipes and flues	8.00 to 8.50

Philadelphia

PHILADELPHIA, PA., August 8, 1911.

While a little hesitancy is observed in the buying of certain classes of finished products, due in a measure to reports of possible price concessions, the general volume of business continues fairly good and in some branches shows a slight gain over the previous week. As far as lower prices are concerned most reports appear to be without fact or at least cannot be definitely traced. Rumors that concessions have been made on plates are denied in this district. Steel bars, however, can be done under the recent 1.25c., Pittsburgh, base. The pig iron movement continues active, with fairly good sales of foundry, forge and steel making grades. A more active demand for freight cars is reported, inquiries for an aggregate of 12,000 to 14,000 being in the market. The situation in refined iron bars is unchanged. The coke market is not very active, but low prices for prompt shipments are less in evidence.

Iron Ore.—Very little interest is being shown in the ore market. Arrivals of foreign ore at this port last week were somewhat larger, including 12,650 tons from Cuba, 5603 tons from Spain, 4443 tons from Africa, 12,600 tons from Newfoundland, 4130 tons from Sweden, 4550 tons from New Brunswick and 183 tons from England.

Pig Iron.—Sales have not been large individually, but a comparatively good aggregate tonnage in various grades has been sold. Sellers report July business as having been very satisfactory under prevailing conditions and furnaces are as a rule so well booked ahead that they are not only showing less disposition to sell, except to take care of customers' regular requirements, but have in several instances practically withdrawn the recent quotation of $15, delivered, for standard analysis No. 2 X foundry. Good brands of this grade are still available, however, at that figure, although several sellers are quoting $15.25, delivered, as a minimum. A more pronounced inquiry for foundry iron is reported. In the higher grades the greatest demand has been for small and moderate lots, running up to 500 tons; several 1000-ton lots, however, are under negotiation. Inquiries have come out for deliveries extending beyond the year end, but sellers still refuse to make definite quotations for shipment so far ahead. Cast iron pipe makers are showing more interest in the market. Practically all the Delaware River pipe foundries are making inquiries for low grade iron, which appears to be rather scarce. One interest has an inquiry out for 5000 tons, half No. 3 foundry and half foundry forge, for October-November shipment. Two other interests would probably take 10,000 tons each, but find that sellers will not meet their views as to prices. A heavier movement in Virginia foundry grades is reported; sales have been largely in moderate lots at unchanged prices, although one of 2000 tons for shipment into this district and one of 1250 tons for Western delivery are reported. Virginia producers have reduced stocks in the past month. The leading producer, which has been running two stacks, now reports but one furnace active. Forge iron has been more active, with one sale of several thousand tons at $14.25, delivered in this district. More interest has developed in the steel making grades; one melter is out with an inquiry for about 25,000 tons of basic for the first quarter of 1912, but sellers have not decided on quotations for deliveries so far ahead. A sale of 6000 tons of Virginia basic to New England, for delivery over the next six months, is reported, at about $12.75 furnace. A lot of several thousand tons of eastern Pennsylvania basic for early delivery was also sold to a nearby consumer at a price equal to $14.50 here. Low phosphorus iron has been taken in moderate lots, for early shipment, at prices around $20 to $20.50, delivered here. The general range of pig iron prices in this district shows no actual change, but concessions have disappeared and sellers are frequently obtaining the outside range of quotations for some grades. Sellers' position is gradually becoming stronger; production probably decreased in July, and stocks, particularly on eastern Pennsylvania furnace banks, will show a further sharp decline. The condition of furnace order books is improving, and a strong undercurrent favoring advances in prices is noted. The following range is reported for standard brands, delivered in buyers' yards, in this immediate district, shipment ranging from prompt to the remainder of the year:

Eastern Pennsylvania No. 2 X foundry	$15.00 to $15.25
Eastern Pennsylvania No. 2 plain	14.75 to 15.00
Virginia foundry	15.00 to 15.50
Gray forge	14.25 to 14.50
Basic	14.50 to 15.00
Standard low phosphorus	20.00 to 20.50

Ferromanganese.—While there has been little fresh inquiry from consumers in this district, the report of a quiet sale of 500 tons to an Eastern consumer at $36.50 just prior to the general advance to $37, Baltimore, has come out. Sellers are now firmly holding the $37 price.

Billets.—Current business has been smaller, sales as a rule being under rather than above 100-ton lots. One inquiry for 5000 tons is reported, but is being looked upon as more for the purpose of testing the market than a bona fide inquiry. Makers are not showing any gains in the productive rate, but continue to maintain firmly the $23.40 basis for rolling billets and $28.40 for ordinary forging billets, delivered in this vicinity.

Plates.—There has been a better run of both small orders and specifications and some of the mills show a slight gain in production over the previous week and look for a higher rate this week. Eastern makers, however, have not yet reached the rate of activity noted late in June. Few sales larger than 300 to 400 tons are reported, although inquiries for several round lots, including one of 1500 and another of 700 tons of ship plates, are to be noted. Negotiations are pending for several thousand tons of plates for pipe. Notwithstanding rumors of lower prices, makers in this terri-

THE IRON AND METAL MARKETS

tory contend that the recent 1.50c. quotation for ordinary plates, delivered here, has not been shaded.

Structural Material.—Sales so far this month have not been particularly active. No large contracts have been reported during the week, although negotiations are pending for several buildings and more work of that character is in prospect. Inquiries are out for 1500 tons of shapes for ship work. While the price of plain material is maintained at 1.50c., delivered here, quotations for fabricated material are still reported to be irregular.

Sheets.—The irregularity in prices in the West does not seem to have interfered materially with Eastern mills. In the majority of cases producers in this district have been more actively engaged, in instances operating at full capacity. The bulk of the orders coming in have been small and for urgent delivery, but aggregate a very fair total. Business promises to continue at a good basis and sufficient orders are on hand to keep plants running full this week. Eastern makers' prices are unchanged, the following range f.o.b. mill being named: Nos. 18 to 20, 2.30c.; Nos. 22 to 24, 2.40c.; Nos. 25 and 26, 2.50c.; No. 27, 2.60c.; No. 28, 2.80c.

Bars.—The proposed advance in prices of refined iron bars does not appear to have been deemed advisable; at any rate the old basis of 1.20c. at mill can still be freely done for good specifications, while 1.22½c. stands for small miscellaneous business. As the buying has been rather indifferent recently, there is some doubt expressed as to the firmness with which sellers will hold the above named figures, which are equal to 1.27½c. to 1.32½c. delivered here. Steel bars are available at 1.35c. to 1.40c. delivered in this vicinity.

Coke.—Spot furnace coke is not in as good supply and prices have stiffened a trifle. For prompt shipment this grade now commands $1.50 to $1.60 at oven. Prices for forward furnace coke range from $1.55 to $1.75 at oven, with few sales reported. There is a moderate movement in foundry coke, both for early and forward delivery. Sales, however, have not been large individually and prices show no particular change. The following range of prices is named, per net ton, for delivery in this vicinity:

Connellsville furnace coke	$3.75 to $3.90
Foundry coke	4.15 to 4.60
Mountain furnace coke	3.15 to 3.35
Foundry coke	3.75 to 4.20

Old Material.—The market has a waiting appearance. Bids are going in against the monthly railroad lists which close between the 10th and 15th, and in a number of instances higher prices than those of last month are being offered. Bidders in the majority of cases are naming over $13.50 for heavy melting railroad steel. Few sales have been reported in any of the usually active grades. Small lots of steel have been sold at recent quotations, but sellers are inclined to hold for a higher level. Rolling mill scrap, while not active, is decidedly strong. The following range of prices about represents the market for early deliveries in buyers' yards, eastern Pennsylvania and nearby points, taking a freight rate from Philadelphia varying from 35c. to $1.35 per gross ton for shipment ranging from prompt to the remainder of the year:

No. 1 railroad heavy melting steel scrap	$13.50 to $13.75
No. 1 yard heavy melting steel scrap	13.00 to 13.25
Old steel rails, rerolling (nominal)	14.25 to 14.75
Low phosphorus heavy melting steel scrap	16.75 to 17.25
Old steel axles (nominal)	19.50 to 20.00
Old iron axles	24.50 to 25.00
Old iron rails	17.50 to 18.00
Old car wheels (nominal)	13.00 to 13.50
No. 1 railroad wrought	15.75 to 16.25
Wrought iron pipe	13.00 to 13.50
No. 1 forge fire	11.00 to 11.50
No. 2 light iron (nominal)	6.75 to 7.25
Wrought turnings	9.50 to 10.00
Cast borings	9.00 to 9.50
Machinery cast	13.25 to 13.75
Railroad malleable (nominal)	11.50 to 12.00
Grate bars, railroad	10.00 to 10.50
Stove plate	10.50 to 11.00

Cleveland

CLEVELAND, OHIO, August 8, 1911.

Iron Ore.—Sales in the past week have been inconsiderable, the aggregate being small. Furnacemen are not coming into the market in the manner expected. July shipments from Lake Superior ports exceeded those of June by 394,868 tons, but it is expected by Cleveland shippers that August will show a decrease as compared with July. We quote prices as follows: Old range Bessemer, $4.50; Mesaba Bessemer, $4.25; old range non-Bessemer, $3.70; Mesaba non-Bessemer, $3.50.

Coke.—Demand has fallen to a minimum in furnace coke, and there is little improvement in the inquiry from foundries. We quote standard Connellsville furnace coke at $1.40 to $1.50 per net ton at oven, for spot shipment, and $1.65 to $1.75 for the remainder of the year. Connellsville 72-hr. foundry coke is quoted at $1.80 to $2.15 at oven for prompt shipment and $2.15 to $2.40 for the remainder of the year.

Pig Iron.—The most important sale in several months in which Cleveland-made pig iron was involved was that to the Westinghouse Electric & Mfg. Company closed several days ago. The bulk of the iron, it is understood, went to a Cleveland maker for both the company's plants at Pittsburgh and in this city. The price is said to have been on the basis of $13.50 for No. 2 Valley, for last half delivery, and $13.75, Valley, for first quarter. However, the furnace company which is generally credited with taking the larger part of the tonnage declared to-day that it did not bid on the next year delivery, refusing absolutely to commit itself on such business with the present uncertainties of the coke market confronting it. It is known also that another bidder on the same business, who offered next year delivery at an advance of 50 cents and more over the present Valley price, did not get the award. The sale is regarded here as important, in that, while it involved Nos. 1, 2 and 3 grades in the total tonnage of 12,500 tons, of which 6000 tons were for the Cleveland plant, it settles more definitely the Valley price for No. 2, which has been more or less problematic for several weeks. Cleveland makers of pig iron all say that a fair tonnage of iron is being daily shipped from their yards, the aggregate being very satisfactory. Foundries are steadily taking iron, apparently for daily consumption, but no large tonnage is going to any one consumer. The feeling among Cleveland furnace owners is better to-day than in months and the general optimism expressed appears to have real foundation in fact. For Cleveland delivery we quote as follows for prompt shipment and for last half:

Bessemer	$15.90
Basic	$13.75 to 14.00
Northern foundry No. 2	14.00 to 14.25
Gray forge	13.25
Southern foundry No. 2	14.35 to 14.60
Jackson Co. silvery, 8 per cent silicon	17.50 to 17.75

Finished Iron and Steel.—Mill specifications are slowly but steadily increasing, but new business is rather slow in coming out. At the moment the only large tonnage in prospect is that for the city hall, but it is generally understood that little will be done about it for some weeks. Considerable new building is being done throughout the city, but the amount of steel used in any one structure is small. The steel bar market, which appeared to have developed a tendency toward weakness in northern Ohio last week, has been given somewhat more of a peg upon which to hang. A tonnage of steel bars, about 800 tons, was let at Toledo a few days ago, the business going to a leading maker at its bid of 1.20c., Pittsburgh, this being one of two bids at that figure. It develops that the bars are to be used by the American Can Company for new construction. There had been some talk that at least one reroller had bid 1.15c. and there was a rumor of even a lower price. But the actual closing at 1.20c. has helped the market, although the general quotation in this city is 1.25c., Pittsburgh, by most makers. Local rolling mills are preparing for more activity this fall. The Empire mill resumed operating last week, the Union is planning to go on in about two weeks and the Lake Erie is also actively preparing to start. We quote iron bars at 1.25c. to 1.30c. at mill.

Old Material.—More buying activity is noted in various grades of material. Up to this time buying locally had been confined largely to heavy steel and turnings, the latter for shipment to Pittsburgh. Now the local mills are inquiring for busheling as well, and in fair quantities, all of which has given the local market a brighter aspect. Some mills are bidding for material in shop alongside dealers. Outside mills, but located in the Cleveland district, are also becoming more active bidders in this city, especially for heavy steel, one offer being $12.50, f.o.b. Cleveland. A sale last Saturday in this locality of 1300 tons of old steel rails brought out some interesting prices. The larger part of the tonnage went to a dealer at $14, while a smaller portion went at a shade under this price. This is an advance of $1.50 a ton over the last previous sale of this material here.

THE IRON AND METAL MARKETS

Dealers' prices, per gross ton, f.o.b. Cleveland, are as follows:

Old steel rails, retrolling	$13.50 to $14.00
Old iron rails	15.00 to 15.50
Steel car axles	17.50 to 18.00
Heavy melting steel	12.00 to 12.50
Old car wheels	12.00 to 12.25
Relaying rails, 50 lb. and over	22.50 to 23.50
Agricultural malleable	10.75 to 11.25
Railroad malleable	12.25 to 12.75
Light bundled sheet scrap	10.00 to 10.50

The following prices are per net ton, f.o.b. Cleveland:

Iron car axles	$21.00 to $21.50
Cast borings	6.75 to 7.00
Iron and steel turnings and drillings	7.00 to 7.50
Steel axle turnings	8.00 to 8.50
No. 1 busheling	11.00 to 11.50
No. 1 railroad wrought	11.75 to 12.25
No. 1 cast	11.25 to 11.75
Stove plate	9.50 to 10.00
Bundled tin scrap	11.00 to 11.50

Cincinnati

CINCINNATI, OHIO, August 9, 1911.—*(By Telegraph.)*

Pig Iron.—Southern prices are firmer and, while it is probable that a few brands of No. 2 foundry can be obtained around $10 for prompt shipment, the majority of furnaces are asking $10.50, Birmingham, for any delivery this year, although a few sales for last quarter shipments have been made at $10.25 at furnace. Considerable speculative iron is being quietly bought by purchasers who generally keep in close touch with inside conditions, and, as the bulk of Southern iron is now held by producers who are not compelled to sell for financial reasons, it is quite likely that the present price advance will stick. Conditions in the Hanging Rock district show no change and No. 2 foundry is freely quoted at $13, Ironton, with malleable around $13 to $13.25. One large inquiry for malleable is out that is expected to be closed shortly. A few lots of Southern charcoal iron are being contracted for between $22 and $22.50 at furnace. Recent sales of Southern No. 2 foundry include 300 and 1000 tons to local foundries for this year's shipment. A few nearby melters have also filled up for the remainder of the year. Among inquiries out are one from central Ohio for 1500 tons of Southern foundry iron, and another from a nearby consumer for 1000 tons of Southern and 500 tons of Northern No. 2 foundry. No quotations are being made for next year's delivery, and it is stated that the furnace interests generally are emphatic in declaring that iron contracted for this year must be moved before January 1. Based on freight rates at $3.25 from Birmingham and $1.20 from Ironton, we quote, f.o.b. Cincinnati, as follows:

Southern coke, No. 1 foundry and 1 soft	$14.00
Southern coke, No. 2 foundry and 2 soft	13.50
Southern coke, No. 3 foundry	13.00
Southern coke, No. 4 foundry	12.75
Southern gray forge	12.75
Ohio silvery, 8 per cent. silicon	$16.95 to 17.20
Lake Superior coke, No. 1	14.70 to 14.95
Lake Superior coke, No. 2	14.20 to 14.45
Lake Superior coke, No. 3	13.70 to 13.95
Basic, Northern	14.45 to 14.70
Standard Southern car wheel	25.50 to 25.75
Lake Superior car wheel	19.00

(By Mail.)

Coke.—One large producer in the Wise County field has advanced the price of 72-hr. coke to $2.25 per net ton at oven for either prompt or deferred shipment, and this has had a tendency to harden prices in that particular district, although some high grade foundry coke is obtainable there as low as $2, with deliveries running through the next six months. Contracting in both foundry and furnace grades is very light, and as consumers have nearly all covered for future requirements no change is anticipated in the demand for some time. Furnace coke in all three fields is rather irregular and is quotable all the way from $1.40 to $1.70 for any shipment wanted. Foundry coke also shows a wider range and it is quite probable that $1.90 to $2 per net ton at oven in all three fields could be done on the lower grades for movement this year, with some of the best known brands bringing as high as $2.35.

Finished Material.—Structural material is moving fairly well and prospects are brighter. So far as mill prices on steel bars are concerned nothing below 1.25c., Pittsburgh basis, is being done here, and at this figure a few medium-sized orders have lately been placed, among them being one for about 500 tons of reinforcing concrete bars for a public job. Sheets are dragging and mills in other territory are reported to be making recessions in the regular market prices, but manufacturers in this vicinity are holding firm, and due to the late advance in spelter they are indifferent about taking orders for galvanized sheets below present quotations. Hoops are stationary at 1.40c., mill, with a slackening up of both the inquiry and actual business booked. The local warehouse price on steel bars is 1.70c. and on structural material 1.80c.

Old Material.—The Baltimore & Ohio and Norfolk & Western railroads, as well as the Big Four, have issued some large lists of scrap. The firmer attitude that has been taken by Southern pig iron producers has appeared to stimulate interest in the scrap market, but sales continue to be limited to small quantities for immediate requirements and long time contracts are said to be scarce. The approximate prices paid by buyers for delivery in their yards, southern Ohio and Cincinnati, are as follows:

No. 1 railroad wrought, net ton	$10.50 to $11.00
Casting borings, net ton	4.50 to 5.00
Steel turnings, net ton	5.50 to 6.00
No. 1 cast scrap, net ton	9.50 to 10.00
Burnt scrap, net ton	6.50 to 7.00
Old iron axles, net ton	16.50 to 17.00
Bundled sheet scrap, gross ton	7.25 to 8.25
Old iron rails, gross ton	13.50 to 14.00
Relaying rails, 50 lb. and up, gross ton	21.00 to 22.00
Old car wheels, gross ton	10.25 to 10.50
Heavy melting steel scrap, gross ton	10.00 to 10.50

Birmingham

BIRMINGHAM, ALA., August 7, 1911.

Pig Iron.—The sentiment in this market continues to improve, but recent additions to order books are comparatively small. Of sales reported for the past week a lot of 400 tons of No. 2 soft for shipment in the third quarter was the largest. This iron was sold at $10.50, Birmingham, and an aggregate of 850 tons, consisting of carloads and lots of 100 to 150 tons, is reported as bringing the same price. For small lots it is claimed that $10.50 for No. 2, with a differential of 50 cents for No. 3 foundry and 25 cents for lower grades is generally ruling as applicable to shipments within 60 to 90 days. For delivery further advanced quotations range above $10.50 for No. 2 foundry, with the limit for all deliveries placed at January 1. In view of the volume of inquiry now pending for 1912, developments in the matter of price for advanced requirements are expected at an early date. As is indicated by the demand for spot shipments and the rate at which old contracts are being taken out, the trade generally is not provided for the farther future to the extent at one time credited. Stock reports of August 1 show a reduction of 22,000 tons in July in the aggregate accumulation, the reduction consisting of 16,000 tons foundry iron and 6,000 tons basic. On August 1 only 17 stacks were being operated in this State, of which four were producing basic iron. We quote prompt shipments or deliveries within the third quarter as below, f.o.b. cars Birmingham furnaces:

No. 1 soft and No. 1 foundry	$11.00
No. 2 soft and No. 2 foundry	10.50
No. 3 foundry	10.00
No. 4 foundry	9.75
Gray forge	9.50
Mottled	9.25
Off basic	$10.00 to 10.50
Standard basic	10.25 to 10.75
Charcoal car-wheel iron	22.50

Old Material.—This market was very quiet during the past week and without any developments that would indicate the correct level of prices. The transactions recorded involved carlots principally, with the consuming interests disposed to consider bargains only. No attempt is made to revise quotations, but we quote the market as steady with the following prices generally asked by dealers. These are per gross ton f.o.b. cars here:

Old iron axles (light)	$13.50 to $14.00
Old steel axles (light)	12.50 to 13.50
Old iron rails	12.50 to 13.00
No. 1 railroad wrought	11.00 to 11.50
No. 2 railroad wrought	9.50 to 10.00
No. 1 country wrought	7.50 to 8.00
No. 2 country wrought	7.00 to 7.50
No. 1 machinery	9.50 to 10.50
No. 1 steel	8.50 to 9.00
Tram car wheels	8.00 to 8.50
Standard car wheels	9.50 to 10.50
Light cast and stove plate	7.00 to 7.50

Cast Iron Pipe.—The successful bidder on the round tonnage of water pipe required for the city of Portland, Ore., and which was to have been awarded August 1, is not known at this time. Awards to local concerns during the past week consisted of comparatively small

THE IRON AND METAL MARKETS

lots, but the aggregate tonnage is fair. No large contracts for early letting have been added to those mentioned last week, and considerable tonnage is still awaiting necessary financial arrangements. Quotations of local sellers have been advanced and the condition of order books when compared with the present rate of production are such that the revised prices will no doubt be maintained. This depends very largely on developments in the pig iron market and the extent to which new business now in contemplation materializes. We quote revised quotations on water pipe as follows per net ton f.o.b. cars here: 4-in. to 6-in., $23; 8-in. to 12-in., $22; over 12-in., average, $21, with $1 per ton extra for gas pipe.

Announcement is made that the Alice furnace of the Tennessee Coal, Iron & Railroad Company will be blown in August 18.

The finishing department of the Southern Iron & Steel Company's plant at Alabama City, Ala., is now being operated to some extent, but no announcement is made relative to the starting up of the open hearth furnaces.

Operations have been resumed at the car works of the Alabama Great Southern Railroad at Gadsden, Ala., after having been suspended for six weeks.

Buffalo

BUFFALO, N. Y., August 8, 1911.

Pig Iron.—Both inquiry and sales have been of smaller volume for this district in the week just past than for the preceding week. Business placed has been principally in carload lots and for foundry grades, although some moderate sized tonnages have been sold for canal shipment to New York.

A moderate business has also been done in charcoal iron, including one order of fairly good tonnage for shipment during the third quarter. Consumers as a rule are hurrying shipments on contracts, indicating that foundries generally are doing a good business and that further buying of pig iron will soon be in order, when buyers become satisfied that the firmer prices at which producers are holding iron are to be maintained.

Prices remain the same as shown in last week's schedules, all furnaces holding stiffly to the recent advance. Some special grades of No. I X are being sold above $14.25, the maximum given in the appended schedule. We quote as follows, f.o.b. Buffalo, for current and last-quarter delivery:

No. 1 X foundry	$13.75 to $14.25
No. 1 X foundry	13.50 to 14.00
No. 2 plain	13.50 to 13.75
No. 3 foundry	13.50 to 13.75
Grav forge	13.50 to 13.75
Malleable	13.75 to 14.25
Basic	13.75 to 14.25
Charcoal	16.50 to 17.50

Finished Iron and Steel.—Most sales agencies report less active conditions prevailing in finished products than a week ago. Others report a fair business with steel bars and plain structural material in the lead, and one of the larger interests states it has enjoyed exceptionally good business for this time of the year, the business placed during the past two weeks having been greater than for any like period for some months. Prices are stable in this district, all agencies disclaiming any shading on their part and stating that nothing lower than 1.25c. for soft steel bars and 1.35c., Pittsburgh, for plates and shapes is quoted. In fabricated material a good volume of business is developing right along and prospects are exceptionally bright for continued good business through the fall months. Bids are soon to be received for the steel superstructure for the 15-story office building to be erected here by the New York Telephone Company and calling for 1000 tons, for which the contract for the foundation work has just been let. Plans are being completed for an 8-story office building to be erected by the Buffalo Natural Gas Fuel Company, taking 400 tons of steel, and bids are being taken for 300 tons required for the Erie County Lodging House, Buffalo. Bids are also about to be asked for steel for a 9-story addition to the Monroe County Court House, Rochester, and for a large foundry and warehouse to be erected at Whitesboro, N. Y., by the Munson Bros. Company, Utica, both involving considerable tonnages. The George Kellogg Structural Company, Buffalo, has been awarded contracts for fabricating and erecting steel for an addition to the Defiance Paper Company's mill at Niagara Falls, for a nurses' home for the Children's Hospital, Buffalo, and for Plymouth Methodist Church, Buffalo, aggregating about 300 tons. The Buffalo Structural Steel Company, Buffalo, has received the contract for 100 tons for the Memorial Hospital, Niagara Falls; the Durolithic Company, Buffalo, the contract for the Home Economics Building for Cornell University, Ithaca, 200 tons, and the Eastern Concrete Steel Company, Buffalo, contract for the Poultry Building to be erected by Cornell at Ithaca, 100 tons. Josiah P. Wright, contracting engineer, Buffalo, was low bidder for furnishing and erecting steel for the Buffalo General Electric Company's 17-story office building, per revised plans calling for 1400 tons.

Old Material.—The demand from mills and foundries continues fairly active in most grades with the market showing a somewhat firmer tone. We quote as follows, per gross ton, f.o.b. Buffalo:

Heavy melting steel	$13.00 to $13.50
Low phosphorus steel	15.50 to 16.00
No. 1 railroad wrought	14.00 to 14.50
No. 1 railroad and machinery cast scrap	13.75 to 14.25
Old steel axles	18.50 to 19.00
Old iron axles	22.00 to 22.50
Old car wheels	18.00 to 18.50
Railroad malleable	12.50 to 13.00
Boiler plate	12.50 to 13.00
Locomotive grate bars	11.00 to 11.50
Pipe	9.50 to 9.75
Wrought iron and soft steel turnings	7.50 to 7.50
Clean cast borings	7.75 to 7.25

The German Iron Market

The Bar Situation a Feature

BERLIN, July 28, 1911.

The market reviews still give conflicting reports as to trade conditions. The official report of the last trading day of the Düsseldorf Exchange used the words, "Bar iron more active at rising prices," and quite a controversy has arisen in the press as to the correctness of this description. Some of the reports positively assert that an improvement in the bar trade, both as to prices and activity is perceptible; but other authorities, apparently of equal weight, deny this with similar positiveness. Thus the leading newspaper of Essen, which had distinguished itself up to a recent date by printing more pessimistic market reviews than any other newspaper in the country, now prints a letter from somebody "in the foremost circles of the trade" which says that an upward movement in bar prices can no longer be denied; and the Frankfurter Zeitung, whose financial and trade reviews stand in high repute, also reported about ten days ago that a slight improvement was visible. On the other hand, the two foremost papers of Cologne, the Koelnische Zeitung and the Koelnische Volkszeitung, both of which make a specialty of iron market reporting, scout the idea that any improvement can be seen; and they quote prices to prove their contention. In opposition to the Düsseldorf Exchange's latest quotation of 99 to 105 marks, against 98 to 103 marks for the previous quotation, the Koelnische Zeitung now asserts that it has seen offers of bars at 99 to 100 marks from some of the big establishments; and that dealers are still selling at 97.50 marks. It adds that one great concern has just reduced its price below 97.50 marks. The other Cologne newspaper quotes similar figures. The former paper further refers to the bad conditions prevailing in the band iron and rod and wire trades as proof that general iron market conditions are not so rosy as described by some writers.

Pig Iron Syndicate Makes Progress

It is at last possible to report substantial progress toward the completion of the Pig-iron Syndicate. An arrangement has been effected with the Gutehoffnungshütte, under which it withdraws its demand for an addition of 40,000 tons to its allotment, with the understanding that it may buy a part of the allotments of several other furnaces. An agreement has also been reached with the Mathildenhütte, which several weeks ago had served notice of its withdrawal. Progress has also been made in the negotiations with the Luxemburg-Lorraine group. Many of the big companies on the lower Rhine also have branch establishments in Luxemburg or Lorraine; and they have already agreed to bring in their furnaces situated there. Negotiations with the establishments operating exclusively in Luxemburg and Lorraine are still in progress, but it is believed that their completion will occur within a week or two. The Norddeutsche Hütte, the new furnace company near Bremen, and the Geisweider and Hüste-

THE IRON AND METAL MARKETS

ner concerns have not yet been brought to terms, but negotiations are continuing.

The completion of the syndicate looks now so certain that the stock markets have begun to reckon with it as an accomplished fact, and considerable buying of iron shares has been observed on some days. Of course stock operators take an optimistic view of the meaning of the completed and enlarged syndicate, but the financial press is warning them that they can easily exaggerate the importance of the event. It is expected, indeed, that one of the first acts of the syndicate after its renewal will be to advance pig-iron prices; but, on the other hand, a restriction of the output of the furnaces is also looked for. For the present such a step would hardly seem to be called for, as it does not appear that stocks of iron are accumulating anywhere, and the trade reviews mention the fact that goods on order are being called for for delivery at a satisfactory price. It is even asserted that the furnaces, in anticipation of the completion of the syndicate, are demanding somewhat higher prices on supplementary orders for 1911 delivery. The waste and scrap-iron market remains in a rather depressed state, owing to the increase of supplies at the end of the business year.

Questions Before the Steel Works Union

The Steel Works Union held its monthly meeting yesterday under more interesting circumstances than usual. The well-known Saerbrücken firm of Gebrüder Stumm again came forward with a demand for a 10 per cent. increase of its allotments in rods and bars. At the same time a resolution came up to reduce the price of steel material for further manufacture by 5 marks per ton, to take effect as of July 1. The latter resolution emanated from the mills running on finished goods and dependent upon other establishments for their steel supplies — a class of mills that is perennially in a state of more or less acute distress. The meeting rejected the motion to reduce the price of steel material for the current quarter, and postponed a decision as to the December quarter till the next meeting at the end of August. All applications for increased allotments were voted down. An attempt in the Band Iron Association to raise prices failed in view of the unsatisfactory market position of this specialty.

The Gutehoffnungshütte of Oberhausen, on the Rhine, has taken a contract to build a steel bridge across the Rhine at Cologne. This will keep its bridge construction department busy for a year. The Gewerkschaft Deutscher Kaiser (Thysseris concern) has just put into blast one of its renovated furnaces. It has also just put into operation a plate mill for medium and thinner qualities.

The reports from the Belgian trade continue to brighten. Bars have further risen to £4 14s. and £4 15s. per ton for export.

It is reported in the German press that a combination of all the furnaces in Northern France is projected to regulate production and prices. Headquarters will be at Valenciennes.

St. Louis

ST. LOUIS, MO., August 7, 1911.

In old material a rather remarkable activity prevails, with higher prices ruling. A good general movement is noted in pig iron, structural steel, coke, etc., but no new business of especial size is apparent either in the inquiries or in the contracts. The ability of consumers to get what they want on immediate delivery is keeping many of them from taking any interest in futures, especially as there seems no strong probability of a change in the present situation.

Pig Iron.—The movement during the week has been chiefly on specifications on contracts and on small orders, carload lots, etc., for immediate delivery. The aggregate mounts up to a very fair total, but nothing in any of the component items is of especial moment. The order for 10,000 tons of basic mentioned last week has not yet been placed. The quotations on pig iron remain about as last given. In some instances the quotations are firmly held—by those who have loaded up on all the cheap business they want for the present. In No. 4 Southern there is some competition with scrap, but nothing to call a feature of the situation.

Coke.—On requisition and on small orders for immediate delivery coke is moving rather freely, with the quotations running $2 to $2.25 at oven for Connellsville or Stonega best 72-hr. selected, for last half delivery, with a tendency to make the price $2.25 to $2.50 for the first half of 1912. The smaller foundries are taking steady quantities, but none of the large consumers is in the market to any extent.

Finished Iron and Steel.—Good conditions prevail in the market for finished products, but there is no one thing that can be characterized as of especial moment. In standard rails the large order of the week was one for 2000 tons for the Southwest; another for 500 tons was taken to go west. These went at the regular figure and will be given prompt delivery, the mills being in good shape to do so. In structural material there is a steady movement of fair proportions, but nothing large. There is some placing of plates, but bars continue to be affected by the differential in favor of iron. In light rails the coal companies continue to show activity, and one fair-sized order was placed during the week by a lumber company. Track fastenings continue firm and in good movement, considering the period of the year.

Old Material.—Scrap has had the boards this week for interest, there having been some very active competition for the railroad material that came out. The Missouri Pacific's 1500 tons mentioned last week and 1000 tons for the Wabash and 500 tons for the Cotton Belt were sold at good prices, better, in fact, than the market. The chief interest is in steel scrap, and quotations generally show an unusual activity. Part of it is speculative, but the speculative disposition seems to be based upon a considerable demand, which promises to become larger according to present accounts. Dealers are watching things very closely and buying up everything they can get hold of at the new prices. Dealers' prices per gross ton, f.o.b. St. Louis, are as follows:

Old iron rails	$13.00 to $13.50
Old steel rails, rerolling	13.00 to 13.50
Old steel rails, less than three feet	11.50 to 12.00
Relaying rails, standard section, subject to inspection	23.00 to 23.50
Old car wheels	13.00 to 13.50
Heavy melting steel scrap	11.50 to 12.00
Frogs, switches and guards cut apart	11.50 to 12.00

The following quotations are per net ton:

Iron fish plates	$11.00 to $11.50
Iron car axles	19.50 to 20.00
Steel car axles	18.50 to 19.00
No. 1 railroad wrought	11.25 to 11.75
No. 2 railroad wrought	10.25 to 10.75
Railway springs	9.75 to 10.25
Locomotive tires, smooth	14.50 to 15.00
No. 1 dealers' forge	8.50 to 9.00
Mixed borings	6.50 to 7.00
No. 1 busheling	9.50 to 10.00
No. 1 boilers, cut to sheets and rings	8.00 to 8.50
No. 1 cast scrap	10.00 to 10.50
Stove plate and light cast scrap	8.00 to 8.50
Railroad malleable	8.50 to 9.00
Agricultural malleable	7.50 to 8.00
Pipes and flues	8.50 to 9.00
Railroad sheet and tank scrap	8.50 to 9.00
Railroad grate bars	8.00 to 8.50
Machine shop turnings	7.50 to 8.00

New York

NEW YORK, August 9, 1911.

Pig Iron.—Foundries in this district appear generally to have a supply of iron for this quarter and there is little concern about purchases for the last three months, while practically no interest is taken on either side of the market in buying for 1912. A few hundred tons of malleable are involved in one inquiry from New England, but pipe foundries are the only melters willing to take on any large tonnage. These as a rule want lower prices than furnaces are entertaining. Buffalo sellers are more generally asking $13.50 for No. 2 X for delivery through the year and in some cases a higher price has been quoted. There has been little movement in Virginia iron apart from the recontracting due to the blowing out for repairs of one furnace which had little stock on hand. Eastern Pig Iron Association stocks declined considerably in July, but the supply is still ample and little change in price is to be expected in the immediate future, though makers are rather more hopeful. Some inquiry is up for basic iron for first quarter delivery in Eastern Pennsylvania. We quote as follows for Northern iron, tidewater delivery; No. 1 foundry, $15.25 to $15.50; No. 2 X, $14.75 to $15.25; No. 2 plain, $14.50 to $14.75. On Southern No. 1 foundry we quote $14.75 to $15.25 and on No. 2, $14.25 to $14.50.

Finished Iron and Steel.—The outlook for the immediate future has brightened considerably, though the week's business has been no better than usual. A decision permitting the third tracking of some of the elevated railroad lines of New York; consideration by the authorities of a project to erect an elevated railroad

THE IRON AND METAL MARKETS

structure in West street; recurrence of the talk on the Hell Gate connecting railroad bridge, and the steel requirements of the new subways of New York help to accentuate the good feeling. So far as the subways are concerned, it is widely believed that the structural material has already been closed for most of the general work awarded. The bar iron business has felt the low prices which have been obtaining in steel bars, but purchases have not been large and there is further talk of price stiffening. The largest new structural proposition appearing is the Filene building, Boston, D. H. Burnham & Co., architects, requiring 5000 to 6000 tons, and bids for general contract to be in probably by August 17. Of structural awards may be mentioned: Apartment house, Seventy-eighth street and West End avenue, for the Cambridge Construction Company, 600 tons, to Ravitch Brothers; Manhattan Soap Company, 900 tons, to William Crawford; McKeon loft building, West Twenty-fifth street, 1200 tons, to Alfred E. Norton Company. Plate mills are running at probably about 60 per cent. capacity. Quotations are: Plain structural material and plates, 1.51c. to 1.56c.; steel bars, 1.36c. to 1.41c.; bar iron, 1.30c. to 1.35c., all New York. Plain material and plates from store, New York, 1.80c. to 1.90c.

Cast Iron Pipe.—General conditions have not changed, and carload lots of 6-in. are quoted at $21 to $22 per net ton, tidewater. The one public letting of importance was for 1700 tons, New Bedford, Mass., scheduled for August 8.

Old Material.—The movement of scrap is very light. A number of Eastern rolling mills are practically closed, and there are considerable accumulations of mill scrap in the hands of dealers. Foundry operations continue on about the scale that has prevailed during the summer and current shipments of cast scrap are on a very moderate scale. The past week has shown quite a little demand for old wrought pipe, but the sales have not been sufficient to make any change in the price. There is no inducement to speculate on a market such as has ruled in recent weeks. Steel works operations in eastern Pennsylvania have been on about a two-thirds basis, and for the small amount of scrap the mills have been taking of late, in lots of, say, 400 to 500 tons they have not been willing to pay more than $13 delivered. Quotations are as follows, per gross ton, New York and vicinity:

Old girder and T-rails for melting	$11.00 to $11.50
Heavy melting steel scrap	10.75 to 11.25
Relaying rails	20.50 to 21.50
Rerolling rails (nominal)	12.25 to 12.50
Standard hammered iron car axles	22.00 to 22.50
Old steel car axles	16.50 to 17.00
No. 1 railroad wrought	13.50 to 14.00
Wrought iron track scrap	11.50 to 12.00
No. 1 yard wrought, long	11.50 to 12.00
No. 1 yard wrought, short	10.50 to 11.00
Light iron	4.50 to 5.00
Cast borings	7.00 to 7.25
Wrought turnings	7.25 to 7.75
Wrought pipe	10.75 to 11.25
Old car wheels	10.75 to 11.25
No. 1 heavy cast, broken up	10.75 to 11.25
Stove plate	8.50 to 9.00
Locomotive grate bars	9.00 to 9.50
Malleable cast	10.50 to 11.00

Ferroalloys.—Fully 2000 tons of ferromanganese has been sold in this market recently at $37 Baltimore. There has been quite a buying movement in ferromanganese and it is estimated that about 7000 tons has been disposed of in the last few weeks. The market for ferrosilicon seems quiet here, and dealers are practically out of the market, as they are asking much higher prices than it can be obtained for in Pittsburgh.

Metal Market

NEW YORK, August 9, 1911.

The Week's Prices

Cents Per Pound for Early Delivery.

	Copper, New York.			Lead.		Spelter.	
Aug.	Lake.	Electrolytic	Tin. New York.	New York.	St. Louis.	New York.	St. Louis.
3	12.75	12.62½	42.15	4.50	4.45	5.90	5.70
4	12.75	12.62½	42.45	4.50	4.45	5.90	5.70
5	12.75	12.62½	.....	4.50	4.45	6.00	5.80
7	12.75	12.62½	42.70	4.50	4.45	6.00	5.80
8	12.75	12.62½	43.00	4.50	4.45	6.00	5.80
9	12.75	12.62½	43.00	4.50	4.45	6.00	5.80

The copper market has strengthened in tone as the result of the July statistics showing a decrease in production and stocks. Pig tin is very scarce in New York and a premium is demanded for spot stocks. Spelter has advanced 10 points. Lead is strong.

Copper.—There has not been enough buying of copper since the announcement of the Copper Producers' statistics for July to test the market, but copper is decidedly firmer in tone. The favorable statistics, which show a noticeable decrease in production, a substantial increase in exports and a decrease of nearly 20,000,000 pounds in stocks, brought about a very cheerful feeling among the sellers, and it is believed that consumers will shortly come into the market. Judging from the inquiries a number of large consumers of electrolytic copper are rather short of stocks. The London market has strengthened noticeably in the last two days, and this morning spot copper there was bringing £56 10s. and futures £57 5s. Exports continue heavy, aggregating so far this month 5660 tons. Prices of Lake and electrolytic copper have not changed in New York as yet, but are liable to go up if any call for the metal develops.

Copper Averages.—The Waterbury average for July was 12.75c. The average price of Lake copper in New York during the month was 12.78c., and the price of electrolytic was 12.58c.

Pig Tin.—Pig tin for spot delivery is very scarce in New York and a premium of ¾c. is demanded. All the available tin is practically in the hands of one party, and considering that there is only 1140 tons at dock and no more is expected to arrive this week spot tin is liable to go considerably higher. There is only 1415 tons of tin afloat and most of it will not arrive until late in the month. The arrivals so far this month have been 1628 tons, but most of this metal was contracted for before it was unloaded. There is no great demand, and what little trading there was done during the week was practically between dealers. Pig tin this morning was 43c., which is an advance of 1c. over last week's prices. The London market shows signs of advancing, and this morning spot tin was sold for £194 and futures for £189, which is an advance of £3 over last week's price for spot.

Tin Plates.—There is a good, steady call for tin plates and can manufacturers are beginning to prepare specifications for their fall needs. The price is unchanged at $3.94 for 100 lb. coke plates. The price of foreign tin plates is unchanged at 13s. 9d. at Swansea, Wales.

Lead.—Some rather sensational buying has been done during the week, and it is believed that the purchases were made by a leading selling interest. It is inferred that the buying was prompted by a desire to steady the Western market, which has an upward tendency. Western dealers have been considerably excited over the shortage of lead in the East, where independent sellers have disposed of most of their holdings. The consumers do not seem to be taking much interest in the situation and prices are unchanged at 4.45c., St. Louis, and 5.50c., New York.

Spelter.—Spelter has advanced 10 points during the week and promises to go higher. A number of Western sellers who have been trying to advance the market within the last three weeks seem to have succeeded in their efforts, as consumers who were holding off have been obliged to begin to buy. According to reports from St. Louis this morning the market there promises to go higher. For the first time this year spelter has been bringing 6c. in New York within the last two days and it is selling at 5.80c., St. Louis.

Antimony.—Hallett's antimony has declined to 7.75c. and the market threatens to go lower. A great deal of antimony has been put on the market of late by speculators who purchased several months ago in the hopes of realizing on the expected success of the syndicate. Their deductions proved wrong, however, as the syndicate is now branded an entire failure. There is only a small jobbing demand for antimony. Cookson's continues firm at 8.50c., and Hungarian and Chinese grades are offered at 7.75c.

Old Metals.—Consumers are not buying freely, but dealers' selling prices, New York, are nominally unchanged, as follows:

Copper, heavy cut and crucible	12.00 to 12.25
Copper, heavy and wire	11.50 to 11.75
Copper, light and bottoms	10.75 to 11.00
Brass, heavy	8.00 to 8.25
Brass, light	6.75 to 7.00
Heavy machine composition	10.50 to 10.75
Composition turnings	8.75 to 9.00
Clean brass turnings	8.00 to 8.25
Lead, heavy	4.20 to 4.25
Lead, tea	3.95 to 4.00
Zinc, scrap	4.25 to 4.30

Chicago

AUGUST 7.—A slowing down in the rate of production has produced a firmer situation in spelter and

THE IRON AND METAL MARKETS

prices are slightly higher. Advances are also asked for lead. Trade has been less active if anything and buying is decidedly spotty in character. We quote, Chicago delivery, as follows: Casting copper, 12.65c.; Lake, 13c., in carloads, for prompt shipment; small lots, ¼c. to ⅜c. higher; pig tin, carloads, 43.50c.; small lots, 45.50c.; lead, desilverized, 4.52½c. to 4.55c. for 50-ton lots; corroding, 4.72½c. to 4.75c. for 50-ton lots; in carloads, 2½c. per 100 lb. higher; spelter, 5.85c. to 5.90c.; Cookson's antimony, 9¼c., and other grades, 8¼c. to 8¾c., in small lots; sheet zinc is $7.50 f.o.b. La Salle, in carloads of 600-lb. casks. On old metals we quote for less than carload lots: Copper wire, crucible shapes, 10¾c.; copper bottoms, 9½c.; copper clips, 10¼c.; red brass, 9½c.; yellow brass, 7½c.; lead pipe, 3.90c.; zinc, 3.90c.; pewter, No. 1, 26c.; tinfoil, 33c.; block tin pipe, 37c.

St. Louis

AUGUST 7.—Metals are still on the upward turn in this market, lead and zinc especially, these being affected by the demand and also by the heavy rains in the Joplin district which have flooded the mines and cut the ore production for the time being at least 50 per cent. Lead is in excellent demand at 4.47½c. to 4.50c., Missouri brand. Spelter has climbed to 4.82½c. to 4.85c., with the end not yet in sight. Tin is higher at 42.85c., while antimony, Cookson's, is steady at 8.85c. Copper is firm at 13.10c. for Lake and 13c. for electrolytic, with the demand good for all these metals. Reports from the Joplin district report zinc ore inactive the past week at $38 to $41.50, but the new week's quotations are expected to go well above that figure. Lead ore there is strong at $58 to $60. Calamine brought $22 to $24. Old metals are quoted: Light brass, 5c.; heavy brass and light copper, 8c.; heavy copper and copper wire, 9c.; zinc, 3c.; lead, 3¼c.; pewter, 20c.; tin foil, 29c.; tea lead, 3c.

Iron and Industrial Stocks

NEW YORK, August 9, 1911.

The highest prices realized for industrial stocks since last week's report were those of Wednesday, August 2. In the three days following prices showed a continued decline, attributed in some quarters to the fear that the investigation of the United States Steel Corporation would have more serious results than had been anticipated. Some of the declines were marked, particularly in Allis-Chalmers preferred and Bethlehem Steel common. There was some variation in crop estimates, but nothing to create a really pessimistic feeling. The range of prices on active industrial stocks from Wednesday of last week to Tuesday of this week was as follows:

Allis-Chalm., com....	6 - 8	Pressed Steel, com..	33¾- 36½
Allis-Chalm., pref...	21¾- 27½	Pressed Steel, pref.	100 -102
Beth. Steel, com....	31½- 37⅜	Railway Spring, com.	34 - 36¼
Beth. Steel, pref...	60 - 63⅜	Republic, com.....	27½- 29½
Can, com.....	10 - 11	Republic, pref.....	92½- 94⅜
Can, pref.....	84½- 87	Sloss, com.....	48 - 49
Car & Fdry., com...	53½- 56½	Pipe, com.....	15 - 15¾
Car & Fdry., pref....	117	Pipe, pref.....	53 - 53½
Steel Foundries.....	38 - 39	U. S. Steel, com...	73½- 79⅜
Colorado Fuel	30 - 31	U. S. Steel, pref...	116¼-118
General Electric....	154½-162	Westinghouse Elec..	64½- 72½
Gr. N. Ore Cert...	52½- 57¼	Va. I. C. & C.....	82
Int. Harv., com....	118 - 122	Chi. Pneu. Tool....	48½- 51½
Int. Harv., pref....	12434-125	Cambria Steel	45 - 46⅜
Int. Pump, com.....	37½- 40¾	Lake Sup. Corp....	24¾- 26
Int. Pump, pref....	87½- 87¾	Pa. Steel, pref.....	106
Locomotive, com....	37½- 39¾	Warwick	10
Locomotive, pref.....	106	Crucible Steel, com.	12 - 12¾
Nat. En. & St., com.	17½- 19	Crucible Steel, pref.	80¾- 82½
Nat. En. & St., pref.	97 - 98½	Harb. Wk. Ref., com....	26⅜

In oil burning furnaces there is no fuel bed the friction of which must be overcome by a lofty chimney to create the draft necessary to overcome the friction. In a short discussion of the subject at a San Francisco meeting of the American Society of Mechanical Engineers, K. G. Dunn, vice-president of Hunt, Mirk & Co., San Francisco, explained that there are many stacks operating successfully on this account of 50 per cent. of the sizes for chimneys given in Kent's Mechanical Engineer's Pocket Book.

No. 1 furnace of the Shenango Furnace Company, Sharpsville, Pa., is to be relined by William McIntyre & Sons, Sharon, Pa., and is expected to be ready for blast about August 15.

The Youngstown Sash Weight Company, recently organized at Youngstown, Ohio, has started work on a new plant at Girard, Ohio, to manufacture sash weights.

Lake Superior Iron Ore Shipments in July

The shipments of iron ore from upper lake ports in July amounted to 5,221,373 gross tons, as against 6,945,289 tons in July, 1910, a falling off of 1,723,916 tons or 24.82 per cent. The Soo Line shipments from the Cuyuna range to Superior were 67,167 tons in July, with a total of 101,947 tons to August 1. This range was not a shipper in 1910. The shipment by ports in July, 1910 and 1911, and the totals to August 1 are as follows, in gross tons:

			To August 1,	
	July, 1911.	July, 1910.	1911.	1910.
Escanaba	644,098	725,123	1,711,806	2,464,859
Marquette	809,438	573,632	843,177	1,723,877
Ashland	439,843	718,309	1,102,263	2,233,864
Superior	1,747,364	1,262,468	4,698,855	3,895,303
Duluth	1,108,816	2,344,226	3,158,450	7,441,488
Two Harbors	972,314	1,321,531	2,549,740	4,104,158
	5,221,373	6,945,289	14,064,291	21,863,549

The shipments to August 1 this year are thus 7,799,258 tons or 35.67 per cent. less than to August 1, 1910—a very marked falling off.

High efficiency with oil-burning steam boilers is shown in a paper read by B. R. T. Collins, Boston, Mass., before a meeting in Boston in April, 1911, of the American Society of Mechanical Engineers. An average of seven tests of a boiler at Redondo, Cal., showed an efficiency of 80.47 per cent., 15.23 lb. of water, being from and at 212 deg. F., being evaporated per pound of oil, the oil corrected for moisture. The highest efficiency was obtained when the boiler was running at 109.2 per cent. of the builders' rating of 604 hp., and the efficiency was 83.3 per cent. and the water evaporated per pound of oil was 15.81 lb. The average percentage of carbon dioxide in the gases was 13.2; the excess of air 21.2 per cent., and the steam used by the burners 2.15 per cent. The heating value of the oil, which was obtained from the Los Angeles fields, was corrected for moisture, 18281 B.t.u. per pound.

The steamship Themis unloaded last week at the ore dock of the Philadelphia & Reading Railroad, Port Richmond, Philadelphia, 12,500 tons of Wabana ore in 66 working hours. This unloading plant is now operating in a most satisfactory manner, and it is expected that even better records will be made in the near future.

It is expected that the second furnace which the Inland Steel Company is now building at Indiana Harbor, Ind., will be ready for operation in January, 1912.

The blast furnace of the Wheeling Steel & Iron Company at Martins Ferry, Ohio, is out of blast for relining and is expected to resume about September 1.

The Pennsylvania Equipment Company, Philadelphia, is in the market for 800 ft. of 16-in. B. & S. cast-iron pipe to stand 100 lb. pressure.

The Dodge Mfg. Company, Mishawaka, Ind., gave its employees an outing to Michigan City, Ind., on July 29, the attendance being fully 3000. This was the fifth annual event of the kind. A street parade was headed by M. W. Mix, president of the company, followed by the Century Club, which is composed of about fifty employees who have been with the company more than twenty-five years.

The new works of the Union Drawn Steel Company at Beaver Falls, Pa., has been completed and a number of machines in it are in operation. All the equipment needed for this plant has been purchased. The company's other two plants, also at Beaver Falls, are in operation.

A patent on a toggle drawing press, granted July 25, has been assigned to the E. W. Bliss Company, Brooklyn, N. Y., by William Klocke and Frederick Orton. Among other things the patent covers a reciprocating blank-holding table. The patent number is 998,968.

Tod Furnace of the Youngstown Steel Company, Youngstown, Ohio, was blown out last week for relining and will be idle about six weeks.

The Steel Corporation Investigation

Testimony of Charles P. Perin, John A. Topping, Charles M. Schwab and Others

Charles P. Perin Testifies

Continuing the hearing in New York City, the Stanley Committee had before it on August 1 Charles Page Perin, William M. Given, and Walter Moore, engineers, who examined the Tennessee Coal and Iron property in 1904 for the proposed consolidation of the Tennessee Coal, Iron & Railroad Company, Republic Iron & Steel Company, and Sloss-Sheffield Steel & Iron Company. This consolidation was never effected. Mr. Perin submitted the report made at the time and explained to the committee technically how they arrived at their conclusions.

Mr. Perin used a map of the Birmingham district, showing the tonnage of ore and coal owned by the three companies referred to his report in explaining the mineral deposits.

The Tennessee Company's Great Ore and Coal Supply

The iron ore of all kinds owned by the three companies totaled 539,810,800 tons, divided as follows: Tennessee Coal & Iron 76.5 per cent., Sloss-Sheffield 14.4 per cent., Republic 9.1 per cent. Total of coal deposits was 2,377,128,400 tons, divided as follows: Tennessee Coal & Iron 68.22 per cent., Sloss-Sheffield 24.48 per cent., Republic 7.3 per cent. Coking coal amounted to 1,532,350,800 tons, as follows: Tennessee Coal & Iron 64.8 per cent., Sloss-Sheffield 25.7 per cent., and Republic 9.5 per cent.

While the report was made in 1904, the totals are practically the same as when the Tennessee Company was absorbed by the Steel Corporation.

Mr. Perin said that the report had been based on the records of all the companies which had been at the disposal of himself and his confreres, showing bore holes, drillings, and actual production. All doubtful veins or those too thin to be merchantable had been cast aside. In other words, he thought the report, while founded upon estimates in a sense, had facts as a basis. He spoke of the proximity to one another of all the raw materials necessary to make pig iron.

"That means," asked Chairman Stanley, "that all these materials necessary for the production of pig iron are found within a total radius or haul of 25 miles."

"Yes, about that," responded Mr. Perin. He then agreed that there was no other region in the world where this condition was to be found as applied to large bodies of ore. He added that the cost of production in the Birmingham region was $4 a ton less than in Pittsburgh, for instance, by reason of this condition. He thought that Birmingham's cost was $3 a ton cheaper than that of any other iron-producing district in the world. But he said: "To this you have to add $3 or $4 a ton freight for every ton of pig iron that goes out of the Birmingham district on account of no local market."

"What was the value of the 400,000,000 tons of ore, the 1,600,000,000 tons of coal and the tonnage of limestone in the Tennessee Coal & Iron property compared with that of equal deposits anywhere else in the world?" Mr. Stanley asked the witness. He replied by pointing out that the value of the deposits depended greatly on the amounts expended to develop the plant and bring about cheap cost of production.

Mr. Perin was asked about the report made in 1904 by Chief Engineer Phillips of the Tennessee Company, putting the cost of production of pig iron by the company at $6.25 per ton. He said that he could not verify Mr. Phillips' figures, but had always considered him as conversant with the mining situation and qualified to figure such a result.

The Company's Need for Money to Put in Its Plant

"Was not the Tennessee Company seeking for money to put into its plant at the time when this report was made?" witness was asked.

"There was never the time when the company was not seeking for money to put into its plant," replied the engineer, with a smile.

In the afternoon Messrs. Given and Moore, engineers who collaborated with Mr. Perin in preparing the report mentioned, confirmed the above evidence. Mr. Given said that while he knew of free undeveloped ore fields which appeared very promising, there was no incentive to the opening of a furnace by another company in the Birmingham district, as there was only a negligible quantity of ore now purchasable.

Mr. Perin was then recalled to the stand. Here the investigation touched on the deposits of ore in Cuba. The Cuban ores, he said, were of high grade, and especially useful in rails owing to the high percentage of nickel and chromium in the ore. The Western Maryland Railroad had worked out a project by which eastward-bound coal cars could be returned with Cuban ores at cost, so as to bring them into the Pittsburgh market at a fair profit. So far this has not met with large success, for the reason that Pittsburgh furnacemen anticipate the same smelting difficulties which were formerly experienced with Mesaba ores.

Mr. Given, who lives in Birmingham, was also questioned as to the real estate value of the land, aside from its mining rights, and testified that it was worth from $20 an acre in some places to $2,000 an acre in the vicinity of Birmingham. The total holdings amounted to about 500,000 acres. The purpose of all this, although no conclusions were drawn during the hearing, is to show that the ore was worth at least 35 cents a ton, or about $140,000,000, and the coal 5 cents a ton, or $80,000,000 more, making a total of at least $200,000,000, aside from the value of the land, instead of the $30,000,000 the Steel Corporation paid for it. This, some of the committeemen think, would support the theory that the Steel Corporation forced the sale and got the property at a bargain.

Grant B. Schley, the Broker, Testifies

The most striking feature of the testimony of Mr. Schley, of the brokerage house of Moore & Schley, given August 3, was his statement that acquisition of the Tennessee Company had never been urged by him as the only step possible to save his firm and avert further panic. The situation in reality seemed to have arisen because of the difficulties following the formation of a second syndicate which has just come to light, and on account of which Moore & Schley became overextended. The first syndicate has frequently been referred to in the previous testimony. The second syndicate was formed to take 50,000 more shares of the Tennessee stock. Besides certain members of the first syndicate, the second had about 30 new members. Each member of the second syndicate paid up for his shares and took them over. The price of the 50,000 shares was 130. Neither Mr. Hanna nor Mr. Gates had any share in the second syndicate. The block which it acquired was mostly taken from George Kessler, who, the witness said, was in distress at the time.

Controlled Practically All the Stock

It developed from questions put by Representative Danforth that Mr. Schley and his allies owned holdings in the syndicate and out of it amounting not merely to control of the Tennessee Company but to almost exclusive possession of the stock. The witness then told of the large size of the firm's borrowing, stating its total at about $35,000,000, of which Tennessee stock represented in the collateral from $5,000,000 to $6,000,000.

Then Representative Littleton undertook to find out from what quarter the pressure came for the elimination of Tennessee stock from Moore & Schley's collateral, to which has been attributed the necessity of selling it or exchanging it for Steel Corporation bonds.

Q.—What banks requested the elimination of Tennessee stock?
A.—I can't answer that. Such requests would come to my cashier. I don't remember any specific instance.

Q.—Was there ever any such demand made by any bank? A.—Only in a general way. The same objection applied to other industrials. Republic stock, for instance, was reduced among the collateral, though not to the same extent.

Q.—Was there any more demand that Tennessee be withdrawn than other industrials? A.—No.

Q.—Did your cashier report that Tennessee had suddenly become unacceptable? A.—Only to the same extent as other industrials.

Q.—Was there a general demand that Tennessee be taken out of existing loans and a refusal to accept it in new loans? A.—There was no difference between that stock and any other industrial stock.

Q.—Was there ever a refusal by any bank to accept Tennessee or a demand that it be withdrawn? A.—I can't remember any specific instance.

Q.—At the time of the panic what caused the obpection to it? A.—Chiefly its position marketwise. Some bankers wouldn't have anything to do with it.

Q.—Was there a general attack on Tennessee or a general drive, as it has been called? A.—I never knew of any.

Corroborates the Ledyard Testimony

Mr. Schley corroborated Mr. Ledyard's testimony as to an exchange of securities with Colonel Payne. The examination by Representative Littleton continued, in part, as follows:

Q.—Then Moore & Schley were not attacked solely because of their ownership of T. C. & I.? A.—No.

Q.—If there was no drive against T. C. & I. and the rumors regarding Moore & Schley were groundless, in what way was the exchange of the stock for Steel Corporation bonds necessary to save Moore & Schley from failure? A.—We had $35,000,000 in loans and our customers were borrowing from us on T. C. & I., which was unmarketable. When we got the bonds in exchange there was an immediate market for them. The bonds could be sold and the accounts cleared.

Q.—Why was it any more necessary to exchange the Tennessee stock than that of the Republic or any of the others which were not readily salable? A.—It wasn't.

Q.—You had just as much reason for trying to negotiate a sale of the other stocks as the Tennessee? A.—Yes; except that we had a very much larger amount of Tennessee.

Q.—Was there any particular reason why the Tennessee should be made the subject of a trade between you and the Steel Corporation? A.—It relieved my needs. It relieved every friend I had and relieved my office.

Mr. Schley corroborated Mr. Ledyard's testimony that Colonel Payne was the first to suggest the sale of Tennessee to the Steel Corporation, putting it in this way: "Colonel Payne talked to me about it for a month before the sale was made. He knew I was worried and lying awake nights. He said: 'Life is too short to be worried like this. Why not sell the Tennessee Company and be done with it?'

The Interview with Judge Gary

Mr. Schley said he asked Mr. Ledyard to see Mr. Morgan. Later Messrs. Frick and Gary came to see him, and Judge Gary said the stock wasn't worth over 60, although Mr. Schley had said it would not be sold for less than par.

"Judge Gary said that was about all he could do," testified Mr. Schley. "I said, 'Then it won't be sold.' After that Mr. Ledyard became quite active, and I saw Messrs. Gary and Frick several times. The second time Judge Gary offered 90 in bonds. At the price the bonds were then selling at this meant 75 for the stock. It had not been specified whether the first offer was in cash or bonds. We didn't get that far. I told Judge Gary that the second offer wouldn't do, and that we must have par."

Q.—What was the upshot of the conversation? A.—Judge Gary said he would see me again after the meeting of the Steel Corporation's Finance Committee, which wouldn't be held until Tuesday. This was Sunday morning. Saturday had been a pretty bad day, and I didn't like the looks of Monday. I told Mr. Ledyard and he brought influence to bear, and the Finance Committee had a meeting Sunday. Mr. Ledyard came and said it looked more favorable. Monday afternoon Mr. Ledyard told me they would pay par.

Q.—Were they reluctant to buy? A.—Judge Gary didn't want to. I never heard Mr. Frick express an opinion.

Q.—How did the sale save Moore & Schley? A.—Perhaps it didn't save us. Perhaps we would have got through anyhow.

Q.—How did it aid, then? A.—By putting us in possession of several million dollars.

Q.—How did it put you in possession of it? A.—I had borrowed from Moore & Schley as well as Mr. Kessler. I sold his bonds first and then my own. His didn't quite extinguish his indebtedness. This brought in $12,000,000.

Q.—You paid off your loan from the firm? A.—Yes. Moore & Schley took the $12,000,000 and liquidated a large part of their loans from the banks.

No Pressure from Morgan Banks

Representative Sterling of Illinois questioned the witness as follows:

Q.—Do you know of any banks connected with the Steel Corporation that were pressing you more than others? A.—No.

Q.—Were any of those known as Morgan banks pressing you? A.—No. I don't know of any banks or system of banks that were pressing me as distinguished from others.

Q.—Did any financial institution seem to make a point of discrediting Tennessee? A.—No.

Q.—Did you have a suspicion that anybody was doing so? A.—I don't remember such a thought entering my mind.

Q.—Was there any thing that would lead you to think that the Steel Corporation was trying to get hold of Tennessee? A.—I have been unable to find any such evidence.

Representative Young of Michigan asked what would have been the effect if Moore & Schley had failed. "It is hard telling to what extent it would have gone. We had 600 clients on our books who would have suffered. There would have been many sales of our $35,000,000 loans. I think it would have been a very serious thing. It would have extended the panic very seriously, and might have gone into the banks."

John A. Topping Examined

John A. Topping, chairman of the Republic Iron & Steel Company, who was chairman of the Tennessee Coal, Iron & Railroad Company at the time of its absorption by the Steel Corporation, was examined August 3. Asked about the Tennessee Company he said he entered the syndicate because he thought it proper as the head of the company to take a financial interest in it. He had been impressed with its mineral resources, as shown by the report of the engineers.

In Poor Condition When Bought by Mr. Topping and Associates

"The year of our purchase," he said, "the company earned about $1,000,000. Its working capital was something over $1,000,000, but it didn't have the capital necessary to develop the property. Its physical condition was very poor, and the property was run down at the heel."

Mr. Topping submitted the auditor's report to show the condition of the company just before the merger. This report was made as the basis of the purchase by the Steel Corporation, he said. It showed a gain of 112 per cent. in earnings, and the net balance of cash was $2,000,000. A map was produced and the property gone over in detail. Then the sale by the syndicate was taken up.

Q.—Was there an understanding that the members of the stock were not to sell without the consent of the syndicate managers? A.—I felt that I was under a moral obligation not to sell and didn't sell. That was the general understanding.

Q.—Mr. Schley testified that you went with him to see Mr. Ledyard about the sale. A.—Yes. I met Mr. Ledyard at Mr. Schley's office. Mr. Schley asked me to tell Mr. Ledyard about the property. I told him the story of the work that had been done and the character of the property. I laid particular stress on the fact that the holdings were fee ownerships, and that their future value was very great. I also talked about the export possibilities. I painted the picture as I believed it existed.

Q.—Did you desire to have Mr. Schley sell the stock? A.—I did not.

Q.—What did you say to him when he asked you to talk to Mr. Ledyard? A.—I told him I couldn't go as an official representative of the company to discuss its sale, as I had no authority to do so. He asked me to go as his friend, and I said I would be glad to do so.

Q.—What was your purpose in regard to the stock? A.—My mind was rather passive. I saw no reason from my point of view why it should be sold. As Mr. Schley from his point of view said he would have to sell his stock, my purpose was to aid him to that extent. I was not representing my own stock or the stockholders. I spoke explicitly on that point.

Mr. Topping said he sold his own stock later because he didn't care to be a minority interest.

Asked what the cost of producing pig iron by his present company was he requested to be excused from answering.

Ore Freight Rates in the Northwest

Chairman Stanley then took up freight rates over the Steel Corporation's roads in the Northwest. It was shown that the Republic Company has to haul its ore from that region over either the Hill or Steel Corporation lines. He said there was no difference in rates as between the two systems. His opinion, based on that of the company's traffic manager, was that the rates are too high. They are much lower in the Birmingham district, and those in the Northwest have not been changed in many years, although the density of traffic there has greatly increased.

Q.—Is it not a fact that your company is now paying $800,000 to $1,000,000 a year in excessive charges as tribute to the Steel Corporation for the privilege of doing business over the roads? A.—I couldn't answer that without knowing the cost to the railroad per ton mile, together with a fair report. To the extent of the excess, whatever it is, we are paying tribute. I don't know how much it it. It is our opinion that the rates are too high and should be adjusted.

Q.—Do you know, or have you any advice, as to how much in money you are affected? A.—I have no data on that point.

Q. How much, in your opinion, does it cost you? A.—That is hardly a fair statement for me to make without a knowledge of the facts.

After some discussion of this point Chairman Stanley inquired why no complaint had been made to the Interstate Commerce Commission.

"Possibly the pressure has not been severe enough up to date," said Mr. Topping, "to cause us to quarrel with our neighbor. In the old days we could stand higher rates than we can now, with the Pittsburgh district menaced by other developments. Perhaps we should not complain so long as all the manufacturers pay the same rates."

Q.—But if the Steel Corporation owns the railroad and it all goes into the same pot, does it make any difference what rate they

charge for carrying their own ore? Does it make any difference how much they pay from one pocket into another? A.—I suppose not, so long as the railroads has a profit from operation.

Q.—So far, the Steel Corporation has been benevolent in enabling you to live and pay these rates? A.—I wouldn't say that. We have lived through our own efforts.

Q.—Hasn't competition been eliminated between the steel manufacturers? A.—I haven't found it so. We are having trouble right now in meeting competition, especially in the Chicago district.

Q.—If the level of prices had not been such as they are and you had been forced to produce at a small margin of profit could you have paid these freight rates actually while the other fellow paid them constructively? A.—I don't think the question of price would have had any influence on our attitude up to this time. You must remember that all railroads are large consumers of steeel and manufacturers are not inclined to make an attack on them for that reason.

Q.—Has it reached such a state in the business that the unity of interest is such that you are indifferent as to how the railroads charge you so long as the railroads are prosperous enough to give you excessive orders through which you may recoup yourselves? A.—I didn't make any such statement as that. I spoke of our state of mind in the past. I can't say what the future may require.

"If the rates made it impossible for you to continue production wouldn't these same railroads be co-sufferers with you?" interjected Representative Young.

"They would," said Mr. Topping, "and I think they will see that it is better that their large profits should be divided with the manufacturers rather than that the ore should be left in the ground."

The Gary Dinners

Representative Beall wanted to know especially about the Gary dinners.

Q.—What is your impression as to the purpose of the Gary dinners.? A.—A general desire of the manufacturers to get together and exchange views to their mutual advantage on commercial questions—sociological, technical, and otherwise.

Q.—Are they connected with any such sordid subject as that of prices? A.—Not in a specific sense. In a general sense, yes.

Q.—Haven't the speakers appealed to the sense of honor of those present to maintain prices? A.—We were not in honor bound to do anything except to take care of our own business.

Q.—Wasn't something said about a moral obligation more binding than a written agreement would be? A.—There may have been something of that kind said by some speaker. It was like the remarks you often hear in other after-dinner speeches.

Q.—Wasn't there any other significance? A.—Decidedly not.

Representative Bartlett asked whether the Republic Company in reducing prices hadn't broken the golden rule established in the trade by the Gary dinners. Mr. Topping said he was not conscious of having broken any golden rule of that sort.

Q.—Are you in favor of Government regulation such as Judge Gary favors? A.—I have no special desire to have the Government run my business, I'm afraid I'll lose my job if it does.

Q.—Then you're not as good a socialist as Judge Gary? A.—I'm not quite in accord with him on that proposition.

Q.—Were you appointed a delegate to the Brussels conference? A.—I was asked to be a delegate, but had declined long before we made our reduction in prices.

Q.—Did you notify Judge Gary of those reductions? A.—I think I did informally.

Q.—Why was that necessary? A.—I don't know that it was, but there was no reason why we should conceal it.

Q.—There must have been some reason for doing it? A.—It was merely a matter of courtesy.

Charles M. Schwab Testifies

The hearing on August 4 was entirely taken up with an examination of Charles M. Schwab, now president of the Bethlehem Steel Company, who was the first president of the United States Steel Corporation. Asked whether he had not made the first suggestion of forming the great corporation, Mr. Schwab told what he had said in a speech at a dinner given to him at the University Club, New York, in the fall of 1899, while he was president of the Carnegie Steel Company. Prominent business men and financiers were present. The subject he had chosen was his idea of the future development of manufactures in the United States.

"He explained in his address the very great advantages that would result in manufacture from such an organization as the United States Steel Corporation. First of all, instead of manufacturing steel as it was then manufactured by a number of companies, each of which manufactured the same lines, it was his idea that the organization, to be truly successful and to attain eminence in the business of the world, should be made of such a character that one mill could be run on one product and not one mill on 50 products, as was then the practice. He continued:

No Idea of Limiting Production

"I made particular efforts to state at that time that my idea of this great organization was not with a view of establishing any arrangement with reference to the limitation of production or the increase or maintenance of prices, but that the economies resulting from these things would be so great as to make capital invested in any of the individual enterprises much more valuable. It would not aim at limiting production, but exciting the skill of the managers to the best production. So strong has that idea been with me that at the Brussels conference I advocated that the independent manufacturers should compare their cost sheets."

"Would you advocate that in this country?" Chairman Stanley asked. "Could the manufacturers here do it without injury to each other?"

"We not only can do it," said Mr. Schwab, "but we do do it."

"Is there any reason why the Steel Corporation should refuse to give its costs?"

"Since I left the Steel Corporation I have obtained all these from them. To-day, in the steel industry, there is only about one item that is not freely exchanged, and that I wanted included. That is conversion cost—the cost of putting the raw material into a ton of pig iron. The item is not a very important one because we all know it within 5 or 10 cents; but if we had it each manufacturer could adopt the best practice of the others."

Got Mr. Carnegie to Name His Price

Coming back to the dinner, Chairman Stanley asked who were there, and Mr. Schwab mentioned J. P. Morgan, E. H. Harriman, Andrew Carnegie, and Henry Phipps.

"I went back to Pittsburgh," he continued, "and thought no more about the matter for some time. One day there was a call on the long distance telephone from John W. Gates. He asked me if I could meet Mr. Morgan in Philadelphia the next day. I said I would, but Mr. Gates advised me later that Mr. Morgan was ill, so I came and saw him at his house here. Mr. Morgan asked me to go over with him again and in more detail the substance of what I had talked about at the dinner. I spent several hours in doing so. Finally, in a day or so, he told me he was fully convinced about the advantages of such an organization as I had suggested. He asked me if I could get a price from Mr. Carnegie at which he would sell his works.

"I hadn't talked with Mr. Carnegie about my idea. I did then. I advised him that at his age and with his desires in life, chiefly philanthropic, he ought to sell his plant, and with a good deal of reluctance he finally did agree to sell it. It is my opinion that shortly afterward he regretted very much that he had made a price. I got the price and took it to Mr. Morgan, and beyond being consulted as to the value of properties and so forth, I had nothing further to do with the formation of the Steel Corporation.

"At the time and shortly after the corporation was formed, in an address before an association of bankers in Chicago, I laid great stress on the point that any consolidation based on the false assumption of maintaining or raising prices or restricting output was bound to fail."

His Idea of a Trust

The following colloquy ensued with Chairman Stanley:

Q.—Would you say that trusts are morally wrong? A.—No.

Q.—You mean industrially? A.—Economically. At that period there was much discussion of the formation of trusts, and the fundamental idea with most people was that the corporation was successful which could control the output of their industry, and people thought the chief advantage came from that direction.

Q.—Are these the means by which a trust endeavored to fix the price above the amount at which it would be placed by supply and demand—an agreement for the division of territory and restriction of output—and this enabled them to divide the swag or profit among themselves? A.—If I understand you such agreements as you mean were frequently broken, and do not constitute what I would call a trust.

Q.—I am speaking of trusts as a generic term. I am trying to get you to help me take the animal out on this table here and dissect him? A.—I will be glad to assist. My definition of a trust is very different from what you have expressed. It is this: If there were 100 manufacturers in the United States that made a given commodity and 95 of them consolidated—a definite consolidation—and restricted output and raised prices, that's what I would call a trust. What you describe was called a gentlemen's agreement. It was never made for a definite length of time. It was usually broken when anybody felt like it.

Q.—Wasn't that what made Mr. Carnegie non grata in the trade—that he would keep his mills running and get the business? A.—That is so, but conditions were different then. He had a position to win. There were older concerns. My belief is that if Mr. Carnegie was in business now with his plant established and

his position established his policy would be somewhat different, in that he wouldn't make the great sacrifice in prices that he then made. At the time he went into the steel business it was costing about $60 to make a ton of rails, to-day it costs $21 or $22. In those days there was a great opportunity for the chemist and the engineer to reduce costs that doesn't exist to-day. The most skillful men with unlimited capital couldn't reduce the price $1 a ton. That's the difference between those times and now. It would not be possible for Mr. Carnegie to pursue the same policy to-day that he did thirty years ago.

The Tariff Question

The tariff question was brought up by Representative Littleton, and Mr. Schwab was asked if he thought the Steel Corporation was able to compete with the industries of the world without the imposition of duties.

If you put conditions the same in all countries, the United States would need no protection. You need protection if you want to pay the same for labor and transportation as we do now.

Q.—Do you think we need as much protection as we have now? A.—I think we ought to have a little more. We have cheaper transportation here than in Europe, but we have much longer distances.

Q.—But without protection we could compete with England? A.—England is not a very large producer.

Q.—Do the countries which are large producers have as high duties as we do? A.—Much higher. I should say nearly double.

Q.—Is it you idea that it would be better to have Government control and if necessary the fixing of prices than to have the archaic days of destructive competition? A.—I couldn't answer that. I haven't thought it out.

Mr. Schwab was asked about the sale of rails abroad for less than at home. He said he didn't know much about it, as his company did no exporting. Asked why it should be done, he said because the foreign sales were all additional business and additional work brought to this country.

Representative Sterling asked if it were true that conditions of labor were worse in the steel industry than in other trades. Mr. Schwab said it certainly was not.

Mr. Schwab took the stand again on Saturday, August 5. Chairman Stanley produced a book containing the minutes of the meetings of the Executive Committee of the United States Steel Corporation and read from those of a meeting held soon after the Steel Corporation was organized. The question of railroad rates and rebates was discussed. E. C. Converse was reported as in favor of paying as high freight rates as the railroads could be induced to fix "if the roads give us some definite rebate." Mr. Schwab was quoted as saying that the Steel Corporation could get no better rates from a certain railroad than others could. Chairman Stanley asked him the name of this railroad but he said he did not recall it. In another extract Mr. Schwab had expressed the opinion that good rates could be obtained through the influence of certain financial interests. Chairman Stanley wanted to know what interests these were, but Mr. Schwab assured him he could not remember.

Ex-President Roosevelt a Voluntary Witness

Theodore Roosevelt appeared before the committee on Saturday morning. He had not been subpoenaed but came in response to a request of the committee. On receiving this request the day previous, he said that he had written a statement embodying his recollection of the representations made to him by Judge Gary and H. C. Frick in 1907, concerning the conditions leading to the purchase of the Tennesee Company's stock by the Steel Corporation. This statement embodied the letter written by then President Roosevelt to Attorney-General Bonaparate November 4, 1907, telling of the visit of Judge Gary and Mr. Frick, and saying that the acquisition of the Tennessee property would not raise the Steel Corporation's proportion of the steel properties of the country above 60 per cent. The President also said in this letter, referring to Judge Gary and Mr. Frick: "They asserted they did not wish to do this [purchase the Tennessee properties] if I stated that it ought not to be done. I answered that while of course I could not advise them to take the action proposed I felt it no public duty of mine to interpose any objections."

A Crisis Calling for Prompt Action

Colonel Roosevelt in the further course of his statement to the committee said:

It was necessary for me to decide on the instant before the Stock Exchange opened, for the situation in New York was such that any hour might be vital, and failure to act for even an hour might make all subsequent effort utterly useless. From the best information at my disposal I believed (and believe) that the addition of the Tennessee Coal & Iron property would only increase the proportion of the Steel Company's holdings by about 4 per cent., making them about 62 per cent. instead of about 58 per cent. of the total value in the country; an addition which by itself in my judgment (concurred in, I may add, not only by the Attorney General, but by every competent lawyer with whom I talked) worked no change in the legal status of the Steel Corporation.

Furthermore, I believed that the action was emphatically for the general good, that it offered the only chance for arresting the panic, and that it would probably arrest the panic, as it did. I answered Messrs. Frick and Gary, as set forth in my published letter, to the effect that I did not deem it my duty to interfere, that is, to forbid the action which more than anything else in actual fact saved the situation. The result justified my judgment. The panic was stopped, public confidence in the solvency of the threatened institution being at once restored.

Incidentally, I may mention that when I was in Birmingham last spring, every man I met, without exception, who was competent to testify, informed me voluntarily that the results of the action taken had been of the utmost benefit to Birmingham, and therefore to Alabama, the industry having profited to an extraordinary degree, not only from the standpoint of the business, but from the standpoint of the community at large, and of the wage workers, by the change in ownership. The results of the action I took were beneficial from every standpoint, and the action itself at the time when it was taken was vitally necessary to the welfare of the people of the United States.

In my judgment I would have been derelict in my duties, I would have shown myself a timid and unworthy public officer, if in that extraordinary crisis I had not acted as I did act. In every such crisis the temptation to indecision, to non-action is great, for excuses can always be found for non-action and action means risk and the certainty of blame to the man who acts. But if the man is worth his salt he will do his duty, he will give the people the benefit of the doubt, and act in any way which their interests demand and which is not affirmatively prohibited by law, unheeding the likelihood that he himself, when the crises is over and the danger passed, will be assailed for what he has done.

The Tennessee Company's Ore Holdings

In the course of the examination of Colonel Roosevelt following the reading of his statement, Chairman Stanley took up the question of the great increase in ore land which accrued to the Steel Corporation from this purchase of the Tennessee Company, one estimate of the value of the latter company's ore being $200,000,000.

Q.—Was it your impression that the Steel Corporation's control over products was increased only 4 or 5 per cent? A.—I am unable to say that they used the word products. The statement was made that the general policy had been to have less than 60 per cent. of the total steel holdings in the country. It is my memory that they said it wouldn't increase the holdings to more than 60 per cent. and I received some other information that it would increase them from 58 to 62 per cent.

Q.—Was it your impression that they were buying some steel mills? A.—That they were buying the Tennessee Coal and Iron plant.

Q.—Was anything said about ore properties? A.—They didn't go into details at all.

Q.—It was your impression that they were buying the plant and that there would be a small increase on the comparative output? A.—I wouldn't be sure that I formulated my impression as clearly as that.

Q.—If they had advised you that it would increase their output, say between Ashland and El Paso, 80 per cent., would you have consented even for this purpose? A.—Now you are putting a hypothetical question. What has been done in developing those properties has almost nothing to do with what they represented then.

Q.—Did they advise you that the Steel Corporation owned 75 per cent of the Lake Superior ores, and that but two great ore regions are now available, the second of which is in the Birmingham district? A.—I have already explained that nothing of that kind was touched on at all.

Q.—Commissioner Smith has stated that this is the case, and Judge Gary says the Steel Corporation prior to this absorption had spent hundreds of thousands of dollars in furnishing data to the Bureau of Corporations. So Mr. Smith had the facts on which to make this report. Did Mr. Smith ever advise you of these facts before Judge Gary and Mr. Frick came to see you? A.—He certainly never made any such report in full to me. I should doubt if he ever told me anything about the Steel Corporation. It is my memory that he started the investigation while I was President. It is my belief that he had not carried it to a point that would have enabled him to make any report to me.

Mr. Stanley also cited reports indicating that the Steel Corporation, through its ownership of railroads over which the ore of its competitors was transported, was in a position to crush them.

Q.—Did any officer of the Government ever call your attention to this traffic condition? A.—I believe not. In the matter of the coal roads similar conditions had been reported and were followed by actions, but I think if the ore roads had been called to my attention I would remember it.

Congressman Bartlett asked whether the depositing of $50,000,000 with the banks by Secretary Cortelyou and the advancing of $60,000,000 by Mr. Morgan and his associates had not really relieved the situation in 1907.

Q.—Was not the impression created in your mind that these acts had checked the panic? A.—That impression was conveyed very strongly, and they did check the panic, but there was strong reason to believe it was recrudescing—recrudescing—growing again. At that time the battle was on. I won—the Administration won. Partial victory after partial victory. If I had sat supinely down and thought the battle won we would have lost. I know that it is as near absolute knowledge as anything outside of mathematics can be.

Q.—You seem to have won Judge Gary over to your side in regard to control of corporations? A.—I hope so.

Q.—Did Judge Gary ever suggest any such control before this investigation started? A.—Not that I remember. I think Judge Gary or somebody else did in a public address back up strongly the position I had taken.

Q.—Between the anti-trust law and destructive competition he is seeking a harbor of safety? A.—Here again you are asking me to search the domain of motives. I am sure as I can be that the course I advocated for the Government to take in connection with the control of these big corporations will ultimately commend itself to the people of the United States.

Chairman Stanley asked if the witness had acquired information since the merger as to the conditions which brought it about. "Every particle of information," said Colonel Roosevelt, "that I have had since has not only convinced me that it was absolutely wise and proper, but that it would have been well nigh criminal if I hadn't done exactly what I did. I cannot state that too emphatically. I may add that my responsibility was complete and absolute."

Congressman Young asked if since he had taken this action Colonel Roosevelt had received any information that any misrepresentation had been made by Judge Gary and Mr. Frick.

"I felt that I had information," said Colonel Roosevelt, "on all the vital points in which I was concerned. It wasn't necessary for me to form any judgment whether the representatives of the Steel Corporation were anxious to get possession of the property or whether they were only anxious to save the situation caused by the panic. In all the essential representations they made to me I believed them to be accurate and sincere. They were in accord with what I had heard from New York. In so far as they affected my judgment, events exactly bore out and justified what I had been told."

A Scottish Tube Works Consolidation

Details have been arranged of an amalgamation in the Scottish tube trade, a preliminary agreement having been made by eight firms to form the Scottish Tube Company, Ltd., with a capital of £600,000. While Stewarts & Lloyds, who have for years had a commanding position in that trade, are not included in the consolidation, it is said they will be interested in the new enterprise and will name a Director on the Board. This company has a capital of £2,250,000 in addition to £350,000 bonds. The firms included in the Scottish Tube Company are the following:

Hendry Bros. Ltd., Glasgow and Garnkirk.
Govan, Glasgow.
Coats Tube Company, Coats Tube Works, Coatbridge.
James Eadie & Sons, Clydesdale Tube Works, Rutherglen.
John Marshall & Sons, Glasgow Tube Works, Glasgow.
Tradeston Tube Company, Tradeston, Glasgow.

For a number of years an international tube syndicate existed in which British, German and American manufacturers were represented. This association dissolved in 1908. At intervals since there have been negotiations for renewed co-operation. The London Iron and Coal Trades Review says:

"The export tube trade has been particularly busy in recent years, the export this year having been at the rate of 475,000 tons a year, or nearly double the export of six years ago. There are about 35 makers in Great Britain, and about 40 in America, while Germany has 25 makers. In other Continental countries there are about 26 makers, divided as follows: France, twelve; Russia, eight; Belgium, five; Austria, four; Spain, two; making a total of about 130 works, the trade being in the hands of many firms, but some of them turning out limited quantities, especially in Great Britain, France, and Belgium. The German and the American works are larger than our own, so that the number of works is no guide to output. The British output in 1907 was returned by the Census at just under 300,000 tons, but as exports have since increased by 50,000 tons, the present output must be assumed to have increased by nearly that amount. Our tube trade has suffered from foreign competition even in our home markets, the imports in 1910 being 20,000 tons, mainly from Germany, the United States, and Belgium. The tube industry is mainly concentrated in the neighborhood of Birmingham and Glasgow, and the Scotch works are able to place their products f.o.b. at about 2s. a ton, while those in South Staffordshire are well placed for the home trade. It is expected that the prospectus of the new company will be issued about October."

June Iron and Steel Exports and Imports

The Record Showing for the Fiscal Year 1911

The report of the Bureau of Statistics of the Department of Commerce and Labor for June shows a further decrease in both iron and steel exports and imports as compared with the figures of May. The total value of the exports of iron and steel and manufactures thereof, not including iron ore, was $20,310,053 in June against $20,616,795 in May, while the value of similar imports in June was $2,777,718 against $2,730,140 in May.

The exports of commodities for which quantities are given totaled 173,818 gross tons in June against 173,920 tons in May and 119,375 tons in June, 1910. The details of the exports of such commodities for June and for the fiscal year ended with June, compared with the corresponding periods of the previous year, are as follows:

Exports of Iron and Steel.

	June		Twelve months ended June.	
Commodities.	1911 Gross tons.	1910 Gross tons.	1911 Gross tons.	1910 Gross tons.
Pig iron	[illegible]	[illegible]	152,047	79,771
Scrap	[illegible]	[illegible]	[illegible]	18,448
Billets, ingots and blooms	[illegible]	1,[illegible]	[illegible]	[illegible]
Wire rods	[illegible]	[illegible]	[illegible]	[illegible]
Steel bars	[illegible]	[illegible]	[illegible]	[illegible]
Rivets, nuts and bolts	[illegible]	[illegible]	[illegible]	[illegible]
Nails and spikes	[illegible]	[illegible]	[illegible]	[illegible]
Iron and steel wire	[illegible]	[illegible]	[illegible]	[illegible]
Sheet iron and steel	[illegible]	[illegible]	[illegible]	[illegible]
Tin and terne plates	4,197	764	31,339	11,682
Barbed wire	[illegible]	[illegible]	[illegible]	[illegible]
All other wire	[illegible]	[illegible]	[illegible]	[illegible]
Wire rope and cables	[illegible]	[illegible]	[illegible]	[illegible]
Cut nails	[illegible]	[illegible]	[illegible]	[illegible]
Pipe and fittings	16,662	13,444	180,673	163,776
Totals	173,818	119,375	1,910,298	1,391,151

The imports of commodities for which quantities are given totaled 29,394 gross tons in June as compared with 23,375 tons in May and 30,322 tons in May, 1910. The details of such imports for June and for the fiscal year ended with June, as compared with the corresponding periods of the previous year, are as follows:

Imports of Iron and Steel.

	June		Twelve months ended June.	
Commodities.	1911 Gross tons.	1910 Gross tons.	1911 Gross tons.	1910 Gross tons.
Pig iron	[illegible]	[illegible]	[illegible]	[illegible]
Scrap	[illegible]	[illegible]	[illegible]	[illegible]
Billets, ingots and blooms	[illegible]	[illegible]	[illegible]	[illegible]
Iron and steel rails	[illegible]	[illegible]	[illegible]	[illegible]
Tin and terne plates	1,679	5,449	42,553	69,003
Wire rods	[illegible]	[illegible]	[illegible]	[illegible]
Totals	[illegible]	30,322	561,257	539,087

The imports of iron ore in June were 118,240 gross tons against 217,467 tons in May and 193,415 tons in the month of June, 1910. The total importations of iron ore for the fiscal year ended with June were 2,133,633 gross tons against 2,381,676 tons in the fiscal year 1910. Of the June imports of iron ore 88,030 tons came from Cuba, 15,282 tons from Sweden, 12,471 tons from Canada and 2513 tons from other countries.

The total value of the exports of iron and steel and manufactures, not including iron ore, for the fiscal year ended with June was $230,725,351 against $179,133,186 in the fiscal year 1910. The total value of the imports of iron and steel and manufactures thereof, exclusive of ore, for the fiscal year ended with June was $34,205,968 against $38,506,757 in the previous fiscal year.

The figures above given for the fiscal year 1910-11 constitute a new record for our export trade, being far in excess of those of any previous twelvemonth, both as to value and quantity.

The Winters-Coleman Scale Company, Springfield, Ohio, has closed a contract with the Howe Scale Company, Rutland, Vt., by which the latter will take the entire output of the Springfield plant. The Howe Scale Company will take over the selling force of the Winters-Coleman Scale Company and a separate department, to be known as the Automatic Scale Department of the Howe Scale Company, has been organized with headquarters at Rutland.

New Officers of Westinghouse Electric & Mfg. Company

At a meeting of the board of directors of the Westinghouse Electric & Mfg. Company, held in New York on August 1, the following officers were elected:

Chairman of the Board of Directors, Robert Mather.

President, Edwin M. Herr.

Vice-Presidents: Loyall A. Osborne, Chas. A. Terry, Harry P. Davis.

Acting Vice-Presidents: Henry D. Shute, George P. Hebard.

Comptroller and Secretary, James C. Bennett.

Treasurer, T. W. Siemon.

Auditor, F. E. Craig.

Mr. Herr is elected to succeed Edwin F. Atkins, who has been president of the company since June, 1910, and who declined re-election. Mr. Herr has been the first vice-president of the company and in charge of operation of same at East Pittsburgh since June 1, 1905. He was born in Lancaster, Pa., May 3, 1860. Upon completion of a common school course, he was given the position of telegraph operator on the Kansas Pacific Railroad, with which company he remained for two years. He was promoted from the construction train service to the position of station agent.



E. M. Herr, president of Westinghouse Electric & Mfg. Company.

In 1881 he entered the Sheffield Scientific School of Yale graduating in the Class of 1884, and worked as an apprentice in the shops of the Pennsylvania Railroad Company at Altoona, Pa., during the two summer vacations. From 1884 to 1885 he was an apprentice at the West Milwaukee shops of the Chicago, Milwaukee & St. Paul Railroad. He then went to the Chicago, Burlington & Quincy Railroad Company as a draftsman in the mechanical engineer's office, and afterwards became assistant engineer of tests, and was promoted from this position to engineer of tests on this road at Aurora, Ill. From 1887 to 1889 he was superintendent of telegraphy, and from 1889 to 1890 was division superintendent of this road. From 1890 to 1892 he was division master mechanic of the Chicago, Milwaukee & St. Paul Railroad at West Milwaukee.

From 1892 to 1894 he was superintendent of the Grant Locomotive Works at Chicago. From 1895 to 1897 he was superintendent of motive power and machinery of the Chicago & Northwestern Railroad. From June 1, 1897, to September 10, 1898, he held the same position with the Northern Pacific Railroad.

On September 10, 1898, he became assistant general manager of the Westinghouse Air Brake Company at Wilmerding, Pa. He was promoted to the position of general manager on November 1, 1899, which position he held until June 1, 1905, when he was elected first vice-president of the Westinghouse Electric & Mfg. Company.

Calvert Townley, was appointed assistant to the president of the Westinghouse Electric & Mfg. Company. He was for many years connected with the company, at first in Pittsburgh and later as manager of its Boston office, and as special representative in New York City. He comes to the company directly from the New York, New Haven & Hartford Railroad Company, where for the past five years he has been closely identified with the electrification of this road.

Harry P. Davis, one of the vice-presidents, has been with the Westinghouse Company for twenty years, and for the last few years has held the position of assistant to first vice-president and manager of engineering at the East Pittsburgh works.

July Copper Production and Stocks

Nearly 20,000,000 lb. less copper was in stock on August 1 than on July 1, according to the statement for July of the Copper Producers' Association. The month's production shows there was a decrease in production in July as compared with May of 12,386,298 lb. Deliveries for domestic consumption decreased 4,672,979 lb. while exports show an increase of 3,420,139 lb.

The figures for July are as follows:

	Pounds.
Stock of marketable copper of all kinds on hand at all points in the United States, July 1	157,434,164
Production of marketable copper in the United States from all domestic and foreign sources during July	112,167,934
Deliveries of marketable copper during July:	
For domestic consumption	56,982,582
For export	74,880,658
Total	131,863,240
Stock of marketable copper of all kinds on hand at all points in the United States, August 1	137,738,858

Labor Notes

Officers of the National Metal Trades Association say that the strike of the International Association of Machinists in District 15, comprising the union locals in Hudson County, New Jersey, and Manhattan, for an eight-hour working day, has been defeated. The strike was called May 1. While the union has not called it off, all the affected shops controlled by members of the Metal Trades Association are working normally and the association has been able to obtain as many men as are needed.

The Willamette Iron & Steel Works, Willamette, Ore., is reported to be putting on new men almost daily, and, while the strike of its boiler makers is still on, the company expects shortly to be operating under as good conditions as prevailed before the strike.

The Employers' and Builders' Association of Tacoma, Wash., held a meeting July 27, at which the Mayor and Commissioner of Public Safety were present. Members of the association put before these officers the facts concerning the lack of protection to the machine shops of Tacoma during the strike of union machinists. Sentiment in favor of the open shop is reported to be making good headway in Tacoma since the strike.

The Hattie Ensley Furnace of the Sloss-Sheffield Steel & Iron Company, at Sheffield, Ala., was blown out July 28. The company has blown in its Philadelphia Furnace at Florence, Ala.

The Republic Iron & Steel Company's general offices at Pittsburgh will be removed next week to the company's new office building at Youngstown, Ohio.

Alleghany Furnace at Iron Gate, Va., which was taken over from the Oriskany Ore & Iron Corporation by the Alleghany Ore & Iron Company, on the expiration of lease, June 28, was put in blast by the latter company July 5.

The Ironton Iron Company, Ironton, Ohio, completed the relining of its furnace July 10, and it is now in readiness for blowing in, but no date has been fixed, resumption depending upon business conditions.

The Taylor-Wilson Mfg. Company, McKees Rocks, Pa., is shipping one of its coupling and screwing machines to Thyssen & Co., Mulheim, Ruhr, Germany. This is the third order received from Germany for this type of machine in the past few months.

Personal

Frank J. Stolle, formerly sales manager for the Chester Steel Castings Company, Chester, Pa., in the Central West, resigned August 1 to act as sales manager for the new Armor Steel Foundry Company, Cincinnati.

The United States Steel Products Company, New York, has opened an office in Toronto. It is under the management of F. C. Brunke, formerly of the company's Buffalo office.

William Jaeger, manager of the New York office of Alfred H. Schutte, the Germany machinery selling house, has returned to this country after a six weeks' absence in Europe.

Ralph H. Pearsall, London, England, is in the United States to arrange for the British manufacturing rights of American mechanical equipment. He is making his headquarters at the Engineering Societies Building, 29 West Thirty-ninth street.

Col. Frank F. Cutting, so long associated with Hill, Clarke & Co., Inc., interests, has been elected president and general manager of the Lapointe Machine Tool Company, Hudson, Mass., the company recently having undergone a reorganization. Ralph R. Lapointe has become the broach expert of the company and will also have charge of the reamer department.

F. P. Huston, sales manager of the Kempsmith Mfg. Company, Milwaukee, Wis., has returned from Europe, where he went six months ago to investigate conditions and establish new agencies for the sale of his company's milling machines. Mr. Huston visited practically all the European countries and had a most successful trip.

R. J. Rote, formerly with the American Electric Fuse Company, Muskegon, Mich., in charge of the rheostat and crane controller departments, has entered the sales department of the Staunton Dielectrite Rubber Company, Muskegon, manufacturer of molded insulation for high and low tension.

Frank Lawrence Glynn has been made principal of the State Trade School, Bridgeport, Conn., succeeding A. P. Pletcher, resigned. Mr. Glynn has been principal of the Albany Vocational School, Albany, N. Y.

Thomas F. Du Puy, formerly with the New York sales office of the National-Acme Mfg. Company, Cleveland, Ohio, has been made sales manager for New York, New Jersey, part of Pennsylvania and the South, for the Windsor Machine Company, Windsor, Vt. He will have as an assistant Frank Greiner, who is well-known as a machine tool salesman.

G. A. Krutschnitt, formerly president of the Aluminum Goods Mfg. Company, has been elected president of the Tea Tray Company, Newark, N. J., succeeding Albert S. Marten, who has retired. J. H. B. Conger is vice-president and treasurer of the company, and H. G. Hull, secretary.

Arthur W. Richards, iron and steel works consultant and metallurgist, has opened offices in the army and navy mansions, 109 Victoria street, London, S. W., England, and announces himself prepared to represent suitable firms in London.

Hildreth & Co., New York, and the Morgan T. Jones Company, Chicago, inspecting and supervising engineers, have formed a combination effective August 1 under the title of the Hildreth-Jones Company. Morgan T. Jones will be in full charge of the Western district, with headquarters in Chicago. These companies are well known in the inspection field, Mr. Hildreth having been in business as a consulting and inspecting engineer in New York since 1888, while Mr. Jones was for ten years connected with R. W. Hunt & Co., and later for nearly seven years was president of the American Bureau of Inspection and Tests.

J. M. Jones, of Chicago, has been elected president of the Racine Tool & Machine Company, Racine, Wis. H. H. Jones remains as secretary and treasurer, and L. I. Redmond as vice-president.

James T. McCleary, New York, secretary of the American Iron and Steel Institute, who has been in Europe for several weeks, will return next week.

New Scheme for Storing Exhaust Steam

An exhaust steam storage tank partaking of the form of a gas holder, but for the same use as the so-called exhaust regenerator employed as an intermediary between a reciprocating steam engine and a low-pressure steam turbine, has been built at the Carl Colliery of the Kölner Bergwerks-Verein. In this new scheme there seem to be no trays for catching intermittent condensation of the steam, leaving the resultant water ready to deliver steam at succeeding momentary reductions of pressure.

The steam storage holder has a double wall for heat insulation purposes. The holder proper is 21½ ft. high and 27 ft. 3 in. in external diameter and is covered with the usual form of movable bell top such as one finds with gas holders, the bell top being 26 ft. high and 23 ft. in diameter. The seal between the holder proper and the bell is of water, with a layer of oil in the top to prevent evaporation of the water. In order to minimize the loss of heat through the portions of the bell in contact with the liquid, the metal is cased with a double layer of oak boards and the rest of the metal surface exposed is covered with 2 in. of asbestos.

The holder is employed in connection with a hoisting engine which in the average of 8 hours of work lifts 1050 tons from a depth of 1215 ft., and it receives also the steam from a compressor compressing 70,000 cu. ft. of air to 90 lb. per square inch per hour. The exhaust is admitted into the holder from underneath at a middle point and passes through an oil separator before reaching the storage space. The supply of exhaust steam to the low-pressure turbine is taken also from the bottom of the holder. The rise and fall of the bell, of course, accommodates the steam as regards volume, and if the volume should become too great the bell automatically opens the safety valve. It is stated that with a bell capacity of 10,000 cu. ft. of steam and a load of 500 kw. the whole of the exhaust steam from the winding engine during one lift can be accommodated, so that there is a minimum possibility of steam being wasted through blowing off.

A test for the loss of heat of the holder was undertaken by filling the holder with steam and noting the time required for the bell to descend a definite distance. It was found that the rate of condensation was about ½ lb. of steam per square yard of area per hour, which is less than 68 B.t.u. per square foot per hour.

Pig Iron Cost at One Southern Plant.—In his speech in the House of Representatives at Washington, August 2, replying to William J. Bryan's criticisms of his position on the wool tariff, Representative Underwood, of the Birmingham, Ala., district, made this reference to his connection with the iron business: "I am a stockholder in the Woodward Iron Company, located near Birmingham, Ala. It produces nothing but pig iron. It makes no other commodity. My brother-in-law, who is the vice-president and general manager of that company, stated to me a very short time ago that the company was making pig iron as cheap as, or a little below, $7.50 a ton, including all costs of every nature and description. In times past they have made pig iron as cheap as $6 a ton. That was some years ago, when the labor costs were cheaper than they are now. I say without expectation of contradiction that the furnace company in which I am interested can make pig iron cheaper than it can be made anywhere in the world."

The J. S. Bretz Company, New York, has its Western office changed to 504 Ford Building, Detroit, Mich., where J. W. Hertzler, Western representative, will make his headquarters. A full sample line of F. & S. ball bearings, German steel balls, Star ball retainers, U. & H. master magnetos, Bowden wire mechanism, Hartford universal joints and clutches, and drop forgings will be displayed there for the convenience of the Western trade.

The Lukens Iron & Steel Company, Coatesville, Pa., made a record run on one of its 50-ton open hearth furnaces in one week during July, producing 756 tons of ingots, using cold charged metal in a run of six consecutive days.

PRODUCTION OF PIG IRON IN THE UNITED STATES IN THE FIRST SIX MONTHS OF 1911.

Compiled from the Manufacturers by The American Iron and Steel Association, all in Gross Tons.

Production in the First Half of 1910, 14,978,738 Gross Tons; Second Half of 1910, 12,324,829 Tons; First Half of 1911, 11,665,796 Tons

Total Production of All Kinds of Pig Iron.

TOTAL PRODUCTION OF PIG IRON BY STATES.

States	In blast June 30, 1911	Out of blast June 30, 1911	Total	Production—Gross tons (Includes spiegeleisen, ferro-manganese, ferro-silicon, ferro-phosphorus, etc.) Last half of 1910	Second half of 1910	First half of 1911
Massachusetts	1	1	2	7,505	9,077	6,424
Connecticut	1	1	2			
New York	15	15	30	1,017,951	920,456	833,467
New Jersey	2	1	3	47,277	109,694	39,277
Pennsylvania	73	81	154	6,065,688	5,290,185	4,952,582
Maryland	3	2	5	170,708	155,506	131,531
Virginia	6	7	13	241,275	200,701	159,996
Georgia	1	0	1	6,725	8,000	
Texas	0	1	1			
Alabama	21	17	38	1,042,745	926,602	809,795
West Virginia	1	1	2	157,000	142,235	149,135
Kentucky	2	5	7	46,520	33,866	46,493
Tennessee	1	0	1	20,000	161,600	165,722
Ohio	45	31	76	3,210,562	2,511,179	2,740,142
Illinois	11	16	27	1,352,100	1,126,180	882,807
Indiana	5	6	11	716,842	533,271	552,056
Michigan	5	7	12			
Wisconsin	4	3	7	174,814	146,816	147,477
Minnesota	1	1	2			
Missouri	1		1			
Colorado						
Oregon	1	0	1	227,068	209,654	197,322
Washington	0	1	1			
California	0	1	1			
Total	206	212	472	14,978,738	12,324,829	11,665,796

PRODUCTION OF MERCHANT PIG IRON BY DISTRICTS.

Districts	In blast June 30, 1911	Out of blast June 30, 1911	Total	Production—Gross tons (Includes spiegeleisen, ferro-manganese, ferro-silicon, ferro-phosphorus, etc.) Last half of 1910	Second half of 1910	First half of 1911
New York	15	14	29	1,017,951	920,456	833,467
New Jersey	2	1	3	47,277	109,694	39,277
Mahoning Valley	6	7	13	268,000	242,000	241,000
Shenango Valley	7	5	12	170,708	155,506	130,901
Virginia	5	7	12	241,275	200,701	159,996
Georgia	1	0	1	6,725	8,000	
Texas	0	0	0			
Alabama	17	16	33	1,042,745	926,602	809,795
Mid. Virginia	3	1	4	137,439	142,235	149,135
Kentucky	2	5	7	46,520	33,866	46,159
Tennessee	1	0	1	20,000	161,600	165,722
Hocking Valley	3	5	8	234,393	196,000	164,482
Toledo	2	1	3	72,000	72,000	72,000
Lake Superior	11	11	22	1,352,100	1,123,486	882,807
Ironton	1	2	3			
Mahoning Valley	1	2	3	67,562	70,456	542,193
Wheeling	3	1	4			
Muskingo	1	1	2			
Missouri	1		1			
Colorado	0	1	1	27,068	142,378	226,431
Oregon	1	0	1			
Washington	0	1	1			
Total	104	100	204	5,000,000	4,500,000	4,000,000

PRODUCTION OF CHARCOAL PIG IRON BY STATES.

States	In blast June 30, 1911	Out of blast June 30, 1911	Total	Production—Gross tons (Includes spiegeleisen, ferro-manganese, ferro-silicon, ferro-phosphorus, etc.) Last half of 1910	Second half of 1910	First half of 1911
New York	0	0	0			
New Jersey	0	0	0	376,739	272,840	149,227
Pennsylvania	13	6	19			
Total	13	6	19	376,739	272,840	149,227

PRODUCTION OF CHARCOAL PIG IRON BY STATES.

States	In blast June 30, 1911	Out of blast June 30, 1911	Total	Production—Gross tons (Includes spiegeleisen, ferro-manganese, ferro-silicon, ferro-phosphorus, etc.) Last half of 1910	Second half of 1910	First half of 1911
Massachusetts	1	1	2			
Connecticut	3	0	3	3	3	
New York	0	0	0	2	2	
Pennsylvania	3	3	4	7	2,323	1,949
Maryland	0	0	1	1	965	590
Virginia	1	1	3	4	15,339	20,365
Alabama	3	1	4	5		
Georgia	0	0	2	2		
Texas	0	0	1	1		
Kentucky	0	1	0	1	5,037	6,110
Tennessee	1	1	1	2		
Ohio	0	1	3	4	20	1,040
Michigan	8	5	7	12	155,740	105,065
Wisconsin	1	1	0	1		
Missouri	1	1	0	1		
Oregon	0	0	1	1		
California	0	0	0	0		
Total	22	16	33	49	*219,653	*176,854

TOTAL PRODUCTION OF PIG IRON AND FERRO-ALLOYS IN THE U.S.

Bituminous	174	150	195	385	14,382,346	11,875,632	11,355,722
Anth. & anth. & coke	10	6	32	48	376,739	272,840	149,227
Charcoal	22	16	33	49	219,653	176,854	160,847
Total	206	212	260	472	14,978,738	12,324,829	11,665,796

Miscellaneous Pig Iron Statistics.

PRODUCTION OF PIG IRON IN PENNSYLVANIA AND OHIO.

	Districts	In blast June 30, 1911	Out	Total	Production—Gross tons. (Includes spiegeleisen, ferro-manganese, ferro-silicon, ferro-phosphorus, etc.) First half of 1910	Second half of 1910	First half of 1911
Pennsylvania	Lehigh Valley	12	13	26	369,529	389,721	423,788
	Schuylkill "	8	7	17	404,583	398,779	375,973
	L. Susq. "	8	7	10	358,511	284,759	223,170
	Juniata "	3	1	8	86,357	97,997	51,518
	Allegheny Co.	23	33	47	2,895,729	2,453,253	2,485,508
	Shenan. Valley	9	9	15	1,041,381	883,127	637,625
	Miscel. bitum.	8	8	11	900,075	715,050	618,298
	Charcoal	3	3	4	2,323	1,949	1,952
	Mahoning Val.	14	16	8	1,345,926	1,189,045	1,134,795
	Hocking "	0	0	1	560,805	607,660	827,976
Ohio.	Lake Counties	6	9	7	16	722,360	563,415
	Miscel. bitum.	8	6	10	16	722,360	563,415
	H. R. bitum.	7	3	12	15	275,451	180,592
	H. R. charcoal	0	1	3	4	20	1,040

PRODUCTION OF BESSEMER AND LOW-PHOSPHORUS PIG IRON.

New York	464,263	370,360	240,641
Pennsylvania	2,400,797	1,927,198	1,741,542
Maryland	170,708	155,506	130,901
Virginia, West Va. Kentucky, and Tenn.	184,281	142,206	173,284
Ohio	1,942,743	1,584,492	1,767,978
Illinois	1,352,581	709,726	650,066
Michig., Wisconsin, Minn. Col. and Cal.	60,379	73,792	60,012
Total	6,575,752	4,921,759	4,764,424

PRODUCTION OF BESSEMER AND LOW-PHOSPHORUS PIG IRON IN PENNSYLVANIA AND OHIO BY DISTRICTS.

Pennsylvania	Lehigh Valley	88,470	76,096	91,720
	Schuylkill Valley			
	Lower Susquehanna Valley	59,374	67,480	44,922
	Pittsburg Valley	1,852,242	1,423,697	1,470,758
	Shenango Valley	996,811	755,506	534,132
	Mahoning Valley			
	Western Pa. Valley	873,187	867,121	861,726
Ohio	Lake Counties	2,636,241	2,236,000	2,475,229
	Hocking Valley	1,942,743	1,584,492	1,767,978
	Miscellaneous	693,498	427,678	426,023

PRODUCTION OF BESSEMER PIG IRON, NOT INCLUDING CHARCOAL IRON.

New York and New Jersey	274,032	149,196	178,293
Pennsylvania, Western Counties	1,480,013	1,227,278	1,335,712
Ohio	1,228,391	1,211,123	1,125,377
Virginia	392,559	264,818	178,012
Alabama	612,331	534,197	585,344
Illinois, Wisconsin, Minn. and Col.	956,616	643,888	620,749
Total	4,943,942	4,149,666	3,935,487

PRODUCTION OF SPIEGELEISEN AND FERRO-MANGANESE.

Pennsylvania	91,382	65,218	66,577
Ohio	39,766	28,266	11,018
Total	130,947	93,484	77,595

PRODUCTION OF ALL KINDS OF PIG IRON FROM 1906 TO 1910.

States	1906	1907	1908	1909	1910
Massachusetts	20,254	19,119	13,794	18,588	16,582
Connecticut					
New York	1,556,655	1,639,752	1,019,495	1,743,675	1,938,407
New Jersey	370,491	378,180	225,572	294,474	264,781
Pennsylvania	11,247,804	11,348,749	6,987,191	10,018,524	11,272,923
Maryland	186,769	411,535	183,502	286,536	326,214
Virginia	183,525	478,771	320,488	591,134	444,976
Georgia	92,599	55,825	24,345	26,072	14,725
Texas					
Alabama	1,674,818	1,686,674	1,397,014	1,763,017	1,939,147
West Virginia	304,534	291,666	65,534	228,282	174,664
Kentucky	98,127	127,946	45,096	86,371	160,509
Tennessee	426,874	393,106	299,426	333,415	397,569
Ohio	5,327,133	5,250,687	2,801,325	5,551,515	5,752,112
Illinois	2,150,866	2,457,768	1,691,044	2,467,156	2,675,646
Indiana	369,456	436,507	348,096	964,289	1,250,103
Michigan					
Wisconsin	373,323	322,083	148,958	348,177	307,200
Minnesota					
Missouri					
Colorado	113,040	468,486	313,071	382,766	428,612
Washington					
California					
Total	25,307,191	25,781,361	15,936,018	25,795,471	27,303,567

The Michigan College of Mines, Houghton, Mich., is celebrating its quarter centennial this week. George W. Perkins, New York, had prepared an address for the first day's exercises on the topic "Wanted—A Constructive National Policy." Mr. Perkins was prevented from attending because of his engagement to testify August 8 before the Stanley Committee at Washington, and the address was read by President McNair of the university.

The Globe Iron Company, Jackson, Ohio, which has produced high silicon silvery irons for more than 25 years, is now manufacturing Bessemer ferrosilicon, which is being marketed under the brand of "Tubal-Pencost." As has been the practice with the company's Globe high silicon softener, it is stated that no shipments of the Tubal-Pencost product will be made unless within the specifications called for in silicon, phosphorus and sulphur.

A Special Coal Handling Crane

Details of a Recent Installation of the Toledo Bridge & Crane Company

At the Madison Street powehouse of the Toledo Railway & Light Company a special coal-handling gantry crane was recently installed by the Toledo Bridge & Crane Company, Toledo, Ohio. Several special conditions had to be met in the design of the crane which is rated to unload either lump or slack coal from four separate tracks at the rate of from 75 to 100 tons per hour. The coal is dumped from the crane bucket into a hopper provided with a screen which prevents foreign material from passing through the hopper into the coal crusher located immediately underneath. The crusher is of the single roll type with a by-pass. The coal is discharged from it into a screw conveyor and then into an elevator. From the discharge spout of the elevator the coal is dumped through hatchways in the roof of the power house into storage bins, which are immediately over the boiler room. This arrangement eliminates the necessity of handling the coal by manual labor and gives a very compact layout as the elevator and the crusher, although driven by independent motors, have their movement controlled from the operator's cage of the crane by a starting box. A general view of the crane is given in Fig. 1, while Figs. 2, 3 and 4 are three views of the trolley showing respectively an end view, the electric brakes and the hoisting mechanism. The drive on both wheels, which is through bevel and spur gears, is illustrated in Fig. 5, which is an end view of the truck.

The girders and the gantry legs are riveted box sections and riveted plate and angle construction is employed for the section which forms a part of the truck. The trucks proper are of cast steel, with equalizing bearings. These are four in number, two drivers and two idlers and each has two 36-in. steel wheels, both of which are drivers. The driving gears are keyed to the truck wheel axles and the truck wheel bearings are of manganese bronze and are self-oiling. The removal of the equalizing pin enables the entire truck to be detached and rolled from beneath the gantry when desired. The drive to the trucks is through bevel gears, all of which are fully inclosed in oil-tight gear cases, a view of the drive being given in Fig. 5.

Details of the Trolley

The general design of the trolley, as will be noticed from Fig. 2, which is an end view, consists of two built-up steel girder side frames, which are connected by structural steel girts with finished bolts in reamed holes. The trolley truck wheels are of cast steel and M.C.B. self-oiling bearings are used.

The driving motors are mounted on the girders at an equal distance from the ends and the connection between the cross shaft and the vertical shaft is made by bevel gears. These motors are connected in parallel and the foot brake, which is operated from the cage, is located on the main cross shaft. The two hoisting motors are controlled by plain rheostatic control, which gives ample ease in operation. When the load is being lowered both motors are braked dynamically, thus giving perfect control regardless of the load on the hook. The trolley and bridge driving motors are controlled by standard face plate controllers with self-contained resistances. The hoisting motors have a limit device, operating in connection with magnetic switches which prevents overtravel in hoisting. The motor brakes, which are illustrated in Fig. 3, are of the shoe type with cast-steel magnet frames and arms and cast-iron brake wheels and shoes. These shoes are lined with a special metal, which possesses long life and gives a high coefficient of friction. The only expense said to be incurred in connection with the maintenance of these brakes is the occasional relining of the shoes. The lowering energy is dissipated in the dynamic braking resistance and in lowering the dynamic brakes become holding brakes when the load is brought to a standstill by dynamic braking, the lowering energy not being dissipated in the trolley brakes under any conditions. The brake coils are wound with double cotton-covered wire, which is one size larger than the motor field winding and the coils are thoroughly shellaced and baked. The coils are connected in series with the motor and are of sufficiently ample proportions to prevent excessive heating.

The hoisting mechanism consists of two motors and separate trains of gears driving three drums, one for hoisting and two for the opening and closing lines of the bucket. A view of this mechanism is given in Fig. 4. The opening and closing lines are operated at a greater speed than the hoisting line, which makes it possible to have all lines hoisting by the time the bucket is loaded and closed. Two sets of pinions and gears take the load on the drum, an arrangement which gives long life and an ample factor of safety. All of the gears in the hoisting mechanism are of high carbon cast-steel, machined and cut from the solid, while a special grade of alloy steel is employed for all of the pinions. All of the hoisting gears operating at high speed are inclosed in oil-tight hinged top gear cases. All of the shafting is of 0.3 to 0.4 per

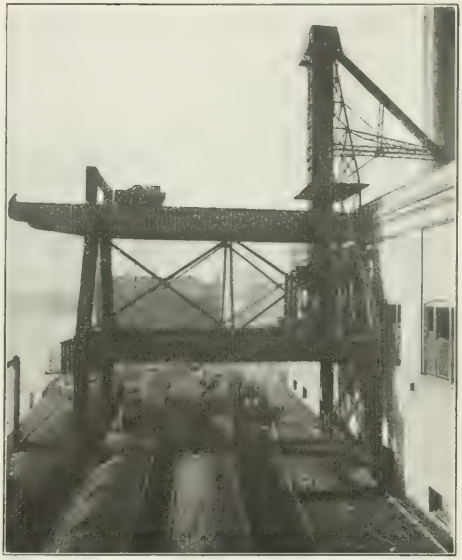


Fig. 1—A Special Coal-handling Crane Installed at the Power House of the Toledo Railway & Light Company by the Toledo Bridge & Crane Company, Toledo, Ohio.

cent. carbon machine steel accurately ground to size and designed to eliminate excessive deflection and to transmit full load torque at not more than a 9000-lb. fiber stress. The cast-iron drums have deep machine groovings for the rope and the combined bending and twisting stress is less than 1000 lb. per square inch. All of the bearings are equipped with split bronze bushings, which are of ample proportions and are held in place with one dowel so that the upper half may be used when the lower portion becomes worn. The shells may be removed without disturbing the shaft. All bearings are capped and standard through bolts are used in all cases, thus excluding studs and special types of bolts. In addition to compression grease cups, grease pockets are also provided for lubricating the bearings, which insure against heating should the operator neglect to fill the grease cups for a considerable length of time.

The operator's cage is located so as to give a clear view of the trolley and the other working parts and contains the controllers, the switchboard, the magnetic switches and the starting boxes, as well as providing sufficient room for the operator. A sub-platform is provided

that access to the cage is easily made and from the cage to the footway, which extends the full length of the girder. A main line switch is located on the bridge at the footway and when the operator opens this switch in going out on the bridge to inspect the crane mechanism, all possibility of accidental starting is eliminated.

falling if they should become accidentally broken and all gears which might fall if they became loosened are held in place by a heavy taper pin driven between the gear hub and the end of the shaft. To brush obstructions from the track, guards are provided over the trolley wheels.

The elevator is of the continuous bucket type and the

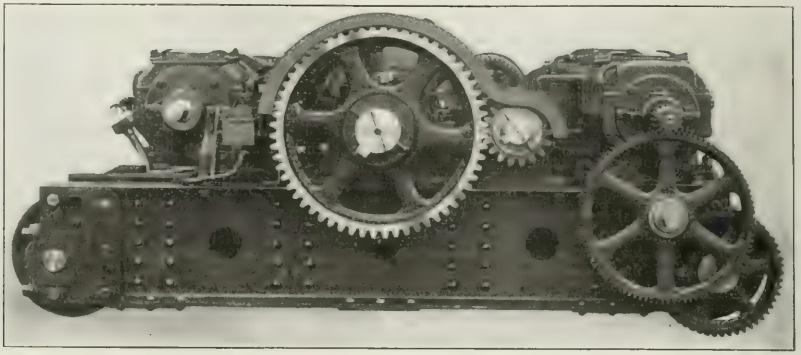


Fig. 2—An End View of the Trolley.

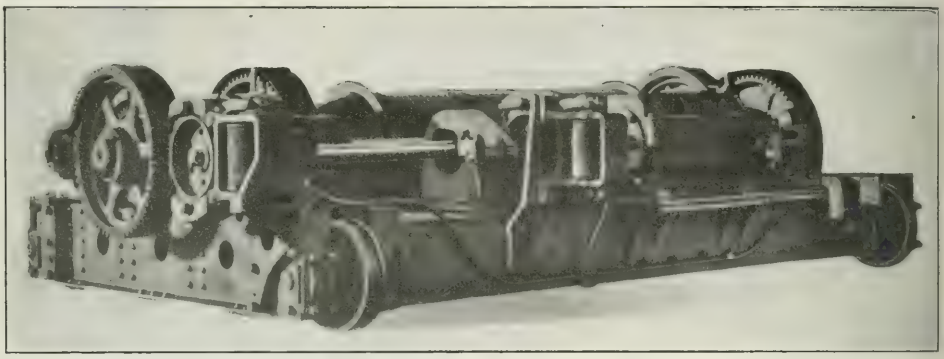


Fig. 3 View Showing the Electric Brakes.

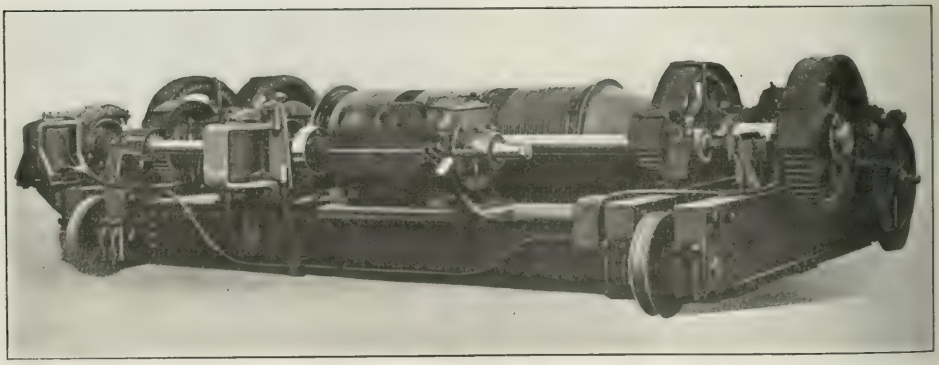


Fig. 4—View Showing the Hoisting Mechanism.
Three Views of the Trolley.

The design of the crane is such that any gear, shaft, motor frame, armature bearing or solenoid brake can be removed for inspection in the shortest time and at a minimum expense without disturbing any other part. No friction clutches are used and lever systems have been carefully eliminated in the design. Special care has been taken to avoid all chance of accident and with that end in view all couplings have been made of the flange type with no projecting bolts or nuts, while brake parts are prevented from

buckets, which were designed especially for this work, are carried by a double flange chain. The elevator leg is braced and supported by an A frame which also forms a support for the elevator motor, the driving mechanism and a platform for its inspection. The discharge spout on the elevator is raised or lowered from the platform on the crane girder.

The distance from the runway rail to the top of the elevator head is 100 ft., while that from the same point

to the top of the trolley rail is 54 ft. The distance between the centers of the truck wheels is 50 ft., and the length of the runway is 400 ft. The capacity of the crane as guaranteed by the builders was 75 to 100 tons of coal

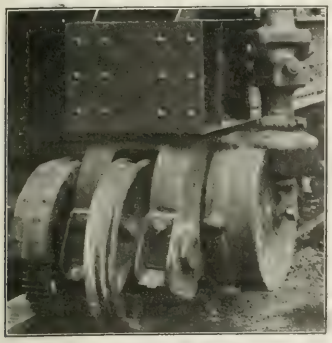


Fig. 5—An End View of the Trucks Showing the Drive on Both Wheels Through Bevel and Spur Gears.

per hour, but in a test made 100 tons of coal was unloaded from the outside track and discharged into the storage bin in 40 min.

The General Refractories Company

Owing to the increase in the business of the General Refractories Company it has purchased the works of W. H. Wynn & Co., West Decatur, Clearfield County, Pa., and the Olive Hill Fire Brick Company, Olive Hill, Ky. In addition to these two works, the company owns the Sandy Ridge Fire Brick Company, Sandy Ridge, Pa., and the Blair Silica Brick Company, Sproul, Pa. It is also erecting a new clay brick works at E. K. Junction, Ky., and will shortly commence the erection of a new works near Philipsburg, Pa., giving in all a daily production of 300,000 brick. In addition to this it is manufacturing magnesite brick, chrome brick, and is a large importer of Austrian and Hungarian magnesite.

The company's principal offices are located at 802 Trinity Building, New York, and the officers are as follows: Wm. C. Sproul, president, Chester, Pa.; Wm. I. Schaffer, secretary and treasurer, Chester, Pa.; E. S. Hitchins, manager Olive Hill Fire Brick Company and the new works at E. K. Junction; J. H. France, manager Sandy Ridge Fire Brick Company and Blair Silica Brick Company; D. R. Wynn, manager W. H. Wynn & Co. and the new works to be erected near Philipsburg.

The selling department is as follows: E. A. McKelvy and R. A. MacDonald, Western district sales managers, with offices in the Olive Building, Pittsburgh, Pa.; Burrows Sloan & Co., Eastern district sales managers, with offices in the Real Estate Trust Building, Philadelphia, Pa.; W. A. Stanton, in charge of sales of magnesite, with offices in the Trinity Building, New York.

Another Italian Steel Combination.—Since the formation early in the year of a syndicate of the large iron and steel works in Italy, and the placing by native banks of a loan of $16,000,000 at the disposal of the combination, efforts have been made to constitute a second group, comprising the smaller undertakings in the iron and steel branches. This scheme, it is stated, has now been carried into effect, and all the products which do not emanate from the works of the Ilva Company, the Società Siderurgica Savona, the Società Alti Forni e Fonderia di Piombino, and the Società delle Ferriere Italiane, can only be sold to consumers through the Società Ferro e Acciaio Laminati, which has been formed for that purpose.

Sarah Furnace of the Kelly Nail & Iron Company, Ironton, Ohio, will probably be blown in this month after being idle for nearly two months.

The Wire and Horseshoe Pool Cases

On August 4, in the Circuit Court in New York City, United States District Attorney Wise asked that the indictment against Erskine Hewitt, vice-president of the Trenton Iron Company, be quashed as he had found that the indictment was a mistake. This was accordingly done by Judge Archbald. Quite a number of those indicted for participation in horseshoe and copper wire pools appeared to plead nolo contendere and were fined $1,000 on the first count and $100 on each succeeding count. There remain ten men who have not yet pleaded.

When the name of Edwin E. Jackson, Jr., the supervisor of the various pools, was called and after he had entered the usual plea, District Attorney Wise made a very strong argument for a prison sentence in his case. The prosecutor characterized Mr. Jackson as a man who was well aware that he was violating the law. He said Mr. Jackson as a lawyer and had violated the law for 20 years.

"He was not a manufacturer," said Mr. Wise. "He was not seeking a manufacturer's profit. He was seeking to earn millions. He went after the manufacturers and induced them to come into the pools." Mr. Wise ended his appeal by saying: "In my opinion this man is the worst type of criminal that society has to contend with. He was well versed in the Sherman law. He knew he was violating the law, and he dragged the others into it. This man could not have earned the great fortune he has in a legitimate law practice."

Mr. Jackson's counsel, De Lancey Nicoll, in reply, said he was surprised at the denunciation heaped on the head of the defendant by the Government prosecutor. He said Mr. Jackson was not in the country when the indictments were found, and had come back voluntarily. Admitting the existence of the illegal pools, Mr. Nicoll said that in every pool there must be an agent. His client, he said, only acted as an agent, for which he received a compensation.

Judge Archbald said it was not possible to present to determine the truth of the assertions of the United States District Attorney. But, he said, sufficient appeared from what had been stated in this case and in other cases before the court to show that but for the defendant the illegal compact might not have been carried out. Judge Archbald said he felt that he must make an exception in the case before him. He said, however, that he would eliminate the question of a prison sentence. He then announced that he would impose the maximum fine in Mr. Jackson's case, $5,000 on each of the nine indictments.

Papers on Fuel Oil

Exhaustive information on fuel oil is contained in the August issue of the Journal of the American Society of Mechanical Engineers. The following are some of the contributions: "Statistics of the Production of Petroleum on the Pacific Coast," by Arthur F. L. Bell, of the Associated Oil Company, San Francisco. "Comparative Evaporative Values of Coal and Oil," by C. F. Wieland, consulting engineer, San Francisco. "Light Oil Compared with Fuel Oil," by Joseph N. LeConte assistant professor of mechanical engineering at the University of California. "Furnace Arrangements for Fuel Oil," by C. R. Weymouth, of Charles C. Moore & Co., engineers, San Francisco. "The Atomization of Oil" by A. M. Hunt, consulting engineer, San Francisco. "Size of Stacks with Fuel Oil," by K. G. Dunn, vice-president of Hunt, Mirk & Co., San Francisco. "Locomotive Practice in the Use of Fuel Oils" by Howard Stillman, mechanical engineer, Southern Pacific Company, San Francisco. "Marine Use of Fuel Oil," by J. H. Hopps, consulting engineer, San Francisco. "Producer Gas from Crude Oil," by E. C. Jones, chief engineer of the gas department of the California Gas & Electric Corporation, San Francisco. The report also includes an extended discussion, both written and oral.

The American Steel Post Company, Los Angeles, Cal., has opened branch offices at 860 Monadnock Block, Chicago, and in the First National Bank Building, Denver, Col.

Acid and Basic Open-Hearth Steel

A Defense of the Quality of Basic Steel

BY WILLIAM HERBERT KEEN*

The paper of Prof. Henry Fay read before the June meeting of the American Society of Testing Materials, and published in *The Iron Age* of July 6, revives consideration of a subject which has often been discussed but never satisfactorily settled. A prominent metallurgist of this country in discussing this matter said: "Acid steel is much better for all engineering purposes. It is almost entirely free from slag and oxide and its physical properties are far ahead of basic open hearth; indeed, the acid is as much better than the basic steel as the basic is better than the Bessemer."

More Care Necessary in Acid Practice

Apparently this is the opinion of nearly every engineer. Some probably have good reason for thinking so, while others are very willing to believe it simply because it is a generally accepted fact. I say a generally accepted fact because it *is* a fact in ordinary commercial practice, and it is deplorable that all basic steel has to suffer the same criticism. If one-half the care were taken in making basic steel that is necessary in the acid practice these conditions would not be so obvious; in fact, I doubt if any marked difference could be shown to the advantage of either process. Each method has it weak points and each its points of advantage, and, if proper precautions are taken to reduce the former to a minimum and enhance the latter as much as possible, I venture to assert that basic steel will show just as good a test in the tensile machine as acid steel

In making acid steel the melter is obliged to use selected stock, while in the basic process anything is good enough. For some time the writer has had experience in melting selected stock on both acid and basic hearths of small capacity, and, so far as can be judged from the laboratory data as well as results of practical use, the basic steel thus produced is in every way the equal of acid steel; and, in fact, in comparing results on alloy steel, a slight balance of merit is found in favor of the basic metal. The tests show a greater toughness as measured by the elongation for any given tensile strength.

It is the object of this paper not to criticise Professor Fay in any way, but rather to advance an opinion on this subject backed up by actual experience with furnaces working under nearly ideal conditions, and to show the application of a formula which is of great assistance in classifying different steels by means of their physical tests.

First of all, let us consider the two methods of melting and note some of their points of superiority and inferiority:—

Factors Which May Lead to Inferiority

ACID.

1—High phosphorus.
2—High sulphur.
3—Oxide of iron, which on account of the slow reaction of the bath has to be added to hasten the removal of carbon and other elements.
4—Manganese burns out completely, so that sulphur has to be neutralized by the ferromanganese added at almost the last moment before tapping.
5.—Usually silicon is present to such an extent that not enough more can be added at the finish to have a good deoxidizing effect on the metal

BASIC.

1—Occluded slag, which is very likely to be present in larger quantity than in acid steel.
2.—Oxide of iron, which has a greater tendency to form on account of the basicity of the slag, although partly eliminated by the manganese which is always present.

Factors Which May Lead to Superiority

ACID.

1.—Oxide of iron not as likely to form, but not necessarily absent.
2.—Small amount of slag necessary in the bath and so probably very small amounts only are likely to go into the steel.

BASIC.

1.—Low phosphorus.
2.—Low sulphur.
3.—Manganese is always present in the bath and so has plenty of time to react with the sulphur and put it into a less harmful condition.
4.—Silicon burns out so that a large amount may be added in the ladle to act as a deoxidizer.

After considering the above factors, we notice that the most prominent advantages are the elimination of sulphur and phosphorus on the one hand and of oxides on the other. The harmful effect of the former has long been established without any question, but only a few papers have as yet been published about the latter, and the majority of these attribute causes of failure only to large isolated occlusions of slag or oxide and not to the sparsely scattered specks which appear in the microsection. Although it is perfectly reasonable and logical to assume a harmful effect of slag, especially when thus segregated, yet it is by no means certain that the small amount present in carefully melted material will seriously affect the quality of the steel. The writer is not aware of any quantitative results that give an idea of the amount of slag or oxide necessary to be present in order to result in failure. Of far greater importance, indeed, are the oxidized portions due to insufficiently cropped pipes of both acid and basic steel. In fact, judging from the standpoint of the chemical analysis, the basic steel has a great deal the better of it, while, judging from the micrograph, the acid has the advantage, although a very doubtful one in the case of alloy steel.

Many Tests Required to Reach a Definite Conclusion

Dr. Fay has armed himself against criticism by saying that his results should be considered as qualitative rather than quantitative. This is a good way to express it, for it certainly does require a great many tests in work of this sort to arrive at any definite conclusion. It must be admitted that, in general, his results show slightly in favor of acid steel, although in the tests of the material as received there is practically no difference in the merit of the two bars. It is the opinion of the writer that equally large differences would be obtained if tests of two different heats of acid steel—or in fact two heats of any one process—were to be compared in a similar way. It is to be regretted that so much careful work was done on samples which, judging from the physical results, were of such poor grade. A steel of 0.40 per cent carbon should give a merit figure of from 35 to 40. I would willingly guarantee a figure of merit of 34 on a basic steel of this analysis and would expect to get a figure of about 39. It seems, therefore, that these bars must have been very faulty to start with, and this being the case it is only fair to minimize the results they give.

In view of the fact that under presumably similar treatment several samples from one heat occasionally give discordant results, it is essential that a large number of tests be accumulated. Just as analyses of carbon steel are not always reliable on account of the great variation possible according to the location of the test, so also do physical tests vary even when taken from the same bar. We have on record, for instance, two tests taken from an inch round bar of mild steel less than 3 ft. long—purchased in the open market—which were pulled at the Bureau of Standards and showed a difference of 7,085 lbs. in their tensile strength. Assuming the contributory factors such as analysis and heat treatment to be identical, we still have to consider the possibility for differences due to forging temperature as well as number and force of blows of hammer and, probably most important of all, the finishing temperature. There is then the possibility that the bars used may have been annealed before shipment from the mill, in which case the temperature may have been higher than the majority of the tests quoted, which would account for the fact that no greater differences were noticeable in the subsequent annealings.

The Question Cannot Be Decided by Tensile Test Alone

Judging from the results tabulated as well as a great many others of similar character, the writer feels compelled to admit that, if given two bars of identical com-

*Head of Research Department, Washington Steel & Ordnance Company, Washington, D. C

position made with equal care, one of basic and the other of acid steel, he would be at considerable loss to identify them. Certainly, as yet, there is not enough data at hand to decide such a question by means of the tensile machine alone, and yet this machine is the standard by which the buyer purchases his material.

There is still considerable disagreement as to the method of judging the merit of steel even after the tensile properties are known. By means of an empirical formula worked out from a large accumulation of results by A. G. McKenna of our company, it is possible to compute a figure of merit which is an excellent guide in thus judging the true quality of samples pulled in a testing machine. of merit figures, as follows:—

$$M = \frac{T\ (E + 20)}{100{,}000}$$

In which M = Figure of merit
T = tensile strength in lbs. per sq. in.
E = percentage elongation

In order to get a better idea of the tests made by Dr. Fay, I have rearranged the results and added a column of merit figures, as follows:

Test.	*Acid.* Tensile strength.	Elonga-tion.	Merit.	*Basic.* Tensile strength.	Elonga-tion.	Merit.
As received.....	85,400	20.3	34.4	73,500	25.0	33.1
(1) 700°.....	78,300	21.2	32.7	72,600	22.6	30.9
(1) 750°.....	77,500	22.2	32.7	70,300	21.5	29.2
(1) 800°.....	79,800	18.8	31.0	73,500	18.8	28.5
(1) 900°.....	81,700	20.4	33.0	74,200	24.2	32.8
(1) 1000°.....	81,700	18.8	31.7	73,000	25.0	32.9
(2) 700°.....	75,100	21.1	30.9	67,800	27.0	31.9
(2) 750°.....	75,700	14.5	26.1	68,200	14.0	23.2
(2) 800°.....	79,700	22.3	33.7	68,300	22.3	28.9
(2) 900°.....	77,200	21.2	31.8	68,100	20.8	27.8
(2) 1000°.....	79,700	20.8	32.5	68,900	20.4	27.8
(3) 700°.....	67,000	14.8	23.3	70,800	18.7	27.44
(3) 750°.....	80,100	21.0	32.8	66,900	23.4	29.0
(3) 800°.....	80,200	21.8	33.5	72,200	22.7	30.8
(3) 900°.....	73,500	21.8	30.7	65,700	28.9	32.1
(3) 1000°.....	73,100	22.6	31.1	68,100	25.7	31.1
(4) 700°.....	77,030	14.0	26.2	66,670	24.2	29.5
(4) 750°.....	74,680	23.4	32.4	67,400	25.0	30.3
(4) 800°.....	71,300	25.0	32.1	63,600	26.5	29.6
(4) 900°.....	72,500	23.4	31.5	72,300	22.6	30.8
(4) 1000°.....	71,200	22.2	30.0	64,600	21.3	26.7
Average.....	76,781	20.5	31.1	69,365	22.9	29 8

The fact that one steel has a lower tensile strength than another is nothing to its discredit, provided it has a compensatingly greater elongation. Take, for instance, the two tests of the steel as received from the mill. There is a considerable difference in the components of the tests, and yet as shown by the figures of merit, 33.1 and 34.4, the bars are practically of equal quality. They are as nearly alike at least as two tests from different parts of a single bar are likely to come. The averages of the results show a greater elongation for the basic steel than for the acid steel. In view of this it is hard to imagine the basic steel as having a greater number of flaws. It is interesting to note the very slight difference existing between the highest and the lowest figures of the series exclusive of the original bars:

Test.	Tensile strength.	Elastic limit.	Elonga-tion.	Merit.
Highest A (800°).....	80,200	37,500	21.8	33.5
Highest B (1000°).....	73,000	36,000	25.0	32.9
Lowest A (700°).....	67,000	33,500	14.8	23.3
Lowest B (750°).....	68,200	33,400	14.0	23.2

It is suggested that a stiffening treatment of these bars by quenching in water from some uniform temperature, followed by varied temperings, would lead to an interesting set of results. The tensile tests would undoubtedly show greater consistency according to the varying temperatures and the investigator would have the assurance that whatever treatment they had received at the mill, barring of course an overheated condition, it would not interfere with his final heatings.

Results of Heat Treatment

It is of course a recognized fact that it is always possible by means of heat treatment to reduce the elongation, to the simultaneous improvement of the tensile strength and elastic limit, and vice versa. The chief value of this merit formula is in estimating within about what limits it is possible to vary these conditions on any one steel. It also shows the relation between two bars as above illustrated, irrespective of differences in strain and stress. This is very strikingly demonstrated in a table of tests* given by Professor Howe, in which he shows the usual upper and lower tensile strength for any given elongation:

Elongation.	Highest tensile strength.	Merit.	Lowest tensile strength.	Merit.
4.....	150,000	36.0	110,000	26.4
6.....	138,000	35.9	102,000	26.5
8.....	130,000	36.4	94,000	26.3
10.....	122,000	36.6	85,000	25.5
12.....	115,000	36.8	80,000	25.6
14.....	109,000	36.7	75,000	25.5
16.....	102,000	36.7	70,000	25.2
18.....	98,000	37.2	64,000	24.3
20.....	93,000	37.2	59,000	23.6
22.....	88,000	37.0	56,000	23.5
24.....	80,000	35.2	52,000	22.9
26.....	77,000	35.4	51,000	23.4
28.....	74,000	35.3	51,000	24.4
30.....	71,000	35.3	50,000	25.0
32.....	70,000	36.4	50,000	26.0

Judging from the uniformity of the merit figures, it is quite possible that all of the conditions of the first column, for instance, with the exception perhaps of the last two or three, could be attained in one piece of steel.

By thus estimating the range attainable, advantage is taken in determining the possibility of meeting a specification with any given steel of which the tensile properties are already known. If one were required to furnish a steel of not less than 80,000 lbs. per sq. in. tensile strength and not less than 20 per cent elongation, and his steel in hand gave 50,000 lbs. and 30 per cent, he would compute the figure of merit for the former as 32.0 and the latter as 25.0, and would know at once that it is probably impossible for him to treat this particular piece of steel to meet the required conditions. On the other hand if he had a piece which gave 130,000 and 10 per cent., which would mean a figure of 39.0, he would know that he could easily meet the specifications. So he could also with a steel of 30 per cent elongation and 65,000 tensile strength, which would give a figure of 32.5, which is larger than the required figure of 32.0. It does not necessarily have to be a larger figure, as I have known cases where a figure three points lower had been brought up to the required value, and even a greater improvement is possible if the steel has not been normalized. The merit figure, like all analytical results, has to be used intelligently, and it must be remembered always that in processes of heat treatment there is the added feature in one's favor that the subsequent heatings of steel frequently improve conditions on account of better refinement of the grain.

There are of course other formulæ which will accomplish a similar comparison, but they do not cover the conditions of a very wide range of elongation and are not of such uniformly general application. Take, for instance, the formula most commonly in use in England, as follows:—

$$M = T + E$$
M = Merit
T = Tensile strength in gross tons
E = Elongation in per cent.

A steel of good quality will add up to about 65. Note the variation which exists when wide limits of elongation are under observation, as shown by the figures obtained from the first column of Professor Howe's table: 71.0, 67.6, 66.0, 64.5, 63.3, 62.7, 61.5, 61.8, 61.5, 61.3, 59.7, 60.4, 61.0, 61.7, 63.3.

I have laid the emphasis on the tensile strength and elongation throughout this paper because as yet there is no very exact way of correlating the other two factors with practical conditions. In general, it may be noticed that for carbon steel the percentage reduction of area is about twice the elongation, while the tendency with alloy steel is to increase this ratio to nearly three times. It is also quite noticeable that various conditions of manufacture influence this particular quality. Generally a forged bar gives a much greater reduction of area than a casting, and there is a slight suggestion that this property is increased according to the amount of work done by the forge. It also becomes greater as the refinement of the grain improves by heat treatment. Overheating reduces it to almost nil.

The elastic limit, while probably a very important factor in materials subject to vibration, seems to be no great assistance in determining quality. It varies a good deal with different heat treatments. It is possible to increase it materially by water annealing, whereas an annealing heat followed by a slow cooling almost invariably reduces it markedly. It is of course greatly increased by hardening processes. The addition of nickel to steel also results

*Howe's Metallurgy of Steel Ed. of 1895, p. 17

in raising the elastic limit. It will be seen, therefore, that when necessary to attain a definite value for this factor it may be readily accomplished by suitable methods of treatment.

Summary

1. The prevailing opinion is that acid steel is superior to basic, but the writer believes that basic steel is not inferior to acid when equal care is used in the melting.

2. A variation of 7,000 lb. in tensile strength is quite possible in two tests from the same bar as received from the mill.

3. Differences in Dr. Fay's results are not enough to warrant conclusions.

4. Knowledge of testing materials at the present time is insufficient to definitely distinguish acid steel from basic when of identical analysis.

5. An empirical formula worked out by A. G. McKenna is of value in judging the merit of steel by means of the physical results and allows predictions as to limits which can be attained in elongation and tensile strength.

Nickel Steel

Some Properties of Heat-Treated Three Per Cent.

A paper was presented at the recent meeting of the Iron and Steel Institute by Prof. A. McWilliam and E. J. Barnes, of Sheffield, on heat-treated 3 per cent. nickel steel which is abstracted as follows:

The steels worked upon were made in a coke-fired crucible furnace, and poured into ingots 3 in. square. They were forged to 1 in. diameter round bars. The analyses are given in Table I, from which it may be seen that they were of great purity.

Table I.—Analyses.

No.	Carbon.	Nickel.	Manganese.
1239	0.06	3.05	0.11
1255	0.12	2.93	0.13
1253	0.28	2.90	0.15
1256	0.30	3.15	0.13
1254	0.47	2.92	0.14
1252	0.67	2.96	0.19
1251	0.74	2.98	0.19
1261	0.91	3.10	0.17

The carbons were carefully determined by combustion. The silicon in all the steels was under 0.10 per cent.; the sulphur was practically constant at 0.03, and the phosphorus at 0.02.

The tensile and alternating stress tests of the steel, as forged, were made under Professor Arnold's standard conditions, and on his machine, and are given in Table II.

Table II.—Physical Tests, Forged.

No.	Carbon.	Nickel.	Yield point, lbs.	Ultimate stress, lbs.	Elon. in 2 in., %	Red'n area. %	Alternations.
1239	0.06	3.05	51,520	66,976	35.0	70.6	189
1255	0.12	2.93	47,040	69,216	34.0	65.8	259
1253	0.28	2.90	51,520	79,744	29.0	57.7	300
1256	0.30	3.15	51,520	80,640	28.0	54.6	301
1254	0.46	2.92	56,000	95,424	22.0	44.6	267
1252	0.67	2.96	60,480	115,360	19.0	36.7	248
1251	0.74	2.98	76,160	129,696	14.0	25.2	218
1261	0.91	3.10	78,400	149,632	8.5	22.1	188

The yield points were determined with the assistance of a Metzger extensometer.

In Table III are given the results after "normalizing." This treatment consisted in placing the bars in a gas muffle at about 700 deg., slowly raising to 900 deg., in about three-quarters of an hour, and holding at this temperature for half an hour. The bars were then taken out, reared on end on fire-bricks, and cooled in air.

Table III.—Physical Tests, Normalized.

No.	Carbon.	Nickel.	Yield point, lbs.	Ultimate stress, lbs.	Elon. in 2 in., %	Red'n area. %	Alternations.
1239	0.06	3.05	47,040	66,528	38.0	72.5	321
1255	0.12	2.93	47,488	67,424	36.5	68.4	319
1253	0.28	2.90	51,520	73,400	31.0	59.1	411
1256	0.30	3.15	50,176	80,640	30.0	55.6	249
1254	0.46	2.92	55,552	92,960	23.0	45.9	278
1252	0.67	2.96	64,960	113,568	19.0	37.2	209
1251	0.74	2.98	69,440	132,608	16.0	44.3	204
1261	0.91	3.10	76,160	149,184	12.0	22.7	149

In Table IV are given the results obtained after a very drastic annealing. The bars were placed in a coal-fired reverberatory furnace, slowly heated up to 950 deg. C, kept at this temperature for about 20 hours, and very slowly cooled down in the furnace. Under this treatment considerable free or graphite carbon was precipitated in some of the steels as shown in the table.

Table IV.—Physical Tests, Annealed.

No.	Total Carbon.	Free Carbon	Nickel.	Yield point, lbs.	Ultimate stress, lbs.	Elon. in 2 in., %	Red'n area, %
1239	0.06	....	3.05	41,216	60,032	39.0	71.7
1255	0.12	....	2.93	42,112	62,048	37.0	66.2
1253	0.28	....	2.90	47,488	68,096	31.5	58.2
1256	0.30	0.03	3.15	37,632	67,200	30.0	54.6
1254	0.46	0.07	2.92	43,008	71,904	28.0	48.7
1252	0.67	0.30	2.96	47,488	70,336	20.0	46.0
1251	0.74	0.70	2.98	36,736	56,000	29.5	46.0
1261	0.91	not det.	3.10	32,256	52,864	17.0	21.8

The results given in Tables V, VI and VII are those after quenching from 850 deg. C and tempering at 400, 500 and 650 deg., respectively. The rather high quenching temperature was chosen because it was above the change points in the lowest carbon steel. The location of the change points, on both heating and cooling, are given in a succeeding table. The bars were heated for quenching in a Brayshaw, gas-fired, salt-bath furnace, the temperature of which was checked by two pyrometers. The pieces were put into it when it was at 830 deg. C. The temperature was raised to 850 deg., and held there for 15 min., when the pieces were rapidly withdrawn and quenched in a large tank of water at from 16 to 20 deg. The tempering was done in another Brayshaw lead-bath furnace. The pieces were held for 15 min. at the required temperature, removed, and cooled in air.

Table V.—Physical Tests, Quenched 850 Deg. C, Tempered 400 Deg.

No.	Carbon.	Nickel.	Yield point, lbs.	Ultimate stress, lbs.	Elon. in 2 in., %	Red'n area, %
1239	0.06	3.05	59,136	74,144	37.0	78.4
1255	0.12	2.93	62,720	80,192	34.0	77.4
1253	0.28	2.90	82,432	104,384	27.0	67.4
1256	0.30	3.15	86,016	112,000	24.0	63.5
1254	0.47	2.92	109,312	149,184	18.0	54.6
1252	0.67	2.96	177,856	203,392	13.0	45.1
1251	0.74	2.98	208,768	216,832	10.0	30.3
1261	0.91	3.10	210,560	236,768	8.0	17.6

Table VI.—Physical Tests, Quenched 850 Deg. C, Tempered 500 Deg.

No.	Carbon.	Nickel.	Yield point, lbs.	Ultimate stress, lbs.	Elon. in 2 in., %	Red'n area, %
1239	0.06	3.05	51,968	71,008	37.5	76.8
1255	0.12	2.93	56,000	77,056	33.5	76.4
1253	0.28	2.90	77,056	100,800	28.5	68.6
1256	0.30	3.15	80,640	112,896	24.0	58.4
1254	0.47	2.92	94,976	135,296	19.0	53.7
1252	0.67	2.96	132,160	167,552	14.5	39.7
1251	0.74	2.98	154,560	184,576	12.0	32.9
1261	0.91	3.10	164,864	199,136	12.0	30.0

Table VII.—Physical Tests, Quenched 850 Deg. C, Tempered 650 Deg.

No.	Carbon.	Nickel.	Yield point, lbs.	Ultimate stress, lbs.	Elon. in 2 in., %	Red'n area, %
1239	0.06	3.05	51,968	69,664	37.0	77.9
1255	0.12	2.93	51,520	73,696	36.0	76.4
1253	0.28	2.90	63,616	86,464	33.0	70.8
1256	0.30	3.15	65,408	90,048	27.5	63.9
1254	0.47	2.92	75,264	105,280	26.0	58.2
1252	0.67	2.96	91,840	117,376	21.0	49.0
1251	0.74	2.98	103,936	125,888	18.5	43.5
1261	0.91	3.10	105,280	130,368	17.0	39.2

In the original paper the details of the heating and cooling curves are plotted. They are tabulated in Table VIII.

Table VIII.—Change Points in Degrees Centigrade.

No.	Heating			Cooling		
	Ac 1	Ac 2	Ac 3	Ar 1	Ar 2	Ar 3
1239	692	746	796	620	661	728
1255	695	729	....	625	656	718
1253	701	....	....	631	663	694
1256	700	....	....	629	649	676
1254	703	....	....	635	654	....
1252	704	....	....	637	....	....
1251	706	....	....	631	....	....
1261	705	....	....	626	....	....

The paper also gives details of the microstructure of longitudinal sections from the bars, and is illustrated with typical micro-photographs.

The Colonial Iron Company, Riddlesburg, Pa., will have its new furnace ready for blast in November. It will be 75 x 18 ft. and will be equipped with three 75 x 18 ft. McClure stoves. The two alternate stacks have been dismantled.

A Grinder for Planer Cutters

An Attachment Recently Developed by the Newton Machine Tool Works

The inconvenience of grinding facing cutters having inserted teeth has been more pronounced in the case of those used by the rotary planing machine than in any other type. The factors which have brought this about are the large diameter of the cutters, the heavy strains to which they are subjected at times and the flexibility of the structural shapes which are frequently handled by these machines. It is of course possible to remove the cutters and shape them in the standard type of grinding machine, but a considerable amount of time is consumed in removing and replacing them and there is the inconvenience of setting the tools to the proper hight; if the slots in the head are not exactly duplicated, some of the cutters will do more than their proportionate share of the work. With a view of eliminating this loss of time and the corresponding expense the Newton Machine Tool Works, Inc., Twenty-fourth and Vine streets, Philadelphia, Pa., designed a rotary grinder, which after two or three years' experience, has been redesigned and perfected to meet the operating conditions existing at the present time. Fig. 1 illustrates the teeth of a rotary planer cutter being sharpened by the most recent attachment brought out by this company, while a view of the attachment itself showing operating details is given in Fig. 2

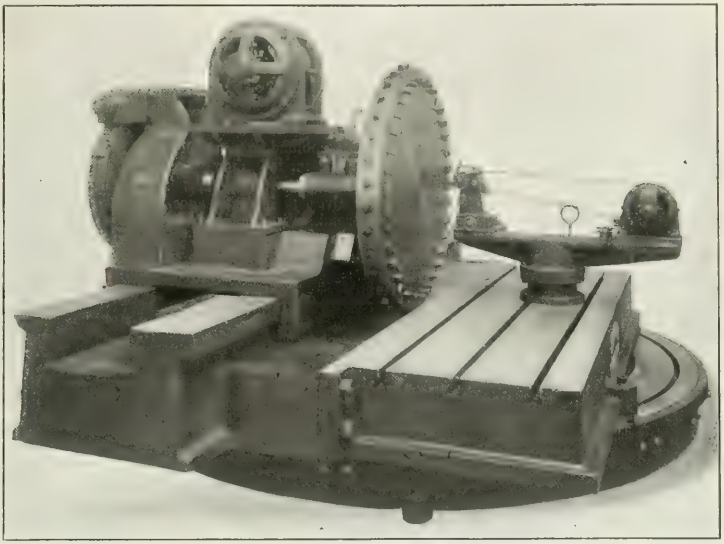


Fig. 1.—The Teeth of a Rotary Planer Cutter Being Ground by the New Grinding Machine Built by the Newton Machine Tool Works, Inc., Philadelphia, Pa.

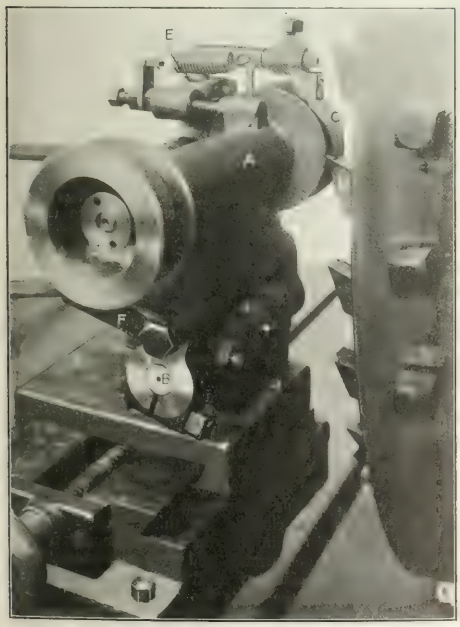


Fig. 2.—View of the Grinding Attachment Showing Details.

The attachment consists of an arm, A, Fig 2, which is pivoted at B and carries the grinding wheel spindle. An oscillating movement is imparted to this arm by the finger C engaging the tools D in succession while the head is rotating. This finger is attached to the arm E on which is fitted a crank plate controlling the length of the movement of the spindle arm A. The finger C is raised as the tool rotates and the arm A is in turn forced under the tool, which gives the clearance angle while the other arm F is engaged to finish the side of the tool. The engagement of this second arm causes the partial rotation of the shaft B which has a helical spiral slot milled in it and a pin in the arm A that engages in this spiral slot imparts the side motion to that arm. The operation of the finger C also gives a side motion and at this time the mechanism for driving the front clearance is disengaged. A side adjustment is provided for the saddle to locate the emery wheel properly and the whole grinding attachment is mounted on a support as shown in Fig. 1.

The attachment is driven by a ½-hp. motor at a speed of approximately 2500 r.p.m. The grinding wheel must of course have the proper shape to give the necessary contour to the tools. If desired, the attachment can be furnished for any style or shape of machine, the only dimension required being the distance from the center of the cutter head to the top of the surface upon which the attachment is to be mounted. The circular sub-base supporting the attachment can be furnished in a variety of hights to accommodate the conditions existing on the different machines. In a test of one of these attachments recently made on a vertical machine it was found that cutters ground in this way and having their hight accurately duplicated and the contour exactly reproduced allowed a feed twice as fast as the ordinary rate employed and gave an exceptionally smooth finish.

A patent on a variable speed gearing has been assigned to the W. F. & John Barnes Company, Rockford, Ill., by John S. Barnes, Rockford, who was granted a patent on July 18, No. 998,227. It appears to cover a construction involving an intermediate shaft between driving and driven shaft with a number of different diameter gears on an intermediate shaft, any one of which may be made to mesh into gears on either the driven shaft or the driving shaft.

The Knight Gasoline Engine

A New Motor Combining Great Power, Flexibility and Silence

In addition to the standard poppet valve motor regularly manufactured, the Columbia Motor Car Company, Hartford, Conn., will bring out next year a new high-powered car in which the Knight sliding sleeve valve gas engine will be used. This motor combines the three essential features of power, flexibility and silence in one motor which is simple in construction. This simplicity of construction is what makes the engine silent running, since approximately one-third of the parts ordinarily employed in gas engine construction have been eliminated, and these were the ones that wore earliest and most and combined in the process to make noise. This motor will be made in the Columbia plant at Hartford, Conn., although castings of Swedish iron for the cylinders, sleeve valves, pistons, rings and other parts will be obtained abroad. Fig. 1 is a view of the motor showing the reciprocating sleeve valves and the simplicity of parts, while a cross sectional elevation of the engine is given in Fig. 2.

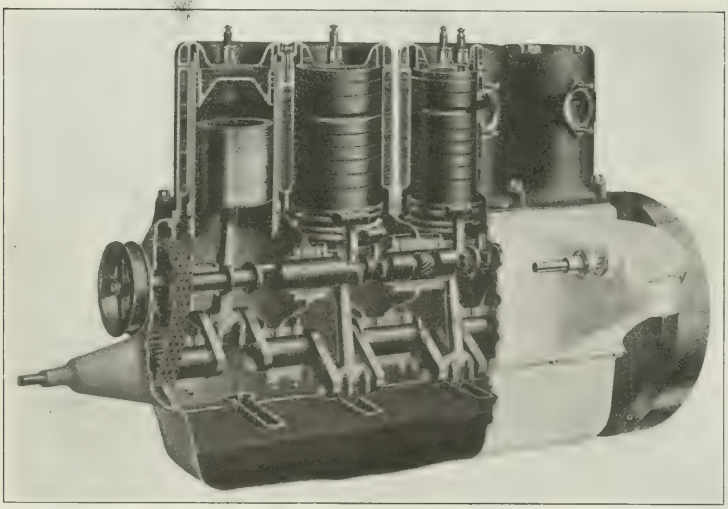


Fig. 1. The New Columbia Knight Gasoline Engine for Automobiles, Built by the Columbia Motor Car Company, Hartford, Conn.

The engine is of the four-cycle type with the cylinders cast in pairs, the dimensions being 4⅞ x 5½ in. Although rated according to the A.L.A.M. standard at 38 hp., the power developed by the motor is said to be 70 hp. without motor racing, while a maximum of 85 hp. can be secured. The cylinder heads, which are gas tight, are bolted on and are depressed and contain two spark plugs for the Bosch dual ignition system. A water jacket encircles all the cylinders and the cylinder heads and the circulation areas inclose the spark plugs and the gas ways so that a uniform heat is maintained throughout the entire length of the piston travel. The sleeves, of which there are two for each cylinder, form the valves and are reciprocated to perform the valve functions by short connecting rods attached to a miniature crank shaft which is driven from the main shaft at half speed by a Coventry silent chain. There are no tappet or mushroom valves, no cam shafts or cam rollers, push rods or trains of enmeshed driving gears in front.

Directly inside the cylinder wall is an endless sleeve having openings on each side. These are in the form of wide slots and are located close to the top of the sleeves. A second endless sleeve is situated inside the first one and has slots on both sides. On the suction stroke of the motor the slots on the right side of these sleeves register perfectly, thus exposing a large opening through which fresh gas may enter just as it would through the aperture of the lift of a mushroom type valve. At the commencement of the compression stroke these sleeves slide, one up and the other down, so that the slots are no longer in register and no way is afforded for the gas which has been drawn in to escape. When the compression of the charge has been accomplished and the piston has risen to the top of the cylinder the charge is ignited and the explosion or power stroke takes place. The piston now being at the bottom of the firing stroke the left-hand slots of the sleeves register, thus providing a large exhaust port through which the spent gases escape. The advantages claimed for this valve mechanism are that the inlet and exhaust openings are twice the size of the gas passages allowed in the most liberally designed tappet type motors and almost three times the size of the passages in motors equipped with the L type valves. The opening and closing of the valves is timed perfectly not only at low speeds, where no difficulty is ordinarily experienced in a cam roller following the cam in a tappet type motor, but also at very high motor speeds. As the timing is mechanical it is claimed that it cannot become deranged through ignorance, neglect or wear.

The design of the motor is such that there are no offset pockets and the minimum cubical contents for the compression chamber is secured. The crank shaft, which is of large diameter, is bored hollow and is so designed that the lubricant travels to the bearings when caught. The valve shaft is cut from the solid and has throws for the connecting rods actuating the sleeves. These rods are forged and the cylinders, the sleeves and the pistons are of imported cast iron machined and ground. Cast aluminum is employed for the two crank cases and the entire motor is supported by four legs.

The lubricating system is interesting and is of the builder's movable dam system. In this system there are four troughs located transversely with reference to the filtering screen of the lower crank case which are hinged on a bus shaft and connected to the throttle. These troughs are automatically raised and lowered with the opening and the closing of the throttle. When the throttle is opened and the troughs are raised the connecting rod scoops dip into the troughs which contain a greater amount of oil before overflowing. When the load on the engine is light the closed throttle lowers the hight of the troughs so that they overflow more quickly and the scoops dip lightly into them and a correspondingly smaller amount of oil is splashed. This oil first falls to the screen and is drained to the reservoir below to be again pumped into the troughs by the plunger pump. The system is thus a combination of force feed oiling and the splash system. In poppet valve engines it has been the common practice to set the oil regulation at a point to meet the most exacting demands of hard hill climbing and continued high speed road work. This results in a considerable waste of lubricant due to the fact that cars are only infrequently called upon to engage in this exceptionally hard work. One of the special features claimed for this system is that it supplies the lubricant in just the proper amount for the work the car is performing and does so automatically. Some idea of the efficiency of the system can be gained from the statement that tests showing an average run of 750 miles for a single gallon of lubricating oil have been made and in one case a mileage as high as 1200 has been secured with this quantity of lubricant. A sight feed indicator upon the dash and a ball topped shaft mounted upon a bob cork float set outside the crankcase give accurate information regarding the amount of oil in the

reservoir and the rate at which the engine is being lubricated.

The drive for the magneto and the oil pump is through a silent chain to the fly wheel end of the motor, while the valve shaft is driven in the same way from the forward end. Individual entrance ways for each cylinder are provided for the exhaust manifold, while the inlet manifold has two main leads to each pair of cylinders, the cylinder port being two-way branched internally to provide entrance for the gas to each cylinder. The ignition system is the Bosch double outfit with two sets of plugs, a pair

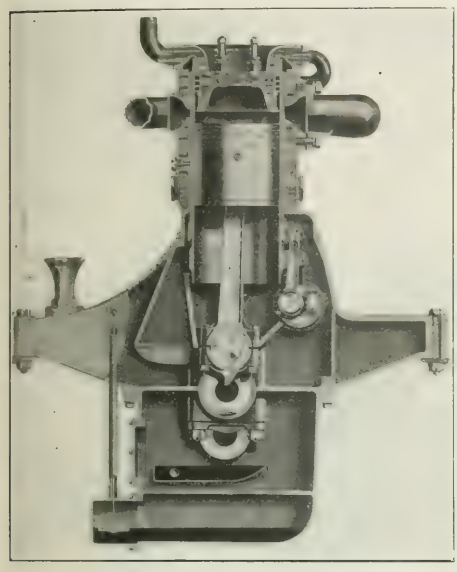


Fig. 2.—Cross Sectional Elevation of the Engine.

being threaded into the head of each cylinder directly over the piston and completely surrounded by the water jacket. The water passages are of large area, the piping is simple while the cooler is of the cellular type. The clutch is of the leather faced cone pattern.

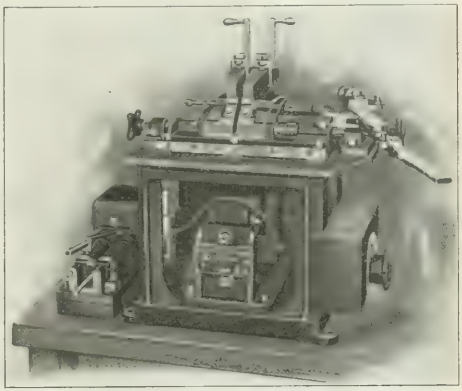
The feature of quietness in operation is secured from the fact that there are no tappet noises and there is no click of falling valves on their seats as well as no gear noise incident to the push and the pull exerted against the whole train of front engine gears. The great power which the motor is able to develop permits it to accelrate rapidly and gives the advantage of flexibility. One of the remarkable features of the motor is that its power increases with use. In a test one of these motors was run under brake load on a bench for 132 hr., afterward placed in a car and run 500 miles a day for four days at an average speed of 40 miles per hour and again placed on the bench for 7 hr. continuous running. The average horse-power developed in the first bench test was 54.3, while that of the latter test was 57.25, thus proving that the power of the motor increased with use.

New Thomson Electric Welder

Ability to make all classes of welds from typewriter bars and small sizes of wire to large links, rings and buckles is claimed by the Thomson Electric Welding Company, Lynn, Mass., for its new butt electric welder. This machine was built to meet the demand for a welder combining strength and durability with accurate and rapid operation. The machine operates on the same principle as the others built by this company and employs heavy currents of electricity at low voltages which are passed through the abutting ends of the pieces of metal to be welded. The passage of this current results in the generation of local heat at the point of contact, while at the same time pressure is applied to force the parts together.

The welder, which is known as the 2-A-1911 model, unites in one machine the essential features of a perfect electric welding machine in addition to improvements that make it suitable for a very wide range of work. In constructing the machine an effort was made to have it as complete as possible in itself and it therefore has a self-contained regulator which enables the current to be controlled perfectly from a maximum to a minimum for the different sizes of work and also includes a self-contained switch which automatically breaks the circuit when the weld is made. As far as possible all the moving parts are constructed to reduce the wear to a minimum, while adjustments have been provided to take up any wear that may occur. The pressure which is applied to complete the weld is exerted almost in a direct line with the work, an arrangement which tends to secure very accurate work, while its amount can be readily adjusted to suit the heaviest or the most delicate work. Although the machine is primarily semi-automatic in operation, it can easily be changed to a hand-operated machine and used as such. The welder is designed as a bench machine, but can be readily placed upon a truck and moved about as a portable welder, the current which operates it being supplied by two wires run to the nearest electric outlet.

The electrical features of the machine have also received consideration in its design and high electrical efficiency is secured by clamping the work directly on the terminals of the transformer, thus doing away with the loss of energy that occurs when long leads connecting the transformer



A New Type of Electric Welding Machine Built by the Thomson Electric Welding Company, Lynn, Mass.

and the work-holding device are used. Another electrical feature of the welder is the use of an individual fuse mounted upon the machine. This does away with the need for a special fuse in the supply mains and eliminates all possibility of interference with the main circuit. The transformer furnished with the welder has a capacity of 3 kw. and can be operated upon an alternating current circuit having a frequency of from 40 to 60 cycles. The primary coil is wound to suit any voltage of from 100 to 440. The transformer is open to the air and in this way thorough ventilation is secured and the conduction of any heat from the work in the work holders to the transformer is prevented. If desired a special attachment can be furnished with the machine which enables hard steel wire to be annealed after welding without necessitating the reclamping of the piece in the work holders.

It is possible to handle steel stock ranging from No. 16 wire up to 5/16-in. rounds and from ⅛ to 3/16 in. copper wire. The time of heating and welding the work varies from ½ to 2½ sec., depending upon the size and the character of the work. The output of the machine per 10-hr. day is from 2500 to 3000 welds according to the skill of the operator, the amount of the current consumed being between 5 and 6 kw.-hr., or 2 kw.-hr. per 1000 welds. Although the maximum size of stock ordinarily handled is 5/16-in. rounds the machine has successfully welded ½-in. round stock in 9 sec. This, however, was a considerable overload on the machine and stock as large as this should not be handled ordinarily except for intermittent work.

Pattern Handling in a Steel Foundry

The Importance of System in this Work

BY C. A. TUPPER, MILWAUKEE, WIS.

In connection with the works of the Falk Company, Milwaukee, Wis., there has been evolved a system of pattern storage and handling which is unusually well planned and complete for a jobbing steel foundry. All patterns, as received from customers, are carefully numbered and deposited in a steel-frame concrete building, well arranged, with shelves and partitions, the largest patterns being suitably grouped in sectional compartments at one side of the building, the medium sizes placed in open bins on the other side and the smallest ones set on shelves above them. A good idea of the general arrangement may be gained from the accompanying illustration, which also shows the brick and concrete walls, columns and ceilings, cement floor and fireproof doors dividing the building into compartments, any one of which can be immediately isolated in case of a blaze. A closely regulated heating system maintains an even temperature in winter, and the open, spacious construction insures good ventilation during the hot summer weather, thus keeping the patterns in excellent condition. The system of numbering, which can be plainly seen from the illustration, as, for example, 1-8 B 9-10—the index letter being on a dividing center—renders it very easy to find patterns as needed. A record of each is kept on a separate file card for ready reference, and in the office it can be ascertained at once just where a pattern is to be found, whether in storage or in service.

The method of keeping track of the work is such that orders can be put through in the quickest possible time. This will be clear from the following: As the instructions come in from customers each day they are written out at the office in quadruplicate. Two copies go to the shipping department, one being kept on file there and the other returned to the office when the order has been completed and shipped. The third copy is sent to the pattern storage department and the fourth is kept on a card record at the main office. From the order received at the pattern storage building a molder's ticket is made out, and this accompanies the pattern to the foundry, rush work being noted on a slip of a special color. The precise amount of work done on a job, each day, is checked up at night and a record kept in the pattern storage office, which shows at any given time how far the order has progressed toward completion. So free from complications and systematic are the methods employed that they require very little clerical labor. Between the pattern storage and the core departments of the foundry is a building in which patterns for immediate use are placed temporarily, awaiting disposition in the foundry. As soon as a man or a gang of men have completed one operation the foreman of the department goes to this building and selects the pattern to be used next.

When work on an order has been finished the pattern is either returned to the main pattern storage building or else sent back to the customer, according to his instructions. At the end of this time a simple card record has been completed which shows when the pattern was received, in what condition, gives a brief description of it, including the core boxes and number of pieces in the pattern, states its exact or approximate valuation, when and how it was returned to storage or to the customer, and also gives the pattern number assigned to it at the Falk Company's works, with section and shelf in the storage building which it occupied while there.



View in the Pattern Storage Building of the Falk Company, Milwaukee, Wis.

A duplicate of this card on light weight paper is pasted in a book under an alphabetical-numerical arrangement, and the patterns returned to customers are immediately distinguishable by having a large "R" stamped opposite the number of each, so that the record clerk, going through the book, has only to look at the numbers of patterns which are actually in the possession of the company and can find what he wants very quickly.

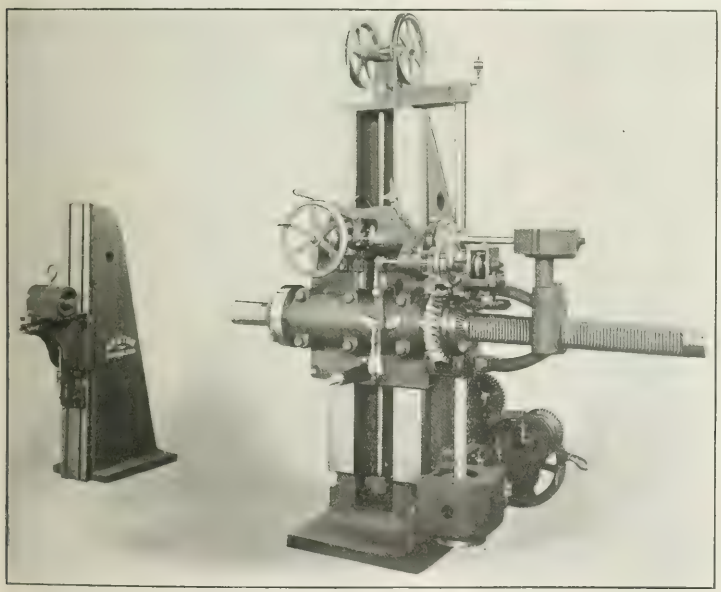
The Falk Company has a well-equipped woodworking shop and makes a specialty of turning out patterns for customers, particularly for duplicate work or that of an intricate nature requiring special care in shrinkage measurements. Some manufacturers of machinery fail to realize the number of ways in which even skilled pattern makers in iron or other metal foundries can find to make bungling jobs of patterns for steel castings. This is a trade in itself, and naturally it is best carried through by men thoroughly experienced in it. At the Falk works a large quantity of lumber is kept constantly on hand so that there may be sufficient stock thoroughly seasoned to meet all operating requirements. The importance of using material in proper condition for castings, thereby insuring against shrinkage or distortion, is not to be overestimated in steel foundry practice.

When business all through the country is slack the advantages of such a system as that above described do not stand out in such strong relief as they deserve to, but during periods when it was difficult to obtain steel castings, without waiting unduly for them, manufacturers were anxious enough to send their orders to the foundries which not only turned out good work but were able to comply strictly with their promises of delivery, etc. With the steadier and more even development of the country's industries more dependence will have to be made upon work of that character and far less upon the haphazard, hit-and-miss operation of the old-fashioned foundry, where "anything went" that a customer would stand for. Meanwhile, however, the value of system in the foundry ought to be recognized and encouraged, wherever found, as similar methods are in other branches of business.

The Newton Combination Portable Boring, Drilling and Milling Machine

A new type of portable boring, drilling and milling machine has been developed by the Newton Machine Tool Works, Inc., Twenty-fourth and Vine streets, Philadelphia, Pa. The special features of the tool are the use of a special construction to prevent the oil used to lubricate the bearings on the vertical driving shaft from escaping and the furnishing of an improved type of facing arm.

The spindle, which is 5 in. in diameter, runs in capped bearings having an aggregate length of 27⅜ in. It is fitted with a No. 6 Morse taper with retaining drift key slots arranged to drive the cutters by a broad face key. A thrust binder in front of the flange on the spindle is provided as well as a binding bolt to engage the rack sleeve and prevent any movement when milling or facing.



A New Portable Boring, Drilling and Milling Machine Built by the Newton Machine Tool Works, Inc., Philadelphia, Pa.

The spindle saddle is counterweighted and has hand elevation only although the elevating screw has a top and a bottom bearing. The drive for the spindle is from a General Electric type CR-10 10-hp. motor operating at a speed of from 450 to 1350 r.p.m., the spindle speed range varying from 3.56 to 35 r.p.m.

Four changes of geared feeds ranging from 0.0177 to 0.0709 in. per revolution of the spindle are available and are obtained by steel rack. The drive is through a bronze worm wheel having an outside diameter of 12¾ in. and a hardened steel worm fitted with roller thrust bearings, both being encased for continuous lubrication. To prevent the escape of oil from this box, bushings that revolve with the shaft are employed, an arrangement which it is claimed prevents the escape of oil through the splines of vertical driving shaft.

An improved type of facing arm on which it is possible to obtain an in and out movement for the tool slides by a star feed is included in the equipment of the machine.

The following table gives the principal dimensions and specifications of the machine:

Diameter of spindle, in.	5
Length of feed, in.	32
Minimum distance between the spindle center and base, in.	25
Maximum distance between the spindle center and base, in.	68
Diameter of spindle sleeve, in.	6¾
Length of spindle bearings, in.	27⅜
Minimum spindle speed, r.p.m.	3.56
Maximum spindle speed, r.p.m.	35
Number of speed changes	4
Minimum speed per revolution of spindle, in.	0.0177
Maximum speed per revolution of spindle, in.	0.0709
Morse taper of spindle	No. 6
Length of spindle bearing upright, in.	26
Width of spindle bearing on upright, in.	20
Width of upright face, in.	26
Base of upright, in.	28 x 46
Tool slide feed, in.	10
Maximum distance between tool post and spindle centers, in.	18

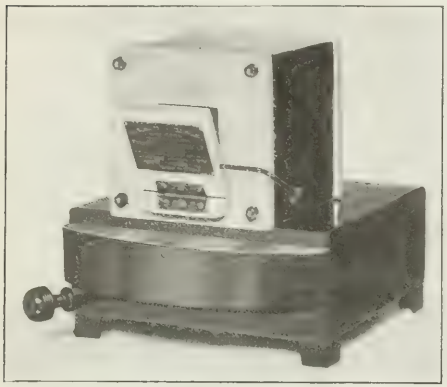
The motor is mounted on a pedestal in the rear, the power being transmitted to the spindle either directly or through back gears, having a ratio of 3 to 1.

Minnesota Steel Company Blast Furnaces

The Pennsylvania Engineering Works, New Castle, Pa., has taken a contract to design, fabricate and erect upon foundations built by the Minnesota Steel Company all the iron and steel work necessary in the construction of two modern blast furnaces on the latter company's site near Duluth, Minn. A large force of engineers are at work designing and detailing, and the New Castle company expects to get into active operation in its shops on this contract within the next three or four weeks. The two furnaces will require upwards of 6000 tons of steel. They will not be completed until the latter part of next year. The contract covers all the iron and steel work, including ten hot blast stoves, gas washing apparatus, cast houses, skip incline, crane runways, etc. The stoves are of the three-pass type, 22 ft. 6 in. in diameter, 100 ft. high. The furnaces will be 21 ft. 6 in. in the bosh, the shells being lined only 12 in. One of the novel features of the furnaces will be the dry cleaning devices for eliminating dust from the gas. From the top of each furnace there will be four uptakes, each leading into a centrifugal dry gas cleaner, the downcomer pipe being taken off from the latter and discharged into another set of centrifugals at the bottom of the furnaces. These centrifugals again discharge into two others of larger size, from which the gas is distributed to the various places for use, some passing through Zschocke washers and some going direct to stoves and boilers. The charging equipment will consist of a single skip with bottom discharge bucket, after the Neeland patent, and will be similar to that in use at the Duquesne, Pa., furnaces of the Carnegie Steel Company. The furnaces will be thoroughly water cooled from top to bottom, the boshes with copper cooling plates and the shells with outside troughs clear to the top.

A Replaceable Unit Electric Furnace

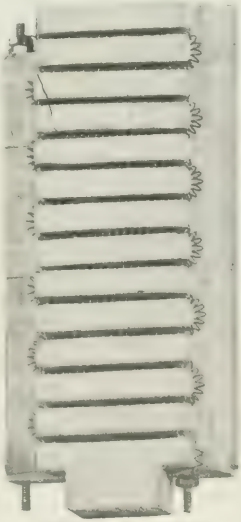
An electric furnace in which the electric heating medium comprises a number of units which can readily be replaced in case of a burnout without the expense or delays of sending the furnace to the factory for repairs has been developed by the Multiple Unit Electric Company, 130 Liberty Street, New York City. Briefly described, the furnace heating chamber is lined with these heating units; the units slide into a structure of refractory material forming the body of the furnace; the body joints are closed with elastic refractory cement, and an outside metal covering, say with a japanned finish, gives the furnace a durable and attractive exterior.



Muffle Type of Replaceable Unit Electric Furnace.

The interest in the furnace lies chiefly in the replaceability of its parts and in what may be called the open construction of the replaceable unit in which the electrical heating wire is exposed to the air of the furnace chamber. The furnaces are regularly made in three general forms: One for crucible work, such as melting metals, for determining the recalescent points of steel and for enameling and general small work; a muffle type furnace for hardening and general heat treatment of steel, for different kinds of chemical work, for the determination of ash and for annealing and enameling purposes; a combustion type furnace, built for the heat treatment of tubes, drills, reamers, springs and for carbon determinations in steel and iron alloys.

The accompanying illustrations show the muffle type of furnace and one of the replaceable electric heating units. The muffle furnace is also suitable for heating hardening baths, such as those of lead, cyanide of potassium, etc., and also for oil quenching baths. The counterbalanced hinged door to the furnace opening may in the open position serve as a platform or shelf in front of the opening, where materials under treatment may, for example, be air cooled or temporarily left, as may be necessary in the manipulation. In case of a failure for any reason of the electric furnace it is necessary merely to unscrew, at the four points indicated in the half tone view, the special composition front which, when removed, exposes the end connections of the replaceable units. In a furnace of the type shown there are four of these units which may be removed by the use of a screwdriver. A simple testing plug may be obtained with the furnace, so that one may determine quickly which of the units is disabled.



One of the Replaceable Heating Units

Each comprises, as indicated in the cut, a number of special form refractory sections bound together with two bolts of a special metal serving also as electrical conductors. The unit has open under-cut slots, and the coiled wire passes through them as indicated. This leaves the wire, the composition of which has been selected to make it resist destruction at high temperature when exposed to the air, in direct communication with the furnace chamber. This means, other things being equal, that a higher temperature is obtainable within the furnace chamber than otherwise, as the resistance material does not have to warm up the refractory lining, which, when the wires are embedded in it, must be higher in temperature than that of the chamber in order that there shall be a flow of heat from the wire to the chamber

An interesting point is that when desired the wires may be connected in various multiple series arrangements so that without the use of a rheostat, which, of course, dissipates heat, the amount of current may be controlled for regulating the temperature. Where necessary a rheostat is provided complete with the machine, and the view of the muffle furnace shown includes the rheostat at the base. A muffle-type furnace is regularly made in three sizes, the chamber size being 8 x 3½ x 2⅞ in. in one case, 10, 4⅝ and 3⅜ in. in another case and 12, 5¾ and 4¼ in. in another case. In the smallest size the current consumption is 18 amperes at 110 volts and, of course, 9 amperes at twice the voltage. The intermediate size is 20 amperes at 110 volts and the largest size 26 amperes at 110 volts.

The quick replacement of a faulty heating unit makes it unnecessary to delay operations to any extent, as the expense and loss of time are both minimized. It may be added that an interchangeable system has been developed in connection with the body refractory material. The corner pieces for any given size or furnace will do for furnaces of different size chambers, different sizes of distant pieces alone being necessary to join one corner with the adjacent corner. The contraction thus makes it possible to make practically any size of furnace. The furnace is covered by patents granted and pending to M. M. Kohn, manager of the Multiple Unit Electric Company.

Growth of the Engineering Societies

A compilation of the important engineering societies of the United States and Canada has been made by the Engineering News. It shows that the growth of the four principal engineering societies in the past five years has been as indicated below:

	Number of members.		Growth in
	1906.	1911.	5 years.
American Institute of Electrical Engineers.	3,594	7,118	3,524
American Society of Civil Engineers.....	3,569	5,976	2,407
American Institute of Mining Engineers. .	3,886	4,200	314
American Society of Mechanical Engineers.	2,929	3,899	970

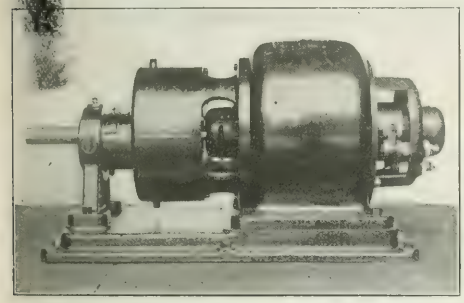
The National Electric Light Association increased its membership by about 1000 in the past two or three months. It had 923 members in 1906 and now has over 9000. The American Iron & Steel Association is credited with a membership of 200 companies and corporations, the American Iron & Steel Institute with 315 members, the American Museum of Safety with 100 and the American Society for Testing Materials with 1350 members. Attention is called to the increase in the number of state engineering societies and of sanitary engineering and water supply associations in five years. Among the more important new societies formed in that period are the American Institute of Chemical Engineers, American Institute of Consulting Engineers, American Metallurgical Society, American Society of Agricultural Engineers, American Society of Engineering Contractors, International Railway Fuel Association, Inventors' Guild, and the Mining and Metallurgical Society of America.

The Columbia Steel Company has about completed the installation of an additional open hearth furnace at Black Diamond, Cal., the work being done under the supervision of S. T. Wellman, of the Wellman-Seaver-Morgan Company, Cleveland, Ohio.

New Model of O'Kelly Speed-Reducing Gear

A new model of the O'Kelly speed-reducing gearing in which the gear case is bolted directly to the motor frame, thus obviating the necessity of a coupling between motor and the reducer, has been developed by the D. O. James Mfg. Company, West Monroe street, Chicago. It may be recalled that in *The Iron Age* of July 30, 1908, a somewhat extended article descriptive of the reducing gear itself and illustrating a number of applications appeared. A special feature of the gear is that a high-speed pinion turned solid on the driving or motor shaft transmits power through three idler pinions 120 deg. apart to an internal gear, which in turn drives the slow-speed king pinion. The accompanying illustration indicates the compactness of the speed reducer, its promising strength, that it is entirely closed and oil tight and that it offers no belting or projections likely to be a menace to the operatives.

Besides the model shown in the illustration, which is known as model A, another model has been developed, model B for higher speed reductions and heavier work. Model A is designed to step down a motor speed of 960 r.p.m. to 150 r.p.m. There is a common bedplate and common end bearing, an arrangement calculated to maintain perfect alignment of the reducer and the motor. Model B, built in sizes ranging from ⅛ to 75 hp. and offering speed ratios varying from 4 to 1 to as high as



Direct Attached Speed-Reducing Gear Made by D. O. James Mfg. Company, Chicago.

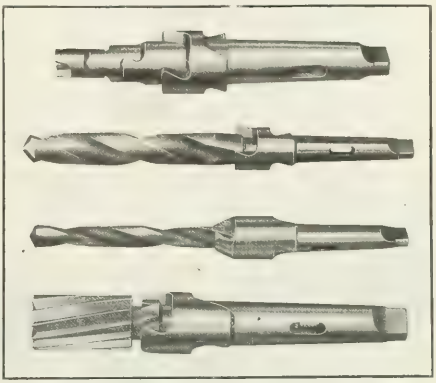
600 or more to 1 is coupled direct to the motor with a universal coupling. For extreme reductions in speed a second internal gear, as explained in the earlier article referred to, completes the train and drives the shaft from which power is taken. The use of three idlers is required in giving the transmission a well balanced drive of ample emergency strength and, to avoid one-sided strain likely to result from a single gear and pinion.

All moving parts run in the same direction and the oil-tight enclosure allows splash lubrication from an oil bath. The bearings are of the chain oiling type and are bushed with Lumen bearing metal. The oil chamber carries a considerable quantity of oil, which, in the absence of any stuffing boxes, is retained by means of a special oil groove and guard. The oil grooves catch the drip from the shaft and return the oil to the chamber. The gears are made of 0.6 carbon forgings. The idlers are also bushed with Lumen bearing metal and are carried on case-hardened and forged steel pins. The internal gears are made of semi steel. These reducers are are furnished complete with motors and starting boxes, if desired.

The Bureau of Manufactures of the Department of Commerce and Labor, has just issued a pamphlet of 15 pages called "Promotion of Commerce." After a rather full description of the work of the Bureau of Manufactures, it outlines in short paragraphs, somewhat after the manner of the Congressional Directory, the duties and functions of various branches of the Government which are carrying on service related to the promotion and development of trade and manufacture. Over thirty bureaus and branches of the Government are listed from the various departments.

The Corona Drill Socket

A new type of drill, reamer and milling tool socket has been recently placed on the market by the Corona Mfg. & Supply Company, 311 Atlantic avenue, Boston, Mass. This new device, which is known as the Corona socket, is designed to take all standard twist drills or other drills made up of twisted shapes, the drive being against the twist. The advantages claimed for the socket



Four Possible Combinations of the Corona Drill Socket Made by the Corona Mfg. & Supply Company, Boston, Mass.

are that there are no broken tangs or worn sockets due to drills turning, the drive is direct which is emphasized as tending to eliminate breakage of the tools, a large range of work can be accommodated due to the nesting feature and with the large sized drills from 3 to 5 in. in length is saved. Drills, the tangs of which have broken, can be machined to fit this new socket by cutting through the flute to the root of the shank. In the case of a new twist drill the benefit of the tang drive is secured as well as the advantages of the flute drive.

With the standard twist drills the flute is carried through to the root of the shank but not below its diameter. With drills made up from twisted shapes the shank is turned without changing the original form. The socket in either case engages and drives from the flute as shown in the two middle views of the accompanying engraving. Milling tools and reamers are made with a taper shank, having an engagement to take that of the socket as shown at the bottom. In this way the tang drive is entirely eliminated. In the view at the top four sockets are seen nested together and when a fifth one is added it is possible to take drills having a maximum diameter of 1 in. The largest size of drill taken by the biggest socket is 3 in. As the device is interchangeable with Morse and other standard taper sockets, the sockets can be utilized as part of the equipment of drill press spindles.

A Corporation Recipe.—The Wall Street Journal has the following: "Dissolution stew: Take a solvent, well-managed and healthy corporation. Investigate thoroughly. Roast in the public press as long as it can be kept hot. To one part prejudice, two parts political demagoguery, add half-baked laws one after the other until the corporation dissolves into thirty-three parts. Issue fractional certificates and serve hot with campaign sauce."

Much interest is taken at Cincinnati in the newly completed Government Fernbank dam, about 10 miles below the city. This is the largest dam on the Ohio River. The Cincinnati Business Men's Club, the prime mover in promoting the dam, made a special inspection trip Aug. 5. Nearly 1,000 members and guests were on a steamer that passed through the locks.

The Adrian Furnace Company, Du Bois, Pa., expects to have its furnace, which is now being relined, ready for blast about the middle of October.

The Caterpillar Traction Engine

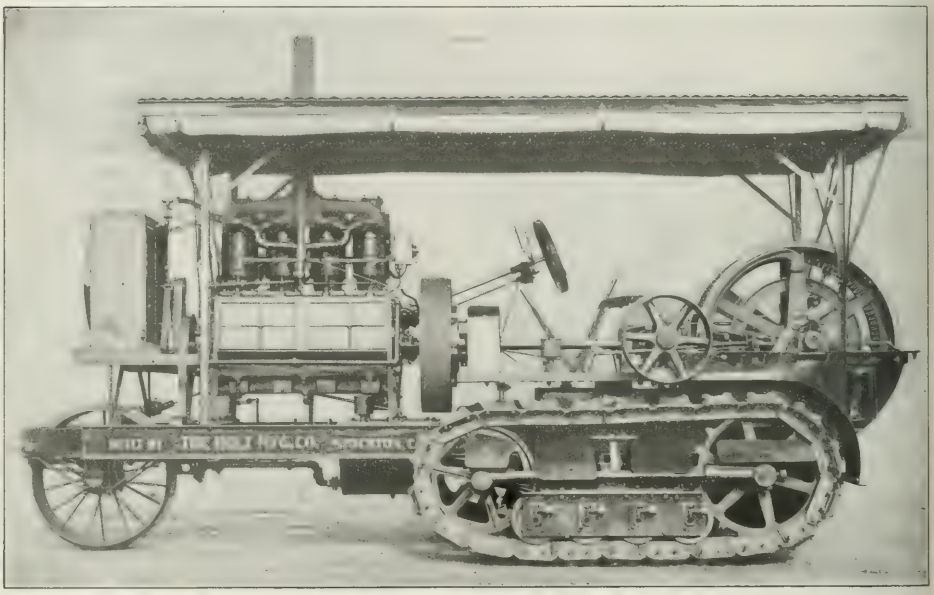
Absence of Traction Wheels a Special Feature

A traction engine without traction wheels is somewhat of a anomaly. In the new engine developed by the Holt Mfg. Company, Stockton, Cal., a tractor has been developed which is characterized by the entire absence of the customary traction wheels. In this engine the traction parts consist of an endless series of track sections or a traction belt on each side of the tractor. Roller trucks supporting the main frame rest on the upper side of the portion of each traction belt which touches the ground. Power is applied to the rear sockets supporting the traction belts which are pulled backward under the supporting rollers, causing the tractor to roll forward. This construction gives a traction area, it is calculated, equal to a wheel approximately 100 ft. in diameter with the additional advantage that the weight rolls on a smooth steel track. One of the special features of the engine

The Engine

The motor used is of the four-cylinder, four-cycle water-cooled type and is rated at 60 hp. The cylinders are cast separately and have a 7-in. bore and an 8-in. stroke. The rated speed of operation is 500 r.p.m. Soft grey iron is used in the construction of the crank case, which contains five rigid supports for the main crank bearings, which are 2 15/16 in. in diameter and are lined with a special bearing metal. The aggregate length of these bearings is 24 11/16 in., divided among the rear bearing, which is 8 in. long, a front bearing 4⅞ in. long and the three center bearings, each of which is 3 15/16 in. in length. Emphasis is placed on the fact that the design of the crank case is such that any bearing, piston or connecting rod can be removed without disturbing any other part of the motor. An automatic leveling oil reservoir to insure proper lubrication for all parts of the motor is also contained in the crank case.

Plastic bronze bushings are used for the rods. The wrist pins, which are made hollow to allow for expansion,



The Caterpillar Traction Engine Built by the Holt Mfg. Company, Stockton, Cal.

that will be noted from the accompanying engraving is the ease with which all parts of the engine can be inspected.

The caterpillar or platform wheel possesses the advantage of giving a smooth road for the tractor at all times. The flexible track bridges over inequalities in the surface in the ground and it is found relieves the entire tractor of practically all the jerks, jars and roughness which it would otherwise receive. The platform wheels proper are composed of four semi-steel rollers suspended from the main frame by springs, one cast-steel driving sprocket and a single idler which carries the track. The four rollers run on roller-bearing hardened steel shafts well lubricated and dustproof, an arrangement which is not only simple but strong. The track is built up of a succession of large open links, made of specially rolled high carbon plow steel. Case hardened pins turning in sleeves of malleable iron bushed with hardened steel are used for the joints and this peculiar construction, it is explained, makes them practically dustproof and insures long wear. The track base plates and the shoes are bolted to the links, the former being made of drop forged plow steel. A special feature of this track is that it contains no rapidly moving parts, and that the weight is always evenly distributed. As the large bearing surface provided measures over 2000 sq. in., the weight per square inch is approximately 9 lb., which is very different from an ordinary round wheel where the weight is concentrated on one point.

measure 2 17/16 in. in diameter. Positive lubrication is secured through the use of an automatic leveling oil reservoir in the base of a crank case, while a sight feed located directly in front of the operator shows him at all times just how much oil is being fed. The lubrication of the various parts is by the splash system. The dual ignition system is of the jump spark type and comprises a high tension magneto and a set of dry cells operating through a spark coil. The carbureter is of a special design, which is said to give a perfect mixture under all conditions. Circulating water driven by a centrifugal pump to a large vertical radiator mounted directly in front of the engine assisted by a large fan between the radiator and the engine is utilized in cooling the engine. The construction of the radiator is such that it can be completely drained to prevent freezing in cold weather.

The Transmission System

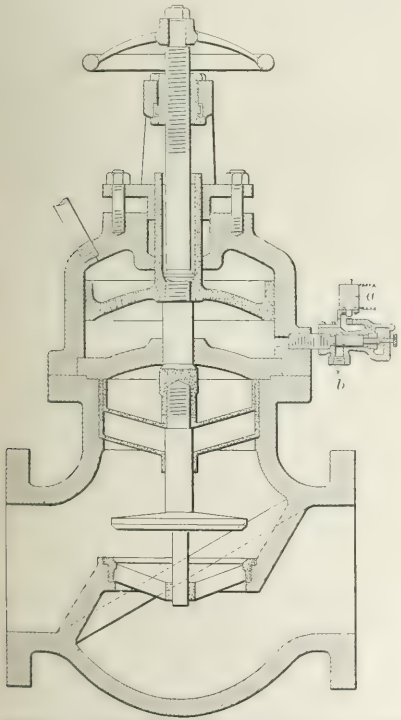
Power is transmitted through a multiple disk clutch and a straight line shaft with bevel gear from the engine to the countershaft, from which a chain drive to each caterpillar wheel is used. All of these parts are controlled by independent frictions. The clutch is composed of two friction fiber disks operating between three plates of soft grey iron. This is said to enable the load to be gradually picked up without jerk or jar and in action to remain engaged. The gearing providing the necessary speed changes is located at the rear end of the engine frame and consists of two large semi-steel bevel gears

carried on a large diameter steel shaft, together with a double high carbon steel beveled pinion mounted on an extension of the crank shaft. The diameter of these bevel gears is over 4 ft., a size which gives exceptional wearing qualities. When the pinion on the crank shaft extension engages the bevel gear at the left, the engine moves forward, while by shifting the pinion to engage the right bevel gear the direction of motion is reversed. For securing a higher speed the pinion is shifted longitudinally on the crank shaft extension so that it engages with the second face of the bevel gear on the left. All the control levers are within an easy reach of the operator and the speed changes ar easily made. In this way it is possible to secure two forward and one reverse speed on a direct drive with no reduction gears in mesh. From the large bevel gears on the countershaft, power is transmitted by a double chain drive to the cast-steel spring drive sprockets of the platform wheels. Each of these drives is independent of the other, and the power is applied to either one or both of the wheels by a friction clutch operating on the inside rim of the large bevel gears. This arrangement enables the machine to pull a load with one wheel in an emergency and also allows it to be turned within its own length.

The frame of the engine is composed of 8-in. I-beams braced and mounted with springs on supporting trucks. The principal dimensions of the engine are overall hight, 11 ft.; length, 18 ft. 7 in.; extreme width, 7 ft., and tread, 82 in. The weight of the engine is approximately 9 tons. The average fuel consumption of the engine is said to be 40 gal. of distillate per 10-hr. day, while a gallon of lubricating oil will last the same length of time.

An Electrically Operated Stop Valve

The Golden-Anderson Valve Specialty Company, Fulton Building, Pittsburgh, Pa., has recently brought out a new type of triple-acting quick-closing stop valve which is equipped with an electrically operated pilot valve. This valve is intended to furnish a quick and reliable means of protecting the steam lines in a power plant in case of accident such as the bursting of a pipe, valve or fitting and is a combination of an automatic non-return valve, an automatic safety stop valve, an automatic emergency-stop valve and a hand-stop valve all in one.



A Cushioned Emergency Stop Valve with Electrically Operated Pilot Valve Made by the Golden-Anderson Valve Specialty Company, Pittsburgh, Pa.

The Corliss dash pot method of cushioning the triple valve is used and consists of two dash pots with a steam connection between them leading to the pilot valve which was illustrated in *The Iron Age*, February 10, 1910. A by-pass is employed to admit the full boiler pressure on both sides of the inner dash pot, which is therefore balanced. If the steam line should become ruptured, the pressure on the upper side of the pilot valve diaphragm would be removed and the pressure from between the two dash pots of the triple valve would be exhausted which would then close.

The construction of this triple valve is shown in the accompanying engraving, the pilot valve with its solenoid being at the left. The solenoid *a*, which controls the operation of the pilot valve is of the same general type as that employed by the Cutler-Hammer Mfg. Company in its solenoid operated valves, an illustrated description of which appeared in *The Iron Age*, March 16, 1911, but special modifications were made in its design to meet the requirements of this particular case. The pilot valve is normally held in place by a balanced latch having a trigger at one end. The solenoid is arranged so that its plunger will give a downward blow to the other end of the lever, which is sufficient to upset the latch. This releases the pilot valve and the steam in it passes out through the exhaust port *b* and the main valve closes. The solenoid is arranged with a frame and a plunger, the latter being normally held up by a spring. When the coil is energized by the closing of the electrical circuit due to the pressing of a push button the plunger will move about ⅜ in. and strike the blow which unseats the latch that holds the pilot valve in position. These push buttons can be located wherever desired around the plant and the steam supply can be thus shut off in case of accident without having to go to the boiler room to close the valve on the header.

Bronze is employed throughout in the construction of the valve with the exception of the coil spring in the pilot valve, the lever and the latch. The spring is made of tempered steel, while tool steel is employed in the construction of the other two parts. The pilot valve has a ½-in. pipe connection to the triple valve and a ⅜-in. connection to the main header.

Official List of Machine Tool Builders

The National Machine Builders' Association, through its secretary, Charles E. Hildreth, Worcester, Mass., has published an Alphabetical and Segregated List, which constitutes a directory of the industry that should be an important handbook. It contains the names of the members of the association and a classification of the members by headings according to the kinds of machinery which they manufacture, each class being thoroughly sub-divided. In this way no less than 154 distinct kinds of machines are enumerated. The list will prove a great convenience to those who desire the names of manufacturers of a given type of machine. For instance, under gear-cutting machines 14 names and addresses are given. The list, which is accurate in every detail, has been compiled at considerable expense, and consequently to non-members of the association the price is 50 cents.

The blast furnace of the Star Furnace Company, Jackson, Ohio, is now being rebuilt and a new stove, new blowing engine and new stock bins will be added. The rebuilt stack will be 70 x 16½ ft. and will have a capacity of 30,000 tons of ferrosilicon or 60,000 tons of foundry iron a year. It is expected it will be ready for blast in 1912. When the stack was blown out two months ago it had been operated continuously on the same lining on ferrosilicon for four years and five months.

The New Jersey Zinc Company completed the dismantling of its furnace B, near Newark, N. J., some time ago. It is probable that its furnace at South Bethlehem, Pa., will not be operated again. Both the furnaces at Palmerton Pa., are now running.

New Brace Miller

For milling the ends and chamfering one edge of each of two 8 x 8 in. angles simultaneously, the Newton Machine Tool Works, Inc., Twenty-fourth and Vine streets, Philadelphia, Pa., has brought out a new type of brace milling machine. Where the volume of work handled is

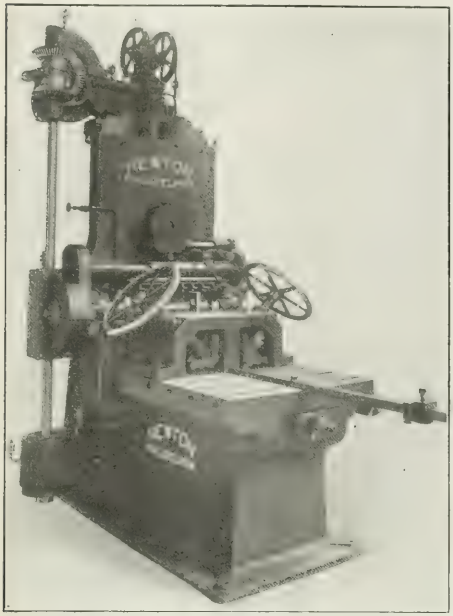


Fig. 1.—A New Brace Milling Machine Built by the Newton Machine Tool Works, Inc., Philadelphia, Pa.

sufficiently large, two uprights are furnished on a base which enables the finishing and the chamfering of both ends of the pieces to be performed simultaneously. A general view of the machine is given in Fig. 1, while the vise is shown removed in Fig. 2 so that ends of columns can be finished by the miller.

The spindle which is arranged to drive the cutter

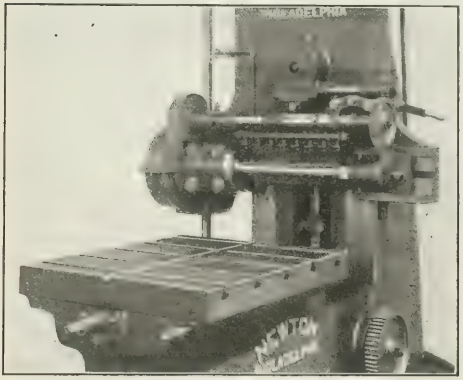


Fig. 2.—A View of the Table Showing the Vise Removed for Finishing the Ends of Columns.

arbor through a broad face key is 5 in. in diameter and is fitted with a No. 6 Morse taper. A through retaining bolt holds the arbor in place and cutters having a maximum diameter of 8 in. and a length of 24 in. can be used, the length being made up either of one or several cutters aggregating the required dimension. Square locked bearings, which are the standard of this company's machines, are employed for fitting the spindle saddle to the upright, while the necessary adjustments for wear are made by taper shoes. A counterweight is provided for the saddle, which has four changes of vertical feed secured through change gears as well as a reversing fast power traverse and hand adjustment. The dimensions of the work table, which has a 6-in. in and out hand adjustment, are 39 in. in length and 36 in. in width. Taper shoes are used to adjust the table to the base.

The vise for holding the angles was formerly cast solid with the table, but in the new type is made a separate casting and is therefore removable. This construction, which is shown in Fig. 2, enables the machine to be employed for finishing the end of columns. One of the special features of the vise is that the jaws are operated independently by hand wheels mounted on the adjusting screws and special provision is made to control the parallel position of the jaws when being elevated by the insertion of two circular guides on which springs are mounted at C, Fig. 1.

The frame of the machine is one solid casting and the floor space occupied is 60 x 92 in., these being the maximum dimensions. The power for the drive is furnished by a General Electric type CQ-10 10-hp. motor, having a speed range of 600 to 1200 r.p.m.

Hours and Wages in the Iron Industry

Secretary Nagel, of the Department of Commerce and Labor, made a report to the Senate last week, in response to the resolution of Senator Borah calling for an investigation of labor conditions in the iron and steel industry. The inquiry, it is stated, covered practically all the iron and steel manufacturing plants in the country, numbering 344. The report says that "the fact that stands out most strikingly in any study of the labor conditions in the iron and steel industry in the United States is the extent to which the 12-hour day and a week of seven days still prevail in this industry. The seven-day working week is not confined to the blast furnace department, where there is a metallurgical necessity for continuous operation, but also was found to a considerable extent in other departments for commercial reasons only."

Much of the Sunday work is no more necessary than in other industries, the report says, in pointing out that in other industries where continuous operation is necessary entirely practicable systems have been found by which one day of rest out of seven can be secured for each employee. "It is in striking contrast to the general tendency in other industries to find in a great basic industry that approximately only 15 per cent. of the 90,000 employees in special iron and steel occupations work less than 60 hours per week, and almost 50 per cent. 72 hours or over per week."

Nearly 60 per cent. of the employees are foreign born, and nearly two-thirds of these are of the Slavic race. Almost half of the 90,000 employees, according to Secretary Nagel, receive less than 18 cents an hour, one-quarter under 25 cents an hour and the other one-fourth, 25 cents and over an hour. A few very highly skilled employees, however, receive $1.25 an hour. Those receiving 50 cents and over an hour number less than one-twentieth.

The heat developed by machinery in motion is sometimes considerable as indicated in some figures collected by a committee in England appointed by the Home Secretary of State to investigate conditions in cotton mills. The average amount of heat given up by the looms in three weaving sheds on a cloudy day was about 62 per cent. of the total generated in each shed. The amount of heat emitted by the operatives averaged about 21 per cent. and the amount of heat radiated from steam pipes amounted to about 17 per cent. To determine the effect of sunshine on the temperature, observations were taken in a number of sheds of the rise in temperature between 6 a. m. and 5.30 p. m. on both cloudy and sunny days and it was found that the average increase due to the sun was 38 per cent.

The Machinery Markets

The railroads are becoming more active in the East. Some small lists of requirements are out in the New York market. The Baltimore & Ohio Railroad is preparing a list of machine tools for large shops to be built at Baltimore and Grafton, W. Va. This business will probably be placed from Baltimore. A more active demand has developed in Philadelphia, where trade had been unusually quiet. The Chicago & Northwestern Railroad has a list calling for $12,000 worth of machinery which has been distributed in the Chicago trade, and the International Harvester Company is preparing to issue another list in that market. The automobile trade continues the center of activity in Detroit, but a good call has developed there for contractors' equipment. The machine tool demand has fallen off on the Pacific coast, although the Southern Pacific Railroad has placed orders against a small list of metal-working equipment. The demand for contractors' machinery and for machinery used in the Southern California oil fields continues excellent. There is a noticeable improvement for all lines in the South. Power machinery, electric apparatus and machine tools lead in activity there, and some municipal enterprises for the construction of water works and power and light plants are being started.

New York

NEW YORK, August 9, 1911.

There are indications that the railroads will shortly become more active purchasers in this market. The Delaware, Lackawanna & Western is inquiring for a small lot of machine tools for replacement. Some of the machines are to be installed at the Buffalo shops. The Pennsylvania Railroad has been making inquiries for metal working equipment, but its requirements are not large. The New York Central has not as yet closed for any part of the large list of machine tools it has had out in this market for several months, but the bids are now in the hands of the purchasing department. Some good business has been placed within the last two weeks by the Saurer Motor Company, Plainfield, N. J., and a few tools are yet to be bought against this list. Other motor truck manufacturers have been buying freely of late, but their purchases are principally for replacements. Inquiries from other sources are coming in in fairly good volume.

Manufacturers of Corliss engines have been getting better inquiries and some good sales of small power units have been made for manufacturing lofts and office buildings in the vicinity of New York. A number of New York houses have been selling some good round lots of machine tools and metal-working equipment to Canadian car manufacturers and the Canadian railroads have been good customers for machinery for their locomotive and car erecting shops.

The Long Island Railroad has secured permission from the Public Service Commission for the electrification of its Port Washington branch, and work on the project will be begun as soon as possible. Plans are entirely prepared and it is proposed to have the line ready for service within the next six months. This means that the company will be in the market for considerable power equipment in addition to contracting machinery and electric locomotives.

The Cambridge Company, which is affiliated with the Riverside Steel Spring Company, Riverside, N. J., is erecting an 18-in. rolling mill at Riverside to roll sections for special steel springs. The mill will be installed in a building 50 x 125 ft. and the company will install a 150-hp. gas engine with generator. Power will be supplied from this plant for other industries.

The Pelton Water Wheel Company, through its Eastern office at 90 West street, New York, has been awarded a contract by the Department of the Interior of the United States for a water power plant to be erected at Carite, Porto Rico, to be used in connection with irrigation work. The plant will be capable of developing 1000 hp., and it will include a driving and main generator of 50 hp. and an exciter wheel, both direct connected to work under a 750-ft. effective head. The generator and exciter wheel will be equipped with Pelton oil-pressure governors. The contract includes the construction of a pipe line approximately 2300 ft. long. An additional wheel of like capacity will be installed in connection with the same work later on.

The Harrisburg Mfg. & Boiler Company, Harrisburg, Pa., which is controlled by the Pelton Water Wheel Company, whose Eastern office is at 90 West Street, New York, is erecting an addition 152 x 155 ft., which is arranged for a later extension of the same size. The new building, it is understood, will be used as an Eastern plant for the Pelton Water Wheel Company, whose main factory is at San Francisco.

The Titan Steel Casting Company, whose plant is at the foot of Chapel street, Newark, N. J., is taking bids for construction of an addition to its main foundry, which is to be 150 x 200 ft. in size, and 42 ft. high. The building will be of modern steel construction. For the present the structure will be served by the cranes in the existing foundry and later on additional apparatus will be installed.

The Locomotive Economy Company has been organized with an authorized capital stock of $20,000 to manufacture railroad appliances. The principal incorporator is E. Ormonde Powers, 15 Broad street, New York.

The Oil Power Company has been incorporated with a New York charter and authorized capital stock of $100,000 to manufacture oil engines under patents controlled by Leon Wygodsky. The company is planning for the erection of a factory, but has not as yet decided on the site. Mr. Wygodsky can be addressed at 2103 Crotona avenue, New York.

The building containing the lead pipe casting department at the plant of Charles Miller & Co., Utica, N. Y., was damaged August 1 by an explosion caused by the accidental dropping of a small quantity of dynamite into a melting kettle containing five tons of molten lead. The building will be rebuilt at once.

The Stecher Lithographic Company, Rochester, N. Y., is to build a two-story addition, 85 x 368 ft., to its plant on North Goodman street. The building will be of reinforced concrete and is estimated to cost about $85,000.

The Rochester Steel Casting Company, Rochester, has been incorporated with a capital stock of $50,000 to manufacture steel castings and deal in foundry appliances and supplies. The directors are Frederick C. Kimmel, P. V. C. Jackson, J. C. Emery, and others, of Rochester, and A. Thompson, of Baltimore, Md.

The J. A. Seitz Company, Syracuse, N. Y., has been incorporated for the purpose of manufacturing motors, engines, etc., with a capital stock of $50,000. The incorporators are Jacob A., B. M. and J. W. Seitz.

The Syracuse Rapid Transit Railroad Company is receiving bids for the erection and equipment of transforming station 62 x 65 ft., two stories, to be located on Townsend street, Syracuse, N. Y.

The Walter C. Goddard Company, Rochester, has been incorporated to manufacture and sell mechanical and electrical machinery. W. T. Goddard, E. C. Goddard and J. M. Cook are the incorporators, with offices at 1007 Monroe avenue, Rochester.

The Munson Bros. Company, Utica, N. Y., manufacturer of iron castings and mill supplies, has plans in preparation for a foundry building 100 x 200 ft., one story; a pattern building 50 x 160 ft., one story; a warehouse and shipping building, 50 x 300 ft., one story. The plant will occupy a site at Whitesboro, N. Y., and will be of steel frame construction, with concrete foundations and brick walls.

An extensive plant for the manufacture of carbonic acid gas is to be built at Mill and Bridge streets, Albany, N. Y., by the General Carbonic Company, formerly of Saratoga Springs. The plans call for a main building, 118 x 154 ft., one story, and is estimated to cost $100,000. Bids are now being received for tanks and apparatus of various kinds.

The American Radiator Company, Buffalo, is adding to its Pierce plant, at Elmwood avenue and the New York Central Railroad Belt Line, a brick foundry building estimated to cost $25,000.

The Republic Metalware Company, Buffalo, has completed plans for a machine shop and storage building which it will at once add to its plant at Republic and Tennessee streets and the Erie Railroad. The building will be of reinforced concrete, with concrete

THE MACHINERY MARKETS

floors, 91 x 102 ft., and wing 38 x 52 ft., all three stories. New machinery equipment will be installed.

The Bassett Motor Car Company, Buffalo, has been incorporated with a capital stock of $10,000, and will establish a plant in that city for the manufacture of motor boats, motor cycles and motor vehicles, with offices at 960 Main street. Among the incorporators are Frank Bassett, Edward J. Meyer, Alexander G. Hoefler and Alfred A. and John F. Bessick.

New England

BOSTON, MASS., August 8, 1911.

The machinery market is dull, but the condition is seasonable, of course. The common belief is that were these the autumn months the existing influences would create an active demand for machine tools and mill supplies of all descriptions. The General Electric Companies has made the necessary appropriation for a large shop building at Lynn, Mass. This is the extension for which an inquiry for some $75,000 worth of machine tools was out some months ago, and the deduction is that the further appropriation for this purpose will be forthcoming before the end of the year. It is understood that the United Shoe Machinery Company, Beverly, Mass., will defer until next year the purchase of equipment for the large extensions in process of erection. Dealers in tool steel report increased sales to railroad shops and to builders of railroad equipment all over the country.

The Lapointe Machine Company, Hudson, Mass., manufacturers of broaching and other metal working machinery, has elected F. F. Cutting president and general manager. J. N. Lapointe retires from active connection with the business, and, with his son Frank J. Lapointe, is equipping a shop in the Longley Building, Marlboro, Mass., for the manufacture of machine tools. Ralph R. Lapointe has been made superintendent of the Lapointe Machine Company. Colonel Cutting has been secretary and a director of Hill, Clarke & Co., Inc., Boston, Mass., with which business he has been connected for a long time. Ralph R. Lapointe has resigned the superintendency of the Universal Boring Machine Company, Hudson, and his successor has yet to be named. He has had a prominent part in developing the Universal boring machine.

Albert R. Stedfast has been elected secretary, sales manager and a director of Hill, Clarke & Co., Inc., Boston, and assumed his new duties July 1. He has been with the company for 27 years, and is prominent in the New England territory as a machine tool salesman.

The North & Pfeiffer Mfg. Company, manufacturer of screw boot calks, has moved its business from New Britain to Hartford, Conn. The former management has disposed of its interest and the board of officers now consists of Ernest Walker Smith, president, and John B. Hart, secretary and treasurer. New capital has been added and the business is being extended in a large way.

The W. T. Fields Company, New Haven, Conn., announces that it has arranged to take over a controlling interest in the Hopkins & Allen Arms Company, Norwich, Conn., manufacturer of guns and pistols. In order to accomplish the transaction it was necessary to agree to purchase all stock which might be offered and the Fields Company will probably acquire a somewhat larger amount than that required to secure the control. Details of the ultimate ownership and management of the flourishing business are not now available.

The Peck, Stow & Wilcox Company, Southington, Conn., voted at its annual meeting to increase its capital stock by $250,000. The new funds will be used for the erection and equipment of new buildings, consisting of a machine shop and warehouse, iron foundry, forge shop, woodworking shop, power house and other structures for miscellaneous purposes. The buildings will be used principally for taking care of the manufacturing now done at factories at East Berlin and Plantsville, Conn., thus concentrating the business at the main plant at Southington. At the annual meeting these officers were elected: President, L. H. Treadway; vice-president, M. H. Holcomb; secretary, Luke E. Fichthorn; treasurer, E. N. Walkley; directors, Mr. Treadway, Mr. Fichthorn, Mr. Holcomb, Webster R. Walkley, Marcellus B. Wilcox, S. H. Wilcox, A. R. Treadway, F. L. Wilcox and F. C. Sumner.

The New Haven Machine Screw Company, New Haven, Conn., will build an addition to its plant 40 x 115 ft., two stories, with a wing for toilet rooms. The structure will be of reinforced concrete of slow burning mill construction, with steel sash.

The Artistic Bronze Company, through its engineer, H. B. Close, 326 Colorado avenue, Bridgeport, Conn., is in the market for an oil or gas engine and electric generator as well as a considerable number of 2, 5 and 10-hp. motors. Other equipment will be purchased later for the new factory at Bridgeport, to which the company will move from Norwalk, Conn.

The Harriman Motor Works, Inc., Glastonbury, Conn., has been petitioned into bankruptcy by creditors, and George H. Barton, West Hartford, Conn., has been made the receiver. The company manufactures motors and engines, specializing on aeroplane engines.

The George D. Mayo Machine Company, Boston, has let the contract for an addition to its plant at Laconia, N. H. Work will be started at once and is expected to be completed in the early fall. This addition will probably necessitate purchases of additional machine tools but a list has not as yet been prepared.

The Water Board of Lawrence, Mass., will receive bids until August 23 for furnishing turbine-driven centrifugal pumps and condenser of 3,000,000 gal. capacity.

Philadelphia

PHILADELPHIA, PA., August 9, 1911.

The indifference of probable purchasers to the closing of pending negotiations keeps the local machinery market rather narrow. There is considerable business in sight, including a few fair propositions. Prospective buyers, who are making extensions to plants or building new ones, appear to be in no hurry to consider purchases of equipment. Meanwhile business drags and continues largely confined to scattered single tool sales. There is still an absence of any material demand from the railroads in this territory; although builders of special equipment for railway shop work report a trifle better demand from railroads in other districts. Business in the special tool and machinery lines is somewhat better than that in the standard lines, although few makers of such equipment are very actively engaged. Tool stocks in merchants' hands, as well as builders' warerooms, continue to increase and in instances extra efforts to move them have not been particularly successful. Current inquiry for either metal or woodworking machinery is light. The second-hand tool and machinery trade reports the market as irregular.

The export trade as far as the standard lines of machine tools are concerned is light. A small amount of business is going in some classes of special machinery; while trade in power equipment specialties appears to be fully maintained. Some few steel-casting plants are taking on a little more business, although orders are practically all for prompt delivery and but little forward business is on the books. Gray iron foundries appear a trifle more active, but in very few cases has the increase been due to orders for machinery builders.

It is stated that the plant of the Columbia Gray Iron Company, Columbia, Pa., recently damaged by fire, will be rebuilt at the earliest possible moment.

The Eagle Coal & Ice Company has purchased an acre of land at Fifty-seventh and Hoffman avenues, West Philadelphia, and is having plans prepared for a concrete building 100 x 250 ft. for ice making. The type of equipment for the plant is now being considered.

A merger which will include a number of the large Eastern manufacturers of ventilating devices has been practically determined upon. The Pullman Automatic Ventilator Mfg. Company, York, Pa., has practically been sold to the new company, in which New York capital is interested. Concerns in Rochester, N. Y., and New York City are to be included in the new corporation. While details have not been completed, it is stated that the new concern will have a capital stock of $800,000.

The Reading Crane & Hoist Company, Reading, Pa., has installed three overhead traveling bridges in the new shop of the Pennsylvania Shafting Company, Spring City, Pa., and is building an 84-ft. span plate girder crane for the Anglo Newfoundland Development Company. Order books are said to be in very good shape and several good inquiries are noted.

The Hess-Bright Mfg. Company, manufacturer of ball bearings, Twenty-first street and Fairmount avenue, has purchased a tract of about 14 acres of land

THE MACHINERY MARKETS

at Erie avenue and B street from the Pennsylvania Railroad Company, with the idea of erecting a new plant thereon at some future date. No definite plans have yet been considered.

The Light Mfg. & Foundry Company, Pottstown, Pa., continues to operate at about its normal capacity, although fewer large orders are on hand. A number of improvements to the plant of this company have been in contemplation, but action has been deferred until the outlook for future business is more favorable.

Contractors are figuring on the construction of a number of buildings to serve as car repair shops for the Baltimore & Ohio Railroad, Baltimore, Md. These consist of engine house, 60 x 112 ft.; sand house and tower, 15 x 45 ft.; ash and inspectors' pits, 10 x 250 ft., and minor buildings. M. A. Long, Baltimore, Md., is the engineer.

The Birdsboro Steel Foundry & Machinery Company, Birdsboro, Pa., is building a new erecting shop 120 ft. long, in which a Morgan 30-ton electric crane, having a 60-ft. span, with a 10-ton auxiliary hoist, will be installed. An 8-in. vertical boring mill, 60-in. open side planer, vertical milling machine, drill presses, and erecting and testing stands for pumps and other machinery, contracts for which have been placed, will be installed. This company has just shipped two large, electrically driven pressure pumps for the Chino Copper Company, weighing 135,000 lb. each, for special duty service.

The Royersford Foundry & Machine Company, Royersford, Pa., has recently completed the installation of additions to its power plant. This company reports the demand for its line of punch and shears as rather quiet, but notes continued increasing interest in its line of Sells Roller Bearing Devices. General business during July was hardly equal to that of the previous month, although a fair share of the business offered in its various lines is being booked.

The McLaughlin Brothers, Inc., Baltimore, Md., have been awarded the contract to design and construct a warehouse at 603 North Calvert street, to be built for the Independent Casket Company. The building will be 24 x 100 ft., five stories, and will be equipped with elevators, electric lights and steam heat. It was erroneously stated in *The Iron Age* of August 3 that this contract had been awarded to Morrow Bros., Inc., Baltimore.

The Elkan-Tufts Construction Company, Baltimore, Md., has been organized with a capital stock of $25,000 to do a general contracting business. Mortimer M. Elkan, Arthur Tufts and R. Barry Tufts are the organizers.

Chicago

CHICAGO, ILL., August 8, 1911.

With the exception of a machinery list from the Chicago & Northwestern Railway amounting to about $12,000, current requirements pending are very light. The International Harvester Company is expected to be in the market for additional tools in the near future to the value of $20,000. Floor sales reported are scattering and of minor importance. The general trade has been quiet.

The Felt & Tarrant Mfg. Company, Chicago, maker of the Comptometer adding and calculating machine, is putting up a large addition to its plant at 1713-1735 North Paulina street, which will require additional machinery equipment. The power equipment will include two additional horizontal tubular boilers, 44 in. x 16 ft., and a direct-connected, high-speed, 125-hp. engine. The present system of individual motor drive will be extended through the additional capacity.

The Barry Automatic Specialty Works, Chicago, has been incorporated with a capital stock of $10,000 by Henry Barry, Charles E. Boughner, William A. Jennings, and others, for general manufacturing purposes.

The Kling Bros. Engineering Works, Chicago, has been incorporated to manufacture and deal in machinery, metals and metal products. The incorporators are Charles Kling, E. N. Bessee, and Jacob J. Ludwig, and the capital is $250,000.

The W. A. Paterson Company, Chicago, has been incorporated for the manufacture of gasoline and electric automobiles.

The Imperial Brass Mfg. Company, Chicago, is about to build a six-story brick factory on South Center avenue, to cost $90,000.

The Chicago Great Western Railway, Chicago, is about to build a five-stall roundhouse at Dubuque, Iowa.

The Crane Company will build a brass foundry, five stories, of brick on North Desplaines street, Chicago, to cost $90,000.

The Cyclone Fence Company, Waukeegan, Ill., is contemplating the erection of a factory adjoining its present plant at an estimated cost of $100,000.

The Wabash Railroad has awarded contracts for the erection of a new machine shop at Decatur, Ill. The new building will be 75 x 168 ft.

The Stevens Mfg. & Foundry Company, Decatur, Ill., has been incorporated with a capital stock of $75,000 to do a general manufacturing business. The incorporators are Samuel J. Dietz, Charles W. Dietz and Willard C. Rowe.

The Southern Illinois Steel & Foundry Company, Carlinville, Ill., has been incorporated with $100,000 capital stock to manufacture iron and steel articles. The incorporators are T. P. Ross, A. G. Dohn and J. Peebles.

The Stover Engine Works, Freeport, Ill., has purchased 20 acres of land on which it contemplates the erection of an entirely new plant. In this connection the company states that despite comparatively recent additions to present foundry and machine shop, which gives the plant a capacity of 1200 engines per month, there has been no time since the first of the year that the plant has not been from 1000 to 2000 engines behind on orders. It is expected that building operations will be commenced in the fall.

The Grafton Iron Foundry, Grafton, Wis., was injured by fire to the extent of $40,000.

The Volrath Company, Sheboygan, Wis., will add to its present plant an addition, 60 x 80 ft., and three stories. The building will include a machine shop, foundry, power house and receiving department.

The Standard Aluminum Company, Manitowoc, Wis., will erect an aluminum factory in that city.

The Chamberlain Machine Company, Waterloo, Iowa, is about to enlarge its machine shop.

The Kretschmer Mfg. Company, Dubuque, Iowa, together with the Spahn & Rose Lumber Company, suffered the loss of $140,000 to its plant by fire.

The Northey Mfg. Company, Waterloo, Iowa, is building an addition 65 x 130 ft., which will cost, together with new machinery to be installed, in the neighborhood of $20,000.

The Indiana Dye Casting Development Company, Indianapolis, Ind., has been incorporated with a capital stock of $100,000. The directors are E. E. Gates, J. L. Baker and W. P. Herod, all of Indianapolis. The company contemplates the erection of a plant as soon as a suitable site is obtained, but expects to buy and install machinery in temporary quarters meanwhile.

The South Bend Pulley Company, South Lafayette street, South Bend, Ind., has just completed an addition to its factory, 65 x 75 ft., and one story.

The Indiana Steel & Iron Company, Linton, Ind., has been organized with a capital stock of $150,000. The directors are M. K. Frank, J. D. Karasik, Algernon Granville, and S. R. Sobel, of Pittsburgh, and W. J. Hamilton, of Linton.

The Wire Specialty Machine Works, South Bend, Ind., has been incorporated with a capital stock of $40,000. Gerald Mahoney, Marian Campbell and Thorvald Hansen have been elected directors.

Detroit

DETROIT, MICH., August 8, 1911.

The demand for machinery in the local market shows little change, dealers reporting a fair amount of business. The automobile trade is still the center of activity and several of the large accessory manufacturers are reported to be planning the purchase of equipment in the near future, and there has, in fact, been some small business from this source the past week. Quite a call for contractors' equipment and shop supplies has been noted recently and a good business in these lines is being done. Orders for pneumatic tools are also coming in quite freely. The market for second-hand machinery seems to be more active than for some time past, probably reflecting general trade conditions.

Building conditions are very quiet, little new work being awarded or new plans being reported, but work promises to be quite brisk a little later as there are a number of large projects on which bids have been asked and on which contracts will be awarded this fall.

Mildner & Eisen, architects of this city, are preparing plans for a large addition to the plant of the Banner

THE MACHINERY MARKETS

Brewing Company, Saginaw, Mich. The additions will include a new boiler house, rack house, wash house and stock cellars.

The Dispatch Printing Company has been incorporated with a capital stock of $3,000 by E. W. Phillips and Peter Connor.

The National Food Products Company has been incorporated by B. W. Doyle, Oscar M. Springer and Mathew Morgan, with a capital stock of $100,000.

The Wolverine Motor Supplies Company has filed notice of an increase of capital stock from $2,500 to $10,000.

The Defiance Mfg. Company, Manton, Mich., will shortly move its plant to Kalamazoo, and will erect a new factory in the latter city. The company has a capital stock of $30,000 and manufactures incubators, etc.

Following the completion of the new plant of the Lewis Spring & Axle Company, Jackson, Mich., it is announced that the Standard Electric Vehicle Company will occupy the building formerly used by the Axle Company and will equip them for the manufacture of its product, electric motor cars.

The Secret Boat Company, Bay City, Mich., is to remove its plant to Port Huron, Mich., in the near future. The company manufactures duck boats, etc.

Plans for the construction of an $80,000 addition to the Monarch Paper Mills, Kalamazoo, Mich., are being prepared. The additions will include a new coating room 86 x 248 ft., a calender room, 86 x 116 ft., and a finishing room, 68 x 123 ft. Considerable new equipment will be installed, including two large coating machines. Several additions have been made to the plant within the last two years, and the mill is now one of the largest in Kalamazoo.

The Hayes Wheel Company, Jackson, Mich., manufacturers of automobile wheels, will soon begin the erection of an addition to the present plant. The company reports an excellent volume of business.

The Grand Trunk Railway Company is planning the erection of a large new warehouse at Lansing, Mich. Among the new equipment to be installed is a hoisting crane, track scales, etc.

Fire which caused a loss of $7,000 destroyed the Stockbridge Roller Mills, Stockbridge, Mich. Definite announcement has not yet been made as to the rebuilding of the mills.

The Elliott Machinery Company, Grand Rapids, Mich., has secured larger factory quarters to take care of rapidly increasing business demands.

The Central Foundry Company has incorporated at Muskegon, Mich., giving its capital stock at $10,000.

The Clyde Produce Company, Jonesville, Mich., has taken over the kraut mill of the Le Roux Company, and proposes in connection with its new property to erect a canning plant.

The Jackson Pressed Brick Company, of Jackson, Mich., has been sold to the Jackson Sandbrick Company, of Saginaw, Mich., and will be known in the future as the Jackson Brick Company. A large amount of new machinery will be installed in the company's plant and its capacity will be doubled.

The Water Board of Flint, Mich., has awarded the contract for the construction of the new municipal filter plant to the Pittsburgh Filter Mfg. Company, at the price of $136,000. Bids for the boilers, pumps and pumping machinery to be installed in the new plant will soon be asked for.

The Cooper-Wells Company, St. Joseph, Mich., manufacturers of knit goods and hosiery, is making several additions to its plant, including a new machine shop and drying room, and will install considerable equipment therein.

The American Tool Works, St. Joseph, Mich., has been forced to convert its office into factory quarters in order to take care of rapidly increasing business.

The Board of Trade of Belding, Mich., has secured a new industry for that city in the nature of an agricultural implement factory. The city will donate a site and building to the new company. The Belding Board of Trade may be addressed.

The Shaw-Walker Company, Muskegon, Mich., has increased its capital stock from $125,000 to $150,000.

Saginaw, Mich., is practically assured of another large industry, plans being under way for the location there of a $100,000 concern, which will manufacture the Aube smoke consumer. Plans are being drawn for the new buildings and a site has been purchased. O. Aube, N. P. Bissonette and J. H. Riopelle are actively interested in the new company.

N. A. Austin proposes to erect a factory at Addison, Mich., for the manufacture of clay shingles.

The Detroit Stoker Company, Detroit, reports among other recent installations of the Detroit stokers four stokers to be installed in connection with four 500-hp. Union Iron Works water tube boilers, and three stokers to be installed in connection with three 200-hp. H. T. boilers in the plant of the Pierce Arrow Motor Car Company, Buffalo, N. Y.; also two Detroit stokers to be installed in connection with two 400-hp. Wickes boilers for the Cadillac Motor Car Company, Detroit.

Nelson Bros. Company, Alma, Mich., has arranged to move its plant to Saginaw, where a new plant will be built. The new factory will include foundry, machine shop and wood-working shop. The company specializes in gas engines and pump jacks.

The Beck Power & Spray Company, Flushing, Mich., has let contract for building a new factory to M. I. Wilcox, of Lansing.

The Lowell Specialty Company, Lowell, Mich., recently mentioned as having a plant in course of construction, states that it will be in the market soon for a full line of tinners' machinery for the manufacture of its line of compressed air sprayers, etc.

Cincinnati

CINCINNATI, OHIO, August 8, 1911.

With the exception of a slightly better inquiry from the East and from Spanish America, the machine tool situation is unchanged. In spite of press reports of rigid retrenchment on the part of several Southern railroads, a good business from that source is anticipated to commence coming in during September.

Manufacturers of internal combustion engines are very busy, due partly to the demand for marine gasoline engines for small power boats, and a local firm reports the receipt of one order calling for 500 of their different sized motors.

The Armor Steel Foundry Company expects to commence operating its plant at Winton place, Cincinnati, August 15. A number of orders for castings have been procured and the company already has tentative plans made up for making an extensive addition to the present plant. About 250 men will be employed when the foundry is in full operation. The newly elected officers are J. E. Jones, president and general manager; John W. Gebhard, vice-president; R. R. Markley, assistant treasurer, and Frank J. Stolle, sales manager. The sales offices are located in the Commercial Tribune Building.

It is announced that the Ohio Mechanics' Institute, whose new five-story home on Vine street, Cincinnati, is nearly completed, will have an industrial exhibit department, modeled along the lines of German industrial museums. The room set aside for this purpose is 30 x 150 ft., with 500 running feet of gallery space. A specialty will be made of locally manufactured products, but outside exhibits will also be accepted.

The Kinsey & Norton Mfg. Company, 610 Baymiller street, Cincinnati, has acquired control of the patents covering the Maxon track jack, formerly manufactured by the Dayton Iron Works and Boyer & Radford, Dayton, Ohio. A full line of these jacks will be manufactured in the Kinsey & Norton Company's plant.

The Fairmont Ice Company, Fairmont, W. Va., is increasing the capacity of its ice plant.

While it has not been definitely announced, it is generally understood that the Baltimore & Ohio Railroad Company will locate large repair shops on a tract of land recently acquired in Cincinnati.

The Virginia-Carolina Chemical Company, whose headquarters are at Richmond, Va., has purchased a large building site in a Cincinnati suburb, and it is reported that work on an immense fertilizer factory will be commenced at an early date.

The Split Fiber Keg Mfg. Company, Cincinnati, whose incorporation was recently noted, is fitting up the building at 1416-20 Plum street. Not all the necessary manufacturing equipment has yet been provided for.

The Scheifele Shoe Company, Cincinnati, will probably make some additions to its factory in Cumminsville suburb.

The Saxon Mfg. Company has been incorporated at Toledo, Ohio, with $10,000, to manufacture auto specialties. Herman Saxon and Chas. G. Cunningham are named among the incorporators.

The Globe Automatic Sprinkler Company is a new Ohio company, incorporated with $75,000 capital stock,

THE MACHINERY MARKETS

to manufacture automatic fire sprinklers. The factory will be located in Minneapolis, Minn., but the sales offices will be in the First National Bank Building, Cincinnati. A. B. Gould is president, A. T. West, vice-president, and W. R. Koehler, secretary and treasurer.

The Parsons Garage & Repair Company, Toledo, Ohio, is a new incorporation with $10,000 capital stock. C. W. Parsons is one of the principal incorporators.

The Safety Cylinder Valve Company, Mansfield, Ohio. has changed its name to the Triumph Valve Company.

It is reported that on account of better labor conditions in Cincinnati that the Corcoran Lamp Company will abandon its Detroit branch and do all of its manufacturing here. Mention has previously been made of proposed additions to the Cincinnati factory.

The South

LOUISVILLE, KY., August 8, 1911.

Business is noticeably improved in all lines connected with the machinery trade. Manufacturers and dealers report not only an increase in the number of inquiries, and therefore in potential business, but also in the actual number of sales. Power machinery, including electrical apparatus, is selling well, while machine tools are in better demand than has been the case for some time. A number of machine shops have been established in Louisville recently, so that this should be a better market in that direction than ever before Numerous public improvements, such as electric light plants and water systems, are being established all over the South, and equipment in this connection constitutes one of the most important factors at present.

The Victor Motor Accessories Company, Louisville, has been incorporated with $25,000 capital stock, by Alfred W. Ott and others. It has arranged to take the entire output of L. C. Young, of Cleveland, who has begun the manufacture of a self-starting device for automobiles.

Longest Bros. & Co., Louisville, have installed some additional machine tools in their auto repair shop. A drill press of the Rockford Drill & Lathe Company was among the items purchased.

The James Clark, Jr., Electrical Company, Louisville, reports a good demand for electrical equipment. Among the leading contracts recently closed is one for a 400-volt, 3-phase, alternating current outfit, including engine, generator, switchboard and motors, which is to be delivered to an ice company at Tucson, Ariz. The company notes an increase in business from the Southwest.

Charles L. V. Frank, well known in machinery trade circles in Louisville, has joined E. D. Morton & Co., and has charge of the machine tool department.

The Standard Sanitary Mfg. Company has ordered three Warner & Swasey screw machines through its local agents, E. D. Morton & Co.

The Globe Machine Company, Louisville, has been incorporated with $5,000 capital stock by Andrew B. Jutt, Richard H. Dietzman and others. The business has been conducted for some time at 704 East Main street, and no changes are contemplated.

The Crystal Laundry Company, Louisville, is building an addition to its plant at 928 West Walnut street. New power equipment is to be ordered, as well as special laundry machines.

The Louisville Railway Company has purchased a site at Twenty-ninth street and Broadway, where a car barn will be erected immediately. It is announced that following its construction the company will erect there shops for car-building purposes. Details regarding the latter have not yet been decided upon.

The health department of the city of Louisville has recommended the establishment of four garbage reduction plants. Address the Board of Public Works.

E. M. Drummond, of the Drummond Mfg. Company, manufacturer of axles, has been elected to the directorate of the Louisville Trust Company, Louisville, Ky.

The two fiscal courts interested have approved the contract whereby the Capital Construction Company, Columbus, O., is to construct a steel bridge, with concrete piers, over Salt River, near Louisville, Ky., the contract amounting to $56,000. Work is to begin at once.

The Board of Education, Louisville, is in the market for 1400 steel lockers to be installed in the Girls' High School Building.

The American Automobile Mfg. Company, New Albany, Ind., has completed the equipment of its machine shop by the installation of the following tools: Grennard arbor press, B. & S. milling machines, Landis grinder, Baker Key seater, Bullard 24 in. vertical lathe, Cleveland No. 2 horizontal boring mill, Steptoe 16-in. shaper, cylinder boring machine, 21 spindle drill press, Brandis vertical grinder, Higley cold saw, Lodge & Shipley lathe, 14 in. x 5 ft.; Henry lathe, 16 in. x 6 ft. Cincinnati No. 2 Universal milling machine; Taylor & Fenn spindle tool press and G. & E. 20-in. shaper. C. D. Norris is superintendent of the plant, which will begin turning out cars in the near future. The plant, it is stated, has a capacity of five cars a day.

The Waller Mfg. Company, Lexington, Ky., is reported to be planning the erection of an addition to its furniture factory.

The New Bluegrass Canning Company, Owensboro, Ky., which is rebuilding plant recently destroyed by fire, is purchasing a lot of equipment, including power machinery and canning machines. The boiler room will be 50 ft. x 80 ft.

The Hill Chemical Company, Cave-in Rock, Ill., is moving its plant to Paducah, Ky. George L. Hill is general manager.

J. A. Omberg, Jr., Memphis, Tenn., has received a contract from the Paducah, Ky., Traction Company for the erection of a steel and concrete bridge over Island Creek. The bid was $7,000. The piers of the bridge will be of concrete and the superstructure of steel.

The Columbia Column Company, Columbia, Ky., has acquired a building and will move its plant to Lebanon, Ky., October 1. It may add somewhat to its woodworking equipment.

W. G. Buchanan, Morganfield, Ky., is purchasing machinery for the equipment of a bakery with a capacity of 12,000 loaves a day.

E. C. Edwards, Charleston, W. Va., and George F. Miller, Huntington, W. Va., are reported to have purchased 60,000 acres of coal lands in Magoffin County, Kentucky, for $600,000. Development work is to be undertaken in the immediate future. The Lexington & Eastern Railroad is extending its line to the locality.

The Home Milling Company, Greenville, Ky., which was recently incorporated, has announced that its plant will be driven by electricity. Equipment for an elevator will be required by the company, which has begun the erection of its mill. George H. Johnston is general manager.

Ashland, Ky., is planning the construction of an independent pumping station. Heretofore the community has been served by a waterworks plant at Catlettsburg, Ky. A bond issue to provide funds for the improvement is to be voted on. Address the mayor.

Falmouth, Ky., is planning the installation of an electric light plant. A local company may be formed. Address J. W. Throckmorton.

The Fowler-Wolfe Sheet Metal Works, Paducah, Ky., has amended its articles of incorporation, increasing its capital stock.

The Nashville Armature Works, Nashville, Tenn., is adding considerable machinery to its plant. Among the items wanted are a 25-hp., 110-volt, d.c. motor and a 10-hp., 3-phase, 220-volt, a.c. motor.

A steam laundry plant is to be built at Gallatin, Tenn., by the Gallatin Laundry Company, which has been incorporated with $5,000 capitalization by D. D. Canfield, E. R. Colbert and W. H. Weakley.

The Southern Motor Works, Nashville, Tenn., has changed its name to the Marathon Motor Works and increased its capital stock to $600,000. The company manufactures automobiles.

The Rockwood Mills, Rockwood, Tenn., may construct a plant for the development of electric power with which to operate its textile mill. Final decision has not yet been reached.

Jonesboro, Tenn., is to vote on a $25,000 bond issue next month, the proceeds of the issue being intended for the construction of an interurban traction line connecting Jonesboro and Johnson City, Tenn.

The Hawkins County court at Rogersville, Tenn., has voted in favor of issuing $20,000 of bonds for the purpose of constructing a bridge over Holston River.

The Ahrens & Ott Mfg. Company, Louisville, announces the establishment of a branch store and office at Fort Worth, Texas. Full stocks of all the products manufactured and sold by the company will be carried.

The Georgia Power Company of Tennessee has been incorporated at Chattanooga, Tenn., with $100,000 capital stock. This company will handle the power

THE MACHINERY MARKETS

business developed for the plant of the Georgia Power Company at Tullula Falls, Georgia.

George T. Hood & Co., Harriman, Tenn., are asking for prices on hoisting machinery.

The Nashville Railway & Light Company, Nashville, Tenn., has purchased property which will be used ultimately for an addition to its power plant. Just when the addition will be built has not been announced.

The Forest Products Chemical Company, Memphis, Tenn., has been incorporated with $100,000 capital stock by James C. Lawrence, B. Lee Mallory and others. The company will build a plant for the purpose of utilizing the refuse of lumber mills. Its products will be charcoal, wood alcohol and acetate of lime.

The A. G. Stivers Lumber Company, Chattanooga, Tenn., has been incorporated with $100,000 capital, by A. G. Stivers and others, and will erect a sawmill.

The Southern Saw Works, Atlanta, Ga., has taken over the American Machinery Company, of that city. A new corporation has been formed under the name of the Southern Saw & Machinery Works. The company will manufacture wood-working machinery and will also deal in general machinery lines. N. S. Boyd is president of the company; J. Edward McGuire, Secretary-Treasurer, and Frank B. Baldwin, factory manager.

The Morrillton, Light & Power Company, Morrillton, Ark., will install machinery to generate 150 kw. additional power. A Corliss engine is included. W. L. Morse is president of the company.

An electric plant will be built by the Reform Ice & Light Company, of Reform, Ala. John Newell is general manager of the company.

The Dixie Culvert & Metal Company, Atlanta, Ga., has completed the erection of a new factory for the manufacture of road culverts and other sheet iron products.

The Board of Bond Trustees, South Jacksonville, Fla., will open bids August 24 for furnishing approximately 5 miles of 4-in. cast iron pipe drilling well, furnishing pumps, generator, exciter, switch board, etc.

The Carolina Metal Products Company, Wilmington, N. C., has been organized to establish a plant for the manufacture of metal culverts, etc. Thomas A. Empie, Wilmington, N. C., is president of the company.

St. Louis

ST. LOUIS, MO., August 7, 1911.

There is a dearth of information in the machine tool market this week, for little has transpired to give the situation character. There have been few inquiries of moment nor have there been any sales to justify giving the market any different tone from that which has prevailed for so many months. Dealers are still hopeful that the fall will improve matters, but they admit having no material evidence of such prospects at present.

The Peroxident Specialty Company, Cincinnati, has bought ground for a factory at Etzel avenue and the Wabash tracks, in the western part of the city, and will erect a factory for its business, which it will remove to St. Louis. The buildings will include two-story shipping and laboratory structures to cost $40,000.

Permits have been taken out for the reconstruction of the planing mill buildings of the Huttig Sash & Door Company, burned recently. The new plant will be larger and better than the old. The buildings are to cost about $150,000. The machinery equipment has not been ordered yet.

The Shelbyville Gas Company has been organized at Shelbyville, Ill., with $30,000 capital stock, and will instal a gas-making and distributing plant. The capital will be increased later as the work progresses.

The American Paper Goods Company has optioned a site here for a branch factory of its Kensington, Conn., plant and will, probably, equip a plant for the manufacture and distribution of its products in the St. Louis territory.

The Liberty Foundry Company has been incorporated here and is arranging to start a plant for the manufacture of attachments to wagon wheels and axles, preventing the loosening and loss of nuts.

The Stahl Incubator & Mfg. Company has been incorporated at Quincy, Ill., with $25,000 capital stock, for the manufacture of incubators and other poultry and farm devices. The incorporators are George H. Stahl, George W. Govert and John O. Glenn.

The Mathews-Davis Tool Co., which has bought ground for a new factory, will increase its plant to about double its present capacity. It will occupy a building 40 x 125 ft., two stories, and will be devoted to the manufacture of the Davis expansion boring tool.

A site for the White River dam, authorized by Congress at its last session, to be used for the development of water power, is being selected by engineers now testing the flow and other conditions. It will furnish electric light and power for Springfield, Mo., primarily, and other cities of southern Missouri.

The Buck Head Rice Co. has been chartered with $100,000 capital at Hickory Ridge, Ark., for the purpose of installing rice mills at that and other points in Arkansas. It is a subsidiary of the same company of New York City.

The Western Wheelbarrow & Mfg. Company has been incorporated at Fort Smith, Ark., with $200,000 capital stock, to manufacture wheelbarrows and other similar vehicles. J. G. Dade and J. P. Ellison, of Kansas City, Mo., and John C. Gordon, of Fort Smith, are the incorporators.

The Chillicothe Iron Company, Chillicothe, Mo., has been organized to take over the property of the Chillicothe Foundry & Machine Company, and new shops will be built on the site of those destroyed by fire.

H. P. Miller, Commissioner of Water Works, Topeka, Kan., is receiving figures covering the installation of a 10,000,000 gal. compound condensing water pump.

Texas

AUSTIN, TEXAS, August 5, 1911.

An unusually large demand for machinery for waterworks and other municipal plants in Texas and the Southwest is expected this fall. Tentative plans are on foot for the installation of many improvements of this character. The rapid growth of towns in Southern Texas, as well as in Western Texas, is causing much attention to be given to providing them with these necessary public utilities. There are also a large number of electric street railway and interurban projects on foot which will require considerable machinery if they are brought to a point of consummation.

The Farmers' Union Ware House & Gas Company has been formed at San Saba, with a capital stock of $10,000. Incorporators are J. H. Hylander, James Burns and J. N. Graham.

The proposition of Wm. D. Johnson, of Hartford, Conn., head of the Hydraulic Properties Company of New York, for the construction of a dam across the Colorado River at Austin and the installation of a hydro-electric plant, will be voted on by the people of the city on August 30. The proposed cost is $1,600,000.

The Alvin Light & Power Company has let the contract to Lovegrove and Wyman, of Houston, for the installation of a complete waterworks system at Alvin, Texas.

The Farmers' Electric Gin & Ice Company has just been formed at Greenville, to erect a cotton gin and ice plant. Charles M. Dollins is interested.

The Columbia Oil Tank Company has been formed to do business at Texarkana, Texas. It has a capital stock of $75,000.

The $85,000 of bonds that were recently issued by the town of Greenville, for extending the waterworks system, have been approved by the attorney general, and the important work will soon be started.

The Medina Irrigation Company, headed by Dr. F. S. Pearson, of New York, has enlarged its plans for irrigating lands in different parts of South Texas. The cost of the dams and canal system, near Kerrville, will be approximately $2,000,000. He has also filed on the water rights of the Frio and Nueces rivers, in Uvalde County, and two or more large dams will be erected across those streams to form water storage reservoirs. The original estimated cost of the irrigation and hydro-electric works that were to be installed by the Medina Irrigation Company was $6,000,000. The enlarged plans, however, bring this estimate of cost up to $12,000,000.

The large power house at League City, of the Galveston-Houston Interurban Railway Company, is finished and the machinery has been given a successful tryout. The construction of the line between Houston and Galveston is well advanced and will be finished before the causeway across Galveston Bay is completed.

J. F. Strickland, of Dallas, president of the Southern Traction Company, says that satisfactory progress is being made in the preliminary work for the construction of an interurban electric railway between Dallas, Waco and Corsicana.

THE MACHINERY MARKETS

It is announced by Corrigan, Lee & Halpin, who have the contract for the construction of the giant steel and concrete viaduct to connect Dallas with Oak Cliff, spanning the Trinity River, that it will be finished by December 1. It is claimed that this viaduct is the largest of its kind in the world.

The Texas Company, Houston, has applied to the City Commission of Dallas for a franchise for laying a system of oil mains in that city whereby consumers of fuel oil may be supplied from the company's refinery direct to their plants.

The City Commissioners of Waco will open bids August 22 for the sale of $200,000 of bonds, proceeds to be used for extensions of the sanitary and storm sewers, opening streets and making improvements to public school buildings.

The Mexico Light & Power Company has completed the installation of two additional 10,000 kw. units in its great hydro-electric plant at Nexaca, Mexico, and they are said to be giving satisfactory service. The new water storage dam, which the company is constructing, will soon be finished. It and other reservoirs have been filled by the recent rains.

The Peden Iron & Steel Company has acquired a site at Houston, upon which it will erect a large addition to its plant. It is stated that this addition will have a capacity larger than the present plant.

The Pacific Coast

SAN FRANCISCO, CAL., August 4, 1911.

Machine tool business has fallen off somewhat toward the end of the month. No orders of any consequence whatever are being placed by shops in the vicinity of San Francisco, and there seems to be little prospect of business in this district for some time to come, as many local machine shop operators take a rather pessimistic attitude. Occasional purchases are made for shops in the interior of the State, but most of the business at present is coming from southern California and the oil fields. Orders on a small list for the Southern Pacific Railroad have been about equally divided among several firms.

Woodworking machinery remains quiet, and very little contractors' equipment is moving in the local market, though occasional inquiries are received from other parts of the State, and considerable buying in miscellaneous lines is being done by the mining interests. The movement of small pumping units is well sustained, and a few pumping outfits of fairly large size are being built, though no orders of unusual importance have been placed recently.

Manning, Maxwell & Moore are opening a branch office in Los Angeles, under the management of L. H. Bailey. The new branch will be under the direction of the San Francisco office, Louis G. Henes, manager. The E. P. Jamieson Company, Seattle, Wash., representing numerous lines of machinery and contractors' supplies, is preparing to carry a large stock in connection with the San Francisco office, which has formerly taken orders only for shipment from the factories or the Seattle warehouse.

The Norman B. Livermore Company now has the new boiler shop at its South San Francisco plant in full operation, with a full equipment of Hilles & Jones tools. The company is filling some good car orders, and has considerable locomotive repair work on hand.

The city of Los Angeles will receive bids August 14 for a drag-line excavator, and on August 13, for 40 tons of chrome steel balls.

The city of Los Angeles is taking figures on a large amount of dredging. It is not yet known whether any large amount of new machinery will be required. The Standard American Dredging Company has a large dredge under construction for work at that point.

The Southern California Gas Company has purchased a large site near Colton, Cal., on which a plant will be erected to supply gas to San Bernardino, Redlands, Riverside and Colton.

It is reported that the Great Western Power Company will start work on three new hydroelectric plants early in 1913, when the dam at Big Meadows is due to be completed. With the present equipment at Las Plumas, the new installations will give the company a capacity of about 500,000 hp.

The Pacific Gas & Electric Company is planning to install a hydroelectric plant of about 70,000 hp. capacity in South Yuba River canyon.

The Western Cutting & Welding Works has been incorporated in San Francisco, with a capital stock of $20,000, by F. W. Clifford, J. Gottstein and M. Fisher.

The town of Dorris, Cal., will receive bids August 25 for the installation of a complete waterworks system.

A new hoisting plant is to be installed shortly at the Burlington mine, near Oroville, Cal., and the management is planning to put in a 100-ton ore mill.

The Bessemer Gas Engine Company will complete the installation of eight 80-hp. compressors for the Honolulu Consolidated Oil Company, in the Bakersfield District, about the middle of the month. The oil company is working on a project to produce gasoline from natural gas.

The Parker Machine Works, Riverside, Cal., has a contract for a lot of fruit-handling machinery for the Riverside Heights Fruit Association.

The Santa Ana, Co-operative Sugar Company, Santa Ana, Cal., has placed an order with a Cincinnati firm for a beet mill with a daily capacity of 600 tons.

The Llewellyn Iron Works has taken a contract amounting to $33,250, for passenger elevators in the Union Oil Building at that city.

The San Francisco office of the Bucyrus Company has taken orders for three drag-line excavators, with 100-ft. booms and 3½-yard buckets. Two are for the Natomas Consolidated of California, and one for Miller & Lux. The Natomas Consolidated has also ordered a 40-yard Bucyrus steam shovel, and the Bucyrus Company is building machinery for the dredge Natomas No. 10, having a bucket capacity of 15 cu. ft. The Bucyrus Company also has the order for a 9 cu. ft. dredge, complete, for the Union Dredging Company, operating near Folsom, Cal.

The Taylor Foundry & Engineering Company, Grass Valley, Cal., is building a large pumping plant for the Providence mine, Nevada City, Cal.

Western Canada

WINNIPEG, MAN., August 5, 1911.

Harvest operations now begin to monopolize the interest of Western Canada. If the crop is got off without mishap it will be almost double the return of the largest crop previously grown in that part of the country. There are some indications of a holding back of orders in certain lines until the general election of September 21 decides the fate of the reciprocity agreement.

C. F. Caldwell, manager of the Utica Mine, near Kaslo, B. C., left for Duluth some days ago, where he will confer with directors about the purchase of machinery for a concentrator plant and tramway on the property.

The Blowey-Henry Company, Edmonton, Alberta, is erecting a five-story warehouse at that point.

P. Burns & Co., Calgary, Alberta, are about to begin the construction of a large meat-packing plant at Edmonton.

John Reid, Sons & Co., Glasgow, Scotland, are establishing a branch factory in Calgary, Alberta.

Apparatus for the carrying out of the construction contracts secured by Foley Bros. and the Northern Construction Company on the Canadian Northern Railway is being brought from the United States, and is now being assembled at Spokane for the Eastern work, which the contractors have undertaken for $16,000,000. The other section is north of Lake Superior and Lake Huron and will cost $12,000,000. Twelve thousand hands will be employed.

A modern coal-handling plant, with a retaining capacity of 20,000 tons, is being built and equipped at Fort William, Ont., by James Murphy.

The Industrial Commissioner of Calgary, Alberta, states that he has been advised by Morris & Co., pork packers, Chicago, that they will this autumn begin the erection of a $3,000,000 packing plant in Calgary. It is also rumored that Armour & Co. are considering the idea of establishing a Canadian packing plant at Calgary.

The contract for the construction of the match factory, which R. B. McArthur has been promoting in Port Arthur, Ont., is to be let about August 15.

The Alberta Foundry & Machine Shop Company, Medicine Hat, Alberta, began operations on July 25.

The Canada Malting Company expects to begin the construction of a plant in Calgary, Alberta, this autumn.

MacKissock & Thomas, Winnipeg and Calgary, have the contract to erect a warehouse at Calgary, Alberta, for John Dure Plow Company.

THE MACHINERY MARKETS

Large power gasoline traction engines have been much in demand in the Canadian West this summer.

A company has been formed to manufacture beet-sugar at Strathmore, Alberta. Its principal members are Calgary men. J. S. Dennis, of the Canadian Irrigation Company, is president. The factory is expected to cost about $1,000,000.

L. B. de Laitte, a French inventor, is arranging to establish in Vancouver a plant in which to manufacture his gas machines.

The city of Brandon has under consideration a recommendation of its engineer to install a sedimentation basin of 4,680,000 gal., to be filled by a centrifugal pump.

Tenders will soon be called for by the town of Wetaskiwin for a steam pump, a steam compressor and a vaporization gas engine.

The town of Wilkie, Sask., will receive up to August 21, tenders for one 60-kw., 3-phase, 60-cycle, 2200-volt a.c. generator; one exciter for above; switchboard, switches; three 2200-volt motors back geared to pumps; five transformers for lighting system; one 100-hp. internal combination engine. Pumping machinery; one working head and deep-well cylinder; one 250,000-gal. pump; one air compressor, necessary shaftings and belting. One pneumatic storage tank. A large amount of wire, c.i. pipe, etc.

Wallace Shipyards, Ltd., will rebuild plant destroyed by fire at North Vancouver, B. C.

The city of Camloops, B. C., will spend $200,000 in developing a power plant at Barrier River.

The Maple Leaf Milling Company, Brandon, Man., requires machinery for a new elevator.

Griffiths Electric Contractor, Ltd., Winnipeg, has been incorporated with a capital stock of $500,000 to carry on business as manufacturer of electrical apparatus, etc.

Lucas Patent Granitic Pipe & Cement Construction Company, Victoria, B. C., is incorporated with a capital stock of $100,000.

United Lumber & Shingle Mills, Ltd., Vancouver, B. C., has been incorporated with a capital stock of $100,000.

Eastern Canada

TORONTO, ONT., August 5, 1911.

It is expected that the opening of the general election campaign in this country will be followed by the placing of several government contracts of large magnitude. The awarding of such contracts at such a time is in accordance with long-established precedent and practice. Improvements of the government's Intercolonial Railway, calling for the expenditure of millions upon terminal facilities at St. John, N. B., the letting of the Hudson Bay Railroad contract and other large undertakings, not to mention the very numerous local public works always provided for at such times—all these things will call for heavy disbursements from the Dominion treasury. One important work which the government may think better than to award before the election is that for the construction of its naval vessels at an estimated cost of about $15,000,000. The navy is an issue in this election, especially in Quebec, the province in which the Laurier government is strongest. To award the contract now would be certain to strengthen the Nationalists in that province. Business throughout the country is better than it usually is at harvest time. A class of machinery for which a demand is expected to spring up in the near future in Ontario is that for the applying of electrical power to farm processes. Adam Beck, chairman of the Hydro-Electric Power Commission of Ontario, has brought back with him from Germany samples of various forms of electrical apparatus, and, as legislation was put on the statute books last session providing for the supplying of power to the farmers by the commission, a large demand for such apparatus is to be looked for.

O'Keefe & Drew are building an abattoir plant in Harwich township near Chatham. A large number of families are being brought from Iowa to supply labor for the new plant.

The Hamilton Bridge Company is building several steel bridges on the Canadian Northern Railway Company's new line between Toronto and Ottawa.

The Taylor-Forbes Company, Guelph, Ont., is installing an electric power service in its works.

The Dome Mining Company, Porcupine, Ont., has ordered a new machinery equipment to take the place of that destroyed in the forest fire. The order amounts to about $200,000. Machinery will also be required for the adjoining West Dome mine.

C. Poirier, of the Vipord Mining Company, Porcupine, Ont., has been in New York to purchase a plant for the mine to take the place of that destroyed in the forest fire.

The Wayagamac Pulp & Paper Company, whose mill is under construction at Three Rivers, expects to commence the manufacture of paper on a very large scale in October.

The Canadian Fairbanks Company, with its head office in Montreal and branches throughout the Dominion, and the Fairbanks-Morse Canadian Mfg. Company, with head office in Toronto, and its subsidiary companies, the Dominion Safe & Vault Company, Farnham, Quebec, and the E. & T. Fairbanks Company, Sherbrooke, Quebec, have amalgamated and the new company is to be known as the Canadian Fairbanks-Morse Company. The president of the new concern will be H. S. Fuller, of Montreal, president of the Canadian Fairbanks Company, and the vice-president, P. C. Brooks, of Toronto, president of the Fairbanks-Morse concern. The capital stock of the new company is to be $2,600,000.

The plants of the United Construction Company and the Ottawa Stone & Brick Company, Ottawa, were damaged by fire on Monday to the extent of $10,000.

It is stated that the American Cash Register Company, Columbus, Ohio, has under consideration the idea of building an assembling plant in Windsor, Ont., in the event of its locating in Detroit.

The Standard Chemical & Lumber Company, which operates a plant at Fenelon Falls, Ont., proposes to establish works at Bancroft, Ont., to cost $150,000.

The Montreal Board of Control has decided to call for tenders for the supplying of five automobile fire-fighting machines and two of the latest improved steam pumps.

Damage to the extent of $30,000 was done by fire August 2 to the stock and plant of the St. Lawrence Pulp & Paper Company, Ottawa, Ont.

The city of Hamilton has decided to install impellers at the Beach pumping station, the offer of the McDougall firm, Montreal, being accepted.

Robert Beirs, manager director of the Cammell-Laird Company, ship builder, England, has announced that, if pending negotiations are successful, a ship yard will be built at St. John, N. B., for the building of Canada's warships by a firm to be established in Canada, though organized and developed by a British company.

W. A. Morr & Co., Millview, Halifax, N. S., have awarded a contract for the building of a $75,000 mill.

The Grand Trunk Pacific Railway Company will shortly call for tenders for the construction of shops at Quebec to cost about $2,000,000.

The Dominion Flour Mills Company, Brantford, Ont., requires machinery for plant.

The Brandon Brick & Tile Company is building a plant at Milton, Ont.

The Sweet Machinery & Foundry Company, North Bay, Ont., will locate a new plant at Cobalt, Ont.

Work is about to be begun on a $200,000 factory at Orillia, Ont., for the Tudhope Carriage Company.

The Preston Woodworking Machinery Company, Preston, Ont., is calling for tenders for the supply of planers, lathes, drills, shapers, milling machines, gears, cutters, screw-cutting machines, key-seating machines, tumbling mill girders and hydro-electric power equipment, the total to cost about $20,000.

The Baine Wagon Company, Woodstock, Ont., will shortly give out the contract to build there an additional factory to cost $25,000.

The Oxford Knitting Company, Woodstock, Ont., is preparing to erect an additional factory there to cost $30,000.

The Independent Tire Company, Guelph, Ont., has awarded the contract for the construction of a factory building to cost $47,000.

M. H. Baker, city engineer, St. Thomas, Ont., will receive tenders up to August 19 for the supplying of a 6,000,000-gal. centrifugal pump and steam engine.

The Tudhope Knox Company, Orillia, maker of steel trucks; the Perrin Plow & Stove Company, Smith's Falls, maker of plows, stoves, etc., and the Tudhope Anderson Company, Winnipeg, selling agent, having agencies at Winnipeg, Regina, Calgary and other large centers in western Ontario, have formed a merger. They have also acquired the West Lorne Wagon Company. F. R. Oliver, of the Perrin Plow

THE MACHINERY MARKETS

& Stove Company, will move to Orillia, where Perrin plows will be manufactured in future. The Smith's Falls' plant will be enlarged and devoted wholly to the manufacture of stoves.

The Rudel Belknap Machinery Company, Montreal, has been incorporated with a capital stock of $40,000.

The National Spring & Wire Company, Albion, Mich., has made arrangements with the town of Windsor, Ont., to move its plant from St. Catharines to Windsor.

Government Purchases

WASHINGTON, D. C., August 7, 1911.

The Bureau of Supplies and Accounts, Navy Department, Washington, will open bids August 22, under schedule 3807, for one 12-hp. gasoline engine and schedule 3806, one cut-off machine and one cut-off saw.

The Bureau of Supplies and Accounts, Navy Department, Washington, will open bids September 5, under schedule 3803, for delivery to Mare Island, Cal., as follows: One sensitive drill, one emery grinder, one gap lathe, one tool room lathe, one shaping machine, one arbor press, one drill press.

The constructing quartermaster, Portland, Maine, will open bids August 15 for the construction of pump house, tank, installation of pumping machinery, piping, etc.

The Paymaster-General, Navy Department, Washington, will open bids August 15, under schedule 3800, for fourteen electrically driven forced draft blowers.

Bureau of Supplies and Accounts, Navy Department, Washington, will open bids August 29, under schedule 3820, for three automatic turret machines, for delivery to Washington, D. C.

Bids were opened August 1 by the Bureau of Supplies and Accounts, Navy Department, Washington, for material for the navy yards as follows:

Schedule 3751, class 51, one steam hydraulic forging press—Bidder 14, Bethlehem Steel Company, South Bethlehem, Pa., $5,455; 33, Camden Iron Works, Camden, N. J., $8,800; 156, United Engineering & Foundry Company, Pittsburgh, Pa., $7,720; 166, Mesta Machine Company, Pittsburgh, Pa., $4,800.

Schedule 3767, class 71, one sawdust exhausting and collecting system—Bidder 1, Allington & Curtis Mfg. Company, Saginaw, Mich., $935.30; 136, Sterling Blower Company, Hartford, Conn., $835 and $685; 146, B. F. Sturtevant Company, Hyde Park, Mass., $885 and $906.

Judicial Decisions of Interest to Manufacturers

ABSTRACTED BY A. L. H. STREET

Buyer's Duty to Inspect.—A buyer of wheelbarrows is bound to inspect them on delivery, and failure to reject those not complying with the order waives any claim that they are not of the quality and character ordered. But this rule does not apply if there has been no opportunity for inspection or an inspection is prevented by acts of the seller, agreement between the parties or a custom of trade. (New York Supreme Court, First Appellate Division, Motley Green & Co. vs. Elmenhorst, 127 New York Supplement 625.)

Validity of Preference of Creditors by Insolvent.—Before a trustee in bankruptcy can recover money paid by the bankrupt, as an unlawful preference, he must show that the creditor receiving it had reasonable cause to believe that the bankrupt was insolvent when the payment was made and that the payment was made with intent to defeat the bankrupt law. There is no unlawful preference, though the debtor be hopelessly insolvent, if the creditor accepts only that part of his debt to which he would be entitled if all the property liable to the debtor's debts should be apportioned among his creditors. (Alabama Supreme Court, Herzberg vs. Riddle, 54 Southern Reporter 635.)

Effect of Contract to Grade Land as Part of Lease.—A lessee's obligation to "grade" land from a certain avenue to a dock requires it to "uniformly" grade the land. (United States Circuit Court, Southern District of New York, Susswein vs. Pennsylvania Steel Company, 184 Federal Reporter 102.

Prerequisites to Rescission of Contract for Breach of Warranty.—If a buyer desires to rescind a contract of sale on the ground of breach by the seller of an express or implied warranty of quality, he must return or offer to return the things bought within a reasonable time, unless they are wholly worthless. (Texas Court of Civil Appeals, Mineral Wells & Lakewood Park Street Railway Company vs. First National Bank of Chicago, 133 Southwestern Reporter 1099.)

When Employee Does Not Assume Risk of Injury.—An employee does not assume the risk of injury through proximity of another machine to the one which he operates, where his employer has assured him that the condition is not dangerous, but that the machine will be removed the next day, if the employee reasonably believes that by proper care he can avoid injury. (Springfield, Missouri, Court of Appeals; Holman vs. E. E. Souther Iron Company, 133 Southwestern Reporter, 379.)

Liability for Injury to Employee.—A member of a rivet gang engaged in structural iron work is not a fellow servant of another workman employed to pile steel beams, as affecting the common employer's liability for injury to one caused by the negligence of the other. The general rule that an employer is not responsible for negligence of a foreman causing injury to a workman unless the foreman was authorized to employ or discharge does not extend to a foreman giving orders to workmen placed under his control. A manufacturer is liable for injury to an employee directed to pick up scraps of iron between piles of steel beams, caused by negligently piled beams falling upon him. (Texas Court of Civil Appeals, Mosher Mfg. Company vs. Boyles, 132 Southwestern Reporter, 492.)

Duty to Warn Employee Against Danger.—An employer is liable for death of an employee caused by his drinking solution of cyanide of potassium from a hose which was ordinarily connected with a water supply pipe and used by the workmen for drinking purposes, where specific warning was not given of the detachment of the hose from the water pipe and its connection with the tank containing the solution. It was a question for the jury to determine whether direction to the employee not to go down for wash water that night because the superintendent was running a solution over into a tank was sufficient warning of the change made. (Wisconsin Supreme Court, Fidelity Trust Company vs. Wisconsin Iron & Wire Works, 129 Northwestern Reporter, 615.)

Rights Concerning Trademarks.—Whether unfair competition by imitating labels or marks exists is tested by the question whether, when they are not side by side, an ordinarily prudent purchaser would likely purchase the one believing that he was purchasing the other; and not whether a difference can be recognized when the competing articles are placed side by side. One manufacturer cannot create a monopoly to be enjoyed by him by adopting a shape or form of product, and particularly when such product is one in general use. And this is emphasized when such product is made from material which is fashioned for its better use, and with better economy for use, according to long-time usage. (United States Circuit Court of Appeals, Eighth Circuit; A. Y. McDonald & Morrison Mfg. Company vs. H. Mueller Mfg. Company, 183 Federal Reporter, 972.)

Effect of Accepting Insurance Policy.—In the absence of fraud or misrepresentation, one who accepts an insurance policy and retains it without objection is bound by its terms, though they are not in accordance with the application or the agreement made in the preliminary negotiations. (United States Circuit Court, District of South Carolina; United States Casualty Company vs. Charleston Mining & Mfg. Company, 183 Federal Reporter, 238.)

Right to Recover Payment Made Under Mistake.—A payment voluntarily made can be recovered on the ground of mistake only when the mistake is one of fact as distinguished from a misconception as to one's legal obligation. Hence, a corporation cannot recover overpayment under a contract for electric power, arising from the company's electrician's erroneous computation of power furnished at a higher rate than the contract called for, where his mistake occurred through misconstruing the effect of the agreement. (New York Court of Appeals, Payne vs. Witherbee, Sherman & Co., 93 Northeastern Reporter, 954.)

Measure of Damages for Breach of Contract to Repair Machinery.—One who fails to comply with a contract to repair machinery, resulting in the owner being prevented from operating his plant in whole or in part, is chargeable with the rental value of the plant or so much thereof as was put out of operation by the breach of contract. (Georgia Court of Appeals, Thornton & Warren vs. Cordell, 70 Southeastern Reporter, 17.)

Current Metal Prices.

The following quotations are for small lots, New York. Wholesale prices, at which large lots only can be bought, are given elsewhere in our weekly market repor

IRON AND STEEL—

Bar Iron from Store—

Refined iron:

1 to 1⅞ in. round and square	₣ lb 1.70¢
1½ to 4 in. x ⅝ to 1 in.	₣ lb 1.70¢
1½ to 4 in. x ¼ to 5-1	₣ lb 1.80¢
Rods—⅜ and 11-16 round and square	₣ lb 1.80¢
Angles:	Cts. ₣ lb
3 in. x ¼ in. and larger	1.90c
2 in. x 5-16 in. and ⅜ in.	2.00c
1¼ to 2½ in. x ⅜ in.	2.05c
1¼ to 2½ in. x 5-16 in. and thicker	1.95c
1 to 1¼ in. x 5-16 in.	2.05c
1 to 1¼ x ¼ in.	2.10c
⅞ x ⅜ in.	2.20c
¾ x ¼ in.	2.25c
⅝ in. x ¼ in.	2.45c
½ x 3-32 in.	3.90c
Tees:	
1 in.	2.25c
1¼ in.	2.20c
1½ to 2½ x ¼ in.	2.00c
1½ to 2½ x 5-16 in.	2.10c
3 in. and larger	2.95c
Beams	1.90c
Channels, 3 in. and larger	1.90c
Bands —1¼ to 6 x 6-16 to No. 8	2.10c
Burden's "H. B. & S." iron, base price	2.95c
"Burden's Best" iron, base price	3.15c
Norway bars	3.60c

Merchant Steel from Store—

	per lb
Bessemer machinery	1.90c
Toe calk, tire and sleigh shoe	2.50@3.00c
Best cast steel, base price in small lots	7c

Sheets from Store—

Black	One pass, soft steel.	C.R.	R. G. cleaned.
No. 16	₣ lb 2.45c		2.75c
Nos. 18 to 20	₣ lb 2.50c		2.85c
Nos. 22 and 24	₣ lb 2.55c		2.95c
No. 26	₣ lb 2.60c		3.05c
No. 28	₣ lb 2.95c		3.30c

Russia, Planished &c.

Genuine Russia, according to assortment ₣ lb 12 @14½

Patent planished, W. Dewees Wood ₣ lb A, 10c; B, 9¢ net

Galvanized

Nos. 12 and 14	₣ lb 2.75c
No. 24	₣ lb 3.10c
No. 26	₣ lb 3.30c
No. 28	₣ lb 3.60c

No 20 and lighter 36 inches wide, 25¢ higher.

Genuine Iron Sheets—

Galvanized

Nos. 22 and 24	₣ lb 5.50c
No. 26	₣ lb 6.00c
No. 28	₣ lb 7.00c

Corrugated Roofing—

2½ in. corrugated.	Painted.	Galvd.
No. 24 ₣ 100 sq. ft.	$2.75	$4.70
No. 26 ₣ 100 sq. ft.	2.85	3.90
No. 28 ₣ 100 sq. ft.	2.50	3.65

Tin Plates—

American Charcoal Plates (per box)

"A.A.A." charcoal:	
IC, 14 x 20	$6.65
IX, 14 x 20	7.90
A. charcoal:	
IC, 14 x 20	$5.60
IX, 14 x 20	5.70

American Coke Plates—Bessemer—

IC, 14 x 20 ..... 107 lb	$4.50
IX, 14 x 20	5.50

American Terne Plates—

IC, 20 x 28 with an 8 lb. coating	$8.70
IX, 20 x 28 with an 8 lb. coating	10.70

Seamless Brass Tubes—

List November 13, 1908. Base price, 18¢

Brass Tubes, Iron Pipe Sizes—

List November 13, 1908. Base price, 18¢

Copper Tubes—

List November 13, 1908. Base price, 21¢

Brazed Brass Tubes—

List February 1, 1911. 19½¢ ₣ lb

High Brass Rods—

List February 1, 1911. 14⅜¢ ₣ lb

Roll and Sheet Brass—

List February 1, 1911. 14⅜¢ ₣ lb

Brass Wire—

List February 1, 1911. 14⅜¢ ₣ lb

Copper Wire—

Base price, Carload lots mill 14¢

Copper Sheets—

Sheet copper hot rolled, 16 oz (quantity lots) ₣ lb 18¢

Sheet copper cold rolled, 1c ₣ lb advance over hot rolled

Sheet copper polished 20 in. wide and under, 1c ₣ square foot

Sheet copper polished over 20 in. wide, 2c ₣ square foot.

Planished copper, 1c ₣ square foot more than polished

METALS—

Tin—

Straits pig ₣ lb 46 @47 ¢

Copper—

Lake ingot	₣ lb 14 @14¼ ¢
Electrolytic	₣ lb 13¾@14 ¢
Casting	₣ lb 13⅝@14 ¢

Spelter—

Western ₣ lb 6⅝@7 ¢

Zinc—

No. 9, base, casks.. ₣ lb 8¢ Open.. ₣ lb 8½¢

Lead—

American pig	₣ lb 5¼@5½¢
Bar	₣ lb 6⅝@6¾¢

Solder—

½ & ½, guaranteed	₣ lb 28¼@28¾¢
No. 1	₣ lb 26¼@26¾¢
Refined	₣ lb 24⅝@25¼¢

Prices of solder indicated by private brand vary according to composition.

Antimony—

Cookson	₣ lb..@ 9¾¢
Hallets	@10 ¢
Other brands	9@9½¢

Bismuth—

Per lb $2.00@$2.25

Aluminum—

No. 1 aluminum (guaranteed over 99% pure), in ingots for remelting 21¢ and 22¢

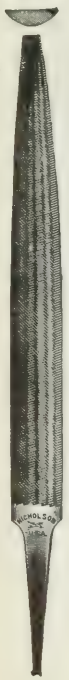
Rods and Wire Base price 37¢

Sheets Base price 35¢

Old Metals—

Dealers' Purchasing Prices Paid in New York.

	Cents.
Copper, heavy and crucible	10.75 to 11.00
Copper, heavy and wire	10.50 to 10.75
Copper, light and bottoms	9.50 to 9.75
Brass, heavy	7.25 to 7.50
Brass, light	5.75 to 6.00
Heavy machine composition	9.25 to 9.50
Clean brass turnings	7.00 to 7.25
Composition turnings	8.00 to 8.25
Lead, heavy	3.75
Lead, tea	3.50
Zinc, scrap	4.00



NICHOLSON

Granted that just ONE mechanic in your shop can save from ten to twenty minutes time per day through the use of NICHOLSON FILES—how great will be the saving when from fifty to one hundred or more men "get busy" with the fast cutting

NICHOLSON?

NICHOLSON U.S.A.



Nicholson File Company
Providence, R. I.

THE IRON AGE

Established 1855 — New York, August 17, 1911 — Vol. 88: No. 7

Published Every Thursday by the
DAVID WILLIAMS COMPANY
239 West 39th Street, New York

Entered at the New York Post Office as Second-Class Mail Matter.

Subscription Price, United States and Mexico, $5.00 per Annum; to Canada, $7.50 per Annum; to Other Foreign Countries, $10.00 per Annum. Unless receipt is requested, none will be sent. Credit for payment will be shown by extending the date on the wrapper of your paper.

W. H. Taylor, - - - - - - President and Treasurer
I. A. Mekeel, - - - - - - - First Vice-President
Harold S. Buttenheim, - - - - Second Vice-President and Secretary

Geo. W. Cope, - - - - }
A. I. Findley, - - - - } Editors
W. W. Macon, - - - - }

M. C. Robbins, - - - - Manager
Charles S. Baur, - - - Assistant Manager

Branch Offices

Philadelphia, Real Estate Trust Building
Pittsburgh, Park Building
Boston, Compton Building
Chicago, Fisher Building
Cleveland, American Trust Building
Cincinnati, 807 Andrews Building

CONTENTS.

Buyers Rather More Hesitant 347
British and American Blast Furnace Activity 348
A Latent Service of Scientific Management 348
The Statistics of Blast Furnace Flux 349
Safety Devices for Grinding Wheels 349
The Steel Corporation's Unfilled Orders 350
Industrial Legislation in Pennsylvania 350
Many Electric Power Charters in Pennsylvania 350
Personal 351
Obituary 351
Western Steel Corporation Bond Issue 351
Back Number Wanted 351
The Iron and Metal Markets 352
An Improvement in Sulphur Tests 363
Systematic versus Scientific Management 364
The Steel Corporation Investigation 366
Efficiency in Boiler Plant Operation 368
Railroad Equipment Orders 368
A New Ohio Wire Mill 368
Latest Development in Slag Pots 369
Customs Decisions 369
Haselton Plant of the Republic Iron & Steel Company 370
New Tools and Appliances 373
Uncovering the Maine 374
A New Westinghouse Direct-Current Motor 375
Modern Types of Elevators 376
Pattern Maker's Disk Grinder 378
Steel Reinforcement Bars 379
Lower Prices on Panama Rails 379
Republic Iron & Steel Company 380
Pittsburgh and the Steel Corporation 381
A Special Langelier Drill 382
The Hill Face Plate Dog 383
The Remington Marking Machine 383
New Standard Pumps 384
The Youngstown Sheet & Tube Company's Profit Sharing Plan 385
Unusual Casts of Low Phosphorus Iron 385
Generating Oxygen and Hydrogen Electrolytically 386
Fluorescent Test of Oil Contamination 386
Specifications for Spelter 387
The Brown Instrument Company's Expansion 387
The Thompson Automatic Cut-Out Hanger 388
Another Plan for Stock-Owning by Employees 388
The Machinery Markets 389
Government Purchases 396
Judicial Decisions of Interest to Manufacturers 397
Trade Publications 397

Buyers Rather More Hesitant

Standard Oil Company Purchases of Tin Plates—More Vessel Building

Buyers of iron and steel are more hesitant in view of late developments. The Government crop report for August 1, with due allowance for some betterment since it was made up, points to continued conservatism in railroad purchases; and while the iron market and the securities market are often at variance, the recent course of the latter has made consumers cautious. It is to be said, on the other hand, that for a good many months the steel mills have been sending their products directly into consumption. That so great a scale of operations has been supported almost entirely on wear and tear demand is no mean argument against any important recession.

The conclusion has been hastily drawn in some quarters that the Steel Corporation's ingot production, now about 77 per cent. of capacity, is a gauge of the entire industry. Counting 15 per cent. of the Corporation's product as exports would give a 66 per cent. operation for the home trade, and that is probably close to the present average of the independent steel companies, whose exports are almost negligible.

On the whole, prices of finished products are not weaker, but in bars alone are they firmer. The situation is one in which deeper cuts might come if there were any good contracting for extended delivery. As long as consumers buy sparingly they will keep price changes within narrow limits.

There are better reports of rail and car buying. The Oregon Short Line has taken 20,400 tons, the Wichita Falls Railroad, 10,000 tons, and the Wabash 2,500 tons—all Bessemer rails, to be rolled in the Chicago district. Japan has placed 4,200 tons of rails in this country and Argentina is out for a large lot. The Erie Railroad has divided 4,000 freight cars among three companies and is to close this week for 60 locomotives. The Frisco System has bought 1,200 cars.

The prospect of considerable vessel building, even though some of it is not immediate, has encouraged the plate trade. The American-Hawaiian Steamship Company plans to build four steamers of the 10,000-ton class. Of the five new Government colliers steel contracts have been let for three. For two of these 6000 tons of shapes have gone to a Pittsburgh mill, while Eastern mills have taken 20,000 tons of plates.

Structural orders have come chiefly from the East and Central West. The American Bridge Company was low bidder on the Point bridge at Pittsburgh—6,000 to 7,000 tons—while the steel for the Kansas City terminal station, 14,000 tons, lies between two large companies. For the proposed municipal convention hall at Philadelphia 6500 tons of steel will be needed. The leading interest will fabricate the steel for the Northwestern Life Insurance Company building, Milwaukee, 5300 tons.

In the sheet trade nominal prices are still cut

$1 to $2 a ton. Shading of the $3.70 base price, Pittsburgh, for tin plates is both affirmed and denied. The Standard Oil Company has recently contracted in this country for tin plates for the remainder of the year. At the same time it has placed a part of its re-export requirements with Welsh mills. The latter have quoted lower prices than at the beginning of the year, when the Standard Company's order went entirely to American mills.

Sales of foundry pig iron have increased, but Southern furnaces have not been successful in their efforts to establish a $10.50 Birmingham basis for the last quarter. Sales have been made at $10.25 for delivery through this year and $10 iron for prompt shipment is still available, while two or three sales of round lots are reported at that figure for delivery extending into the fourth quarter.

In Eastern Pennsylvania 10,000 to 12,000 tons of basic iron has been bought for this year at $14.75 to $14.90 delivered. A Pittsburgh steel company has bought 5000 to 6000 tons of basic for the remainder of the year at a little below $13 at Valley furnace. Pittsburgh reports an inquiry for a large amount of Bessemer iron.

After a long wait, the Lake iron ore market has developed some activity, recent sales amounting to 100,000 tons. Swedish ores are now quoted at 8 cents per unit alongside Delaware River dock.

British and American Blast Furnace Activity

A sharp contrast is furnished in the conditions of pig iron production in Great Britain and the United States. British blast furnaces are very much better employed than those of the United States. In 1910 both countries broke all previous records in the production of pig iron, but in Great Britain the achievement was one of note, while in the United States there was disappointment that the record was broken by so small a margin. In the United States from 1897 to 1907, both years being record years in their time, production increased 267.1 per cent., which was an average gain, each year over the preceding, of 10.3 per cent. The 1910 production, however, was a gain of only 6 per cent. over that of 1909, and of practically the same percentage over 1907. If production had continued to increase year by year after 1907 at the same rate as from 1897 to 1907 the 1910 production would have been 34,600,000 tons instead of 27,300,000 tons. While the gain made in 1910 may be considered fairly satisfactory at long range, it was quite unsatisfactory compared with the experience of the ten years 1897 to 1907, a period of unusually rapid expansion.

In Great Britain, on the other hand, the gains in a long period of years have been only occasional. In the past 40 years there have been only 11 years in which all previous records were broken, and from 1897 to 1907 the gain was only trifling. The earlier year made a new record, which was broken in 1899, while the 1899 record was not broken until 1905. One year later the 1905 record was broken, but that of 1906 was not broken until 1910.

Thus the year 1910 was a good year in the blast furnace industry, and we find from statistics collected by the Iron and Coal Trades Review that the average number of furnaces in blast in the year was 335. In the first quarter of this year the average number in blast was 333, according to the same authority, while in the second quarter the average was 318, making a general average for the first half of this year of 325 furnaces. The June quarter, with 505 furnaces and 318 in blast, showed a proportion of 63 per cent. in operation. In the United States the proportion has been much smaller. From the midsummer presentation of the American Iron and Steel Association we derive the following comparison:

	Total number	In blast June 30.	Percentage in blast.
Bituminous coal and coke	385	199	51
Anthracite and mixed	38	6	16
Charcoal	49	17	33
All furnaces	472	212	45

Thus we have 45 per cent. of the American blast furnaces in blast on June 30, against 67 per cent. of the British furnaces in blast during the June quarter. One is accustomed to think of our charcoal and anthracite furnaces pulling down the average, so it may be observed that, excluding them entirely, the percentage of bituminous coal and coke furnaces active was only 51, which still makes an unfavorable comparison with the British furnaces.

We have commonly thought of the evolution of the blast furnace from the primitive to the modern being slow in Great Britain and rapid in the United States, but as a matter of fact the progression on the blast furnace is not uniform throughout the American industry. While some producing interests are continually rebuilding their furnaces, others are not. The race of furnaces with iron pipe stoves is not extinct, although nearly so; but not many years ago a relatively large number were producing pig iron alongside of modern automatically filled furnaces. It is possible that the very slowness of expansion in the British industry has made it that the distance is smaller from the most primitive to the most modern furnaces. In the United States there is a great distance.

It would be difficult to estimate what proportion of the total number of furnaces would be found active in the two countries, in times which would be regarded as really good; but a large part of that difficulty is due to the fact that the concept of good times is different in the two countries. In England times are considered good when profits per ton of pig iron are moderate according to the American idea, which in recent years has been that "good times" means the employment of practically all the listed furnaces. When the least fit are running at their cost line, however, the best positioned furnaces are making several dollars a ton profit.

A Latent Service of Scientific Management

Labor problems and scientific management are interdependent and it is to skillful scientific management that many look for the solution of the labor question. Industry has of late become so involved in a sociological way that readjustment of wages has become more difficult than ever. The well being of a class of workers as a whole has gradually been accepted as of paramount importance. At the same time public opinion, in developing a greater expression of the paternal spirit of government, is probably making scientific management more difficult to introduce even though it takes firm root when once properly understood.

More general elimination of Sunday working, talked of and tried, is a good instance of the close linking of society and business; but the real problem—of giving the worker the income to which he is ad-

justed and of maintaining for the employer the unit production on which his business can be kept competitive—has not had much public solution. The boon of scientific management, providing it meets this great problem, is immeasurable. We realize the latent danger to the whole fabric of business in even the one item of wage readjustment, and while the present tendency of compromise and delay, avoiding the real issue, may seem weak and likely to aggravate the violence of the final eruption, this very dalliance is undoubtedly giving scientific management its chance.

The Statistics of Blast Furnace Flux

Beginning with 1897 the American Iron and Steel Association has gathered statistics of the amount of limestone consumed in making pig iron. These statistics have usually attracted little attention, but, believing that a presentation of the data for the entire period would be of some interest, we have compiled the table below. It shows, first, the average number of pounds of limestone reported used per ton of pig iron made, for all grades of pig iron, and, second, the average quantity reported used by the coke and anthracite furnaces, excluding the charcoal furnaces. The consumption of the latter is very light, being in 1910 369 lb. and in 1909 382.8 lb. per ton of pig iron made. It is impossible to determine how accurate the returns are, for it is quite likely that at some furnaces exact figures are not kept from day to day, and also that some furnaces arrive at an approximate total of the year's consumption of limestone by some other method than that of adding the quantities ascertained as the furnace is charged. However reached, the figures are presumably not far from the precise truth.

Average Limestone Consumed in Making Pig Iron—Pounds of Lime stone per Ton of Pig Iron.

	Coke and anthracite.	All fuels.
1897	1,002.3	985.7
1898	1,020.4	1,003.7
1899	[illegible] data]	1,103.1
1900	1,222.9	1,205.6
1901	1,202.7	1,186.5
1902	1,207.7	1,192.8
1903	1,207.3	1,193.0
1904	1,128.0	1,112.6
1905	1,144.2	1,132.7
1906	1,192.8	1,178.8
1907	1,247.8	1,233.2
1908	1,229.4	1,217.1
1909	1,190.5	1,178.7
1910	1,204.0	1,191.8

On the whole, the figures for 14 years show a negative result. So much has been said about the decreasing average iron content of the ores used from year to year that the first thing one is prompted to look for in such a presentation is statistical evidence of a progressive increase in the amount of flux required as the average of impurities in ore used increased. This we do not find. It is true that for 1897 and 1898 the average limestone consumption was only a trifle over 1000 lb. per ton of coke and anthracite iron produced, while in later years the average has been fully 1200 lb. or 20 per cent. more, but from 1900 to 1910 we do not see any progressive increase. The average of 1900-1-2, indeed, is 1211 lb., while the average of 1908-9-10 is 1208 lb., or 3 lb. less.

The amount of limestone required does not, of course, depend solely upon the character of the iron ore, but depends also to an extent upon the coke. If there had been a progressive change during the period in the kind of coke used, we might look to this as tending to conceal other forces believed to have been at work, but there has been no change such as can be claimed clearly to have had a bearing.

The changes from year to year do seem to follow one principle with considerable fidelity, and that is that the limestone consumption appears to go up in good times, when there is heavy production with high prices, and to go down when conditions are reversed. In this we may perhaps discern a tendency to use leaner ores when profits are large, and to drive furnaces harder at the same time, both of which trends would serve somewhat to increase the average limestone consumption. It may be that the more rapid increase in the production of Northern iron, as compared with Southern, has tended to rearrange the average, but this influence would not be very important, particularly as there are partly self-fluxing ores in the South. The general showing is that the coke and anthracite furnaces of the country report that they are using 0.54 to 0.55 ton of limestone per ton of pig iron produced.

Safety Devices for Grinding Wheels

A common form of failure to guard against accidents to employees is in the use of grinding machinery. The manufacturers of abrasive wheels and of machines for their use have given the subject a great deal of specialized attention, and as a result safety devices have been developed which must reduce the risk practically to a minimum. The great danger, of course, lies in wheel explosions due to excessive speeds. All abrasive wheels are tested before they leave the factory, where they are run at speeds which give a wide margin of safety over correct commercial practice. If an explosion follows in the shop of a customer, the presumption is that the fault lies in usage rather than in manufacture.

A common error is to place too large a wheel on a spindle without reducing the revolutions per minute. Peripheral speeds multiply rapidly with increased diameters, and the wheel, getting beyond its breaking point, goes to pieces, causing, perhaps, the death or serious injury of workmen. Many grinding machines are equipped with guards, the removal of which is necessary before too large a wheel can be substituted. The user is provided with other means with which to secure immunity from accident, if he is willing to accept them. But he must follow up the use of the devices in his works in order that careless or ignorant employees may not throw them aside. With large wheels special safeguards are furnished to keep the revolving mass under control. With certain types a heavy steel band encircles the disk, to assist in withstanding the strains of centrifugal energy. In many works, especially in small establishments, wheels are to be seen mounted on spindles running at speeds far too great for the diameters.

With the coming in of liability laws compelling the payment of damages for injuries to workmen regardless of liability, employers should look carefully into menaces such as these. Owners of small works complain that under the new statutes crippling financial injury may be done them, because the increased ratio of overhead burden due to accidents may be too great for them to endure. If such a condition has been created it behooves the employer to use every effort to reduce the chance of accident, and many ways are open to him in proceeding to that end.

The Steel Corporation's Unfilled Orders

The unfilled tonnage of the United States Steel Corporation on July 31 was 3,584,085 tons, an increase of 223,027 tons over the total on June 30, which in turn was 247,871 tons greater than that for May 31. The following table gives the unfilled tonnage of the Steel Corporation by months since June 30, 1910, together with tonnage at close of each quarter from December 31, 1902, to June 30, 1910:

July 31, 1911	3,584,085	Mar. 31, 1908	3,765,343
June 30, 1911	3,361,058	Dec. 31, 1907	4,624,552
May 31, 1911	3,113,187	Sept. 30, 1907	6,423,008
April 30, 1911	3,218,704	June 30, 1907	7,603,878
Mar. 31, 1911	3,447,301	Mar. 31, 1907	8,043,858
Feb. 28, 1911	3,400,543	Dec. 31, 1906	8,489,719
Jan. 31, 1911	3,110,919	Sept. 30, 1906	7,936,884
Dec. 31, 1910	2,674,757	June 30, 1906	6,809,830
Nov. 30, 1910	2,760,413	Mar. 31, 1906	7,018,712
Oct. 31, 1910	2,871,949	Dec. 31, 1905	7,605,086
Sept. 30, 1910	3,158,106	Sept. 30, 1905	5,865,377
Aug. 31, 1910	3,537,128	June 30, 1905	4,829,655
July 31, 1910	3,970,331	Mar. 31, 1905	5,579,560
June 30, 1910	4,257,794	Dec. 31, 1904	4,696,203
Mar. 31, 1910	5,403,514	Sept. 30, 1904	3,027,436
Dec. 31, 1909	5,927,031	June 30, 1904	3,192,277
Sept. 30, 1909	4,796,833	Mar. 31, 1904	4,136,961
June 30, 1909	4,057,939	Dec. 31, 1903	3,215,123
Mar. 31, 1909	3,542,595	Sept. 30, 1903	3,278,742
Dec. 31, 1908	3,603,527	June 30, 1903	4,666,578
Sept. 30, 1908	3,421,977	Mar. 31, 1903	5,410,719
June 30, 1908	3,313,876	Dec. 31, 1902	5,347,523

About September 1 the new and enlarged plant of the Orenstein-Arthur Koppel Company, of Pittsburgh, will be put in operation. It is located at Koppel, Pa., on the Pittsburgh & Lake Erie and the Pittsburgh, Fort Wayne & Chicago railroads, and was built by the Nicola Company, of Pittsburgh. It gives about double the former capacity of the Orenstein-Arthur Koppel Company, enabling it fully to take care of the demand for its industrial cars, portable track and other railroad equipment. The new shop will also put the company in position to handle to better advantage orders for specially designed steel cars.

Combination coal and oil firing of boilers is practised in the Westport station of the Consolidated Gas, Electric Light & Power Company, Baltimore. The installation was described in a recent paper by H. A. Wagner, read before the National Electric Light Association. The space under the boiler, back of the usual coal grate, is made into a large combustion chamber with the oil burners at the extreme rear end. This combustion chamber is separated from the boiler tubes above by tiling and from the coal grate by a low bridge wall. It has been found that 2000 kw. of station load can be carried by each boiler when using coal and oil together with as much ease and certainty as 1200 kw. per boiler can be carried by coal alone.

On August 1 the entire six Duquesne furnaces of the Carnegie Steel Company at Duquesne, Pa., were in blast, but since that date No. 2 has been blown out for relining. At present the Carnegie Steel Company is operating 42 of its 59 blast furnaces in the Pittsburgh, the Wheeling and the two Valley districts. In the Pittsburgh district on August 1 seven Carrie stacks were in blast, two out of three Clairton furnaces, seven out of eleven Edgar Thomson furnaces and the two Lucy furnaces. Edith furnace, the three Isabella stacks and Neville Island have been out of blast for a long time.

The Anglo-California Trust Company, San Francisco, Cal., has been named as trustee of an issue of $1,200,000 first mortgage bonds authorized by the directors of the Pacific Coast Steel Company, San Francisco, with which concerns at Portland and Seattle were recently consolidated.

The Ontario Exploration Company has decided to close its iron mines at Wilbur, north of Kingston, Ont., for a time. President Hanna, of Cleveland, Ohio, who recently visited Kingston, said there was no market for iron ore in the United States. The company has had 140 men at work at Wilbur. It has not made any shipments as yet.

The Brightman Mfg. Company announces that its new plant at Columbus, Ohio, is now completed and in operation. It is especially equipped for the manufacture of shafting and the company's line of straightening and shafting machinery.

Industrial Legislation in Pennsylvania

HARRISBURG, PA., August 14, 1911—State commissions to investigate the causes of industrial accidents and the methods of building construction in Pennsylvania are to be named by Governor Tener in September with a view to drafting legislation to be presented to the general assembly of 1913. The administration has taken up the subject of employers' liability and a study of laws of other states will be made in conjunction with the investigation into accidents. The commissions will be composed of seven men each, most of the members to be legislators, and ample funds will be provided for experts and for inspections in industrial centers. Particular attention is to be given to conditions in iron and steel plants and to railroad operation.

The legislative commission to study the taxation system and recommend new laws for corporate taxation will resume its sittings this fall. Its report is to be made in January, 1913.

Many Electric Power Charters in Pennsylvania.—Over 200 charters for electric companies have been granted by the State of Pennsylvania since May 1, this year, and considerable significance is attached to the fact that the groups into which they were divided embrace coal and water power centers. The companies were chartered with nominal capital and each one was given a district in which to supply electricity for light, heat or power, the ultimate plan being to consolidate. The large coal companies of the anthracite region are behind some of the charters, New York capital being interested in a group chartered for the Lehigh Valley. In the soft coal region groups have been secured for townships in the vicinity of Johnstown, Pittsburgh, Washington and Uniontown. Fourteen were taken by interests which will use Susquehanna river power and charters for nineteen are pending for a group to operate in the Clarion river valley.

A good performance with stokers for steam boilers is reported from Amoskeag Mills, Manchester, N. H. The refuse from four boiler rooms, one with hand-fired boilers and three with boilers equipped with the Jones stoker, was analyzed. Deductions made by Capt. Chas. H. Manning, consulting engineer of the Amoskeag Mfg. Company, were that the refuse from the Jones stoker was found to contain 15.73 per cent. combustible, while the refuse from the hand-fired boilers amounted to 42.78 per cent. combustible. The mills burn 120,000 tons of coal each year at a cost of $4.50 per ton. It is felt that this showing justifies the statement that the stokers are saving the mills $11,143.11 each year in reduced combustible in the refuse. Capt. Manning is quoted to the effect that not only is there less waste fuel, but better results are obtained from the portions utilized. The boilers are the Manning fire tube type, designed by Capt. Manning.

The Pitt Construction Company, Pittsburgh, will build a 300,000-gallon water filtration plant, half-million gallon reinforced concrete covered reservoir, settling basin and appurtenances for water works for the State Asylum for Chronic Insane at Wernersville, Pa. Plans and specifications were drawn by Shester & Fleming, Union Bank Building, Pittsburgh.

The members of the International Association of Machinists have been holding an election by letter ballot for several weeks past and the count has now been completed. James O'Connell has been unseated as president and W. H. Johnson, Providence, R. I., has been elected in his place. Walter Ames, Boston, who was vice-president of the association, was also defeated for re-election.

Thomas Carlin's Sons Company, Oliver Building, Pittsburgh, has shipped an 8-ft. automatic wet-grinding pan, with base for motor drive, to the Pennsylvania Steel Company, Steelton, Pa., and is finishing tank and other work for a Pittsburgh asphalt plant.

The new Morgan rod mill of the Jones & Laughlin Steel Company at Aliquippa, Pa., is nearly completed and will be put in operation in the near future.

Personal

F. B. DeGress has resigned the position he has held for more than ten years as New York district manager of the Crocker-Wheeler Company to become general sales manager for the Pulsometer Company, 17 Battery place, New York City. In addition to looking after the sales department he is also carrying on a series of experiments with a view to improving certain features of the pulsometer and making it suitable for general pumping work in power plants and industrial establishments.

Wm. Paul Gerhard, author and consulting engineer for hydraulic and sanitary works, New York City, has been given the honorary degree of doctor of engineering by the Technical University of Darmstadt, Germany.

G. Walter Bates, of Matlack & Bates, pig iron and coke merchants, Philadelphia, sailed August 12 for a month's trip abroad.

H. C. Frick has resigned in the past week as a director of the Union Pacific Railroad. The report was current that he would resign also from the directorate and the Executive Committee of the United States Steel Corporation, but this he has denied.

James W. Fagans, who has been for the past year superintendent of the plant of Abendroth Brothers, Port Chester, N. Y., has just been appointed general manager. Previous to going to Port Chester he was connected with the Detroit Stove Works for thirteen years.

Frank A. Moeschel, sales manager of the Newport Rolling Mills Company, Newport, Ky., has returned from a vacation trip to Canada.

Ashley P. Peck, for six years identified with Allis-Chalmers Company as sales engineer, connected with its New York office, recently associated himself with the Terry Steam Turbine Company as district sales manager for the Middle West, with offices at 814 People's Gas Building, Chicago, Ill. Prior to 1902 he was actively connected with the machinery sales field of Chicago, and since that date, for three years, was manager of the Milwaukee district sales office of the National Electric Company, going from Milwaukee to the Allis-Chalmers Company at New York in 1905. He is a graduate of Purdue University and is an associate member of the American Institute of Electrical Engineers.

William Vaughan, chemist, of Arthur D. Little, Inc., Boston, has been detailed from that organization as an assistant in the new centralized testing department which has just been organized under its direction for the General Motors Company, Detroit, Mich. Mr. Vaughan was chemist for the Salem Iron Company, Leetonia, Ohio, and Union Iron & Steel Company.

T. J. Drummond, of Drummond, McCall & Co., Montreal, and president of the Lake Superior Iron Corporation, who attended the congress of steel manufacturers in Brussels, has returned. While abroad he completed financial arrangements for the extension of the Algoma Central and the Algoma Eastern lines, which are controlled by the Lake Superior Corporation.

John C. Searight, superintendent of blast furnaces for the Republic Iron & Steel Company in the Northern district, with headquarters at Youngstown, Ohio, has resigned. His successor has not yet been appointed.

Arthur T. Herr has been appointed western representative of the Inter-Ocean Steel Company, Chicago, with headquarters at 412 First National Bank Building, Denver, Colo.

E. E. Protherow has joined the staff of the Gregory Electric Company, Chicago, and will represent the company in the sale of its motors in Chicago and adjacent territory. He was for six years connected with the Chicago office of the Crocker-Wheeler Company. R. D. May is also a new member of the selling force of the Gregory Electric Company. He was for a number of years with H. M. Byllesby & Co.

Robert E. Brooke, general manager E. & G. Brooke Iron Company, Birdsboro, Pa.; Edgar S. Cook, president Warwick Iron & Steel Company, Pottstown, Pa., and Albert Broden, manager Temple Iron Company, Reading, Pa., sailed August 8 for a short trip abroad. Mr. Brooke and Mr. Cook will return early in September, while Mr. Broden expects to make a more extended visit.

C. H. Elliott, formerly superintendent of the Atlanta Steel Company, Atlanta, Ga., has been appointed superintendent of the new open-hearth steel plant to be built by the Youngstown Sheet & Tube Company, Youngstown, Ohio. He will supervise the erection of the six new furnaces to be built, plans for which are now being prepared in the company's engineering department, to be passed upon by Julian Kennedy, consulting engineer.

W. D. Creider has resigned as superintendent of the plant of the Pressed Radiator Company of America at West Pittsburgh, Pa., to become superintendent of the works of the Duff Mfg. Company.

Obituary

CHARLES KOEGEL, Springfield, Mass., senior member of the firm of Charles Koegel & Son, manufacturers of paper mill machinery, died August 9. Born in Germany and educated at Heidelberg University, he came to the United States as a young man and entered the paper manufacturing industry. He invented various improvements in papermaking machinery and in 1892 established the business which bears his name. He leaves a widow and three sons.

Western Steel Corporation Bond Issue.—It is announced that stockholders of the Western Steel Corporation, Seattle, Wash., have approved the recommendation by the directors of an issue of $5,000,000 bonds to provide new operating capital. It is stated that the company's president, James A. Moore, has arranged for placing this issue in the East. Work was resumed at the company's steel plant at Irondale, Wash., early in August and it is stated that the rolling mill will be run steadily for some time. The open-hearth department is in operation and a third furnace is being prepared for starting. The blast furnace at Irondale has not been in operation this year.

Back Number Wanted.—The Circulation Department of *The Iron Age* desires a copy of No. 15, Volume 81. If one of our readers can spare this copy of the paper we would be glad to have him notify us, addressing the department above named.

The Cambria Steel Company, Johnstown, Pa., which heretofore has built only steel cars, announces that it will engage in the manufacture of wooden box cars and passenger cars. It is now prepared to quote prices on wooden box cars, and in the spring will quote prices on passenger cars. It will install the necessary new equipment at once, contracts for the most of which have already been placed.

The Republic Iron & Steel Company's offices, formerly located in the Oliver Building, Pittsburgh, have been removed to the new office building erected by the company at Youngstown, Ohio. A district sales office will be maintained in the Oliver Building, in charge of George L. Claypool, whose title will be district sales manager, in charge of sales in the Pittsburgh district.

James Rees & Son, Pittsburgh, have received a contract for the building of 14 small steel boats for use on the Amazon River, South America. Each of the boats will be about 125 ft. long, and will carry about 200 tons of freight. The steel will be furnished by the Carnegie Steel Company.

The Pittsburgh & Conneaut Dock Company has established a record in ore unloading at its Superior dock, Ashtabula, Ohio, which is equipped with four 15-ton Hulett electric unloaders. These four machines took 10,234 gross tons of ore out of the steamer Thomas Lynch August 10 in 4 hours and 6 minutes. The unloading began at 6:30 a. m. and was concluded at 10:36 a. m. The average per hour per machine was 637.6 tons. The average tons per hour, start to finish, by the four machines was 2550.5.

The Duff Mfg. Company, N. S., Pittsburgh, has received a large contract for hydraulic jacks and Barrett geared ratchet jacks within the past week from the Brazilian Government Railways in Brazil. These jacks comprise various sizes for car and locomotive equipment, with special traversing bases whereby the cars or locomotives may be moved sidewise after having been raised. They run from 25 to 40 tons capacity.

The Iron and Metal Markets

Comparison of Prices

Advances Over the Previous Week in Heavy Type, Declines in Italics.

At date, one week, one month and one year previous.

	Aug. 16, 1911.	Aug. 9, 1911.	July 19, 1911.	Aug. 17, 1910.
PIG IRON, Per Gross Ton:				
Foundry No. 2 standard, Philadelphia	$15.00	$15.00	$15.00	$16.00
Foundry No. 2, Valley furnace	13.50	13.50	13.50	14.25
Foundry No. 2 Southern, Cincinnati	13.50	13.50	13.25	14.25
Foundry No. 2, Birmingham, Ala.	10.25	10.25	10.00	11.00
Foundry No. 2, at furnace, Chicago*	14.50	14.50	15.00	16.50
Basic, delivered, eastern Pa.	**14.75**	14.50	14.25	15.00
Basic, Valley furnace	13.00	13.00	13.00	14.00
Bessemer, Pittsburgh	15.90	15.90	15.90	16.15
Gray forge, Pittsburgh	13.90	13.90	13.90	14.25
Lake Superior charcoal, Chicago	16.50	16.50	16.50	18.50
COKE, CONNELLSVILLE, Per Net Ton, at Oven:				
Furnace coke, prompt shipment	**1.50**	1.40	1.40	1.55
Furnace coke, future delivery	1.65	1.65	1.55	1.75
Foundry coke, prompt shipment	1.85	1.85	1.80	2.15
Foundry coke, future delivery	2.10	2.10	2.00	2.25
BILLETS, &c., Per Gross Ton:				
Bessemer billets, Pittsburgh	21.00	21.00	21.00	24.50
Forging billets, Pittsburgh	26.00	26.00	26.00	30.00
Open hearth billets, Philadelphia	23.40	23.40	23.40	27.50
Wire rods, Pittsburgh	27.00	27.00	27.00	28.00
OLD MATERIALS, Per Gross Ton:				
Iron rails, Chicago	14.00	14.00	14.00	16.00
Iron rails, Philadelphia	17.50	17.50	17.50	18.00
Car wheels, Chicago	12.75	12.75	12.50	14.50
Car wheels, Philadelphia	13.00	13.00	13.00	14.00
Heavy steel scrap, Pittsburgh	13.25	13.25	13.00	14.25
Heavy steel scrap, Chicago	10.75	10.75	10.50	12.25
Heavy steel scrap, Philadelphia	13.50	13.50	13.25	13.75
FINISHED IRON AND STEEL, Per Pound:	Cents.	Cents.	Cents.	Cents.
Bessemer rails, heavy, at mill	1.25	1.25	1.25	1.25
Refined iron bars, Philadelphia	1.27½	1.27½	1.27½	1.42½
Common iron bars, Pittsburgh	1.25	1.25	1.25	1.45
Common iron bars, Chicago	1.20	1.20	1.20	1.40
Steel bars, Pittsburgh	1.20	1.20	1.25	1.40
Steel bars, tidewater, New York	1.36	1.36	1.41	1.56
Tank plates, Pittsburgh	1.35	1.35	1.35	1.40
Tank plates, tidewater, New York	1.51	1.51	1.51	1.56
Beams, Pittsburgh	1.35	1.35	1.35	1.40
Beams, tidewater, New York	1.51	1.51	1.51	1.56
Angles, Pittsburgh	1.35	1.35	1.35	1.40
Angles, tidewater, New York	1.51	1.51	1.51	1.56
Skelp, grooved steel, Pittsburgh	1.20	1.20	1.25	1.50
Skelp, sheared steel, Pittsburgh	1.30	1.30	1.35	1.60
SHEETS, NAILS AND WIRE, Per Pound.	Cents.	Cents.	Cents.	Cents.
Sheets, black, No. 28, Pittsburgh	2.00	2.00	2.00	2.20
Wire nails, Pittsburgh†	1.70	1.70	1.70	1.70
Cut nails, Pittsburgh†	1.60	1.60	1.60	1.65
Barb wire, galv., Pittsburgh†	2.00	2.00	2.00	2.00
METALS, Per Pound:	Cents.	Cents.	Cents.	Cents.
Lake copper, New York	12.75	12.75	12.75	13.00
Electrolytic Copper, New York	12.62½	12.62½	12.55	12.62½
Spelter, St. Louis	**5.95**	5.80	5.57½	5.05
Spelter, New York	**6.15**	6.00	5.75	5.20
Lead, St. Louis	4.45	4.45	4.40	4.30
Lead, New York	4.50	4.50	4.50	4.40
Tin, New York	**44.00**	43.00	42.00	33.85
Antimony, Hallett, New York	7.75	7.75	8.00	7.95
Tin plate, 100-lb. box, New York	$3.94	$3.94	$3.94	$3.84

* The average switching charge for delivery to foundries in the Chicago district is 50c. per ton.

† These prices are for largest lots to jobbers.

Prices of Finished Iron and Steel f.o.b. Pittsburgh

Freight rates from Pittsburgh in carloads, per 100 lb.: New York, 16c.; Philadelphia, 15c.; Boston, 18c.; Buffalo, 11c.; Cleveland, 10c.; Cincinnati, 15c.; Indianapolis, 17c.; Chicago, 18c.; St. Paul, 32c.; St. Louis, 22½c.; New Orleans, 30c.; Birmingham, Ala., 45c. Rates to the Pacific Coast are 80c. on plates, structural shapes and sheets, No. 11 and heavier; 85c. on sheets, Nos. 12 to 16; 95c. on sheets, No. 16 and lighter; 65c. on wrought boiler tubes.

Structural Material.—I-beams and channels, 3 to 15 in., inclusive, 1.35c. to 1.40c., net; I-beams over 15 in., 1.45c. to 1.50c., net; H-beams over 18 in., 1.50c. to 1.55c.; angles, 3 to 6 in., inclusive, ¼ in. and up, 1.35c. to 1.40c., net; angles over 6 in., 1.45c. to 1.50c., net; angles, 3 in. on one or both legs, less than ¼ in. thick, 1.40c., plus full extras as per steel bar card effective September 1, 1909; tees, 3 in. and up, 1.40c., net; zees, 3 in. and up, 1.35c. to 1.40c., net; angles, channels and tees under 3 in., 1.40c., base, plus full extras as per steel bar card of September 1, 1909; deck beams and bulb angles, 1.65c. to 1.70c., net; hand rail tees, 2.45c.; checkered and corrugated plates, 2.45c., net.

Plates.—Tank plates, ¼ in. thick, 6¼ in. up to 100 in. wide, 1.35c. to 1.40c., base. Following are stipulations prescribed by manufacturers, with extras to be added to base price (per pound) of plates:

Rectangular plates, tank steel or conforming to manufacturers' standard specifications for structural steel dated February 6, 1903, or equivalent, ¼ in. thick and over on thinnest edge, 100 in. wide and under, down to but not including 6 in. wide, are base.

Plates up to 72 in. wide, inclusive, ordered 10.2 lb. per square foot, are considered ¼-in. plates. Plates over 72 in. wide must be ordered ¼ in. thick on edge, or not less than 11 lb. per square foot, to take base price. Plates over 72 in. wide ordered less than 11 lb. per square foot down to the weight of 3-16-in. take the price of 3-16-in.

Allowable overweight, whether plates are ordered to gauge or weight, to be governed by the standard specifications of the Association of American Steel Manufacturers.

	Cents per lb.
Gauges under ¼ in. to and including 3-16 in. on thinnest edge, extra	.10
Gauges under 3-16 in. to and including No. 8	.15
Gauges under No. 8 to and including No. 9	.25
Gauges under No. 9 to and including No. 10	.30
Gauges under No. 10 to and including No. 12	.40
Sketches (including all straight taper plates) 3 ft. and over in length	.10
Complete circles, 3 ft. in diameter and over	.20
Boiler and flange steel	.10
"A. B. M. A." and ordinary firebox steel	.20
Still bottom steel	.30
Marine steel	.40
Locomotive firebox steel	.50
Widths over 100 in. up to 110 in., inclusive	.05
Widths over 100 in. up to 115 in., inclusive	.10
Widths over 115 in. up to 120 in., inclusive	.15
Widths over 120 in. up to 125 in., inclusive	.25
Widths over 125 in. to 130 in., inclusive	.50
Widths over 130 in.	1.00
Cutting to lengths or diameters under 3 ft. to 2 ft., inclusive	.25
Cutting to lengths or diameters under 2 ft. to 1 ft., inclusive	.50
Cuttings to lengths or diameters under 1 ft.	1.55

No charge for cutting rectangular plates to lengths 3 ft. and over.
TERMS—Net cash 30 days.

Sheets.—Makers' prices for mill shipments on sheets in carload and larger lots, on which jobbers charge the usual discounts for small lots from store, are as follows: Blue annealed sheets, Nos. 3 to 8, U. S. standard gauge, 1.40c.; Nos. 9 and 10, 1.50c.; Nos. 11 and 12, 1.55c.; Nos. 13 to 14, 1.60c.; Nos. 15 and 16, 1.70c., one pass, cold rolled, box annealed sheets, Nos. 10 to 12, 1.65c.; Nos. 13 and 14, 1.70c.; Nos. 15 and 16, 1.75c.; Nos. 17 to 21, 1.80c.; Nos. 22, 23 and 24, 1.85c.; Nos. 25 and 26, 1.90c.; No. 27, 1.95c.; No. 28, 2c.; No. 29, 2.05c.; No. 30, 2.15c. Three pass, cold rolled sheets, box annealed, are as follows: Nos. 15 and 16, 1.85c.; Nos. 17 to 21, 1.90c.; Nos. 22 to 24, 1.95c.; Nos. 25 and 26, 2c.; No. 27, 2.05c.; No. 28, 2.10c.; No. 29, 2.15c.; No. 30, 2.25c. Galvanized sheets, Nos. 10 and 11, black sheet gauge, 2c.; Nos. 12, 13 and 14, 2.10c.; Nos. 15, 16 and 17, 2.25c.; Nos. 18 to 22, 2.40c.; Nos. 23 and 24, 2.50c.; Nos. 25 and 26, 2.70c.; No. 27, 2.85c.; No. 28, 3c.; No. 29, 3.10c.; No. 30, 3.30c. All above prices are f.o.b. Pittsburgh, terms 30 days net, or 2 per cent cash discount 10 days from date of invoice, as also are the following base prices per square for painted and galvanized roofing sheets, with 2½-in. corrugations:

Gauge	Painted.	Galvanized.	Gauge	Painted.	Galvanized.
29		$2.40	23	$2.40	$3.50
28	$1.40	2.55	22	2.60	3.70
27	1.55	2.60	21	2.80	4.05
26	1.65	2.65	20	3.05	4.35
25	1.85	3.05	18	4.05	5.70
24	2.10	3.15	16	4.90	6.50

Wrought Pipe.—The following are the jobbers' carload discounts on the Pittsburgh basing card on wrought pipe, in effect from October 1, 1910:

	Butt Weld. Steel Black.	Steel Galv.	Iron Black.	Iron Galv.
⅛ to ⅜ in.			49	43
½ in.	75	63	71	59
¾ to 1½ in.	79	69	75	65
2 to 3 in.	80	70	76	66
	Lap Weld.			
2 in.	76	66	72	62
2½ to 4 in.	78	67	74	64
4½ to 6 in.	77	67	73	63
7 to 12 in.	75	59	71	55
13 to 15 in.	51½			
	Butt Weld, extra strong, plain ends,		card weight.	
⅛, ¼, ⅜ in.	69	50	65	55
½ in.	74	68	70	64
¾ to 1½ in.	78	72	74	68
2 to 3 in.	79	73	75	69

THE IRON AND METAL MARKETS

Lap Weld, extra strong, plain ends, card weight.				
2 in.	75	69	71	65
2½ to 4 in.	77	71	73	67
4½ to 6 in.	76	70	72	66
7 to 8 in.	69	59	65	55
9 to 12 in.	64	54	60	50
Butt Weld, double extra strong, plain ends, card weight.				
⅜ in.	64	58	60	54
¼ to 1½ in.	67	61	63	57
2 to 3 in.	69	63	65	59
Lap Weld, double extra strong, plain ends, card weight.				
2 in.	65	59	61	55
2¼ to 4 in.	67	61	63	57
4½ to 6 in.	66	60	62	56
7 to 8 in.	59	49	62	56

Plugged and Reamed.

1 to 1½, 2 to 3 in. Butt Weld
2, 2½ to 4 in. Lap Weld

} will be sold at two (2) points lower basing (higher price) than merchants' or card weight pipe. Butt or lap weld, as specified.

The above discounts are for "card weight," subject to the usual variation of 5 per cent. Prices for less than carloads are three (3) points lower basing (higher price) than the above discounts.

Boiler Tubes.—Discounts on lap welded steel boiler tubes to jobbers in carloads are as follows:

	Steel.
1¾ to 2¼ in.	65
2½ in.	67½
2¾ to 3¼ in.	70
3½ to 4½ in.	72½
5 to 6 in.	65
7 to 13 in.	62½

Less than carloads to destination east of the Mississippi River will be sold at delivered discounts for carload lowered by two points for lengths 22 ft. and under; longer lengths f.o.b. Pittsburgh. Usual extras to jobbers and boiler manufacturers.

Wire Rods and Wire.—Bessemer, open hearth and chain rods, $27. Fence wire, Nos. 0 to 9 per 100 lb., terms 60 days, or 2 per cent. discount in 10 days, carload lots, to jobbers, annealed, $1.50; galvanized, $1.80. Carload lots, to retailers, annealed, $1.55; galvanized, $1.85. Galvanized bar wire, to jobbers, $2; painted, $1.70. Wire nails, to jobbers, $1.70.

The following table gives the price to retail merchants on wire in less than carloads, including the extras on Nos. 10 to 16, which are added to the base price:

Fence Wire, Per 100 lb.

No.	0 to 9	10	11	12 & 12½	13	14	15	16
Annealed	$1.65	$1.70	$1.75	$1.80	$1.90	$2.00	$2.10	$2.20
Galvanized	1.95	2.00	2.05	2.10	2.20	2.30	2.70	2.80

Market and Stone Wire in Bundles, Discount from Standing List.

Bright and Annealed:
9 and coarser 80
10 to 18 ..... 80 and 10
19 to 26 ..... 80 and 10 and 2½
27 to 36 ..... 80 and 5
Galvanized:
9 and coarser ..... 75 and 10
10 to 16 ..... 75 and 10
17 to 26 ..... 72½ and 10
27 to 36 ..... 72½
Coppered or Liquor Finished:
9 and coarser ..... 75 and 10
10 to 26 ..... 75 and 10
27 to 36 ..... 70 and 10 and 5
Tinned:
6 to 18 ..... 75 and 10 and 10

Pittsburgh

PITTSBURGH, PA., August 16, 1911.—*(By Telephone.)*

Pig Iron.—The pig iron market is distinctly better as regards inquiries and sales, but low prices are still ruling. Consumers believe it is a good time to cover ahead at present prices and several large purchases have been made. The Colonial Steel Company has bought 5000 to 6000 tons of basic iron from a Valley furnace for delivery over the remainder of this year at a price slightly under $13 at furnace. The Standard Sanitary Mfg. Company has inquiries out for about 3000 tons of Northern No. 2 foundry iron for its North Side and New Brighton, Pa., plants, but may buy more if the prices made are attractive. A large inquiry is reported in the market for Bessemer iron. The Carnegie Steel Company has blown in one of its three Isabella furnaces and one more Edgar Thomson furnace and is now operating 44 of its 59 blast furnaces, the largest number it has had in blast for more than a year. We quote as follows: Bessemer, $15; basic, $13 for early delivery, and $13.25 for extended delivery; No. 2 foundry, $13.50 to $13.75; malleable, $13.25 to $13.50; gray forge, $13, all at Valley furnace, the freight rate to Pittsburgh being 90c.

Steel.—In the first half of August, actual orders sent to the mills for rolling by the billet and rail sales departments of the Carnegie Steel Company showed a gain of over 37,000 tons over the same period in July and the gain for the second half of August will be still larger. The Homestead, Clairton, Duquesne, Mingo Junction, Belfaire and New Castle steel works of the Carnegie Company are this week running at 100 per cent. of capacity, for the first time in over a year and a half. This company is now operating 82 per cent. of its total ingot capacity. We note a sale of 500 tons of 4 x 4 in. open hearth billets at $21, Pittsburgh, and a sale of 300 tons of forging billets at $26, Pittsburgh. We quote Bessemer and open hearth billets, 4 x 4 in. and up to but not including 10 x 10 in., $21, base, and sheet and tin bars in 30-ft. lengths, $22; 1½-in. billets, $22; forging billets, $26, base, usual extras for sizes and carbons, all prices being f.o.b. Pittsburgh or Youngstown district, with freight to destination added.

Structural Material.—The Carnegie Steel Company has received a contract for about 6000 tons of shapes for two Government colliers to be built by the Newport News Shipbuilding & Dry Dock Company, and will also get a contract for a similar tonnage of shapes for two more colliers to be built by the Maryland Steel Company. The plates for these four boats, upward of 20,000 tons, will be furnished by Eastern mills. In the first half of August orders of the structural and plate departments of the Carnegie Steel Company showed a gain of 12,000 tons over those for the first half of July.

(By Mail.)

The steel mills are not only maintaining the improved rate of operations noted for several weeks but are increasing it. This week the Cambria Steel Company is operating all of its eight blast furnaces and its 25 open hearth furnaces. The Republic Iron & Steel Company is running practically full in its Bessemer and open hearth steel works and its finishing mills. The Carnegie Steel Company is operating this week to nearly 80 per cent. of ingot capacity, the highest rate for some months. The Jones & Laughlin Steel Company is operating its five Eliza blast furnaces, its American Iron & Steel Works on the South Side to about full capacity, and may start this month two of its blast furnaces and several of its Talbot open hearth furnaces at Aliquippa, Pa. Its Soho furnace is out for relining. The larger steel mills report that new orders and specifications against contracts are heavier than for months. Specifications against contracts for billets and sheet bars are better, and the mills will ship out more steel this month than in July. While on some lines prices of finished iron and steel are none too strong, the tone of the market is firmer. Consumers of scrap are willing to buy ahead at to-day's prices, but dealers are inclined to hold, believing that prices will be better in the near future. The market on strictly standard Connellsville coke is firmer at $1.50 per net ton at oven for spot.

Ferromanganese.—Reports as to prices for delivery next year are conflicting. It is stated that some sellers are willing to take contracts for first half at $37, Baltimore, and that some tonnage has been sold at this price. Others will not consider this price, but are holding for first half at $37.50 to $38, Baltimore. A Sharon consumer is in the market for 250 to 500 tons of 80 per cent. for first half, and the business is likely to be closed this week. Most consumers are covered over the remainder of this year. We quote 80 per cent. foreign ferro at $37, Baltimore, for remainder of this year delivery, and from $37.50 to $38 for first half of next year, the freight to Pittsburgh district being $1.95 a ton.

Ferrosilicon.—While there is practically no new demand for ferrosilicon, prices are very firm and sellers are asking higher figures. On several small lots of 50 per cent. for early shipment as high as $53 to $54, Pittsburgh, has been quoted, and the market seems to be firm at these figures. We quote blast furnace ferrosilicon as follows: 10 per cent., $23; 11 per cent., $24; 12 per cent., $25, f.o.b. cars Ashland and Jisco furnaces.

Muck Bar.—The stronger feeling in other lines of semifinished products is reflected in muck bar, prices on which are firmer. We quote best grades of muck bar, made from all pig iron, at about $29, Pittsburgh. There have been no recent sales.

Skelp.—New inquiry is light, but the mills that roll skelp for the open market have a fair amount of tonnage on their books. Prices seem to be a shade firmer. We quote: Grooved steel skelp, 1.20c.; sheared steel skelp, 1.30c.; grooved iron skelp, 1.45c. to 1.55c., and sheared iron skelp, 1.65c. to 1.70c., all for delivery at consumers' mills in the Pittsburgh district.

Wire Rods.—Mills report that specifications against contracts for wire rods are coming in a little better, but new inquiry is light. Very few rods are now sold in the open market, most consumers having their own sources of supply. We quote Bessemer, open hearth and chain rods at $27, Pittsburgh.

THE IRON AND METAL MARKETS

Steel Rails.—The Cambria Steel Company has received an order from the Southern Railway Company for 5000 tons of open hearth rails. The Carnegie Steel Company has taken several fair sized orders for standard sections in the past week, and it is said that some rather large inquiries are pending. This company received new orders and specifications in the past week for about 2500 tons of light rails. Prices on light rails are as follows: 12-lb., 1.25c.; 16, 20 and 25-lb., 1.21c. to 1.25c.; 30 and 35-lb., 1.20c., and 40 and 45-lb., 1.16c. These prices are f.o.b. at mill, plus freight, and are the minimum of the market in carload lots, small lots being sold at a little higher price. Standard sections are held at 1.25c. per lb. for Bessemer.

Plates.—The market is more active. The Carnegie Steel Company reports that its orders for plates and shapes so far this month are about 12,000 tons ahead of the same period in July. Some large car orders have been booked and others are pending. The Erie Railroad has bought 1000 composite gondola cars from the Pressed Steel Car Company, 2000 from the Standard Steel Car Company and 1000 from the American Car & Foundry Company. The Missouri Pacific is in the market for steel underframe box cars, 2000 all-steel gondolas, 500 steel underframe stock cars, 400 automobile furniture cars and 500 steel underframe flat cars. The Pennsylvania Lines West are in the market for 700 gondolas, the Illinois Central for 1000 gondolas, the Wabash for 1000 steel underframe box cars, the Frisco system for 250 steel underframe cars, the Florida East Coast Line for 300 to 500 flat cars, 50 to 60 composite gondolas and equipment for 25 steel passenger cars, the Queen & Crescent is asking for 150 all-steel gondolas, 22 all-steel coke cars and 175 all-steel hopper cars, and the Atlantic Coast Line is asking prices on eight postal cars. The general demand for plates is better and the leading mills are slightly increasing their rate of operations. We continue to quote ¼-in. and heavier plates at 1.35c., Pittsburgh, but in some cases 1.30c. is being named on specially desirable orders on both narrow and wide sizes.

Structural Material.—Bids went in last week on the steel, 6000 to 7000 tons, for the new Point Bridge in this city. The contract has not been awarded, but will likely go to the American Bridge Company, the lowest bidder. Bids have also gone in on the addition to the First National Bank building in this city, about 2600 tons. These are the only large local jobs in the market. The American Bridge Company has taken about 1000 tons of steel for new buildings for the Westinghouse Electric & Mfg. Company at East Pittsburgh. New inquiries are fairly active and the outlook is good. We quote beams and channels up to 15-in. at 1.35c., Pittsburgh.

Sheets.—New orders and specifications on sheets in the past 10 days have been very heavy and shipments by the mills this month are certain to show a large increase over July. The unsatisfactory feature of the market is prices, there being a good deal of cutting going on in black, galvanized and roofing sheets. In most cases this does not exceed $1 a ton, but in some instances it has amounted to $2 a ton. The American Sheet & Tin Plate Company is operating this week to about 70 per cent. of its hot sheet mill capacity, and the independent mills are running at about the same rate. Regular prices on black, galvanized and roofing sheets are printed on a previous page.

Tin Plate.—Little or no new business is being placed at present, but the mills report that specifications are coming in in good shape and shipments this month will show an increase over July. The American Sheet & Tin Plate Company is operating this week to 80 per cent. of its hot tin mill capacity, and this rate of operation promises to be maintained for several months. We quote 100-lb. cokes at $3.70 per base box, f.o.b. Pittsburgh.

Bars.—Most leading consumers of steel bars are now pretty well covered over the remainder of this year, and in some cases into the first half of next year, so that the actual amount of new business being placed is not as heavy as it was some time ago. Specifications against contracts are coming in freely and one or two mills report that they are from two to three weeks back in shipments. While prices are reported as being a shade firmer, it is still possible to place desirable orders for steel bars at 1.20c., Pittsburgh. The new demand for iron bars is only fair and is mostly in small lots to meet actual needs. Prices on iron bars are weak, and it is said that in some cases they are being sold below cost. We quote steel bars at 1.20c. to 1.25c., Pittsburgh. While iron bars are quoted at 1.25c. to 1.30c., Pittsburgh, these prices have been shaded.

Hoops and Bands.—There has been a considerable increase in new orders for both hoops and bands, while specifications against contracts are also coming in better. Recently there has been some slight shading in prices of hoops, but this has not exceeded about $1 a ton and is not general by any means. Shipments of hoops and bands this month promise to be heavier than in July. We quote steel hoops at 1.40c. and bands at 1.35c., extras on the latter as per the steel bar card.

Merchant Steel.—New orders and specifications so far this month are better than in July, one mill reporting nearly double the business entered so far this month as compared with last. Prices are reported firmer, but are still being shaded. Regular prices are as follows: Iron finished tire, ¼ x ½ in. and heavier, 1.40c., base; under these sizes, 1.55c.; planished tire, 1.60c.; channel tire, 1.80c., base; toe calk, 1.90c.; flat sleigh shoe, 1.55c.; concave or convex, 1.75c.; cutter shoes, tapered or bent, 2.25c.; spring steel, 2c.; machinery steel, smooth finish, 1.90c.

Rivets.—New business is showing some betterment, and consumers are also specifying more freely against contracts. We continue to quote structural rivets at 1.70c. to 1.75c. and boiler rivets at 1.80c. to 1.85c., but in very exceptional cases and for desirable business these prices are slightly shaded.

Wire Products.—New orders for wire and wire nails are still confined to small lots to cover actual needs. Jobbers and retailers are carrying as light stocks as possible, fearing that present prices may not be held. A heavier business in wire and nails is looked for when fall trade opens up. Prices on both wire and nails are still being shaded, in some cases about $1 per ton. Regular prices are as follows: Galvanized barb wire, $2 per 100 lb.; painted, $1.70; annealed fence wire, $1.50; galvanized, $1.80; wire nails, $1.70, and cut nails, $1.60, all f.o.b. Pittsburgh, with full weight added to point of delivery.

Spelter.—The market has shown a sharp advance in the past week. The new demand is heavier than for some time. We quote prime grades of Western at 6c., East St. Louis, equal to 6.12½c., Pittsburgh.

Iron and Steel Scrap.—Not a great deal of scrap is being sold at present by dealers to consumers for the reason that the dealers believe that prices will be higher in the near future, and they are disposed to hold their scrap and take chances on the market. The consumption of steel making scrap is heavier now than for some months, and it is stated that stocks held by most consumers are rather light. We note sales of 500 tons of cast iron borings at about $9.65 delivered at buyer's mill; 500 tons of machine shop turnings at $9.85 delivered and 1000 tons of heavy steel scrap at $13.25 delivered at buyer's mill in the Pittsburgh district. Dealers now quote as follows, per gross ton, f.o.b., Pittsburgh, unless otherwise noted:

Heavy steel scrap, Steubenville, Follansbee, Sharon, Monessen and Pittsburgh delivery	$13.25 to $13.50
No. 1 foundry cast	13.25 to 13.50
No. 2 foundry cast	12.75 to 13.00
Bundled sheet scrap, f.o.b. consumers' mill, Pittsburgh district	11.75 to 12.00
Rerolling rails, Newark and Cambridge, Ohio, Cumberland, Md., and Franklin, Pa.	13.50 to 13.75
No. 1 railroad malleable stock	12.75 to 13.00
Grate bars	10.75 to 11.00
Low phosphorus melting stock	16.00
Iron car axles	23.00 to 23.50
Steel car axles	17.50 to 18.00
Locomotive axles	23.00
No. 1 railroad wrought scrap	12.00 to 12.25
No. 2 busheling scrap	8.50 to 8.75
Old car wheels	13.00 to 13.25
Sheet bar crop ends	15.25 to 15.50
*Cast iron borings	9.50 to 9.65
*Machine shop turnings	9.75 to 9.85
Old iron rails	15.50 to 15.75
No. 1 wrought scrap	13.50 to 14.00
Heavy steel axle turnings	10.00 to 10.25
Stove plate	10.50 to 10.75

*These prices are f.o.b. cars at consumers' mills in the Pittsburgh district.

Merchant Pipe.—No large orders for gas or oil lines have been placed in the past week, but several good-sized inquiries are in the market. The new demand for merchant pipe keeps up remarkably well for the season, and shipments by the mills this month promise to be heavier than in July. It is stated that prices on iron and steel pipe are being well maintained, there being only occasional concessions. Regular discounts will be found on a previous page.

Boiler Tubes.—The market on boiler tubes does not

THE IRON AND METAL MARKETS

show any betterment either in new demand or prices. The new demand is light and specifications on orders are only fair. Discounts continue to be materially shaded.

Coke.—Some betterment in the new demand for furnace coke is reported, but most consumers are covered by contracts. Several furnaces, however, are buying their coke from month to month, and claim they are saving money by doing it. There is not much new demand for foundry coke, most consumers being covered. The optput in the Upper and Lower Connellsville regions is now running close to 290,000 tons per week, a material gain over two or three weeks ago. We quote standard makes of furnace coke for prompt shinment at $1.50 to $1.55 and for the remainder of the year $1.60 to $1.65 per net ton at oven. We quote 72-hr. foundry coke for prompt shipment at $1.90 to $2 and on contract from $2.10 up to $2.25 per net ton at oven.

Chicago

CHICAGO, ILL., August 16, 1911.—*(By Telegraph.)*

Mill and steel making furnace operations in this district at the present time apparently do not exceed 60 per cent. of their rated capacity. The ingot production is frequently at a greater rate than that of finished material. The necessity for placing dependence upon orders received from day to day continues to cause an intermittent operation of the mills. Progress has not been so rapid in August as was hoped for during the July spurt. The leading interest reports sales of about 32,000 tons of rails during the week. Structural business, while active, was not heavy, and contracts for fabricated steel were less than 1000 tons in the aggregate. Figures are being invited for a 4000-ton building for Chicago. Concessions in sheets and steel bars are still common, despite some improvement in the size of orders. In the scrap market dealers and brokers are disposed to hold material except when they can sell at an advance over present prices but the demand is very light. The Southern pig iron situation continues firm, as regards the asking price of $10.50, Birmingham, for No. 2, but there are practically no sales on this basis. Inquiry, particularly for malleable, is still plentiful but buying has suffered a check.

Pig Iron.—Inquiry for malleable iron is quite general, but it is understood that malleable foundries are not receiving specifications against their contracts for castings at a very satisfactory rate, and it is apparent that inquiries are allowed to drag and become old without any purchases being made. This is despite the fact that the local situation as to prices is still weak and $14.50 f.o.b. furnace will be made. Melters are asking for quotations on first quarter iron, but aside from nominal quotations furnaces are declining to consider tonnage for this delivery. Current quotations are for last half delivery. In the South the furnace attitude is firm. One interest will take business at $10.25, Birmingham, but others ask $10.50 and are not anxious for business, while $11 is still another's minimum. The amount of iron being bought at these prices is small, and, judging from the rate at which the recently purchased $10 iron is being taken, higher-priced iron will not be immediately in demand. We quote for Chicago delivery, except on local irons, which are f.o.b. furnace, the following prices:

Lake Superior charcoal	$16.50 to $17.00
Northern coke foundry, No. 1	15.00 to 15.50
Northern coke foundry, No. 2	14.50 to 15.00
Northern coke foundry, No. 3	14.25 to 14.50
Northern Scotch, No. 1	16.00
Southern coke, No. 1 foundry and No. 1 soft	15.10
Southern coke, No. 2 foundry and No. 2 soft	14.60
Southern coke, No. 3	14.35
Southern coke, No. 4	14.10
Southern gray forge	13.85
Southern mottled	13.85
Malleable Bessemer	15.00
Standard Bessemer	17.40
Basic	15.50
Jackson Co. and Kentucky Silvery, 6 per cent	17.90
Jackson Co. and Kentucky silvery, 8 per cent	18.90
Jackson Co. and Kentucky silvery, 10 per cent	19.90

(By Mail.)

Rails and Track Supplies.—Sales of standard section rails the past week aggregated about 32,000 tons for this market, all of which, with the exception of 500 tons, was included in two orders, one for the Pacific coast and one for Texas shipment. Light rails, while selling at low prices and in small quantity, show a better sales record for the past month than for several months previous. We quote standard railroad spikes at 1.65c. to 1.75c., base; track bolts with square nuts, 2.10c. to 2.20c., base, all in carload lots, Chicago; standard section Bessemer rails, 1.28c.; open hearth, 1.34c.; light rails, 40 to 45 lb., 1.16c. to 1.20½c.; 30 to 35 lb., 1.19½c. to 1.24c.; 16, 20 and 25 lb., 1.20½c. to 1.25c.; 12 lb., 1.25c. to 1.30½c.; angle bars, 1.50c. to 1.60c., Chicago.

Structural Material.—The lettings of contracts for fabricated material during the week as reported were exceedingly light, totaling only 721 tons. The American Bridge Company will furnish 233 tons for a template shop and crane runway for the Haskell & Barker Car Company, Michigan City; 200 tons for the city hospital, Minneapolis, and 123 tons for a viaduct at Moline, Ill., for the Tri-City Railway Company. Steel for the new machine shop of Williams, White & Co., Moline, Ill., 165 tons, will be fabricated by the Kenwood Bridge Company. The mill situation as regards structural shapes remains as it has been, with a fairly good booking of specifications for immediate operations. Few contracts in hand, however, extend beyond the first of the year. Future business has not been encouraged by the mills at current prices and no great inclination has been shown by buyers to anticipate the future. Prices for fabricated steel are firmer on the less attractive work, but there seems to be ample capacity remaining to take care of desirable tonnage at low prices. The movement of steel from store has been only fair. The price of plain material is being maintained with a considerable degree of regularity. We quote plain material for mill shipment at 1.53c. and from jobbers' stocks 1.75c., Chicago.

Plates.—Aside from a continuance of the tendency to permit slight concessions, the plate situation has not developed any matters of special significance. Specifications were somewhat freer, perhaps, but new business fails to show any material gains. We quote for Chicago delivery, mill shipment, 1.53c. and for store delivery 1.75c.

Sheets.—The slump in the volume of orders experienced in the latter part of July has been followed in August by some improvement. No response to this increase is indicated in the strength of prices. A weakness in the prices of sheet bars is credited with being the cause of recent concessions, opportunity being thus given to certain mills buying their bars to take business by making corresponding concessions in the finished material. Prices as much as $2 a ton below the nominal quotation are reported, but the general run of business indicates that it would be very difficult to obtain more than $1 a ton off. Out of store No. 28 galvanized sheets are now quoted at 3.45c. maximum, following a reduction of $2 a ton. We continue to quote Chicago prices as follows: Carload lots, from mill: No. 28 black sheets, 2.18c.; No. 28 galvanized, 3.18c.; No. 10 blue annealed, 1.68c. Prices from store, Chicago, are: No. 10, 1.95c. to 2.05c.; No. 12, 2c. to 2.10c.; No. 28 black, 2.45c. to 2.55c.; No. 28 galvanized, 3.45c.

Bars.—The mill situation is reported to be improving, but it is stated that for fairly attractive specifications in carload lots 1.20c., Pittsburgh, can be obtained. On the contrary, it is equally true that in some quarters a strict adherence to the regular quotation of 1.25c. will be encountered. From a tonnage standpoint bar iron is hardly more active, but asking prices are distinctly firmer and for some business a price of 1.25c. would be within the range of the market. We quote as follows, f.o.b. Chicago: Soft steel bars, 1.43c.; bar iron, 1.20c. to 1.25c.; hard steel bars, rolled from old rails, 1.20c. From store, soft steel bars, 1.70c. to 1.80c., Chicago.

Wire Products.—Very encouraging crop reports from the South and the Pacific coast have brightened the tone of trade in wire products, although the movement is still at the dull midsummer rate. Wire mills are operating at but little over half capacity. Some interest is being displayed in goods for fall shipment for fencing and other manufactured articles, but barb wire and nails show little change. Jobbers' carload prices, which are quoted to manufacturing buyers, are

THE IRON AND METAL MARKETS

as follows: Plain wire, No. 9 and coarser, base, 1.68c.; wire nails, 1.88c.; painted barb wire, 1.88c.; galvanized, 2.18c.; polished staples, 1.88c.; galvanized, 2.18c., all Chicago.

Cast-Iron Pipe.—An award of 2000 tons of 48-in. pipe was made at Minneapolis last week to the United States Cast Iron Pipe & Foundry Company, which company also took 2000 tons of 8-in. at Portland, Ore. An additional 1800 tons was also placed by that city. A number of miscellaneous small orders are reported. We quote as follows, per net ton, Chicago: Water pipe, 4-in., $25.50; 6 to 12-in., $24.50; 16-in. and up, $24, with $1 extra for gas pipe.

Old Material.—While the market of the week was devoid of important transactions, it is apparent that stocks of scrap are being held more closely in the hope that the general business improvement will bring better prices. Current demand from melters is still very small and sales that are made do not show any higher prices. Inquiries for particular grades of scrap are likely to bring out quotations considerably above the market, particularly if the material is to be sold short. Certain inquiries for scrap of somewhat irregular grading are known to have gone begging on offers which would be attractive, based on the present market prices. We quote below for delivery to buyer's works, Chicago and vicinity, all freight and transfer charges paid, per gross ton, as follows:

Old iron rails	$14.00 to $14.50
Old steel rails, rerolling	12.25 to 12.50
Old steel rails, less than 3 ft	11.25 to 11.75
Relaying rails, standard sections, subject to inspection	24.00
Old car wheels	12.75 to 13.25
Heavy melting steel scrap	10.75 to 11.25
Frogs, switches and guards, cut apart	10.75 to 11.25
Shoveling steel	10.25 to 10.75
Steel axle turnings	8.50 to 9.00

The following quotations are per net ton:

Iron angles and splice bars	$12.50 to $13.00
Iron arch bars and transoms	13.75 to 14.25
Steel angle bars	10.25 to 10.75
Iron car axles	18.00 to 18.50
Steel car axles	16.00 to 16.50
No. 1 railroad wrought	11.00 to 11.25
No. 2 railroad wrought	10.00 to 10.50
Steel knuckles and couplers	10.00 to 10.50
Locomotive tires, smooth	15.00 to 15.50
Machine shop turnings	6.25 to 6.75
Cast and mixed borings	5.50 to 6.00
No. 1 busheling	8.75 to 9.25
No. 2 busheling	6.75 to 7.25
No. 1 boilers, cut to sheets and rings	7.50 to 8.00
Boiler punchings	12.00 to 12.50
No. 1 cast scrap	10.25 to 10.75
Stove plate and light cast scrap	9.00 to 9.50
Railroad malleable	10.00 to 10.50
Agricultural malleable	9.25 to 9.75
Pipes and flues	8.00 to 8.50

Philadelphia

PHILADELPHIA, PA., August 15, 1911.

A very fair volume of business has been transacted in both crude and finished materials. While buying has not been heavy in any one line, the aggregate has enabled producers, particularly in finished products, to hold their recent operative rate and in instances to make further slight gains. Less is heard of price concessions in finished materials. In pig iron a number of fair sized inquiries are under negotiation. Steel making irons show further movement, with basic at slightly higher prices. The pig iron situation continues to drift toward the seller's side. Negotiations for material for ship and car building are still under way, and some large business is expected to develop. The old material market drags, although prices in some grades show a slight advance, based largely on recent bids for railroad offerings.

Iron Ore.—Consumers are showing a little interest in the market and some would take on small lots of low priced ore if it were available. An air of expectancy regarding possible negotiations in Swedish ore for extended delivery is also noticeable. Importations for the week ended August 12 include 6466 tons of Swedish and 16,700 tons of Cuban ore.

Pig Iron.—The movement in foundry grades continues on an unchanged basis. The usual run of small orders, principally for near future delivery, continues to be placed at prices ranging from $15 to $15.25 for No. 2 X foundry, delivered in this vicinity. The bulk of the sales have been made at prices above $15, which some producers now name as a minimum for either No. 2 X, No. 2 plain or No. 3 foundry. A number of producers hold and obtain $15.25 as a minimum for standard No. 2 X, and even at that figure are not seeking business. Quite a few inquiries for lots of 500 to 1000 tons are before the trade from general foundries and soil-pipe makers, several of which are expected to be closed this week. The cast iron pipe makers are still in the market for round lots of low grade iron; one Delaware River interest has closed for a part of its recent inquiry for 5000 tons, the only definite sale reported being a lot of 500 tons of No. 3 Southern foundry at $10, Birmingham. Virginia producers continue to report a fair volume of business in lots running from carloads up to 300 and 400 tons, for both early and remainder of the year delivery. Prices for Virginia foundry grades are unchanged at $12.25 to $12.50 at furnace for prompt and $12.50 for shipments extending over the remainder of the year. The productive rate in Virginia has decreased and promises to be further reduced by the blowing out of another furnace. Little is now heard of concessions for standard analysis Virginia foundry irons. The higher range of prices on Southern iron is practically prohibiting business in competition with Northern brands at the present range of quotations. The movement in forge iron has been light, only small sales of Northern forge for rolling mill purposes being reported at $14.25 to $14.50, delivered in this territory. Steel makers show more interest in the basic situation; a sale of about 6000 tons for fourth quarter shipment has been made at $14.75 to $14.90, delivered, while several thousand tons for prompt shipment, outside this immediate territory, were sold at a price equal to the market had the iron been delivered here. The inquiry for about 25,000 tons for the first quarter of 1912 reported last week is still before the trade; on this $15.50 delivered has been quoted, which is 50 cents above the buyer's idea, although the majority of sellers still refuse to name a price for shipment so far ahead. Sales aggregating about 1000 tons of low phosphorus iron are reported at prices ranging from $20 to $20.50, delivered. While there has been no general advance in prices of foundry grades, sellers are decidedly firmer in their views. The Eastern Pig Iron Association, which met in this city last week, reports orders for July as being somewhat larger than those in June; stocks on merchant furnace banks show a decline, while those of the steel works furnaces show a slight increase, the average, however, being slightly less than that for the previous month. The following range of prices is named for standard brands delivered in buyers' yards in this vicinity, shipment ranging from prompt to the remainder of the year:

Eastern Pennsylvania No. 2 X foundry	$15.00 to $15.25
Eastern Pennsylvania No. 2 plain	14.75 to 15.00
Virginia foundry	15.00 to 15.50
Gray forge	14.25 to 14.50
Basic	14.75 to 15.00
Standard low phosphorus	20.00 to 20.50

Ferromanganese.—Contradictory reports are current as to the firmness with which the recently named $37, Baltimore, basis for 80 per cent. is being held. Rumors that business has been done at $36.50 are heard. Very little inquiry, however, has developed in this territory and the market has not been seriously tested.

Billets.—Mills are operating largely on week to week orders, which are small individually, and then have little business booked ahead. Odd lot sales of misfit rolling and forging billets are reported at about $1 a ton under the market for standard billets. Occasionally inquiries for large lots of rolling billets come out but contracts develop slowly. Prices are firm at $23.40 for open-hearth rolling billets and $28.40 for ordinary forging billets, delivered in this vicinity.

Plates.—Eastern mills as a rule report operations at 70 per cent. of their capacity, which represents a gain of 10 per cent. over the previous week. While business is still largely confined to orders of a miscellaneous character, they are sufficient in number to enable makers to increase their productive rate. Considerable tonnage in the way of ship plates has been estimated on and car and structural plates are also being extensively figured on. Plate makers are decidedly encouraged with the outlook. Prices are being well maintained, 1.50c. delivered being held for the general run of ordinary business.

Structural Material.—While immediate business has not been particularly large, there has been a better distribution of orders and some of the smaller mills and fabricators have been getting a larger volume. Some of the more important fabricators are said to be seeking business less urgently. Several pretty fair structural propositions are in sight. The Municipal Convention

THE IRON AND METAL MARKETS

Hall will require about 6500 tons, while the quantity required for the new Stock Exchange Building has not yet been figured. Considerable business in small bridge work has been coming from the railroads, but few are requiring over 100 to 200 tons. The Pennsylvania Railroad is said to have come in the market for an aggregate of 1000 tons of such bridge material during the month past. A little more firmness in fabricated prices is reported, while plain shapes are firmly held at 1.50c. delivered in this territory.

Sheets.—A fairly steady small lot demand is reported. Eastern mills continue to operate at full capacity and have not been affected by reported concessions on Western sheets. The bulk of the business is for early delivery, consumers showing little disposition to make contracts for extended shipment. Eastern makers' prices are unchanged.

Bars.—The demand has been very light, business placed being confined to small lots for prompt shipment. Refined iron bars appear to be pretty firmly held at 1.20c. Eastern mill, but there has not been enough attractive business to test the market. Steel bars have also been quiet; less disposition to shade 1.25c, Pittsburgh, is reported, although buyers claim to be still able to do 1.20c. on attractive orders. For delivery in this territory refined iron bars are quoted at 1.27½c. to 1.32½c., and steel bars 1.35c. to 1.40c.

Coke.—The demand is less active. A few small contracts have been made for foundry coke at unchanged prices, and considerable spot lot buying is reported. Less movement in furnace coke is noted, consumers confining their purchases largely to odd lots for early shipment. The recent range of prices still prevails, the following quotations, per net ton, being named for deliveries in this district:

Connellsville furnace coke	$3.75 to $3.90
Foundry coke	4.15 to 4.60
Mountain furnace coke	3.15 to 3.35
Foundry coke	3.75 to 4.20

Old Material.—The general market drags, both buyers and sellers awaiting developments. Material offered on the recent railroad lists went largely at slightly advanced prices, consumers bidding direct, getting the bulk of the offerings. Bids slightly over $13.50 failed to get railroad steel, and it is believed that $13.75 was nearer the price obtained. Better than $16 was bid for the railroad wrought scrap. Very little business is moving between consumers and brokers, and in few instances can any quantity of the leading grades of old material be had from dealers, who are holding for higher prices. The following range of prices about represents the market for early deliveries in buyers' yards, eastern Pennsylvania and nearby points, taking a freight rate from Philadelphia varying from 35c. to $1.35 per gross ton for shipment ranging from prompt to the remainder of the year:

No. 1 railroad heavy melting steel scrap	$13.50 to $14.00
No. 1 yard heavy melting steel scrap	13.00 to 13.50
Old steel rails, rerolling (nominal)	14.25 to 14.75
Low phosphorus heavy melting steel scrap	16.75 to 17.25
Old steel axles (nominal)	19.50 to 20.00
Old iron axles	24.50 to 25.00
Old iron rails	17.50 to 18.00
Old car wheels (nominal)	13.00 to 13.50
No. 1 railroad wrought	16.00 to 16.50
Wrought iron pipe	13.00 to 13.50
No. 1 forge fire	11.25 to 11.75
No. 2 light iron (nominal)	6.75 to 7.25
Wrought turnings	9.50 to 10.00
Cast borings	9.00 to 9.50
Machinery cast	13.25 to 13.75
Railroad malleable (nominal)	11.50 to 12.00
Grate bars, railroad	10.00 to 10.50
Stove plate	10.50 to 11.00

Cleveland

CLEVELAND, OHIO, August 15, 1911.

Iron Ore.—After a long period of dullness the market is taking on a little life. Sales in small lots aggregating over 100,000 tons are reported during the week and some inquiries are still pending. Many furnace interests bought no ore early in the season and ore firms have been looking for some business during the latter part of the summer from consumers who will need a little to last them until the opening of the next shipping season. Scattered buying in small lots is therefore expected in the next few weeks, but it is not believed that the aggregate tonnage will be large. With a total movement of slightly over 14,000,000 tons to August 1 it appears unlikely that the season's shipments will exceed the estimate of 30,000,000 tons made early in the year, and it is very probable that the total will be slightly less than that. Ore companies are planning to shut down some of their mines earlier than usual this season. We quote prices as follows: Old range Bessemer, $4.50; Mesaba Bessemer, $4.25; old range non-Bessemer, $3.70; Mesaba non-Bessemer, $3.50.

Pig Iron.—The market shows a little improvement in the demand for foundry grades in this territory, and local sellers are getting a better volume of inquiry from Eastern points. The largest local sale reported is 2000 tons of No. 2 Southern to the Best Foundry Company, Bedford, Ohio, for last quarter delivery. A central Ohio pipe manufacturers has bought 1500 tons for the remainder of the year, half Northern and half Southern. The leading sanitary interest is reported in the market for a large tonnage of Northern iron for its Pittsburgh plant and 1000 tons of Southern gray forge for its Louisville plant for the fourth quarter. Northern iron is fairly firm at $13.50, Cleveland and Valley furnace, for No. 2 for the last half delivery, although a local producer is understood to have shaded this price 25c. a ton on a large inquiry. While furnace interests generally feel that for the first quarter of 1911 they should get 25c. to 50c. a ton over current prices few care to make sales for delivery beyond January 1, and not many consumers show any desire to place contracts for the first quarter or half. Southern iron is firmer. Contracts are now being made on the basis of $10.50, Birmingham, for No. 2, which has become the ruling price for the last half, but for early shipment there is still Southern iron to be had at $10.25, Birmingham. For Cleveland delivery we quote as follows, delivered, for prompt shipment and for the last half:

Bessemer	$15.90
Basic	$13.75 to 14.00
Northern foundry No. 2	13.75 to 14.00
Gray forge	13.25
Southern foundry No. 2	14.60 to 14.85
Jackson Co. silvery, 8 per cent. silicon	17.55

Coke.—Some demand is being received for foundry grades in small lots. The only sale of any size reported is 2500 tons to an Eastern consumer for the remainder of the year. Foundries are nearly all covered with contracts and they are taking shipments fairly well. No sales of furnace coke are reported in this territory on which to base prices, but $1.50 to $1.55 per net ton at oven is now the general quotation for standard Connellsville grades for prompt shipment and $1.60 to $1.70 for the remainder of the year. We quote Connellsville 72-hr. foundry coke at $1.85 to $2.15 for prompt shipment and $2.10 to $2.40 for the remainder of the year.

Finished Iron and Steel.—The volume of business is slightly better. While few orders of any great size are coming out consumers are ordering in somewhat larger lots than they have been recently, and the actual consumption of steel among manufacturing plants in this territory appears to be increasing. The steel bar market is firmer than it has been for several weeks. While desirable specifications and good sized lots for prompt shipment will doubtless still bring out a 1.20c., Pittsburgh, price for steel bars, the regular price of 1.25c. is now being more generally maintained for small lots and some mills are refusing to make any concession. Hard steel bars are being sold at 1.10c. at mill. We note the sale of about 500 tons of hard steel bars for reinforcing of two local buildings. The demand for structural material in small lots continues quite active and regular prices are being maintained. Some consumers seem to think that prices may go lower and are refusing to place contracts for future delivery. Bids will be received by the city of Cleveland August 17 for 800 tons of steel for rebuilding the Central viaduct. No building contracts requiring steel tonnage of any size are pending. The demand for sheets is moderate; regular prices are being generally shaded $1 a ton. Rivet prices remain about stationary; contracts are being taken for delivery until January 1 at 1.60c., Pittsburgh, for structural rivets and 1.70c. for boiler rivets. The demand for spikes shows an improvement, but prices are not firm. The demand for iron bars is more active. Both local rolling mills are now in operation, the Union mill having started up this week. We quote iron bars at 1.25c. to 1.30c., at mill.

Old Material.—The demand is more active and prices are firmer. One local steel plant that has not been buying scrap for some time is now in the market and is expected to contract for considerable tonnage. Another local steel plant has bought about 12,000 tons of scrap, mostly heavy steel, in the past few days and is now cov-

THE IRON AND METAL MARKETS

ered for its requirements for about two months. While considerable heavy steel has been purchased at $12.50 in the past week very little can now be picked up at that price. Dealers generally are holding to a minimum quotation of $12.75. Dealers' prices, per gross ton, f.o.b. Cleveland, are as follows:

Old steel rails, rerolling	$13.50 to $14.00
Old iron rails	15.00 to 15.50
Steel car axles	17.50 to 18.00
Heavy melting steel	12.50 to 12.75
Old car wheels	12.00 to 12.25
Relaying rails, 50 lb. and over	22.50 to 23.50
Agricultural malleable	10.75 to 11.25
Railroad malleable	12.25 to 12.75
Light bundled sheet scrap	10.00 to 10.50

The following prices are per net ton, f.o.b. Cleveland:

Iron car axles	$21.00 to $21.50
Cast borings	6.75 to 7.00
Iron and steel turnings and drillings	7.00 to 7.50
Steel axle turnings	8.50 to 9.00
No. 1 busheling	11.00 to 11.50
No. 1 railroad wrought	11.75 to 12.25
No. 1 cast	11.25 to 11.75
Stove plate	9.50 to 10.00
Bundled tin scrap	11.00 to 11.50

Cincinnati

CINCINNATI, OHIO, August 16, 1911.—*(By Telegraph.)*

Pig Iron.—Several Southern producers have advanced the asking price on No. 2 foundry to $11, Birmingham, for any delivery this year or for the first quarter of next year, but naturally they are not booking any business just now at this quotation. Southern market prices continue to show more signs of steadiness, and while $10 iron has not entirely disappeared it is only obtainable from a very few interests and strictly for prompt shipment. Quotable figures on Southern No. 2 foundry range from $10.25, Birmingham, for third quarter delivery to $10.50 for the last quarter, although $10.25 has lately been inserted in a number of contracts running to the end of the year. A St. Louis melter contracted on this basis for 1000 tons and several central and southern Ohio consumers also covered for medium sized tonnages. A central Ohio stove maker succeeded in getting 500 tons of Southern analysis iron at $10 at furnace for August-September shipment. The buying for strictly fourth quarter movement is mostly based on $10.50, Birmingham, and an Ohio manufacturer took on 2000 tons equally divided between Nos. 2 and 3 foundry at the price mentioned for the No. 2 grade. Consumers generally are contracting without sending out any inquiries, although there is one before the trade for 1500 tons of Northern foundry that is expected to close this week. A central Ohio melter wants about 1000 tons of low phosphorus iron for the last quarter, and for the same delivery Chicago territory furnishes a prospective purchaser for 1000 to 2000 tons of foundry iron, running 2 to 2.5 silicon. Northern basic, malleable and foundry irons are dull and all three are obtainable around $13 to $13.20, Ironton, for any shipment this year. A few sales of Southern charcoal have been consummated lately around $22.25 to $22.50, Birmingham. Based on freight rates at $3.25 from Birmingham and $1.20 from Ironton, we quote, f.o.b. Cincinnati, as follows:

Southern coke, No. 1 foundry and 1 soft	$14.00 to $14.25
Southern coke, No. 2 foundry and 2 soft	13.50 to 13.75
Southern coke, No. 3 foundry	13.00 to 13.25
Southern coke, No. 4 foundry	12.75 to 13.00
Southern gray forge	12.75 to 13.00
Ohio silvery, 8 per cent. silicon	16.95 to 17.20
Lake Superior coke, No. 1	14.70 to 14.95
Lake Superior coke, No. 2	14.20 to 14.45
Lake Superior coke, No. 3	13.70 to 13.95
Basic, Northern	14.20 to 14.45
Standard Southern car wheel	25.50 to 25.75
Lake Superior car wheel	19.00

(By Mail.)

Coke.—Prices on furnace coke in the Connellsville field have stiffened considerably, and for prompt shipment $1.55 per net ton at oven is about the best that can be done now. Future contract quotations range from $1.60 to $1.75. As only about 35 per cent. of the ovens are in operation in the Wise County district, prices in that field are also firmer and would average about $1.60 for prompt shipment and between that figure and $1.80 for movement during the remainder of the year. Pocahontas quotations are practically the same as those given for the Wise County district and in none of the fields is there any activity. Foundry coke ranges from $2 for prompt shipment to $2.25 per net ton at oven for extended delivery, with only small lots being contracted for. The inquiry is very light and 450 tons of stock coke, wanted locally for nearby shipment, is about the largest lot being worked on in this immediate territory.

Finished Material.—A slightly better tonnage of steel bars was placed last week, but the improvement is looked on simply as a flurry. Prices in this territory are said to be maintained around the 1.25c., Pittsburgh, basis. While there is considerable business in sheets offering, the price disturbance has caused purchasers to hold off until conditions are a little more settled. Structural material continues to hold up reasonably well and hoops are also fairly good sellers. Local warehouses quote steel bars at 1.70c. and structural material around 1.80c.

Old Material.—The railroads have disposed of a little more than the usual quantity of scrap in the past few days, but dealers are holding back taking on any very extensive tonnages, as stocks in yards are said to be large. Consumers are buying in small quantities generally, and, while there does not appear to be any chance for an early improvement in the demand from that source, prices are being firmly maintained. The approximate prices paid by buyers, for delivery in their yards, southern Ohio and Cincinnati, are as follows:

No. 1 railroad wrought, net ton	$10.50 to $11.00
Casting borings, net ton	4.50 to 5.00
Steel turnings, net ton	5.50 to 6.00
No. 1 cast scrap, net ton	9.50 to 10.00
Burnt scrap, net ton	6.50 to 7.00
Old iron axles, net ton	16.50 to 17.00
Bundled sheet scrap, gross ton	7.25 to 8.25
Old iron rails, gross ton	13.50 to 14.00
Relaying rails, 50 lb. and up, gross ton	21.00 to 22.00
Old car wheels, gross ton	10.25 to 11.00
Heavy melting sheet scrap, gross ton	10.00 to 10.50

San Francisco

SAN FRANCISCO, August 10, 1911.

The middle of July was about the dullest period so far this year. The month ended fairly well and bookings for the first few days of August have been encouraging, though the market is still very quiet. Many consumers are expected to enter the market on a larger scale next month. As prompt delivery can be had in most lines, merchants are still limiting their purchases. Sheets are in somewhat better demand, though the jobbing trade is still unsatisfactory. A lull has come in cast iron pipe, though more activity is expected soon.

Bars.—Twisted and corrugated bars still comprise a very important part of the tonnage, though there is considerable delay on a number of large concrete jobs. Current orders for soft steel bars are small, though the aggregate tonnage is a little better than last month. There is no disposition in the trade to accumulate heavy stocks. Bars from store, San Francisco, are quoted at 2c. for steel and 1.90c. for iron.

Structural Material.—New business is coming out very slowly and awards are anxiously awaited on several inquiries. Local building conditions appear fairly good, the official record showing an increase of about $200,000 for July, and the selection of the site for the Panama-Pacific Exposition is expected to have a beneficial effect. Bids have been submitted on the new high school and the Knights of Columbus building, on which orders may be forthcoming very shortly. The Pacific Gas & Electric Company is in the market for a small substation at Sacramento, Cal., and a small warehouse job is up at the same place. Figures are being taken on a court house at Placerville, Cal. For the Standard Oil Company's local building a contract is expected before the end of the year. Action is also expected within a few months on the U. S. subtreasury building. An order is expected within a few weeks for about 350 tons for a theater building at Twelfth and Franklin streets, Oakland, and plans are being drawn for the St. Paul's Church building in Oakland, which will require considerable steel. Plans are up for a hotel at Stevenson and New Montgomery streets, this city, and a large apartment house at Ellis and Mason streets, but the outlook for these structures is uncertain. The Water Board, of Portland, Ore., will receive bids September 1 for 5000 feet of iron fence with 54 posts.

Rails.—Business is beginning to come from some of the new interurban projects. The Northwestern Pacific Railroad is planning a number of improvements, including considerable double-tracking. Its new extension to Eureka, Cal., is progressing rapidly. It is announced that a line from Eugene, Ore., to Coos Bay will be built shortly by Southern Pacific interests.

Sheets.—Several local merchants who do their own corrugating are making up stock for the fall trade and have placed some substantial orders. Aside from this

THE IRON AND METAL MARKETS

buying is confined to narrow limits. Prices are still somewhat depressed in the jobbing market and may continue so for some time.

Plates.—The demand for marine plates continues fairly good, but tank plates are rather quiet. F. C. Roberts & Co. have taken the local water tank contract. The Ensign-Baker Company is preparing to install a large asphalt refinery near San Luis Obispo, Cal.

Merchant Pipe.—Bookings for the first week of August are slightly larger than for the same period last month, but the tonnage is still very light and no material increase can be counted on for the remainder of the month. Large orders are entirely lacking, either from merchants or oil operators. The Pine Mountain Water Company is using wood stave pipe for a 40-mile line near Maricopa, Cal. The town of Oakdale, Cal., is taking figures on about nine miles of 4 to 2-in. wrought pipe. Negotiations have been started for a consolidation of gas plants in Porterville and Tulare, Cal., and neighboring towns, which, if carried out, will involve the laying of additional mains.

Cast Iron Pipe.—The tonnage for the last several weeks has been lighter than for some time previous, recent bookings including nothing of special importance. Most of the business at the moment is coming from San Diego, where the gas and water companies have placed their orders. The city of Los Angeles has purchased about 250 tons of 4 to 6-in. pipe, and the People's Water Company, of Oakland, is buying some pipe of the same sizes. There is no movement to San Francisco at present. A very fair amount of inquiry is noted in Oregon and Washington, though recent sales in those States, aside from an order from Portland, Ore., have been small.

Pig Iron.—There is no general activity in the foundry trade, though some melters report a fair business and occasional small orders are being placed for foreign pig iron to arrive. The general range of values remains about as before, being $20 to $24 for ordinary brands of English, Continental and Chinese iron. No. 2 Southern foundry is nominally $20.50.

Old Material.—The market remains very quiet and all kinds of scrap are accumulating at the yards. The only movement worth noting is a shipment of 3000 tons of steel melting scrap by sea for Philadelphia by the San Francisco Iron & Metal Company. Prices are quoted as follows: Cast iron scrap, net ton, $16; steel melting scrap, gross ton, $10.50 to $11; wrought scrap, net ton, $11 to $15; rerolling rails, net ton, $11.

Birmingham

BIRMINGHAM, ALA., August 14, 1911.

Pig Iron.—A considerably larger business was done in this market last week than in the week previous. It was largely hand-to-mouth buying and comparatively small lots were taken. An aggregate of 2500 to 3000 tons for shipment during the next 60 days was sold around $10.50 per ton, and 1250 tons for strictly last quarter delivery brought $11 per ton at Birmingham for No. 2 foundry. This last consisted of two lots of 500 tons each and a lot of 250 tons, and the unusual price was secured because the brand is given preference by manufacturers of certain lines. A lot of 300 tons of special analysis iron was sold at $10.75 and warrants for 500 tons of No. 2 soft at $10.50, Birmingham. Both of the lots just mentioned are for comparatively early delivery. At this time the schedule of $10.50 per ton Birmingham is being quoted as applicable to deliveries over the remainder of the year by two producing interests only. Grades below a No. 3 foundry, in such quantities as are available, continue to bring 25 cents a ton over the usual differential on a No. 2 foundry basis. It is intimated that No. 3 foundry in round tonnage and for immediate shipment could be had on a lower basis, but sellers generally report that $10 has been their price for No. 3 since the advanced schedule became effective. The amount of No. 2 foundry that has recently been offered producers at $10 Birmingham is very attractive and indicates a disposition to speculate in forward deliveries. The latest development in this market is the announcement by one of the leading producers of an advance to $11 Birmingham for any deliveries of No. 2 during the remainder of this year. We quote the market as fairly active with figures as below being received for shipments within the next 60 days, per gross ton f.o.b. cars at Birmingham district furnaces:

No. 1 soft and No. 1 foundry	$11.00
No. 2 soft and No. 2 foundry	10.50
No. 3 foundry	10.00
No. 4 foundry	9.75
Gray forge	9.50
Mottled	9.25
Old basic	$10 to 10.50
Standard basic	10.25 to 10.75
Charcoal car-wheel iron	22.50

Cast Iron Pipe.—It is formally announced that the plant of the Dimmick Pipe Company has been sold to the United States Cast Iron Pipe & Foundry Company and that operations will soon be resumed. It is understood that with the starting of the Dimmick plant the Bessemer, Ala., plant of the United States Company will be partly closed for repairs and that the aggregate output will not be materially increased for some months. Of the round lot of water pipe recently placed for Portland, Ore., Southern producers were awarded only a part, the remainder going to the Oregon Iron & Steel Company to be made at its Oswego, Ore., plant. The small orders placed in the past week were of fair volume and many additional inquiries are now pending. Without evidence to the contrary, we quote the market as correctly represented by figures last published for such quantities as are being placed, which are as follows, per net ton f.o.b. cars here: 4-in. to 6-in., $23; 8-in., $22; over 12-in., average, $21, with $1 per ton extra for gas pipe.

Old Material.—Dealers' asking prices are probably stronger owing to the advance in pig iron, but business has not increased appreciably. The demand is principally for light cast with an occasional inquiry for steel scrap and old car wheels. We quote nominally as follows per gross ton f.o.b. cars here:

Old iron axles (light)	$13.50 to $14.00
Old steel axles (light)	12.50 to 13.50
Old iron rails	12.50 to 13.00
No. 1 railroad wrought	11.00 to 11.50
No. 2 railroad wrought	9.50 to 10.00
No. 1 country wrought	7.50 to 8.00
No. 2 country wrought	7.00 to 7.50
No. 1 machinery	9.50 to 10.50
No. 1 steel	8.50 to 9.00
Tram car wheels	8.00 to 8.50
Standard car wheels	9.50 to 10.50
Light cast and stove plate	7.00 to 7.50

St. Louis

ST. LOUIS, MO., August 14, 1911.

The movement in this market is largely on the carload order, there seeming to be no large business available for the dealers to compete over at present. Part of this is due to the fact that the buyers in this territory, to a very large extent, are on their vacations and part to the fact that a good proportion are well loaded up with material for the present and do not care to add to their stocks in the present state of affairs. The activity in old material continues unabated, especially in steel scrap, with prices well held and dealers apparently anxious to get all they can.

Pig Iron.—The pig iron sellers, seemingly, are trying to hold up the market as best they can and more than one is quoting prices with no stock from which to make deliveries, being thus the better enabled to hold fast to higher figures. Some few are letting go at concessions, but these concessions are for immediate delivery only. For last quarter delivery $10 for No. 2 Southern is the lowest possible and there is no anxiety to let go at that figure. The orders that have been coming into the market in the past week have been scattering, running, perhaps, a carload at a time and the aggregate of no imposing proportions. Little is expected in this direction before the first of the coming month. In No. 2 Northern, basic, malleable and the rest there is nothing at all doing.

Coke.—The sales of coke continue largely of the hand to mouth character. The new business for the week will not exceed 2500 tons. None of the large consumers is in the market as yet for new deliveries or for contracts.

Finished Iron and Steel.—The volume of business for the past week held up very well. No large new orders are coming in of individual moment, but the aggregate of smaller orders has been sufficient to maintain a good tonnage all down the line. An encouraging development is the renewed insistence on immediate deliveries, indicating that the buyers are being pushed on their contracts. This is especially true in structural material. In standard section steel rails the business of the week included two orders of 500 tons each and one of 6100 tons, all of which will go into the South-

THE IRON AND METAL MARKETS

west. Another inquiry for 3000 tons is out. All this business is exceptional, as the demand is usually supplied in this market for the year by this time. Plates continue in normal movement. Structural material is continuing to show a good aggregate tonnage but none of the individual orders has been of large size. The fabricators are coming into the market in pretty good shape for stock. The coal mines are ordering small quantities of light rails, but the lumber companies are out of the market apparently. Track fastenings are quiet but firm.

Old Material.—The demand for steel continues very active and all that appears is quickly taken up at firm prices, with the demand apparently unsatisfied. While there is undoubtedly considerable speculation in this market, there is sufficient actual demand to keep the dealers busy in their search for the material. All the railroad lists went at the top prices the past week and more could have been sold had it been available. Dealers' prices, per gross ton, f.o.b. St. Louis, are as follows:

Old iron rail	$13.00 to $13.50
Old steel rails, rerolling	13.00 to 13.50
Old steel rails, less than three feet	11.50 to 12.00
Relaying rails, standard section, subject to inspection	23.00 to 23.50
Old car wheels	13.00 to 13.50
Heavy melting steel scrap	11.50 to 12.00
Frogs, switches and guards cut apart	11.50 to 12.00

The following prices are per net ton:

Iron fish plates	$11.00 to $11.50
Iron car axles	19.50 to 20.00
Steel car axles	18.50 to 19.00
No. 1 railroad wrought	11.25 to 11.75
No. 2 railroad wrought	10.25 to 10.75
Railway springs	9.75 to 10.25
Locomotive tires, smooth	14.50 to 15.00
No. 1 dealers' forge	8.50 to 9.00
Mixed borings	6.50 to 7.00
No. 1 busheling	9.50 to 10.00
No. 1 boilers, cut to sheets and rings	8.00 to 8.50
No. 1 cast scrap	10.00 to 10.50
Stove plate and light cast scrap	8.00 to 8.50
Railroad malleable	8.50 to 9.00
Agricultural malleable	7.50 to 8.00
Pipes and flues	8.50 to 9.00
Railroad sheet and tank scrap	8.50 to 9.00
Railroad grate bars	8.00 to 8.50
Machine shop turnings	7.50 to 8.00

The German Iron Market

Renewal of the Pig Iron Syndicate

BERLIN, August 3, 1911.

The Pig Iron Syndicate has at last been renewed. An agreement was reached on Saturday, July 29. The organization, however, lacks something of the completeness that had been hoped for inasmuch as the concerns in the Luxemburg-Lorraine region are still holding aloof. Seven of these have maintained a sort of loose organization of their own for some time, standing in contrast relations with a combination of dealers; and three others have been and remain wholly independent. The big Rhenish-Westphalian companies with branches in the Luxemburg-Lorraine district have put their furnaces there into the syndicate. The latter will continue negotiations with the ten outsiders, hoping at least to reach a price agreement with them if they still refuse to join. Their joining, however, is regarded as exceedingly doubtful. The syndicate has also still to arrange some details with the Norddeutsche Huette, of Bremen, although that concern has already joined.

The membership of the syndicate is only 40—a surprisingly small number in view of the importance of the German iron industry. The smallness of the membership is chiefly due to two facts: The Silesian and other furnaces comprising the East German Pig Iron Association enter as a single member, and the numerous fusions of recent years have reduced substantially the number of independent furnaces. The Siegerland concerns are all in the new syndicate, although they had refused to join when the organization was first formed a year ago.

The syndicate will continue to make Essen its headquarters. The management will be assisted and superintended by an advisory council, of which Baron von Bodenhausen, one of Krupp's directors, will be chairman. He was Germany's leading representative at the recent international conference of iron and steel manufacturers at Brussels. The present organization is in the form of a joint stock company, modeled after the Steel Works Union. Henceforth buyers of iron will have to send in their orders exclusively to the Essen headquarters and no longer to the individual members. The syndicate, however, controls less than one-fourth of Germany's iron production. The allotments as now fixed amount to only about 3,350,000 tons out of an indicated total production of about 15,500,000 tons for 1911. This fact is due to the circumstance that by far the largest part of the iron made in Germany is converted directly into steel by the producers, and such iron is not under the syndicate arrangement. The final completion of the organization has given great encouragement to the trade, inasmuch as it will undoubtedly tend to smooth the way for the renewal of the Steel Works Union, negotiations toward which will be opened in a month or two.

An Effort to Advance Bars

Movements in the bar trade have been the subject of next importance during the past week. On Friday the members of the old bar convention met at Dusseldorf to discuss the situation. While they could take no binding action owing to the lack of an organization, they gave out a statement expressing their unanimous conviction that a home market price of less than 102 marks for bars of basic steel and an export price of less than 96 marks f.o.b. Antwerp should no longer be granted. Then on Monday the Dusseldorf association of bar dealers voted to advance prices 5 marks. It is regarded, however, very doubtful whether these changes will be adhered to, in view of the go-as-you-please state of things that has prevailed in the bar trade for some months. Prices are not maintained with any regularity outside of the fully syndicated products of the Union.

The band-iron association the other day adopted a price of 127.50 marks, or 5 marks less than the previous list price; but the association has for weeks been itself selling at 125 marks in competition with the independents, and it will doubtless continue to do so. In heavy plates, too, although there is a price convention, and although business in this specialty is unusually active, the price of the convention is regularly cut by about 2 marks.

The cold rolling mills have begun taking orders for the December quarter at unchanged prices; but there is no abatement of the demoralization and price cutting that have characterized this section of the trade for some weeks.

The new Pig Iron Syndicate has begun to take supplementary orders for 1911 delivery at unchanged prices. On August 20 the 1912 list will be adopted. A slight advance is looked for.

A Better Market for Steel Products

The market résumé given out at last week's meeting of the Steel Works Union is rather more favorable than hitherto. The foreign demand for heavy steel rails in particular is described as unusually large; very big orders have been taken and others are pending. The Bavarian State Railways have taken larger amounts than hitherto. Foreign inquiries for grooved rails are uncommonly heavy for the summer season and good orders have been placed. Calls for delivery of rails for mines, both on home and foreign orders, continue satisfactory. Business in structural forms is brisk and the autumn outlook is bright. The foreign market is calling for goods on order at an active pace, but shows a certain hesitancy in placing new orders, due in part to the uncertainty of conditions in the United States. The foreign market for semi-manufactured steel material has improved, but home conditions have hardly changed within the month.

The market for iron shares registered some pretty heavy gains in July, but last week there was some disappointment over the dividend of the Bochumer Gusstahl Company. The market had been looking for a big advance over last year's 12 per cent., but the new dividend is only 12½ per cent. The report, however, is an excellent one, showing gross profits of 6,250,000 marks, against 5,420,000 marks last year.

A Large Seaboard Coking Plant

This week the news from the Belgian market indicates further improvement. Prices still tend upward and are very firmly held. An interesting undertaking is about to be inaugurated near Terneuzen on the Scheldt below Antwerp, where a large coking plant is to be established. It will use English and German coal and the coke produced will be shipped in 40-ton cars to the Longwy region. Ores from the adjacent Briey district will be shipped back to the sea coast as return freight, and they will reach the lower Rhine furnaces at 1 franc per ton lower freight cost than by the pres-

THE IRON AND METAL MARKETS

ent all-rail route. Coke will be produced at Terneuzen at 17.50 francs per ton, as against 22.50 francs in Liege and Charleroi. It is planned to build 160 ovens at present, and further batteries are projected for Antwerp, Vilvorde and Ghent. It is also apparently contemplated to build iron works at some of these points. A secondary object had in view in this movement is to sell illuminating and power gas to adjacent cities, which are both numerous and thriving on the Belgian coast.

Buffalo

BUFFALO, N. Y., August 15, 1911.

Pig Iron.—The week has shown fairly good inquiry for moderate sized lots of foundry grades from New York State and New England points, but a lack of both inquiries and orders for large lots. Buyers for any considerable tonnage are apparently still inclined to preserve a waiting attitude. Orders coming in are principally for carloads and 100 to 500-ton lots. New England bookings in the Buffalo district are restricted by sales of Virginia iron at prices prohibitive of Buffalo competition. Shipments on contracts continue to go out freely, indicating a large consumption. Good sized tonnages are going forward by the Erie Canal. We quote as follows for current and fourth quarter delivery, f.o.b. Buffalo:

No. 1 X foundry	$13.75 to $14.00
No. 2 X foundry	13.50 to 13.75
No. 2 plain	13.50 to 13.75
No. 3 foundry	13.50 to 13.75
Gray forge	13.50 to 13.75
Malleable	13.75 to 14.25
Basic	13.75 to 14.25
Charcoal	16.50 to 17.50

Finished Iron and Steel.—Trade in general lines of finished products, although somewhat quieter than experienced during the fore part of the month, is of fairly good volume for this season. Specifications on contracts are being received in very good quantity, and one or two agencies report the mills being operated closer to capacity than for some time. Several orders of moderate tonnage for concrete reinforcing bars are noted. Prices for bars, plates and shapes are unchanged. A good many buyers are seeking concessions, owing to rumors that have been prevalent of lower prices having been obtained in some instances, but find they are unable to place orders at less than regular schedules. Considerable activity is reported in sheets, although the business taken is at very close figures and without profit to manufacturers. Business in structural lines continues to show pronounced activity and fabricating concerns report a large number of orders in hand and in sight. Figures are being taken this week for steel for the St. Mary's Hospital at Niagara Falls, about 400 tons. The Riverside Bridge Company, Martin's Ferry, Ohio, has been awarded contract for the fabricated steel for the Buffalo General Electric Company's office building, Buffalo, 1400 tons, to be erected by Josiah P. Wright, contracting engineer, Buffalo. The Lane Bridge Company, Painted Post, N. Y., has received contract for the structural steel for the academy building to be erected by the city of Elmira, N. Y., requiring about 150 tons.

Old Material.—There has been some demand for turnings and borings from outside districts as well as for some other grades of scrap and the local demand has also been good, with light offerings, all of which has caused a firmer feeling, with a slight advance in price in some grades. We quote as follows, per gross ton, f.o.b. Buffalo:

Heavy melting steel	$13.00 to $13.50
Low phosphorus steel	16.00 to 16.50
No. 1 railroad wrought	14.00 to 14.50
No. 1 railroad and machinery cast scrap	13.75 to 14.25
Old steel axles	18.50 to 19.00
Old iron axles	22.00 to 22.50
Old car wheels	13.00 to 13.50
Railroad malleable	12.50 to 13.00
Boiler plate	12.50 to 13.00
Locomotive grate bars	11.00 to 11.50
Pipe	9.50 to 9.75
Wrought iron and soft steel turnings	7.25 to 7.70
Clean cast borings	7.00 to 7.50

New York

NEW YORK, August 16, 1911.

Pig Iron.—Business in foundry irons continues to be substantially a small lot trade, 500-ton orders being rare. Buffalo furnaces have succeeded in establishing the $13.50 basis for No. 2 foundry iron at furnace for the remainder of the year, but it is still possible to shade this slightly on prompt iron. As a rule eastern Pennsylvania furnaces are asking $14.50 at furnace for No. 2, equivalent to $15.20 at tidewater. There has been considerable interest in the developments of the basic situation for the first quarter of 1912. Few furnaces will entertain proposals for such shipment either in steel making or in foundry iron. However, some business has been done in basic for delivery this year at $14.75 to $14.90 at buyers' works. It is reported that a further order for basic for New England consumption has been taken by a Virginia furnace. Pipe foundries are buying lots of both Northern and Southern iron where the figures meet their views. One such transaction in Southern iron is reported at $10, Birmingham, for No. 3. We quote as follows for Northern iron, tidewater delivery; No. 1 foundry, $15.50 to $15.75; No. 2 X, $15 to $15.50; No. 2 plain, $14.75 to $15.

Finished Iron and Steel.—The betterment in the promise of increasing business in finished lines, indicated in last week's sentiment, has more tangible expression in the further accumulation of structural work not yet awarded, in a stiffening of bar-iron prices and in assertions of a stable price in plates. The contracts actually handed out are not specially encouraging. In steel bars those in the strongest position are probably reinforcement bars for concrete structures. Plates have shown a slightly increased demand in the local market and bar iron is distinctly better. Considerable interest is taken in the Filene department store building in Boston, involving 5000 to 6000 tons, but bids may not go in until early next week. The exposition or auditorium building in Fairmount Park, Philadelphia, will require 2000 to 3000 tons. Some of the recent structural awards are: McDonald building, East Nineteenth street, 300 tons, to Lackawanna Bridge Company; Lillie building, Waterbury, Conn., 300 tons, to the Lehigh Structural Steel Company, Allentown, Pa.; Boston & Maine bridge, Greenfield, Mass., 1750 tons, to Phoenix Bridge Company; power house for Yadkin River Power Company, Peedee, N. C., 500 tons, to the Virginia Bridge & Iron Company; building for Standard Oil Company, Baltimore, 200 tons, to Lauer & Harper, Baltimore; Central School, Troy, N. Y., 350 tons, to American Bridge Company, which also recently took the 500-ton Times-Despatch building in Richmond, Va. Quotations are: Plain structural material and plates, 1.51c. to 1.56c.; steel bars, 1.41c. to 1.46c.; bar iron, 1.30c. to 1.35c., all New York. Plain material and plates from store, New York, 1.80c. to 1.90c.

Cast-Iron Pipe.—A fair volume of business is reported, with carload lots of 6-in. quoted at $21 to $22 per net ton, tidewater.

Old Material.—Perhaps old wrought pipe has been the most active form of old material in the past week, and the movement has resulted in slightly lower prices. The accumulations of cast scrap are considerable but foundry operations are not such as to create any special demand. Some variations appear in the prices of foundry scrap, the question of credits being a factor. Eastern Pennsylvania steel works have done little in melting stock but the scrap dealers consider the purchase of pig iron an indication that the demand for old material may improve. Quotations are as follows per gross ton, New York and vicinity:

Old girder and T-rails for melting	$11.00 to $11.50
Heavy melting steel scrap	10.75 to 11.25
Relaying rails	20.50 to 21.50
Rerolling rails (nominal)	12.25 to 12.50
Standard hammered iron car axles	22.00 to 22.50
Old steel car axles	16.50 to 17.00
No. 1 railroad wrought	13.50 to 14.00
Wrought iron track scrap	11.50 to 12.00
No. 1 yard wrought, long	11.50 to 12.00
No. 1 yard wrought, short	10.50 to 11.00
Light iron	4.50 to 5.00
Cast borings	7.00 to 7.25
Wrought turnings	7.25 to 7.75
Wrought pipe	10.50 to 10.75
Old car wheels	10.75 to 11.25
No. 1 heavy cast, broken up	10.75 to 11.25
Stove plate	8.50 to 9.00
Locomotive grate bars	9.00 to 9.50
Malleable cast	10.50 to 11.00

Ferroalloys.—Consumers are asking for some good round lots of ferromanganese and dealers here are quoting at $37 for delivery through next year. Very little ferrosilicon is being asked for in this market.

THE IRON AND METAL MARKETS

Metal Market

NEW YORK, August 16, 1911.

The Week's Prices

Cents Per Pound for Early Delivery.

	Copper, New York.			Lead.		Spelter.	
Aug.	Lake.	Electrolytic.	Tin. New York.	New York.	St. Louis.	New York.	St. Louis.
10	12.75	12.62½	43.05	4.50	4.45	6.00	5.80
11	12.75	12.62½	43.00	4.50	4.45	6.05	5.85
12	12.75	12.62½	.....	4.50	4.45	6.10	5.90
14	12.75	12.62½	43.00	4.50	4.45	6.10	5.90
15	12.75	12.62½	43.50	4.50	4.45	6.20	6.00
16	12.75	12.62½	44.00	4.50	4.45	6.15	5.95

Pig tin is very scarce, and a premium of 2½c. is asked for spot supplies. Copper is rather easy. Spelter continues to advance. Lead is strong.

Copper.—The copper situation is attracting very little attention from buyers who refuse to stock up at prices now asked. Dealers are disappointed, as it was fully expected that the recent excellent report of the Copper Producers' Association would induce consumers to enter the market. There are reports of some sales of electrolytic copper at a shade less than 12.60c., but the usual price demanded is 12.62½c., while Lake is offered at 12.75c. There is really not enough buying to test the market. The London market is very quiet but firm. This morning spot copper was offered there at £56 3s. 9d. and futures at £56 18s. 9d.

Pig Tin.—Not within the memory of some of the oldest dealers in pig tin have spot stocks been so short as they are at the present time. The strike among London dock workers has tied up shipments. Attempts which were made to send tin by way of Southampton and Liverpool were unsuccessful. The consequence is that the London market is glutted while no tin is to be had here. It is only through the good will of one of the largest consumers of pig tin that dealers have been able to supply stocks where they were badly needed. Just now any one who is short of pig tin in this market is in a very bad way, as yesterday attempts to locate a few one-ton lots were unsuccessful and the day before there were some small sales at 43.50c. This was a premium of 2¼c. on the import price. To-day the market here was up to 44c., while in London the market was quiet with spot offered at £190 and futures at £187 7s. 6d.

Tin Plates.—A good demand for tin plates is coming in from jobbers, and can manufacturers are specifying for a few lots. The price is unchanged at $3.94 for 100-lb. coke plates. The quotation on foreign tin plates is unchanged at 13s. 9d. at Swansea.

Lead.—Lead continues to be offered relatively cheaper in New York than in St. Louis. In the latter market the leading interest is meeting the quotations of the outside sellers, but here they are offering lead at fully 15 points less than the St. Louis parity. Consumers are not taking very large stocks and this morning's quotations were 4.45c., St. Louis, and 5.50c., New York.

Spelter.—The spelter market has been steadily advancing as a result of a scarcity of ore in the Joplin district. Labor troubles there have been threatening to limit production. Consumers are buying very freely and the market went to 6c., St. Louis, yesterday, but was down 5 points this morning. Quotation, New York, is 6.15c.

Antimony.—Antimony continues weak, although an increased demand has strengthened prices of Chinese and Hungarian grades. Hallett's is 7.75c.; Cookson's is firm at 8.50c., and Chinese and Hungarian grades are 7.75c.

Old Metals.—The market is inactive, with dealers' selling prices, New York, nominally unchanged, as follows:

Copper, heavy cut and crucible	$12.00 to $12.25
Copper, heavy and wire	11.50 to 11.75
Copper, light and bottoms	10.75 to 11.00
Brass, heavy	8.00 to 8.25
Brass, light	6.75 to 7.00
Heavy machine composition	10.50 to 10.75
Composition turnings	8.75 to 9.00
Clean brass turnings	8.00 to 8.25
Lead, heavy	4.20 to 4.25
Lead, tea	3.95 to 4.00
Zinc, scrap	4.25 to 4.30

Chicago

AUGUST 14.—A generally quiet week has prevailed in the metal trade, with prices for spelter and sheet zinc slightly higher. Tin quotations have fluctuated, with prices fractionally lower at the end of the week. We quote, Chicago delivery, as follows: Casting copper, 12.65c.; Lake, 13c., in carloads, for prompt shipment; small lots, ¼c. to ⅜c. higher; pig tin, carloads, 43c.; small lots, 45c.; lead, desilverized, 4.52½c. to 4.55c. for 50-ton lots; corroding, 4.72½c. to 4.75c. for 50-ton lots; in carloads, 2½c. per 100 lb. higher; spelter, 5.95c. to 6.00c.; Cookson's antimony, 9¼c., and other grades, 8¼c. to 8¾c., in small lots; sheet zinc is $8 f.o.b. La Salle, in carloads of 600-lb. casks. On old metals we quote for less than carload lots: Copper wire, crucible shapes, 10¾c.; copper bottoms, 9½c.; copper clips, 10¼c.; red brass, 9½c.; yellow brass, 7½c.; lead pipe, 3.90c.; zinc, 3.90c.; pewter, No. 1, 26c.; tinfoil, 33c.; block tin pipe, 37c.

St. Louis

AUGUST 14.—The metal market is in a very satisfactory condition, with the demand good and prices well held. Tin is higher, being 43.45c. against 42.85c. last week. Copper is firm at 13.10c. for Lake and 13c. for electrolytic. Cookson's antimony is well held at 8.85c. Lead is quiet, but the quotation is firm at 4.47½c. Spelter is higher and strongly held at 6c. In the Joplin market the past week the top price for blende was $47 per ton and the basis price was $45 for 60 per cent. zinc. The bulk of the ore brought around $43.50. The weekly output of blende will not be more than 4000 tons for several weeks, as the mines are not yet free from the surplus of water which has been bothering them. The normal output is about 5500 tons per week. At the new price, too, Mexican importations of ore begin to make themselves felt. Calamine was strong at $21 to $24 per ton, with choice lots running as high as $28. Lead ore is stronger at $62 per ton for the top price. Prices of old metal follow: Light brass, 5c.; heavy brass and light copper, 8c.; heavy copper and copper wire, 9c.; zinc, 3c.; lead, 3¼c.; pewter, 20c.; tinfoil, 29c.; tea lead, 3c.

Iron and Industrial Stocks

NEW YORK, August 16, 1911.

The more cheerful feeling in the stock market in the early part of last week, resulting from a slight recovery in prices, was dissipated on Friday, August 11, by a further break which was continued in the market of Saturday, the prices reached on the latter day being the lowest in many weeks. Two weeks of falling prices have raised new questions as to the business situation in the remainder of the year, evidences appearing in the stock market of urgent liquidation. The unfavorable government crop estimates as of August 1 were held, in part, responsible for the further recession. The market showed a slight upturn on Monday of this week and there was a further advance on Tuesday. The range of prices on active industrial stocks from Wednesday of last week to Tuesday of this week was as follows:

Allis-Chalmers, com.	6¼	Pressed Steel, com..	32 - 33¾
Allis-Chalmers, pref.	20 - 22⅞	Pressed Steel, pref.	99¾
Beth. Steel, com.	30 - 32¼	Railway Spring, com.	30¾ - 34
Beth. Steel, pref.	58¼ - 61⅞	Railway Spring, pref.	101⅞
Can. com.	9 - 9¼	Republic, com.	25 - 28⅜
Can. pref.	81½ - 84	Republic, pref.	90⅜ - 92⅝
Car & Fdry, com.	49½ - 53¼	Sloss, com.	45 - 47½
Car & Fdry, pref.	115⅝-116½	Pipe, com.	13⅜ - 14½
Steel Foundries	36 - 38	Pipe, pref.	51½ - 53
Colorado Fuel	29 - 30½	U. S. Steel, com.	71⅝ - 75⅛
General Electric	151½-154¾	U. S. Steel, pref.	115½-117⅜
Gr. N. Ore Cert.	46¾ - 53⅛	Westg. Elec.	64 - 66
Int. Harvester, com.	114⅝-118	Am. Ship, com.	54½ - 56
Int. Harvester, pref.	120⅛-124¼	Chic. Pneu. Tool	47½ - 48¾
Int. Pump, com.	32¾ - 38	Cambria Steel	44½ - 45⅞
Int. Pump, pref.	87	Lake Sup. Corp.	23½ - 25
Locomotive, com.	36 - 38	Pa. Steel, pref.	106 -106¾
Locomotive, pref.	104 -107½	Crucible Steel, com.	12- 12¼
Nat. En. & St., com.	17	Crucible Steel, pref.	79½ - 81
Nat. En. & St., pref	94½ - 96		

Directors of the United States Cast Iron Pipe & Foundry Company met August 15 and voted to omit the usual quarterly dividend of 1¾ per cent. on the preferred stock for the three months ending August 31. Earnings were said to be more than sufficient for the dividend, but the management thought it advisable to take additional properties and make improvements.

The law for factory illumination in Holland stipulates that the employment of women and young children is forbidden in works in which the artificial light is normally required between 9 a. m. and 3 p. m. An illumination of 1½ foot-candles is specified as the minimum for certain processes exceptionally trying to the eyes, such as embroidery, type setting, engraving, drafting, instrument making, knitting, quilting, etc., and a minimum of one foot-candle in less exacting occupations.

An Improvement in Sulphur Tests

A Method That Insures Against Errors

BY GEORGE AUCHY.*

In *The Iron Age* of November 10, 1910, the writer brought up the fact that the ordinary cadmium chloride evolution method for sulphur in steel and iron possesses not only the plus hydrocarbon error avoided by Wood by filtering but also a minus error from dissociation of a part of the sulphuretted hydrogen in solution before titration. This latter error is to a certain extent avoided by filtering on account of the cadmium sulphide dissolving slowly in that case, and thus permitting the titration to head off the loss to a certain degree—sometimes perhaps completely. To insure entire accuracy and reliability, therefore, it was found only necessary to add to the precaution of Wood (filtering the cadmium sulphide) that of keeping the iodine in excess of the sulphuretted hydrogen all through the titration. This can best be done, it has since been found, by pouring on the folded-up filter containing the cadmium sulphide and resting in the 8-oz. Fresenius nitrogen bulb in which the precipitation was made, 50 c.c. of 1 to 1 dilute hydrochloric acid previously diluted and mixed with 125 c.c. water, the bulk of the iodine solution that will be required in the titration, and the starch solution. After cleaning out the delivery tube into this mixture the nitrogen flask is agitated until the blue color of the solution first turns to purple, and the titration is finished with the observance of the precaution to add the iodine solution promptly at the appearance of the purple each time.

Filtration Avoided

But filtering the cadmium sulphide, it was found, added greatly to the time and labor of the method and became irksome, and it was wondered if something could not be found which if added to the contents of the nitrogen bulb would neutralize or prevent the disturbing influence of the dissolved hydrocarbons upon the titration, and thus make filtration unnecessary, and permit the use of the author's titration precaution directly on the cadmium sulphide suspended in its liquid. By accident such an inhibitive substance was found to be dilute hydrochloric acid in large excess (50 c.c. in excess of the amount necessary to neutralize the ammonia), with the 7 c.c. ammonia habitually used at that time. But when this amount of ammonia was increased to 10 c.c., as was afterwards found advisable, then the 50 c.c. acid in excess failed of entirely preventing the error, and larger amounts seemed inadvisable. But at this point it was discovered that it was not dissolved hydrocarbons that affected the titration and brought results too high, but simply the slight heat (imperceptible to the hand with the 7 c.c. ammonia first used—that a perceptible heat means high results was well known), generated by the acidification, and that therefore all that was necessary to avoid this error was to cool the liquid before acidification to such a point that the heat ensuing just brought the temperature normal for the titration. At the same time the 50 c.c. excess hydrochloric acid was used as an additional safeguard. Still another safeguard, it was later found, is the running of the liquid containing the suspended cadmium sulphide by degrees, and not all at once, into the mixed water, iodine solution, and starch as below described. In detail:

A 4-gram factor weight of drillings is placed in an 8-oz. Erlenmeyer flask, 50 c.c..; strong hydrochloric acid quickly poured on, and the flask quickly connected with a Troillius bulb holding water, which in its turn is connected by a 100 c.c. pipette (narrowed in the middle of the bulb and top of tube cut off short) with an 8-oz. Fresenius nitrogen bulb containing about 35 c.c. cadmium chloride solution made up as follows:

First stock solution of one pound in 2000 c.c. water. Then 100 c.c. of this mixed with 300 c.c. strong ammonia and 600 c.c. water. After connection, a low flame is applied and when drillings are dissolved, the solution is boiled until the second small bottom bulb of the Troillius gets too hot for the fingers to grasp. The flask is then detached while still boiling, and the apparatus well blown through by the mouth. The Troillius bulb is then placed in cold water and the pipette detached from the nitrogen flask (but not from the Troillius bulb) and stood in a small beaker. The nitrogen flask is provided with a short piece of gum tubing attached to the bulbs at the side. The cadmium sulphide precipitate and cadmium chloride solution are drawn up into these bulbs and kept there by a Mohr compressor clipping the gum tube. Then into the flask thus emptied is poured a mixture of 60 c.c. dilute (1:1) hydrochloric acid, 115 c.c. ice water (ordinary drinking water), the bulk of the iodine solution that will be required in the titration, and a little starch solution. Then to this mixture in the nitrogen flask are transferred the contents of the Troillius bulb and pipette and of the little beaker. The contents of the bulbs at the side are run down into this liquid little by little with shaking, until the color first changes from blue to purple. A few drops of iodine solution are then added from the burette—enough to restore the blue color, and as much more as one dares—and a little more of the cadmium sulphide and cadmium chloride run down from the side bulbs, and so on until these bulbs are emptied and the titration in them finished.

The iodine solution is standardized, not by a standard steel—a very inaccurate process unless the precaution has been observed in the standard aqua regia method to dissolve the drillings with painful (perhaps several days) slowness—but by permanganate and thiosulphate; 10 c.c. of permanganate of iron, strength 0.005585, sets free 0.12692 gram of iodine from excess of potassium iodine acidified with sulphuric acid. But the titration by the thiosulphate must be made promptly in order that the sulphuric acid may not have time enough to also set free some iodine.

Counteracting Errors

As the two errors of the usual method are opposite and therefore tend to counteract each other, it may happen that an investigator may get the same result by the modification described in this paper as by the usual method. But he must not therefore rashly conclude that there is "nothing in" the precautions herein recommended. To satisfy himself of the reality of the Wood error, he need simply make a test as above directed, except with the use of ordinary water instead of ice water, the running in of the cadmium sulphide and chloride all at once instead of by degrees, and the omission of the large excess of hydrochloric acid. To test the reality of the writer's error, on the other hand, let him use the ice water, the 50 c.c. dilute hydrochloric acid in excess and the running in gradually, but omitting the iodine solution from the mixture in the nitrogen flask and titrating as usual. The results of this investigation would occupy considerable space and are therefore omitted from this article.

*Laboratory of Henry Disston & Sons, Inc., Philadelphia

Sailing Dates in Foreign Commerce.—A bulletin is about to be issued at Washington by the Department of Commerce and Labor, through its Bureau of Statistics, giving sailing dates from the principal ports of the United States to the principal ports and countries of the world. The publication, which is to be issued as a monthly bulletin or poster, is intended to furnish advance information as to the dates in September at which merchandise may be exported from the ports of the United States to the various ports or countries of the world. It shows that more than 100 different steamship lines or companies have regular sailings from the ports of the United States, and that the fixed dates for sailings during the month of September, as reported to the Bureau, alone number nearly 700. The ports of the country from which there are regular sailings number about 20, and the ports in foreign countries for which sailing dates are named number about 75. This bulletin will be supplied free of charge to those requesting it.

At the recent annual meeting of the Federal Steel Foundry Company, Chester, Pa., Henry S. Grove, H. W. Hand and Albert Strauss, New York, were re-elected directors. Henry S. Grove was elected president, H. W. Hand, vice president, and Charles T. Taylor, secretary and treasurer. The control of the company is owned by the Wm. Cramp Ship & Engine Building Company, Philadelphia.

Systematic versus Scientific Management

A Word of Caution Against Precipitate Introduction of Radical Shop-Working Measures

BY F. C. PECK*

It is hardly possible at the present time to pick up a trade journal or magazine without seeing something about "scientific management." It seems to be a craze for every one who has ever done anything along this line to rush to the front with it, seemingly for fear that unless he gets it before the public, the two or three most prominent exponents of "scientific management" will absorb all the future credit for what seems to be a new era in industrial management.

It is not my intention to argue against a movement toward greater efficiency. I believe in it thoroughly, but I am afraid that it will be much overdone. Attempts will be made to follow fixed laws without the keen discrimination necessary, and disappointments will be sure to follow.

According to Century dictionary, "scientific management" as applied to manufacturing would be a management that had acquired accurate and systematic knowledge of the principles by observation and deduction. This seems to apply to the so-called "scientific management" perfectly, and I have no fault to find if we leave out the word "accurate." On this word the success or failure of the experiment may hinge.

From the layman's point of view, how are we going to know when we have acquired the accurate principles, and if we lay out a system accordingly and inaugurate it, what will happen to it if we discover that the acquired principles are not accurate? The decision as to the accuracy of the acquired principles will rest with the man we have hired as the "scientific management" expert, and the success of the venture will depend entirely upon his ability. He would have to be given full power, and large sums of money would be spent before the results were known. If he does not turn out to be the right man it will not take many experiments of this kind to make owners think there is nothing in it.

The Dependence on Right Man for System Manager

The difficulty of obtaining an A-1 man for any special position and the number of candidates to be tried out is well known, and it would be greater in the case of a scientific manager, because it is comparatively new and accurate knowledge as to his ability hard to obtain. The importance and difficulty of getting the right man is clearly cited by one of the foremost exponents of "scientific management" in his paper on "Shop Management." He says:

> The first step after deciding on the type of organization should be the selection of a competent man to take charge of the introduction of the new system, and the manager should think himself fortunate if he can get such a man at any price.

This statement is so strong that it implies that the success of his system depends upon the ability of the man introducing it. There are a number of men in different parts of the country who are thoroughly capable of installing and carrying out "scientific management," and these men will make a success of it; but there will be a hundred who have had only a smattering of training along this line and who are not so capable. These are the ones to look out for, because they only think they know, and a great deal of money will be spent and many a shop turned up side down before one realizes that he has the wrong man.

Not One Best Working Method for All

Several of the most widely-known exponents of "Scientific management" state specifically that there is just one best way for every man to do a given piece of work. I do not agree with this except as applied to the most primitive work. There is a best way for a man to do a piece of work but this way may not be the best for another man. No two people think and act alike and the best set of movements for one man may be entirely wrong for another owing to his particular make-up. At work requiring skill a man who is speedy and naturally deft with his hands would have a different best way from the man who is less skilful and less speedy but stronger. I wonder how many would actually be competent to decide which is the one best way to play baseball and what kind of a game it would be after the players had been instructed in this way and tried to use it. No doubt every barber shop in the country could furnish one or more experts who could tell how it should be done and the game would be benefited just about as much as some industrial plants are by installing "scientific management."

Collecting Unnecessary Data

From the foregoing it might be inferred that I am against "scientific management" and that I am not in favor of the general movement toward greater efficiency. To prevent this article giving the reader the wrong impression I want to state positively that I am in favor of any system which will produce more and better work for less final cost, provided the workman receives a percentage for his increased effort and skill. I am also in favor of collecting and keeping the necessary records for conducting the business in a systematic manner but no more. Collecting unnecessary data costs money and is of about as much use as tail feathers would be on a pig. Systematic management would be a better name for the particular brand that I favor, because if a business is systematically reorganized from top to bottom by a competent man the leaks and weaknesses will be discovered. It will also be found where new blood is needed and then the best attainable should be gotten.

An industry with a first-class man in charge of the manufacturing and working piece work will not be benefited much by "scientific management" because if the man is first-class he will systematize and organize everything under him and he will have actual knowledge of the details of all the work and know whether or not his costs are right. He will also have the necessary records to do this with, if he has to sit up nights to get it. He will be in fact systematic manager and a scientific manager according to some without the planning department. He is his own planning department and having *accurate knowledge* of the details of the work will only need clerks to tabulate it for him. He will not be fooled by the many excuses followed by the sharp ones to get a high rate because the men soon know how much the boss can be fooled. He will not insist on every man doing a piece of work the exact same way, even his way if he can produce results another way.

Cases of Costly Scientific Management

In one small shop with which I am familiar, an expert (?) has succeeded in saving $965 per year over previous methods, but the collection of the enormous amount of data necessary for him to do this cost $1,000 for the same period, and as every slight change in the article manufactured makes most of these data obsolete, no reduction of this $1,000 is in sight. Adding the salary of the expert, this makes "scientific management" in that shop rather costly.

A man who thoroughly understood his business would have figured out the saving and compared it with the cost of collecting the data before going ahead. He should have seen that there was no saving, and then either reported this finding or attacked the problem from a different angle.

Another expert told a certain large concern, after spending several days in its plant, that its drilling was costing ten times what it ought to, and being a very fluent talker he was employed. He went around the shop and picked out the best men and induced them to drill a number of different size holes for him in the quickest possible time.

*General superintendent, Cleveland Twist Drill Company, Cleveland.

He plotted these results and according to the rules laid down by the different writers, he made an operation sheet with prices for the drilling. In his estimation he had accurate and systematic knowledge of the job on hand and all that remained was to get the management to stand behind him and the results would be forthcoming. Some of the results were: a hairbreadth escape from a good healthy strike; loss of a number of good men; a barrel of burned-up drills; another of broken ones; a carload of scrap castings, and a state of affairs in general that made the owner "hit the ceiling" every time anything about "scientific management" was mentioned.

Incompetent Managers the Cause of Failures

The reason for this failure was the lack of judgment and ability of the expert. He should have known that hard dirty castings could not be drilled at the same rate as soft clean ones, and that wornout drill presses with a great deal of spring in them would break drills if pushed too hard. If he insisted on drilling at this rate, he should have seen that his working conditions corresponded with his test conditions, both as to material and machines. He should have taken the human factor into account or instituted a system of inspection and routine so accurate as to be able to ignore this element.

A man who understood his business afterward put this shop in good order and succeeded in doing the drilling for about one-fourth of what they were originally paying. He systematized the work, organized the inspection of material and put it on a straight piece-work basis. I am afraid he would not be called by some authorities a "scientific manager," but he produced results at a very low cost, and when I visited this place I formed the opinion that it would be a long time before any expert would be able to lower the cost in this plant.

Disastrous So-Called Scientific Management

Another well-known concern with an enviable reputation for good work was built up and managed by two men; one in charge of the business end, the other of the entire manufacturing. The business started in a small way and, owing to the energy and ability of the two men, grew until they employed about 400 men. The business was profitable and healthy but the two men running it were sadly overworked, and needed each a good assistant to carry part of the load. The stockholders decided that what they needed was "scientific management"; that they had outgrown their system and that the two men who had built up the business did not know what modern organization was, but they might handle the new organization after they were properly trained.

After the scientific management expert got the place organized (?), the man who formerly handled the business end was made general manager with the office of secretary and treasurer, and given as assistants an office manager, chief engineer and chief draughtsman. The man who looked after the entire manufacturing end was made superintendent and given as assistants an assistant superintendent, master mechanic and production expert. It is hard to believe that stockholders could be talked into this large increase in the overhead against the advice of two such capable men, but they were firm in their opinion that they were behind the times.

The red tape under the new system handicapped the heads of the business and in turn every one down the line to such an extent that orders could not be got out, mistakes of costly nature occurred, traceable to errors in the engineering department or to improper relations between this department and the factory. New ways f doing things raised the cost in place of cheapening it. This was partly due to the friction in the organization and too many bosses; it took more time to correct errors than it formerly did to do the work. This company struggled along with this state of affairs for nearly two years and is at the present time in the hands of a receiver.

Human Factor of the Utmost Importance

Most of the writers on "scientific management" fail to place the proper value on the human factor. In my estimation it is of the utmost importance, and I believe when the end is reached it will be found that the saving effected will be inversely proportional to the skill required to do the work.

Most of the examples of large reductions in cost are those which require little or no skill and no brains at all. It seems perfectly logical to state that the more brains a man uses and the more skilful he is, the harder it is to improve on his methods. This has been my experience, and it is not at all uncommon to find skilful men producing first-class work in rapid time by almost diametrically opposite methods. How many of the experts are qualified to say which method is the right one, and would the man using the other method be let go if he could not maintain the required pace when forced to work by another method than the one at which he can produce results?

Again, some men are so skillful that they would make a poor method successful, and some are unskilful enough to make a failure of a good method. The man who can discriminate in this case will have to have no small amount of judgment and ability, and while I admit there are some who are qualified in this respect, there is going to be an epidemic of experts who will make enough failures to discredit the system.

Initiative of Mechanic Not to Be Checked

My principal objection to "scientific management" as laid down by several of the best known writers is that it tends to destroy the ambition of mechanics, because they are not allowed to work and think for themselves, but must follow a blueprint. It is well known that real first-class mechanics will usually find quicker and better means for doing the work than any imported expert, and this skill ought not to be hampered.

Twenty years ago apprentices were taught to be all around mechanics. When they were given good work to do, they were told that Sam Jones did it the last time in nine hours and the work was O. K. The apprentice's ambition was to scheme to do it in less time, because Sam Jones' ability was a well-known standard in that locality. He looked forward to the day when his work was to be held up to someone else following him up the ladder. His ambition was to be the best all-around machinist in the town, knowing that when he had that reputation he could command a high salary and have a standing of importance in the community.

In most shops to-day apprentices are made into specialists and there is a scarcity of all-around men. The majority of the good shop managers I am acquainted with were once skilled tool makers, and when a good mechanic has learned to think he usually makes good. Training the rank and file as specialists for manufacturing is the correct idea but let us have all the first-class tool makers we can educate.

Blueprint Working Not a Training for Skilled Leaders

If we adopt systems which take away the ambition and initiative of the future skillful men, we will find ourselves without the very ability and skill which will be needed at the productive head of any systematized industry.

The prime requisites for a systematic producer are ability, judgment and "stick-to-itiveness" and he can hardly be a "top notcher" unless he has had enough practical training to make him entirely familiar with all the details. If none of this kind of men is trained and we are forced to put either blueprint-trained men or the best of the automatons in charge of our production in the future we can expect but little advancement. The United States is ahead of the world in mechanical manufacturing and it is due principally to the efforts of good mechanics who have trained themselves to be good thinkers as well. We want greater efficiency all along the line—managers, engineers and workmen—but we don't want any kind of system which handicaps originality, thought and skill in the workman, engineer or manager. We should strive to make more good mechanics and induce them to study and think so that when needed they can fill responsible positions.

The Knox Pressed & Welded Steel Company, Niles, Ohio, and the Keystone Furnace Construction Company, the latter being patentee of the Knox welded-steel water cooler ports, doors and frames for open hearth furnaces, have removed their offices from the Fulton Building to room 618 Farmers Bank Building, Pittsburgh.

The Steel Corporation Investigation

George W. Perkins and W. C. Temple, Steel Pool Commissioner, Give Testimony

George W. Perkins, a member of the Executive Committee of the United States Steel Corporation and formerly chairman of its Finance Committee, gave testimony before the Stanley Committee at Washington last week, his examination covering three days. The questions of Chairman Stanley and other members of the committee covered a wide range. In the first place the purchase of the Tennessee Coal, Iron & Railroad Company by the Steel Corporation was taken up and again gone into in detail, but without developing any new information. To the suggestion of conspiracy to drive the Tennessee property into the market Mr. Perkins said nothing was ever more false than such a statement. Mr. Schley, he said, having loans to meet, wanted in any way possible to pay his obligations and the situation was such that the Steel Corporation was his only available relief.

Questions were asked as to J. P. Morgan's relation to the Steel Corporation and Mr. Stanley read from the minutes of the Executive Committee of the Corporation a statement by Judge Gary to the effect that Mr. Morgan was the financial head of the house that had the responsibility of bringing out the Steel Corporation and he (Judge Gary) thought that Mr. Morgan should have the opportunity of being consulted as a member of the board of directors or otherwise. Mr. Perkins admitted that that was the policy from the beginning.

As to the average balance the United States Steel Corporation had on deposit with J. P. Morgan & Co., Mr. Perkins said he could not tell from memory, but that the Corporation usually had from $40,000,000 to $70,000,000 in accounts all over the world. He thought the interest paid was, as stated by Chairman Stanley, 2.6 per cent.

Political Contributions

A long examination was conducted on the political contributions made by the Steel Corporation. The minutes of the Executive Committee showed, as cited by Chairman Stanley, that requests were made at different times for contributions by the corporation to campaign funds, and it was stated in the minutes that "the written opinions of John G. Jackson and David P. Watson were received that this corporation has no right to make contributions for political or charitable purposes."

The minutes were quoted from to show that the corporation made a contribution of $2,000 to the American Protective Tariff League; also that $1,000 was contributed to help publish a book "Protection and Prosperity," by George B. Curtis of Binghamton, N. Y. In reply to the question, "Wasn't it your fixed policy to make liberal contributions to further a political dogma which you regarded profitable to your business?" Mr. Perkins said that all such developments were before Attorney Jackson gave his opinion in 1906. Since that time the witness said he had no knowledge of such contributions.

Mr. Perkins was asked whether when he was connected with the New York Life Insurance Company contributions to campaign funds were made by that company and he refused to answer on advice of counsel. He was also asked as to personal contributions to campaign funds and was advised not to answer, though at one point in the colloquy he expressed a willingness to give the information. However, objection was made by one of the members of the committee to this line of inquiry, and after threatening to have the witness cited before the bar of the house for refusing to answer, the chairman asked for an executive session of the committee. The outcome was a decision not to insist upon answers to the questions concerning personal campaign contributions.

The Bond Conversion Scheme

Considerable time was taken up with discussion of the plan brought forward by Mr. Perkins in March, 1902, for the conversion of $200,000,000 of the preferred stock of the Steel Corporation into 5 per cent bonds and the issue of $50,000,000 additional bonds to meet the corporation's need of funds to complete extensions which were under way when the various properties were taken over. This is familiar history to the iron trade. The chairman of the committee endeavored to discredit the conversion scheme and in this respect his position was not different from that of many persons in and out of the iron trade who watched the workings of the conversion plan in 1903. In commenting on this portion of Mr. Perkins's testimony the New York Evening Post of August 12, has the following as to the result of the bond conversion syndicate's operations: "Before the syndicate had completed its operation, the syndicate agreement was cancelled and terminated at the request of the finance committee of the Steel Corporation itself; in response, apparently, to protest by some large interests in the company. Instead of raising $50,000,000 in cash without cost, and saving $1,500,000 in annual charges (as Mr. Perkins had described the proposal in reporting it to the Steel Corporation's Executive Committee), the Steel Corporation as a matter of fact placed an additional mortgage for $150,000,000 on its property, converted a contingent annual charge of $9,200,000 into a fixed charge of $6,500,000, raised $20,000,000 cash costing $1,000,000 a year and paid the syndicate a commission of $6,800,000."

Special Prices to Large Consumers

Chairman Stanley asked whether one result of the formation of the Steel Corporation had not been to give special prices to "powerful favorites" rather than to reduce prices to the general consumer. Mr. Perkins said consumers generally had been benefited. Mr. Stanley then read from the minutes of the Steel Corporation of July 15, 1902, whereby it was agreed to sell tubes to the Standard Oil Company at 5 per cent. below the prevailing price. Mr. Perkins said he knew nothing as to whether such an agreement was still in existence.

There was a long discussion over the records of the purchase of the Clairton Steel Company from the Crucible Steel Company in 1903. Minutes of the Steel Corporation showed that the contract was written providing that the Crucible Company should not enter into competition in making similar products to those of the Clairton Company, namely, billets, for a period of ten years. The contract finally signed did not contain that restriction, however.

Counsel Lindabury, for the Steel Corporation, declared that such a restrictive provision had been declared legal by the courts many times. Chairman Stanley replied: "If there is such a gap in the Sherman law as would permit such proceedings the committee will have business on its hands before it gets through."

Some Constructive Work Needed

On several occasions in the course of his examination Mr. Perkins expressed himself strongly on the necessity for constructive work on the problem of controlling great consolidations. One of his suggestions was that a government commission which would give publicity to the affairs of the large corporations would be useful. These corporations, he said, which had grown up under the demands of existing conditions, could no longer successfully go on under the Sherman Anti-Trust Law as now rigidly enforced. The government's dissolution of the Standard Oil Company had served as the waving of a red flag of warning to every corporation in the United States. The establishment of a government bureau which could give accurate information to the public as to the condition of corporations would be an active inducement to the people to make wise investments. One of the most striking developments of the present system of conducting business on a large scale is the dividing of great interests into the hands of many investors rather than concentrating them in the hands of a few.

W. C. Temple a Witness

At the final session of the Stanley Committee on Saturday, August 12, at which it adjourned to meet again on

October 16, W. C. Temple, of Pittsburgh, where he was commissioner of the plate, shafting and structural steel pools, was a witness. He is now engaged in fruit growing in Florida. Mr. Temple explained the plan of organization and methods of working of the various pools. He said that the termination of the plate and structural associations was due to Judge Gary, who refused to go on with what he believed to be an illegal arrangement.

Methods of the Pools

The first combination was made in 1897, and discontinued in December, 1904, when by a gentlemen's agreement every scrap of paper connected with the pool contract was burned. It was by the accident of a copy having been kept by the printer who turned it over to Mr. Stanley that the matter was uncovered. Mr. Temple had authority to manage all details, investigate business, production, and shipments. These pools distributed the tonnage among the various manufacturers in the pools, and there were arrangements for enforcing the agreements. Guarantee funds were provided by contribution of the different members in proportion to the tonnage assigned to them, and there was power in the commissioner to enforce penalties against concerns violating the agreement. Mr. Temple insisted, however, that penalties were practically never enforced.

Referring to the "prince or pauper" description of the steel trade, the witness said: "If you will put capacity at, say, 100, and consumption at 110, it is all champagne and terrapin for the steel man. But if consumption is 90 it is free lunch or corn bread and pork only. In no other business will such a slight difference in the per cent. of consumption decide between success and failure."

"What is a fair per cent. of profit for the steel maker?" asked Mr. Stanley.

"Twenty per cent.," replied the witness.

Structural Steel Percentages of 1897

A copy of the agreement for the structural steel pool entered into in 1897 was laid before the committee and witness. This agreement apportioned to its members a percentage of sales as follows: The Carnegie Steel Company, 49⅜ per cent.; Jones & Laughlin Steel Company, 12⅞; A. & P. Roberts Company, 11½; Passaic Rolling Mill Company, 6; Phoenix Iron Company, 5; Cambria Iron Company, 5; Universal Construction Company, 4½; Pottsville Iron & Steel Company, 3; Cleveland Rolling Mill Company, 3.

Under the agreement each member of the pool was bound to make a sworn statement of its production and shipments each month. If one member produced more than its allotted share, it was forced to pay a fine of 0.5 cent for each pound of steel shipped over the allotted amount. Firms failing to ship up to their allotment received 0.5 cent a pound for their shortages. These rates later were changed to 0.35 cent a pound, or $7 a ton. A guaranty fund of the pool was provided, each member being assessed originally $2500, and $500 a month thereafter.

One portion of the agreement provided that "the New Jersey Steel & Iron Company and the works of the said New Jersey Steel & Iron Company shall remain inoperative in the manufacture of certain beams and channels during the life of this agreement, in consideration of which the New Jersey Steel & Iron Company shall receive from the association the sum of $5000 per month."

Judge Gary Opposed the Pools

Mr. Temple said that all these pools ceased to exist in 1904, and he declared that they were broken up by E. H. Gary.

"What," Chairman Stanley exclaimed, "do you mean Judge Gary, the chairman of the Steel Corporation Board of Directors?"

"Yes, Judge Gary declared that he did not believe in these associations. He said they were no longer necessary or desirable, and he demanded the abrogation of all such agreements and the discontinuance of business under them."

Mr. Temple produced in connection with the structural steel agreement a price list, in which the country was apportioned and different prices fixed for various sections.

"Under that agreement were the members of the association able to adhere to the price list?"

"After the bitter warfare in the steel business prior to 1897 it was difficult to hold anybody, but after 1904 I may say there was no destructive competition." Speaking of the plate pool, the witness said:

"I knew intimately all the concerns in the Steel Plate Association—knew them far better than they knew each other. I got all the facts in strict confidence. When complaint of violation was made I took it up at once. At first nobody much reported, and about everybody broke the agreements. In those days every man in the steel business carried a tomahawk. The Carnegie Company was never caught, but once it complained of a competitor violating its agreement. This competitor had taken the steel for a building at a very low price. The head of the company said: 'My boys made an awful mistake; they figured on a ten-story building when it should have been eleven!' No fine was imposed, but that sort of excuse was typical. The concern was allowed to go and sin no more. The association continued until 1904. At the outset the people were all afraid of each other, bitterly hostile. At the end of a year they got friendly, exchanged information, and made business more like a family than a warfare."

The International Harvester Company's Statement

Edgar Bancroft, counsel for the International Harvester Company, presented to the committee a reply to the report of Assistant Attorney-General Townsend on the Harvester combination in 1908, this having been placed in the record of the Stanley Committee. He said that nearly every important statement in this report relative to the purpose of the investigation was either grossly inaccurate or entirely untrue. The report charged that the knotter in the self binder is protected by patents and that the International Company owns the patents on all the best types of knotters. Mr. Bancroft said that there is no patent whatever on the essential part of any type of knotter and there has not been any in force since 1896. Neither are there any existing patents on any essential part of the grain-binding machine. The charge of a binder twine trust he declared to be without foundation. The Harvester Company's relation to the United States Steel Corporation is not different from its relations with the competitors of the Steel Corporation. In the past seven years it has bought 10 per cent. of its total needs from the Steel Corporation and 30 per cent. from competitors of the Steel Corporation, while the remainder is supplied by its own subsidiary, the Wisconsin Steel Company. The charges of higher prices for harvesting machinery were also answered. While raw materials have increased more than 30 per cent., the company did not increase its prices until 1908, and then only 7 per cent., while for 1912 a reduction of 5 per cent. was announced last month.

Quotations were made from the government's own reports from foreign countries showing that harvesting machinery was sold abroad at higher prices than in the United States in spite of what Mr. Bancroft pronounced the "perennial falsehood" that agricultural machinery is sold cheaper abroad than at home.

Further Sessions

It is stated that Andrew Carnegie and J. Pierpont Morgan will appear before the committee in October. Mr. Morgan will be examined not only to testify regarding the affairs of the Steel Corporation, but will be asked to aid the committee in formulating recommendations to Congress of legislation deemed necessary to meet the demands of industrial organizations as they exist to-day.

In the recess Chairman Stanley and a force of assistants will work up further evidence. The matter of control of transportation facilities by the Steel Corporation is to be a special subject of inquiry in later sessions of the committee. It has been decided to call on the Steel Corporation for the books of all subsidiary companies as well as those of the corporation itself. Chairman Stanley announced that the committee would not go further into the affairs of the International Harvester Company and its relations with the Steel Corporation at this time, as he had information that the Department of Justice intended to take action in the case of the Harvester company.

Efficiency in Boiler Plant Operation

Steam Making as a Manufacturing Proposition—An Example of Scientific Management

Efficiency management of the steam-boiler plant and the operation of the plant as a factory which produces steam are two messages of high practical value given in a paper by John A. Hunter, steam engineer of the American Sheet & Tin Plate Company, read before the Engineers' Society of Western Pennsylvania and published in the July issue of the Proceedings of that society. The author paid special attention to cost sheets and efficient superintendence, and related two experiences. One was to prove the value of giving the boiler plant the same close, watchful oversight commonly accorded the other departments of an industrial establishment, and the other, reprinted below, exhibited the satisfactory results of studying in a detailed way the items of expense which should be considered as the essentials of a cost sheet.

The first case related to the operation of a water-purifying system. The plant was installed in 1904. Until 1908 no system of reports or records of the treatment of water was kept. During this period almost the only benefits derived were the neutralization of the free acid and possibly a slight reduction in the incrusting solids. In 1908 a regular system of reports was started and the treatment of the water was increased so that it was completely treated. The table shows the tube renewals per 1,000,000 boiler hp. hr. operated per year:

1907	49.83 tubes
1908	19.25 tubes
1909	6.59 tubes
1910	0.67 tubes

The second case is that of a boiler plant which was being operated at an efficiency varying from 50 to 55 per cent. In order to increase this it was decided to put a man in charge whose duties would be to keep the plant operating at the highest efficiency possible.

The following is a brief description of the plant: Fourteen water tube boilers equipped with chain grate stokers, coal and ash-handling machinery, an intermittent water purifying system and auxiliary apparatus, such as Venturi meter, recording feed-water thermometer, recording steam-pressure gauge, recording CO_2 machine, damper regulator and feed water regulators. The accompanying table shows the efficiency and actual cost of operation for an average month before and after the boiler superintendent had been put in charge. The month of March was before the man had been put in charge and January after:

Table Showing Results of Efficient Boiler Superintendence—Cost per 1000 b. hp. hr.

	March, 1910	January, 1911
PRODUCING LABOR—		
Superintendence	.....	$0.0566
Unloading fuel	$0.0504	.0334
Coal crushing	.0384	.0506
Firemen	.2206	.1992
Ash wheelers and conveyor tenders	.0744	.0653
Water and feed pump tenders	.1204	.0962
Boiler washers and cleaners	.0046	.0615
Attendance water purifying plant	.0091	.0067
Total Producing Labor	.5779	.6234
LABOR IN REPAIRS AND MAINTENANCE—		
Buildings	.....	.0715
Coal handling and crushing machinery	.0086	.0024
Ash handling machinery	.0016	.0023
Stokers, burners, grates and attachments	.0045	.0014
Boilers and fittings	.0497	.0441
Steam mains and pipe coverings	.0063	.0023
Feed water heaters and pumps	.0038	.0046
Water purifying or filter plant	.0002	.0115
Total Labor in Repairs and Maintenance	.0742	.1403
MATERIAL IN REPAIRS AND MAINTENANCE—		
Buildings	.0001	.0485
Coal handling and crushing machinery	.0070	.0053
Ash handling machinery	.0184	.....
Stokers, burners, grates and attachments	.0054	.0144
Boilers and fittings	.1092	.1174
Steam mains and pipe coverings	.0146	.0182
Feed water heaters and pumps	.....	.....
Water purifying or filter plant	.....	.0042
Total Material in Repairs and Maintenance	.1517	.1968
LUBRICANTS	.0066	.0056
TOOLS AND MISCELLANEOUS SUPPLIES	.0316	.1085
Total Cost Above Fuel	.8420	1.0746
Coal fired, tons	4661	3878
Average price coal, per ton	1.56	1.56
Number of 1000 h.p. hrs	1690	2031
Cost of fuel per 1000 boiler hp. hrs	4.2797	2.9787
Grand total cost, including fuel	$5.1217	$4.0533
Boiler efficiency, per cent	53.3	62.0

From these figures it is seen that the efficiency of the plant was increased from 53.3 to 62.0 per cent., and the grand total cost per 1000 b. hp. hr. was reduced from $5.12 to $4.05, or a saving of $1.07 per 1000 b. hp. hr. If an operation of 7000 hr. per year is assumed the saving would be $7.49 per b. hp. year. It is to be noted in the above figures that the total cost above fuel apparently increased, but that is not altogether correct. A small part of the increase is accounted for by the wages of the boiler superintendent, but the greater part is due to the fact that more money was expended for repairs and maintenance.

In conclusion the author asserted that whereas the system as outlined seems somewhat elaborate, yet the results from systematic operation of the plant fully justify the trouble and expense. It is the opinion of the author that an investigation of an average boiler plant in industrial works will reveal even greater possibilities of improvement than those given.

Railroad Equipment Orders.—The Pennsylvania Lines West are asking for bids on 700 freight cars and the Baltimore & Ohio is in the market for 10 baggage cars. Among orders recently placed were the following: The Atlantic Coast Line, 900 box cars and 100 flat cars, from the Standard Steel Car Company; Swift & Co., Chicago, 50 tank cars, from the Pressed Steel Car Company; Missouri Pacific, 15 baggage cars and 14 mail cars, from the American Car & Foundry Company and 21 cars from the Pullman Company; the American Railways of Porto Rico, 4 compound consolidation locomotives, from the American Locomotive Company; the St. Louis & San Francisco, 12 switching locomotives from the Baldwin Locomotive Works; the Chicago & Eastern Illinois, 8 Pacific type locomotives from the Baldwin Locomotive Works. The Pittsburgh, Shawmut & Northern has ordered 500 all-steel hopper cars.

A New Ohio Wire Mill.—The Ohio Steel & Wire Company has closed negotiations with the Warren Board of Trade, Warren, Ohio, for the establishment of a new wire mill in Warren. A 12-acre site has been donated to the company, which will have a capitalization of $400,000. A one-story building with about 80,000 sq. ft. of floor space will be erected. The company will make light wire for various purposes. Until September 1 its offices will be in the Columbus Savings & Trust building, Columbus, Ohio. It officers are the following: President and general manager, E. A. Henry; vice president, L. C. Connor; secretary and treasurer, Charles C. Hubbell.

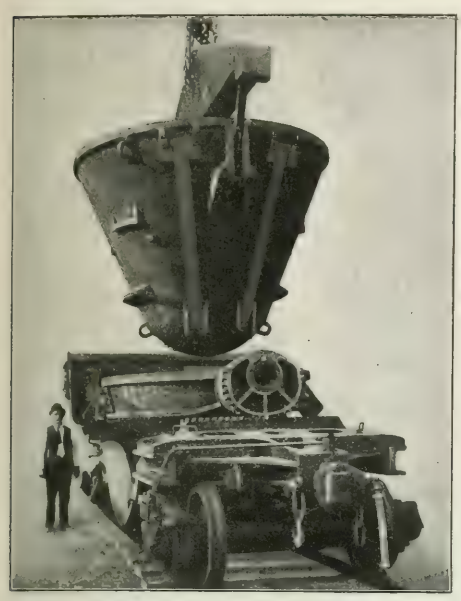
The latest roofing catalogue of the American Sheet & Tin Plate Company, Pittsburgh, consists of 42 pages of illustrated, descriptive and tabular matter, dealing particularly with the Apollo brand of galvanized roofing and siding, and the American brand of plain and painted material. Seven standard widths of corrugations are manufactured; namely 3/16, 5/8, 1 1/4, 2, 2 1/2, 3 and 5 in., and the full standard weights per square are given under the illustration of each product. Photographic reproductions are given also of curved corrugated sheets, pressed standard seam roofing, crimped roofing, roll roofing, corrugated flashing, and various forms of siding, including weather board, rock face and beaded. Standard weights per square of corrugated sheets, formed roofing and siding products, are added together with diagrams showing the application of corrugated sheets for roofing or siding.

A test of a Maxim water tube boiler is referred to in a recent letter of Allan Stirling, maker of the boiler, Drexel Building, Philadelphia. In a boiler with the Alison patent economizer or fourth pass, the temperature of the steam on test was 357 deg. F., while that of the escaping gas was only 312 deg. F. In the economizer the gases pass downward while the water rises and a partition is provided in the lower drum to prevent the feed-water from getting into the boiler circulation until it has been heated and purified in the economizer tubes.

The Warner & Swasey Company, Cleveland, Ohio, has directed attention to the 30th anniversary of the company by the distribution of a souvenir card showing the modest plant of August 5, 1881, and the imposing one of August 5, 1911, the latter view including the important additions made in the past two years

Latest Development in Slag Pots

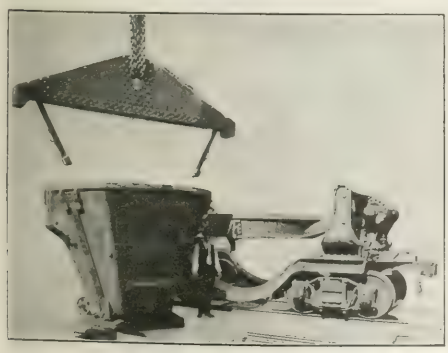
Transportation of liquid slag in large quantities from open hearth furnaces presents characteristic conditions with which it is necessary to contend. At blast furnace plants the slag can be handled so that a car and pot may



Berg Slag Pot, Showing Reinforcing Straps.

run on a track opposite the cinder notch, and the furnace flushed into the ladle, following which the car may be pulled out. As distinguished from this method, the practice of open hearth plants is to employ about three pots for each car. The empty pots are placed in receptacles or on stands alongside of the furnace, and next to the steel ladle, and the slag is then permitted to run over into them. Each pot is allowed to stand thus until filled, and is then lifted to the car, which operations, unless special provision is made, are accompanied with considerable spilling of cinder around the ladle and the floor.

For the convenient meeting of these conditions and for the purpose of furnishing a design capable of withstanding great strains, the Wm. B. Pollock Company, Youngstown, Ohio, is building the open-hearth slag car, illustrated in *The Iron Age* of March 23, and in the accompanying views. The ladle pot is picked up by means of a suitably designed bail hung from a crane and is placed in the ladle car. The pot is set in a trunnion ring, where it



Inclined Lifting Hangers on the Bail.

is securely locked for transportation to the dump. The tipping device is operated by steam or air from the locomotive, under the control of the train crew.

In the usual blast furnace cinder pots the continued expansion and contraction with each alternate filling and emptying results ultimately in the pots cracking horizontally along the line of the surface of the hot slag. Where the pot is permanently fixed in the ring of the car there is not so much danger of the car breaking at these cracks and spilling the liquid slag. In open hearth practice, however, where the pots are lifted it is necessary to provide against the possibility of their breaking. To this end they are reinforced externally by a pair of steel straps extending from top to bottom of the pot. These straps are of considerably greater tensile strength than the material of the pot and can be tightened by the nuts on the lower end of the straps. In this way the lifting strain may be transferred to the bottom of the ladle and thus prevent a failure at the usual line of cracking.

The lifting hangers on the bail are inclined in the same direction as the sides of the ladle, so as to engage the lugs close to the ladle and to avoid any tendency to strain or distort the shape of the pot. The capacity of the ladle illustrated is 260 cu. ft. of liquid slag. The car is of the Berg type, standard gauge, M. C. B. trucks, all steel construction, and of 100,000 lb. capacity.

Customs Decisions

The Board of United States General Appraisers has overruled a protest filed by the John A. Roebling's Sons Company. The merchandise consists of wire-drawing plates, of steel, about 2 in. x 1¼ in. and 7/16 in. thick. The local appraiser reported that these articles are made by drilling holes through pieces of rolled steel. The importer set up several claims, all of which are denied by Judge Fischer, who writes the decision for the tribunal. One of the claims was that the goods are forgings, but the decision says that there is nothing in the record to show that the articles are forgings. In fact, the appraiser reports them as articles of rolled steel. The collector's assessment of 45 per cent is affirmed.

The board has also decided unfavorably to the Washburn Wire Company and others a claim dealing with the classification of drawing-plates. They were assessed at 45 per cent ad valorem, and were claimed dutiable at lower rates under two paragraphs of the tariff law.

In overruling a protest filed by the Cleveland Stamping & Tool Company, the Board of United States General Appraisers has decided that merchandise which consists entirely of steel, such as handles and spouts which have been stamped from sheets of steel and then spun into shape, or otherwise manipulated to produce completed steel articles for use in the manufacture of enameled steel ware, must stand duty at the rate of 45 per cent., and not at lower rates as claimed by the importers.

A controversy between the Government and the Chicago Junk Company was decided in favor of the United States. In these cases the merchandise consisted of old rails, old steel belts, scrap iron and other products. They were all returned by the collector at 45 per cent., as being manufactures in chief value of metal. The importers claimed that the goods are entitled to entry at $1 a ton as scrap iron or steel. It was also claimed in the alternative that the old metal is free of duty as junk, or dutiable at 10 per cent. as waste. The claims are all overruled.

The Illinois Central Railroad Company was defeated in an attempt to secure lower duty on cylindrical drums used in the importation of crude glycerine. The collector assessed the drums separately from the contents at the rate of 30 per cent. ad valorem. It was alleged that the drums are usual coverings and as such free of entry. This claim the board denies.

The Allegheny Steel Company, Pittsburgh, which manufactures steel sheets, plates, boiler tubes, sheet and tin bars and other products at its Brackenridge, Pa., plant, has opened an office at Room 100 Third National Bank Building, St. Louis. J. A. Armstrong, who has been connected with the sales department of the company at Brackenridge, Pa., for seven years, is in charge.

Haselton Plant of the Republic Iron & Steel Company

New Open Hearth Furnaces, Blooming Mill and Billet and Sheet Bar Mill

In connection with a description of the Republic Iron & Steel Company's tube works in *The Iron Age* of January 5, 1911, reference was made to the new construction then under way and also forming a part of the company's Haselton plant at Youngstown, Ohio. This consisted of eight open-hearth furnaces, a blooming mill, continuous billet and sheet bar mills and a 500-ton blast furnace. In addition, a plate mill and a continuous merchant mill have been authorized, and work on both is well under way. The present article deals particularly with the open-hearth plant, the starting up of which, on June 12, marked the company's entrance in an important way upon the manufacture of open-hearth steel. Later articles will describe the new No. 4 blast furnace and the plate and merchant mills.

Fig. 1 is a general view of the open-hearth group of buildings, which are all on the left or east side of the picture, being bounded on the west by a steel viaduct



Fig. 1.—General View from the North of the Republic Iron & Steel Company's New Open Hearth Steel Plant at Haselton, Ohio.

which the company is building at a great outlay in return for the abandonment by the city of Youngstown of several streets which interfered with plans for future extensions of the works.

Arrangement of the Haselton Plant

The arrangement of the entire Haselton plant, including the blast furnaces, open-hearth works and the tube mills, is shown in Fig. 2, which indicates in dotted lines the proposed location of two additional blast furnaces.

The Brown-Bonnell works of the company, including its Bessemer plant and extensive billet, sheet bar and finishing mills, are entirely to the west of the Haselton site, and not far from the business center of Youngstown.

Plans were drawn for the Haselton steel works with a view to the best use of the property available and to permit of the future addition of four more open-hearth furnaces. It is also arranged so that two Bessemer converters can be installed between the mixer building and the open-hearth furnaces should the company decide to adopt the duplex process of making open-hearth steel. The property is 1¼ miles long. Between the open-hearth plant and the tube works, which is located at the extreme west end of the same property, is a space one-half mile in length which will be used for future finishing mills. A portion of this space has already been used for a plate mill and a continuous merchant mill. North of these latter and on the west side of the viaduct are the machine shop and boiler shop, as shown on the right in Fig. 1. The buildings comprising the steel plant are arranged parallel to each other and to the river, this being the plan adopted for the most economical use of the property. Beginning at the river side of the plant, Fig. 2, will be seen the stock house, and in line with it the calcining building, the two being connected by an overhead trestle which is used for delivering certain classes of material to these buildings. This is the only overhead track in the plant, if we except the approach to the charging floor and the hot metal track connecting the mixer building with the charging floor.

Open Hearth Furnaces

The open-hearth plant proper consists of eight furnaces of a rated capacity of 60 tons each, but of an actual capacity of 80 tons each, and already heats of 80 tons have been made. The furnaces are of unusually heavy construction. The steel ladles, which have a capacity of 80 tons, are handled by means of 125-ton ladle cranes. Both the charging floor and the pouring side, Fig. 3, are very wide, giving ample space for working, and the building is very high and well ventilated, this feature being given particular attention in order to make the conditions as comfortable as possible for the workmen. The pouring platforms are large, and are partly outside of the main building, so that the men can have ample light and air. In this building, as in all the others, escape platforms have been provided and every means taken to insure the safety of the workmen.

There are 16 automatic gas producers arranged in batteries of four, two to each furnace, connected to the furnaces by means of overhead gas mains. This method was adopted in order to overcome the danger from high water, which would have accompanied the use of underground flues. The furnaces also are set very high, so that the bottoms of the checker chambers are above possible high water. Coal is supplied for the gas producers by means of a bucket conveyor which hoists the coal into an overhead bin of 450 tons capacity. From this bin the coal is conveyed to each gas producer by means of an overhead larry car, a bin having a capacity sufficient for 24 hours' supply being provided over each producer.

Mixer and Pit Furnace Buildings

The mixer building contains one mixer of 400 tons capacity, and space is left for an additional mixer should this be necessary at some future time. Hot metal is brought from the blast furnaces across the Mahoning River, on a specially constructed bridge, in ladles of 35

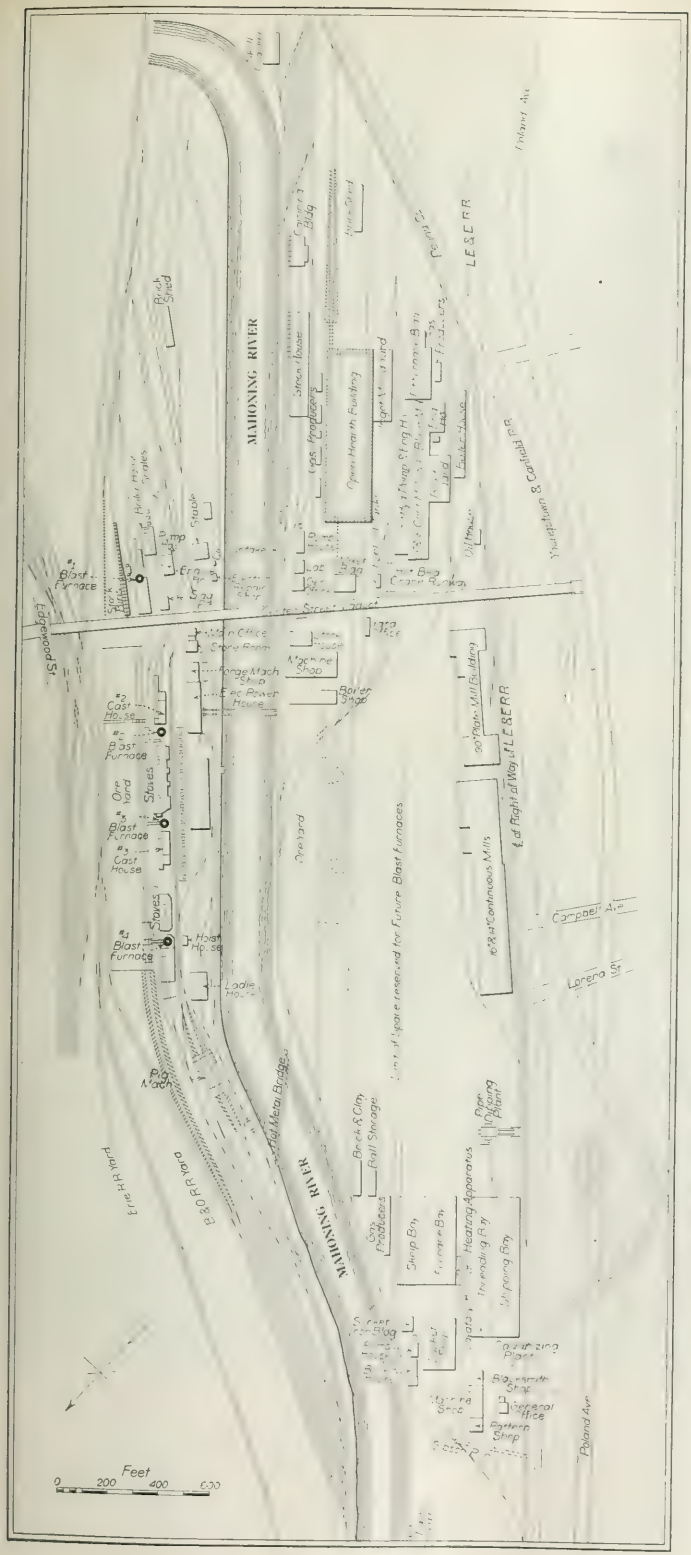


Fig. 3.—Plan of the Haselton Works, Including Blast Furnaces, Open Hearth Plant, Tube Works, Blooming, Billet and Finishing Mills.

tons capacity, and is poured into the mixer by means of a 75-ton crane. From the mixer it is conveyed to the furnaces by an electric locomotive attached to a 40-ton ladle car running on an overhead track which is level with the charging floor. For pouring the metal into the furnaces a 75-ton ladle crane is provided.

The pit furnace building contains four 4-hole pits, each hole having a capacity of six 20 x 24-in. ingots. In this building are an electric stripper of 150 tons capacity and 7½-ton charging and drawing cranes, all on the same runway. Space has been reserved for two additional soaking pits to be installed when the capacity of the plant requires it. Four automatic gas producers furnish the gas for the soaking pits, and the coal is handled by a bucket conveyor which delivers it into overhead bins

Forty-Inch Blooming Mill

The blooming mill, Fig. 4, is of special and massive design, and embodies all the latest features applicable to a mill of this character, including a Wellman-Kennedy slab manipulator on each side of the rolls. The mill is driven by a pair of 44 and 76 x 60-in. horizontal tandem compound direct connected reversing engines, and is arranged for rolling 4-in. billets, blooms of all sizes and slabs 34 in. wide. Material rolled on this mill can be delivered direct to the 21-in. mill or else transferred by means of a rope transfer to a large slab shear, and from there delivered to the billet yard by means of chain conveyors.

Continuous Mills

The 21-in. continuous mill consists of four stands of 21-in. rolls which will take blooms of 42 sq. in. section and roll them into billets of about 3⅞ in. square for the 18-in. mill, also to the necessary section for making sheet bars on the 18-in. mill. The 18-in. continuous mill, Fig. 5, consists of six stands of 18-in. rolls. It will roll billets of from 1¾ in. square to 3 in. square section and sheet bars 8 in. wide of various

thicknesses. These mills are driven by one 48 and 84 x 60-in. horizontal cross compound condensing Corliss engine, by means of a long shaft and a set of bevel gears for each stand of rolls. A space of 150 ft. has been left between the 21-in. mill and the 18-in. mill, so that large billets can be taken from the former if desired. The material

high. The boilers are provided with mechanical stokers, super heaters and a continuous bucket conveyor for handling coal and ashes. Above each boiler is a coal bin with a capacity for 24 hours' supply. The whole installation has been made as complete as possible, and is an example of the highest type of steel works boiler plant.

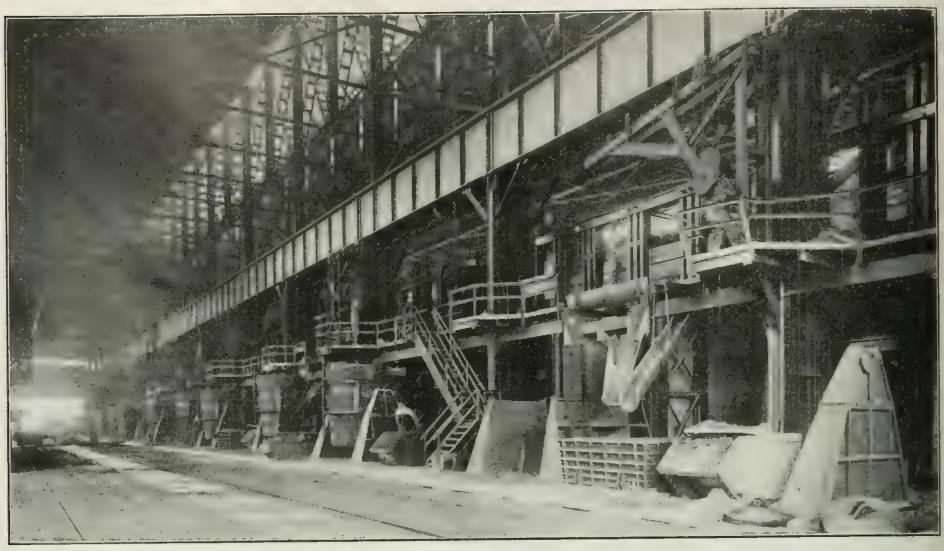


Fig. 3.—Casting Side of Open Hearth Furnaces.

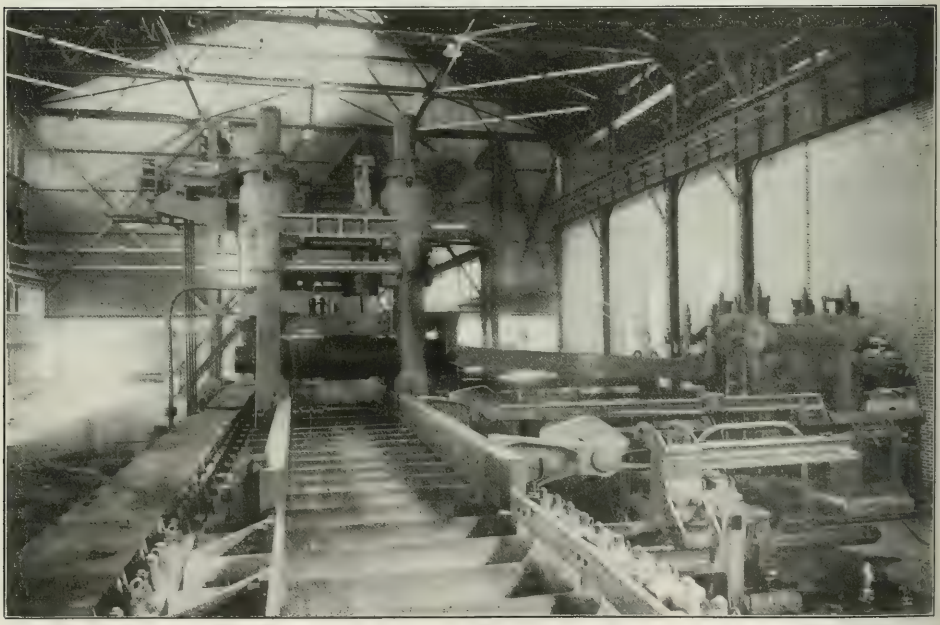


Fig. 4.—The 40-Inch Blooming Mill.

from the 18-in. mill is delivered to a double cooling bed and from this loaded direct into cars by an overhead crane.

Power Plant

The boiler plant consists of 12 500-hp. boilers arranged in two batteries of six each, with one stack for each battery. The stacks are 10 ft. diameter inside and 250 ft.

Wherever possible electric power has been adopted for operating the machinery in connection with the plant, the electric power being supplied from the blast furnaces which are on the opposite side of the river. Hydraulic power is supplied by two cross compound engine type hydraulic pumps, each having a capacity of 1500 gal. per minute. Service water is supplied by three motor-driven

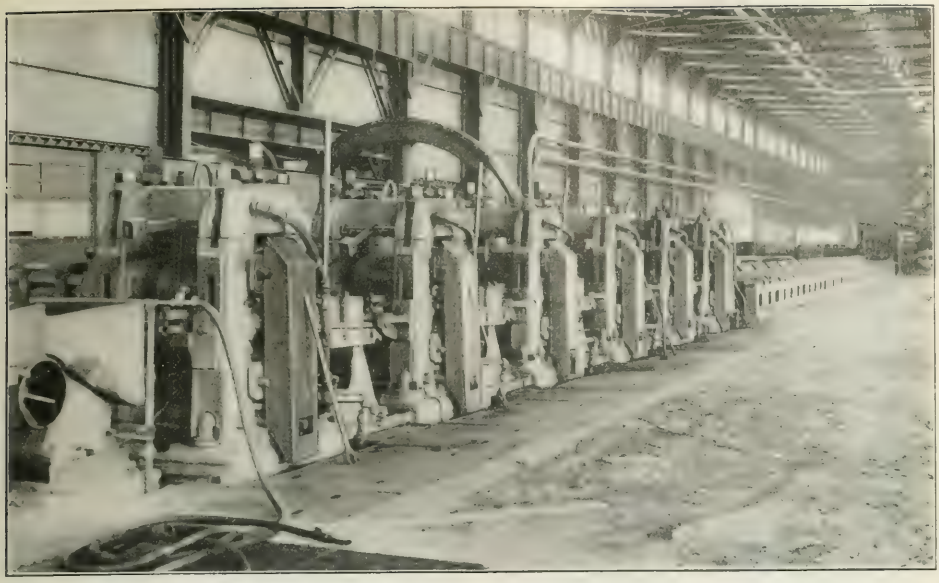


Fig 5.—The 18-Inch Continuous Billet and Sheet Bar Mill.

two-stage centrifugal pumps, each having a capacity of 7,000,000 gal. per day.

A very complete laboratory, machine shop, boiler and blacksmith shop and all necessary offices have been provided. It was the aim of the management to make the new works as complete and self-contained as possible, and no expense was omitted which would contribute to that end and to the maximum of economy in working. The plant was designed, built and organized by the operating and engineering departments of the Republic Iron & Steel Company, no outside engineer being employed.

New Tools and Appliances

This is essentially a news department for which information is invited.

A New Gap Lathe.—The Rahn-Larmon Co., Cincinnati, Ohio, has brought out a new type of electrically-driven gap lathe in which the motor is attached to the tool and the power transmitted directly to the spindle through gearing. To eliminate the vibration at high speed as far as possible the motor is mounted very close to the spindle, an arrangement which also enables the entire headstock and the change gears to be covered, thus protecting the operator. The starting and the stopping of the motor are controlled by a lever mounted at the right of the apron in a position convenient for the operator. In general the design of this new tool is such as to secure a rigid machine of simple construction. A hand wheel operating a coarse pitch screw enables the extension bed to be adjudged to any width of gap within the range of the lathe. Both of the beds are very heavy and the top one is accurately planed and fitted. The carriage is gibbed to the bed both in front and back and has a long continuous bearing. It can be firmly locked when using the cross feed and is so arranged that tool rest can be brought close up to the gap when necessary. An extension which is firmly braced on the front of the carriage provides extra travel for the tool rest so that the tool may operate on the largest diameter that can be swung in the gap. A large range of both longitudinal and cross feeds are obtained by shifting the change gear lever attached to the feed box, and the feeds are so arranged that no two can be engaged simultaneously. A safety device prevents the breaking of the feed box gears or those in the apron either because of accident or carelessness. Micrometer disks are furnished for the compound rest and the cross feed screws.

A New Chain Saw.—The International Endless Chain Saw Company, 34 University place, New York City, has built a line of sawing machines possessing a number of novel mechanical features. The saw blade frames of the smaller machines are balanced automatically by a sliding weight which keeps the parts in equilibrium at all times. The chain saw itself is made up of punched steel sections riveted together with teeth on one side and a guide on the other, the former bing spaced far enough apart to give clearance for the saw blade, which is made up of three pieces of flat steel riveted together so as to form a channel on each edge for the link guides to travel in. This chain is driven by a sprocket at the inner end of the blade and runs over another at the outer end, which is mounted on a tension device that keeps the chain taut at all times and yet provides the give required in a mechanism of this character.

Radiation Pyrometer.—The Thwing Instrument Company, Philadelphia, Pa., has recently developed a pyrometer, the operating principle of which is the measurement of the total energy of radiation by the current generated in a sensitive thermocouple by the radiation concentrated upon it. A conical mirror is employed for concentrating the radiation, and in fact, to do away with the loss of time required for focusing and eliminating the error due to inaccurate focusing. The galvanometer, while it does not require leveling, is nevertheless sufficiently sensitive to respond to the small current generated in the thermocouple by a difference of temperature which never exceeds 100 deg. C. A pivoted coil renders leveling unnecessary, and as light magnets are used the complete instrument weighs but 4 lb. and it is possible to carry it about from place to place easily. In action the pyrometer is said to be very rapid, responding instantly to temperature changes and reaching a state of equilibrium in 5 sec. after being pointed at the hot surface and returning as quickly to the zero position when the radiations are cut off. The instrument is especially adapted for measuring the temperatures in open-hearth furnaces and the range of temperature is unlimited in either direction.

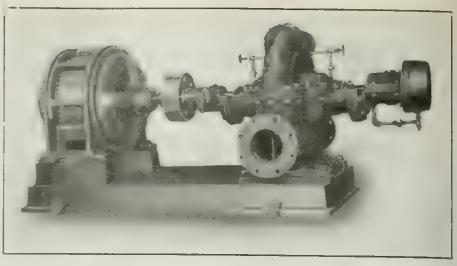
Combination Toolroom Furnace.—Tate, Jones & Co., Pittsburgh, Pa., have recently brought out a hardening furnace which is adapted for general toolroom work. The heating chamber is a cube measuring 6 in. on an edge, and is directly fired by a gas flame. For very delicate work a muffle can be inserted in the opening on the top, while for lead hardening and tempering or for case-hardening small parts a pot can be inserted.

Uncovering the Maine

Progress of the Notable Work in Havana Harbor

It will be noticed that the title avoids the expression "raising the Maine," for it has not been and never will be raised as an entirety. Present indications are that possibly the after part of the boat may be floated, but the forward half will have to be removed piecemeal, and perhaps the whole vessel will have to be cut up to get it out of the mud in which it is now held so fast. The remains of the wreck will be sunk with appropriate ceremonies somewhere out in the Atlantic Ocean where they will not be a menace to shipping. The steel foremast of the vessel weighs 10 tons and was shipped to New York June 13. The military mast may possibly be erected on the plot in the National Cemetery in Washington where the bones of the sailors who were lost in the disaster will be buried.

The cofferdam, comprising twenty steel cylinders each 50 ft. in diameter, formed of Lackawanna interlocking steel sheet piling, was described in *The Iron Age* of June 8. To insure the stability of the cofferdam, although there were no indications that serious fears were held concerning it, 20,000 tons of stone were deposited against its inner wall. At this writing, with about 34 ft. of water removed, there remains about 17 ft. of mud before the wreck will be cleared so that there will finally be left a wall 51 ft. high to resist a tremendous pressure from the water outside. The ship is 324 ft. long and the elliptical cofferdam which has been constructed around it has a major axis of 399 ft. and a minor axis of 219 ft. This is undoubtedly the first time that the cofferdam method has been applied to a similar purpose or on so large a scale.



One of the Jeanesville Pumping Units.

The pumping began June 6 and the next day the water had been lowered 5 ft. The pumping was continued at intervals with enough time left between the periods to allow the wall of the cofferdam to adjust itself to the increased strain upon it and allow any evidences of weakness to manifest themselves so that they might be corrected. Thus far the leakage has been insignificant and stopped without much effort. When the water had been lowered only 7 ft. it was apparent that the shattering of the hull of the battleship was far greater than had been supposed, the structure of the vessel being distorted, bent and crumpled to an almost unbelievable extent.



Photograph by Underwood & Underwood, New York.

The Uncovered Stern of the Maine and the Twisted Mass of the Wreckage at the Bow.

July 18 the unwatering of the wreck was practically completed. At this writing the bow as far aft as frame 18 has been uncovered, permitting the study of the plates, beams, etc., and it was found that they originally belonged to the structure of the double bottom, which is now 40 ft. higher than its normal position, apparently confirming the truth of a tremendous exterior explosion. No authority, however, can be obtained from the engineers in charge to confirm this conclusion.

For removing the water within the cofferdam two large Jeanesville centrifugal pumps, driven by General Electric motors, were used. These pumps were built especially for the work and were sent out late in the year 1910 from the shops of the Jeanesville Iron Works Company at Hazleton, Pa. The largest machine has a 14-in. suction pipe opening and a 12-in. discharge pipe opening, and was designed to handle 4000 gal. per min. of Havana Harbor sea water against a 65-ft. maximum and a 5-ft. minimum head. The other machine had a 10-in. suction pipe opening and an 8-in. discharge pipe opening and was designed to handle 1800 gal. per min. of Havana Harbor sea water against a maximum head of 65 ft. and a minimum head of 5 ft. Each machine was provided with full complement of suction and discharge hose, strainers, valves, etc.

The main castings of the pumps were of a special grade of cast iron; the impellers of a special grade of bronze, and the shafts of steel, bronze covered. Each

pump is connected to its motor by a flexible coupling of pin-and-rubber-buffer type, the whole mounted on a common substantial cast-iron sub-base. The pumps are mounted on floats within the enclosure, the floats settling as the pumping proceeded and the current for operating the motors is obtained from a power house on shore transmitted through a cable. The above machines are what are technically known as Jeanesville double suction split casing pumps.

In the double suction pump the incoming fluid enters on both sides of the impeller and discharges from the impeller into a common vortex chamber. The casings and bushing boxes are split horizontally, which permits of ready access to all interior parts of the machine without breaking pipe joints or other connections and without disturbing the shafting or deranging the alignment of the pump and prime mover.

Although the water has been removed, the wreck has sunk so deeply into the mud that the keel of the Maine lies about 50 ft. below the level of the Havana Harbor. Probably 20 ft. of mud will be removed before the wreck is fully exposed. All of the ports were open when the vessel sank and the mud has settled in great quantities within the wreck. The only water inside of the cofferdam now is the overflow from the hydraulic pressure used to clean out the inside of the wreck.

Parts of the wreck which cannot be removed intact will be cut up by the use of oxy-acetylene torches. This apparatus has reached the site and has been set up inside the cofferdam.

The engineering work, superintended by Major H. B. Ferguson, taken as a whole, has been very successful in spite of the pessimistic predictions of those who maintained that the cofferdam method was impracticable.

The Ruggles-Coles Engineering Company, New York City, is to sell Monel metal castings in the United States and Canada for the Bayonne Casting Company. Monel metal is an alloy composed principally of nickel with some copper, iron and manganese, and has very high tensile strength. In external appearance it resembles pure nickel and takes the same finish. Its qualities make it well adapted for many purposes requiring a non-corrosive metal. In the form of sheets it is used for roofing, especially smelter roofs, and for skylights, boat sheathing, cooking utensils and chemical apparatus. As castings it is used in marine work for propellers, pump valves, cylinder linings and fittings subjected to superheated steam. Rolled into rods it is furnished for pump rods, steam turbine parts and electrical apparatus.

The Herman Pneumatic Machine Company, Zelienople, Pa., recently shipped to the Standard Car Company at Verona, Pa., a number of molding machines of new design.

A New Westinghouse Direct Current Motor

Excellent commutation and a highly efficient lubricating system are the features claimed by the Westinghouse Electric & Mfg. Company, East Pittsburgh, Pa., for a new direct-current motor intended for general power service. The new machine, which is known as the type SK, has a number of novel features and represents in many respects the most advanced design of direct-current motors. Fig. 1 is a view of the completed motor, while Fig. 2 shows the field frame.

The motor frame, which is of a new design, is illustrated in Fig. 2 and is made of a ring of open hearth steel hot rolled from the slab into shape and having the ends welded together. Rolled steel is regarded as an exceptionally good material for motor frames because of its high magnetic permeability, uniform structure and great strength. The feet are pressed from a steel plate and are riveted under pressure, calculated to give a rigid construction.

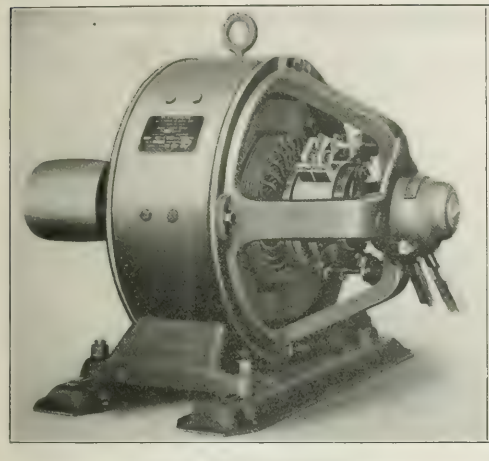


Fig. 1. The Complete Motor.

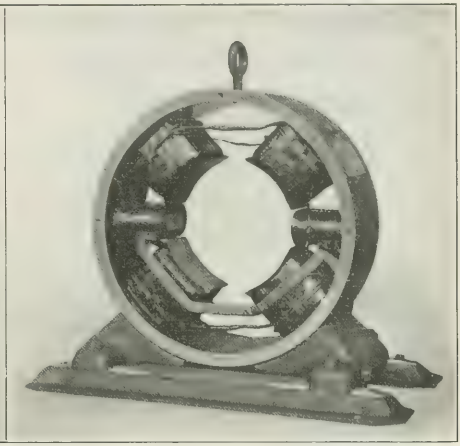


Fig. 2.—The Field Frame.

Two Views of the New Type S K Direct-Current Motor Built by the Westinghouse Electric & Mfg. Company, East Pittsburgh, Pa

Practically sparkless commutation under all conditions of speed or load up to heaviest overloads which the motor will stand has, it is stated, been secured in tests made at the builder's shops. In winding the armature wide spaces are left between the ends of the coils and ventilating ducts are provided in the core. Form wound coils laid in open slots and held in place by fibre wedges and bands are used. If desired the shaft can be forced out of the armature without disturbing the windings and the commutator connections. The dust-proof bearing surfaces are lubricated by large oil rings while the motor is in operation.

These motors are built in a variety of sizes ranging from 1½ to 50 hp. and are wound for 115, 230 and 550 volts. The speeds correspond closely to the full load speeds on the company's induction motors, an arrangement which simplifies the application of the motors and makes changes from one type to another a comparatively easy matter.

The Gardner Convertible Gas Engine Company at Washington, Pa., has been purchased by B. D. Northrup, owner of the Northrup Machine Company, also of Washington, Pa.

The customs imports at Windsor, Ont., are increasing rapidly and if the present gain is maintained will aggregate $2,000,000 for the year. This is largely due to the American industries which have opened Canadian branches there this year.

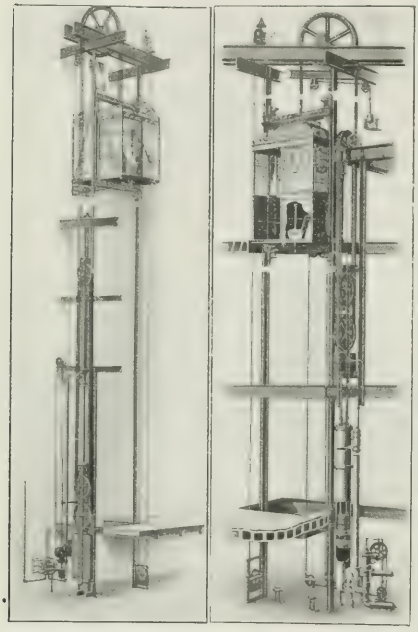
The American Duralumin Company, Hanover Bank Building, Nassau and Pine streets, New York, is distributing a paper cutter made of the new metal duralumin.

Modern Types of Elevators*

Their Characteristics and Fields of Usefulness

BY F. E. TOWN, PITTSBURGH, PA.†

The types of elevators most used today are the vertical-geared hydraulic, the direct-acting plunger elevator, the inverted-plunger elevator, the electric-drum machine, the worm-gear traction electric machine, and the gearless electric traction elevator. For many years the vertical-geared hydraulic elevator was used almost exclusively for high-speed, high-rise service; that is, for 20-story office buildings and the like. Some eight years ago the direct-plunger elevator became an active competitor in this field, and more recently still both have been largely supplanted by the gearless traction machine, which is the type of elevator used in the new Oliver Building.



Inverted Plungers. Vertical Geared.

Fig. 1. Two Types of Hydraulic Elevators.

The vertical-geared hydraulic machine—shown at the right of Fig. 1—consists essentially of a vertical cylinder placed either in the elevator hatchway or in a separate hatchway adjacent to it. This cylinder contains a piston connected by two piston rods passing through glands in the cylinder head to what is called the traveling sheave strap, to which are connected the counterweight and the necessary number of traveling sheaves. Directly above these traveling sheaves, at the proper hight in cylinder hatchway, are placed the required number of auxiliary sheaves. The cables start from a hitch near the auxiliary sheaves, pass down under the top traveling sheave, thence upward and over the bottom auxiliary sheave, then down again under the next traveling sheave, and so on, until after passing under the lowest traveling sheave they pass up over the overhead and down to the hitch on the car crosshead. The cable connections, therefore, correspond to the ordinary block and tackle, and a given movement of the piston moves the car a certain distance, depending on the gear ratio. For an office building of about 20 stories these machines are commonly geared 6:1, so that the piston travels only about one-sixth of the hight of the hatchway.

The water is usually supplied to these elevators from a pressure tank carrying about 160-lb. pressure, which is maintained by pumps pumping from a discharge tank directly into the pressure tank. The pressure tank is kept about one-third full of air to maintain, as nearly as possible, uniform pressure and cushion the pulsations due to the pumps. Water is admitted from a supply pipe to the elevator through an operating valve, which is controlled by a pilot valve connected by cable to the operating lever in the car. The movement of this operating lever opens either the supply or exhaust port of the pilot valve, and thereby causes the operation of the main valve, the direction of its motion depending on which port is open.

A rotary cut-off valve is placed in the discharge from the cylinder and operated by an arm on the traveling sheave strap to stop the machine automatically at the top and bottom limits of travel. By the use of the circulating pipe the cylinder is kept full of water above and below the piston, and this, connected to the circulating pipe, itself also full of water, maintains a constant head, so that there is no pressure variation due to the different hights of piston.

In the case of the direct-plunger elevator the cylinder is placed in the ground at the bottom of the hatchway, and a plunger, the full hight of the elevator travel, operates in this cylinder. The plunger itself does not touch the sides of the cylinder, but passes through a stuffing box in the cylinder head. Water is admitted to the cylinder at the cylinder head and discharged from the same point by a valve similar in general principle to that used for a vertical-cylinder machine. The pumping plant, the tanks, the piping, etc., are also about the same as would be required for other hydraulic elevators. Two separate cut-off valves are used, which are operated by long levers, the ends of which are connected to cables which pass diagonally up the hatchway. Small sheaves on the car, which travel along these cables, lift up the valve levers, one at the top and one at the bottom of the hatchway. The up-limit valve is placed in the supply line, and the down-limit in the discharge line, so that the car is automatically brought to a stop at the limits of travel. It is customary with all hydraulic elevators to place, in addition to the basement pressure tank, a pressure tank on the roof, connected to the basement tank by a standpipe, so that in the event of failure of air pressure from any cause there would still be a supply of water and sufficient pressure due to gravity to permit handling the elevators.

The inverted type of plunger elevator, illustrated at the left of Fig. 1, is not in such common use as the others. Its cylinder is placed in an inverted position in the hatchway, and the plunger, which passes through a stuffing box at the cylinder head at the lowest point of the cylinder, carries a traveling sheave strap and a counterweight similar to that used on the vertical-geared hydraulic. The car and the load are heavier than the plunger with its sheaves and counterweight, and tend to raise the plunger in the cylinder. The water when admitted under pressure forces the plunger down, thus raising the car. This elevator is used for high-water pressures of 750 to 850 lb. per square inch; and, instead of pressure tanks, accumulators are used to maintain a constant pressure of water. The pumps, the valves, etc., are of the high-pressure type, but the principle of the valve operation is the same as that of the other hydraulic apparatus. The pilot valves, however, operate on a separate pressure system at about 80 lb. to prevent excessive cutting due to the high pressure.

Electric Elevators

The electric-drum machine is in very general use over a wide range of duties, but is limited in speed to about 400 ft. per minute; in fact, for speeds of 300 to 400 ft. per minute the worm-gear traction machine is superior and is generally used if the rise is above 6 or 8 stories and not over 12 or 15. Where the travel is more than 12 or 15 stories and still higher speed becomes important the gearless-traction elevator is used. This machine is suitable for rises even higher than any for which elevators have been installed to-day, and for the highest permissible speeds.

The drum machine. Fig. 2, almost every one is familiar with. The car-hoisting cables and the machine counter-

*Extracts from informal address made before the Manufacturers and Contractors Club, April 11, 1911.

†Resident agent, Otis Elevator Company.

weight cables pass over a drum which is revolved by worms and gears. The worm shaft in turn is direct connected to the armature shaft of the motor driving the elevator. On the best types of this apparatus a switch is used in the car, connected electrically with magnets on the controller, which gives the operator control of the car as to starting and stopping and direction of movement. The controller, however, is so designed that the acceleration in starting and the retardation in stopping are controlled automatically.

The worm-gear traction machine, shown in Fig. 3, is similar to the drum machine, but has a traction sheave instead of a drum. The machine is commonly placed overhead and the cables pass from the car crosshead up over this traction sheave, thence down under an auxiliary sheave just below the traction sheave, then upward over the traction sheave a second time, and thence down to the counterweight. The auxiliary sheave is used merely to permit the double wrap over the traction sheave for the purpose of giving additional tractive effect. The control is similar to that used for the drum machine. A complete set of limit switches is placed at the top and one at the bottom of the hatchway, so that the car automatically cuts itself out at the top and bottom in the same manner the operator would by using the car switch. The counterweight carries an oil buffer, and an oil buffer is placed in the pit directly below the car, so that either car or counterweight would be brought to an easy and gradual stop from full speed if no other stopping devices were in operation.

The gearless or 1:1 traction machine is the latest, safest and most efficient elevator in use today. It consists of a large slow-speed motor, having a driving sheave connected directly to the armature and on the same shaft. The normal motor speed is 60 r.p.m., and the usual diameter of the traction sheave is such as to give a speed of about 600 ft. per minute to the car. The car is cabled exactly as described for the worm-gear traction machine. The entire machine is very heavy and substantial, and on account of the absence of gearing is extremely smooth in its operation. Further, as the armature speed is very low the period of acceleration is correspondingly short, and it is possible to start and stop these machines quicker than any other type; that is, it takes less time and a shorter distance of travel for the car to attain maximum speed, or to come to a stop from maximum speed. It can be readily understood that if either the car or the counterweight bottoms on the oil buffer the traction due to the pull of the cables on the traction sheave is reduced. Consequently, it is inherently impossible with this type of machine to pull either the car or the counterweight into the overhead work, a very important safety feature.

Safety of the Different Types

Regarding the safety of the different types of elevators, all, with the exception of the plunger, are provided with clamp safeties under the cars, operated by centrifugal governors usually placed at the top of the hatchway, so that excessive speed of the car in descending would cause

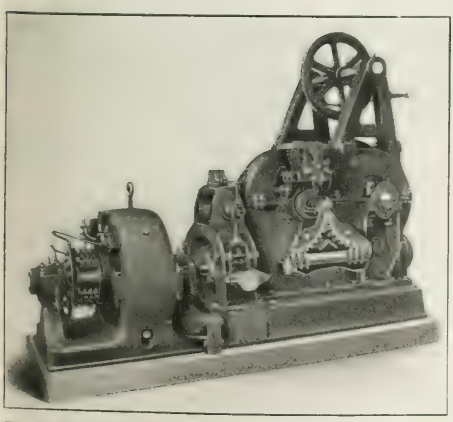


Fig. 2.—A Double Screw Direct Current Machine with Switch Control.

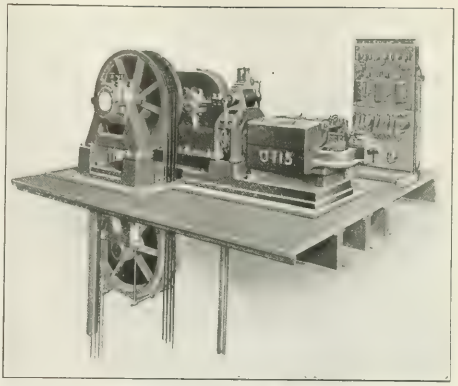


Fig. 3.—The Duplex Geared Traction Elevator with Overhead Type of Switch Control.

the governor to grip the governor cable and operate the safety, clamping the car to the guide rails. This prevents the possibility of falling due to breakage of hoisting ropes or of descending at a dangerous speed from some other cause. In the case of the plunger elevator it would not be possible to use a safety of this type, as the weight of the plunger would tear it loose from the car, if the car were stopped suddenly independently of the plunger. On the other hand, on account of the plunger running in a cylinder full of water below it, the car cannot descend faster than the water can escape, so that the guide grip safety is unnecessary. All hydraulic elevators excepting plungers can be provided with emergency levers in the cars, which permit the operator to throw on the safety by hand. The machines are also provided with limit stops to prevent overrun of the car at top and bottom, as before described.

The electric-drum machine, when used with switch control, as in Fig. 2, is provided with emergency switch in car, which permits the operator to open the potential switch and make an emergency stop. The machine is also provided with a stop-motion switch for stopping the car at the limits of travel, and in addition to this limit switches are placed at the top and the bottom of hatchway, which would stop the car in case the stop-motion switch on machine should fail.

The worm-gear traction machine meets all the safety requirements of the drum machine and has in addition the oil buffers heretofore described. It has also the advantage of loss of traction when either the car or the counterweight is blocked in descending. The gearless, or 1:1, traction machine is provided with all the safety devices known in elevator practice, including an emergency wheel in the car for operating the clamp safety.

The vertical-geared hydraulic elevator has given satisfactory service for years. The operation is good and maintenance and operating cost low. The plunger elevator came in vogue for high rise service partly because it was thought by many to be safer than other types, and partly because the plunger being directly under the car, no space in the hatchway is required for the cylinder, as in the case of the vertical-geared machine, and hence there is economy of floor space. The plunger elevator gives excellent results for moderate speeds and a rise, say, not over 8 or 10 stories, but for the modern skyscraper it has not proved as great a success as other types. It is impossible to get as short and smooth starting and stopping with it, and on account of this it would not make as many round trips and handle as many passengers in a given length of time as the geared hydraulic. The inverted plunger type is not in very general use, but in large hydraulic installations the high pressure and smaller volume of water result in keeping down the space required for piping, cylinders, etc., an obvious advantage.

The American Duralumin Company, Hanover Bank Building, Nassau and Pine streets, New York, is distributing a paper cutter made of the new metal duralumin.

Pattern Maker's Disk Grinder

Details of a Recent Product of the Gardner Machine Company and the Work Done by It

Improvements recently made in the patternmaker's disk grinder built by the Gardner Machine Company, Beloit, Wis., illustrated in *The Iron Age*, January 5, 1911,

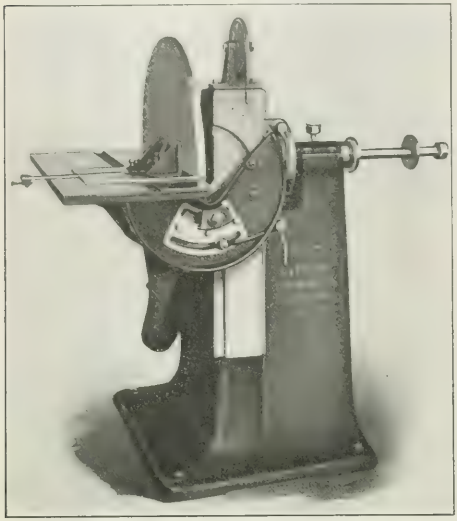


Fig. 1.—The No. 17 Pattern Maker's Grinder Built by the Gardner Machine Company, Beloit, Wis.

have resulted in the securing of a machine of the same promise in the woodworking field as the disk grinder has been in the metal working field. The equipment of this machine includes a universal work table, universal angle and duplicating gauges, a circular coreprint gauge, dust hood, countershaft and extra supplies. A view of the grinder equipped with a 30-in. disk wheel on one end and the universal duplicating gauge is given in Fig. 1, while Fig. 2 shows a special pattern that was recently produced by one of these machines.

The universal work table, which may be tilted to any angle with the face of the wheel, is one of the main features of the machine. One turn of the hand nut locks the table in the required position and the angle is indicated by the graduated segment at the right of the wheel. The design of the axis bearing, or tilting axis, is such that the inside edge of the work remains close to the face of the wheel regardless of its angular or lateral position. The entire weight of the work table is counterbalanced by a weight within the base of the machine. The weight is connected by a steel cable passing over a grooved pulley at the top. This arrangement enables the work table to be raised and lowered easily, and locked at the desired hight by turning the hand nut.

The universal duplicating gauge, which is illustrated in Fig. 1, is a convenient attachment for producing duplicate work. It is graduated from 0 to 45 deg. in either direction from parallel and an adjustable stop screw regulates the amount of stock removed. One of the special applications of this gauge is in the preparation of segments which can all be gotten out before the gluing operation is performed. It is also unnecessary to put the pattern on a lathe before attaching additional layers of segments, as they are all parallel and of the same thickness.

The universal angle gauge or protractor head furnished as a part of the grinder's equipment is a great convenience for squaring and producing angles and draught. It is graduated from 0 to 45 deg. in either direction and by using these graduations in conjunction with those on the head of the table any desired combination of angles can be quickly obtained. The guide bar can be adjusted so that when the table is tilted or the gauge is set at an angle the bar itself can be moved either to the right or the left, thus keeping one end close to the wheel. Like the mechanism of the work table, locking is secured by a single turn of a hand nut which simultaneously locks the guide bar in the required position and at the proper angle. The circular core print gauge is employed for producing round or curved surfaces. The work is pivoted on a pin driven in the gauge at the proper radius and is then swung or turned against the wheel. An adjustable stop screw regulates the amount of stock removed, and also makes it possible to produce duplicate work, while tilting the table gives the taper required. The use of this attachment enables core prints, bosses, hubs, etc., of all sizes to be made accurately and rapidly.

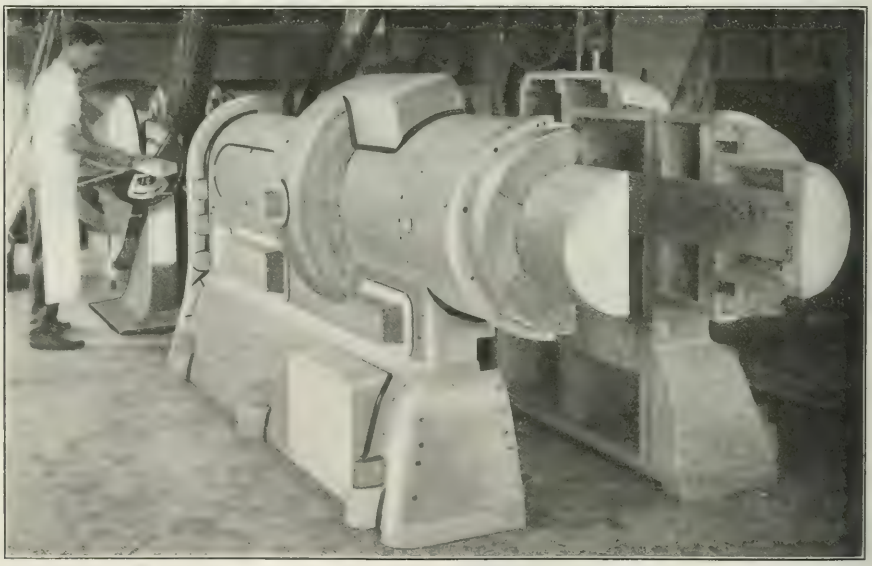


Fig. 2.—A Specimen of the Work Turned out by the Machine.

The construction of the spindle is the same as that employed in the maker's No. 7 disk grinder, which was illustrated in *The Iron Age*, November 25, 1909. The spindle driving pulley is 10 in. in diameter with 5-in. face and 5 hp. is sufficient to drive the machine at a wheel speed of 6000 ft. per minute. Where this machine is used in the pattern shops the trimmer can be practically dispensed with, it is claimed, and in addition much lathe, band saw, jointer and drum sander work can be accomplished besides reducing the amount of hand planing, carving and sanding knots, cross and end grains in either soft or hard wood and projecting nails and screws can be worked without difficulty.

The pattern which is illustrated in Fig. 2 is that for the front, or cylinder, half of a 150-hp. gas engine ready for varnishing. The special features of the pattern worthy of note are the heads and the staves on the main core print as well as the segments further back. The cylinder and the base are both built up of staves and all the glue joints throughout the entire piece were not touched with a plane or any kind of tool or machine except the grinder at the left of the engraving. All of the core prints, no matter what their shape, including the large ones at the front end, were made entirely on the grinder and none of them were put into a lathe. The 3 x 8 in. hardwood pieces that anchor the heads together and stiffen the whole pattern were also ground to fit on this disk grinder.

Three sizes in all of this machine are built, which are known as the Nos. 16, 17 and 18. The first and the second are equipped with wheels on one end only, the diameter of the former being 24 in. and that of the latter 30 in. The No. 18 grinder is equipped with two 30-in. wheels, one mounted on each end.

Steel Reinforcement Bars

The Specification Proposed by the American Society for Testing Materials

The standard specifications for steel reinforcement bars in the slightly modified form in which it was ordered at the annual meeting of the American Society for Testing Materials, that they should be sent to the general membership for a mail vote, are here printed. They were compiled by Committee A-1, of the society, William R. Webster, chairman.

1. Steel may be made by either the open-hearth or Bessemer process. Bars shall be rolled from billets.

Chemical and Physical Properties

2. The chemical and physical properties shall conform to the following limits:

Properties Considered.	Structural Steel Grade—Plain Bars.	Structural Steel Grade—Deformed Bars.	Hard Grade*—Plain Bars.	Hard Grade*—Deformed Bars.	Cold-Twisted Bars.
Phosphorus, max.					
Bessemer	0.10	0.10	0.10	0.10	0.10
Open-hearth	0.05	0.05	0.05	0.05	0.05
Ult. tensile strength, pounds per sq. in.	55,000-70,000	55,000-70,000	80,000 min.	80,000 min	Recorded only
Yield point, min., pounds per sq. in.	33,000	33,000	50,000	50,000	55,000
Elongation, min. per cent. in 8 ins.	1,400,000 tens. str.	1,250,000 tens. str.	1,200,000 tens. str.	1,000,000 tens. str.	5 per cent.
Cold bend without fracture:					
Bars under ¾ in. in diameter or thickness	180°d. = 1t.	180°d. = 1t.	180°d. = 3t.	180°d. = 4t.	180°d. = 2t.
Bars ¾ in. in diameter or thickness and over	180°d. = 1t.	180°d. = 2t.	90°d. = 3t.	90°d. = 4t.	180°d. = 3t.

*The hard grade will be used only when specified.

3. In order to determine if the material conforms to the chemical limitations prescribed in Paragraph 2 herein, analysis shall be made by the manufacturer from a test ingot taken at the time of the pouring of each melt or blow of steel, and a correct copy of such analysis shall be furnished to the engineer or his inspector.

4. Chemical determinations of the percentage of phosphorus, shall be made by the manufacturer from a test ingot taken at the time of the pouring of each melt of steel and a correct copy of such analysis shall be furnished to the engineer or his inspector. A check analysis may be made by the purchaser or his representative if desired, in which case an excess of 25 per cent. above the required limits will be allowed.

5. For the purposes of these specifications, the yield point shall be determined by careful observation of the drop of the beam of the testing machine, or by other equally accurate method.

6. (*a*) Tensile and bending test specimens may be cut from the bars as rolled, but tensile and bending test specimens of deformed bars may be planed or turned for a length of at least 9 in. if deemed necessary by the manufacturer in order to obtain uniform cross-section.

(*b*) Tensile and bending test specimens of cold-twisted bars shall be cut from the bars after twisting, and shall be tested in full size without further treatment, unless otherwise specified as in (*c*), in which case the conditions therein stipulated shall govern.

(*c*) If it is desired that the testing and acceptance for cold-twisted bars be made upon the hot-rolled bars before being twisted, the hot-rolled bars shall meet the requirements of the structural steel grade for plain bars shown in this specification.

Number of Tests

7. At least one tensile and one bending test shall be made from each melt of open-hearth steel rolled, and from each blow or lot of 10 tons of Bessemer steel rolled. In case bars differing ⅛ in. and more in diameter or thickness are rolled from one melt or blow, a test shall be made from the thickest and thinnest material rolled. Should either of these test specimens develop flaws, or should the tensile test specimen break outside of the middle third of its gauged length, it may be discarded and another test specimen substituted therefor. In case a tensile test specimen does not meet the specifications, an additional test may be made.

(*d*) The bending test may be made by pressure or by light blows.

8. For bars less than 7/16 in. and more than ¾ in. nominal diameter or thickness, the following modifications shall be made in the requirements for elongation:

(*e*) For each increase of ⅛-in. in diameter or thickness above ¾ in., a deduction of 1 shall be made from the specified percentage of elongation.

(*f*) For each decrease of 1/16 in. in diameter or thickness below 7/16 in., a deduction of 1 shall be made from the specified percentage of elongation.

(*g*) The above modifications in elongation shall not apply to cold-twisted bars.

9. Cold-twisted bars shall be twisted cold with one complete twist in a length equal to not more than twelve times the thickness of the bar.

10. Material shall be free from injurious seams, flaws, or cracks, and have a workmanlike finish.

11. Bars for reinforcement are subject to rejection if the actual weight of any lot varies more than 5 per cent. over or under the theoretical weight of that lot.

12. When an inspector is furnished by the purchaser to inspect material at the mills, he shall have full access, at all times, to all parts of mills where material to be inspected by him is being manufactured.

Lower Prices on Panama Rails.—The Canal Record of August 2 says concerning a recent purchase of open-hearth rails for Panama: "A contract for about one-half of the total amount of steel rail required for the track of the towing machines along the walls of the locks has been let to the Bethlehem Steel Company, the lowest bidder which offered open-hearth rail at $31.35 a ton. The amount of the contract is 1250 gross tons of 90-lb. steel rail, 85 per cent. in 30-ft. and 15 per cent. in 33-ft. lengths. The original bids were opened on May 10, but on account of high prices new bids were asked for, and foreign competition was invited. The second bids were opened on July 18, and the lowest prices offered were 50 cents per ton less for open hearth, and 35 cents per ton less for Bessemer rail. No bids were submitted by foreign manufacturers."

Radford Furnace, at Radford Furnace P. O., Va., which has long been idle, has been dismantled. It was built in 1868 and had an annual capacity of 4000 tons.

Republic Iron & Steel Company

Report for the Year Ending June 30, 1911—The Purchase of Steel Vessels

The twelfth annual report of the Republic Iron & Steel Company, which covers the fiscal year ending June 30, 1911, shows net profits of $3,008,934, as compared with $3,325,522 in the year preceding. The gross volume of business was considerably less than in the preceding year—$24,071,771 against $28,296,266—and the net profits were also reduced by an increase in fixed charges incident to building new steel works and a blast furnace which did not contribute to gross income, as they were not operated in the fiscal year. They are now running, however, and in the next six months a new sheared plate mill and a modern continuous mill will be in operation.

The report makes an announcement of special interest in the following. Details are not given as to the financial arrangements involved, but it is understood that bonds of the Republic Company were taken in payment for the vessel property:

"The Executive Committee has recently caused to be incorporated a steamship company known as the Republic Transportation Company, which will take over two modern steel steamships from the Federal Transportation Company and one modern steel steamship from the French Transportation Company, which consolidation of interests has been effected on a basis believed to be favorable to this company and will tend to establish its transportation interest on a more self-contained basis than has heretofore existed. This company will control the new transportation company through the ownership of 60 per cent. of the stock."

The balance sheet for June 30, 1911, is as follows:

ASSETS

Capital assets:		
Cost of properties July 1, 1910		$85,212,414.68
Additions for the year ending June 30, 1911		5,938,858.14
		$64,151,272.82
Investments:		
In Potter Ore Company	$401,000.00	
In other companies	529,852.09	930,852.09
Total capital assets		$65,082,124.91
Cash deposited with trustee:		
For redemption of first mortgage 5% gold bonds in addition to bonds of a par value of $2,139,000.00 retired in terms of the trust deed, per contra		48,495.76
Current assets:		
Inventory of manufactured products, material and supplies on hand at or below cost	$7,608,333.73	
Ore contract payments represented by ore at docks	686,254.79	
Accounts and bills receivable after deducting reserve for bad and doubtful accounts	3,245,775.42	
Cash	3,173,082.25	
Total current assets		14,173,446.19
Deferred charges to operations:		
Expenditure for stripping at Mines, advanced royalties, etc., chargeable to future operations		819,963.83
		$80,124,030.69
Net current assets	$10,729,102.80	

LIABILITIES

Capital stock:		
Common—273,520 shares of $100 each	$27,352,000.00	
Less—in treasury	161,000.00	$27,191,000.00
Preferred 7 per cent. cumulative—250,000 shares of $100 each		25,000,000.00
Total capital stock outstanding		$52,191,000.00
First mortgage 5 per cent. gold bonds:		
Total issue	$10,000,000.00	
Deduct—deposited with trustee and cancelled	2,139,000.00	
	$7,861,000.00	
Less—deposited with trustee of the 10-30-year 5 per cent sinking fund bonds in exchange for bonds of that issue	6,206,000.00	
Balance outstanding	$1,655,000.00	
Less—purchased and held in treasury	10,000.00	1,645,000.00
10-30-Year 5 per cent. sinking fund mortgage gold bonds:		
Total authorized issue, $25,000,000.00		
Total issued	$11,730,000.00	
Less—in treasury	$681,000.00	
Purchased for sinking fund	294,000.00	975,000.00
		10,755,000.00
Hasclton property mortgage notes:		
(To retire which a like amount of 10-30-year bonds are reserved)		1,475,000.00
Potter Ore Company bonds:		
$641,000 outstanding first mortgage 5 per cent. bonds guaranteed jointly with Tennessee Coal, Iron & Railroad Company, less that company's proportion		320,500.00
Bonds and notes outstanding on the Martin Coke Works property		373,382.40
Funds:		
For exhaustion of minerals	$1,394,379.80	
For depreciation and renewal of plants	1,418,240.44	
For refining furnaces	257,118.07	
For fire and accident insurance	436,893.50	
For contingencies	114,937.24	3,621,569.05
Dividend warrants:		
Payable in equal annual installments from October 1, 1911, to 1915, inclusive		935,790.00
Current liabilities:		
Accounts and bills payable	$2,483,791.06	
Ore contract balances representing cash received in excess of the value of ore shipped to customers	210,861.23	
Taxes accrued	132,351.05	
Interest accrued	177,154.30	
Dividends payable: 1¾ per cent. on preferred stock payable July 1, 1911 $437,500.00		
Unclaimed dividends 2,745.75	440,245.75	
Total current liabilities		3,444,343.39
Surplus:		
Balance June 30, 1911, as per attached statement		5,362,445.85
		$80,124,030.69

Income for the Year

The income account and statement of surplus for the year are as below. The total of profits, $3,758,698, compares with $4,227,369 in the previous year, and with $2,769,147 in the year ending June 30, 1909:

Net earnings from operations, after deducting charges for maintenance and repairs of plants amounting to $1,313,162.25		$3,758,698.20
Interest and dividends received		86,302.12
Total profits for the year		$3,845,000.32
Less—Provision for depreciation and renewal of plants	$600,254.56	
Provision for exhaustion of minerals	235,811.34	836,065.90
Net profits for the year		$3,008,934.42
Deduct:		
Interest on bonds	$586,414.79	
Dividend on 7 per cent. cumulative preferred stock	1,750,000.00	2,336,414.79
Surplus for the year		$672,519.63
Add—Surplus at July 1, 1910		4,954,660.54
		$5,627,180.17
Deduct:		
Discount and expense in connection with the new issue of mortgage bonds		264,734.32
Net surplus carried to balance sheet		$5,362,445.85
Net profits applicable to dividends		2,422,519.63

New Record in Unfilled Orders

Chairman Topping says of the situation as to tonnage and prices:

"The slackening in sales and weakness in prices noted in the last annual report became more pronounced during the first half of this fiscal year, the calendar year 1910 closing with iron and steel markets much unsettled with production in most all classes on a steadily declining basis, low ebb being reached during the early part of May, 1911, at which time competition became decidedly aggressive, particularly for the commodities manufactured by this company. To meet this situation, substantial price reductions were made by this company, followed shortly thereafter by a general reduction in prices by all other manufacturers, covering most all lines of iron and steel, which action stimulated confidence in values and started a buying movement of sufficient proportions to enable us to place in operation the new open hearth steel works and Haselton blast furnace No. 4, recently completed, and also to continue satisfactory operations at the Bessemer steel works. The unfilled tonnage of orders on hand is in excess of that reported for the year preceding, and it is believed, with business booked and the tonnage now in prospect, that the gross volume for the coming year should be substantially increased. For comparison, the following figures of unfilled orders are submitted:

	Finished and Semi-finished, Net Tons.	Pig Iron, Gross Tons.
June 30, 1907	448,627	74,500
June 30, 1908	283,743	59,196
June 30, 1909	392,420	94,247
June 30, 1910	341,887	82,906
June 30, 1911	481,425	102,077

"In the totals of finished and semi-finished product nothing is included but fixed contracts; sliding scale contracts with periodical adjustments are excluded."

Additions to property account during the year aggregated $5,938,858. The new construction to June 30, 1911, in the northern district, amounted to $17,359,927, and in the southern district to $3,668,794, making a total of $21,028,721. The total of net working assets at the end of the fiscal year, $10,729,102, compares with $12,785,590, $7,809,901 and $6,713,820 for the fiscal years ending June 30, 1910, 1909 and 1908, respectively.

Condition of Properties

A review is given of the improvements of the year and the present status of plants, with comparative figures of production. A synopsis of this statement is as follows:

A new washer has been installed at Pioneer furnace No. 3, South, and a new hot blast stove has been authorized at Haselton furnace No. 1. The new blast furnace known as Haselton No. 4 was put in blast in June of this year. Comparative figures for pig iron production are as follows:

	Gross Tons.
Year ending June 30, 1907	614,954
Year ending June 30, 1908	494,676
Year ending June 30, 1909	678,799
Year ending June 30, 1910	793,962
Year ending June 30, 1911	850,863

The theoretical blast furnace capacity is 1,170,000 gross tons a year.

The production of Bessemer steel ingots in the year was 597,991 tons, and of billets, slabs and sheet bars, 534,537 tons, against 681,884 and 606,531 tons, respectively in the preceding year. Work on the new open-hearth steel plant was actively presecuted during the year and it was put in operation in June 1911. At present it is operating to about 75 per cent. of capacity. Results so far indicate that the estimated full production of 30,000 tons of ingots per month will in a few months be exceeded.

The new 14-16-in. continuous bar mill authorized in the year will have a capacity of about 100,000 tons per annum of bars, structural material and skelp, the site chosen being adjacent to the company's new open-hearth plant. The new 90-in. sheared plate mill will have a capacity of about 5,500 tons per month and will provide sheared plates for the larger sizes of pipe which are being made in the company's tube works, as well as for the general trade. It is expected that the plate mill will be in operation in November, 1911. The annual production as given below shows a decrease on account of business conditions:

Annual Production of Finished and Semi-Finished Products.

	Gross Tons.
Year ending June 30, 1907	804,360
Year ending June 30, 1908	434,230
Year ending June 30, 1909	**565,151**
Year ending June 30, 1910	827,515
Year ending June 30, 1911	684,553

Raw Materials

An increase in the company's iron ore reserves has resulted from the exploration and development work of the year. At the Northern ore mines recent drilling has developed additional ore bodies at the Onondaga and Franklin mines. At the Kinney mine the old shaft has been abandoned because of its interference with stripping operations, and a new shaft is being sunk on an adjoining forty acres, leased for that purpose. At the Union mine, 50 per cent. of which is owned by the company, stripping operations have been continued, and by early winter the entire ore body will be stripped. At the Bray mine a new boiler house, machine shop and coal docks have been erected. At the Lillie mine a new shaft has been sunk to reach an ore body not available from the old shaft. At the Southern ore mines recent drilling at Tannehill and Houston mines has developed additional ore. At the Raimund division new tenement houses have been erected and the reconstruction work completed. As of June 30, 1911, there was in stock at the Pioneer furnaces, South, 25,000 tons of brown ore and 75,000 tons of red ore as a reserve supply to insure regular operations at these furnaces.

Iron ore production in the year was 1,861,185 tons, against 2,050,224 tons in 1910, 1,451,434 tons in 1909, 1,025,460 tons in 1908 and 947,069 tons in 1907. The ore reserves in the North are put at 38,812,467 tons and in the South at 127,471,048 tons.

At the Northern coke properties 50 new ovens were added. The coke production for the year, 723,859 tons, was the largest in the company's history, comparing with 670,018 tons in the previous year. The total number of ovens in the North is 784 and in the South 1010, the capacity of the former being 548,800 tons and of the latter 606,000 tons. The estimated coal reserves June 30, 1911, were 88,707,475 tons in the North, against 89,238,710 tons one year previous, and 32,484,030 tons in the South, against 74,792,090 tons in the previous year. The large falling off is due to the fact that a considerable acreage in the South, heretofore estimated to contain coal, was found on actual drilling to contain no coal of a workable character.

Limestone production was 88,239 tons in 1911, against 115,473 tons in 1910. Limestone reserves are around 31,000,000 tons, as they have been for several years. The average number of men employed at all works last year was 11,588, against 12,066 in 1910, 8340 in 1909, 8547 in 1908 and 13,895 in 1907. The total expended for labor was $8,273,630, against $8,652,102 in 1910.

Pittsburgh and the Steel Corporation

President James A. Farrell, of the United States Steel Corporation, was in Pittsburgh last week inspecting various plants of the Carnegie Steel Company. He visited the Homestead steel works and the Edgar Thomson steel works on Thursday, August 10, the Duquesne steel works and the National tube works at McKeesport on Friday and the Schoen steel wheel works and the Bessemer & Lake Erie Railroad on Saturday.

While in Pittsburgh Mr. Farrell gave out an interview in which he said that having been a worker in the steel industry of Pittsburgh for many years he had a deep interest in all that pertains to it. While in some quarters there had been a disposition to depreciate the future of Pittsburgh as a steel-producing center, he said that the increase in capacity of the Carnegie Steel Company alone is equal to the capacity of the Steel Corporation's works at Gary. "This country is great enough to support several large producing centers and it is natural that as the trade and population of the country extend westward and southward Chicago, Gary, Duluth and Birmingham should each have a measure of importance, leaving the great and growing East and Central West and the worldwide markets as the consuming field for the Pittsburgh district. Not only is Pittsburgh located to satisfy the great demands of its contiguous territory but it may look forward to an increasing foreign business, the extent of which may be conjectured from the fact that the United States Steel Corporation is now approaching 2,000,000 tons of exports annually, all of which is produced in its mills in Pittsburgh and vicinity."

Particularly significant is Mr. Farrell's statement below that since he has been president of the corporation, or since January 1 of this year, about $750,000 has been spent for safety devices and in welfare work:

It has been my duty and pleasure to investigate and recommend to the Steel Corporation for favorable consideration a number of important appropriations for the betterment and extension of its plants, aside from some $750,000 for the installation of safety appliances and extension of welfare work for the benefit of our employees, and I am pleased to state that these appropriations have been approved with cheerfulness, as, notwithstanding the numerous claims for consideration, it is recognized that our Pittsburgh industries must be developed to the highest state of efficiency. Proposals from time to time are under consideration, which, when carried out, will add still further to the effectiveness of its plants, increased capacity and diversity of its product and for the improvement of social and economic relations with its employees.

Referring to the warehouses established at Pittsburgh, Waverly and Cleveland and those to be established at San Francisco, Baltimore and in foreign countries Mr. Farrell said that these would afford outlets for the proper distribution of product without taxing the mills with small, difficult and urgent specifications. The requirements of these warehouses will be supplied to a large extent from the Pittsburgh district.

There is a great future for our Pittsburg industries, and it is with the intention of investigating personally, so far as possible within a limited time, its facilities, the future needs of its plants and other conditions such as affect raw materials and their transportation, that I am here to make the necessary inquiries and observations in advance of a careful study, which will serve to supplement the recommendation of our officials. We cordially endorse the theory that it is not only our duty from a humane standpoint, and an acknowledgment of the rights and privileges of our fellow men, but also good business practice to make a close and continual study of the conditions under which all of our employees live and labor, and to improve those conditions so far as they can be improved consistent with natural environments. Much has been and is being accomplished in this direction.

A Special Langelier Drill

A Recently Developed Tool for Drilling Meat Cutter Plates.

For drilling the holes which regulate the size of the finished product in meat choppers the Langelier Mfg. Company, Providence, R. I., has adapted one of its larger size

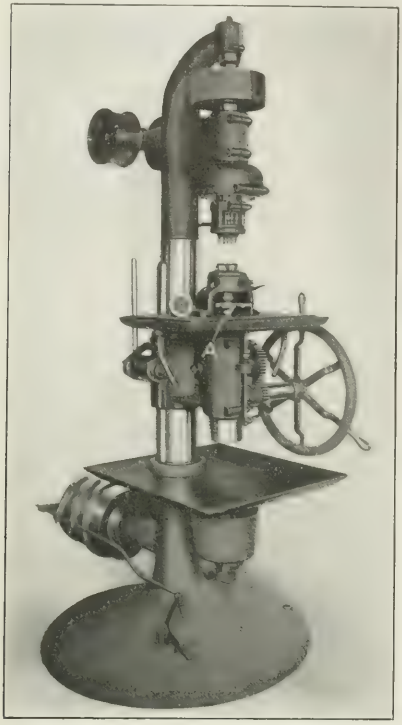


Fig. 1.—A Multiple Spindle Drill Equipped for Drilling Holes in Meat Cutter Plates Built by the Langelier Mfg. Company, Providence, R. I.

multiple drilling machines of the raising-table type. This tool was equipped with six interchangeable drilling heads, each having a different spindle layout and a table fixture for locating, holding and indexing the plates while the holes were being drilled. While the distance between the holes in all these plates was approximately 1 1/3 times the diameter of the drills used, it was not considered possible to design a spindle which would complete the work in any one plate in a single operation. Another serious disadvantage even if such a construction were possible was the clogging up of the drills with stringy steel chips. Fig. 1 is a general view of the drilling machine employed for doing this work, while Figs. 2 and 3 show a typical set of plates drilled and the special drilling heads employed to do this work, respectively.

The rows of holes in the plates shown in Fig. 2 were arranged on either circular, polygonal or involute lines, and considerable ingenuity had to be exercised to arrange a layout of drilling spindles which would do the work in the least possible number of operations. This was especially true where the number of holes in any one row was odd, and it was recommended that the manufacturers of these plates design the holes so that the number in each row will be even. The following table gives the number of holes in each of the plates illustrated in Fig. 2, together with the number of spindles employed and the number of operations.

Plate.	No. of holes	No. of spindles.	No. of operations.
A	40	8	6
B	50	10	5
C	102	17	6
D	78	12	7
E	80	16	5
F	144	36	4

Five of the six interchangeable drilling heads are shown in Fig. 3, the sixth one being illustrated in Fig. 1, in position on the drilling machine with a steady jig attached. These heads are all self-contained and are easily and quickly interchanged by using the four-leg cradles furnished with the heads for safe keeping when not in use. Phosphor bronze was employed for the heads and spindle drivers and the drilling spindle holes are bored to within 0.0005 in. of their proper location. The drilling spindles, which are of tool steel, are cut from the solid bar and hardened, tempered and ground. They are fitted with pinch chucks for taking straight-shank wire twist drills.

The main driving spindle, which is 1 5/16 in. in diameter, runs in loose perforated bushings in both the upper and the lower bearings, thus increasing its resistance to wear and to becoming heated from the high speed at which it runs. All the parts connected to this spindle and running at high speed are lubricated through a capped brass oiler screwed into the upper end of the main spindle. On this oiler the lubricant flows down through a hole extending the entire length of the main spindle to the drilling head. The influence of gravity and centrifugal force lubricates both the upper and the lower spendle bearings, although in the case of the former dependence is not placed upon this method alone, a separate oil well being provided for it.

The table used with this drill has a working surface of 12½ x 20 in., with an oil trough on all sides having an outlet on each end leading to the oil pan beneath. A feed of 9 in. is provided, which is controlled by an 18-in. hand wheel through a pair of gears and pinion and rack, which increase the ratio of the table feed leverage to 30 to 1. A stop screw enables accurate duplication of the depth of

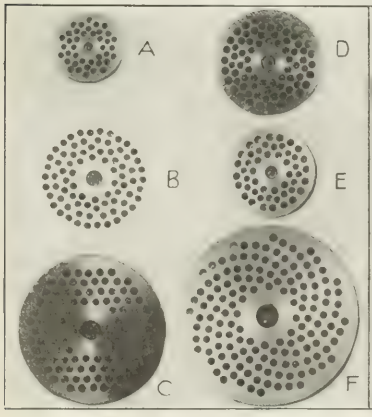


Fig. 2.—A Typical Set of Plates

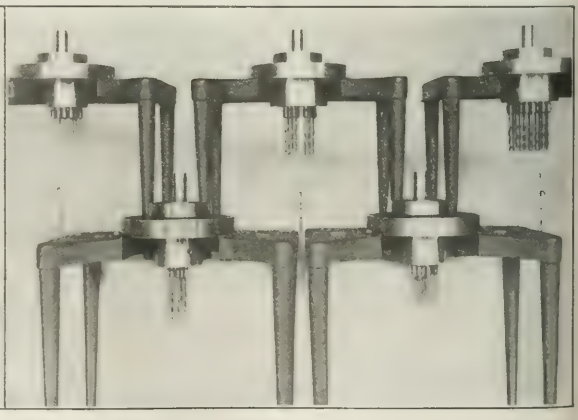


Fig. 3.—Some of the Special Drilling Heads Used.

holes to be procured. The arm supporting the table is adjustable, and its movement is controlled by a ratchet-pawl and a rack and pinion mechanism located on the left side of the machine. The distance from the lowest position of the table to the end of the drills is 10 in., and the supporting arm for the table can be clamped in any convenient position required. The distance from the main spindle center of the table to the outside of the column is 6⅞ in. In Fig. 1 a cutter plate fixture and a drilling steady jig are shown. The former is centrally located with reference to the drilling head, and is fastened by screws to the table. The functions of this fixture are locating, holding and indexing the cutter plate, which is seated on three short steel posts in the indexing head, while an expanding arbor projecting above the top face of this head locates the plate centrally with reference to the drilling head, and holds it in position. Individual indexing heads and expanding arbors are required for each plate and are quickly and easily interchanged. The indexing head is moved down by hand and is locked in position by a locking pin actuated by a downward pressure on the small lever at the right of the fixture, while the arbor is expanded by turning the small hand wheel A, Fig. 1, which has the spokes carried through the rim. The other fixture is clamped to the lower end of the drill head, and is adjustable in the vertical plane to permit the cutting end of the drill to project sufficiently to drill through the plate. This jig is used on the four smaller sizes of heads, and the only change that is required is the removal of the steel plate containing the jig bushings, which are held in place in the lower opening of the steady jig by screws and the substitution of another.

The drills are supplied with cutting oil by an oil pump, and after being used this oil flows into the lower oil pan and is filtered twice before entering the supply oil tank to be used again. The pump supplying the oil to the drill is located on the base of the machine at the right side.

The machine is belt driven, the driving shaft with the tight and loose pulleys being located on the base of the machine. This shaft is of the trunnion type driven into a hub on the base, and all the pulleys are fitted with loose perforated bushings. A foot belt shifter controls the starting and the stopping of the drill.

The following table gives the principal dimensions and specifications of the machine:

Working surface of table, in.	12½ x 20
Length of table feed, in.	9
Maximum distance between table and drill, in.	10
Diameter of main driving spindle, in.	1 5 16
Distance between main spindle center of table and inner face of column, in.	6⅞
Speed of spindles, r.p.m.	800
Floor space required, in.	33 x 42
Overall hight, in.	80
Net weight, lb.	1750
Domestic shipping weight, lb.	1950
Foreign shipping weight, lb.	2494

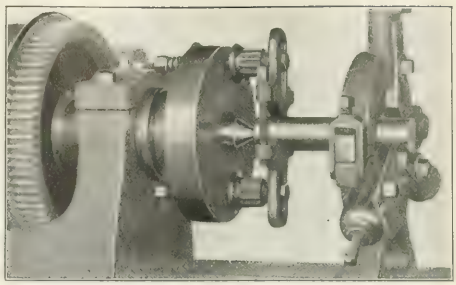
Other drilling heads with different spindle layouts which can be arranged within a 5-in. circle can also be used in this machine. The drill head casing can be removed if desired and another casing substituted to accommodate larger heads where the layout of the spindles is not larger than an 11-in. circle.

The Hill Face Plate Dog

As a substitute for belt lacing or a hook bolt to hold work against the headstock center of a lathe while the other end of the piece is running in a steady rest, the M. B. Hill Mfg. Company, Worcester, Mass., has brought out a holdback and faceplate dog.

The device consists of an adjustable dog or driver and two bolts which pass through the face plate. Spiral springs which are shown back of the face plate are mounted on these bolts and give the flexibility of the lacing. The bolts, which need only be set once, hold the work as securely as a hook bolt and can be adjusted to draw equally on both ends of the dog, thus causing the work to run true in the rest.

In use, the bolts are first put through from the back of the face plate and screwed into the threaded sleeves for three turns. The dog is then tightened on the work and the bolts screwed in so as to compress the springs to half their length. The fluted nuts on the opposite side of the face plate prevent the springs from pulling the dog back and should be set up tight against the face plate when



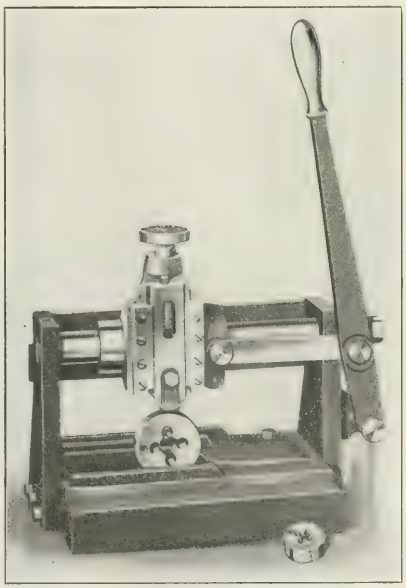
A Holdback and Face Plate Dog for Lathe Work Made by the M. B. Hill Mfg. Company, Worcester, Mass.

the dog is to be loosened and run back after the dog has been tightened on the work.

The attachment, which is said to be positive in action and more easily operated than the ordinary way, is made in two sizes. The smaller one will accommodate work from ½ to 2 in. in diameter while pieces between 1 and 3½ in. are cared for by the larger size.

The Remington Marking Machine

For the marking of tools and other small pieces which was formerly done by hand with a set of steel stamps, the Remington Tool & Machine Company, 50 Congress street, Boston, Mass., has placed on the market a simple form of marking machine. This new device is adapted for straight stamps for round work and circular stamps for flat work and is designed to give a uniform impression and to eliminate the breakage of the steel stamps



A New Type of Marking Machine for Metal Pieces Made by the Remington Machine & Tool Company, Boston, Mass.

employed as there is practically no injury to the face of the stamp used.

The stamp is attached to a slide which in turn is mounted on a head that is moved horizontally by the lever shown at the right of the accompanying engraving. To compensate for varying thicknesses of the stock being stamped means for quick vertical adjustment is provided for the head, while an automatic stop regulates the horizontal movement. The capacity of the machine is 1800 pieces per hour.

New Standard Pumps

Details of a General Line of Motor-Driven Machines

A new line of motor-driven pumps for all kinds of water supply systems has recently been brought out by

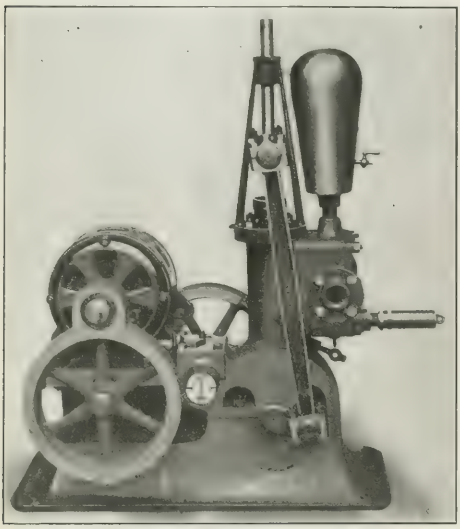


Fig. 1.—A New Motor-Driven Suction Lift Pump Built by the Standard Pump & Engine Company, Cleveland, Ohio.

the Standard Pump & Engine Company, Cleveland, Ohio. These pumps are designated as the Standard electric pumps. One type is a 1-hp. suction lift or deep well pump with the electric motor and the pump mounted on one base. This pump is of the double-acting differential cylinder type, which does away with stuffing boxes and inaccessible pump valves. Practically no change in mechanism is necessary to convert this from a suction lift to a deep well pump, the only change required being the taking out of the suction lift flange and substituting in its place a drop pipe flange for holding the pipe which is lowered into the well. The capacity of this pump is 400 gal. per hour against any pressure up to 90 lb. This pump may be used in connection with the water supply systems made by the company.

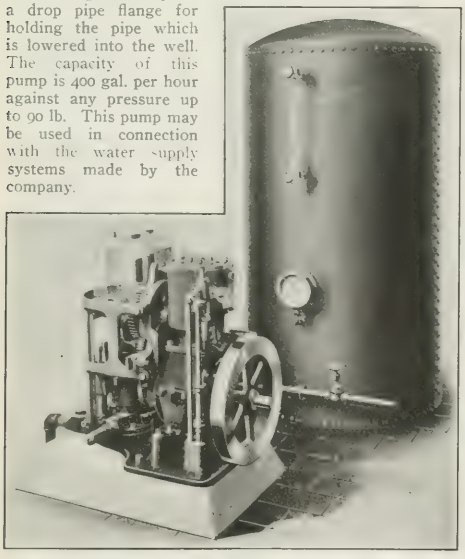


Fig. 2.—The Standard Jr. Pump Equipped with a Water Supply Tank.

This company has also brought out a 2 and 5 hp. motor-driven suction lift pump, shown in Fig. 1. This has a capacity of from 800 to 4000 gal. per hour against a 90-lb. pressure. The pump section in this machine is identical to that used in the 2 and 5 hp. gas engine driven pumps made by the company. The motor is so arranged that the pump may be disengaged and the motor used for power purposes without operating the pump. The pump is of the double-acting valve chamber type.

Another new type is the Standard 2 and 5 hp. motor-driven deep well pump. The capacity, pump section and the motor mounting are the same as in the 2 and 5 hp. suction lift pump referred to above. All of the Standard deep well pumps are designed with differential cylinders so that the load is divided between the up and the down stroke, making it possible to deliver water with an even flow against high pressure, so that the pumps can be used for spraying and irrigating, in greenhouses and on truck farms without storage tanks. All of this company's pumping outfits are fitted with air compressor attachments when used in connection with pneumatic water supply systems.

In the electrically-driven pumps the motor is mounted on the base in place of a gas or gasoline engine and the gearing is so arranged that any type of make of motor may be used according to the electric current available.

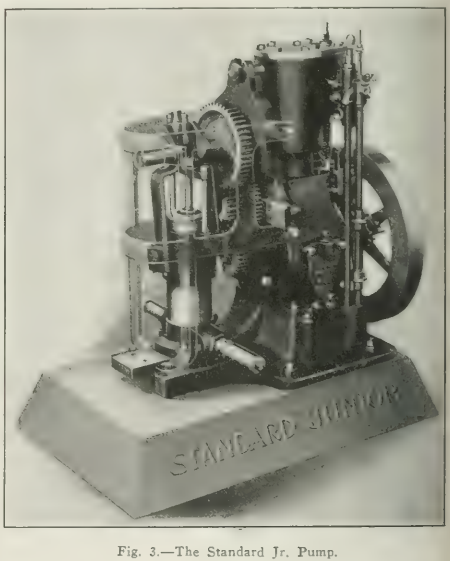


Fig. 3.—The Standard Jr. Pump.

The motor is supplied with a noiseless pinion which meshes with a larger gear on the reduction shaft, the small gear of which drives into the pump crank gear and in that way imparts an even powerful motion to the pump piston. An automatic cut-out switch starts and stops the pump according to the pressure. These pumps are designed for pumping into pneumatic water supply tanks, elevated storage tanks or for direct pressure into the pipe line.

The company has also brought out a new gas or gasoline pump. This pump, which is designated as the Standard, Jr., is made in the suction lift and the deep well types. This pump with and without water supply tank is shown in Figs. 2 and 3 respectively. The engine is the same size as in the 2-hp. pump but the pump itself is smaller, which permits of some modification in the design. One new feature is that the stuffing boxes, which sometimes leak and cause trouble, are entirely eliminated. Another new feature is an automatic safety valve by which the engine can be stopped at any pressure to which it is adjusted from 10 to 90 lb. per square inch. There is a gasoline tank in the base, with all pipes cut and fitted, this being another new feature. The pump is double acting of the differential cylinder type, which insures a steady flow of water. It is constructed in such a way

that the entire pump can be opened for cleaning or inspection by simply removing four screws. The cylinder is brass lined and is fitted with brass pistons and hydraulic packing. It has a disengaging device so that the engine can be used for other purposes without operating the pump. This pump has a capacity of 400 gal. per hour against any pressure up to 90 lb. per square inch. Both types are supplied with air compressor attachments when used for pneumatic water supply systems. This pump is

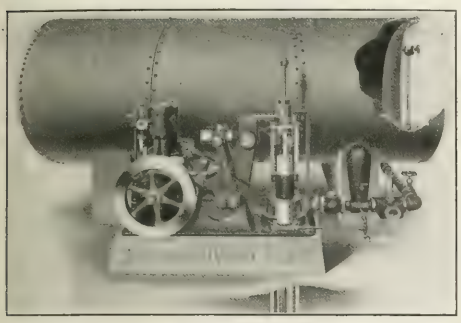


Fig. 4.—A Gas Engine Driven Deep Well Outfit.

designed especially for small water supply systems for suburban residences and farm houses. It is very compact, being 18 x 20 in. in size at the base and 28 in. high. It weighs 500 lb.

Another new type is a gas or gasoline engine driven deep well pump made in 2 and 5 hp. sizes, which is shown in Fig. 4. This differs from the company's other 2 and 5 hp. gas and gasoline engine pumps in that it has an air pump attachment for supplying air with water for a pressure tank system.

The Youngstown Sheet & Tube Company's Profit Sharing Plan

Under date of August 10, 1911, the Youngstown Sheet & Tube Company, Youngstown, Ohio, issued the following statement to its employees concerning the working of its system of profit distribution. It is signed by W. C. Reilly, general superintendent:

June 30 marked the end of the company's second year under a profit-sharing plan. While the earnings of the company for the fiscal year ending June 30, 1911, were less than 60 per cent. as large as in the preceding year, the directors, desiring to show their appreciation of the efforts of the employees, have decided to disregard the reduction in the company's earnings and pay the same percentage as last year. On August 19, therefore, employees entitled to participate will receive as a share of the company's profits for the year ending June 30, 1911, a sum equal to 5 per cent. of the wages paid them by the company during that year.

The company is now entering its third year of profit-sharing, and it seems fitting at this time to consider just what profit-sharing means. It means, above everything else, that the employees have an interest in the prosperity of the company. It means that the greater the company's success the more its employees receive for their year's work. It means that when an employee saves the company money he gets for himself a portion of the money so saved. It means that in addition to the regular wages for work a cash premium for ability and loyalty is paid. It is a substantial proof of the statement that the interests of the employees and the company's interests are the same.

When the company started this profit-sharing plan it had great hopes that it would be a success in many ways The company was paying, as it always has, as high wages as any of its competitors, and it was felt that in offering a share of the profits as well it would go far in making its plant a desirable place in which to work. It was in hopes the new plan would encourage employees to be careful not to cause the company expense through needless spoiling or wasting of tools, supplies or product, because such expense reduces the total profit, and hence the share of the employees. The hope was, in a word, that the new plan would bring the company and its employees closer together, result in greater efficiency all along the line and in benefit to all concerned.

In many ways it is difficult for the officials of the company to know just how far these hopes are being realized. An employee closely in touch with the workings of his department can tell better than anyone else whether the standard of efficiency has been and is being raised, and he should be much interested in this question. From one point of view he is the same as a stockholder in the company, and a decrease in its earnings for any reason means a decrease in his earnings. The profit-sharing plan will be continued for another year, and it is hoped that the results will warrant its continuance indefinitely.

PRIZES FOR SUGGESTIONS.

The company, of course, wants to operate its plant as efficiently as possible, and desires to secure efficiency in all lines of work. In handling material, in transportation, in methods of manufacture, in clerical work, in every line of its operations the company wants to secure the best results, and this can only be done by using the best methods. The company wants to make products of the highest quality. The company wants to safeguard its plants and prevent unnecessary accidents. All these things the company desires to do, and it would like the employees to help it do them. To this end employees are asked to give the company the benefit of their ideas. It has been decided to give $50 each month for the best suggestions received from employees, the money to be divided as follows:

First prize	$25.00
Second prize	15.00
Third prize	10.00

Department heads and their assistants will not be eligible to receive prizes.

Suggestions must be made in writing.

The suggestions received will be examined by a committee each month, and the awards made as promptly as possible.

Unusual Casts of Low Phosphorus Iron

The following analyses represent the casts of Chateaugay low phosphorus pig iron made at the Standish furnace of the Northern Iron Company at Standish, N. Y., August 2 to August 5, 1911. The low and uniform sulphur and phosphorus percentages are particularly noteworthy:

Cast.	Tons.	Silicon.	Sulphur.	Phos.
194	34	1.15	.028	.023
195	26	1.10	.019	.023
196	30	1.32	.017	.022
197	36	1.70	.019	.022
198	33	1.75	.018	.020
199	27	1.50	.017	.020
200	32	1.40	.016	.019
201	30	2.15	.015	.020
202	22	1.60	.016	.020
203	33	1.25	.021	.020
204	22	1.30	.017	.018
205	33	1.10	.017	.022
206	34	1.45	.014	.021
207	33	1.10	.016	.022
208	32	1.00	.019	.022
209	36	1.25	.017	.024
210	31	1.53	.016	.020
211	36	1.50	.017	.021
212	32	1.35	.016	.021
213	34	1.35	.017	.019

Alternating-current motors for elevator service were recently discussed in an article in the *Electric Journal* by A. G. Popcke. He explains that it has been found that squirrel-cage motors in sizes up to 15 or 20 hp. are satisfactory for elevator service. A speed of 720 r.p.m. is also mentioned as most desirable, and that, therefore, 8-pole 60-cycle motors of the squirrel-cage type are mostly used for this kind of service. The controller is a reversing drum type switch which connects the motor directly across the line. It is located near the motor and is operated by means of a rope or lever in the elevator car. This type of motor is rarely used when the elevator speed exceeds 150 ft. per minute, since the power will usually exceed 20 hp. at the higher speeds.

Generating Oxygen and Hydrogen Electrolytically

Electrolytic generation of oxygen and hydrogen has been known abroad for some time, but was not done in this country until the International Oxygen Company, 68 Nassau street, New York City, acquired the American rights for the gas-producing appliances of two prominent French companies. The two gases are being used more and more extensively for oxy-acetylene welding and cutting of metals as well as the oxy-hydric process. It is essential that the gases used in either of these processes be free from impurities of all kinds if the best results are to be secured. The electrolytic process of generation, it is emphasized, results in the securing of gases which are free from chlorine or nitrogen, impurities which very materially reduce the efficiency of the oxygen and the hydrogen. At the present time the International Oxygen Company is producing oxygen and hydrogen for commercial use and is also building generators of the type illustrated herewith for use in plants where it is desired to produce the gases and have the process under the direct control of the user. Fig. 1 is a view of the generator employed, while Fig. 2 is a sectional view giving some of the constructional details.

It is claimed for these plants that they are simple and reliable in operation, require no expert attention and have a very low maintenance cost. The cost of the oxygen which is produced by the electrolysis of water is very low and is practically the same as that of the current used. The generator is very simple in construction and consists of an iron tank, A, Fig. 2, which is utilized as the negative pole and contains the perforated tank D which is the positive pole. This tank is suspended from the cover B and is separated from the outer tank by an asbestos sack, E, which divides the generator into two compartments. When the current is sent through the generator the water decomposes into its two constituents, oxygen and hydrogen, the former being given off on the wall of the inner tank and the other on the inner wall of the outer tank. The gases are thus produced in separate compartments and are absolutely pure, while an additional check against possible mixing is afforded by the asbestos sack which, when impregnated with the solution of caustic soda that is added to render the water more easily decomposed, forms an effective barrier between the two gases. The oxygen and the hydrogen do not pass directly from the generator to the pipes leading to the reservoirs, but are first led through

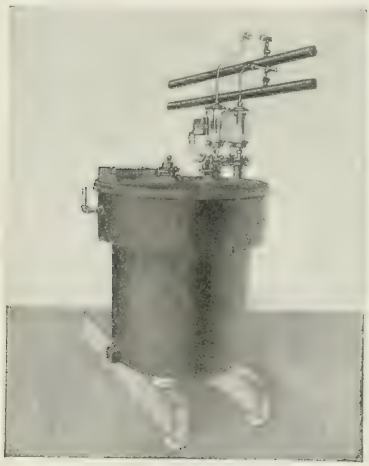


Fig. 1.—Exterior of a New Cell for Producing Oxygen and Hydrogen Electrolytically Made by the International Oxygen Company, New York City.

water placed in the glass lantern G on top of the generator. The rate at which the gases bubble through this water indicates the condition of the generator and serves as a check on its action. The hydraulic joint C between the cover and the tank is filled with oil and prevents the escape of either of the gases. As an additional precaution against short-circuiting the cover is kept separate from the tank by the use of wooden wedges and porcelain in-

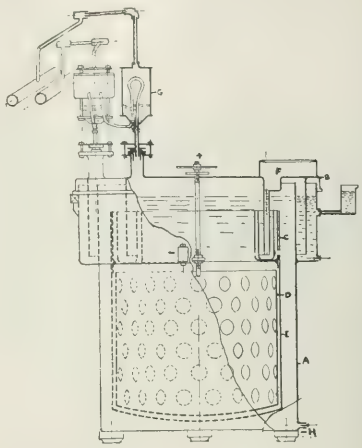


Fig. 2.—Sectional Elevation of the Generator.

sulators H are placed underneath the cell to raise it from the floor.

The generator is filled with water, which can be supplied from any available source, the only precaution being that it must not be exceptionally acid or akaline. The use of either of these kinds of water will result in an excessive amount of impurities being thrown down to the bottom of the generator and clogging it. After the generator is filled with water through the hole F, about 80 lb. of sodium hydroxide is added to reduce the resistance of the water to the passage of the electric current. This hydroxide also forms a tension on the asbestos sack as previously mentioned and serves to keep the two gases from mingling. One gal. of water will produce 100 cu. ft. of oxygen, and as the output of the generator is only 65 cu. ft. per 24-hr. day but little attention is required beyond adding a small amount of water each morning. The amount of current required to produce this quantity of oxygen is 300 amperes at 2 volts. If it is desired to increase the amount of oxygen above this figure, additional cells can be connected in series to give the required amount. As 1 kw.-hr. will produce approximately 3 cu. ft. of oxygen and twice that quantity of hydrogen, the cost of making the gases in this way is approximately one-quarter that when they are produced in the ordinary way.

Fluorescent Test of Oil Contamination

The fluorescent test of oil adulteration discovered by Alexander E. Outerbridge, Jr., chemist and metallurgist of William Sellers & Co., Philadelphia, described by him in a paper read before the American Society for Testing Materials, is proving of practical value beyond the expectations of the discoverer, as the late experiences of Mr. Outerbridge attest. An extended reprint of the paper was given in *The Iron Age* of July 13. An importer of linseed oil from Europe, not doubting his oil was pure, tested a sample under the ultra-violet light and found a decided bloom. He took samples from 50 barrels and every one contained mineral oil. He said that a test of the ordinary sort would have cost about $500, and would not have been as convincing as were the fluorescent tests. An investigation showed that the oil was probably shipped in old petroleum barrels and that there was no intention of adding mineral oil. Mr. Outerbridge had suggested this very contingency for the reason that the different samples showed varying quantities of contamination, which likely would not have been the case were the contamination purposely made.

The Penn Iron & Coal Company, Canal Dover, Ohio, is relining its blast furnace and expects to have it ready for blast in September.

Specifications for Spelter

Proposed Standard of the American Society for Testing Materials

Standard specifications for spelter were drawn up for the American Society for Testing Materials, by its Committee B-2 on non-ferrous metals and alloys, Prof. William Campbell, of Columbia University, chairman, and submitted to the annual meeting of the society, which voted to refer them to a letter ballot of the society. They are as follows:

1. Under these specifications virgin spelter, that is, spelter made from ore or similar raw material by a process of reduction and distillation and not produced from reworked metal, is considered in four grades, as follows: A, High Grade; B, Intermediate; C, Brass Special; D, Prime Western.

2. A brand shall be cast in each slab by which the maker and grade can be identified.

3. The maker shall use care to have carload of as uniform quality as possible.

Composition of Grades of Spelter

4. *A. High Grade.*—The spelter shall not contain over 0.07 per cent. lead, 0.03 per cent. iron, 0.05 per cent. cadmium. It shall be free from aluminum. The sum of the lead, iron and cadmium shall not exceed 0.5 per cent.

B. Intermediate.—The spelter shall not contain over 0.20 per cent. lead, 0.03 per cent. iron, 0.50 per cent. cadmium. It shall be free from aluminum. The sum of the lead, iron and cadmium shall not exceed 0.5 per cent.

C. Brass Special.—The spelter shall not contain over 0.75 per cent. lead, 0.04 per cent. iron, 0.75 per cent. cadmium. It shall be free from aluminum. The sum of the lead, iron and cadmium shall not exceed 1.20 per cent.

D. Prime Western.—The spelter shall not contain over 1.50 per cent. lead, 0.08 per cent. iron.

5. The slabs shall be reasonably free from surface corrosion or adhering foreign matter.

Sampling for Chemical Analysis

6. Not less than ten slabs shall be taken as a sample from each car; for smaller lots, in the same proportion to the total number, but in no case less than three slabs. In case of dispute half of the sample is to be taken by the maker and half by the purchaser; and the whole shall be mixed.

The slabs selected as samples are to be sawed completely across and the sawdust used as a sample. In case no saw is available for this purpose, the slabs should be drilled completely through and the drillings cut up into short lengths. The saw or drill used must be thoroughly cleaned. No lubricant shall be used in either sawing or drilling, and the sawdust or drilling must be carefully treated with a magnet to remove any particles of iron derived from the tools.

7. *Lead.*—For the determination of lead in High Grade not less than 25 g., in Intermediate not less than 15, in Brass Special not less than 10, and in Prime Western not less than 5 g., shall be taken; that is, the sample used for analysis should not contain less than 0.01 g. lead.

Iron.—The sample for iron should contain not less than 25 g. for the three higher grades and not less than 10 g. for Prime Western. The entire sample must be dissolved, the iron precipitated as ferric-hydroxide, then re-dissolved, reduced, and the iron determined by titration.

Cadmium.—Dissolve 25 g. in 330 cc. of a solution of one part of hydrochloric acid (specific gravity 1.2) and five parts of water. Let it stand over night; filter and wash; reject filtrate and dissolve the residue, which should be about 5 per cent. of the zinc, in nitric acid. Add 10 cc. of sulphuric acid; evaporate to fumes; dilute and filter out and wash the lead sulphate. Dilute the solution to 500 cc.; add 5 g. of ammonium chloride; pass a slow stream of hydrogen sulphide for one hour and let stand for about five hours; filter, wash with hot water; dissolve in 10 cc. of culphuric acid and 50 cc. of water; filter and wash. Dilute to 400 cc.; precipitate with hydrogen sulphide as before. Weigh as cadmium sulphide or dissolve in hydrochloric acid and titrate with potassium ferrocyanide.

Claims

8. Claims to be considered shall be in writing within thirty days of receipt of material at customer's mill and the results of customer's test shall be given. The shipper shall be given one week from date of receipt of such claim to investigate his records and then shall either agree to satisfy the claim or send a representative to the mill.

(*a*) *Analysis by Car Lots.*—No claims shall be considered unless the minimum samples as specified for the grade in question can be shown to such representative.

(*b*) *Physical Defects of Individual Pieces.*—No claims shall be considered unless the spelter in question, unused, can be shown to such representative.

9. Where the spelter satisfies the chemical and physical requirements of these specifications, it shall not be condemned for defects of alloys in which it is used or for defects in the coating of galvanized products.

10. The maker's representative shall inspect all pieces where physical defects are claimed. If agreement is not reached the question of fact shall be submitted to a mutually agreeable umpire, whose decision shall be final.

On a question of metal contents an adequate sample shall be drawn by the representatives of both parties; the sample shall be prepared from the slabs so selected as described under "Sampling." The sample shall be mixed and separated into three parts, each of which shall be placed in a sealed package, one for each party and one for the umpire if necessary. Each party shall make an analysis and if the results do not establish or dismiss the claim to the satisfaction of both parties, the third sample shall be submitted to a mutually agreeable umpire, who shall determine the question of quality and whose determination shall be final.

11. The expenses of the maker's representative and of the umpire shall be paid by the loser or divided in proportion to concession made in case of compromise.

In case of rejection being established, damages shall be limited to the payment of freight both ways by the maker for substitution of an equivalent weight of spelter meeting these specifications.

The Brown Instrument Company's Expansion

The Brown Instrument Company, whose office and laboratory have been located at 311 Walnut street, Philadelphia, since 1860, is moving to larger quarters because of the great increase in its business, which has more than quadrupled during the past five years. The business was originally established by Edward Brown, who was the first manufacturer of pyrometers in the United States, and bore his name until recently, when an incorporated company was formed, of which Richard P. Brown is president. As electrical instruments play an important part in the construction of pyrometers, Mr. Brown has desired to superintend the manufacture of millivoltmeters for use in the company's pyrometers, so as to best design the instruments for pyrometric use. With this end in view, he has become president of the Keystone Electrical Instrument Company, Philadelphia, which, for a number of years, has manufactured voltmeters and ammeters. The shops and laboratory of the Brown Instrument Company are being combined with those of the Keystone Electrical Instrument Company at Ninth street and Montgomery avenue, Philadelphia.

By this arrangement the Brown Instrument Company and the Keystone Electrical Instrument Company will manufacture pyrometers, thermometers, speed indicators, draft gauges, recording gauges, voltmeters and ammeters, being now in a position to manufacture or repair practically any type of instrument. Slight changes in the Keystone millivoltmeters have been made at Mr. Brown's suggestion. In addition to the works and office at Ninth street and Montgomery avenue, Philadelphia, an office will also be maintained for the present at 311 Walnut street, and the branch offices of the Brown Instrument Company at Pittsburgh and Chicago will also be continued.

An apparatus for threading nuts has been made the subject of a patent granted July 25, No. 999,090, awarded to Albert H. Bray and assigned to the Detroit Screw Works, Detroit, Mich. It forms part of a nut tapping machine.

The Thompson Automatic Cut-Out Hanger

As a safety device in mills and factories and a means of reducing the cost of operation the Thompson Hanger Works, 337 Superior avenue, N. W., Cleveland, Ohio, has brought out an automatic cut-out hanger for arc lamps. This hanger is designed for either direct or alternating current circuits and to enable a great deal of wire to be eliminated. Access to the lamp is rendered easy, without using cranes or ladders. The lamp is automatically cut out of the circuit when it is lowered, while raising it automatically re-establishes the circuit.

Two views of the hanger are given, Fig. 1 showing the lamp raised and in use, while Fig. 2 illustrates the lamp being lowered. Among the advantages claimed for this hanger are a saving in time in caring for lamps, the elimination of the danger that accompanies lamp trimming from a crane and the doing away of the long swaying lengths of conductor wire, which are not only unsightly and expensive, but are dangerous to life and property.

The construction of the hanger is simple and substantial, and the device is positive in operation. There are but two members, an upper and a lower one, both parts being connected by brass latches. A sheave wheel in cast-iron housings is mounted in each part, and the latches are fastened to the outside of the housings and insulated therefrom. These latches form the physical and electrical connection between the two parts of the hanger, and a short, quick jerk on the rope separates them, and the lower one travels down with the lamp. The line wires are connected to binding posts in the upper section and the lamp is connected by short leads to the binding posts in the lower part. By employing two pulleys the weight of the lamp on the lifting cord is reduced one-half and the suspension is not subjected to any strain except when the lamp is disconnected, as shown in Fig. 2.

With this hanger the lamp may be placed in any desired location, and can be readily reached by lowering it to the ground or the floor. The hanger is fitted with a top bail, so that it can be attached conveniently to a pipe bracket, cable, truss, ceiling or other support. If it is more convenient the hanger may be placed in the peak of the roof or at some other point which is considerably higher than the desired position of the lamp, the hight of the latter being adjusted by extending a rope or wire to the lower section of the hanger and the lamp. A universal joint connection between the hanger and the lamp enables the latter to swing in any direction, while a guard prevents rocking in the latches. All the parts of the hanger are insulated, and the hanger itself is protected by a weatherproof cover. Although designed primarily for indoor use, this hanger can also be used for street lighting service.

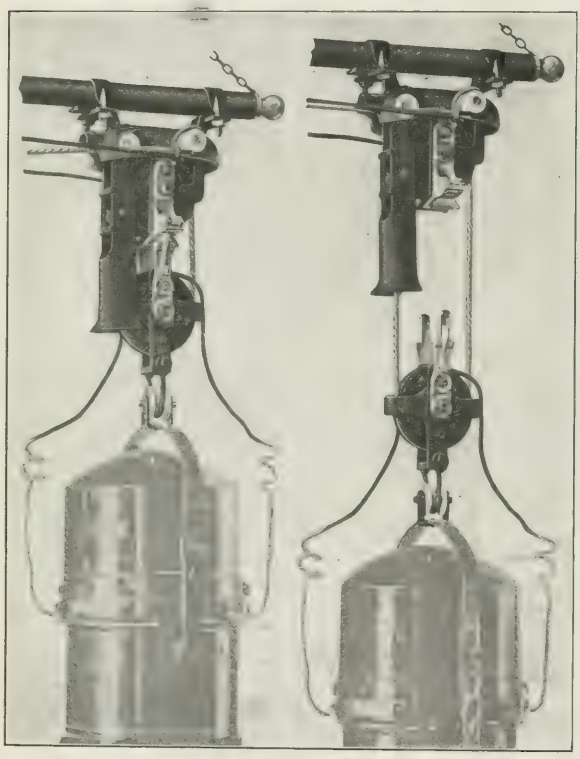


Fig. 1.—The Lamp in Use. Fig. 2.—The Lamp Being Lowered.

Two Views of an Arc Lamp Equipped with the New Automatic Cut-Out Hanger Made by the Thompson Hanger Works, Cleveland, Ohio.

Another Plan for Stock-Owning by Employees

The Union Switch & Signal Company, Pittsburgh, has in operation a plan by which its employees can become stockholders. Early in the year the company increased its capital stock to give the stockholders an opportunity to make additional subscriptions. After they had subscribed there were some 2000 shares unused. These were set aside for the employees, to be purchased on easy terms. The plan was worked out and the employees, more than 1800 in number, are taking advantage of the offer. The stock is selling at $75 a share.

An employee can purchase a share of stock by paying $1.50 monthly. This would amount to $18 the first year. He would pay the same amount the second year, but a dividend amounting to $6 would be added. A dividend during the third year would bring his payments up to $24, which would leave but five months of the fourth year upon which payments would have to be made. The employee then has the privilege of taking out a participation certificate or a regular stock certificate. The employees are divided into three classes: In Class A are employees whose annual compensation does not exceed $1,000, and five shares is the maximum number for which they can subscribe. In Class B are employees whose annual compensation is $3,000 or less. The maximum purchase is 13 shares. Class C is for employees whose annual compensation exceeds $3,000. The maximum placed on them is 20 shares.

If a subscriber cancels his subscription he is to be refunded all he has paid in, with 5 per cent. interest. If an employee dies or becomes permanently disabled payment will be made to his estate or to him as the case may be.

A coal high in sulphur from its own mines is used by the Lackawanna Steel Company for its 45,000 hp. of boilers. The coal is of high calorific value, but in other respects is a poor steam coal and gives an ash that fuses into a dense hard clinker. It was found impossible to use this coal on overfeed stokers and only with difficulty could it be used by hand-firing, and when so used required so much steam that the combined boiler and furnace efficiency was less than 50 per cent. A trial Taylor stoker gave a combined boiler efficiency of 75 per cent. at 135 per cent. of boiler rating, according to Walter B. Snow, Boston, and in a four-hour test developed 198 per cent. of boiler rating.

Frank Toomey, Inc., has purchased the equipment of the Bonneville Cement Company, Siegfried, Pa., and is offering it for sale either in whole or in part. The plant consists of five steel buildings, a number of frame structures, 33 acres of real estate, of which only about 10 per cent. has been developed. The plant is located on the Central Railroad of New Jersey and has a capacity of 400,000 barrels of cement per year.

The Machinery Markets

While the machinery inquiries are more plentiful in some selling centers and business is improving, the trade in the East is noticeably dull. Current orders in New York and Philadelphia are small and there is sharp competition in both cities for such business as is in sight. The situation is somewhat better in New England, where the automobile trade is buying and the general demand is picking up. Inquiries for machine tools are increasing in Cincinnati, although there are signs of impending labor troubles in the West. The Cleveland market is dull and has no distinctive features. There is a fair improvement in small orders for machine tools in St. Louis and the call for metal-working equipment is on the increase on the Pacific Coast. Wood-working machinery is in good demand in the latter market. Business is satisfactory in the South, where refrigerating equipment is selling well. The market for irrigating machinery and equipment for making cotton seed oil products is decidedly good in Texas.

New York

NEW YORK, August 16, 1911.

There is very little demand for machinery in the New York market and dealers are not encouraged over the outlook. It is apparent that August will not be a very big month. The railroads are slow about placing orders for equipment about which they have inquired and the call from general manufacturers is small.

Export inquiries and sales continue to help the market materially and some good business has been placed by Japanese engineering houses which have been buying machine tools for railroad interests. Exporters, who buy for the European market, have been contributing a steady volume of business to the machine tool trade of late and considerable wood-working machinery is being sold for delivery abroad. The Canadian railroads and the Canadian car manufacturers continue to make good purchases in this market.

A noticeable feature locally is the absence of new manufacturing enterprises; a number of projects which were expected to result in business by this time have been held up.

Smith & Kaufman, manufacturers of silk ribbons, with New York offices at 569 Broadway, will build a new two-story brick factory at Leonia, N. J. This will include a manufacturing building, 105 x 161 ft., and a power house, 40 x 80 ft. The power equipment has not been decided upon as yet.

The Fagan Iron Works, Fourteenth street, Jersey City, N. J., has acquired a tract of land adjoining its present works and is planning the construction of an office building, warehouse and other structures. The plans for the buildings have not as yet been completed.

The Globe Malleable Iron & Steel Company, Syracuse, N. Y., is installing some additional hammers, both steam and board drop presses, a high-duty plane, lathe and universal miller and some additional die room equipment.

The Fatoute Iron & Steel Company, 65 Lawrence street, Newark, N. J., has acquired a large tract of land at Frelinghuysen avenue, that city, for the erection of the new plant.

The British Vacuum Ice Machine Company, at 124-7 Minories, London, England, is inquiring in this market for manufacturers who can take over the American rights for making a small type of the hand ice-making machines.

The Torrington Building Company, Torrington, Conn., has been awarded the contract for the erection of an addition to the plant of the Simplex Automobile Company at New Brunswick, N. J. The structure will be 66 x 319 ft. and two stories.

The Delaphena Company, Poughkeepsie, N. Y., is having plans prepared for a manufacturing plant which it will erect in that city on a site having an extensive frontage on the Hudson River.

A two-story factory, 68 x 148 ft., for the manufacture of safes and automobiles supplies, is to be erected at Yonkers, N. Y., by A. R. Mosler & Company, New York City.

The Plastergen Wall Board Company has been incorporated at North Tonawanda, N. Y., with a capital stock of $25,000. The company will commence operations on September 1 in the buildings formerly occupied by the Martinizing Process Company which are now being equipped for the purpose. The officers of the company are Carl G. Whattier, president; John C. Baines, vice-president; Arthur H. Showalter, secretary, and Henry J. Boeckel, treasurer, all of Buffalo, N. Y.

The Buffalo Steam Pump Company has purchased the large factory building of the Ideal Sectional Building Company adjoining its plant at Oliver street and the Erie Railroad, North Tonawanda, N. Y., and will remodel and equip it for use in connection with its present plant.

The Rand Company, North Tonawanda, N. Y., has taken over the business of the Time Saver Company, Boston, and will remove the plant of the latter company to North Tonawanda early next month. An additional story is being built on the factory building of the Rand Company to provide space for the new business.

The Star Electric Company, Binghamton, N. Y., has let the contract for the erection of a factory building 60 x 100 ft., two stories.

The Mitchell & Church Company, Binghamton, N. Y., will build a factory, 45 x 126 ft., four stories, of brick and terra cotta on Water street that city.

The Delaware & Hudson Railroad Company will install a coaling plant and ash pit at Binghamton in connection with the new roundhouse it is building at the east end of the Binghamton yards. Geo. Burgess is chief engineer, Albany, N. Y.

A pump mill, 60 x 100 ft. and one story, is to be built at Norwood, N. Y., by Martin Bros., from plans prepared by the Stebbins Engineering Company, Watertown, N. Y.

The Elmira Water, Light & Railroad Company has let the contract for a two-story addition, 36 x 52 ft., which it will make to its power house on Madison avenue.

The Corning Glass Works, Corning, N. Y., has let the contract to Gahren, Dodge & Maltby, New York City, for the erection of a one-story addition, 92 x 280 ft., to be made to its blowing room and an addition to its storehouse, 60 x 184 ft. one story, at the plant of the company on the New York Central Railroad.

The water-works system, Mexico, N. Y., for which plans are being prepared by W. G. Stone & Co., engineers, Utica, N. Y., will include a pumping station, 30 x 32 ft. one story, a sheet-steel standpipe 22 ft. in diameter by 80 ft. in hight, a considerable number of gate valves and hydrants and nine miles of cast-iron pipe from 12 to 4 in. in size.

The Crown Metal Furniture Company, Jamestown, N. Y., is having plans prepared for a new factory which it will build on a 4½-acre site recently purchased with a frontage of 300 ft. on the Erie Railroad at East Jamestown. The main building will be about 400 ft. long.

New England

BOSTON, MASS., August 15, 1911.

Indications multiply that business is improving and that the change will become more sharply accentuated with the coming of cold weather. The machinery houses are doing more business than they had expected for this season of the year. The dealers have booked a good many orders in the past fortnight, though few of them are large. The automobile trade is buying more freely than had been anticipated, chiefly the special machinery which will increase quality and, more particularly, will decrease cost. The prospect is that this demand will be a constant one, perhaps increasing. Poor crops in New England will probably restrict local buying of agricultural equipment.

The amount of new building construction is evidenced by the demand for galvanized sheets which is considerably larger than in 1910. The black sheet market is fairly active. Some cutting of quoted prices is reported as confidential transactions to secure immediate specifications. Copper and the pig metals generally are in fairly active demand in this territory.

The promise of a boom in the cotton industry is becoming brighter each day. At the present time the manufacturers are producing as slowly as possible, in the face of present high prices and the harvesting of

THE MACHINERY MARKETS

the great crop which should bring the market down to normal conditions. But even now production is fairly good, as compared with the last year, because of immediate requirements of customers, whose stocks are sadly depleted. With the return to lower prices the whole country will have to be stocked up which will mean full capacity production with the mills and a strong demand for textile machinery and other mill equipment.

The large machinery requirements of the Boston & Maine system have been still further augmented by the destruction of the repair shops and round house of the Maine Central Railroad at Calais, Me., with a loss of $110,000. The shops were equipped quite recently with modern machine tools, which will doubtless be replaced in the near future, for the conditions which lead to their purchase still exist.

The Bicknell-Thomas Company has been organized at Greenfield, Mass., to manufacture Wahlstrom's patent friction clutch for machine tools up to 10 hp., and a line of tapping attachments and other screw cutting accessories which will be sold to the Wells Bros. Company of Greenfield. F. O. Wells is the president of the new company; F. A. Bicknell superintendent and W. C. D. Thomas, secretary and treasurer. The company states that it has taken the factory recently occupied by the E. F. Reece Company at Greenfield.

The Archer Company, New Haven, Conn., has been organized to manufacture specialties. The company is now negotiating for the purchase of a factory. The incorporators are: Frank R. Graves, Roscoe E. Peterson and Samuel B. Pettengill.

In connection with the election of W. H. Whiteside to the general managership of the Stevens-Duryea Company, Chicopee Falls, Mass., the report has gone abroad that the step is in connection with a consolidation of interests. The company makes the statement that such is not the case. Mr. Whiteside was, until recently, general manager of the Allis-Chalmers Company, a fact which probably gave rise to the report. He succeeds Irving H. Page, who wishes to be relieved of the active management of the business, that he may devote his time to the J. Stevens Arms & Tool Company.

The business of the R. L. Morgan Company, Worcester, Mass., builder of motor trucks, has been reorganized and placed upon a substantial financial basis, under the name of the Morgan Motor Truck Company. Of an authorized capital stock of $1,100,000, preferred stock to the amount of $144,800, a special preferred to the amount of $75,000, and common to the amount of $500,000, has been issued. The indebtedness of the old corporation has been taken care of. Harry Unwin, New York, is the president, Evan F. Jones, treasurer. The directors are: Mr. Unwin, Mr. Jones, who is the general manager of the Morgan Spring Company; Jerome R. George of the Morgan Construction Company, John E. Bradley, head of the Bradley Car Works, all of Worcester, and Lancaster P. Clark, manager of the machinery division of the Blake & Johnson Company, Waterbury, Conn. Charles H. Derby is the clerk of the corporation. Ralph L. Morgan, founder of the business, has been engaged as consulting engineer. The company's truck has been successful, and the plan is to proceed in its manufacture and development, aggressively but conservatively.

Some interest is expressed in the incorporation of the R. H. Machinery Company, Hartford, Conn., with a Connecticut charter and a paid-in capital stock of $375,000. Richard H. Long, South Framingham, Mass., is the president and treasurer, and Alton Bennett, Springfield, Mass., the secretary. The company, which succeeds a Massachusetts corporation of the same name, will manufacture machinery, and will carry along the line of shoe machinery which Mr. Long has been developing for some years at his works at South Framingham.

It is understood that the Mead-Morrison Company, Cambridge, Mass., manufacturer of hoisting and other machinery, has deferred the establishment of new and much more spacious works. The plan had been to proceed with the enterprise in the immediate future; in fact the project would have been well under way by this time had it not been for a change in management resulting from death.

The Jaeger & Sword Mfg. Company, New London, Conn., has established a factory at 192 Main street, that city, for the manufacture of the Jaeger patent roll grip mandrel and other metal goods. It is a new Connecticut corporation, with capital stock of $35,000. The incorporators are Max Jaeger and William F. Sword, New London, and Edward J. Hayes, Pawtucket, R. I.

The Hart & Cooley Company, New Britain, Conn., manufacturer of steel registers and lockers, will erect a storage building 50 x 75 ft., two stories.

The Diamond Machine Company, Providence, R. I., announces to its customers that its shops will be closed for the annual vacation from August 26 to September 5, during which time correspondence will be handled as usual and shipments made from stock.

The Regal Silver Mfg. Company, Bradley and William streets, New Haven, Conn., will be in the market for drop hammers. The company has just been organized with a Connecticut charter and capital stock of $25,000. M. L. Baker is the president and secretary; William Cun, vice-president, and G. F. Hemming, the third director. The product will be table cutlery and plated ware.

The Shoe Hardware Company, Waterbury, Conn., will erect an addition 86 x 96 ft., five stories, of brick mill construction.

B. F. Perkins & Sons, Inc., Holyoke, Mass., will build a brick addition 100 x 200 ft., two stories.

The Blakeslee Drop Forging Company, Southington, Conn., has increased its capital stock from $50,000 to $150,000.

The Eastern Maine Railroad has been incorporated under an act of the last Maine legislature, with a capital stock of $500,000, with the privilege of increasing to $2,000,000, to build and operate a line from Brewer to Houlton, Me., crossing the Maine Central railroad at Bancroft. The directors are: William H. Taylor, New York; George W. Maxfield, Flavius O. Beal, Bangor, Me.; Harlan P. Sargent, South Brewer, Me.; Alfred G. Chambers, Haynesville, Me.; president, George W. Maxfield; treasurer, Flavius O. Beal; clerk, Herbert M. Heath, Augusta, Me.

The Maine Central Railroad has acquired the Sandy River and Rangley Lakes Railroad.

Additions to general manufacturing plants of New England include the following: J. B. Martin & Co., Taftville, Conn., addition 50 x 60 ft., two stories; Killingly Mfg. Company, Killingly, Conn., a new corporation to enlarge Williamsville mill to 60,000 spindles; Hamilton Mfg. Company, Lowell, Mass., new mill, 135 x 268 ft., four stories; Brunswick Knitting Mill, Brunswick, Me., to rebuild plant destroyed by fire.

Philadelphia

PHILADELPHIA, PA., August 16, 1911.

Local merchants report business as just about holding even. Current orders continue small and sharp competition is to be noted for such business as comes out. Inquiries generally are confined to single tools and occasional small lots. Buying is light and orders received come from widely scattered districts. While a great volume of business is not expected during August, the trade expresses very hopeful views for a more aggressive movement in the fall. The increased demand for rolling stock coming from the railroads is considered encouraging, although as far as being actual buyers of any tools in quantity the railroads in this district are still a negative factor. A fair amount of buying continues to be reported in special equipment and the smaller builders of machinery of that class are comparatively busy. Makers of the heavier class of equipment report a fair amount of new business in hand, as well as in prospect. The situation in the second-hand machinery market is without feature, the demand being dull and irregular. A moderate inquiry for power equipment is to be noted, small installations are coming out from time to time but as a rule close rather slowly. Inquiries for equipment of the heavier and high power type is light. The foundry trade is reported a trifle more active but the demand is still irregular, both for steel and iron castings, and slight spurts in business have, as a rule, been followed by duller periods.

The Baltimore & Ohio Railroad has an inquiry out for a medium size centering machine for Baltimore delivery.

The H. E. Grau Company is preparing to erect a $10,000 power house for the Presbyterian Orphanage, Fifty-ninth street and Chester avenue. The necessary permits for the work have been granted by the Bureau of Building Inspection.

In connection with various improvements recently authorized by the Baltimore & Ohio Railroad Company, permits have been taken out for the erection of

THE MACHINERY MARKETS

water tanks and alterations to its pumphouse at Snyder and Meadow avenues; also for erection of water tank supports along the Delaware River near Synder avenue.

Contractors have been estimating on a one-story boiler, engine and pump house, 107 x 140 ft., designed by Frank C. Roberts & Co., for the Ebensburg Coal Company, Colver, Pa.

The receivers of the Screw Cutting Company of America have, we are informed, been dismissed and the obligations of the company met. The building of the company at Seventeenth street and Sedgely avenue will be disposed of. Engineers are designing new machines for continuous, accurate work at a commercial speed, after which it is proposed to reorganize the company.

The A. P. Witteman Company is about completing extensive improvements to its plant at Chester, Pa. A new power house is being built and a 200-kw direct-connected generator has been put in position. Foundations are also being laid for a 1,200-ton forging press. Several heavy machine tools have also been recently installed. This company reports business as being very good and the additions to both plant and equipment now being made will materially increase its facilities for heavy forging work.

The Department of Public Health and Charities, Joseph S. Neff, N. D., director, will receive bids until August 21 for the construction and equipment of a laundry building at Thirty-fourth and Pine streets, recently destroyed by fire. Plans, specification, etc., may be obtained from Philip H. Johnson, architect, 1824 Land Title Building, this city.

The Tindel-Morris Company, Eddystone, Pa., notes a somewhat better demand for its special line of tools. In its forging department a decided improvement in business is reported. This company has recently shipped one of its 17-in crank shaft lathes for export to Germany; one of the same size has also been furnished the York Mfg. Company, York, Pa., and an order is in hand for a 24-in. machine for a Western concern.

Sauer & Hahn, architects and engineers, are engaged on plans for a group of buildings to be erected in Camden, N. J., for the American Artificial Silk Mfg. Company. The preliminary plans have been completed and the plant will consist of a main building of reinforced concrete, with brick and terra cotta exterior 72 x 180 ft. and four stories. On either side of the main building will be one-story buildings, 26 x 151 ft. The manufacturing department, consisting of a one-story building 180 x 324 ft., is also included. Sawtooth skylights will be placed on the one-story buildings. The exterior walls of the various buildings will have a minimum pier construction and maximum glass area. The power plant will be housed in a building measuring 50 x 120 ft.

Chicago

CHICAGO, ILL., August 15, 1911.

A better tone is reported as prevailing in the machinery trade during the past week, although floor sales were not especially active. Inquiry for new tools has improved, but the demand for second-hand equipment has been so slow as to cause an accumulation of used tools in the hands of some of the dealers. The Chicago & Northwestern Railway has added another list of tools to its previously reported requirements, which will increase its purchases by about $8,000. The several boring mills, vertical lathes for which the International Harvester Company has asked prices, have not yet been placed. One sale of interest reported included a group of six milling machines.

Tenders are being asked until August 21 covering the furnishing and delivery of pump barrel castings for the Fourteenth Pumping Station, Chicago. Plans and specifications may be obtained at the office of the Director of Public Works.

The Russell Bronze Company, Chicago, with a capital stock of $20,000, has been incorporated by M. S. P. Thomas, W. S. Underwood and R. Swanston to manufacture ornamental bronze fixtures.

The Midland Electrical Mfg. Company, Chicago, has been organized to manufacture mechanical devices. The capital stock is $50,000 and incorporators are Andrew Engstrong, Arthur O. Carlson and Frederick Deiser.

The Joor Engineering Company, Chicago, contractor and manufacturer, has been incorporated with a capital stock of $60,000 by Samuel E. Joor, Frank Walsh and A. B. Gordon.

The Oakdale Iron Company, Chicago, has been incorporated with a capital stock of $25,000 to engage in the iron and steel business, the incorporators being Jacob Ringer, Ludwig Loewenstein and Milton N. Hirsch.

Canners Can Company, 4840 South Western avenue, Chicago, has been issued a factory building permit providing for a $200,000 structure.

H. M. Byllesby & Co., Chicago, engineers and managers of public utilities, confirm the reported purchase of the Sioux Falls Light & Power Company, of Sioux Falls, S. D. This company owns and operates a water-power generating plant on the Big Sioux River, reinforced by a modern steam auxiliary station, and serves the greater part of Sioux Falls with current for lighting, transportation and power. Formal possession will be taken in a few days with N. C. Draper, formerly of Zanesville, Ohio, as manager. Improvements and extensions will be made to the property.

The Co-Operative Stove Company, Bloomington, Ill., will conduct a general foundry business with an authorized capital stock of $50,000. The incorporators of the company are Jno. W. Hayes, A. C. Hamilton and E. N. Hamilton.

The Central Malleable Iron Company, Decatur, Ill., has changed its name and will operate in the future as the Decatur Foundry Company.

The Fairbury Electric Light Company, Fairbury, Ill., has just purchased a 300-hp boiler in connection with the enlargement of its plant and also contemplates the installation of additional power equipment.

Williams, White & Co., Moline, Ill., are about to let the contract for a new machine shop adjoining their present plant. The new building will be of steel construction, 52 x 142 ft.

The Marseilles Hydraulic Company, Quincy, Ill., Duncan McDougal, president, is about to let contracts for the construction of an electro-hydraulic plant capable of developing 8000 hp.

The city of Paxton, Ill., will construct and operate a $17,000 electric light plant, for which an issue of bonds has already been authorized.

The International Tank & Pump Company, Decatur, Ill., has been incorporated with a capital stock of $5,000 to manufacture and deal in pumps. The incorporators are W. C. Field, L. R. Taylor and W. R. Batchelder.

The Waukesha Motor Company, Waukesha, Wis., has increased its capital stock from $100,000 to $200,000, the purpose being to provide for an enlargement of its plant and the installation of considerable special machinery.

The National Boat & Engine Company, Shell Lake, Wis., is preparing plans for the erection of a new plant at that place.

The Edgar Veneer & Mfg. Company, organized with a capital stock of $15,000, Mr. C. C. Barrett, president, contemplates building a veneer factory at Edgar, Wis., a short distance from Wausau.

The Colby Motor Company, Mason City, Iowa, is planning the erection of an addition to its present plant to be 150 x 400 ft. long and two stories.

The Minnesota Box & Lumber Company, St. Paul, Minn., was recently destroyed by fire, causing a loss of $75,000.

The Lafayette Safe & Lock Company, Lafayette, Ind., is about to build an addition to its plant which it hopes to place in operation within six weeks.

The Dakota Welding & Mfg. Company, New Rockford, N. D., has been organized with a capital stock of $20,000. The incorporators are David F. Geiger, Jno. A. Geiger and O. W. Munsell, all of that city.

The Cascade Flouring Mill Company is arranging to double the capacity of its mill at Cascade, Mont., in which connection new machinery will be installed.

Cleveland

CLEVELAND, OHIO, August 15, 1911.

The local machinery market is dull. Dealers generally report a lighter demand for machine tools than during July. Last month some of the automobile manufacturers placed orders for round lots of machinery covering their requirements for making their 1912 output, but orders from this source are now scarce, being limited mostly to an occasional order for a very small lot of tools. Other business is scattering and confined largely to single tool orders. As August is usually a very dull month with the machinery trade the present inactivity is not unexpected. The outlook for the fall business is regarded as somewhat more favorable than

THE MACHINERY MARKETS

early in the summer. Reports from manufacturers in metal working lines generally indicate that orders are more plentiful than they were earlier in the summer. The outlook in the automobile industry is considered very satisfactory. Some large orders for automobile parts have been placed recently and a number of manufacturers of automobile parts have all the work they can do for some time. Second-hand machinery is moving slowly. The demand for mill supplies is fair.

The installation of additional equipment made necessary by a steady growth of its business has resulted in the Park Drop Forge Company, Cleveland, reaching the limit of its present capitalization and the company has increased its capital stock from $140,000 to $250,000. In addition to installing some additional small drop hammers the company has recently put in two 1500-ton hydraulic hammers and an Ajax upsetting machine and its plant is now equipped for turning out all of the heavier work in automobile forgings. No room is left in the present plant for further expansions and the company now has under consideration the erection of an addition, which will probably be built during the coming fall. The company reports that it has recently taken some large orders and the amount now on hand necessitates running the plant overtime.

The Alliance Brass & Bronze Company, Alliance, Ohio, will shortly begin the erection of a new plant. The company has closed a deal with the Alliance Board of Trade for a 2¾-acre site adjoining the Cleveland & Pittsburgh Railroad tracks. One building, 100 x 40 ft., will be erected at once and an office building and pattern room will be erected later. The new plant will enable the company to largely increase its output. The officers are C. J. Rath, president; John Bracher, vice-president and treasurer, and C. W. Smith, secretary.

The Perfection Spring Company, 2415 Superior avenue, Cleveland, has acquired the plant of the Standard Brass Foundry Company, 6608 Central avenue, and will remodel and enlarge it. When the changes are completed the spring company will operate the new plant as well as its present one. In addition to its present line of automobile springs the company will shortly place on the market a new automobile motor. Twelve new furnaces and considerable spring manufacturing machinery will be installed. To provide for its extensions the Perfection Spring Company has increased its capital stock from $200,000 to $500,000.

The Standard Brass Foundry Company has opened temporary quarters on Columbus road and expects to build a new foundry for the manufacture of brass, bronze and aluminum castings as soon as a site is secured. This company has just increased its capital stock from $50,000 to $100,000 and will add additional names to its board of directors.

The Ferro Machine & Foundry Company, Cleveland, is enlarging its plant by the rebuilding of a large part of its present foundry, the new building being of fireproof construction. This will give the company about double its present foundry capacity. Some new equipment will be purchased, including conveyors and trolley systems.

The Board of Trade of Alliance, Ohio, has closed a contract with the Michigan Twist Drill Company, Detroit, Mich., to locate in that city. A new plant will be erected by the company just west of the plant of the Transue & Williams Company.

The Youngstown Sash Weight Company, which has commenced the erection of a new plant at Girard, Ohio, will make sash weights, flue rings, elevator weights, tampers, iron horse hitchers, brake shoes and other products. The new building will be 35 x 125 ft., one story high. An old foundry building adjoining will be overhauled and a new cupola installed. O. A. Potts, of Youngstown, is the manager.

The Mather Spring Company, recently incorporated in Toledo, Ohio, will erect a plant, 70 x 400 ft., for the manufacture of automobile springs.

The Republic Rubber Company, Youngstown, Ohio, will make further extensions to its plant, which with new buildings now under construction will practically double its capacity.

The Canton Grass Clipper Company, Canton, Ohio, has been incorporated with a capital stock of $20,000 by Otto Karcher and others.

An ice manufacturing plant will be built by the Bevin Company, Steubenville, Ohio.

The Rummell Machine Company, Cleveland, Ohio, maker of screw machine products, is building a new plant on West Seventy-seventh street, 32 x 120 ft., and one story. The company will shortly be in the market for several automatic screw machines and a few machine tools.

It is reported that the Buckeye Iron & Brass Works, Dayton, Ohio, will build a new five-story plant.

The Riverside Bridge Company, Martins Ferry, Ohio, will increase its capital stock to $300,000 for the purpose of adding to its equipment and increasing the capacity of its plant.

Henry Wagner, of Cincinnati, has placed a contract with Sol Mendelsson, Elyria, Ohio, for the erection of a garbage disposal plant in Elyria.

An increase in capital stock from $500,000 to $1,000,000 has been authorized by the stockholders of the Standard Welding Company, Cleveland. The company recently remodeled parts of its plant and has added several new buildings in the past year, the new capital covering these improvements as well as preparing for steady growth in the welding industry in this city, the demand for welded parts by automobile manufacturers having largely increased.

At the annual meeting of the Toledo Machine & Tool Company, Toledo, Ohio, August 25, the following officers were elected: E. P. Breckenridge, president; H. J. Hinde, vice-president and general manager; L. J. Hinde, secretary; Charles W. Greenig, treasurer, William W. Edwards and E. C. Edwards were made directors. It was decided at the meeting to have the plans prepared for an extension to the company's plant which will be made in the near future.

Cincinnati

CINCINNATI, OHIO, August 15, 1911.

There is a slightly better inquiry for medium sized lathes reported, but orders for all kinds of machine tools continue coming in very slowly. In spite of reported impending labor troubles in the West, mail reports and those from traveling salesmen, would indicate that the general trade is taking a more cheerful view as to the near future.

The recent stiffening of pig iron prices is said to have brought the foundries a little extra business, but as a rule they are operating to only about 50 per cent. of capacity.

Crop reports are eagerly watched by all manufacturers, and so far as the Central West is concerned, they are excellent.

The American Rolling Mill Company, Middletown, Ohio, rolled its first sheets in the new east-side works August 8. Only four of the eight mills were started, but the plant is expected to be in full operation early in the Fall.

The Triumph Electric & Ice Machine Company, Oakley, Cincinnati, has recently closed contract for the construction of a 30-ton ice plant at St. Petersburg, Fla., for the N. C. Williams Company, of that city.

The Toledo Railway & Light Company, Toledo, Ohio, has let contract to A. Bentley & Sons, of that city, for the construction of a large boiler house addition to its repair shops on Detroit avenue.

The Brewers Bottle Case Association, having a large band saw mill at Hays, Ky., and a factory at Sandusky, Ohio, has acquired a site in Cincinnati, and will soon move its Sandusky plant here. The company manufactures a patent beer bottle case, and will employ about 50 men at the outset. S. E. Patton is president of the association and Charles W. Smith, secretary and treasurer.

The Cincinnati Commercial Association expects to be able to announce soon the location of a large automobile factory here, and it is understood that tentative plans have already been agreed on as to manufacturing quarters.

The Cincinnati Fire Extinguisher Company has been incorporated with $50,000 capital stock, and has leased a building at 2070 Reading road, Cincinnati, that will be used for manufacturing automatic sprinkling equipment. Harley Duley, now connected with the Cincinnati Fire Prevention Bureau, is said to be one of the principal incorporators.

The J. H. Day Company, Cincinnati, manufacturer of bakers', paint, laboratory and other special machinery, is having plans prepared for an addition to its plant on Harrison avenue.

The Riley Shoe Company, Columbus, Ohio, will build an addition to its shoe factory. F. L. Packard, Columbus, drew up the plans.

It is quite probable that the city of Newport, Ky., will soon advertise for bids on new boilers to replace those now installed in the City Waterworks plant.

The Crescent Tool Company, Cincinnati, has been

THE MACHINERY MARKETS

incorporated with $10,000 capital stock to take over the business of the Crescent Machine & Tool Company, 115 West Second street, manufacturer of metal specialties, including a new patented car mover. No additions to the present plant are contemplated.

Kirk & Blum, Cincinnati, sheet metal workers, are moving into their new factory in the western part of the city. This move more than doubles their manufacturing capacity.

There is an unconfirmed report that the Columbus Buggy Company, Columbus, Ohio, will soon make some large additions to its plant.

Detroit

DETROIT, MICH., August 15, 1911.

Conditions in the machinery market locally are highly encouraging. While large individual orders for machinery are few, the many small orders indicate a healthy condition in nearly all manufacturing lines. A member of one of the largest machinery and mill supply houses in this city, whose experience would reflect general conditions, states that his firm has experienced a marked increase in orders booked during the last 40 days, and particularly in the last two weeks. He states further that prospective business is larger than at any time in the firm's history, but that the individual amounts are characteristically small and well scattered.

The automobile industry continues to hold the spotlight, especially in Detroit. There seems to be no limit to its possibilities. Reports of extension and increases of capacity are on every hand, making a fertile field for sellers of high grade machinery. The market for high price cars of standard make is remarkably strong.

There is little change in building conditions. Considerable activity is more or less evident, but owners seem reluctant to award contracts on many buildings that are already figured. No doubt fall will see many of these contracts placed and the buildings pushed to a rapid completion. No new plans of special mention are noted.

The Abbott Motor Company has opened a factory branch at 260 Jefferson avenue, in the new Dodge Building, under the management of E. C. Thompson, of the sales organization. A complete service department and garage will be inaugurated in the branch for use of Abbott-Detroit cars.

The State Railroad Commission has authorized the organization of the Consolidated Light & Power Company, Detroit, with a capital stock of $100,000. The stockholders are J. L. Hudson, F. R. Poss and C. A. Abbott, of this city.

The Lavinge Mfg. Company has increased its capital stock from $50,000 to $100,000.

United States Frumentum Company has increased its capital stock from $60,000 to $80,000.

Engineering Products Company has been incorporated with a capital stock of $20,000.

The Packard Motor Car Company is planning extensive plant additions to accommodate its immense business for 1912. Work is being rushed on new buildings which will triple the capacity of the Packard truck shops, a second story is being built on the service plant and a 50-ft. addition is being made to the foundry. The company is reported to have $14,000,000 worth of orders on hand for next season, and is operating night and day.

Directors of the Michigan Adjustable Hub Company, Bay City, Mich., have elected John Walsh president and H. C. Moulthrop secretary and treasurer. The company has a site arranged for and preliminary work of erecting a large plant will begin at once.

The Union Garage Company, Adrian, Mich., has just been organized by Adrian business men, to be conducted under the management of C. S. Keating. The Russ Building is being remodeled to house the company. The garage will compare favorably with those of the larger cities and will be equipped with modern machinery and accessories preparatory to handling the highest class of work.

The Lutz & Scharmer Company, Fife Lake, Mich., is erecting a 36 x 90 ft. addition to its salting station, and the Grand Rapids & Indiana Railway is constructing suitable yards and chutes in the same town for live-stock shipments.

The plant at Milford, Mich., occupied by the Detroit-Milford Sanitary Mfg. Company and later the Michigan Auto Body Company has been sold to F. A. Black, with the Globe Furniture Company, and H. C. Whitney, secretary and treasurer of the Detroit Auto Dash Company, both of Detroit. The new firm expects to commence work at once, employing a force of 10 men, and will manufacture for the present sectional bookcases and sanitary woodwork.

Improvements in the water power of L. J. Smith's factory at Smithville, Mich., have been started. The present flume will be replaced by one of cement, and two new wheels will be installed which will furnish 500 hp. Owing to the rapidly increasing business it is reported that the factory will have to be enlarged in the near future. Present improvements will necessitate a suspension of business for about 60 days.

The Holton Company, Jackson, Mich., has been organized to conduct a general machine and foundry business with an authorized capital stock of $75,000, all of which has been subscribed and paid in.

It is reported that the Fowler & Fowler Company, Fremont, Mich., manufacturer of canvas gloves, etc., is looking for a site for the location of its factory in Big Rapids, Mich.

The Cadillac Chair Company, Cadillac, Mich., has elected the following officers: President, D. B. Kelley; vice-president, Joseph Murphy; secretary-manager, J. N. Perkins; treasurer, John P. Wilcox. Work is now under way on the foundations, and the contract for the factory building will be let in a short time.

The Wickwire Mining Company, Iron River, Mich., has been organized with the following officers; President, I. H. Wickwire, Jr.; vice-president, T. H. Wickwire, Sr.; treasurer, W. A. Wickwire; secretary and superintendent, E. C. Bowers. The new company is a subsidiary of the Wickwire Steel Company, Buffalo, N. Y., which has recently become quite largely interested in this district.

Fire destroyed the mill and dry kilns last week of the Stiles Bros. Lumber Company planing mill, Cadillac, Mich., and damaged some of the stock lumber in adjoining yards. The loss, $25,000 to $40,000, is covered by insurance. The mill will be rebuilt, equipped and operations resumed at the earliest possible date.

The Great Lakes Dock & Dredge Company expects to begin work on the cement contract for the new canal at Sault Ste. Marie as soon as equipment, which has begun to arrive, is all there. The company's two years' operations will require considerable equipment, tools, stone-crushing plants, etc., and it will probably be at least 60 days before actual operations will have begun.

The Michigan Sugar Company will shortly begin building an addition to its beet sheds at the Sebewaing, Mich., plant, putting in a number of new beet flumes and erecting a large new molasses tank.

The Board of Trade of Manistee, Mich., is negotiating with a large chemical plant, with excellent prospects of landing the industry for that city.

The Mason Motor Car Company has been organized at Flint, Mich., with a capital stock of $100,000. A factory building has already been secured and the company will do a general business in the manufacture of engines for the automobile trade. A large machinery equipment will be required.

The Richmond Cement Culvert Company, which operates plants at Richmond and Caro, is making arrangements to operate a third plant at Howell, Mich.

The Walsh Mfg. Company, Frederick, Mich., is rebuilding its new mill recently burned. A band mill is to be added and the plant will be improved in many ways over the old one.

The Auto Body & Specialty Company, Flint, Mich., by the addition of a two-story building 42 x 82 ft., just completed, has increased its capacity sixfold. The company has begun operating the factory at its capacity, employing about 60 men.

An entire reorganization of the official force of the Rodgers Iron Mfg. Company, Muskegon, has occurred. P. P. Schnorbach is now president and L. E. Schnorbach is vice-president. The plant is being overhauled.

The South

LOUISVILLE, KY., August 15, 1911

Business continues satisfactory, considering the midsummer season, and in spite of the fact that intensely hot weather has tended to reduce activity in many directions. The condition of the cotton crop remains excellent, and prospects based on a large output are therefore being maintained. Refrigerating machinery continues to hold first place in the matter of inquiries, while boilers and other power equipment are in good demand. Electrical machinery is also selling well.

The Henry Vogt Machine Company, Louisville, is

THE MACHINERY MARKETS

in the market for a boiler plate roll. It must be capable of taking a ¾-in. plate. The contract for its installation will be let as soon as bids can be secured.

The Globe Machine Company, Louisville, which was recently incorporated with $5,000 capital stock, has elected Andrew B. Jutt president and general manager. The company is now making a specialty of the construction of elevators and distillery outfits.

The Kosmos Portland Cement Company, Kosmosdale, Ky., which has general offices in Louisville, has recently completed the installation of a conveyer system for handling raw and finished material. The company is contemplating the addition of equipment for enlarging the capacity of the plant.

The Culley Cement Block Company, Louisville, is considering the purchase of two additional concrete mixers to be used in the manufacture of concrete block.

The Norman Lumber Company, Louisville, which recently increased its capital stock to $75,000, is contemplating the installation of a planing mill. The machinery will probably be electrically operated.

The City Council of Owensboro, Ky., is contemplating the enlargement of the municipal lighting plant. The business of the concern has greatly increased during the past few years, it is reported, and a good deal of new equipment is urgently needed.

The Burley Tobacco Society, which has its headquarters at Lexington, Ky., is working out plans for the establishment of a factory for the manufacture of tobacco products. The society proposes to incorporate a separate company with $2,000,000 capital stock.

The Ames Auto Company, Owensboro, Ky., plans the establishment of a garage and repair shop at Lexington, Ky. J. W. Carter and W. C. G. Hobbs will be in charge.

The Modern Machine & Vulcanizing Company, Henderson, Ky., has been incorporated with $8,000 capital stock. Ike Loeb, Albert Keifer and J. H. Gillespie are the incorporators.

Jackson, Ga., is considering the issue of $5,000 of bonds for the purpose of making improvements in the water and electric light systems.

Lawrenceville, Ga., is planning to issue bonds to the amount of $35,000 for the construction of a system of water works. The J. B. McCrary Company, Atlanta, is the engineer.

The Phoenix Hotel, Lexington, Ky., which is erecting a large addition to its building, is contemplating the installation of a refrigerating plant. C. E. Richards, Columbus, Ohio, is architect of the hotel.

The Neuhoff Abattoir Company, Nashville, Tenn., will rebuild part of its plant which was recently destroyed by fire. The company has just completed the erection of an ice plant.

The Etowah Water & Light Company, Etowah, Tenn., will build a hydro-electric power plant. W. H. Price is general manager of the company, which will probably build the concrete dam itself, and is in the market for the necessary equipment.

The Auto Electric Company, Chattanooga, Tenn., has been incorporated with $25,000 capital stock by W. B. Royster, A. C. Carroll and others for the manufacture of electric machinery and appliances. Machinery is now being installed in a building which has been secured at 722 Chestnut street.

A. J. Gahagan, Chattanooga, Tenn., is organizing a company to erect a furniture manufacturing plant which will take the place of the furniture factory of the Loomis & Hart Mfg. Company, which was recently destroyed by fire.

An 85-ft. electric turntable is to be installed in the shops of the Atlantic Coast Line Railway, at West Montgomery, Ala., it is reported. F. B. Pleasants is chief engineer of the company.

The Helena Electric & Gas Company, Helena, Ark., has let a contract for the erection of a power-house and will require a lot of power equipment, including boilers, turbines, rotaries, etc. The expenditures involved will approximate $200,000.

Martin Shalliday has been appointed receiver for Harry S. Bosler, who has the contract for the erection of the pumping station of the City of Chattanooga, Tenn., and is pushing the installation of the electrical machinery which has been ordered.

Edwards & Co., Cincinnati, Ohio, will, it is reported, erect a clay-working plant for the manufacture of turpentine cups at Daisy, Tenn., near Chattanooga. The cost of the plant will be about $10,000.

The plant of the Converse Bridge Company, Chattanooga, Tenn., was destroyed by fire with a loss of $25,000. The plant, it is announced, will be rebuilt at once.

St. Louis

ST. LOUIS, MO., August 12, 1911.

There is a fair movement of machine tools in small orders, as has been the case for the past six months or more, but there is nothing in the business which could be called large, nor are there any inquiries in the market of especial consequence. Dealers are hopeful of better conditions soon, but have little on which to base their hopes.

The American Car & Foundry Company announces that there is nothing of immediate prospect in the purchase of 200 acres for a plant site at Gary, Ind. It states that while there are plans prepared for a $10,000,000 plant, there will be nothing done for a year at least, and perhaps not then, unless the business situation warrants it. The present capacity of the company is just now more than equal to the demands upon it.

The Joliet Rolling Mill Company, Joliet, Ill., has increased its capital stock from $150,000 to $250,000 for the purpose of increasing its plant.

The Byrnes Belting Company, which recently planned an increase of capacity, has taken out a permit for a $40,000 building to house the additional equipment.

The Jennings Amos Mfg. Company has leased a new building which will enable the doubling of the plant equipment of the company.

The Winter Bros. Engraving Company has leased new quarters which will enable the increase of their mechanical capacity by about 50 per cent.

The Newburg Tripoli Company has purchased a site in St. Louis and will construct a plant at once for the treatment of the tripoli ore mined in Phelps County, Mo. The plant will involve equipment costing about $25,000.

The Nixdorff-Krein Mfg. Company, manufacturer of chains, etc., and employing about 200 men, will build a new plant on the western edge of the city and will install new equipment to increase its capacity.

The Armstrong-Bell Mfg. Company, Kansas City, Mo., with $100,000 capital stock, has been incorporated by J. S. Armstrong, E. Armstrong and W. J. Bell.

The Hanna Mfg. Company, Oskaloosa, Iowa, has optioned a site in St. Louis and will remove here, enlarging its equipment and capacity.

E. J. King, City Clerk, Shelbina, Mo., will receive proposals until August 25 covering the furnishing and erection of a steel tower, 100 ft., and tank of 70,000-gal. capacity.

The David & Weber Counties Canal Company, First National Bank Building, Ogden City, Utah, is inviting tenders covering complete building and installation of machinery for a hydro-electric power plant at Riverdale, Utah.

The Scoffield Engineering Company, Little Rock, Ark., has let the contract for the construction of a new power house, where it will install new power plant and lighting machinery.

Plans are being prepared by Chas. S. Sturtevant, engineer for the erection of a new municipal electric lighting plant, at Curtis, Neb.

The Pacific Coast

PORTLAND, ORE., August 11, 1911.

A fair volume of business is coming out in metal working tools, but with very few exceptions individual purchases are of little importance, the larger shops, as a rule, keeping out of the market. Large orders have not been especially numerous since the first of the month, but buying has been quite general in many lines, and a number of important inquiries are reported. Sawmill and woodworking machinery, usually among the most important items in this territory, is in especially active demand at present. Lumbermen are complaining of low prices, but the demand is increasing, and many mills are increasing their capacity and replacing old equipment with machines of modern design. A number of mills are also putting in new power equipment. Some of the most important inquiries recently received have been for electrical machinery, and extensive development in this line is expected during the coming year. Contractors' supplies are in very fair demand, and there is a steady movement of pumping machinery, both for waterworks and irrigation. Marine

THE MACHINERY MARKETS

work at ports of Oregon and Washington is keeping well up to the recent average and gas engines for small boats are in strong demand.

The Pacific Brake Shoe Company has been incorporated at Seattle, Wash., with a capital stock of $50,000, by F. Moore, C. Kucher and A. J. Tannant.

Bids will be received at this city September 6 by Major J. J. Morrow, Government engineer, for the construction of a steel sea-going dredge with suction equipment to be used on Coos Bay. The estimated cost is $350,000. Plans will be drawn shortly for two additional steel dredges for the use of the Government engineers at this port.

The Moran Company, Seattle, Wash., has taken a contract for the construction of two submarine torpedo boats for the government of Chile, the work amounting to about $1,000,000. The company has about completed work on two destroyers for the United States.

The Chicago, Milwaukee & Puget Sound Railway Company has purchased land at St. Maries, Idaho, upon which it expects to erect a new round house and machine shop.

The machine shops and round house to be built by the Northern Pacific and Great Northern railroads at Centralia, Wash., are to be begun within 90 days. Round house is to be large enough to accommodate 80 locomotives.

The Portland office of the Meese & Gottfried Company, dealers in power transmission equipment, reports a heavy demand for the last month from lumber interests throughout the Columbia River district.

The Willamette Iron & Steel Works, this city, has taken an order for traction equipment to be used by the Yosemite Lumber Company at Merced Falls, Cal. The company has placed its order for general mill equipment, including two large band saws, and has ordered a machine shop outfit from San Francisco. The order for the power plant is still to be placed. A turbine generator is being considered.

Foss & Co., who are preparing to operate the Ninemire mill at Montesano, Wash., are installing a lot of new mill equipment, including an automatic lumber stacker.

A project has been started for the installation of a gas plant at Klamath Falls, Ore.

Vincent & Grosline, Sherwood, Ore., are preparing to rebuild their sawmill.

D. W. Dorrance and others are planning to build a sawmill and box factory at Medford, Ore.

The Pacific Power & Light Company expects to start work shortly on a large new power development project at Priest Rapids, on the Columbia River.

The Idaho Glazed Cement Pipe Company has purchased a site for a new factory at Baker City, Ore.

The Wasco Warehouse & Milling Company, whose mill at The Dalles, Ore., was burned recently, is having plans drawn for a new and larger plant.

The Central Door & Lumber Company has purchased a site for a new plant adjoining the Southern Pacific shops in this city.

Machinery specifications are being prepared for a concentrator and tramway at the Utica mine near Kelso, Wash.

The local plant of the Diamond Brick Company has been purchased by the Denny-Renton Clay Company interests of Seattle, Wash., and will be greatly enlarged.

The Dils-Miller Key-seated Self-locking Nut Company has been incorporated at Tacoma, Wash., with a capital stock of $1,000,000, by L. A. Dils, Allen Miller and W. Miller. The company proposes to manufacture metal furniture.

Texas

AUSTIN, TEX., August 12, 1911.

Preparations are being made in the semi-arid portions of Texas and in many localities of Arizona and New Mexico for the installation of large irrigation plants. Many of these projects will be consummated this fall and dealers of irrigation machinery anticipate an unusually good trade in that line. Business conditions over the state and through the Southwest remain very satisfactory.

The Denton Cotton Oil & Gin Company is remodeling its round bale gin at Denton, which it recently purchased from the Planters' Compress Company.

W. C. Grant and associates will erect a factory at Abilene for the manufacture of a maize header machine.

The Bellville Cotton Oil Company has been formed at Bellville with a capital stock of $30,000. The incorporators are A. Brugger, Sr., C. F. Hellmuth and A. A. Sander.

The Middle Texas Oil Company has just purchased from J. D. Sugg the cotton-seed oil mills at Bartlett, Granger and Belton for a total consideration of $227,131 and will install new machinery and make other improvements.

Rasmussen Bros. have overcome the objections to the proposed fertilizing plant that they are to erect in North Dallas and the construction work will soon be started.

The People's Water Company has been formed at Celeste with a capital stock of $6,000. The incorporators are D. R. Buchanan, H. E. Jones and G. D. Henslee.

The Gunter Water Supply Company has been organized at Gunter with a capital stock of $5,175. The incorporators are J. D. Bowen, H. J. Barnes and J. S. Yowell.

The International & Great Northern Railroad is erecting new car buildings and repair sheds at Taylor. Five iron-working machines for car repairing work will be installed.

The Missouri, Kansas & Texas Railway Company will soon begin the erection of large shops at Greenville. A. M. Acheson, chief engineer, is seeking a site for the proposed shops. It is announced that construction will be started as soon as one is found.

H. E. Luck and assocates are arranging to establish a factory for the manufacture of automobiles at Cleburne.

The El Paso & Southwestern Railroad, which is to be extended to Tucson, Ariz., has acquired a site for machine shops, roundhouse and other features of its proposed terminals. The yards will cover 15 acres.

The Kansas City, Mexico & Orient Railroad will install machine shops at Alpine.

W. B. Walker & Sons will enlarge their canning factory at Austin.

H. H. Taylor is installing extensive machine and repair shops at Austin.

Simon Philp is installing a new cotton gin at Chriesman.

The Business Men's Club of Orange is promoting the establishment of a furniture factory.

Dr. F. L. White, superintendent of the Southwestern Insane Asylum at San Antonio, will install a canning factory to be run in connection with that institution. He will also install an irrigation pumping plant.

Jose Vasconcelos, of Mexico City, representing a syndicate of Americans, has applied to the city council of Oaxaca, Mexico, for a franchise to install an electric light and power plant in the latter city. It is the announced purpose of the syndicate to construct transmission lines to many of the towns and mining camps of the state and provide them and various industries with electrical energy.

The Fleming-Morton Company, Kirbyville, contemplates the installation of new electric light machinery.

Eastern Canada

TORONTO, ONT., August 12, 1911.

On this side of the line there are no indications of the slowing down of industry that is more than perceptible in several departments of production in the United States. Reciprocity is the issue in the current campaign, but it does not affect the manufacturing industries in any appreciable degree. At all events the manufacturing industries of Canada are now, almost without exception, in a highly flourishing state, and they are looking forward to much greater activity when the proceeds of the splendid harvest the country is reaping begin to be expended. But Canadian manufacturers, active though they are, and continuously busy up to their full capacity as they have fair promise of being, will by no means have all the home market to themselves. The competition from the United States grows keener, and Great Britain is steadily getting more of a grip on the Canadian market. Canada is just now importing, very largely from the United States, what may be called manufactured material, as forms of merchant steel, tubes, etc., to be utilized in the making of implements, machinery and articles of plant equipment. It is in the development of the upper layers of manufacturing industry that Canada is showing its greatest factory expansion.

The Otis-Fensom Elevator Company is the latest company to announce that it will erect a large addi-

THE MACHINERY MARKETS

tion in Hamilton, Ont. It will add a building 60 x 200 ft.

The Standard Sanitary Mfg. Company, Toronto, has taken out a permit for the building of another factory alongside the plant it is now operating.

The E. B. Eddy Company, Hull, is building a warehouse near its works, the cost to be $50,000.

The rate payers of Cornwall, Ont., have voted in favor of raising $30,000 to be applied in water main construction.

Work is in progress for adding largely to the engine house of the Dominion Department of Public Works at Stellarton, N. S. A new boiler and other equipment is to be added to the machine shop.

The Standard Underground Cable Company, Hamilton, Ont., is building a large carpenter's shop in connection with its plant and woodworking machinery is required therefor.

The Nova Scotia Carriage & Motor factory, Kentville, N. S., is building a large extension to its works.

The McGlashan, Clark Company, Niagara Falls, Ont., has its addition to factory nearly ready for the installation of the machinery. It requires a punch press, rolls, etc., and suitable machinery for spoons and cutlery.

The Brown Smith Turning Company of Broadbent, Ont., has obtained premises for a planing mill in Parry Sound, Ont., and is installing machinery.

Plans are prepared and tenders called for for the depot of the Algoma Central Railway at Sault Ste. Marie.

There has been a conference of representatives of the City of St. John and of the Province of New Brunswick to consider the advisability of making a bid for the shipbuilding plant that is to construct the Canadian naval vessels, and in view of the fact that Halifax and the Nova Scotia government are willing to contribute $400,000, and Sydney has $300,000 available, it is considered certain that $500,000 will be offered by St. John and the New Brunswick government.

The Canada Carriage Company, Brockville, Ont., is erecting an additional factory.

The Town of Middleton, N. S., wants equipment amounting to about $15,000 or $20,000 for an electric lighting system.

J. Robinson & Sons, Niagara Falls, Ont., want a lathe drill press, a sharper electric rectifier, motor shafting, pulleys, etc.

J. Grant Henderson, Commissioner of Industries, Hamilton, Ont., announces that he has concluded arrangements with the Schacht Motor Company, an offshoot of a Cincinnati concern, to locate works in Hamilton. The officers of the company are: President, Thos. P. Rolph, Toronto; vice-president, T. H. Schacht, Cincinnati; treasurer, Gerrard Muntz, Toronto; secretary and sales manager, J. S. Innes, Toronto.

The Manufacturers' Paper Company is now looking over the ground in Canada with a view to establishing manufacturing plants on this side of the line. The Canadian manufacturers will largely increase their purchases of pulpwood from private holders of pulpwood lands in Ontario, Quebec and New Brunswick, with a view to enabling them to export free of duty into the United States the paper manufactured therefrom.

The Dominion Sugar Company, which has factories at Wallaceburg and Berlin, Ont., is preparing to build one of 10,000-ton capacity at Chatham, Ont.

The Northern Ontario Light & Power Company, whose plant was destroyed in the brush fire that swept away South Porcupine, Ont., is rebuilding and putting in a lot of new machinery and equipment, and it is preparing to give a service to all the places about Porcupine Lake.

The North American Smelter Company, Kingston, Ont., has let the contract for the erection of a manufacturing building to cost $40,000.

Western Canada

WINNIPEG, MAN., August 12, 1911.

The view taken in the West as to the elections on September 21 is that, however they go, they will have no effect to retard progress there. If the Laurier government is sustained and the reciprocity agreement is thus approved the agreement will be ratified without delay. If, on the other hand, the government is defeated, the agreement will not again be submitted to Parliament, and consequently will not come into effect. In either event, settlers will continue to flow into Western Canada both from the other side of the border line and from the other side of the Atlantic, and capital from abroad will continue to drift to Canadian undertakings. The Canadian West will go on expanding against any political conditions that it is likely to experience.

J. A. Kilpatrick, general manager of the Canada Iron Corporation at Fort William, Ont., and F. W. King, formerly general manager of the Michigan Stove Company, Detroit, and more recently of the McClary Mfg. Company, London, Ont., are in treaty with the municipal corporation of Fort William and with W. J. Copp, Son & Co. for the taking over of the stove works of the last-named, and for obtaining concessions from the city, in consideration of which that plant would be very greatly increased in capacity.

The city of Vancouver is about to spend $50,000 in the purchase of electric light standards.

It is expected that the Ocean Falls Company will begin the manufacture of pulp and paper at its new $2,000,000 plant at Ocean Falls, B. C., in about three months. About one-half the equipment of the company's machine shop, mechanical pulp mill, hydro-electric power plant, planing mill and export sawmill is already installed. The head office of the company is in Vancouver and its directors are prominent capitalists.

The Burrard Grain Company, Daysland, Alberta, contemplates the installation of flour mill machinery in connection with its elevator plant there.

The rate payers of Namaino, B. C., have granted a franchise to Haffner & Smith, Montreal, to provide hydraulic power for all purposes within city limits.

It is stated that the Canadian Pacific Railway Company has practically decided upon Calgary for the location of its Western shops.

It is stated that the British Canadian Lumber Company, Vancouver, B. C., will itself build its projected $400,000 mill on Lulu Island, but will take tenders on separate contract and machinery.

Plans have been prepared for an eight-story building in Victoria, B. C., for the Norton Griffiths Steel Construction Company.

The Canadian Fairbanks Company is erecting a $100,000 warehouse in Winnipeg and a $56,000 warehouse in Saskatoon, Sask.

New negotiations have been opened by the City Council of Edmonton, Alberta, for the construction of a great municipal power plant. Another company backed by an English syndicate is seeking the water rights at Grand Rapids, north of the city.

The City of Portage la Prairie, Man., has agreed to buy the plant of the General Electric Company there.

On August 24 the following by-laws will be submitted to the rate payers of Saskatoon, Sask., to raise $80,000 for erection of power house and purchase of site; $135,000 for purchase of machinery for new electric light and power plant.

Ely Bros., manufacturers of guns, rifles, cartridges and fire arms generally in Britain, are reported to have decided upon the establishment of branch works at Transcona, near Winnipeg. A site of 40 acres has been purchased there for the firm and men are at work upon the site.

The Alberta Linseed Oil Company is erecting a plant at Medicine Hat, Alberta. Machinery has been ordered in Toronto, in Ohio, and in England. The output is to be 1,400 gal. per day.

The Dominion Government will put in a lock at Lacolle Falls, on the Saskatchewan River, to cost $350,000. This will be of great advantage to Prince Albert, Sask., which is developing power there. It is stated that when the power is ready a New York company will utilize a large part of it in the operation of great pulp mills it proposes to establish there.

Government Purchases

WASHINGTON, D. C., August 14, 1911.

Paymaster General, Navy Department, Washington, will open bids August 29 under schedule 3820 for one No. 2 automatic screw machine complete and two new model automatic turret machines.

The Bureau of Supplies and Accounts, Navy Department, Washington, will open bids September 5 under schedule 3803 for one motor-driven extension base, one motor-driven back gear power feed drill press, one motor-driven two-wheel emery grinder with two spare wheels, one motor-driven sensitive drill, one screw-cutting back-geared, motor-driven tool room lathe, one back-geared, motor-driven extension gap lathe and one arbor press for delivery to Mare Island navy yard.

The Supervising Architect, Treasury Department, Washington, will open bids until September 15 for the mechanical equipment, elevators, mail-handling apparatus, heating and ventilating systems for the United States post office, Washington.

The Bureau of Supplies and Accounts, Navy Department, Washington, opened bids August 8 for material and supplies for the navy yards as follows:

Schedule 3749, class 1, two saddles for multiple drilling machine. Bidder 90, Manning, Maxwell & Moore, New York, $1,110.40; 99, Niles-Bement-Pond Company, New York, $2,100.

Judicial Decisions of Interest to Manufacturers

ABSTRACT BY A. L. H. STREET

Delay in Performing Contract Waived.—Where delay in performing a contract to install a heating plant was caused by both parties and the work was continued after expiration of the agreed time for completion, without objection by the owner until it was almost completed, the time limit is waived. (United States Circuit Court of Appeals, Second Circuit, Buffalo Forge Company vs. N. P. Pratt Laboratory, 184 Federal Reporter 287.)

Rights of Purchaser of Good Will of Business.—One is entitled to protection of the good will of a business purchased by him though he does not continue in business at the old location. Neither is it essential that he purchase all the assets of the old concern. (United States Circuit Court, Southern District of New York; S. F. Myers Company vs. Tuttle, 183 Federal Reporter, 235.)

Right to Interest on Payments on a Note Before Maturity.—One who makes payments on his note before they are payable according to the terms of the note is not entitled to interest on them from the date they are made to the date when they were due, unless there is an agreement to that effect. (Georgia Court of Appeals, Blackshear Mfg. Company vs. Stone, 70 Southeastern Reporter, 29.)

Rights Under Warranty of Thing Sold.—A custom in trade cannot be shown for the purpose of limiting the effect of an express warranty of a thing sold. A buyer has the right to rely upon a warranty of the quality of an article notwithstanding the fact that he had an opportunity to inspect it before accepting delivery. (Indiana Appellate Court, Hitz vs. Warner, 93 Northeastern Reporter, 1005.)

Validity of Conditional Sale Contract as Against Third Persons.—A sale of machinery on condition that title is to remain in the seller until the price is paid is valid against a purchaser of the buyer's property and against a prior mortgage, where the machinery is held in place by bolts and is removable without injury to the real estate. (Pennsylvania Supreme Court, Wickes Brothers vs. Island Park Association, 78 Atlantic Reporter, 934.)

Rights of Buyer on Breach of Warranty.—If a contract of sale has been completed the buyer cannot rescind it and return the things bought for breach of warranty unless they are worthless. But if the transaction is not complete he can return the articles and recover the purchase price. (New York Supreme Court, Niagara County; Isaacs vs. Wanamaker. 127 New York Supplement, 346.)

Right to Recover Special Damages for Breach of Contract to Sell.—Special damages resulting from breach of a contract to sell articles on account of the buyer being prevented from using the articles for a special purpose are recoverable only when they were contemplated by the parties when the contract was made. (New York Supreme Court, Appellate Term; Collins vs. A. Luban Company, 127 New York Supplement, 461.)

Contracts Violating State Anti-Trust Laws.—That goods sold and to be sold under a contract in restraint of competition were shipped from another State does not make the contract an interstate transaction so as to exempt it from operation of the State anti-trust law, where the goods became a part of a stock in the State. (Texas Court of Civil Appeals, State vs. Racine-Sattley Company, 134 Southwestern Reporter, 460.)

Right to Rescind Contract for Misrepresentation.—One induced to enter a contract through fraud is entitled to elect to acquiesce in the contract or to avoid it, but when he discovers the fraud and remains silent under circumstances tending to show acquiescence, or if he acts under the contract in such way as to indicate willingness to stand by it, he ratifies it and cannot afterward avoid it. (Maryland Court of Appeals, Latrobe vs. Dietrich, 78 Atlantic Reporter, 083.)

Trade Publications

Pumps.—Weber Subterranean Pump Company, 90 West street, New York City. Pamphlet. Size, 6 x 9 in.; pages, 8. Points out the advantages of using the Weber subterranean pump for supplying suburban residences and estates, hotels, factories and mills with water as well as draining mines and quarries. One of the special features claimed for this pump is the small number of simple parts entering into its construction, only three moving parts being employed. A complete installation consists of a pump, a motor, an air compressor, an air receiver and the necessary pipe and fittings. The pump can be directly connected with the prime mover, which is either an electric motor or a gasoline engine or a belt, a chain or a set of gears can be employed to transmit the power if desired.

Side Crank Engine.—A. L. Ide & Sons, Springfield, Ill. Bulletin No. 17. Refers to the Ideal engine and describes its construction with numerous illustrations.

Autogenous Welding Equipments.—Linde Air Products Company, 155 Chandler street, Buffalo, N. Y. Booklet No. 184. Size, 6 x 8¾ in.; pages, 49. Covers a line of autogenous welding supplies which includes generators, gauges, line and blowpipe regulators and back pressure valves. A brief description of the autogenous welding system is given, together with instructions for using the blowpipe, notes on the practical operation of the system and notes on welding. Space is given to a number of repairs made by this process, all of which are illustrated. These include ornamental iron work, locomotive parts, a large transformer case and a number of pipe fittings where the flanges were built up and broken parts welded on.

Globe Valves.—Chicago Mfg. Company, Chicago, Ohio. Pamphlet. Concerned with the Lippy valve for use on steam, water, air and gas lines. The special features claimed for this valve are absolute freedom from scale cutting and kindred evils and ability to pack the valve under pressure with no inconvenience. These valves are made with screwed or flanged ends in seven sizes ranging from ¼ to 3 in.

Transformers, Condensers, Ore Breaker and Engines.—Allis-Chalmers Company, Milwaukee, Wis. Three bulletins and two instruction leaflets. The first, No. 1076, superseding No. 1047, is concerned with the Allis-Chalmers power transformers which are built in three types for self, water and air blast cooling. A general description of the construction of the transformers supplemented by half tone and line engravings is given, followed by a discussion of the electrical characteristics illu trated with curves. A discussion of the conditions governing the choice of a transformer is included, together with information regarding the relative fire risk of the oil and the air blast types. Bulletin No. 1071 refers to the type C jet condenser which, it is claimed, is the only type of jet condenser in which vacuum can be formed or recovered with full load on the engine or turbine without a stop valve in the main exhaust pipe or an auxiliary forced injection. The construction, operation and efficiency of this condenser are discussed at length and the text is supplemented by line engravings. Bulletin No. 1448, superseding No. 1416, contains a detailed description of the construction of the style K Gates rock and ore breaker supplemented by illustrations. Instruction leaflets No. 2004A and 2004B, both of which are reprints, give directions for setting the valves of the Allis-Chalmers 1890 and Girder Frame and the Allis-Chalmers Heavy Duty and Reliance Corliss engines respectively.

Sipe's Japan Oil.—James B. Sipe & Co., North Side, Pittsburgh, Pa. Pamphlet, 6 x 9 in., 20 pages. Contains facsimile letters from users of Sipe's Japan oil, etc., the letters coming from various sections of the United States, New Zealand, Australia, etc. Gives practical information to users and buyers of paint supplies who desire to be informed on securing best results in painting.

The Excelsior Carburetor.—Excelsior Needle Company, Torrington, Conn. Pamphlet; 24 pages; illustrated. Describes a carburetor which is automatic in action. Contains exceptionally interesting information because of the great detail with which the apparatus is described, line drawings adding much to the article.

Gears.—The Boston Gear Works, Norfolk Downs, Mass. Catalogue E-4. Size, 3½ x 6 in.; pages, 80. Lists with numerous illustrations the various sizes and styles of gears which this company is prepared to furnish. These include cut iron and steel involute spur gears, steel racks with involute planed teeth, brass and steel pinion wire with machine cut teeth and finished brass spur and internal gears. Miter and bevel gears can also be supplied in steel, iron or brass, together with single or double thread steel worms and cast iron worm gears and iron and brass spiral and helical steel gears. In addition to the illustrations tables are included giving the diameter and the size of the hole bored through the center of the blank. Space is also given to sprockets and chains of various kinds, steel and bronze universal joints and ball thrust bearings. A number of tables, including ones giving the relative value of diametrical and circular pitches in terms of each other, decimal equivalents dimensions of standard keyseats and the weights of round and square steel bars complete the catalogue.

Current Metal Prices.

The following quotations are for small lots, New York. Wholesale prices, at which larger lots only can be bought, are given elsewhere in our weekly market report.

IRON AND STEEL—

Bar Iron from Store—

Refined iron:
1 to 1½ in. round and square ..... ₱ lb 1.70¢
1½ to 4 in. x ⅛ to 1 in. ..... "
1½ to 4 in. x ¼ to 6 in. ..... ₱ lb 1.80¢
Rods, ¼ and 11-16 round and square ..... ₱ lb 1.80¢

Angles:	Cts ₱ lb.
¼ in. x 1 in. and larger	1.90¢
¼ in. x 3/16 in. and ⅜ in.	2.00¢
1½ to 2½ in. x ⅛ in.	2.00¢
1½ to 2½ in. x 5/16 in. and thicker	1.95¢
1 to 1½ in. x 3/16 in.	2.05¢
1 to 1½ x ¼ in.	2.10¢
⅝ x ⅝ in.	2.20¢
7/8 x 7/8 in.	2.50¢
1 x 1 in.	2.50¢
1¼ x 3.52 lb.	2.90¢
Tees	
1 in.	2.35¢
1¼ in.	2.20¢
1½ to 2½ x ¼ in.	2.00¢
1½ to 2½ x 5/16 in.	2.10¢
3 in. and larger	2.95¢
Beams	1.90¢
Channels, 3 in. and larger	1.90¢
Bands, 1¼ to 6 x 6 to No. 8	2.10¢
Burden's "H. B. & S." iron, base price	2.95¢
"Burden's Best" iron, base price	3.15¢
Norway bars	3.60¢

Merchant Steel from Store—

per lb

Bessemer machinery ..... 1.90¢
Toe calk, fire and sleigh shoe ..... 2.50@3.00¢
Best cast steel, base price in small lots ..... 7¢

Sheets from Store—

Black	One pass, soft steel	C R cleaned	G
No. 16	₱ lb 2.45¢	2.75¢	
Nos. 18 to 20	₱ lb 2.50¢	2.85¢	
Nos. 22 and 24	₱ lb 2.55¢	2.95¢	
No. 26	₱ lb 2.60¢	3.05¢	
No. 28	₱ lb 2.95¢	3.30¢	

Russia, Planished &c.

Genuine Russia, according to assortment ..... ₱ lb 12 @14½
Patent planished, W. Dewees Wood ..... ₱ lb A, 10¢; B, 9¢ net

Galvanized

Nos. 12 and 14	₱ lb 2.75¢
No. 24	₱ lb 3.10¢
No. 26	₱ lb 3.30¢
No. 28	₱ lb 3.60¢

No 20 and lighter 36 inches wide, 25c higher

Genuine Iron Sheets—

Galvanized

Nos. 22 and 24	₱ lb 5.50¢
No. 26	₱ lb 6.00¢
No. 28	₱ lb 7.00¢

Corrugated Roofing—

	2½ in. corrugated	Painted	Galvd.
No. 24	₱ 100 sq. ft	$3.75	$4.70
No. 26	₱ 100 sq. ft	2.85	3.90
No. 28	₱ 100 sq. ft	2.50	3.65

Tin Plates—

American Charcoal Plates (per box)

"A A A" charcoal:
IC, 14 x 20 ..... $6.65
IX, 14 x 20 ..... 7.90
A charcoal:
IC, 14 x 20 ..... $5.60
IX, 14 x 20 ..... 6.70

American Coke Plates—Bessemer—
IC, 14 x 20 ..... 107 lb $4.50
IX, 14 x 20 ..... 5.50

American Terne Plates—
IC, 20 x 28 with an 8 lb. coating $8.70
IX, 20 x 28 with an 8 lb. coating 10.70

Seamless Brass Tubes—

List November 13, 1908. Base price, 18¢

Brass Tubes, Iron Pipe Sizes—

List November 13, 1908. Base price, 18¢

Copper Tubes—

List November 13, 1908. Base price, 21¢

Brazed Brass Tubes—

List February 1, 1911. 19½¢ ₱ lb

High Brass Rods—

List February 1, 1911. 14¾¢ ₱ lb

Roll and Sheet Brass—

List February 1, 1911. 14¾¢ ₱ lb

Brass Wire—

List February 1, 1911. 14¾¢ ₱ lb

Copper Wire—

Base price. Carload lots mill 14¢

Copper Sheets—

Sheet copper hot rolled, 16 oz. quantity lots) ..... ₱ lb 18¢
Sheet copper cold rolled, 1¢ ₱ lb advance over Lot rolled
Sheet copper polished 20 in. wide and under, 1¢ ₱ square foot.
Sheet copper polished over 20 in. wide, 2¢ ₱ square foot
Planished copper, 1¢ ₱ square foot more than polished

METALS—

Tin—

Straits pig ..... ₱ lb 46 @47 ¢

Copper—

Lake ingot ..... ₱ lb 14 @14¼¢
Electrolytic ..... ₱ lb 13⅞@14 ¢
Casting ..... ₱ lb 13¾@14 ¢

Spelter—

Western ..... ₱ lb 6⅝@ 6¾¢

Zinc—

No. 9, base, casks ..... ₱ lb 8¼¢ Open ..... ₱ lb 8¾¢

Lead—

American pig ..... ₱ lb 5½@5⅝¢
Bar ..... ₱ lb 6⅜@6½¢

Solder—

½ & ½, guaranteed ..... ₱ lb 28½@28¾¢
No. 1 ..... ₱ lb 26½@26¾¢
Refined ..... ₱ lb 24½@25½¢
Prices of solder indicated by private brand vary according to composition

Antimony—

Cookson ..... ₱ lb. 6@ 9¾¢
Hallett ..... @10 ¢
Other brands ..... 9@ 9½¢

Bismuth—

Per lb ..... $2.00@$2.25

Aluminum—

No. 1 aluminum (guaranteed over 99% pure), in ingots for remelting ..... 21¢ and 22¢
Rods and Wire ..... Base price 31¢
Sheets ..... Base price 33¢

Old Metals—

Dealers' Purchasing Prices Paid in New York.

	Cents
Copper, heavy and crucible	10.75 to 11.00
Copper, heavy and wire	10.50 to 10.75
Copper, light and bottoms	9.50 to 9.75
Brass, heavy	7.25 to 7.50
Brass, light	5.75 to 6.00
Heavy machine composition	9.25 to 9.50
Clean brass turnings	7.00 to 7.25
Composition turnings	8.00 to 8.25
Lead, heavy	3.75
Lead, tea	3.50
Zinc, scrap	4.00

NICHOLSON U.S.A. TRADE MARK

NICHOLSON

NICHOLSON U.S.A. TRADE MARK

Time is not the only saving effected through the use of **Nicholson Files.**

Their hard cutting surface and perfect temper gives them a **lasting quality** that makes them by far the most **economical** of all files to use.

Our Catalog shows what styles to use. Our book, "File Filosophy," tells how best to use them.

NICHOLSON FILE COMPANY

PROVIDENCE, R. I., U. S. A.

THE IRON AGE

Established 1855 | New York, August 24, 1911 | Vol. 88: No. 8

Published Every Thursday by the
DAVID WILLIAMS COMPANY
239 West 39th Street, New York

Entered at the New York Post Office as Second Class Mail Matter.

Subscription Price, United States and Mexico, $5.00 per Annum; to Canada, $7.50 per Annum; to Other Foreign Countries, $10.00 per Annum. Unless receipt is requested, none will be sent. Credit for payment will be shown by extending the date on the wrapper of your paper.

W. H. Taylor, - - - - - President and Treasurer
I. A. Mekeel, - - - - - - First Vice-President
Harold S. Buttenheim, - - - Second Vice-President and Secretary

Geo. W. Cope, - - - - }
A. I. Findley, - - - - } Editors
W. W. Macon, - - - - }

M. C. Robbins, - - - - Manager
Charles S. Baur, - - - Assistant Manager

Branch Offices

Philadelphia, Real Estate Trust Building
Pittsburgh, Park Building
Boston, Compton Building
Chicago, Fisher Building
Cleveland, American Trust Building
Cincinnati, 807 Andrews Building

CONTENTS.

Output Exceeds New Orders 399
Steel and Commodity Prices 400
Any Readjustment Will Include Labor 401
Permanency in Shop Buildings 401
The Steel Corporation Helps Its Competitors 402
Increasing Liability for Fatal Accidents 402
Railroad Equipment Orders 402
The Automobile Outlook for 1912 403
Personal 403
The Iron and Metal Markets 404
Freight Rate Reductions from Buffalo 414
The Imataca Iron Deposit in Venezuela 414
Trade Publications 415
Obituary 416
Proposed Iron and Steel Tariff Changes 416
A New 24-hour Record in Unloading Iron Ore 416
New York's Barge Canal and Iron Ore Freights 417
Michigan's Iron and Copper Mines 417
The New Pittsburgh Bridge 417
Youngstown Sheet & Tube Profit Sharing 417
The Croton Magnetic Iron Mines Suit 418
Iron Ore Production in 1910 420
Southern Iron Consolidations 421
British Iron and Steel Exports and Imports 421
The Sintering of Fine Iron-Bearing Materials 422
Specifications for Steel Axles and Shafts 425
Sample Book of Abrasive Disks 425
Interest Charges and Profit 426
New Goulds Centrifugal Pumps 427
Sprinklers in Knock-Down Form 428
Minimizing Peak Electric Loads 430
A New Pratt & Whitney Vise 430
The Garvin Automatic Tappers 431
Automatic Sprinkler Efficiency 431
The Heely Boiler Tools 432
An Improved Corliss Valve Gear 432
The Schulz Tilting Vise 433
New Tools and Appliances 434
The Machinery Markets 435

Output Exceeds New Orders

The Structural Outlook Favorable

No Pig Iron Buying for Next Year—An Early End of Ore Shipments

The steel mills are scarcely holding their position, production and shipments being in excess of new orders. Prices show continued irregularity, with competition more pronounced as the possibility of a return of free contract buying grows more remote.

The Pittsburgh district is still leading in the percentage of capacity employed, but there as elsewhere each week's operations are determined by what the week brings forth, so that prophecy as to the duration of the present high tide in specifications is of little value. The Steel Corporation, which is doing much more at its Central Western plants than at those in the Chicago district, has 72 per cent. of its blast furnace capacity going this week and about 75 per cent. of its ingot capacity.

It is needless to catalogue all the forms of finished material in referring to the price situation. But steel bars are reported to be under more pressure in the Chicago district, and iron bars are weaker there. Plates, sheets, tin plates and wire products are named in Pittsburgh reports as showing closer competition.

The demand for rails is spasmodic, but the orders in hand for this year promise better rolling schedules than has been commonly known. The Ensley mill has little open space for the next four months. This week it reports a contract of 22,050 tons with the Southern Railway. The Colorado mill is booked for most of the four months. At Gary the outlook for rail tonnage is not so promising. The report of a recent rail order coming to this country from Argentina is unfounded.

In the structural trade developments have been favorable. For the New York Central Terminal, New York, 5000 tons has been placed with the American Bridge Company, which also has the 4000 tons for the Ritz-Carlton Hotel in Philadelphia. At its Eastern plants this company is now working 95 per cent. of capacity, and work now in hand will keep all its shops busy at their present rate for nearly six months. The Thompson Starrett Company has the general contract for the Field Museum at Chicago, 8000 to 10,000 tons. Pending business includes 5000 tons of bridges for the Boston & Albany, 4000 tons for the Aeolian Building, New York, and 5000 tons for the new post office at Washington, D. C. The American Bridge Company is low bidder on 7,000 tons for the St. Louis bridge approach.

The principal inquiry before the wrought pipe mills is for 63 miles of 10-inch pipe for the Medina Gas & Fuel Company's projected line from Lima to Mansfield, Ohio.

Operations of tin plate mills increased in the past

week. Reports persist of sales at $3.60 per base box, Pittsburgh.

Expectations of a good fall trade are general in the wire trade, but meantime operations are light, the jobbing trade keeping its stocks at a minimum.

The pig iron market reflects plainly the prevailing uncertainty about future demand. Melters would ordinarily be buying in considerable quantities by this time for the new year; yet the closer working of supply and demand as merchant production has been cut down in recent weeks has caused no anxiety to cover for 1912. Some inquiry is up, but buyers are not convinced that the higher prices now asked for next year can be held.

At Pittsburgh a sanitary supply company bought 7,000 tons for its Northern plants, mostly at $13.50 Valley furnace and $13.25 at a Pennsylvania furnace which has a higher than the Valley freight. There is nothing like a buying movement in foundry iron and Southern furnaces, while asking $10.25 and higher for this year's shipment, are doing little business.

A large amount of Southern iron was sold at the $10 level earlier in the month, one interest disposing of over 70,000 tons in one week. Some of this iron was bought on speculation by dealers and is therefore yet to come upon the market.

The expectation of a secondary buying movement in Lake Superior ores has been disappointed. Only about 150,000 tons was sold in scattering lots in the past two weeks. Preparations are now making by the leading interest for an early end of the shipping season. Unless unexpected improvement comes to the pig iron trade the season's movement of Lake ores will not exceed 30,000,000 tons.

Steel and Commodity Prices

For a proper appreciation of the position of the steel market general attention needs to be directed to the lowness of steel prices as compared with commodity prices in general. It is a fairly familiar fact that while the various compilations of commodity index prices show no material reduction since 1907 steel prices have suffered a large decline since that year, but the full bearing of this fact may possibly be lost if emphasis is not frequently put upon it. A fact not so generally recognized, probably, is that while since last May commodity prices have shown an advancing tendency steel prices have shown a slight declining tendency, so that the gap is being widened at the present time.

The highest prices of steel products in recent times were attained just at the close of the highly prosperous three-year period extending from late in 1904 to 1907. Steel prices advanced during that period, but very moderately indeed considering the excess of demand over capacity and the eagerness of buyers to place orders. Frequently in that period mills were from three to six months behind in delivery of standard products, and consumers sometimes suffered hardship through inability to secure deliveries as early as desired. Of course the degree of hardship was not to be measured directly by the apparent distance by which mills were behind in deliveries, for keen buyers anticipated conditions and frequently placed specifications in advance of their real necessities. Nevertheless, it will doubtless be generally admitted that the mills were extremely moderate in their price advances during that period, and the price level reached by October, 1907, was by no means an extreme one. It was, for instance, very much lower than the hight reached in the 1899 boom, when prices soared without restraint, although production costs in that year were very much lower than eight years later.

From the price level of October, 1907, finished steel products, exclusive of rails, have declined to the present date about $8.75 per net ton, or about $10 per gross ton, a decline of 21 or 22 per cent. Consulting the index numbers we find that Bradstreet shows a decline from October, 1907, to July, 1911, from 8.851 to 8.594, which is less than 3 per cent. The index number of the Bureau of Labor, which has just been published, is carried only through December, 1910; but from October, 1907, to that month the change is from 131.0 to 131.6, which is an advance of about one-half of one per cent. The Bradstreet standard, it may be explained, is a purely nominal one, the index number being merely the sum of the values of a great number of commodities, expressed in their usual terms. The Bureau of Labor's basis, on the other hand, is the average price of the commodities considered during the ten years 1890 to 1899 inclusive, that average being taken as 100. The Bradstreet number has declined only slightly from December to July, so that it may be taken roundly that commodity prices in general show no appreciable decline from the level of October, 1907, to the present, whereas prices of finished steel products outside of rails have declined more than 20 per cent., and the importance of this fact is increased by the observation already made, that while since May the Bradstreet number has slightly advanced, the prices of steel products have shown a slight declining tendency.

Comparing present steel prices with the lowest on record, made in 1897, the advance to the present moment may be estimated at approximately 30 per cent. Taking the Bradstreet numbers for 1897 and for July, 1911, an increase of exactly 40 per cent. is shown, while the Bureau of Labor's number shows an advance from 1897 to December, 1910, of 46 per cent.

Thus, compared with these standards, prices of steel products are lower than they were in 1897, when nominally they were at the lowest. That iron and steel manufacture has carried a burden greater than most industries in the matter of advancing costs in the past dozen years is well known. In common with other industries it has had to meet higher wage rates, increased cost of various supplies and higher freight rates. Not in common with other industries, but as a special burden, it has had to bear a very considerable decrease in the average iron content of the ores available. This is a physical change, having no connection with the higher standard of values everywhere present, and one which no invention or improvement can overcome and which is not subject to the possibility of adjustment or compensation in future by a lower standard of wage or commodity values being restored. The richest ores are used up, and their equal is not being found. The increased content of impurity is a drag all along the line, involving the mining, transport and reduction of a larger quantity of ore per ton of pig iron produced, while in addition ore must be sought farther underground.

Unquestionably the iron industry has found some compensations. In various ways it has improved its practice, or already an unbearable condition would have been reached. If the citation of the fact that present steel prices relative to commodity prices in general are lower, both by comparison with 1907 and by comparison with 1897, merely serves to show that

the industry has instituted economies and improvements, the showing is an important one in these days of indiscriminate criticism of iron and steel manufacturers for having indulged in excesses of various sorts.

Any Readjustment Will Include Labor

The avowed object of many of the legislative proposals that have been brought forward at Washington is to reduce prices of commodities and, presumably, to meet the long-standing complaints of the high cost of living. Anti-trust proceedings and investigations are begun in large part with the purpose of reducing the prices of so-called trust products. Bills for tariff revision are introduced apparently in the expectation that with lower duties will come lower prices in the home market. In all this not the slightest indication is given by the sponsors of these measures that along with the general scaling down of commodities which they seek there will come any reduction in the price of labor.

Now and then the view is expressed by careful observers of present tendencies that if any serious disturbance of prices of manufactured products comes out of the present agitation, an accompanying liquidation in labor cannot be avoided. In the iron trade, in which there has been an important reduction in prices, practically no change has been made in wages, and manufacturers generally have been averse to wage reductions. So far as the iron and metal-working trades are concerned there is no indication today that manufacturers will take any initiative in this direction. Should any such step become necessary it would no doubt be promptly challenged with the familiar charge that it was in "retaliation" for recent legislative attacks upon business.

It needs to be remembered, in the midst of all these efforts for a downward revision of values, that the old-time economic laws have not been abolished. If duties are reduced sufficiently to lower prices of any domestic product there will be just one choice for American labor engaged in the manufacture of that product—either to bear a reduction in wages while making the same output as before or to increase output. The profits of manufacturing operations have been by no means adequate in recent years. If one basic industry be taken as an example—that represented by the blast furnaces of the country which make pig iron for sale in the open market—there have been nearly four years of unsatisfactory prices and diminishing profits. It is safe to say that in many cases there has been a loss on pig iron sold in the past six months. There are concerns in the metal trades—foundries and machine shops—whose profits in the same period have been meager indeed. The returns from manufacturing operations in practically all lines have undergone very serious readjustment in recent years, while wages have been either maintained, or, as in the case of the railroads, materially advanced.

The plain intent of the notification concerning railroad wages given by the last administration at Washington, in the depression following the panic of 1907, was that any readjustments of values must be borne entirely by capital. So now it is evidently the idea of those who are aiming to reduce the American standard of values, that while the returns on investments may be reduced, the wage earner, with undiminished pay, will be able to buy more cheaply than before. The public mind, in holding before it the profits of the great promotions of ten to fifteen years ago and the fortunes made by the few who sold out their business at extravagant prices, forgets that the 6 and 7 per cent. dividends which the owners of these selfsame industries are getting today are exceedingly modest returns on a manufacturing investment. The tens of thousands of stockholders in the great industrial companies of today constitute a very important percentage of the community of "manufacturers" who presumably are to bear the brunt of the revisions in values now aimed at through legislation. The belief that labor will benefit by the shaking down of prices, or at least will escape unhurt while the returns to capital are further curtailed appears to be entertained by some who should know better. For them and any who are deluded into following their lead there is the certain prospect of a rude awakening.

Permanency in Shop Buildings

Shacks for shop buildings were vehemently urged a few years ago. It was argued that permanent structures for housing the machinery of the works were unwise. Equipment and methods were likely to get antiquated and a change to take advantage of developments in apparatus or to provide for expansion was sure to require costly alterations to buildings. The injunction was only here and there taken very seriously. New plants were constantly erected of a degree of permanency calculated to inspire confidence in the stability of the enterprise and in many cases actually to beautify the surroundings. Such works, however, were not built as new ventures in new fields, but as enlargements of existing establishments. To the requirements was given careful study of the possibilities of the future. The young industry usually starts in a modest way in structures formerly occupied by institutions which have prospered, and in the event of successful growth it is in a position to select for its needs. It is recognized that old established going works are often found in buildings illy adapted to their needs, but these were launched before plant operation was given the scientific attention it now receives. The permanent or substantial buildings, involving a considerable money outlay and early exhibiting their shortcomings, were in fact the text on which the sermon of mere shelters for men and machinery was preached.

The present tendency toward high-class inclosures as well as contents for factories spells the transition which is taking place in the industrial world in this country. Speed in achieving results was formerly the watchword. The population was stretching itself as quickly as possible over large areas. Months of deliberation over the inauguration of some project could not be afforded. Now territories to be supplied are more restricted or more definite. A better index to probable demand is at hand. The question is not the immediate, but the more distant future, and we are to see an increasing amount of care in reaching decisions. Europe has long stood for an absolutely sure policy and the character of buildings and railroads attest it. Its development has been altogether different from that which has brought the spotlight to these shores. Guesses regarding successes of ventures are not now so often made and the better opportunity to gauge the future appears to justify what may be termed permanency of construction.

The Steel Corporation Helps Its Competitors

The Stanley Committee, in probing the affairs of the United States Steel Corporation, failed to bring out some of the good deeds of that great institution. The American consumers of pig tin, on more than one occasion, have had reason to be thankful for the existence of this huge commercial organization. Through the tin plate mills of its subsidiary, the American Sheet & Tin Plate Company, it is by far the largest consumer of tin not only in the United States but in the world, and its purchases of this important commodity are therefore on a correspondingly large scale. Producing no tin in this country, we are dependent on outside sources for our supply. The tin market is frequently subjected to speculative influences, centered largely in London, where advantage is taken of every contingency to compel American consumers to pay high prices.

Within the past few months the price of tin has been forced to an extravagant hight, and American consumers have been considerably distressed on this account. The recent strike of workmen in London has further greatly interfered with the movement of tin through the warehouses of that city, that being the transshipping point for vessels arriving from the East Indies. On this subject the following excerpt is made from the market report of C. S. Trench & Co., New York, dated August 17:

With us the feature has been the inability to get usual supplies on account of the London strike. On an average 2500 tons per month should reach us from London. Not a ton has been shipped from London in two weeks, and no likelihood of any for another week; in fact, we hear September 3 given as the first date of a London steamer to bring tin. This has reduced the stock of Straits tin here to virtually nothing other than the stocks being carried by the United States Steel Corporation. Whether from astute judgment and foresight, or from luck (we favor the former view) this large consumer has, during the late corner in London and the squeeze here, been in a most comfortable position, and has been generous in helping out its fellow consumers during these periods. The fact that it has been able to replace for future delivery at lower prices than it has sold its spot surplus to needful consumers is only an incident, and does not depreciate its service to the market.

If the United States Steel Corporation had chosen to use all its advantages for its own purposes and to ignore its competitors the opportunity here existed for reaping important benefits. This would have been ordinary commercial selfishness, and would by no means have been illegal restraint of trade. The Steel Corporation chose to do otherwise, however, and thus signally manifested its liberality and magnanimity. Will practices of this kind find a place in the report of the Stanley Committee?

Increasing Liability for Fatal Accidents

The Connecticut Legislature is proceeding favorably with a bill which would increase the amount of liability for death due to accident from $5,000 to $10,000, with a minimum of $1,000. The $5,000 figure is the usual one when death comes quickly to the victim, without "conscious suffering." Custom has decreed this to be a fair limit. To double it is a very radical step. The new limit applies, presumably, in accidents to employees as well as in cases where a public service corporation is the responsible party. Thus it is another reason why a workmen's compensation law may prove to be less of a burden than the existing employer's liability acts. The wisdom of the change is to be doubted, however. If the limit is now too low the increase should be a more gradual one. It may be argued that the statute does not compel the payment of $10,000 for each death, but merely increases the maximum liability. Nevertheless the ordinary jury nowadays does not hesitate to make the maximum award for the loss of a life, especially against corporations, even though from an economic as against a sentimental standpoint the award be too great.

Railroad Equipment Orders.—Some large orders for railroad equipment were placed during the week. Locomotive buying is on the increase. Among the orders placed were the following: The Missouri Pacific, 15 Pacific type locomotives from the American Locomotive Company; the Erie, 40 Mikado locomotives, divided between the American Locomotive Company and the Baldwin Locomotive Works, and 20 to be built in its own shops; the Government Railways of Japan, 12 Pacific type locomotives from the American Locomotive Company; Pennsylvania Railroad, 15 passenger locomotives, 10 freight locomotives and 10 switching locomotives to be built at its Altoona shops; St. Louis & San Francisco, 12 switching engines from the Baldwin Locomotive Works; Eastern Illinois, 8 engines of Pacific type from the Baldwin Locomotive Works. Car orders have been placed as follows: St. Louis & San Francisco, 250 flat cars; Chicago & Gulf, 50 flat cars and 50 box cars from the Central Locomotive Works; Swift & Co., 50 tank cars from the Pressed Steel Car Company. The St. Louis & San Francisco is inquiring for 250 flat cars and the Pennsylvania Lines West is asking bids on 700 assorted freight cars.

The John W. Danforth Company, Buffalo, N. Y., has just received formal notification from the Secretary of the Navy of the acceptance of a recent proposal tendered at Washington for the complete mechanical equipment at the Mare Island Navy Yard, San Francisco, Cal. This is one of the most important navy yards on the Pacific coast, and the contract includes the equipment for one of the largest power houses in the Navy Department. The work includes condensers and pumps for large electrical generating units, driven by steam turbines, switchboard and electrical connections, boiler feed pumps, motor-driven centrifugal water supply pumps, feed water heaters and all of the power plant piping connecting the boilers and the various power plant apparatus. The Danforth Company secured the contract in competition with New York, Philadelphia and San Francisco bidders. The work is to be completed in nine months' time. Reports from Washington state that the contract price is approximately $105,000.

The Society of Automobile Engineers is now issuing leaflets showing the mechanical standards recommended by its professional committees and accepted by the society. The society is the custodian of the standards formerly established by the Association of Licensed Automobile Manufacturers known as A. L. A. M. standards. Of these one of the less successful was the yoke and eye rod end standard. To supersede this standard, the society has now announced the S. A. E. standard for drop-forged yoke and eye rod ends.

A two-cycle single-cylinder oil engine of 65-hp. capacity is shortly to be brought out by the Remington Oil Engine Company, Stamford, Conn. It is to follow the design of other Remington oil engines, and is intended for electric lighting units, having close speed regulation. Its normal speed is 225 r.p.m.

Two dryers were recently shipped to Varanger Fjord, Norway, 400 miles inside of the Arctic Circle, by the Ruggles-Coles Engineering Company, New York. Each machine is rated to dry 55,000 lb. of iron ore concentrates per hour.

It is stated that the Blandon Rolling Mills, near Reading, Pa., has started its 8- and 11-in. mills, which will be operated on full time. For the past year this department has been running very irregularly.

The Princess Furnace Company, Glen Wilton, Va., will blow out its furnace this week.

Furnace No. 3 of the Woodward Iron Company, Woodward, Ala., has blown out.

The Automobile Outlook for 1912

The growth of automobile manufacturing in this country since 1907 has been so great that automobile makers have probably become, next to the railroad interests, the most important class of purchasers of metal working machinery and especially of machine tools. The recession in the automobile business in the early part of this year was keenly felt by the machinery trade, although it lasted but a short time, and its recovery was marked by renewed machinery buying. A canvass of some 30 representative automobile manufacturers made by *The Iron Age*, with a view to ascertaining the outlook for their industry for 1912, brings out the fact that while perhaps 20 per cent. of those written to will not produce as many cars in 1911 as in 1910, all of them expect at least to equal their 1910 production next year. In some cases the manufacturers report that in their experience the schedule of production for this year resulted in a surplus of cars. The other replies indicate for next year an increase over the 1911 production, ranging all the way from 30 to 75 per cent. Some manufacturers are unwilling to state for publication what their production was in the last two years and how 1912 will compare with 1911 and 1910. Others are willing to make public their expectations, and their replies indicate that they are looking forward to a year of large business.

The Thomas B. Jeffery Company, Kenosha, Wis., which makes the Rambler cars, is figuring on a minimum production of 3,500 cars for 1912 as against 2,500 made in 1910 and 2,000 in 1911. This company is now enlarging its plant to provide additional manufacturing space, approximating 85,000 sq. ft. It is also planning the erection of service buildings in Boston, New York, Chicago and San Francisco and will need additional machinery for both the factory and service buildings.

The Lozier Motor Company, Detroit, states that the increase in its manufacture for the year 1912 will be fully 75 per cent. and that it is planning for extensive additions to be made within the next six months.

The Ford Motor Company, Detroit, produced 20,000 cars in 1910. Its 1911 production will amount to 40,000 cars, and it anticipates a production of 75,000 cars in 1912.

The Willys-Overland Company, Toledo, Ohio, is now building a four-story body manufacturing plant, 250 x 400 ft., and a large die shop to increase its output to 20,000 cars as against 17,000 to be produced this year. This company has also just completed a large engineering building and has added to its power plant.

The Mack Brothers Motor Car Company, Allentown, Pa., expects to increase its productive facilities 50 per cent. over those of 1910 and consequently will enlarge its plant about one-third so as to be able to produce between 1,600 and 1,700 trucks.

Much of the added business that is coming to the automobile makers in this country is placed abroad. The value of exports of automobiles and parts in the fiscal year ending June 30, 1911, was $15,301,000, against $11,100,000 in 1910 and $5,992,000 in 1909. The import trade in motor cars is steadily decreasing. In the 12 months ending June 30, 1911, the imports consisted of 888 machines valued at $1,898,000, against 1,473 valued at $2,851,000 in 1910 and 1,624 valued at $2,905,000 in 1909. The values of imported parts in the three years were $352,000, $985,000 and $773,000 respectively.

Benjamin Briscoe, president of the United States Motor Company, in an interview published last week makes the statement that the automobile output of the country in 1912 will be 210,000 machines, not including motor trucks, as against 140,000 machines scheduled for production in 1911. The greatest year of the industry, Mr. Briscoe states, was 1910, when 186,000 automobiles were made.

The National Machine Tool Builders' Association will hold its annual convention at the Hotel Astor, New York City, October 10, 11 and 12. The National Supply & Machinery Dealers' Association will hold its convention at the same hotel October 10 and 11. The two bodies will hold one joint session for the purpose of bringing them in closer touch and for the discussion of matters of mutual interest, such as a uniform contract arrangement with a non-cancellation clause. Secretary Fernley, of the National Supply Association, will extend an invitation to all legitimate dealers now unaffiliated to attend the convention.

Personal

W. E. Corey returned to New York last week after a six months' absence in Europe. His offices are at 111 Broadway.

F. S. Witherbee, of Witherbee, Sherman & Co., New York, sailed for Europe last week.

George Bartol, general manager of the Otis Steel Company, Ltd., Cleveland, Ohio, has returned from a European trip.

J. Henry Teschmacher, Jr., has established himself at 347 Bay Ridge avenue, Brooklyn, N. Y., as consulting sheet metal worker, to advise with regard to methods of designing and erecting sheet metal construction.

A. H. Teuchter, president of the Cincinnati Bickford Tool Company, Oakley-Cincinnati, Ohio, sailed from Bremen August 22 on the Kaiser Wilhelm II, and will arrive in New York August 29.

T. G. Meachem and T. W. Meachem, of the New Process Rawhide Company, Syracuse, N. Y., have been elected president and vice-president respectively of the Palmer-Moore Company, of the same city, in which they have purchased a controlling interest. The latter company has recently increased its capital stock from $25,000 to $100,000 and will install new machinery and expend its business. It has been perfecting a two-cycle engine for automobiles.

Gano Dunn, who for some years has been first vice-president, chief engineer and a director of the Crocker-Wheeler Company, has resigned from that company in order to accept an important engineering and executive position. He will sail shortly for Europe to attend, as president of the American Institute of Electrical Engineers, the meeting during the Turin Exposition of the International Electrochemical Commission, to be held on September 7, 8 and 9, and also the following meeting of the International Electrical Congress.

A. W. Wheatley has resigned as manager of the Brooks Works of the American Locomotive Company at Dunkirk, N. Y., and will assume the management of the Canadian Locomotive Company's plant at Kingston, Ontario. He will be succeeded at Dunkirk by H. Swoyer, formerly manager of the American Locomotive Company's plant at Richmond, Va.

J. Weillberger, representing the Government of Nicaragua, has been in California investigating the use of oil burning appliances.

Ferdinand Thun, president of the Textile Machinery Company, Wyomissing, Pa., recently returned from a trip to the Continent. Mr. Thun has crossed the Atlantic 21 times.

F. B. Keiser resigned as vice-president and general manager of the Southern Iron & Steel Company on August 1. A successor has not yet been appointed.

E. T. Conners has been placed in charge of the recently opened Chicago office of the American Rolling Mill Company, at 313 People's Gas Building.

James A. Green, senior partner of Mathew Addy & Co., Cincinnati, Ohio, pig iron merchants, has returned from an extended vacation spent in Canada.

W. W. Hull will continue in charge of the local district of the Republic Iron & Steel Company at Pittsburgh, as manager of sales, while G. L. Claypool will be in charge of the general business of the company in the Pittsburgh district, with the title of assistant general manager of sales. Both will have offices in the Oliver Building.

Robert Garland, president of the Garland Nut & Rivet Company, Pittsburgh, and also actively identified with many other large interests in that city, has been named as one of the nine councilmen in Pittsburgh, and has accepted. P. J. McArdle, president of the Amalgamated Association, has also been named as a councilman and has accepted.

A patent on a machine for seaming can tops was granted August 8 to Joseph Maline, of St. Ouen, Seine, France, and assigned to the E. W. Bliss Company, Brooklyn, N. Y.

The Iron and Metal Markets

A Comparison of Prices

Advances Over the Previous Week in Heavy Type. Declines in Italics.

At date, one week, one month and one year previous.

	Aug. 23, 1911.	Aug. 16, 1911.	July 26, 1911.	Aug. 24, 1910.
PIG IRON, Per Gross Ton:				
Foundry No. 2 standard, Philadelphia	$15.00	$15.00	$15.00	$16.00
Foundry No. 2, Valley furnace	13.50	13.50	13.50	14.00
Foundry No. 2 Southern, Cincinnati	13.50	13.50	13.25	14.25
Foundry No. 2, Birmingham, Ala.	10.25	10.25	10.00	10.00
Foundry No. 2, at furnace, Chicago*	14.50	14.50	14.50	16.50
Basic, delivered, eastern Pa.	14.75	14.75	14.50	15.00
Basic, Valley furnace	13.00	13.00	13.00	14.00
Bessemer, Pittsburgh	15.90	15.90	15.90	15.90
Gray forge, Pittsburgh	13.90	13.90	13.90	14.15
Lake Superior charcoal, Chicago.	16.50	16.50	16.50	18.50
COKE, CONNELLSVILLE,				
Per Net Ton, at Oven:				
Furnace coke, prompt shipment.	1.50	1.50	1.50	1.55
Furnace coke, future delivery..	*1.60*	1.65	1.65	1.75
Foundry coke, prompt shipment.	1.85	1.85	1.85	2.15
Foundry coke, future delivery..	2.10	2.10	2.00	2.25
BILLETS, &c., Per Gross Ton:				
Bessemer billets, Pittsburgh....	21.00	21.00	21.00	24.50
Forging billets, Pittsburgh.....	26.00	26.00	26.00	29.50
Open hearth billets, Philadelphia	23.40	23.40	23.40	27.50
Wire rods, Pittsburgh	27.00	27.00	27.00	28.00
OLD MATERIALS, Per Gross Ton:				
Iron rails, Chicago	14.00	14.00	14.00	16.00
Iron rails, Philadelphia	17.50	17.50	17.50	18.00
Car wheels, Chicago	**13.00**	12.75	12.50	14.50
Car wheels, Philadelphia	13.00	13.00	13.00	13.75
Heavy steel scrap, Pittsburgh..	13.25	13.25	13.25	14.25
Heavy steel scrap, Chicago....	**11.00**	10.75	10.50	12.25
Heavy steel scrap, Philadelphia.	13.50	13.50	13.50	13.75
FINISHED IRON AND STEEL.				
Per Pound:	Cents.	Cents.	Cents.	Cents.
Bessemer rails, heavy, at mill..	1.25	1.25	1.25	1.25
Refined iron bars, Philadelphia	1.37½	1.37½	1.37½	1.40
Common iron bars, Pittsburgh..	1.25	1.25	1.25	1.45
Common iron bars, Chicago....	1.30	1.30	1.30	1.37½
Steel bars, Pittsburgh	1.20	1.20	1.20	1.40
Steel bars, tidewater, New York.	1.36	1.36	1.36	1.56
Tank plates, Pittsburgh	1.35	1.35	1.35	1.40
Tank plates, tidewater, New York	1.51	1.51	1.51	1.56
Beams, Pittsburgh	1.35	1.35	1.35	1.40
Beams, tidewater, New York...	1.51	1.51	1.51	1.56
Angles, Pittsburgh	1.35	1.35	1.35	1.40
Angles, tidewater, New York...	1.51	1.51	1.51	1.56
Skelp, grooved steel, Pittsburgh	1.20	1.20	1.25	1.45
Skelp, sheared steel, Pittsburgh..	1.30	1.30	1.35	1.55
SHEETS, NAILS AND WIRE.				
Per Pound:	Cents.	Cents.	Cents.	Cents.
Sheets, black, No. 28, Pittsburgh	2.00	2.00	2.00	2.20
Wire nails, Pittsburgh†	1.70	1.70	1.70	1.70
Cut nails, Pittsburgh†	1.60	1.60	1.60	1.65
Barb wire, galv., Pittsburgh†	2.00	2.00	2.00	2.00
METALS,				
Per Pound:	Cents.	Cents.	Cents.	Cents.
Lake copper, New York	12.75	12.75	12.75	13.00
Electrolytic copper, New York..	*12.50*	12.62½	12.60	12.62½
Spelter, St. Louis	5.95	5.95	5.60	5.20
Spelter, New York	*6.10*	6.15	5.80	5.35
Lead, St. Louis	*4.42½*	4.45	4.45	4.30
Lead, New York	4.50	4.50	4.50	4.40
Tin, New York	**45.00**	44.00	42.00	34.50
Antimony, Hallett, New York..	7.75	7.75	8.00	7.87½
Tin plate, 100-lb. box, New York	$3.94	$3.94	$3.94	$3.84

* The average switching charge for delivery to foundries in the Chicago district is 50c. per ton.

† These prices are for largest lots to jobbers.

Prices of Finished Iron and Steel f.o.b. Pittsburgh

Freight rates from Pittsburgh in carloads, per 100 lb.; New York, 16c.; Philadelphia, 15c.; Boston, 18c.; Buffalo, 11c.; Cleveland, 10c.; Cincinnati, 15c.; Indianapolis, 17c.; Chicago, 18c.; St. Paul, 32c.; St. Louis, 22½c.; New Orleans, 30c.; Birmingham, Ala., 45c. Rates to the Pacific coast are 80c. on plates, structural shapes and sheets, No. 11 and heavier; 85c. on sheets, Nos. 12 to 16; 95c. on sheets, No. 16 and lighter; 65c. on wrought boiler tubes.

Structural Material.—I-beams and channels, 3 to 15 in., inclusive, 1.35c. to 1.40c., net; I-beams over 15 in., 1.45c. to 1.50c., net; H-beams over 18 in., 1.50c. to 1.55c.; angles, 3 to 6 in., inclusive, ¼ in. and up, 1.35c. to 1.40c., net; angles over 6 in., 1.45c. to 1.50c., net; angles, 3 in. on one or both legs, less than ¼ in. thick, 1.40c., plus full extras as per steel bar card effective September 1, 1909; tees, 3 in. and up, 1.40c., net; zees, 3 in. and up, 1.35c. to 1.40c., net; angles, channels and tees under 3 in., 1.40c., base, plus full extras as per steel bar card of September 1, 1909; deck beams and bulb angles, 1.65c. to 1.70c., net; hand rail tees, 2.45c.; checkered and corrugated plates, 2.45c., net.

Plates.—Tank plates, ¼ in. thick, 6¼ in. up to 100 in. wide, 1.35c. to 1.40c., base. Following are stipulations prescribed by manufacturers, with extras to be added to base price (per pound) of plates:

Rectangular plates, tank steel or conforming to manufacturers' standard specifications for structural steel dated February 6, 1903, or equivalent, ¼ in. thick and over on thinnest edge, 100 in. wide and under, down to but not including 6 in. wide, are base.

Plates up to 72 in. wide, inclusive, ordered 10.2 lb. per square foot, are considered ¼-in. plates. Plates over 72 in. wide must be ordered ¼ in. thick on edge, or not less than 11 lb. per square foot, to take base price. Plates over 72 in. wide ordered less than 11 lb. per square foot down to the weight of 3-16 in. take the price of 3-16 in.

Allowable overweight, whether plates are ordered to gauge or weight, to be governed by the standard specifications of the Association of American Steel Manufacturers.

	Cents per lb.
Gauges under ¼ in. to and including 3-16 in. on thinnest edge, extra	.10
Gauges under 3-16 in. to and including No. 8	.15
Gauges under No. 8 to and including No. 9	.25
Gauges under No. 9 to and including No. 10	.30
Gauges under No. 10 to and including No. 12	.40
Sketches (including all straight taper plates) 3 ft. and over in length	.10
Complete circles, 3 ft. in diameter and over	.20
Boiler and flange steel	.10
"A, B, C" and ordinary firebox steel	.20
Still bottom steel	.30
Marine steel	.40
Locomotive firebox steel	.50
Widths over 100 in. up to 110 in., inclusive	.05
Widths over 100 in. up to 115 in., inclusive	.10
Widths over 115 in. up to 120 in., inclusive	.15
Widths over 120 in. up to 125 in., inclusive	.25
Widths over 125 in. up to 130 in., inclusive	.50
Widths over 130 in.	1.00
Cutting to lengths or diameters under 3 ft. to 2 ft., inclusive	.25
Cutting to lengths or diameters under 2 ft. to 1 ft., inclusive	.50
Cuttings to lengths or diameters under 1 ft.	1.55

No charge for cutting rectangular plates to lengths 3 ft. and over.

TERMS—Net cash 30 days.

Sheets.—Makers' prices for mill shipments on sheets in carload and larger lots, on which jobbers charge the usual discounts for small lots from store, are as follows: Blue annealed sheets. Nos. 3 to 8, U. S. standard gauge, 1.40c.; Nos. 9 and 10, 1.50c.; Nos. 11 and 12, 1.55c.; Nos. 13 and 14, 1.60c.; Nos. 15 and 16, 1.70c. One pass, cold rolled, box annealed sheets, Nos. 10 to 12, 1.65c.; Nos. 13 and 14, 1.70c.; Nos. 15 and 16, 1.75c.; Nos. 17 to 21, 1.80c.; Nos. 22, 23 and 24, 1.85c.; Nos. 25 and 26, 1.90c.; No. 27, 1.95c.; No. 28, 2c.; No. 29, 2.05c.; No. 30, 2.15c. Three pass, cold rolled sheets, box annealed, are as follows: Nos. 15 and 16, 1.85c.; Nos. 17 to 21, 1.90c.; Nos. 22 to 24, 1.95c.; Nos. 25 and 26, 2c.; Nos. 27, 2.05c.; No. 28, 2.10c.; No. 29, 2.15c.; No. 30, 2.25c. Galvanized sheets, Nos. 10 and 11, black sheet gauge, 2c.; Nos. 12, 13 and 14, 2.10c.; Nos. 15, 16 and 17, 2.25c.; Nos. 18 to 22, 2.40c.; Nos. 23 and 24, 2.50c.; Nos. 25 and 26, 2.70c.; No. 27, 2.85c.; No. 28, 3c.; No. 29, 3.10c.; No. 30, 3.30c. All above prices are f.o.b. Pittsburgh, terms 30 days net, or 2 per cent. cash discount 10 days from date of invoice, as also are the following base prices per square for painted and galvanized roofing sheets, with 2½-in. corrugations:

Gauge.	Painted	Galvanized.	Gauge.	Painted.	Galvanized.
29	...	$2.40	23	$2.40	$3.50
28	$1.40	2.55	22	2.60	3.70
27	1.55	2.60	21	2.80	4.05
26	1.65	2.65	20	3.05	4.35
25	1.85	3.05	18	4.05	5.70
24	2.10	3.15	16	4.90	6.50

Wrought Pipe.—The following are the jobbers' carload discounts on the Pittsburgh basing card on wrought pipe, in effect from October 1, 1910:

	Steel		Iron	
	Black.	Galv.	Black.	Galv.
Butt Weld.				
1 to 1¼ in.	..	..	49	43
1½ in.	74	63	71	59
1¾ to 1¾ in.	79	66	75	65
2 to 3 in.	80	70	76	66
Lap Weld.				
2 in.	76	66	72	62
2½ to 4 in.	78	67	74	64
4½ to 6 in.	77	67	73	63
7 to 12 in.	77	59	71	55
13 to 15 in.	51½	..	..	..
Butt Weld, extra strong, plain ends, card weight.				
⅛, ¼, ⅜ in.	60	50	65	55
½ in.	74	68	70	64
¾ to 1¼ in.	78	72	74	68
2 to 3 in.	79	73	75	69

THE IRON AND METAL MARKETS

Lap Weld, extra strong, plain ends, card weight.				
2 in.	75	69	71	65
2½ to 4 in.	77	71	73	67
4½ to 6 in.	76	70	72	66
7 to 8 in.	69	59	65	55
9 to 12 in.	64	54	60	50
Butt Weld, double extra strong, plain ends, card weight.				
½ in.	64	58	60	54
¾ to 1¼ in.	67	61	63	57
2 to 3 in.	69	63	65	59
Lap Weld, double extra strong, plain ends, card weight.				
2 in.	65	59	61	55
2½ to 4 in.	67	61	63	57
4½ to 6 in.	66	60	62	56
7 to 8 in.	59	49	62	56

Plugged and Reamed.

1 to 1½, 2 to 3 in. Butt Weld
2, 2½ to 4 in. ..... Lap Weld

} will be sold at two (2) points lower basing (higher price) than merchants' or card weight pipe. Butt or lap weld, as specified.

The above discounts are for "card weight," subject to the usual variation of 5 per cent. Prices for less than carloads are three (3) points lower basing (higher price) than the above discounts.

Boiler Tubes.—Discounts on lap welded steel boiler tubes to jobbers in carloads are as follows:

	Steel.
1¾ to 2¼ in.	65
2½ in.	67½
2¾ to 3¼ in.	70
3½ to 4½ in.	72½
5 to 6 in.	65
7 to 13 in.	62½

Less than carloads to destination east of the Mississippi River will be sold at delivered discounts for carload lowered by two points for lengths 22 ft. and under; longer lengths f.o.b. Pittsburgh. Usual extras to jobbers and boiler manufacturers.

Wire Rods and Wire.—Bessemer, open hearth and chain rods, $27. Fence wire, Nos. 0 to 9 per 100 lb., terms 60 days, or 2 per cent. discount in 10 days, carload lots, to retailers, annealed, $1.55; galvanized, $1.85. Galvanized bar wire, to jobbers, $2; painted, $1.70. Wire nails, to jobbers, $1.70.

The following table gives the price to retail merchants on wire in less than carloads, including the extras on Nos. 10 to 16, which are added to the base price:

Fence Wire, Per 100 lb.

No.	0 to 9	10	11	12 & 12½	13	14	15	16
Annealed	$1.65	$1.70	$1.75	$1.80	$1.90	$2.00	$2.10	$2.20
Galvanized	1.95	2.00	2.05	2.10	2.20	2.30	2.70	2.80

Market and Stone Wire in Bundles, Discount from Standing List.

Bright and Annealed:
9 and coarser 80
10 to 18 ..... 80 and 10
19 to 26 ..... 80 and 10 and 2½
27 to 36 ..... 80 and 5
Galvanized:
9 and coarser ..... 75 and 10
10 to 16 ..... 75 and 10
17 to 26 ..... 72½ and 10
27 to 36 ..... 72½
Coppered or Liquor Finished:
9 and coarser ..... 75 and 10
10 to 26 ..... 75 and 10
27 to 36 ..... 70 and 10 and 5
Tinned:
6 to 18 ..... 75 and 10 and 10

Chicago

CHICAGO, ILL., August 22, 1911.

Except for the weaknesses that have developed in steel bar and sheet prices and the lack of momentum in the pig iron situation the strength of the market generally is well sustained. The growth and the broadening of business are beginning to make themselves felt through the less prominent channels of business, and complaints because of the times are less frequent. Rail orders during the week past were light, but encouragement may be had from the placing or orders by the Erie Railroad for about 4000 cars and by the Frisco system for 1200. Manufacturers of railroad supplies report that prospective work for which estimates have been submitted in the past fortnight is exceedingly extensive. Including the steel work for a bridge at St. Louis, Western transactions involving about 10,000 tons of fabricated steel are to be noted for the week. The shops of fabricators are engaged with larger tonnages and some improvement in prices is reported. The tonnage of current business in sheets and bars still seems to be insufficient to go round, and concessions of $1 a ton are freely made. Melters of scrap iron in this immediate territory are not taking such material in with any noticeably increasing freedom, but in the preliminary handling decidedly firmer tendencies are manifest.

Pig Iron.—Very little iron was purchased during the past week. The sales reported comprised several lots of a few hundred tons each for shipment during the remainder of the year, but melters generally are not interested in Southern iron at $10.50, Birmingham, for anything but first quarter and first half delivery. It is generally conceded that the demand for last half iron was well filled with iron bought on the basis of $10 and that as long as the situation remains as it is with local irons Southern furnaces can scarcely hope for much business at the advanced price. Some Southern furnaces not in the Birmingham district will sell at $10.25 and the statement has been made that $10 was done by such a furnace in the past week. Local makers continue to take business at $14.50 at furnace. Inquiry for malleable, though still active, is but poorly supported by actual purchases, and one large inquiry has been withdrawn. Deliveries of iron on recently placed orders are being accepted on schedule apparently, but a very large tonnage is held up in this district on old contracts, particularly for malleable. A new freight rate is now in effect on Lake Superior charcoal at an advance of 25c. a ton, making the tariff $1.75 into Chicago. We quote for Chicago delivery, except for local irons, which are f.o.b. furnace, the following prices:

Lake Superior charcoal	$16.50 to $17.00
Northern coke foundry, No. 1	15.00 to 15.50
Northern coke foundry, No. 2	14.50 to 15.00
Northern coke foundry, No. 3	14.25 to 14.50
Northern Scotch, No. 1	16.60
Southern coke, No. 1 foundry and No. 1 soft	15.10
Southern coke, No. 2 foundry and No. 2 soft	14.60
Southern coke, No. 3	14.35
Southern coke No. 4	14.10
Southern gray forge	13.85
Southern mottled	13.85
Malleable Bessemer	14.50 to 15.00
Standard Bessemer	17.40
Basic	15.50
Jackson Co. and Kentucky Silvery, 6 per cent.	17.90
Jackson Co. and Kentucky Silvery, 8 per cent.	18.90
Jackson Co. and Kentucky Silvery, 10 per cent.	19.90

Rails and Track Supplies.—The rail business of the past week as reported by the leading interest was confined to small lots which did not exceed in the aggregate 10,000 tons. Quite a number of similar orders are in prospect. The major portion of the rails ordered are Bessemer and the South Chicago mill is comfortably provided for, but an increase in the open-hearth rail tonnage on the books would not be unwelcome. We quote standard railroad spikes at 1.65c. to 1.75c., base; track bolts with square nuts, 2.10c. to 2.20c., base, all in carload lots, Chicago; standard section Bessemer rails, 1.28c.; open hearth, 1.34c.; light rails, 40 to 45 lb., 1.16c. to 1.20½c.; 30 to 35 lb., 1.19½c. to 1.24c.; 16, 20 and 25 lb., 1.20½c. to 1.25c.; 12 lb., 1.25c. to 1.30½c.; angle bars, 1.50c. to 1.60c., Chicago.

Structural Material.—With the taking of a number of small orders for fabricated steel, the status of local structural shops with reference to the volume of profitable business on the books has improved. For this class of work and for most of the bridge work better prices are being obtained. It is understood that the plants of the larger interests are now handling more work than for a considerable period. The American Bridge Company is reported to have been the low bidder for the approach to a Mississippi River bridge at St. Louis. The work reported as placed during the week amounted to about 3,000 tons, of which the largest order was for 1,100 tons for the Washington Street bridge awarded to the Strobel Steel Construction Company. The Wisconsin Bridge Company will build two turntables weighing 136 tons for the Chicago, Milwaukee & St. Paul Railroad. The Minneapolis Steel & Machinery Company will furnish 588 tons of steel for the Brunet Falls Mfg. Company, Cornell, Wis. The Chicago, Burlington & Quincy Railroad let 199 tons to the Klemp-Simpson Company, Muncie, Ind. For the Lincoln Park (Chicago) Zoo 176 tons went to the Vierling Steel Works. A lodge building at San Francisco requiring 444 tons was awarded to the Central Iron Works of that city and an addition to a brewery at Portland, Ore., calling for 191 tons, was placed. We quote plain material, Chicago delivery, mill shipment, at 1.53c. and from store, 1.75c.

Plates.—Demands on jobbers' stocks and mill orders do not indicate any very great activity on the part of local tank and boiler shops. Mill tonnage now being rolled is largely for railroad, bridge and car work. Labor troubles have made great inroads on the normal volume of boiler and tank business transacted here by the plumbing and steam fitting contractors, and only recently has any evidence of a return of normal conditions been sighted. We continue to quote for Chicago delivery, from mill, 1.53c., and from store, 1.75c.

Sheets.—While shading of sheet prices is the rule, the extent of these concessions varies greatly, being

THE IRON AND METAL MARKETS

for the most part in keeping with the amount of freight advantage the various mills enjoy. Prices as much as $2 a ton below nominal quotations are reported, but no evidence appears here confirming concessions of more than $1.50 per ton. Current business holds up sufficiently to preserve about the same percentage of mill operations as has prevailed for some weeks, but little improvement is noted in the accumulation of specifications for future rolling. We continue to quote Chicago prices as follows: Carload lots, from mill: No. 28 black sheets, 2.18c.; No. 28 galvanized, 3.18c.; No. 10 blue annealed, 1.68c. Prices from store, Chicago, are: No. 10, 1.95c. to 2.05c.; No. 12, 2c. to 2.10c.; No. 28 black, 2.45c. to 2.55c.; No. 28 galvanized, 3.45c.

Bars.—Local bar iron mills are reported as operating from 50 to 60 per cent. of their average normal capacity. The weakness in steel bar quotations has not tended to enhance the firmer attitude which the bar iron mills have been assuming. Concessions of $1 a ton for steel bars are quite general, notwithstanding which some business is reported placed at full prices. Current buying is only moderate. We quote as follows, f.o.b. Chicago: Soft steel bars, 1.43c.; bar iron, 1.20c. to 1.25c.; hard steel bars, rolled from old rails, 1.20c. From store, soft steel bars, 1.70c. to 1.80c., Chicago.

Wire Products.—With the passing of the midsummer season the extreme quiet in the wire trade is yielding to the awakening of fall demand. Increases are noted in wire nail business and in specifications for wire entering into manufactured products. Barb wire is not in demand. The worst of the price shading seems to be over, but the fact that crop reports have fallen short of earlier expectations has not been without its discouraging effects. Jobbers' carload prices, which are quoted to manufacturing buyers, are as follows: Plain wire, No. 9 and coarser, base, 1.68c.; wire nails, 1.88c.; painted barb wire, 1.88c.; galvanized, 2.18c.; polished staples, 1.88c.; galvanized, 2.18c., all Chicago.

Cast Iron Pipe.—Bids are to be received this week at St. Louis covering about 1,000 tons of pipe. The lettings of the past week did not include any of important tonnage but the miscellaneous business was well maintained. The leading interest will furnish 250 tons for Ironton, Ohio. Prices continue firm and we quote per net ton, Chicago, as follows: Water pipe, 4 in., $25.50; 6 to 12 in., $24.50; 16 in. and up, $24, with $1 extra for gas pipe.

Old Material.—Although the consumptive demand seems not to be any more active, a stronger tone prevails in the scrap market and prices indicate an upward tendency. A sale of 1800 tons of rerolling rails by the Great Northern Railroad is said to have brought about $13, Chicago, and 1000 tons of No. 1 wrought was placed by another railroad at $11.60, delivered. Dealers are paying higher prices for almost all steel scrap items. Cast borings are greatly in demand. In territory West and Southwest a stronger situation prevails than in this immediate market. The Northern Pacific is offering about 1200 tons of old material. We have revised our prices and quote as below for delivery to buyer's works, Chicago and vicinity, all freight and transfer charges paid, per gross ton, as follows:

Old iron rails	$14.00 to $14.50
Old steel rails, rerolling	12.75 to 13.25
Old steel rails, less than 3 ft.	11.50 to 12.00
Relaying rails, standard sections, subject to inspection	24.00
Old car wheels	13.00 to 13.50
Heavy melting steel scrap	11.00 to 11.50
Frogs, switches and guards, cut apart	10.75 to 11.25
Shoveling steel	10.50 to 11.00
Steel axle turnings	8.50 to 9.00

The following quotations are per net ton:

Iron angles and splice bars	$12.50 to $13.00
Iron arch bars and transoms	13.75 to 14.25
Steel angle bars	10.25 to 10.75
Iron car axles	18.00 to 18.50
Steel car axles	10.00 to 10.50
No. 1 railroad wrought	11.00 to 11.50
No. 2 railroad wrought	10.00 to 10.50
Steel knuckles and couplers	10.00 to 10.50
Locomotive tires, smooth	15.00 to 15.50
Machine shop turnings	6.25 to 6.75
Cast and mixed borings	6.00 to 6.50
No. 1 busheling	8.75 to 9.25
No. 2 busheling	6.75 to 7.25
No. 1 boilers, cut to sheets and rings	7.50 to 8.00
Boiler punchings	12.00 to 12.50
No. 1 cast scrap	10.25 to 10.75
Stove plate and light cast scrap	9.00 to 9.50
Railroad malleable	10.00 to 10.50
Agricultural malleable	9.25 to 9.75
Pipes and flues	8.00 to 8.50

Philadelphia

PHILADELPHIA, PA., August 22, 1911.

Transactions in iron and steel have been on a somewhat smaller scale. The strength of the pig iron market has, however, been fully maintained and sellers continue to treat inquiries for extended shipment rather indifferently. In finished products an undertone of weakness is apparently developing, although there is no quotable change in current prices. Consumers have been endeavoring to break the market, but quantities inquired for have, as a rule, not been attractive enough to induce makers to shade, even if they were willing to do so. The market for billets drags. Little business is offered in either iron or steel bars, but prices are comparatively firm. The old material market is inclined to be weak and in some grades small lot business has been at lower figures.

Iron Ore.—There has been some little odd lot movement in local ores, and one interest has extended its contract by one cargo, some 10,000 to 12,000 tons, of Newfoundland ore. Over-sea ore has been quiet, the scarcity of bottoms and the high freight rates, 10s. 3d. from western Mediterranean and 11s. from eastern Mediterranean points, being of a rather prohibitive nature at the present range of prices for foreign ores at tidewater. No arrivals of foreign ore were reported in the past week.

Pig Iron.—Recent transactions have been largely confined to foundry grades, principally small lots for prompt and early shipment. While there has been considerable inquiry, the position of sellers in this district is gradually becoming stronger and less attention is being given to inquiries covering extended delivery. Some producers have advanced quotations for foundry grades 25 cents a ton to other than present customers, whose regular requirements they are still willing to take care of at current quotations. A number of the eastern Pennsylvania furnaces have their output, at the present rate of operation, sold for the third and a considerable portion of the fourth quarter, and are therefore not particularly anxious for business at present quotations and have not determined on a price for delivery beyond the year end, for which there is considerable inquiry. Deliveries on contracts are being taken freely and, in instances, consumers are pressing for shipments. For prompt and near future shipment No. 2 X iron of standard analysis is available at $15 to $15.25, delivered in this vicinity. A purchase of a lot of 1000 tons of low grade iron by a soil pipe maker is reported, while one of the Delaware River cast iron pipe makers is out with an inquiry for 1000 tons of low grade for prompt shipment. Pipe makers have been taking on some further small lots of off iron, but no large purchases are reported. The movement in Virginia foundry grades has been less active, and it is stated that the price of $12.25 at furnace for Virginia foundry iron is now available, in instances, for deliveries extending over the remainder of the year. The majority of sellers, however, still maintain the $12.25 basis for prompt and name $12.50 for more extended delivery, although in a few cases the latter quotation is still the minimum. Forge iron has not been in active demand; several small lots of rolling mill forge have been sold at $14.25 to $14.50, delivered in this vicinity, but there is practically no inquiry for large lots. No sales of basic beyond those noted last week are reported; consumers are awaiting developments. The Eastern mill recently in the market for 25,000 tons of basic for the first quarter of 1912 has practically withdrawn the inquiry. One Eastern mill is reported to be in the market for a moderate lot of Bessemer iron. Small sales of low phosphorus iron are reported at prices ranging from $20 to $20.50, delivered, for standard analysis iron. The following range of quotations is named for standard brands delivered in buyers' yards in this vicinity, shipment ranging from prompt to the remainder of the year:

Eastern Pennsylvania No. 2 X foundry	$15.00 to $15.25
Eastern Pennsylvania No. 2 plain	14.75 to 15.00
Virginia foundry	15.00 to 15.50
Gray forge	14.25 to 14.50
Basic	14.75 to 15.00
Standard low phosphorus	20.00 to 20.50

Ferroalloys.—Notwithstanding the apparent firmness with which sellers are maintaining the $37, Baltimore, quotations for 80 per cent. ferromanganese, rumors will not down that as low as $36.50 has been quoted and sales made on that basis. Lots ranging from 150 to 500 tons for extended delivery are said to have been sold, while small sales at $37 are also

THE IRON AND METAL MARKETS

reported. A better demand for ferrosilicon is noted; several hundred tons of 50 per cent. have been sold at $57, delivered in this vicinity, while inquiries for furnace silicon in lots of 100 to 300 tons are reported. The latter grade is quoted at $26.30 for 10 per cent., $27.30 for 11 per cent. and $28.30 for 12 per cent., within Bessemer limits as to phosphorus and sulphur content, delivered in this district.

Billets.—Business coming to the mills continues light. Current orders for both rolling and forging billets are confined to small lots for early delivery, and consumers show less interest in contracts for extended shipment. Mills are almost entirely dependent on current orders, but manage to continue operations on about an even basis. Quotations are firmly maintained at $23.40 for open-hearth rolling billets, and $28.40 for ordinary forging billets, delivered in buyers' yards in this vicinity.

Plates.—The demand continues of a moderate character, and, while individual orders are small as a rule and largely for early delivery, the aggregate, together with current specifications, is sufficient to enable mills to operate at an unchanged basis. While the trade is encouraged with the prospects, comparative quietness at the present time is generally reported. Producers in this district maintain the recent quotations, although rumors that lower prices might be had for desirable business are heard, but the market has not been thoroughly tested, and current business easily commands 1.50c., delivered here.

Structural Material.—Immediate business continues along narrow lines. There is considerable inquiry for small lots of plain and fabricated material for bridge and building work, but orders develop more slowly. Nothing definite has transpired regarding the new Stock Exchange Building, while the proposals for the new Municipal Convention Hall will not go in until the end of the month. Plans are out for the new Post Office Building in Washington, D. C., for which from 9000 to 10,000 tons of structural material will be required. Inquiries for small railroad bridge work continue to come out. Prices of fabricated work are said to be less firm, as competition has again become sharper. Plain shapes are maintained at 1.50c., delivered in this district, but as most of the business is small the market has not been very seriously tested.

Sheets.—Little change in the situation is reported by Eastern mills, which continue dependent on day to day orders, which, as a rule, are confined to small lots for early delivery. As Eastern mills make prompt shipments, they have so far been unaffected by weakness in prices of Western sheets. There has been practically no inquiry from consumers for contracts covering extended deliveries.

Bars.—Business offered, either in steel or refined iron bars, continues small. Steel bars are more generally quoted at the 1.40c., delivered, basis, although it is not impossible, it is said, to slightly shade that figure. Current business in iron bars has been confined to small lots for which 1.20c., Eastern mill, is the minimum, on desirable specifications, and 1.22½c., mill, has been done for less desirable business. For delivery in this territory refined iron bars are quoted at 1.27½c. to 1.32½c.

Coke.—While the demand is not particularly active, sellers show more firmness in maintaining quotations. Several moderate contracts for foundry coke for deliveries ranging over the remainder of the year to a full twelve months are reported at from $2.20 to $2.35 at oven, while prompt foundry coke can be had down to $2. Furnace coke has been quiet, with prompt quoted at $1.50 at oven, and forward at $1.60 to $1.70. The major portion of the business done has been in prompt coke. The following range of quotations is named, per net ton, for deliveries in this vicinity:

Connellsville furnace coke	$3.75 to $4.05
Foundry coke	4.25 to 4.60
Mountain furnace coke	3.35 to 3.55
Foundry coke	3.85 to 4.20

Old Material.—The demand, which has been inactive for some weeks, has become easier. Consumers have in several instances, withdrawn from the market, and sales by some weak holders of material have been made at lower figures. There has been little movement in steel and the higher range of prices has practically disappeared. Buyers' ideas of prices for heavy melting steel range from $13 for No. 1 yard to $13.50 for No. 1 choice railroad with sellers holding at about 25 cents above those figures. Cast borings and wrought turnings have been sold in moderate lots at 25 cents under last week's quotations. Railroad wrought is 50 cents under recent prices. Both buyers and sellers are holding off awaiting developments, as the present stage of the market is by no means clear. There is almost an entire absence of speculative buying or selling. The following range of prices about represents the market for early deliveries in buyers' yards, eastern Pennsylvania and nearby points, taking a freight rate from Philadelphia varying from 35c. to $1.35 per gross ton for shipment ranging from prompt to the remainder of the year

No. 1 railroad heavy melting steel scrap	$13.50 to $13.75
No. 1 yard heavy melting steel scrap	13.00 to 13.25
Old steel rails, rerolling, nominal	14.00 to 14.50
Low phosphorus heavy melting steel scrap	16.75 to 17.25
Old steel axles, nominal	19.50 to 20.00
Old iron axles	24.50 to 25.00
Old iron rails	18.00 to 18.50
Old car wheels (nominal)	13.00 to 13.50
No. 1 railroad wrought	15.50 to 16.00
Wrought iron pipe	12.75 to 13.25
No. 1 forge fire	11.25 to 11.75
No. 2 light iron (nominal)	6.75 to 7.25
Wrought turnings	9.25 to 9.75
Cast borings	8.75 to 9.25
Machinery cast	14.25 to 13.75
Railroad malleable (nominal)	11.50 to 12.00
Grate bars, railroad	10.00 to 10.50
Stove plate	10.50 to 11.00

Cleveland

CLEVELAND, OHIO, August 22, 1911.

Iron Ore.—Ore firms that early in the season looked for a moderate buying movement in the late summer or early fall now have little confidence that these expectations will be realized. It is quite generally admitted that the demand for steel and pig iron has not improved sufficiently to stimulate much if any activity in ore. The little spurt of small lot buying noted last week has subsided. Additional sales aggregating only about 50,000 tons are reported. The Steel Corporation is planning an early closing of its ore shipping season and most of the merchant ore firms will be through with their shipments earlier than usual. Business in the Lake trade is dull and some of the vesselmen are talking of tying up their boats for 15 days. We quote prices as follows: Old range Bessemer, $4.50; Mesaba Bessemer, $4.25; old range non-Bessemer, $3.70; Mesaba non-Bessemer, $3.50.

Pig Iron.—Sales of Southern iron in this territory have improved, advancing prices apparently having caused consumers to cover for their last quarter requirements. A local stove manufacturer has bought 750 tons and a local furnace builder has contracted for 500 tons of Southern iron, both for the last half delivery. We also note the sale of 1000 tons of Southern to a Barberton, Ohio, plant for the last quarter. The Standard Sanitary Mfg. Company, in addition to purchases of Northern iron for its plants near Pittsburgh, is reported to have bought 1500 tons of No. 2 Southern and 1000 tons of Southern gray forge for its Louisville plant. The market is firm at $10.50, Birmingham, for No. 2 for the last quarter, but the same grade can still be bought at $10.25, for delivery through the remainder of the year. There is little activity in Northern foundry iron. A number of sales are reported, but they are nearly all in quite small lots. Many consumers have not yet covered for their last quarter requirements and are expected to hold off for another month. One local consumer is in the market for 1000 tons of Northern. The consumption shows little change, foundries generally running at about 60 per cent. of their full capacity. Northern iron is firm at $13.50, Valley furnace, for No. 2, although in some cases slight concessions are reported to absorb freight rates higher than from Valley shipping points. For Cleveland delivery we quote as follows, delivered, for prompt shipment and for the last half:

Bessemer	$15.90
Basic	$13.75 to 14.00
Northern foundry No. 2	13.75 to 14.00
Gray forge	13.25
Southern foundry No. 2	14.60 to 14.85
Jackson Co. silvery, 8 per cent. silicon	17.55

Coke.—The market is very dull. The only demand is for foundry grades in small lots for spot shipment. Most consumers, however, are under contract. We quote standard Connellsville furnace coke at $1.50 to $1.60 per net ton at oven for prompt shipment and $1.60 to $1.70 for the remainder of the year. Connellsville 72-hr. foundry coke is held at $1.85 to $2.15 for prompt shipment and $2.10 to $2.40 for contract.

THE IRON AND METAL MARKETS

Finished Iron and Steel.—The demand in finished lines is fairly good, orders coming out in about the same volume as they have during the past two or three weeks. There is an absence of a demand for large tonnages. Orders and specifications from manufacturers are quite numerous but they are for small lots on which quick shipment is desired. Some of the mills are no longer shading prices on steel bars but good-sized lots for prompt delivery can still be bought at 1.20c., Pittsburgh. The demand for small lots of structural material is quite active. The contract for a new steel span for the Central viaduct, Cleveland, requiring 600 tons, has been awarded to the King Bridge Company, and the contract for six track stringers, taking 120 tons, to the Republic Structural Iron Works Company. The Donovan Wire & Iron Works Company, Toledo, has taken 400 tons for an addition to the plant of the Stroh Brewing Company in that city. Bethlehem sections will be used. New bids for the city hall, Cleveland, requiring 4000 tons, will be received September 7. Bids are being received for steel for the Leader Building, Cleveland, requiring 4000 to 5000 tons, the amount depending on whether it is finally decided to make it a 14 or a 16-story structure. The erection of this building will not be started until next year. The Pennsylvania Railroad crossing elimination work in Cleveland will require about 2000 tons of structural steel for bridges. The demand for sheets is not active, specifications on contracts not being liberal. The ruling price for both black and galvanized sheets is $1 a ton below published quotations. The demand for iron bars continues light. The Empire rolling mill has shut down for a few days. We quote iron bars at 1.25c. to 1.30c., Cleveland. Jobbers report an improvement in warehouse business, which at present is fairly satisfactory.

Old Material.—Following a good demand a few days ago, the market has settled down and prices are easier, quotations on several grades being reduced 25c. to 50c. a ton. One local steel plant has completed the purchase of a round tonnage, and sales aggregating 4000 tons are reported to a Canton steel plant. Local steel and iron mills appear now well supplied with scrap and dealers expect no further orders for the present from mills outside of this district. The prospect of a dull period for the next few weeks has resulted in the softening of prices. Dealers' prices, per gross ton, f.o.b. Cleveland, are as follows:

Old steel rails, rerolling	$13.00 to $13.50
Old iron rails	15.00 to 15.50
Steel car axles	17.50 to 18.00
Heavy melting steel	12.00 to 12.25
Old car wheels	12.00 to 12.25
Relaying rails, 50 lb. and over	22.50 to 23.50
Agricultural malleable	10.75 to 11.25
Railroad malleable	12.25 to 12.75
Light bundled sheet scrap	10.00 to 10.50

The following prices are per net ton, f.o.b. Cleveland:

Iron car axles	$20.50 to $21.00
Cast borings	6.50 to 6.75
Iron and steel turnings and drillings	7.00 to 7.50
Steel axle turnings	8.25 to 8.75
No. 1 busheling	10.00 to 10.50
No. 1 railroad wrought	11.75 to 12.25
No. 1 cast	11.25 to 11.75
Stove plate	9.50 to 10.00
Bundled tin scrap	11.00 to 11.50

Birmingham

BIRMINGHAM, ALA., August 21, 1911.

Pig Iron.—A lot of 1000 tons of No. 2 foundry, for shipment during the remainder of this year and extending into the first quarter of 1912, is the largest inquiry now pending. Quotations have just been submitted on 350 tons of No. 2 soft for last quarter delivery, and several carloads and lots of 100 to 250 tons each for comparatively early shipment are in demand. The aggregate sold the past week was considerably less than that of the week previous. In last reports from the selling agents mention is made of the sale of 500 tons of gray forge for shipment during the remainder of the year at $9.50, Birmingham. The sale of 400 tons of No. 3 foundry for last quarter shipment is reported at $10.50, Birmingham, and 300 tons of No. 2 soft for shipment commencing immediately and covering the next 60 days brought the same price. A lot of 500 tons of No. 3 foundry for spot shipment was sold at $10, Birmingham. The aggregate of carload orders for prompt shipment, and which was entered at $10.50 for No. 2 soft, is estimated at from 750 to 1000 tons. There has been no change in quotations by any of the furnace companies since last report. The majority continue to adhere to a basis of $11, Birmingham, for deliveries during the last quarter without committing themselves for deliveries further advanced. It is believed that a basis of $10.50 correctly represents the market for any delivery within the remainder of the year, and that offers of $11 for first quarter deliveries would not be refused. The buying interests are, apparently, disposed to await further developments before contracting the first quarter requirements. From the continued heavy rate of shipment from furnace yards against contracts, and the fairly strong demand for prompt deliveries, it appears that all lines of foundry trade have improved; however, but few cases are reported where higher prices for the finished product are being actually received. It is understood that an additional furnace will soon be blown in on foundry iron, but no authoritative statement has yet been made in that connection. The Alice Furnace of the Tennesse Coal, Iron & Railroad Company has just been blown in on basic iron, making a total of five stacks now in operation on that grade. The output of foundry iron is still represented by thirteen active stacks. We quote the market for deliveries during the remainder of the year at the schedule below, per gross ton, f.o.b. cars, Birmingham furnaces:

No. 1 soft and No. 1 foundry	$11.00
No. 2 soft and No. 2 foundry	10.50
No. 3 foundry	10.00
No. 4 foundry	9.75
Gray forge	9.50
Mottled	9.25
Ore basic	$10.00 to 10.50
Standard basic	10.25 to 10.75
Charcoal car-wheel iron	22.50

Cast Iron Pipe.—Producers report the outlook for new business encouraging, but the aggregate recently placed is comparatively small. Inquiries now pending consists of some 500 tons for Cleveland, Ohio; 150 tons for San Antonio, Texas, and 500 to 750 tons for requirement in southern California. It is understood that the Dimmick plant at North Birmingham will be put in operation within the next 30 days. We quote the market firm as follows, per net ton, f.o.b. cars here: 4 to 6 in., $23; 8 to 12 in., $22; over 12 in., $21, with $1 per ton extra for gas pipe.

Old Material.—This market continues to improve slightly and better prices have been received during the past week for all cast grades than for many weeks past. The business transacted consisted largely of carload lots, but dealers are more encouraged and are adding to their stocks at a fair rate. Prices are unchanged though stronger, and we quote the market as below, per gross ton, f.o.b. cars here:

Old iron axles (light)	$13.50 to $14.00
Old steel axles (light)	12.50 to 13.50
Old iron rails	12.50 to 13.00
No. 1 railroad wrought	11.00 to 11.50
No. 2 railroad wrought	9.50 to 10.00
No. 1 country wrought	7.50 to 8.00
No. 2 country wrought	7.00 to 7.50
No. 1 machinery	9.50 to 10.50
No. 1 steel	8.50 to 9.00
Tram car wheels	8.00 to 8.50
Standard car wheels	9.50 to 10.50
Light cast and stove plate	7.00 to 7.50

St. Louis

ST. LOUIS, MO., August 21, 1911.

Decided firmness has characterized all branches of the iron market the past week and quotations are more stiffly held than for months. The inquiries, especially for coke, are more active, while in finished products there has been a tonnage movement that is very satisfactory. The same has been true of the pig iron movement and the tenor of the whole situation is generally better, except that in old material, though prices are still firmly held and steel continues active, there is a tendency toward quietness for the moment.

Pig Iron.—The determination of pig iron sellers to hold the market up seems to have born fruit, for at the present time there is nothing lower than $10, Birmingham, for No. 2 for immediate delivery to be found here, while last quarter delivery is $10.50. The firmness of the sellers has for the moment put buyers out of the market, but they are expected to come in when they realize that the price has been marked up to stay. No. 2 Northern is quotable at $13 to $13.50, Ironton, but practically nothing is doing. The movement in pig iron for the past week has aggregated more than for a long time, but it has been made up of carload and even less than carload lots, indicating that the buyers are taking on a hand-to-mouth policy pending development of permanency of prices.

THE IRON AND METAL MARKETS

Coke.—An inquiry for 5000 tons of best selected 72-hour Connellsville coke came into the market during the week, but the order has not been placed and there is considerable competition for it, so that it is likely to be placed at a very low price as it is largely wanted for quick delivery. Forward deliveries are well held, however.

Finished Iron and Steel.—The situation continues very satisfactory as regards the aggregate business, the tonnage footing up a good figure for the week as a whole, but it was all taken in small individual lots on both new orders and on contract specifications. The insistence on immediate deliveries continues, especially on structural material, though no large orders have been placed. Specifications on contracts, like new business, have both been of the hand-to-mouth order, but inquiries are reported as coming in which indicate a much more active situation by the first of the coming month. In standard section steel rails the Southwest took 1750 tons during the week in a group of small orders. This was the sum total in that line for the period. In plates, bars, etc., the business for the present is almost altogether on specifications on contracts and the tonnage taken is only fair. Track fastenings are in normal demand and firm in price. The coal companies have taken about 200 tons in light rails for the week, but the lumber companies have done nothing in this line. The fabricators are coming more and more into the market in preparation for stock for winter work. In general the situation is looked upon as much better in tone.

Old Material.—The situation is a little unsettled just now, though this has had no unfavorable effect on quotations as yet. Steel is as strong as ever, and the present quietness is generally regarded as a result of the cleaning up of the railroad material market, all the recent lists having been sold up. The new lists of the end of the month are expected to show renewed activity and possibly higher prices. Dealers have not so much stock in their yards now as they have had. The inquiry for relaying rails has fallen off some, but not enough to lower prices any. Dealers' prices, per gross ton, f.o.b. St. Louis, are as follows:

Old iron rails	$13.00 to $13.50
Old steel rails, rerolling	13.00 to 13.50
Old steel rails, less than three feet	11.50 to 12.00
Relaying rails, standard section, subject to inspection	23.00 to 23.50
Old car wheels	13.00 to 13.50
Heavy melting steel scrap	11.50 to 12.00
Frogs, switches and guards cut apart	11.50 to 12.00

The following prices are per net ton:

Iron fish plates	$11.00 to $11.50
Iron car axles	19.50 to 20.00
Steel car axles	18.50 to 19.00
No. 1 railroad wrought	11.25 to 11.75
No. 2 railroad wrought	10.25 to 10.75
Railway springs	9.75 to 10.25
Locomotive tires, smooth	14.50 to 15.00
No. 1 dealers' forge	8.50 to 9.00
Mixed borings	6.50 to 7.00
No. 1 busheling	9.50 to 10.00
No. 1 boilers, cut to sheets and rings	8.00 to 8.50
No. 1 cast scrap	10.00 to 10.50
Stove plate and light cast scrap	8.00 to 8.50
Railroad malleable	8.50 to 9.00
Agricultural malleable	7.50 to 8.00
Tires and flues	8.50 to 9.00
Railroad sheet and tank scrap	8.50 to 9.00
Railroad grate bars	8.00 to 8.50
Machine shop turnings	7.50 to 8.00

The German Iron Market

An Improvement in Business

BERLIN, August 11, 1911.—The market reports this week are almost unanimous in noting a gradual improvement of business. It is evident that no further price reductions have been made, and even some small advances are mentioned. On the Düsseldorf Exchange several days ago an advance of about 1 mark for most of the Siegerland qualities of pig iron was quoted, which was explained by the completion of the general syndicate. At the same time basic steel bars were quoted at 100 to 105 marks, as against 99 to 105 marks previously. The trade report given out by the exchange contained this summary of the iron situation: "Bars again firmer and calls for delivery of goods in all lines satisfactory." The bar price just noted is said in general trade reports to correspond pretty fairly to actual conditions; but reports differ as to the amount of orders in hand for bars. Some say that the amount of work booked will keep the mills employed for months ahead; others that the mills must have in some cases as much as six weeks' time for filling new orders. At any rate, it appears certain that manufacturers are less urgent in their offerings and are more inclined to keep up prices than they were several weeks ago. Some of the market reviews further note that the mills are looking for an active autumn demand for bars and think that prices can again be lifted slightly. In the Siegerland district, too, bar mills are reported as having more work to do and at somewhat better prices.

No new fact has developed in the negotiations between the Pig Iron Syndicate and the Luxemburg-Lorraine group of independent furnaces. The two parties are still meeting in conference. According to the latest reports the independents have at length shown a more decided disposition to join, and a certain optimism in that direction is noted in the trade and on the stock markets. The pig-iron trade remains quiet, pending the further developments in these negotiations. Some selling of supplementary amounts for 1911 delivery is going on, and some of the reports assert that such sales are at 2 to 3 marks higher than a month ago. The Siegerland furnaces appear to have accumulated moderate stocks during the past few months, but they are now able to dispose of these owing to the increased buying movement caused by the completion of the syndicate.

Pig Iron Output to Increase

The production of pig iron in July reached 1,290,106 tons, comparing with 1,262,997 tons in June and 1,228,316 tons in July, 1910. The rate of daily production, however, has been gradually declining since April, when high-water mark was touched at 42,847 tons per day. The July rate was 1231 tons a day less than that figure. But indications are not lacking that a further increase of production will occur within a reasonable time. Besides the new furnaces recently reported in this correspondence as building or projected, it is now announced that the Differdingen branch of the big Deutsch-Luxemburg Company has just commenced the erection of its ninth furnace, and it is further reported that it is trying to buy land on which to build three more. In the Siegerland region some idle furnaces are to be blown in. Higher production figures may therefore be expected soon. At present the furnaces are operating at 88 per cent. of their normal capacity. The waste and scrap iron market has been improved by the organization of the Pig Iron Syndicate. Although pretty heavy quantities of material are coming upon the market, these are absorbed at steady or rising prices.

Not much business is doing in ores, the furnaces having previously arranged for their requirements to the end of the year, and sales for 1912 delivery not yet having been opened. There is also little new business in foreign ores, but the arrivals from abroad in July were uncommonly heavy. The preliminary trade statistics show imports of 1,312,300 tons, which compares with only 348,600 tons last year.

The business of the Steel Works Union in fully syndicated products continues good, and calls for delivery on order are coming in briskly. The July shipments of steel material for further manufacture, structural forms, rails and ties amounted to 456,000 tons, which was about 8000 tons more than last year, but about 43,000 less than in June, 1911, when many works were hurrying up their deliveries before the close of their business year. Most of the big Union companies are turning out blooms and billets beyond their allotments. They have a heavy demand for their own consumption, and it is mentioned that some of them are even buying extra amounts in the market. It is not believed that the Union will grant the price reduction on steel for the December quarter applied for by the rod and band iron makers. Structural steel work remains brisk and will apparently continue so pretty well into the autumn. The heavy plate mills report that there is no letup in their big run of orders. Manufacturers of light plates have also been able to increase their bookings recently, but there has been no advance in prices. The unsatisfactory conditions hitherto reported as prevailing in the band iron, rod and tubing trades have apparently undergone no change for the better.

Large Exports of Steel

Germany's exports of steel products in July reached unusual proportions. The following are the figures, with the comparative amounts for last year, in metric tons:

	July, 1911.	July, 1910.
Blooms, billets, etc.	80,138	29,691
Beams	67,066	37,111
Steel rails	58,870	45,441
Ties	9,611	7,138
Totals	215,685	119,381

THE IRON AND METAL MARKETS

It is reported that Thyssen & Co., owners of the great establishment, Gewerkschaft Deutscher Kaiser, are negotiating for the purchase of the Lothringer Eisenwerke at Ars on the Moselle River, which operates with a capital of nearly 5,000,000 marks.

Iron, coal and other mining shares listed on the Berlin stock market registered an average advance of nearly 5 points in July. This fact expresses considerable optimism on the part of speculators, in view of the adverse political situation of the month in connection with Germany's Morocco policy. The market yesterday received further encouragement by the announcement of a dividend of 20 per cent. by the Hoesch Works, of Dortmund, one of the strongest of the Westphalian establishments. Its gross profits reached 9,101,000 marks, as against 8,011,000 marks last year.

This week's news from the Belgian market is again good. The steel mills agreed upon an advance of 2.50 francs for plates of basic steel for home delivery, while light beams were marked up 5 francs. The export price for heavy basic steel plates was advanced 1 franc to 96 francs, f.o.b. Antwerp.

Buffalo

BUFFALO, N. Y., August 22, 1911.

Pig Iron.—Extreme dullness has characterized the market in this district for the past week, the sales reported having aggregated only about 8000 tons, mostly foundry grades. No transactions of importance are noted. Large shipments are being made on contracts, however, and it is understood that furnaces in this territory have not been piling any iron the past month or six weeks. An interesting feature is that heavy shipments are being made by lake to Chicago and vicinity from this producing district. Prices remain substantially unchanged since last report, although there is no doubt that in certain instances furnaces can be found that would accept a shade under the prices shown below where very desirable business is offered. We quote as follows, f.o.b. Buffalo, for prompt and last half delivery:

No. 1 X foundry	$13.75 to $14.00
No. 2 X foundry	13.50 to 13.75
No. 2 plain	13.25 to 13.50
No. 3 foundry	13.25 to 13.50
Gray forge	13.25 to 13.50
Malleable	13.75 to 14.25
Basic	13.75 to 14.25
Charcoal	16.50 to 17.50

Finished Iron and Steel.—Considerable activity is noted in small lot buying for immediate requirements, applying to all classes of finished products, a feature of the situation being that consumers commence to press for delivery as soon as an order is placed, indicating the close character of the buying and that the market is bare of stocks. The feeling among sellers is that with this condition existing there must be an increase in buying over the remainder of the year. Two good sized contracts for bars are reported and also 150 tons of reinforcing bars for the Republic Metalware Company's new warehouse, for which the Turner Construction Company has the general contract. As far as can be ascertained none of the mill agencies in this territory is quoting 1.20c., Pittsburgh, for steel bars, 1.25c. being apparently the market price here. Canadian business has been exceedingly good for bars, plates and structural material and specifications on contracts are coming in from Ontario users in large volume. Exceptional activity is noted in fabricated structural material. All fabricating shops in Buffalo are filled with work and prices for fabricated material are somewhat better than for two or three months. The Buffalo Structural Steel Company has received contract for fabrication and erection of the steel for the new New York Central union station at Rochester, about 1500 tons. The larger portion of the steel will be furnished by the Lackawanna Steel Company. The Buffalo Structural Steel Company will also fabricate the 200 tons of steel for the Home Economics Building for Cornell University, Ithaca, for which the Durolithic Company, Buffalo, has the general contract. The American Bridge Company will furnish the fabricated steel, 150 tons, for the Poultry and Husbandry Building at Ithaca, for which the Eastern Concrete Steel Company holds the general contract. Steel for the new postoffice building, Schenectady, for which the Durolithic Company, Buffalo, has the general contract, 100 tons, is to be sublet this week. Chas. F. Ernst's Sons Iron Works, Buffalo, has received contract for fabrication and erection of the steel for the Main Street Realty Company's store and office building, 600 tons. The Lackawanna Steel Company will furnish the steel with the exception of the columns, which will be Bethlehem shapes.

Old Material.—Demand continues fairly active for most grades of scrap, although outside inquiry for turnings and borings, which was quite active the previous week, has fallen off materially. The business transacted has been mainly in small lots; consequently the movement for the week has been of comparatively small tonnage. Prices are practically unchanged from last week. We quote as follows, per gross ton, f.o.b. Buffalo:

Heavy melting steel	$13.00 to $13.75
Low phosphorus steel	16.00 to 16.50
No. 1 railroad wrought	14.00 to 14.50
No. 1 railroad and machinery cast scrap	13.75 to 14.25
Old steel axles	18.50 to 19.00
Old iron axles	22.00 to 22.50
Old car wheels	13.00 to 13.50
Railroad malleable	12.75 to 13.25
Boiler plate	12.50 to 13.00
Locomotive grate bars	11.00 to 11.50
Pipe	9.25 to 9.50
Wrought iron and soft steel turnings	7.25 to 7.70
Clean cast borings	7.00 to 7.50

New York

NEW YORK, August 23, 1911.

Pig Iron.—Inquiry is rather more active and a fair amount of business has been closed in the past week, all of it for delivery this year. Furnaces at Buffalo are receiving inquiry from a good many points, more from New York State than from New England or New Jersey. Few large amounts are under consideration, 200 to 500 tons being the range. One interest in New Jersey is asking for 750 tons of malleable iron. The market for the remainder of this year is close to $14.50 at eastern Pennsylvania furnace and $13.50, Buffalo, which would mean $15.20 in the one case and $15.25 in the other for No. 2 at Jersey City. The amount of iron recently asked for for 1912 delivery would indicate that business will not long be delayed for shipment at least over the first quarter, the question being just how much of an advance over 1911 prices can be secured. Buffalo sellers have talked $14; buyers will naturally stand for $13.75 or somewhat less. There is some variation in prices on current business and it remains to be seen how firmly sellers will hold for some of the advances that have been talked about. Production in Eastern districts is at the lowest point in many months. How much of the idle capacity will blow in on the taking of the first step in the establishment of higher prices is a question of some moment. One feature of the irregularity seen in recent prices is the offering of iron by certain furnaces in districts which they do not ordinarily enter, their idea being to divert a certain amount of their product and keep prices from being disturbed in their natural territory. There are, of course, some possibilities of similar action by sellers whose iron has been displaced, particularly if production increases. We quote as follows for Northern iron, tidewater delivery: No. 1 foundry, $15.50 to $15.75; No. 2 X, $15.25; No. 2 plain, $14.75 to $15. Southern iron is quoted at $15.25 to $15.50 for No. 1 foundry and at $14.75 to $15 for No. 2.

Finished Iron and Steel.—A large amount of structural work has been contracted for in Eastern territory and a fair volume of new projects have come into the market. Two large awards appeared practically overnight—one of 5,000 tons for the New York Central terminal, mainly sub-surface work, to the American Bridge Company, and the other of 1,700 tons for an addition to the Ritz-Carlton Hotel in New York, to Levering & Garrigues. Incidentally, it appears that the Ritz-Carlton Hotel in Philadelphia, 4000 tons, has been taken by the American Bridge Company, which has also received, it is believed, the 12,000 or 14,000 tons, placed in Chicago, for the Kansas City terminal. The 325-ton Scherzer bridge at Elizabeth, N. J., for the Central Railroad of New Jersey has gone to the Phoenix Bridge Company; a 300-ton bridge at Hartford for the New York, New Haven & Hartford Railroad has been awarded to the Pennsylvania Steel Company; a 180-ton Boston & Maine bridge has been taken by the Boston Bridge Works; 340 tons for a new plant at Phillipsburg, N. J., for the A. S. Cameron Steam Pump Works has been placed by the Ingersoll-Rand Company with the McClintic-Marshall Construction Company, and the 300-ton McDonald

THE IRON AND METAL MARKETS

building on East Nineteenth street will be fabricated to hold at 1.30c. New York—Quotations remain: by the Eastern Steel Company. Post & McCord are to fabricate 3000 tons for two New York apartment houses, one of these of late origin. The Boston & Albany Railroad is in the market for 5,000 tons for bridge work; it is understood that the structural work for the Aeolian building is again being refigured; fabrication estimates are being made for an 11-story building in upper New York for the Locomobile Club garage and also for a 600-ton apartment house on Amsterdam avenue, for R. H. McDonald; and a building requiring 200 tons of steel is to be erected for the Montefiore Home in the Bronx. Inquiries are expected shortly for a 5,000-ton structure for a post office in Washington, D. C., D. H. Burnham & Co., architects, and the 4600-ton building in Washington for the Bureau of Engraving and Printing is promising to be an early subject for closure. Fabricating prices are reported a trifle better, but are sensitive and likely to remain so for some time. The American Bridge Company's Eastern shops are working at 90 to 95 per cent. of full capacity with orders sufficient to maintain that rate for a number of months. Bar iron is even stronger than was the case last week. Inquiries are coming in in good volume, and to a considerable extent from the railroads, and prices seem to hold at 1.30c. New York—Quotations remain: Plain structural materials and plates, 1.51c. to 1.56c.; steel bars, 141c. to 1.46c.; bar iron, 130c. to 1.35c.; all New York. Plain material and plates from store, New York, 1.80c. to 1.90c.

Cast Iron Pipe.—Pipe manufacturers report not only a better feeling but more life to trade. The inquiry in the past two weeks has been much better than for the three preceding months. The gradual stiffening in pig iron has apparently caused consumers of pipe to become more interested, especially those who have been waiting in the hope of buying at the bottom. The Warren Foundry & Machine Company has been awarded the contract placed by New Bedford, Mass., for about 1800 tons of 60-in. No important lettings are announced by Eastern cities in the near future. Carload lots of 6 in. continue to be quoted at $21 to $22 per net ton, tidewater.

Old Material.—Dealers have been considerably disappointed by the development of a much weaker feeling in heavy melting steel scrap. Consumers in eastern Pennsylvania have apparently secured a sufficient supply for their near future requirements and are offering considerably lower prices. As a result of this New York dealers have reduced their bids on steel scrap 50 cents per ton or more. Wrought pipe is also considerably weaker, following the withdrawal from the market of a large eastern Pennsylvania consumer who has purchased sufficient to supply his needs for some time. Cast scrap is also lower, with very little buying by founders. The entire old material market is weak and the tendency seems to favor a further decline in prices. Quotations are as follows per gross ton, New York and vicinity:

Old girder and T-rails for melting	$11.00 to $11.25
Heavy melting steel scrap	10.50 to 10.75
Relaying rails	20.50 to 21.00
Re-rolling rails (nominal)	12.25 to 12.50
Standard hammered iron car axles	22.00 to 22.50
Old steel car axles	16.50 to 17.00
No. 1 railroad wrought	13.00 to 13.50
Wrought iron track scrap	11.00 to 11.50
No. 1 yard wrought, long	11.00 to 11.50
No. 1 yard wrought, short	10.00 to 10.50
Light iron	4.25 to 4.75
Cast borings	6.50 to 7.00
Wrought turnings	7.00 to 7.25
Wrought pipe	10.25 to 10.50
Old car wheels	10.50 to 11.00
No. 1 heavy cast, broken up	10.50 to 11.00
Stove plate	8.50 to 9.00
Locomotive grate bars	8.50 to 9.00
Malleable cast	10.50 to 11.00

Pittsburgh

PITTSBURGH, PA., August 23, 1911.—*By Telephone.*

Pig Iron.—The Standard Sanitary Mfg. Company has bought 7000 tons for delivery over the last quarter, consisting of Northern No. 2 and 3 foundry and gray forge, about half of this for delivery at its Allegheny, Pa., works and the remainder for its New Brighton, Pa., works. The No. 2 foundry for New Brighton will come from Valley furnaces and the price was $13.50 at furnace. The No. 2 iron for the Allegheny works will come from a local furnace and from an Eastern furnace, the price being $13.25 per ton at furnace. The gray forge iron will all come from Valley furnaces and the price was $13 at furnace. We also note a sale of 1000 to 1200 tons of Bessemer iron, deliveries being 250 to 300 tons a month commencing September, at $14.85 at Valley furnace, the iron being sold by a dealer; also 200 tons of Bessemer iron for September shipment at $15 at furnace. The market has quieted down in the past week, and there is not much new inquiry. We quote as follows: Bessemer, $15; basic, $13 for early delivery and $13.25 for extended delivery; No. 2 foundry, $13.50 to $13.75; malleable, $13.25 to $13.50; gray forge, $13, all at Valley furnace, the freight rate to Pittsburgh being 90c.

Steel.—Consumers are specifying very freely against contracts for billets and sheet and tin bars, and shipments of steel this month by the Carnegie Steel Company and other large steel concerns will show an increase over July. There is not much new demand, as most consumers are covered by long time contracts. We quote Bessemer and open hearth billets, 4 x 4 in. and up to but not including 10 x 10 in., $21, base, and sheet and tin bars in 30-ft. lengths, $22; 1½-in. billets, $22; forging billets, $26, base, usual extras for sizes and carbons, all prices being f.o.b. Pittsburgh or Youngstown district, with freight to destination added.

(By Mail.)

The volume of new business is holding up remarkably well for the summer months. While there is no contracting ahead by consumers a steady stream of small orders is coming into the mills aggregating a fairly large tonnage. Consumers are still pursuing the policy of buying only to cover actual needs, there being no incentive to anticipate requirements. Prices are not liable to advance in the near future, but on the contrary are weak on nearly all lines of finished iron and steel and are being more or less shaded. This applies particularly to plates, sheets, tin plate and wire products. In addition, the mills are able to make prompt deliveries and the consumer knows he will be able to get his material just when he needs it. The shading in prices that has been going on for some time is a matter of much concern to the heads of selling departments; it is due entirely to the fact that with the heavy increase in capacity in the last two years the country is not consuming more than 65 to 70 per cent. of what the mills can turn out, if that much. The mills, however, are running to-day at a greater rate of capacity than at any time since last March, and the outlook for the rest of this year is regarded as fairly encouraging. The wonder is that prices have not been affected more than they have, when it is remembered that for a considerable period operations were on about a 50 per cent. basis, and only in the last few months have shown a small but steady increase. There has been some buying of pig iron in the past week, one local consumer having taken about 7000 tons of foundry iron, and there are several other inquiries out for good sized lots. There is not much new inquiry for Bessemer or basic, but prices are fairly strong. Specifications against contracts for billets and bars are reported to be more active than in July, and $21, Pittsburgh or Youngstown, on billets and $22 on sheet bars seem to be maintained. Prices on the higher grade of furnace coke are stronger, but there is not much new inquiry. Sales of scrap are light, dealers being inclined to hold their material for higher figures.

Ferromanganese.—A Shenango Valley consumer has bought about 500 tons of foreign 80 per cent. at a price reported to be about $36.50, Baltimore, deliveries running through the first half of 1912. Some importers are asking $37.50 to $38 for next year, but there have been no sales at these prices. We quote foreign 80 per cent. ferro at $36.50 to $37, Baltimore, the higher price for next year shipment.

Ferrosilicon.—In spite of lack of new demand prices are very strong, and sellers continue to ask from $53 to $54, Pittsburgh, for 50 per cent. We quote blast furnace ferrosilicon as follows: 10 per cent., $23; 11 per cent., $24; 12 per cent., $25, f.o.b. cars Ashland and Jisco furnaces.

Muck Bar.—Mills rolling muck bar made from all pig iron are asking about $29, Pittsburgh, for it, but some grades can be bought for $28 to $28.50. The A. M. Byers Company has recently put on a large number of puddling furnaces at its plant at Girard, Ohio, but most of the muck bar there made is for its own use in the manufacture of iron pipe.

Skelp.—No new inquiry in the market. We quote

THE IRON AND METAL MARKETS

Grooved steel skelp, 1.20c.; sheared steel skelp, 1.30c.; grooved iron skelp, 1.45c. to 1.55c., and sheared iron skelp, 1.65c. to 1.70c., all for delivery at consumers' mills in the Pittsburgh district.

Wire Rods.—The quiet condition ruling in the wire trade is reflected in wire rods, which are dull, while specifications against contractors are not coming in at a very satisfactory rate. We quote Bessemer, open hearth and chain rods at $27, Pittsburgh, but the market is none too strong at this figure.

Steel Rails.—No important domestic orders have been placed in the past week, but the Carnegie Steel Company continues to receive some good sized contracts for standard sections for export. This company received new orders and specifications in the past week for upward of 3000 tons of light rails. The Edgar Thomson rail mills continue to operate to about 50 per cent. of capacity. Prices on light rails are as follows: 12-lb., 1.25c.; 16, 20 and 25-lb., 1.21c. to 1.25c.; 30 and 35-lb., 1.20c., and 40 and 45-lb., 1.16c. These prices are f.o.b. at mill, plus freight, and are the minimum of the market in carload lots, small lots being sold at a little higher price. Standard sections are held at 1.25c. per lb. for Bessemer.

Plates.—The leading steel car companies are figuring now on inquiries for about 15,000 cars, but no important contracts have been placed in the past week. The Pennsylvania Lines West have authorized the building of 35 locomotives at Altoona, Pa., consisting of 15 passenger, 10 freight and 10 switching engines. The general demand for plates from boiler shops and other consumers is said to be slightly better. We continue to quote ¼-in. and heavier plates at 1.35c., Pittsburgh, but in some cases 1.30c. is being named on specially desirable orders on both narrow and wide sizes.

Structural Material.—The American Bridge Company has taken the Point Bridge in this city, about 6000 tons, and it is reported that it is now filled up on all work it can turn out in the next six months. A very large amount of structural work is being figured on at present, and some of it will likely be placed in the near future. The Jones & Laughlin Steel Company reports that its fabricating shops are well filled and have recently been running double turn. This company is now prepared to furnish to the trade 24-in. beams in 105, 110 and 115-lb. sections. The 115-lb. beam will have a ¾-in. web and a flange of 8 in., while those of 105 and 110-lb. sections will be fractionally less. We continue to quote beams and channels up to 15-in. at 1.35c., Pittsburgh.

Merchant Steel.—This month promises to make a much better showing than July, the mills reporting that new orders and specifications are a good deal ahead of the first three weeks last month. Prices are being more or less shaded and have been for some time. Regular prices are as follows: Iron finished tire, ¼ x ½ in., and heavier, 1.40c., base; under these sizes, 1.55c.; planished tire, 1.60c.; channel tire, 1.80c., base; toe calk, 1.90c.; flat sleigh shoe, 1.55c.; concave or convex, 1.75c.; cutter shoes, tapered or bent, 2.25c.; spring steel, 2c.; machinery steel, smooth finish, 1.90c.

Hoops and Bands.—New orders so far this month have shown a considerable increase over the same period in July, and specifications against contracts are also coming in at a better rate. We quote steel hoops at 1.40c. and bands at 1.35c., extras on the latter as per the steel bar card.

Sheets.—Leading mills report that the present situation in the sheet trade is fairly satisfactory as far as demand and specifications are concerned, but not in the matter of prices. When the reduction in prices of sheets was made early in June it was believed it was heavy enough to prevent any further cutting, but this has not been the case, as prices have been more or less shaded since then. At present this amounts to about $1 per ton in most cases, but recently some mills have made concessions of $2 per ton. Jobbers are placing fairly heavy orders, and the leading sheet mills as a whole are operating from 70 to 75 per cent. of capacity. The higher prices ruling for spelter have made prices on galvanized sheets a little stronger. The full schedule of regular prices on black, galvanized and roofing sheets is printed on a previous page.

Tin Plate.—The demand for tin plate is dull now, as it always is at this season, but specifications against contracts are coming in nicely and the mills are running at present to about 75 to 80 per cent. of capacity, with good prospects of maintaining this rate of operations until October 1 or later. In the last week or so some weakness in prices has developed, and occasionally tin plate is being shaded about 10c. per box. We continue to quote 100-lb. cokes at $3.70 per base box, f.o.b. Pittsburgh.

Bars.—Most of the large consumers of both iron and steel bars have covered their requirements for some time ahead, and as a result the bar mills are not entering as much new business now as they were two or three weeks ago. However, specifications against these contracts are coming in quite freely and shipments of steel bars this month by the mills promise to be heavier than in July. There is still some weakness in prices of steel bars, and in some cases orders are being taken at 1.20c., but it is believed that this figure is bottom of the market. The new demand for iron bars is rather quiet and specifying against contracts is light. We continue to quote steel bars at 1.20c. and iron bars at 1.25c. to 1.30c., Pittsburgh.

Rivets.—New orders are fairly active and specifications so far this month are heavier than in the same period in July. Prices are still being shaded on good orders. We continue to quote structural rivets at 1.70c. to 1.75c. and boiler rivets at 1.80c. to 1.85c., but in very exceptional cases and for desirable business these prices are slightly shaded.

Wire Products.—The new demand for wire and wire nails continues to be only for small lots to cover actual needs and to allow jobbers to maintain a fair assortment of sizes in stock. Fall trade should open up early next month. Prices on both wire and nails are still being shaded about $1 per ton. Regular prices are as follows: Galvanized barb wire, $2 per 100 lb.; painted, $1.70; annealed fence wire, $1.50; galvanized, $1.80; wire nails, $1.70, and cut nails, $1.60, all f.o.b. Pittsburgh, with full weight added to point of delivery.

Spelter.—Prices are not at strong as a week ago. We quote prime grades of Western at 5.97½c., East St. Louis, equal to 6.10c., Pittsburgh. Futures are quoted at slightly lower prices.

Railroad Spikes.—The new demand is quiet and mostly for small lots. We quote spikes at $1.50 to $1.55 per 100 lb. for base sizes, f.o.b. Pittsburgh.

Shafting.—Conditions in this trade are very unsatisfactory, the new demand being dull, while prices are more or less demoralized. For ordinary lots, shafting is being quoted at 60 and 7½ to 60 and 10 per cent. off. In some cases slightly lower discounts are named on desirable orders.

Merchant Pipe.—The Medina Gas & Fuel Company, Lima, Ohio, is expected to place an order this week for about 63 miles of 10-in. line pipe, to be used for taking gas into Mansfield, Ohio. This is about the only large line in the market at present, but several gas and oil projects are being figured on, that will take a very heavy tonnage of pipe if they go through. The general demand for merchant pipe is keeping up very well for the summer months, and the mills are entering more actual orders than usual at this season. The leading mills are estimated to be running at 65 to 70 per cent. of capacity. Prices on both iron and steel pipe are reported as being fairly well maintained, and regular discounts are printed on a previous page.

Boiler Tubes.—The new demand for railroad tubes is reported to be a little better, but merchant tubes are dull and orders for only small lots are being placed. Prices on boiler tubes are very low, and regular discounts continue to be shaded.

Coke.—Several of the Valley blast furnaces that are not covered on their supply of furnace coke for the remainder of the year are sounding the market, but have not decided whether they will place contracts or buy from month to month, this depending on the prices that are named on their inquiries. The best grades of furnace coke seem to be a little firmer, and we note sales of about 5000 tons of standard Connellsville for prompt shipment at $1.50 per net ton at oven. The output in the upper and lower Connellsville regions last week was 304,044 tons, an increase of about 14,000 tons over the previous week.

Iron and Steel Scrap.—Not much scrap is being sold by dealers to consumers, as the latter are not satisfied that present prices can be maintained and are staying out of the market. Stocks held by consumers are fairly heavy and two leading users have asked that shipments be suspended for 10 days, until they can

THE IRON AND METAL MARKETS

reduce their stocks. Dealers are firm in their ideas as to prices, and are not forcing their scrap on the market. We note sales of about 2000 tons of heavy melting scrap at $13.25 delivered to buyer's mills, and also a sale of about 1000 tons of low phosphorus melting scrap at slightly less than $16, delivered. Dealers now quote as follows, per gross ton, f.o.b. Pittsburgh, unless otherwise noted:

Heavy steel scrap, Steubenville, Follansbee, Sharon, Monessen and Pittsburgh delivery	$13.25 to $13.50
No. 1 foundry cast	13.25 to 13.50
No. 2 foundry cast	12.75 to 13.00
Bundled sheet scrap, f.o.b. consumers' mill, Pittsburgh district	11.75 to 12.00
Rerolling rails, Newark and Cambridge, Ohio, Cumberland, Md., and Franklin, Pa.	13.50 to 13.75
No. 1 railroad malleable stock	12.75 to 13.00
Grate bars	10.75 to 11.00
Low phosphorus melting stock	16.00
Iron car axles	23.00 to 23.50
Steel car axles	17.50 to 18.00
Locomotive axles	23.00
No. 1 busheling scrap	12.00 to 12.25
No. 2 busheling scrap	8.50 to 8.75
Old car wheels	13.00 to 13.25
Sheet bar crop ends	15.25 to 15.50
Cast iron borings	9.50 to 9.65
*Machine shop turnings	9.75 to 9.85
Old iron rails	15.50 to 15.75
No. 1 wrought scrap	13.50 to 14.00
Heavy steel axle turnings	10.00 to 10.25
Stove plate	10.50 to 10.75

* These prices are f.o.b. cars at consumers' mills in the Pittsburgh district.

Cincinnati

CINCINNATI, OHIO, August 22, 1911.—(*By Telegraph.*)

Pig Iron.—Due to the slack demand, the recent advance in Southern foundry iron prices has been considered in certain quarters as being a little premature. However, well authenticated reports now coming in would indicate that practically every producer in the South has fallen into line and that ten-dollar iron will soon be a thing of the past. A few furnaces with favorable freight differentials are probably able to book business at $10, Birmingham basis, for prompt shipment, but it is not believed that they will continue this policy very much longer. Among recent sales are 500 tons of Southern foundry iron, running from 2 to 2.5 silicon to a nearby melter at $10 for last half shipment. A consumer in northern Ohio took 300 tons of No. 2 foundry at $10.25, August-December delivery. For the same delivery, St. Louis territory furnished a customer for about 700 tons of strictly graded No. 2 foundry, taken at $10.50, Birmingham. Inquiries include one from a Kentucky melter for 500 to 1,000 tons of Southern No. 2 foundry for September-March movement. Indiana manufacturers are asking for miscellaneous lots of 100 to 300 tons. A Michigan manufacturer wants 2500 tons of Northern foundry and high silicon iron and another in the same district has put out an inquiry for 800 tons of low phosporous and Bessemer, all for last quarter delivery. Northern foundry continues slow, and the largest late sale reported is for 1,500 tons to a Southern Ohio consumer for this year's shipment. Malleable shows some improvement; a West Virginia concern contracted for 500 tons to be shipped during the fourth quarter and there are also several inquiries before the trade. Both Northern No. 2 foundry and malleable are quoted around $13.00 to $13.25 Ironton, for any delivery this year, and it is reported that a few producers are willing to book first quarter orders at $13.50, but the regular open quotations for next year's business do not run below $14.00. Both Northern and Southern basic are inactive. Based on freight rates at $3.25 from Birmingham and $1.20 from Ironton, we quote, f.o.b. Cincinnati, as follows:

Southern coke, No. 1 foundry and 1 soft	$14.00 to $14.25
Southern coke, No. 2 foundry and 2 soft	13.50 to 13.75
Southern coke, No. 3 foundry	13.00 to 13.25
Southern coke, No. 4 foundry	12.75 to 13.00
Southern gray forge	12.75 to 13.00
Ohio silvery, 8 per cent. silicon	16.65 to 17.00
Lake Superior coke, No. 1	14.70 to 14.95
Lake Superior coke, No. 2	14.20 to 14.45
Lake Superior coke, No. 3	13.70 to 13.95
Basse, Northern	14.20 to 14.45
Standard Southern car wheel	25.50 to 25.75
Lake Superior car wheel	19.00

(By Mail.)

Coke.—So far as this immediate territory is concerned there is no demand for coke with the exception of small lots of foundry coke for prompt shipment. The curtailment in production has helped to hold up prices in the Wise County and Pocahontas fields while the increased consumption in the Connellsville district has also aided in keeping up quotations there in spite of the fact that a number of dormant ovens have been lighted and are now in operation. For prompt shipment we quote furnace coke in all three fields around $1.55 to $1.65 per net ton at oven, with an additional 15c. to 25c. per ton added for contract business. Foundry coke remains at about $2 per net ton at oven for prompt movement to $2.15 to $2.35 for shipment during the next six months, although there are a few brands held at $2.40 for any future delivery.

Finished Material.—Steel bars continue to show improvement in demand, but it is conceded that some desirable business has lately been taken in this territory around 1.20c., mill; the ruling price, however, is 1.25c., Pittsburgh basis. Structural material is moving about the same as recent reports indicated, and, while it is rather a hand-to-mouth business just now, there are a number of large contracts to be let in this territory within the next few months that will probably bring out some spirited bidding. Local warehouse prices on steel bars and structural material are 1.70c. and 1.80c. respectively.

Old Material.—There is an apparent lull in the scrap market. Scrap melters have been holding off making any large contracts and are buying mainly for immediate requirements. Dealers generally believe that the demand is on the mend but present conditions do not warrant any advance in current quotations. The approximate prices paid by buyers for delivery in their yards, southern Ohio and Cincinnati, are as follows:

No. 1 railroad wrought, net ton	$11.50 to $11.00
Casting borings, net ton	4.50 to 5.00
Steel turnings, net ton	5.50 to 6.00
No. 1 cast scrap, net ton	9.50 to 10.00
Burnt scrap, net ton	6.50 to 7.00
Old iron axles, net ton	16.50 to 17.00
Bundled sheet scrap, gross ton	7.25 to 8.25
Old iron rails, gross ton	13.50 to 14.00
Relaying rails, 50 lb. and up, gross ton	21.00 to 22.00
Old car wheels, gross ton	10.25 to 11.00
Heavy melting sheet scrap, gross ton	10.00 to 10.50

Metal Market

NEW YORK, August 23, 1911.

The Week's Prices

Cents Per Pound for Early Delivery.

	Copper, New York.	Electro-	Tin.	Lead.—New	Lead.—St.	Spelter.—New	Spelter.—St.
Aug.	Lake.	lytic.	New York.	York.	Louis.	York.	Louis.
17	12.75	12.62½	46.00	4.50	4.45	6.15	5.95
18	12.75	12.62½	46.00	4.50	4.45	6.15	5.95
19	12.75	12.50	.....	4.50	4.45	6.15	6.00
21	12.75	12.50	46.00	4.50	4.45	6.10	5.95
22	12.75	12.50	45.00	4.50	4.45	6.10	5.95
23	12.75	12.50	45.00	4.50	4.45	6.10	5.95

The feature of the market is the relief in sight for pig tin. Stocks in hand are greatly depleted and early in the week pig tin reached 46c., but prices have eased off. Copper is quiet and quotations are nominal with no takers. Spelter is easy. Lead is dull.

Copper.—The copper market is extremely quiet. There seems to be a deadlock between buyers and sellers. Large sales of electrolytic are nevertheless rumored to have been made by important interests at concessions. Prices are largely nominal, with Lake quoted at 12.75c. and electrolytic at 12.50c., cash New York, for September and October delivery. Spot copper is scarce. The London market is quiet, and this morning spot copper was offered at £56 8s. 9d. and futures at £57 3s. 9d. The exports so far this month have amounted to 20,627 tons.

Pig Tin.—There is a change in the sentiment and condition of the pig tin situation. It is rumored that large shipments are on the way from Continental ports in steamers unnamed, and this has had its effect on the market. Early in the week consumers who found themselves short of stocks were obliged to pay premiums, but with the report of approaching arrivals prices have eased off. Pig tin is now quoted at 45c. and is expected to go lower. There is little if any tin in the hands of dealers, as attempts to buy even small stocks have been unsuccessful. In London this morning the market was quiet with spot offered at £190 and futures at £180 5s. The arrivals of tin so far this month were 2496 tons and 1310 tons are reported to be afloat.

Tin Plates.—The demand for tin plates continues fair in small quantities for varied purposes. The price

THE IRON AND METAL MARKETS

is unchanged at $3.94 for 100-lb. coke plates. The quotation on foreign tin plates is unchanged at 13s. 9d., Swansea, Wales.

Lead.—Lead is dull and the recent manipulation is believed to have been abandoned. The leading interest is still asking 4.50c., New York. Outside sellers are asking 4.42½c., St. Louis, and there is every reason to believe that even this price is being shaded.

Spelter.—The spelter market continues dull and uninteresting. What demand there is seems to be all for quick shipments. Dealers are asking 6.10c., New York, and 5.95c., St. Louis.

Antimony.—The antimony market is still feeling the effects of the London dock strike and stocks in hand are scarce. Prices are expected to recede as soon as shipments are received. Hallett's is offered at 7.75c and Cookson's is firm at 8.50c.

Old Metals.—The demand is slow. Dealers' selling prices, New York, are nominally unchanged, as follows:

Copper, heavy cut and crucible	$12.00 to $12.25
Copper, heavy and wire	11.50 to 11.75
Copper, light and bottoms	11.00 to 11.00
Brass, heavy	8.00 to 8.25
Brass, light	6.25 to 7.00
Heavy machine composition	10.50 to 10.75
Composition turnings	8.75 to 9.00
Clean brass turnings	8.00 to 8.25
Lead, heavy	4.00 to 4.25
Lead, tea	3.75 to 4.00
Zinc, scrap	4.25 to 4.30

Chicago

August 21.—The scarcity of tin, due to the recent situation abroad, has occasioned an advance in the local market in keeping with the extreme conditions. Spelter also is bringing a slightly higher price. The copper market has shown only moderate activity and a tendency toward weakness has been felt. We have revised our quotations for Chicago delivery as follows: Casting copper, 12.65c.; Lake, 13c., in carloads, for prompt shipment: small lots, ¼c. to ⅜c. higher; pig tin, carloads, 40½c.; small lots, 48½c.; lead, desilverized, 4.45c. to 4.50c. for 50-ton lots; corroding, 4.72½c. to 4.75c. for 50-ton lots; in carloads, 2½c. per 100 lb. higher; spelter, 6.10 to 6.15c.; Cookson's antimony, 9¼c., and other grades, 8½c. to 8¾c., in small lots; sheet zinc is $8 f.o.b. La Salle, in carloads of 600-lb. casks. On old metals we quote for less than carload lots: Copper wire, crucible shapes, 10¾c.; copper bottoms, 9½c.; copper clips, 10¼c.; red brass, 9½c.; yellow brass, 7½c.; lead pipe, 4c.; zinc, 5c.; pewter, No. 1, 26c.; tinfoil, 33c; block tin pipe, 37c.

St. Louis

August 21.—The week has shown considerable activity in tin, which is up to 46.85c. to-day, but copper is a shade off, with Lake quoted at 13.05c. and electrolytic at 12.95c. The latter situation is true in antimony, Cookson's being quoted at 8.72½c., a drop of an eighth; there has been a good business, however, so far as volume goes. Lead is quotable at present in this market at 4.45c. to 4.47½c., while spelter is still well held, sellers asking 6.10c., though the market quotation is put at 6.05c. In the Joplin mining district blende prices the past week have ranged from $44 to $45 per ton on the 60 per cent. zinc content basis, with choice lots commanding $48 per ton, the highest of the year. The market has been the strongest for eight months and very little ore brought less than $44. Activity is increasing in the mining district as a result of the higher prices and many mines have been unwatered, while old ones are being overhauled. The calamine production injured by the recent heavy rains flooding the mines is back to normal, but the price is stronger at $22 to $24 per ton on a 40 per cent. assay basis for metallic contents; choice lots have sold as high as $30, the highest figure paid for months. The surplus in all bins has been virtually cleaned up, thus strengthening the situation. Lead is firm at $60 to $62 per ton for the ore. Prices of old metals follow: Light brass, 5c.; heavy brass and light copper, 8c.; heavy copper and copper wire, 9c.; zinc, 3c.; lead, 3¼c.; pewter, 20c.; tinfoil, 29c.; tea lead, 3c.

Iron and Industrial Stocks

New York, August 23, 1911.

The past few days have witnessed rapid changes. Market sentiment became buoyant with the Presidential veto of tariff bills, and prices rose on Friday and Saturday only to be pulled down again when hopes of better conditions were chilled by the announcement of drastic retrenchment by important Western railroads. The range of prices on active iron and industrial stocks from Wednesday of last week to Tuesday of this week was as follows:

Allis-Chalm., com...	6¾ - 6½	Pressed Steel, com..	31⅞ - 32¼
Allis-Chalm., pref...	19½ - [illegible]	Pressed Steel, pref..	98 - 99
Beth. Steel, com	[illegible]	Railway Spring, com.	31 - 32½
Beth. Steel, pref	[illegible]	Railway Spring, pref.	101½
Can. com	[illegible]	Republic, com	25 - 26⅞
Can. pref	85¼ - 85½	Republic, pref	90¼ - 91⅞
Car & Fdry., com...	50⅝ - 51⅝	Pipe, com	13 - 13¼
Car & Fdry., pref...	116 - 116½	Pipe, pref	46¼ - 49⅝
Steel Foundries	35 - 36	U. S. Steel, com	70¼ - 73⅝
Colorado Fuel	29 - 30	U. S. Steel, pref	115⅝ - 116⅜
General Electric	153 - 154	Westinghouse, Elec..	64⅜ - 66¼
Gt. N. Ore Certs.	40 - 45	Am. Ship, com	54½
Int. Harvester, com.	124 - 131	Chic. Pneu. Tool	46⅝ - 47¾
Int. Harvester, pref.	121½-123¼	Cambria Steel	44⅜ - 45
Int. Pump, com	35 - 36	Lake Sup. Corp.	23 - 25
Int. Pump, pref	86¾	Crucible Steel, com..	12 - 12¼
Locomotive, com	36 - 38	Crucible Steel, pref..	80½ - 81½
Locomotive, pref	107	Harb. W. Ref., com..	48
Nat. Enam. & St., com	16 - 17	Harb. W. Ref., pref..	99
Nat. Enam. & St., pref	93 - 96		

William Salomon & Co., New York and Chicago, have recently sold at par and interest, the unsold portion of $1,000,000 6 per cent. serial gold Iroquois Iron Company debentures, dated December 1, 1910, due in annual installments of $100,000 from June 1, 1912 to June 1, 1921, but callable at 105 and interest, either as entire issue or any part (by lot), and after 1911 for sinking fund on any interest date on six weeks' notice. The management of the company is practically controlled by Rogers, Brown & Co. interests.

Dividends Declared

The General Electric Company, regular quarterly of 2 per cent., payable October 14.

Freight Rate Reductions from Buffalo.—The New York Central Railroad Company will establish new rules, effective September 4, which will permit the fabrication in transit of structural iron and steel in carloads at Syracuse. The stop-off privilege for fabrication—which includes cutting, punching, riveting and inspection—is to be charged for at the rate of 1½ cents per 100 lb. in addition to the through rate and will apply on traffic destined for Eastern points, with the exception of stations on the New York, New Haven & Hartford Railroad. The New York Central has also announced that after September 7 it will make numerous reductions in rates on iron and steel articles in carload lots and less on its Buffalo, Western, Rochester, Mohawk, and Pennsylvania divisions. The South Buffalo Railroad, which is the Lackawanna Steel Company's terminal and transfer road, will, in conjunction with the Lehigh Valley, Pennsylvania, Lackawanna and West Shore railroads, make reductions effective September 7 on steel rails from Lackawanna City (South Buffalo)—which is the Lackawanna Steel Company's shipping and terminal station—to points on the roads named.

The Imataca Iron Deposit in Venezuela.—A dispatch from Caracas says that the Venezuelan Government has signed a contract with a representative of the Canadian-Venezuelan Ore Company, of Montreal, ceding to the company the Imataca iron mine, which was part of the famous Fitzgerald concession. The Montreal company, it is stated, will develop the mine for operation on a large scale. The contract with the Government requires the company to deepen the bar of the Orinoco River and build a lighthouse. The Orinoco company, which formerly held the Fitzgerald concession, forfeited it in 1909 under the protocol signed by the late William I. Buchanan, then special American Commissioner in Venezuela.

The Keystone Bronze & Brass Company, New Brighton, Pa., has let a contract to the Penn Bridge Company, Beaver Falls, Pa., for the erection of a structural steel building addition, 32 x 50 ft., which will be used for the new furnace system that will be installed. It will increase the capacity of the plant from 150,000 to 300,000 lb. per month. A number of Schwartz down-draft furnaces have been ordered for melting bronze and brass, fuel oil being used. The company makes a specialty of railroad and rolling mill castings. An order has been received from the Pressed Steel Car Company for 175,000 lb. of railroad journal castings to be used for cars being built for the Southern Pacific Railroad Company.

Trade Publications

Exhausters.—The Green Fuel Economizer Company, Matteawan, N. Y. Bulletin No. 136. Size, 6 x 9 in.; pages, 20. Describes the low and standard speed types of planing mill exhausters built by this company, the former being a recent improvement designed to secure economy of power in operation. This has been secured by the substitution of a larger and slower running fan which while passing as great a volume of air as the high speed fan formerly used will consume less power and give the required volume and suction for picking up materials at the intake. Other advantages claimed for the slow speed fan which is of the cone type with a large number of blades are less wear and tear and vibration.

Smokeless Furnace.—The Model Stoker Company, Dayton, Ohio. Booklet illustrates and describes the Model automatic smokeless furnace, the special advantages of which are self cleaning, complete combustion, small power consumption, accessibility and durability.

Rock Crushing Machinery.—Allis-Chalmers Company, Milwaukee, Wis. Bulletin No. 1411. Gives general description and specifications for the various types of machinery built by this company which enter into the construction of rock crushing plants. These include rock crushers, elevators, belt conveyors, bin gates, cars and hoists. Illustrations of these different machines are given and a number of line engravings, showing various installations built by this company complete the bulletin.

Packings.—The Mechanical Rubber Company, Cleveland, Ohio. Section D of its loose leaf catalogue. Devoted to the various types of packings which this company is prepared to furnish. These include coil, ring and spiral packings in various sizes and brands, high and low pressure diagonal packing, throttle and valve stem packing, hydraulic and steam packings and various types of sheet packings and gasket. The catalogue is arranged on the loose leaf principle and illustrations of the different brands are given on the upper portion of the leaves while a brief list of the uses to which it may be put and the different sizes in which it is made occupy the remainder. Tables giving the temperatures of dry or moist steam, water heads and equivalent pressures and areas and circumferences of circles complete the catalogue.

Soot Cleaner.—G. L. Simonds & Co., 801 Steinway Building, Chicago, Ill. Catalogue. Size, 6 x 9 in.; pages, 32. Calls attention to the Vulcan soot cleaner and shows how the Vulcan system can be applied to water tube and return tubular boilers, economizers, superheaters and combustion chambers. The question of keeping boiler tubes clean is discussed and the advantages of using this system which is a stationary piping one operated by valves outside the boiler setting are pointed out.

Rolled Shapes for Metal Trim.—United States Metal Products Company, 203 West Fortieth street, New York, N.Y., which is a consolidation of the John W. Rapp Company and the J. F. Blanchard Company. Loose-leaf album of 10½ x 13½-in. pages, known as catalogue No. 105, giving full size dimensioned profiles of the bars and moldings going into the construction of hollow steel and Kalamein metal doors, windows, partitions and trim. The products are cold rolled and may be obtained with imitative wood finishes. The numerous drawings are calculated to be of direct practical value to the engineer and architect and the loose-leaf feature allows for ready insertion of drawings of new shapes. The catalogue is the design and compilation of C. Dickens Sternfels, advertising manager of the company.

Electric Control Apparatus.—Cutler-Hammer Mfg. Company, Milwaukee, Wis. Pamphlet entitled "Cutler-Hammer Control in New York." Size, 5 x 8¼ in.; pages, 48. Is an attempt to illustrate and describe some interesting applications of electric power and ingenious forms of electric control in New York City. This has been done by showing the various buildings in which this company's apparatus has been installed on the left-hand pages, while the facing ones contain a brief description of the building and the purposes to which the apparatus is put. Among the buildings shown is the Metropolitan Life Building, in the tower of which is a large clock that has the chimes controlled by solenoids. Other applications are the use of the Kohler control system for printing presses, the use of the Cutler-Hammer dimmers in some of the large theatres, push-button fan control in the Custom House and a number of other special but nevertheless interesting applications of the company's controllers and motors in the different hotels and office buildings of the city.

Heat Regulator.—Electric Heat & Regulator Company, 705 Collins Building, Minneapolis, Minn. Folder. Describes and illustrates the Minneapolis heat regulator, a new type which is controlled by a thermostat. If desired a time attachment can be furnished that enables the temperature control point to be changed at any predetermined hour. The illustrations show the regulator with the time attachment, the motor used and reproductions of records of the temperature in houses where the device was and was not employed.

Rock and Hammer Drills.—The Sullivan Machinery Company, 112 South Michigan avenue, Chicago, Ill. Three bulletins. No. 66A describes the standard Sullivan reciprocating type of rock drill used for excavating rock under ordinary conditions. These drills are made in two types with differential and tappet valves. Both drills are illustrated together with the two valves and sectional views of both are also included. No. 66B lists the accessories required for rock drilling work, such as drill mountings, steel, hose and various kinds of tools. All of these are briefly described and the text is supplemented by half-tone engravings and dimension and specification tables. No. 66C treats of the Sullivan hammer drills for mining and construction work. The limits of the use of hammer drills, their advantages, development and action are first discussed, followed by detailed descriptions of the air-feed stoping drill and two types of hand hammer drills. Both of these descriptions are supplemented by a line and half-tone engravings showing the drills in use and giving details of their construction.

Turbine Generators and Steam Flow Meters. General Electric Company, Schenectady, N. Y. Two bulletins. No. 4836 relates to a steam flow meter which is made in two styles, one for recording and the other for merely indicating the rate of flow. No. 4845 contains illustrations and descriptive matter in considerable detail of the Curtis turbine-generator sets which are made in varying capacities from 100 to 1000 kw. These turbines are designed to operate at a speed of 3600 r. p. m., which is the maximum speed permissible for use with the 60-cycle alternating current generators employed. The construction of the generating set is described at length, and there are a number of views showing the units installed in various types of industrial plants.

Fans.—B. F. Sturtevant Company, Hyde Park, Mass. Catalogue No. 180. Size, 6½ x 9 in.; pages, 92. Describes in detail the multivane volume fans built by this company. An effort has been made in compiling this catalogue to include such information as would aid prospective purchasers in securing the type and size of fan best suited to meet their requirements. The description of the design and the construction briefly gives the reasons for the high efficiency and great durability secured with this fan while engravings supplementing the text suggest a few of the many combinations possible where direct-connected engines, motors and steam turbines are employed to furnish the power required. Eighteen pages of tables of installation data give the pressure, volume and horse power for a wide range of conditions as well as the proper type and size of engine, motor or pulley for driving the fan. These tables have been compiled from the results of a number of tests. The last 32 pages of the catalogue are devoted to dimension tables for all sizes and types of standard fans which should be of great assistance in making preliminary layouts of apparatus.

Saw Grinding Wheels.—Norton Company, Worcester, Mass. Pamphlet. Contains suggestions on the selection and use of grinding wheels for saw and knife sharpening. The shapes of wheels adapted to gumming saws, grinding molder cutters, etc., and those furnished for knife grinding machines are all illustrated. In the case of the wheels for knife grinders the names of the different machines are given together with the various dimensions of each type.

Coal Crushers.—Jeffrey Mfg. Company, Columbus, Ohio. Bulletin No. 41. Describes the Jeffrey single roll crusher for reducing large lump and run-of-mine coal to stoker size in a single operation. Some of the points emphasized are accessibility of the crusher roll, the toothed segments of the roll face, and a safety device for action when an undue stress comes on the machine from any cause. A rule for capacity of crushers and tables of speed, capacity and horse power are given.

Railroad Electrification. General Electric Company, Schenectady, N. Y. Two bulletins. The first, No. 4834, is a reprint of an article describing the electrical equipment of the Detroit River Tunnel which appeared in the Electric Railway Journal. Views of the equipment are given together with line drawings showing the location and profile of the tunnel, dimensions of the locomotives and wiring diagrams. The other bulletin, No. 4851, which is entitled "Electricity in the Service of Steam Railroads," treats of the various electrified railroads for which this company has furnished apparatus and include the New York Central electrification and the Cascade Tunnel of the Great Northern Railroad. Space is also given to the gas-electric motor cars now in use as well as the electrical equipment of steam railroad shops, signals with generating sets and mercury arc rectifiers for charging the batteries, train lighting steam turbines and the illumination of railroad stations. All of these applications are illustrated and briefly described.

Forging Presses.—The United Engineering & Foundry Company, Pittsburgh, Pa., Mailing card. Deals with the high-speed steam-hydraulic forging press built by this company. The engravings show the presses in use in America and India as illustrated in *The Iron Age*, January 26, 1911.

Motor Drive.—General Electric Company, Schenectady, N. Y. Two bulletins. No. 4833 describes a number of installations of motor-driven gold dredges. The illustrations include views of the dredges as well as the motors and their applications. No. 4835 illustrates and describes various types of motor-driven pumps designed for different purposes, including those for mine use, sewage disposal plants and dry docks, irrigation projects and house water supply. The various combinations include induction and direct current motors for driving centrifugal, turbine, mine, Underwriters' and sinking pumps. Tables giving the theoretical horsepower required to raise the water to various hights, the friction of water in pipes and elbows, and data on various points in connection with pumping installations complete the bulletin.

Valves.—The Kelly & Jones Company, Greensburg, Pa. Mailing card. Relates to the K. J. iron body valves which are made in the globe, angle, cross, safety, swing-check, disk and gate types with either screwed or flanged ends.

Obituary

Franklin B. Shuster

Franklin B. Shuster, president and treasurer of the F. B. Shuster Company, New Haven, Conn., died at his home in that city, August 14. He was born at New Haven, May 10, 1866. After learning the trade of a machinist with John Adt & Son, he became foreman of the machine and tool department of the New Haven Clock Company. Later he was for about six years with the Wilmot & Hobbs Mfg. Company, now the American Tube & Stamping Works, of Bridgeport, Conn., in charge of the machine and tool designing departments.

On the death of John Adt in 1895, Mr. Shuster purchased the business, Mr. Adt's son having died some years previous, and in 1898 the F. B. Shuster Company was incorporated. The business was established in 1866 by John Adt, who invented and manufactured the Automatic wire straighteners and cutters and riveting machines which are now being turned out in large numbers and improved forms by the company. Mr. Shuster invented and patented many new machines and tools and increased the business so that these machines are shipped to all parts of the world.



FRANKLIN B. SHUSTER.

Mr. Shuster was a genial, courteous gentleman, winning friends wherever he went. He was a member of the National Association of Manufacturers, and of the Quinnipiack Club and other local organizations. He leaves a widow, a son and a daughter.

HIRAM OLDERSHAW, New Britain, Conn., secretary of the Vulcan Iron Works of that city, died August 18, aged 65 years. He was born in Nottingham, England, and was brought to this country in childhood. He went to New Britain as a young man, and began his connection with the Vulcan Iron Works, to which he devoted his business life. He was first employed as superintendent, and while holding the office of secretary had the general managership of the business. He leaves a widow, a daughter and two sons, one of whom, Arthur H. Oldershaw, is treasurer of the same company.

OMAR N. STEELE, manager of the Cleveland yards of the American Shipbuilding Company, died August 17, aged 68 years. He was an engineer on the Great Lakes for 20 years and brought out the first iron boat built on the Lakes. He became associated with Robert Wallace of the Cleveland Shipbuilding Company, now a part of the American Shipbuilding Company, about 27 years ago.

WALTER I. WEED, treasurer of Weed & Co., wholesale and retail dealers in hardware and iron and steel, Buffalo, N. Y., died in that city August 17 of heart failure, aged 34 years. He was the son of Hobart Weed, the president of the company, and was one of the most prominent men in the hardware trade in western New York.

JOHN H. OSBORNE, a brother of the late David M. Osborne and with him one of the founders of the Osborne works, now the property of the International Harvester Company, at Auburn, N. Y., died August 16, aged 79 years. He retired from business on the transfer of the works at Auburn to the International Harvester Company.

THOMAS C. RICHARDS, Winsted, Conn., president, treasurer and the founder of the T. C. Richards Hardware Company, of that place, died August 17, aged 76 years. The business was established in New York City in 1863 and was moved to Winsted in 1874.

Proposed Iron and Steel Tariff Changes

President Taft sent to the House on Friday, August 18, a message vetoing the bill which puts fencing wire, cotton ties, certain kinds of lumber, agricultural implements, meat, flour and several other commodities on the free list. One of the reasons given for the veto was elaborated at length in the President's message of the day preceding, vetoing the bill reducing the wool tariff. The President argues that the Tariff Board should first make its report on the schedules involved in these two bills and points out that the country will need to wait but three months to receive the report of this board. Referring to the provisions of the free list bill the President says that it would inevitably lead to the greatest uncertainty, imposing a heavy burden on the administrative branch of government, in addition to creating "disastrous uncertainty in commercial circles and a burdensome amount of litigation." The President finds the language so ambiguous that it is impracticable for the Treasury Department to give an exact estimate as to the diminution in revenue which will follow its passage. Both the wool tariff bill and the free list bill failed to pass over the President's veto.

On Thursday, August 17, the Senate passed the House cotton tariff revision bill as amended by a resolution of Senator Cummins of Iowa, reducing the tariff on certain steel products. The Cummins amendment provides for a reduction in the duty on structural steel from ½ cent to ¼ cent per lb. whether plain or fitted for use. It also reduces other duties in the steel and iron schedule by 40 per cent. of their present amount. The amendment reduces the duty on machines used in cotton fabric production to 30 per cent. and adds coal to the Canadian reciprocity list under certain conditions. On Monday, August 21, the House concurred in the Senate amendments to the cotton bill by a vote of 180 to 107, and on the next day, just before the adjournment of Congress, President Taft vetoed the bill.

A New 24-Hour Record in Unloading Iron Ore

In *The Iron Age* of August 17 a new record of 2550.5 gross tons an hour in unloading a single iron ore cargo was mentioned, four Hulett 15-ton machines being employed at the Conneaut, Ohio, docks. All records for unloading iron ore in a day of 24 hours on any lake dock were broken at the docks of the Pittsburgh & Conneaut Dock Company at Conneaut last week. From 6 a. m. August 18 until 6 a. m. of August 19, 61,661 tons of ore was unloaded from these docks, this being at the rate of 2569 tons per hour. This ore was taken from eight boats, but the tonnage was not the entire cargoes of the vessels, some of them being partly unloaded at the beginning and others only partly unloaded at the expiration of the 24-hour period.

The annual outing of general office employees of the American Sheet & Tin Plate Company, Pittsburgh, was held at Cascade Park near New Castle, Pa., on Saturday, August 19, the employees and their friends going to the park by special train over the Pittsburgh & Lake Erie Railroad. The outing in every way was one of the most successful ever held. A handsome programme of the events was issued, this being the work of H. V. Jamison.

A number of patents were granted August 8 to William H. Bristol, of the Bristol Company, Waterbury, Conn.

New York's Barge Canal and Iron Ore Freights

A paper on "The New York State Barge Canal," by William B. Landreth, read before the Engineers' Club of Philadelphia, gives interesting data concerning construction methods and costs. The author estimates that the work will be completed early in 1915. The following extract is from a discussion of the paper by John Birkinbine, Philadelphia, which appears in the July Proceedings of the Engineers' Club of Philadelphia:

The data presented in the paper must impress upon us the facts that our sister State of New York built, many years ago, a canal system which has been jealously maintained, and that now $101,000,000 is being expended to convert it into barge canals to accommodate boats of capacities suited to advanced conditions. The maintenance of the canal system has added greatly to the material progress of the Empire State, and the array of important cities along the Erie Canal testifies to the value of this improvement, for, while the canal system has continued to do a large business, at least five through lines of railroad have been built to connect the Hudson River with Lake Erie.

The State of Pennsylvania expended $40,000,000 (and private capital largely supplemented this) in the construction of a canal and slack-water system aggregating 1100 miles in length which has gone out of use, with the exception of the stretches along the Delaware, Lehigh, and Schuylkill rivers, on which an important traffic is maintained, and the slack-water navigation along the Monongahela River. Whether the improvement of the waterways of this State will be again taken up is problematical, but in view of the possibilities of such improvement the Pennsylvania Water Supply Commission approves applications for the construction of dams or bridges across important streams, with a proviso that, should the State or National Government in the future establish improved waterways, the dams and bridges will be altered to meet the changed conditions.

The capacity of barges which the improved New York canal will pass (1500 tons) admits of applying improved means of loading and discharging; for one barge will carry the equivalent of a train load of freight. A producer of iron ores in large quantities informed me that it was expected that when the barge canal is completed the freight on iron ore from Lake Champlain to New York harbor will not exceed 50 cents, and the charge from Lake Erie to New York will approximate the same amount.

The advantage of railroad service is that material or product can be loaded as large or small units on cars at mines or industries and delivered immediately at the works or manufactories where they are to be used, whereas in water transportation the freight must be conveyed from the locality where it originates to barge or vessel, and transferred from these to the consumer, requiring a breakage of bulk. Modern methods in dock construction, loading and unloading devices materially reduce this expense, where the volume is sufficient to utilize these satisfactorily. In this connection it may be interesting to note the fact that 140,000 tons of sugar from Hawaii were carried to Philadelphia in 1910, using the Tehuantepec Railroad across the Mexican isthmus, the modern facilities provided at the termini of this road permitting of breaking bulk at a material saving over the all-water route.

The New York barge canal and modern propelling facilities for barges are confidently expected to advance greatly the business interests of that State, and to increase the traffic between the Lakes and the ocean.

The Orenstein-Arthur Koppel Company, Machesney Building, Pittsburgh, has shipped to the Fairmont & Morgantown Railroad, West Virginia, 125 V-shaped dump cars of 1½ sq. yd. capacity, to be used in grading the road which, when completed, will be used as a coal road. The company also shipped a consignment of cars to Cuyahoga Falls, Ohio, to be used in the construction of a dam that will supply water to the town and to an artificial lake.

The Mumford Molding Machine Company has opened an office at 75 High street, Boston, where it will be represented by T. J. Mumford 2d.

Michigan's Iron and Copper Mines

Prof. J. R. Finlay, mining expert of New York, has made his report to the State Tax Commission of Michigan as a result of the appraisal he has been making for two months. The appraisal was made by direction of the Legislature in order to determine whether these classes of property are paying their share of taxation.

He values the copper mines at $69,815,000, the iron mines at $119,485,000 and the coal mines at $861,745, making a total of $190,161,745. Of these figures the increase comes particularly in iron mines, while the copper mines are not increased to any extent over the figures at which these properties have been assessed. Discussing the copper situation, Professor Finlay says:

Only nine copper companies in Michigan made money during the last five years. If we could assume that these mines would last forever the investor would probably be satisfied with five per cent income and he would probably capitalize their average earnings of $8,240,000 into a present value for the group of $164,800,000. The fact is that these mines are not worth even half this amount, because their future life is not by any means perpetual. On the contrary their future is much less promising than it is popularly supposed to be. These mines have shown unusual persistence in depth, but the limit in profitable working is now in most cases in plain sight. It must not be forgotten that the tonnage maintained must be three times as great as the mines have averaged in their 50 years of life.

The copper mines were valued by Professor Finlay, by counties, as follows: Kewenaw, $10,700,000; Houghton, $58,815,000; Ontonagon, $300,000. The iron counties were valued as follows: Gogebic, $41,560,000; Iron, $23,339,000; Dickinson, $11,508,000; Baraga, $335,000; Marquette, $42,743,000. For the coal mines in certain counties the following valuation is fixed: Bay, $484,709; Saginaw, $350,924; Midland, $12,862; Tuscola, $3,500; Shiawasse, $9,750.

"These valuations are based substantially on past and present earnings," the report says. "During the past five years profitable copper mines earned $50,937,690.27 over expenditures, but I consider these earnings abnormal, being mainly due to the great boom of 1906 and 1907. The iron mines earned in five years $57,551,202 without the benefit of any abnormal prices."

The estimate is made that the Marquette, Menominee and Gogebic iron ranges will produce 360,000,000 tons more of ore.

The New Pittsburgh Bridge.—The contract for the erection of the superstructure of the North Side Point Bridge, Pittsburgh, was awarded to the American Bridge Company, the lowest bidder, at $297,792 for the finished structure. The piers and abutments for the bridge are being built by the Dravo Contracting Company, Pittsburgh; they are to be carried to bedrock by the pneumatic process, and are to be of concrete construction with stone facings. This part of the work is to be completed by June 1, 1912, which will probably permit the bridge to be completed before cold weather of next year. The bridge will consist of approaches and two river spans, each of which will be 531 ft. in length. The total width of the structure will be 60 ft., providing a 36-ft. roadway and 8-ft. sidewalks. The roadway will be paved with creosoted wood blocks and the sidewalks with reinforced concrete. The floor of the bridge will be 70 ft. above the mean level of the river at that point to provide ample room for river traffic.

Youngstown Sheet & Tube Profit Sharing.—More than $200,000 was paid out August 19 by the Youngstown Sheet & Tube Company, Youngstown, Ohio, in bonuses to its employees under the profit-sharing plan being conducted by the company. All the employees, with the exception of the officers and a few others on the payroll who have been engaged in construction work and did not directly help in making the profits for the company, participated in the distribution of a bonus of 5 per cent. of the amount they had earned during the year. This bonus was granted by the company in spite of the fact that its profits in the past year were much smaller than in the year before, when the same award was made.

The Federal Engineering Company, House Building, Pittsburgh, sales agent for the Oil City Boiler Works, has been awarded a contract for two 204-hp. Geary water-tube boilers, for installation at Manitowoc, Wis., and one 500-hp. boiler of the same maker for the Schmulbach Brewing Company, Wheeling, W. Va.

The Croton Magnetic Iron Mines Suit

A Review of a Most Interesting Case

Settlement has been made by the city of New York with the Croton Magnetic Iron Mines for damages claimed as resulting from the city sequestering part of the company's property, including its railroad connection, and for interference with future exploitation of the iron ore deposit of this company. This settlement is the sequel of litigation which had been in progress for nearly five years before a commission consisting of William Church Osborn, John Quinn and William M. Benjamin, the Croton Magnetic Iron Mines Company being represented by Richard T. Greene and the city of New York by I. J. Beaudrias.

This litigation attracted attention because of the amount of damages claimed, the number and reputation of the witnesses examined and the wide scope of testimony which included the geological formation, the character and quantity of the material, the costs and methods of mining, the expenditures requisite for magnetic concentration and nodulizing, freight rates on the mineral and numerous details.

Believing that a synopsis of the testimony would be of interest to our readers, we have had 4,000 pages of printed and type-written matter revised and present below in as concise form as possible many of the salient features, prefaced by a sketch of the property in dispute, which is intended to describe the deposit, its location and the causes which brought about the litigation, all abstracted from testimony presented.

History

The property which was sequestered in 1906 by the city consists of a deposit of iron ore of admitted great extent in Putnam County, New York, two miles south of the village of Brewster, on the Harlem division of the New York Central Railroad. A dense magnetite is exposed by a large tunnel penetrating what is known as Theall Hill for a distance of 1,150 ft., with side drifts and rooms, by a shaft north of the tunnel with levels at 80 ft. and 155 ft. below the Theall tunnel floor, and by two pits and a drift south of the tunnel. The ore was also traced by magnetic needle most of the distance to a shaft at Brewster, and its existence proved by intermediate explorations, this extension of the deposit passing through the property of the Croton Magnetic Iron Mines for 2,000 ft. north of the shaft above mentioned.

In providing for additions to the storage of the New York water supply, the Aqueduct Commission located a large reservoir on the Middle Branch of the Croton River, which will back water close to the property of the Croton Magnetic Iron Mines, and constructed a feeder canal from the East Branch of Croton River (on which a diversion dam is placed) through a portion of the Croton Mines property and along the right of way of its railroad switch.

The property having been sequestered in 1906 by the city of New York for the purposes mentioned, it became necessary for the Croton Magnetic Iron Mines to establish the damage done by the city taking a part of the deposit, by the loss of the railroad connection, dumping ground, etc., also for any injury to the remnant of the property as a mining proposition.

The existence of the iron ore deposit in Theall Hill was reported in 1839, but it was not until 1880 that active operations were started by driving a tunnel of sufficient size to accommodate a double track railroad, and from this excavation, its side drifts or rooms and an opening to the south, 30,000 tons of iron ore was shipped to blast furnaces and used, the material disposed of being the richer portion of the mine or hand-picked ore. Mining operations ceased in 1883.

Although some rich magnetic ore can be won from the deposit, the mass of the ore body carries insufficient iron to be classed as merchantable, except by removing the leaner or barren portions, and as sulphur and phosphorus are present in proportions in excess of what is considered desirable, much of the mineral as mined requires to be improved. To enrich and improve the ore, a concentrating mill equipped with crushers, rolls, screens and water jigs were erected, which proved expensive to operate, and the water supply was inadequate to maintain its operation.

A 700-ton dry concentrating mill, with roasting kilns and magnetic separator, was erected in 1890 and handled up to 525 gross tons of crude material per day of 20 working hours, for although the screening and crushing capacity was ample the output was restricted by the inadequacy of roasters and separators.

This mill was supplied mainly with rejected ore of earlier mining operations, which were charged into three Davis-Colby roasters, fired with petroleum, the consumption amounting to 3.8 gal. of Lima oil per ton of crude ore. The material crushed to 12 mesh was passed over separators, the concentrates going to shipping bins and the middlings being recrushed for subsequent treatment. A large expenditure of money was also made to produce, by means of a direct process, metal or iron sponge, the method followed being to charge iron concentrates and solid carbon into externally heated cylinders with the expectation that the ore would be reduced. The material produced was run into vessels with tar, so as to prevent loss and as an aid for convenience in shipping.

In the meantime the tunnel had been extended to a length of 1,100 ft., large rooms were opened, the shafts and other pits mentioned sunk and plans made for a concentrating plant of large capacity, when the owners became financially involved and work was suspended, the concentrating plant being subsequently destroyed by fire, and the property remained practically inactive until the city of New York sequestered a portion of it.

Under the circumstances described the city of New York claimed that the property must be considered either as an abandoned mine or as a deposit of iron ore of little or no value, while the claimant sought to prove that the property had intrinsic value in a large body of ore, which by improved methods could be mined, concentrated, nodulized and shipped to consumers within such distance as would require but a small expenditure for freight.

The deposits of magnetite in the vicinity of Brewster, including the property of the Croton Magnetic Iron Mines, were reported upon by various experts, and a geological discussion was prepared by the late N. F. Shaler of Harvard. The deposits also received detailed attention in the census of 1880 by Prof. Raphael Pumpelly.

Basis of Claims for Damages

In 1891 John Birkinbine, consulting engineer, of Philadelphia, Pa., and W. B. Kunhardt of New York, now of the Carpenter Steel Company, made an elaborate report on the property of the Croton Magnetic Iron Mines, the developments being those above described. This report includes maps, cross-sections, records of numerous analyses and estimates of the cost of mining and treating ore and of the amount obtainable. It stated that the average of the net available ore amounting to 4,500,000 tons (then assuming the deposit to exist to a depth of 200 ft. below the Theall tunnel) was 37 per cent. of iron, but no money value was placed on the property as a whole, for this had not been requested. This report was introduced as evidence in the early stages of litigation, and the contest for damages in the condemnation proceedings naturally centered mainly about it.

According to the Birkinbine and Kunhardt report, the Croton Magnetic Iron Mines property consists of the main deposit with some outlying stringers of ore; the length of the ore body on the property of the company 4,100 ft. (of which somewhat over 1,300 ft. was sequestered by the city); the width 90 ft., with a general course north, 34 deg. east, south 34 deg., west the dip 70 deg. to the east and the pitch of 10 deg. to 25 deg. to the north. The hanging wall is of syenitic gneiss with a face of chloritic shale, but there is no well defined footwall.

The contention of the claimant was that by the condemnation of the city of New York the iron ore body had been rendered of little practical value, because the dumping ground for refuse, the mill site and the means of

access to the railroad had been taken and that the property sequestered upon which no mining had been done represented a value to the owner of $960,000 based on 2,400,000 tons of ore in place at 40 cents per ton, of which 25 cents per ton was considered as royalty on the ore and 15 cents per ton mining profit. Also that the residue of the property upon which the developments of the company were located was estimated to contain 9,600,000 tons which could not be economically exploited, and this was valued at the time of the taking, April 27, 1906, on the 40 cent basis, at $3,840,000, the total claim therefor being $4,800,000.

The prescribed method of procedure limited the claimant to testimony as to the amount of damage and the basis on which it was calculated, leaving the contestant, the city, full opportunity for cross examination as to any detail. This resulted in giving the testimony a wide range, covering the technical and practical features of ore deposits, ore mining, ore treatment and of transportation, comprised in the voluminous record above referred to.

There was no contention as to the deposit being of large volume, or that the ore was magnetic, most of which required treatment to make it of commercial value, but the witnesses for the city questioned the average width, the quantity of available ore, its average analyses, the cost of mining, of concentrating and of freights, and suggested alternate means of overcoming the loss of mill site, dumping grounds, railroad connections, etc. Each feature received full consideration, as will be apparent from the list of those who gave expert testimony and the time occupied in the hearings.

The canal connecting the East Branch of the Croton River with the new storage reservoir crosses the northern portion of the property of the Croton Magnetic Iron Mines, cutting the extension of the main ore deposit at an acute angle, and this, together with the adjacent property which the city sequestered, segregated a part of the northern portion of the deposit, rendering it, according to the claimant, valueless, as it could not be worked to advantage. The city of New York stated that owing to the dip the deposit evidently extended to great depth into territory not taken by the Aqueduct Commission and that this isolated portion could be mined by levels at considerable depth which would be on the uncondemned property to the east.

The Witnesses

The Croton Magnetic Iron Mines called as witnesses to sustain Birkinbine and Kunhardt the authors thereof and the following: William S. Harvey, Charles Vivian, Sam Tate, A. E. Lehman, S. W. Traylor, Henry H. Hindshaw, Geo. C. Davis, P. deP. Ricketts, E. Gybbon Spilsbury, James Arthur, Josef Westessen, C. G. Buchanan, Samuel Brownsell, August Hecksher, James W. Peale, John Moody.

The city of New York offered testimony: James F. Kemp, Francis May Simonds, F. S. Cook, Michael R. Conley, Owen J. Conley, Don H. Bacon, Frederick A. Canfield, Charles Page Perin, George D. Harrington, Richard Dougherty, Gerard VanTassel, Henry James Lamborn, Robert H. Richards, J. Parke Channing, Martin S. Decker. In addition witnesses were called to prove real estate values, surveys, transfers, etc.

Quality of Ore

To test the character, size and depth of the ore deposit in the sequestered portion of the property, the claimant sank ten vertical bore holes varying in depth from 65 ft. to nearly 600 ft., the cores of which were preserved, sampled and analyzed; these ten holes showed the cores to vary from ore carrying iron over 60 per cent. to barren rock. By the bore holes the claimant demonstrated the continuance of the ore deposit upon the tract sequestered and that its general character and width apparently corresponded with the portion to the south where mining operations had been carried on, while its depth was attested by the deepest bore hole.

It was asserted by counsel for the city that to show the true character of the ore the bore holes should have been run at right angles to the dip of the deposit and not perpendicularly from the surface.

Witnesses for the city of New York also claimed that in estimating the quantity of ore only "ore in sight" should be considered, which was defined as ore exposed on three sides by excavations not too far apart. On this assumption the city's experts figured that there was no "ore in sight" on the property sequestered, that on the residue there was slightly over 1,000,000 tons of ore blocked out, and in actual mining this amount could not be obtained.

The Birkinbine and the Kunhardt report on the mine stated that the deposit had been thoroughly sampled, all of the workings having been examined, and samples secured either by chipping pieces from the walls at intervals of 2 to 3 ft. or by firing small blasts and taking about 30 lb. for a sample. By the first method 198 samples were taken, representing some 9,900 testing points, and in addition 390 holes were drilled and fired to obtain 190 shot samples, the recorded weight of samples taken from the mine being five net tons. These samples were quartered down and 388 analyses made. Owing to the irregular character of the deposit this was deemed the best plan to pursue, giving a general average analysis of 37 per cent. after discarding one-third of the workable ground as too lean or barren to be profitably treated.

The city contended that as the personal factor entered into the above it is not the proper method of sampling, but that channels should be cut at regular intervals of 50 ft. at right angles to the strike and entirely across the width of the deposit. On cross-examination it was admitted that this method approved by the city had been imperfectly followed by its experts.

The channel samples collected for the city were analyzed and a distinction made between "total" and "available" iron, the latter being the percentage of iron in the ore after the non-magnetic portion is removed, which it was claimed would be the case in concentration. The city reported 87 samples weighing 2,190 lb. from which were made analyses showing total iron from 5.17 to 52.19 per cent. and available iron from 4.56 to 50.59 per cent. The differences in the two methods of stating the percentage of iron ranged from a fraction of 1 per cent. to almost 4 per cent. Using the "available" ore only, the city's testimony was that the average analysis of the ore, according to its sampling, was 33.41 per cent. of iron. Only the Theall tunnel workings were sampled, and no ore which analyzed less than 27 per cent. of iron was considered, the claim being made that because roof samples opposite the rooms were richer than those between the rooms, an arbitrary reduction of 10 per cent. was made, leaving the average iron in the ore 30.06 per cent. As some wall rock will fall and mix with the ore, this average was further diminished 4 per cent. on that account., and still further reduced because it was claimed that 200,000 tons of the richest ore had been removed, which would affect the value of the remaining. The city of New York therefore fixed the average per cent. of iron as 29.5 per cent.

Testimony as to Costs

In testifying as to the costs of mining, milling, concentrating and freight rates there was much diversity of opinion, and many different methods were used in arriving at the expense of preparing a ton of nodules or concentrates and delivering them at furnaces within a radius of 150 miles. Briefly, these may be summarized as follows, the witnesses being grouped for the claimant and the city:

FOR THE CLAIMANT.

John Birkinbine estimated that in mining one cubic yard of material two tons of ore, averaging 37 per cent. of iron, would be obtained, the balance going to waste dumps; that the cost of mining, milling and nodulizing (2.3 tons of ore being required per ton of concentrates) would be $3.27 per ton; that a fair freight rate to furnaces is $1.50; a total of $4.77 per ton of 65 per cent. nodules delivered at furnaces, which at 9 cents per unit of iron would be worth $5.85. He placed the royalty at 25 cents per ton and the working profit 15 cents per ton.

Wm. S. Harvey based his estimate on the report of Birkinbine and Kunhardt and valued the ore in the ground at 40 cents per ton, and in addition 23 cents a ton profit in mining.

Charles Vivian, who had mined the Croton ore, said that he could move the material for $1 per cu. yd., or, if he included a profit to himself, for 45 cents per ton.

Sam Tate placed the cost of mining at 66 cents per ton, including waste material. Above ground the cost would be $1 per cu. yd., at 155-ft. level $1.25 and at 255-ft. level $2 per cu. yd.

Henry Hindshaw estimated the cost of mining at $1

per cu. yd. or 50 cents per ton open cut and from 70 to 75 cents per ton for underground mining. Crushing and concentration would cost 16 to 19 cents per ton.

P. deP. Ricketts estimated that, on the basis of 40 per cent. of iron in the ore, mining two tons would cost $1.50, crushing and concentrating 30 cents, nodulizing 65 cents, freight $1.50, shrinkage 10 cents, or a total of $4.05, per ton of nodules worth $6.50 per ton, leaving $2.45 per ton profit, which divided by two tons would give $1.22 less 50 cents for commission, profit, etc., 72 cents, and with a deduction for contingencies he calculated a royalty of 45 cents per ton in estimating the value of the Croton mines property.

James Arthur stated that the total cost of labor to break down 2,400 tons of ore in 24 hours would be $259.05 daily, and in addition management would cost $740 per month. This did not include surface work.

E. Gybbon Spilsbury estimated the cost for mining, milling and interest on capital at 64.8 cents per ton. Assuming 3½ tons were mined to produce one ton of 65 per cent. concentrates, this would cost $2.268. A ton of nodules is worth $6.50 at furnaces, deducting 1 cent per unit for expenses of nodulizing leaves $5.85 per ton of concentrates allowing freight and handling $1.625 per ton would bring this to $4.225 per ton, showing a profit of $1.957 per ton of concentrates, which divided by 3½ tons equals 56 cents per ton profit for the crude ore.

August Hecksher testified that nodules would be produced carrying 62 to 64 per cent. of iron, with sulphur not over 0.15 per cent., based on 2¼ tons of crude being required per ton of concentrates. He gave the following expenditures: Mining $1.37, milling 77 cents, general expenses 18 cents, or $2.32 per ton of concentrates. The cost of nodulizing, 60 cents per ton, did not include interest or amortization, and he allowed 10 per cent. of the capital (estimated $700,000) for this purpose. The nodules would be worth 10 cents per unit delivered, and the freight rate would be $1 per ton. The fluctuations in price of nodules was 8 to 11 cents per unit.

S. W. Traylor estimated that with a 1,200-ton mill, making 2,400 tons in 24 hours, the cost to crush, mill and concentrate would be 30 cents per ton.

C. G. Buchanan testified that crushing and concentrating would cost 15 cents per ton, or 30 cents per ton of concentrates. He also testified that in magnetically cobbing the Croton ore one-third was rejected, the balance averaging 39 per cent. of iron.

FOR THE CITY

For the city of New York F. M. Simonds estimated that 2.74 tons of 29.5 per cent. ore would be required to make a ton of 60 per cent. concentrate, and for this estimated that the mining underground would cost $3.23, milling $1.18, nodulizing 83 cents, freight $2, selling expenses 40 cents, or a total of $7.34 per ton, and, by valuing nodules at $4.20 per ton, showed a loss of 3.14, or $1.15 per ton of crude ore. If the ore was mined open cut mining would cost $1.97 per ton, the other figures remaining the same, and there would be a loss of $1.88 per ton of nodules, or 69 cents per ton of crude ore.

James F. Kemp considered that the Croton mine was abandoned and had no value.

Don H. Bacon assumed that the ore carried 25 per cent. of iron, and on this basis it would cost $1.25 per ton for mining or for 10 tons $12.50; 10 per cent. iron would be lost in tails, leaving 225 units of iron, which would supply 3.63 tons of 62 per cent. ore. He gave the cost of concentrating 10 tons of crude ore, at 70 cents, $7; cintering 3.63 tons, at 70 cents, $2.54; for selling 3.63 tons, 36 cents; freight, at $1.50 on 3.63 tons, $5.44, a total of $27.84, which divided by 3.63 gave the cost per ton of concentrates at furnaces $7.67, or 12.3 cents per unit. Nodules he estimated at 7 cents per unit, thus showing a loss per ton of nodules of $3.29.

Frederick A Canfield took John Birkinbine's estimate that one-third of the material would be discarded and on that basis testified that to produce a ton of concentrates there would be required 2.47 tons of 37 per cent. ore, of which the cost for mining would be $3.62, milling and concentrating (at 70 cents per ton) $1.73, nodulizing 65 cents, sinking fund or amortization 37 cents, freight $2, commission 10 cents, contingencies 10 cents, making a total cost for the nodules delivered at furnaces $8.57 per ton, or 13.18 cents per unit. He though these nodules were worth about 7 cents per unit.

Charles Page Perin stated that the quality of the ore was so poor, using the city's estimate of 29.5 per cent. of iron, that the deposit had no value as a mine, as it would cost $7 per ton to make and deliver a ton of 55 per cent. concentrates, assuming a freight rate of $1.50 per ton.

J. Parke Channing estimated the cost of mining at 90 cents to 1.10 per gross ton, not including amortization. This was based on mining 1,000 tons per day, but if 2,400 tons was won the cost would be reduced to 70 to 90 cents per ton.

Owen J. Conley thought that 2.74 tons of ore would be required per ton of concentrates, which would cost for underground mining, at $1.2268 per ton, $3.3614 transportation, at 1 cent per ton from mine to mill, 0.0274; milling, per ton, at 0.42465 = $1.1635, a total of $4.55. In the open cut work mining would cost 64.2 cents per ton, the other items remaining the same, and the cost per ton of concentrates would be $2.92. None of his figures included nodulizing, freight or commission.

Henry James Lamborn assumed a basis of 30 per cent. of iron in the ore, estimating the cost of open cut mining at 75 cents and concentrating 40.3 cents, and stated that 2.404 tons would be required to make a ton of 56 per cent. concentrates, which would cost $2.77. Underground mining would cost $1.28 per ton, making the cost per ton of concentrates $4.05 per ton. If 65 per cent. concentrates were made the concentrating would cost 53.5 cents per ton and 2.94 tons of crude ore would be required, making the cost of underground concentrates $5.34 and open cut $3.78 per ton. Valuing the concentrates at 7½ cents per unit, and using a freight rate of $2, this would show a loss of $1.47 per ton open cut and $1.75 underground for 56 per cent. concentrates, and for 65 per cent. concentrates losses of $1.80 and $3.38 per ton respectively.

Robert H. Richards estimated the cost of milling and concentrating per ton of crude ore reduced to 12 mesh at 66 cents per ton, and if recrushed to 30 mesh at 87 cents per ton of crude ore.

Testimony was also offered as to the number of men required to mine a given quantity of ore, as to cost and amount of explosives required, expenditures for sinking shafts, erecting concentrating and milling machinery, water supply, overhead tramways, railroad connections, geological formation, methods of analyses, leases paid elsewhere for iron ores, etc.

The litigation resulted in a finding by the commissioners which restored to the Croton Magnetic Mines most of the property taken, the city of New York accepting an easement for the portion occupied by the diversion canal. The mining company is also assured a new right of way for railroad switch and necessary water supply. A relatively small cash payment is also made to the mining company, and the city of New York assumes the cost of legal proceedings.

Iron Ore Production in 1910

The United States Geological Survey has given out the preliminary figures for iron ore production in the United States in 1910, the total being 56,889,734 gross tons, as compared with 51,155,437 tons in 1909 [the Survey report for 1909 gave the total as 51,294,271 tons], an increase of 5,734,297 tons or 11.21 per cent. The figures include only iron ore used in blast furnaces, and not that used for fluxing precious metals in Montana, Nevada, New Mexico and Wyoming, or that used in the manufacture of metallic paint. The value of the production in 1910 was $140,135,607, against $109,964,903 in 1909.

The Cochran Pipe Wrench Mfg. Company, Seventy-eighth street and Woodlawn avenue, Chicago, is adding to its line three more sizes of wrenches. These sizes are 6, 8 and 36-in. The company has heretofore made 10, 14, 18 and 24-in.

The Dahlstrom Metallic Door Company and the Crown Metal Mfg. Company, both of Jamestown, N. Y., have opened joint offices in Pittsburgh, at 2435 Oliver Building, in charge of L. H. Gibson.

Laws for Accident Prevention

A survey of laws for the safety of workers in factories is summarized in the June issue of the American Labor Legislation Review, and an editorial reference to the laws is made in the same issue by Leonard W. Hatch, chief statistician of the New York State Department of Labor. Elaborate tables have been compiled covering the features of the laws of the different states in relation to comfort, health, safety and cleanliness in factories. The following comments from Mr. Hatch's article are of interest, particularly as pointing out the need of uniform laws.

Mr. Hatch asks why, if New York, the first State in manufactures, finds in common with many others that "machinery of every description" needs to be brought within the requirements for guards, Massachusetts, third in value of manufactured products, does not seem to find it necessary to require guards for more than "belting, shafting, gearing and drums." While the dangers to be guarded against by factory laws are largely general and uniform wherever there are manufacturing industries, there is nothing like uniform recognition of these dangers in different states. Factory laws for safety do not bear any general evidence of having been formulated on the basis of careful study of the dangers with which they deal.

Continuing Mr. Hatch says: In reading through the provisions with regard to safeguarding machinery, one is struck by the very general terms of the requirements in many states, and that such requirements really do nothing more than prescribe generally that all machinery shall be properly guarded, without discriminating any different classes of machine dangers, and, still more, without prescribing any specific kinds of safeguards. In a word, often the law contains only a requirement of safety rather than specific *means* of safety. In this respect there is a general contrast between provisions regarding machinery and those for the other classes of dangers distinguished above. Thus, in the case of shafts and openings, and of stairways, the laws commonly prescribe the specific safeguard, that is, inclosure, handrails or rubber treads. A still better illustration is the requirement of belt shifters and loose pulleys. Instead of prescribing that the starting and stopping of machinery shall be properly guarded, this requirement names the specific means of making those operations safe. But aside from this specification as to starting and stopping machines, and the specific prohibition of cleaning machinery in motion (usually for minors or women), the most common provision for the great danger field of power-driven machinery, the principal and most characteristic source of factory accidents in modern times, is a single declaration in general terms that such machinery "shall be guarded."

Southern Iron Consolidations

It is now stated that the negotiations in progress for some months for the merger of the Alabama Consolidated Coal & Iron Company with the Southern Iron & Steel Company will be completed in the next two weeks. Terms have been agreed upon which are satisfactory to the directors of the Alabama Consolidated Company and to the larger interests in the Southern Iron & Steel Company. The new corporation will be known as the Alabama Iron & Steel Company. The total capitalization will be $28,000,000, as against $33,000,000 for the two companies at present. Underlying the new issues of bonds will be $1,800,000 bonds of the Southern Iron & Steel Company and $2,200,000 bonds of the Alabama Consolidated Coal & Iron Company.

The report of a deal pending between the Woodward Iron Company, Woodward, Ala., and the Central Coal & Iron Company for the acquisition of the Holt, Ala., blast furnace and other properties of the latter company is authoritatively denied. The Central Coal & Iron Company is an affiliated interest of the Central Foundry Company, which for some time has been in the hands of a receiver.

A method of printing by sound has been patented by Arthur C. Ferguson, Brooklyn, N. Y. It appears to comprehend a mechanism for recording sound waves as transmitted fo. example over the telephone, characters being printed on a printing sheet carried on the drum. The patent was granted Augus 8 and was assigned in part to Lyman C. Smith, Syracuse, N. Y.

The Hopkins & Allen Arms Company

The Hopkins & Allen Arms Company, Norwich, Conn., having a capital of $300,000, and assets of upward of $670,000, has just been turned over to a local syndicate which contemplates the enlargement of the business and the adoption of the latest improvements and devices in the manufacture of arms. The syndicate secured practically all of the stock through purchase by the W. T. Fields Company, broker and investment dealer, New Haven, Conn. The Thames National Bank of Norwich was designated as a depository for such stock as might be offered and the Union & New Haven Trust Company as a depository for the funds necessary to make the purchase. The syndicate formed by the W. T. Fields Company is composed of successful business men and manufacturers, a number of whom have had valuable experience in the manufacture of firearms and it is expected that they will take up the active management of the company, insuring a material increase in the output while largely reducing the cost of production.

The Hopkins & Allen Arms Company, organized in 1868, has been controlled by a number of the leading citizens of Norwich and has been in active operation since that time. The business, which at first amounted to $250,000 annually, has gradually increased so that the output of manufactured goods in 1910 amounted to $650,000, and will be larger this year. It is understood that the company's products, which have attained a reputation for excellence and a world-wide market, will be on the same lines as heretofore, although the standard of workmanship will be of higher grade. The result of this purchase and transfer is expected to be of great advantage to the city of Norwich, as, with new, progressive and skillful management, the company, having on its payroll upward of 500 employees, will become a much more important factor in the manufacturing industries of the city.

British Iron and Steel Exports and Imports

In the seven months ending with July the exports of iron and steel from Great Britain were 2,673,436 gross tons against 2,797,009 tons in the first seven months of 1910. The values were £25,637,000 and £25,210,000 respectively. The July total fell 100,000 tons short of that for July, 1910, being 325,688 tons against 426,370 tons.

The imports of iron and steel products for the first seven months of this year were 1,059,173 tons against 782,218 tons in the corresponding period of 1910. The July returns showed that increases over the corresponding months of 1910 continue, the total being 127,827 tons against 102,010 tons in July, 1910. Semi-finished steel showed a noteworthy increase. The total of blooms, billets, slabs and sheet bars imported in July was 49,800 tons against 31,400 tons in July, 1910. British rail exports continue to fall off. They were 30,945 tons in July, against 43,779 tons in July, 1910. For the seven-month periods in the two years they were 216,000 and 266,000 tons respectively.

New House Organ.—The United States Radiator Corporation, Detroit, Mich., has recently issued a new house organ entitled "Radiation." This will be issued occasionally and will be devoted to the subject which gives the periodical its name. The initial number contains an article on "Setting the Sun to Work," which deals with the various types of solar motors which have been developed. The first installment of a series of articles on heating buildings with steam appears in this number, together with a brief description of the heating plant of the Ritz-Carlton Hotel in New York City. Installments of two other articles, one dealing with the "Story of the Match" and the other with "Fuel and Draft," complete the periodical.

Panama Railroad Requirements.—The Panama Canal Record says that a requisition has been made for the following materials for use on the relocation of the Panama railroad: Two thousand gross tons of 90-lb. open hearth steel rails; 8000 pairs of 4-hole splice bars; 1000 extra special track bolts; 160,000 Economy No. 9 rolled steel 4-hole tie plates; 400,000 screw spikes, 5 in. long under flange, and 7-8 in. diameter; 800 special joint tie plates; 17,000 special joint screw spikes, 5 15-16 in. long.

The Sintering of Fine Iron-Bearing Materials*

The Use of the Dwight-Lloyd Process in Preparing Flue Dust and Concentrates for the Blast Furnace

BY JAMES GAYLEY

[The following paper, which is reprinted from the Bulletin of the American Institute of Mining Engineers for August, 1911, was prepared by Mr. Gayley for the Wilkes-Barre, Pa., meeting of the Institute. The process of Dwight and Lloyd (Arthur S. Dwight, 25 Broad street, New York) has been in use for several years in the sintering of lead and copper sulphide concentrates. The American Ore Reclamation Company, 71 Broadway, New York, has secured the rights to use the process on iron-bearing materials and is constructing a plant at the blast furnaces of the E. & G. Brooke Iron Company, Birdsboro, Pa., for the treatment of flue dust. It will be in operation in September.—EDITOR.]

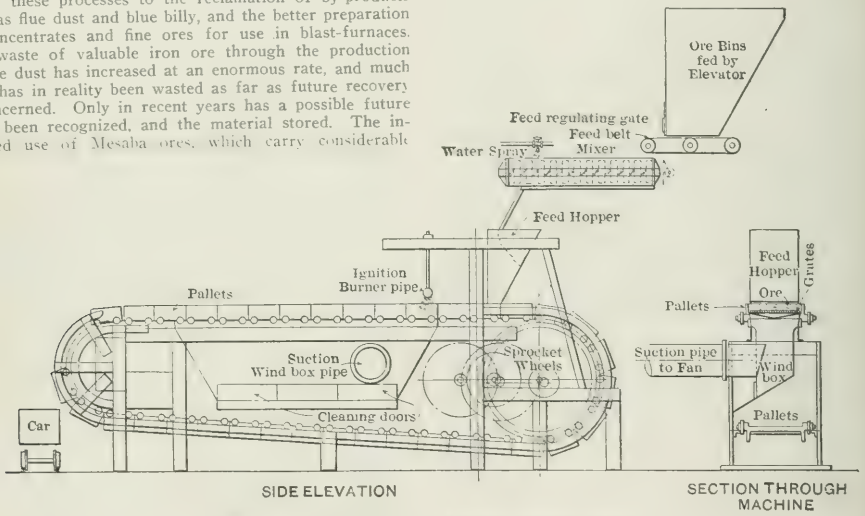
The paper presented to the Institute in 1910, by H. O. Hofman, on "Recent Progress in Blast Roasting,"* has called the attention of the iron industry to the adaptability of these processes to the reclamation of by-products such as flue dust and blue billy, and the better preparation of concentrates and fine ores for use in blast-furnaces. The waste of valuable iron ore through the production of flue dust has increased at an enormous rate, and much of it has in reality been wasted as far as future recovery is concerned. Only in recent years has a possible future value been recognized, and the material stored. The increased use of Mesaba ores, which carry considerable fine ore, is principally responsible for the great increase in the production of flue dust. The amount of fine material that is carried over depends on the fineness of the material and the velocity of the gases, and also to a very great extent on the regularity or irregularity of the working of the furnace. Attempts to recover a part of this loss have been made by recharging a portion of the production into the furnace; but as this material has been once carried out from the furnace, it is naturally in good shape to be carried out again. A recent practice at some works is to soak the flue dust thoroughly with water to give it more cohesiveness; but by many this is considered of doubtful advantage in the furnace, and the gases are in consequence heavily laden with moisture.

There are vast deposits of magnetic iron ores in the United States and Canada that are too low in iron for use at the present time, but which can be economically concentrated into very rich material; in many cases the fineness of crushing necessary to secure proper concentration has prevented their use except in extremely limited quantities. The reclamation of these ore bodies will add tremendously to the ore reserves of the United States, and this can best be done by a simple and efficient method of sintering.

*Transactions American Institute of Mining Engineers, xii, p 736 (1911).

Construction of the Machine

Attention was directed especially to the Dwight and Lloyd system of sintering fine material in thin layers by internal combustion as promising to solve this problem most efficiently. The Dwight and Lloyd patents cover most of the simple forms of apparatus by which their process can conveniently be carried out, but the one that has given the best satisfaction in practice and has now been adopted as the standard is known as "Type E," or the "straight-line-conveyor type" described by Hofman. As shown in the illustration, the machine consists essentially of a frame of structural steel supporting a sheet iron suction box, open at the top, over which may be pushed a train of conveyor elements called "pallets," each of which has a floor composed of ordinary herring-bone grates, and which slides on its planed bottom, making an air-tight joint with the horizontal top edges of the suction box on which it rests. The vertical surfaces of contact of the pallets with each other are also accurately planed, so that all joints are closed air tight when the train of pallets is being pushed along.



Dwight and Lloyd Sintering Machine, Conveyor Type.

An exhaust fan, connected with the suction box by suitable piping, induces air-currents to travel downward through the openings in the pallet grates and through the permeable material resting upon them. To trap the air properly, a smooth-surfaced dead plate, somewhat longer than one pallet length, is bolted to each end of the suction box.

The movement of the train of pallets is accomplished by a pair of cast steel sprocket wheels, which serve the double purpose of lifting the pallets from the lower level and pushing them horizontally across the suction box. Each pallet is provided with four small roller wheels which hang idle while the pallet is traveling over the suction box, but serve to carry the pallet on its return trip to the point of beginning. The return of the pallets is provided for by a pair of semicircular discharge guides, terminating in a lower trackway sloping downward to the base of the main sprocket wheels, and continuing as semicircular guides around their peripheries. The pallets when they complete their journey across the suction box to the point of discharge have their wheels engaged

by the curved guides, and when pushed still further, beyond the crest of the curve, break away from the train that is pushing them, and one by one drop with a sharp blow on the upturned edge of the pallet just preceding. This shock serves to dislodge the cake of sinter from the surface of the grates, which now stand more or less vertical. The train of discharged pallets, in the guides and on the inclined lower trackway, crowds down by its own weight to the foot of the main sprocket-wheel. During this period of their travel, the pallets are upside down, which automatically tends to clean out the grate-slots. The sprocket-wheel lifts the train of pallets to the upper level and the cycle is completed.

We thus have a practically endless conveyor, any individual element of which can be removed for repairs and a new one substituted without stopping. The circuit may, if desired, be made a closed one, and this arrangement has been used under special conditions; but, in general, it is customary to leave an interval in the train of about one and a half pallet lengths, which gives just about the right amount of shock.

The speed of horizontal travel of the pallets is adjustable to meet varying requirements, with the usual range from 7 to 30 in. of linear travel per minute.

Ore-Charging and Sintering

The ore charge is automatically fed to the pallets in a thin layer (from 4 to 6 in. thick) from a simple funnel-shaped hopper of the same width as the pallets, hung directly over them at a point between the main sprocket wheels and the suction box. There being no bottom to the hopper, the material rests directly on the pallets and is dragged out by their movement, the front edge of the hopper acting as a scraper to form a uniform layer of the proper thickness.

The stream of ore emerging from the hopper passes under an igniting device which kindles the combustible elements in the charge on its top surface, and the combustion thus started is carried downward through the mass by the air currents while the material is passing over the suction box. This ignition can be accomplished by almost any kind of flame that will give a quick, intense heat. The amount of heat required at this point of the operation is exceedingly small and the cost of ignition correspondingly low. The wide variety of suitable means makes it possible to meet almost any local requirements

The complete cycle of operations is as follows: A pallet being pushed outward tangentially from the top of the sprocket wheels, passes under the feed hopper, where it takes its load of ore in the form of a continuous, even layer of charge, say 4 in. thick. It next passes under the ignition, where the top surface is ignited, and at the same time the charge comes within the influence of the down draft induced by the exhaust fan through the suction box. The air currents promote rapid internal combustion of the fuel ingredients in the charge, and carry the action progressively downward from the top surface until it reaches the grates. This internally developed heat and the chemical reactions resulting, serve to bind the mass together until it becomes a coherent cake of cellular material, much resembling coke. The speed of the machine should be regulated so that the combustion and sintering operation is complete when a given pallet has reached the far end of the suction box, where the cake is discharged by the pallet dropping into the discharge guides and striking the one just preceding it. The empty pallets then gradually crowd back to the face of the sprocket wheels, are slowly raised to the upper track, take their load and make a new trip.

Power Requirements and Repairs

This type of machine is now made in two standard sizes, one having a suction box 30 in. wide by 150 in. long and a nominal rated capacity of 50 tons per day; and the other with two suction boxes in tandem, having a width of 42 in. and an aggregate length of 264 in., and having a nominal rated tonnage of 100 tons per day on average material. The area of the suction box is the measure of the capacity of the machine, and the suction fan must be so proportioned as to maintain a vacuum of about 6 oz., when handling approximately 4,000 cut. ft. of gases per minute, this being the average volume from each 100-ton unit. Such a fan, with short and straight pipes and running at about 850 rev. per min., requires from 25 to 35 hp. The sintering machine itself consumes about 1.5 hp., but 10 hp. is usually allowed for machine, conveyors, feeds, and mixers—in fact, everything except the fan.

Each sintering unit is self-contained and occupies space approximately as follows: 30 by 150 in. machine (so called 50-ton unit):

Length over all, 27 ft.
Width ... . 7 ft.
Height of top of hopper above foundation, 11 ft. 4 in
Units in battery may be set with 11-ft. centers.
Weight of complete machine, approximately 16 tons.

42 by 264-in. machine (so called 100-ton unit):

Length over all, 40 ft. 8 in.
Weight ... . 7 ft. 6 in.
Height of top of hopper above foundation, 13 ft. 9.5 in.
Units in battery may be set with centers 12 to 14 ft. apart.
Weight of complete machine, approximately 26 tons.

The grates are of the simple herring-bone pattern and are made of cast-iron. There should be very little breakage. The heat developed in the operation being internal to the ore mass, does not cause the pallets to become very hot, and there is but little damage from this source. Moreover, on account of the extremely slow movement of the mechanism, the wear and tear is very small. In one plant which was in steady operation for two years the average cost of supplies and repairs was from 2 to 4 cents per ton; 5 cents per ton will easily cover all ordinary contingencies. In many ways the excellence of this particular type of mechanism has been thoroughly demonstrated, and it may now be confidently stated that it is a simple, efficient, and workmanlike device for carrying out this special purpose, and can be adapted to almost any location.

Results with Flue Dust and Fine Ores

A number of iron bearing materials, of different kinds, were treated on this machine, and in each case with satisfactory results. Among them were two shipments of iron flue dust, which were widely different as to physical condition. One was the usual character of flue dust, which I shall designate as No. 1, while the other, No. 2, was extremely fine, 50 per cent. of it passing through a 100-mesh sieve; but the sintered product of each was not distinguishable, and both were ideal in size and structure for the blast furnace. There were no large and compact masses like the product from the briquetting process, nor was the material rolled together in balls from the size of a pea to that of a cannon ball, as in the revolving kiln; but, instead, the individual pieces were cellular, like open pumice stone or porous cinder, which helps materially towards economic reduction in the furnace, as a large area of contact is provided between the ore and gases.

In Schinz's book, "The Action of the Blast Furnace," published in 1871, a chapter is devoted to "area of contact." The opening sentence is as follows:

> A chemical action can only take place between two bodies, however great their affinity, if they are in intimate contact with each other, and the rapidity of this action will be so much greater, the more numerous the points of contact are.

In the Dwight and Lloyd method of sintering with a bed of material that is not disturbed or agitated during the sintering operation, the sintered product is all so cellular that a large "area of contact" is provided; and its reducibility is very great compared with the more massive agglomerated products, just as coke, by reason of its cellular spaces, burns more readily than anthracite coal, which can have only a superficial combustion. Although the product from the Dwight and Lloyd furnace in sintering flue dust is of a desirable size for blast furnace use, yet a fair proportion of the product would be suitable for use in the open hearth furnace.

In sintering materials which do not contain any heat producing substances, recourse can be had to the practice of the ancient Catalan or Corsican process, where carbon fuel was mixed with the ore, and which, in its first stage, was an agglutinizing process. In order to test the machine on this class of work, some magnetic concentrates were treated, after being mixed with 7 per cent. of coal, and the product was found to be satisfactory in every particular. The material was sintered into a coherent mass, but so open and cellular in structure that the mass, in discharging from the pallets, broke into very convenient sizes for the furnace, and without any fines. As the

mixture contained less carbon than the flue dust, it was sintered much more quickly. While in the test on flue dust, a travel of 12 ft. in the grate movement was required to complete the sintering, the concentrates were completed in a travel of 6 ft. This represents, in the treatment of magnetic concentrates, a greatly increased capacity for the machine.

Some Cuban (Mayari) iron ore was also treated on the machine after being mixed with 7.5 per cent. of coal and coke in alternate tests, and afterwards the ore was mixed with 10 per cent. of coal in one test and 10 per cent. of coke in another; but the use of 10 per cent. of fuel did not show any advantage over 7.5 per cent., nor were the results from coke any better than from coal. The sintered product resembled closely that obtained from the flue dust; there was very little fine material, and in fact no fines that would require retreatment. The sintered material was irregular in shape, with an average size of a hickory nut.

Analysis of Fine Material Treated

The following are analyses of the material treated:

Sample.	Fe Per Cent.	P Per Cent.	Mn Per Cent.	SiO$_2$ Per Cent.	Al$_2$O$_3$ Per Cent.	CaO Per Cent.	MgO Per Cent.	Carbon Per Cent.
No. 1. Flue-dust	46.06	0.194	0.54	9.68	3.00	1.80	0.83	17.00
Sintered product	57.90	0.260	0.66	12.30	3.95	2.00	1.20	0.60
No. 2 Flue-dust	46.43	0.123	0.60	9.88	1.72	2.00	1.44	13.75
Sintered product	58.84	0.150	0.75	11.81	3.05	2.50	1.71	2.10
Magnetic Concentrates	57.52	0.090	0.56	9.70	3.43	0.35	0.10	0.00
Sintered product	59.65	0.110	0.60	10.60	4.00	0.30	0.10	0.00

Sulphur.

	Per Cent.
Magnetic concentrates with 7 per cent. of coal	1.17
Sintered concentrates	0.0006

Sieve Test.

Sieve.	No. 1. Flue-Dust, Per Cent.	No. 2. Flue-Dust, Per Cent.	Magnetic Concentrates. Per Cent.
On 10-mesh	14.0	4.0	28.0
On 20-mesh	31.0	1.0	44.0
On 40-mesh	31.0	6.0	15.0
On 60-mesh	14.0	4.0	7.0
On 80-mesh	3.0	15.0	2.0
On 100-mesh	3.0	20.0	1.0
Through 100-mesh	4.0	50.0	3.0

	Ferrous Iron. Per Cent.	Ferric Iron. Per Cent.	Total Iron. Per Cent.
Cuban (Mayari) ore (dried at 212°)	0.63	47.80	48.43
Sintered product	6.67	44.30	53.97

Sieve-Test, Mayari Ore, Sintered.

	Per Cent.
On 2-mesh	53.88
On 4-mesh	16.33
On 8-mesh	23.35
On 20-mesh	4.33
On 40-mesh	1.12
On 60-mesh	0.51
On 80-mesh	0.02
On 100-mesh	0.14
Through 100-mesh	0.32

The physical structure of the sintered product varies under different conditions. Where there is a large amount of moisture and carbonaceous matter present, a corresponding shrinkage within the mass must take place as the volatile constituents are driven out, and this may cause the cake of sinter as a whole to break up into irregular shaped masses or fingers. The smallest of these pieces, however, have a cellular structure like popcorn, which is peculiarly desirable for the blast furnace. In the case of magnetite concentrates, where there is less internal shrinkage, the sinter comes off in slabs having an open structure.

The Cuban ore being the finest, the sinter was of a smaller average size than the magnetic concentrates, which were coarser and did not shrink so much in sintering. The flue dust being coarser than the Cuban ore produced a sinter about midway in size between the flue dust and the concentrates. The cohesiveness of the material is inversely as the amount of internal shrinking of the mass during sintering.

Advantages of the Process

Among the advantages observed in the Dwight and Lloyd process, the following may be noted:

1. The feeding of material to and discharge from the machine, without interfering with the continuity of the process.

2. The down-draft of air exerts pressure in the direction of the gravity of the mass, and prevents the displacement of particles.

3. The down draft of air intensifies the combustion at the beginning of the sintering, and towards the end of it operates efficiently to cool the mass.

4. The sintering operation is under constant observation during the whole period, and permits of rapid changes in adjustment.

5. The process can be stopped at any time to make any changes without interfering with or clogging any part of the apparatus.

6. The duration and activity of treatment are subject to ready control.

7. The adjustability of the process makes it adaptable to treating any class of fine material, without modifying the construction.

8. The withdrawing of the gases by a fan provides a heating medium for drying ores carrying a surplus of moisture.

9. There is no nodulizing of the sintered material, and the cellular structure, which is so important, is preserved.

10. The product is ideal in structure for use in the blast furnace, on account of the large "area of contact" provided, and its adaptability in size for distribution in and passage through the furnace.

Value of the Sintering Process

With the large productive capacity that has been built up in the iron and steel industry in the United States, matters of economy in production are now engaging the attention of the industry to a much greater extent than in the past. The most promising field for effecting economies therein, is in the manufacture of the basic metal—pig iron; here several avenues are still open for effecting great reductions in cost. A very important field to operate in is the treatment of the fine ores before being charged into the furnace. Twenty-five years ago the practice of charging large lumps of ore and stone and large pieces of fuel was discontinued, and the crusher came into general use for reducing these materials to a more uniform size, and with beneficial results in the furnace. The increasing use of the Mesaba ores has led to the other extreme in practice, so that the fine ores and the flue dust resulting from their use require an agglomerating process, in order to return to the ideal condition of material as it was "sized" by the crusher.

The use of very fine materials in the blast furnace has not been successfully worked out, and probably never will be in the modern blast furnace, and no time should be lost in adopting efficient and economical methods for treating these materials to make their use successful. The practice of recharging the flue dust as such, is considered by many a questionable one. Some furnace men hold the opinion that while the recharged flue dust is retained in large part in the blast furnace, it is nevertheless detrimental, as it tends to collect on the bosh walls, and causes frequent slips and irregular working. Because so much ore is saved from the waste, it does not follow that it represents a saving in cost of pig iron. The screening of coke to eliminate the fine pieces is certainly beneficial, but it does not seem logical to recharge the same kind of material when intermixed with fine ore, as in flue dust, into the furnace.

The actual amount of objectionable "fines" in the Mesaba ores represents only a small percentage; but its pernicious influence is out of all proportion to the amount involved. At some furnaces in England, where the fine material is screened from the ores and sintered, very beneficial results have been obtained.

When the screening of the fine material from the coke was first advocated, it was objected to by many, as representing a waste of fuel, although of poorer quality, that might have some value in the furnace; but now the economic value of the practice is fully appreciated. The same practice applied to ores, and sintering the fine material to prevent waste promises as great or even greater benefits.

The American Hoist & Mfg. Company, Hamburg, Pa., is making arrangements to move the plant to Lock Haven, Pa., and is now erecting new buildings, which will be completed within 60 days. The company will continue to manufacture a full line of chain hoists.

Specifications for Steel Axles and Shafts

Proposed Standard for Heat Treated Carbon Steel

Specifications for heat-treated carbon steel axles, shafts and similar parts were submitted to the recent annual meeting of the American Society for Testing Materials. They have since been referred to the membership for a letter ballot and are given below. The work of drawing up the specifications constituted a part of the studies of Committee A-1, of the society, William R. Webster, chairman.

1. Steel under this specification shall be made by the open-hearth or other approved process.

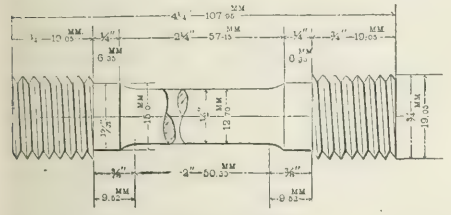
2. A sufficient amount of discard must be made from each ingot to insure freedom from piping and undue segregation.

Chemical Composition

3. The steel shall conform to the following limits in chemical composition:

Carbon	Not over 0.60 per cent.
Manganese	0.40 to 0.80 per cent.
Phosphorus	Not over 0.05 per cent.
Sulphur	Not over 0.05 per cent.

4. Drillings shall be taken from the crop end of one axle, shaft, or similar part from each melt represented,



Dimensions of Test Bar.

parallel to the axis on any radius one-half the distance from the center to circumference, to determine whether the chemical composition of the heat is within the limits specified in Paragraph 3.

In addition to the complete analysis, the purchaser has a right to call for a phosphorus determination, to be made from turnings from each tensile test specimen, and the phosphorus must show within the limits called for by Paragraph 3.

Physical Tests

5. The steel shall conform to the following minimum physical properties:

Ultimate strength, lb. per sq. in.	85,000
Elastic limit, lb. per sq. in.	50,000
Elongation in 2 in. per cent.	22
Reduction of area, per cent.	45

The elastic limit shall be determined by extensometer. Above 40,000 lb. per sq. in., each increment of load shall be not more than 1000 lb. per sq. in

6. The test specimen as shown by Fig. 1, 0.5-in. diameter and 2-in. gauge length, shall be used to determine the physical properties as specified in Paragraph 5. Tests specimens shall be taken from the crop end of one axle, shaft or similar part, from each treating-plant heat; if more than one open-hearth heat is represented in a treating-plant heat, a test shall be taken from each open-hearth heat represented. A full-size prolongation shall be left on each axle, shaft, or similar part.

7. A cold bend test shall be made from the crop end of one axle, shaft, or similar part, from each treating-plant heat; if more than one open-hearth heat is represented in a treating-plant heat, a test shall be taken from each open-hearth heat represented. The test shall be made with a ½-in. square specimen, not exceeding 6 in in length, around a flat mandrel with edges of ½-in. radius, and the specimen shall bend, without fracture, 180 deg. around the said mandrel.

8. Specimens for tensile test and cold bend test shall be taken parallel to the axis of the axle or shaft and on any radius one-half the distance from the center to the circumference.

9. In case the physical results obtained from any lot of axles, shafts or similar parts, do not conform to those called for by Paragraphs 5 and 7, the manufacturer shall have the privilege of re-treating such parts, from which new tests shall be taken by the purchaser, and these shall govern the acceptance or rejection of the lot.

Heat Treatment

10. Each axle, shaft, or similar part shall be allowed to cool after forging, shall then be re-heated to the proper temperature, quenched in some medium, allowed to cool, and then re-heated to the proper temperature for annealing.

11. Warped axles or shafts or similar parts must be straightened hot; that is, at a temperature above 900 deg. F., and before offering the parts for test.

12. All axles, shafts, and similar parts shall be free from cracks, flaws, seams or other injurious imperfections when finished. Those which show such defects while being finished by the purchaser will be rejected and returned to the manufacturer, who must pay return freight.

13. All axles, shafts, and similar parts must be rough-turned with an allowance of ⅛ in. on surface for finishing, except on collar, which is to be left rough forged. Turning must be done on 60 deg. centers with clearance drilled at point.

14. The heat number shall be stamped on the rough forged collar. After rough turning, the manufacturer's name, heat number, individual axle or shaft number, and inspector's mark shall be stamped at place indicated by the purchaser, except at any point between the rough collars.

15. The inspector representing the purchaser shall have free entry, at all times while his contract is being executed, to all portions of the manufacturer's shop which concerns the manufacture of material ordered. All reasonable facilities shall be afforded to the inspector by the manufacturer to satisfy him that the axles, shafts and similar parts are being furnished in accordance with the specifications. All tests and inspection shall be made at the place of manufacture prior to shipment and free of cost to the purchaser. The purchaser shall have the right to make tests to govern the acceptance or rejection in their own test-room, or elsewhere, as may be decided by the purchaser, such test, however, to be made at the expense of the purchaser and to be made prior to the shipment of the material. Unless otherwise arranged, any protest based on such tests must be made within six days, to be valid. Tests and inspection shall be so conducted as not to interfere unnecessarily with the operation of the mill.

Sample Book of Abrasive Disks.—To assist a customer in securing exactly the kind of disks he desires the Gardner Machine Company, Beloit, Wis., has brought out a sample book showing the various kinds of material and the different grades of the Gardner extra heavy coated abrasive disks for use on all disk grinders. These samples are mounted on 3 x 5 in. cards and include the two main lines of the company's abrasives for metal grinding, namely, Amalgite and Adamite, together with the garnet paper disks for finishing wood. Each leaf in the sample book contains a specimen of the abrasive measuring 2 in. in diameter together with its name and the special field for which it is best adapted. The company in bringing out this book had in mind the simplifying of orders for disks so that instead of ordering "fifty very coarse emery cloth disks for cast iron" the customer could word his order instead "fifty No. 12 Amalgite B disks" with the result that the manufacturer would know just what grade of abrasive was desired and in addition the purchaser might see just what kind of a disk he would secure. In addition to its factory at Beloit, the company maintains branch offices at Detroit, Cleveland, New York and Boston, where large stocks of all sizes, grades and materials are carried.

The new erecting shop to be built by the Hydraulic Press Mfg. Company, Mount Gilead, Ohio, will be equipped with a 20-ton crane, 40-ft. span and operated with three motors with 220 d. c. current. The building will be so located that a railroad track will run through one end of it, enabling machinery to be loaded into the cars in the shop. The present plant, which occupies a 14-acre site, consists of 13 buildings occupying 100,000 sq. ft. of floor space. The company reports that its business, which was dull the early part of the year, has been very good for the past 60 days, and that it now has the largest volume of orders in its history. The plant is being operated night and day.

Interest Charges and Profit

The Lack of Agreement in Determining Manufacturing Costs—Chart Showing Cost Distribution

A number of examples of a general character to indicate the different attitudes taken with regard to interest charges in determining manufacturing costs and profits is given below. They are taken from a discussion contributed by E. P. Roberts to a paper, entitled "The Design of a Factory System," by A. B. Roberts, presented in the Journal of the Cleveland Engineering Society. Besides the examples a chart is reproduced from the paper, showing at a glance the comparative importance as bearing on cost, of different phases of the work. The reference to this chart in the paper is as follows:

The stores keeper or stock keeper should keep a record of receipts and issues of material, so that a fairly accurate inventory may be taken at any time. From these perpetual inventory records summaries should be prepared periodically, preferably monthly, to show the distribution of all material issued.

From the progress tags daily production reports are prepared by the production or planning department to show the stage of completion reached by every order in the factory.

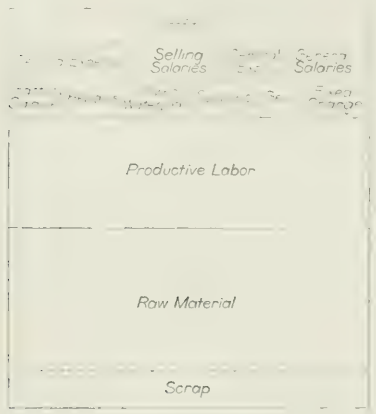


Chart to Show Distribution of Costs.

The timekeeper should prepare summaries showing the pay roll distribution for each pay period.

All summaries should be sent to the cost department, where the data can be assembled to show the cost per shop order or work order, the value of material in process, and the cost of goods shipped.

The cost department can then make out a report to the accounting department, giving totals only, so that a working balance can be prepared to show the gross and net earnings per month.

From the data thus given a chart can be prepared to show the percentage each item of cost bears to the total cost. It has been found that many accountants can read a chart of the nature of that shown more readily than one employing co-ordinates.

This chart shows which are the largest items of cost and indicates where savings of 1 or 2 per cent. will result in the greatest net saving. It will often happen that the addition of clerical help will effect savings in connection with scrap and other losses that will result in greatly increased profits.

What E. P. Roberts had to say in regard to the paper was, practically in full, as follows:

With reference to the rectangular diagram, the larger rectangle showing total cost and profit, and the smaller rectangles showing cost of various departments, and the upper one profit, it seems to me that it is particularly suited to the bringing out of an important point which is frequently overlooked; that is, the *comparative* importance of various departments as affecting *total* cost. It also shows that quite a large increase in the clerical force is justifiable if it results in only a slight decrease in the percentage of cost in other departments.

Relative to piece system of payment, the author calls attention to the advisability of not changing the rate after it has been established. In my opinion, such action has been one of the principal reasonable arguments that labor organizations have had for objecting to the piece system, or any system of payment other than on the hour basis.

Working Capital and Interest Charges

I consider the author's statement, that interest should not be charged as part of manufacturing cost, correct fundamentally, but owing to the fact that it is frequently done, and some authorities advise it, I think that the point might be elaborated, and also that the place for considering interest be noted.

What is the object of any cash investment?

To obtain interest on the investment.

What amount of cash investment is required for a manufacturing business?

First.—Construction Cost, which is the cost of the plant placed in position.

Second.—Working Capital, which is the amount required to conduct the business until such time as the cash returns from goods sold is sufficient to carry on the business, and this capital must be permanently maintained, and in addition thereto, there should be a reserve for contingencies, such as granting unusual credit or failure to collect. Among items requiring working capital are:

A—Labor—usually entire amount of payroll for considerable period.
Material—to a greater or less amount
Factory—overhead charges, such as:
Superintendence.
Factory office expense.
Taxes and insurance.
Maintenance, including supplies and labor for same.
Power, light and heat, including supplies and labor for same.
B—Selling Cost.
C—Advance payments required, or advisable, such as insurance, advertising, etc., discounting bills payable, etc. The items under this heading will really be distributed under A or B.
D—To purchase patents, or other special privileges, which have a lessening value as time passes until at the expiration of a certain period the value is zero.

How may such capital be obtained if a corporation is formed?

First.—The stockholders paying in the entire amount, or—

Second.—By bonding for part of the capital; the balance being obtained by subscription to common stock, or—

Third.—By bonding and obtaining the balance by preferred and common stock.

The cash invested is the same in any case.

How can the financing plan affect cost of manufacturing?

If the manufacturing concern is a firm, or a corporation with stock only issued, and all expenses are paid, cannot it continue in business even if no interest on investment is earned? It can.

Capital Charges and Cost of Manufacturing

If, however, 6 per cent. interest, or any other per cent. is charged as *part of the cost* and on such basis the cost is not earned by an amount equal to interest, which has been charged, has an actual loss been sustained? It has not.

Why not ascertain net profit above actual zero instead of above some higher point—arbitrarily taken.

If a company requires $100,000 capital and can obtain it by selling $125,000 par value of stock at 80, or by selling $50,000 bonds at par and $100,000 stock at 50, does that affect *cost of manufacturing?* Not at all.

If the capital required is $150,000 cash and $100,000 is required for plant cost and $50,000 for working capital, and 6 per cent on $100,000 is charged as part of the manufacturing cost, should not 6 per cent on $50,000 be charged somewhere?

If so, to what shall it be charged?

If a portion of the $50,000 is required to carry customers' accounts and, owing to change in business conditions, instead of having to carry same as long as previously—cash on delivery is obtained, has the manufacturing cost been reduced? Not at all. The cash required in the busi-

ness is less, and, therefore, if the investment be reduced, any amount available for dividends would be a larger percentage.

If the reverse conditions arise and more time has to be given and additional working capital thereby necessitated, has the manufacturing cost increased?

If there are two companies, one manufacturing and one selling, which one would benefit, or lose, by the conditions stated above?

Ex: If $150,000 is required—
$100,000 for plant,
$ 50,000 for working capital,
$50,000 obtained from bonds at par at 6 per cent = $3,000 interest; 6 per cent is charged on $100,000 (plant cost) as part of manufacturing cost.

If after paying interest on bonds there remains *according to the books* zero profit?

Is not the $6,000 charged to interest on plant in the treasury and available for dividend?

Have not the stockholders made 6 per cent on *their* equity, the $100,000 investment?

The manufacturing account would show no profit to the stockholders.

The amount of the investment, or the interest on investment, should receive consideration when comparing various possibilities or actualities.

For example: If two plants manufacture the same class of goods at the same cost, exclusive of cost of plant, and are of the same capacity, and one plant cost was $100,000 and the other $150,000 and only half the goods can be sold and it is decided to shut down one plant, decision will not be made on the basis of what the plant *did* cost, but for other reasons, such as transportation charges, labor, market, etc.

But if the question is which of such two plants *shall be* built, then the one which will cost the least is evidently the better investment if other factors are equal, as it is not a question of cost of manufacturing, but of investment required.

Factors Involved in Purchasing a Shop Tool

In other words, the question of investment and interest on same is a comparative one, actual or suppositious.

For example: If the question arises, will it pay to purchase an expensive tool to do certain work previously done by hand labor, the factors to be considered are:

First.—How much less will the labor charge be per unit passing test.

Second.—How will it affect cost of material per unit passing test. This and the foregoing include consideration of scrap and net cost of such scrap.

Third.—The maintenance and depreciation charge against the tool.

Fourth.—Cost of power required—additional or pro rata, as the case may require.

Fifth.—Charges other than interest on additional space.

Sixth.—Cost of additional heating and lighting.

Seventh.—Additional cost, if any, of overhead charges of other nature, such as superintendent, factory clerical force, etc. But usually such overhead charges would not be a factor.

After ascertaining comparative cost per unit on such basis, and number of articles turned out per year, the net saving, if any, is shown, and such net saving is the net earnings on—

Cost of the machine, plus power equipment, plus space required, plus any other construction charge.

The above principle applies to comparisons between departments, or complete plants.

A company has two plants manufacturing similar articles and comparison is desired

First.—On manufacturing cost—ready to ship.

Second.—On cost at market.

Third.—On capital required to conduct each.

The transportation charges (second) affect net results to company but are they part of manufacturing cost?

If a company is able to change from a long-credit system to practically a cash basis, has it changed the cost of manufacturing?

Such change would lessen investment required and the same net profits would give a greater rate of interest, but the *plant* investment would not be reduced.

New Goulds Centrifugal Pumps

The Goulds Mfg. Company, Seneca Falls, N. Y., has recently placed on the market a new and improved line of centrifugal pumps which can be furnished in both the single-stage single-suction and single-stage double-suction types. Both classes of pumps can be arranged for belt or direct connection to electric motors, gas, gasoline or

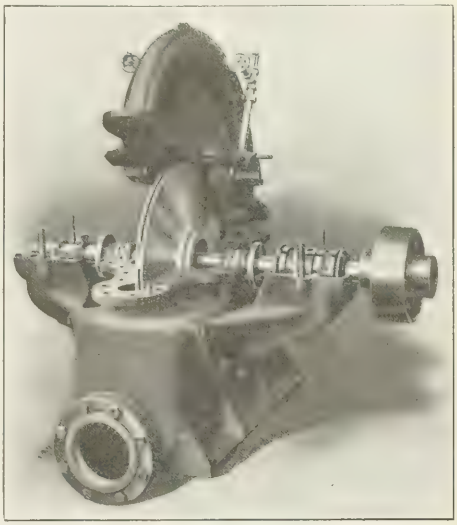


Fig. 1.—The New Single-Stage Double-Suction Centrifugal Pump Built by the Goulds Mfg. Company, Seneca Falls, N. Y.

steam engines and steam or hydraulic turbines. The double-suction pump is illustrated in Fig. 1, while the single-suction pump directly connected to an electric motor is shown in Fig. 2.

In double-suction pump, illustrated in Fig. 1, the casing proper consists of two castings bolted together on a horizontal joint, the point of division being clearly shown. The type of construction was employed to secure access

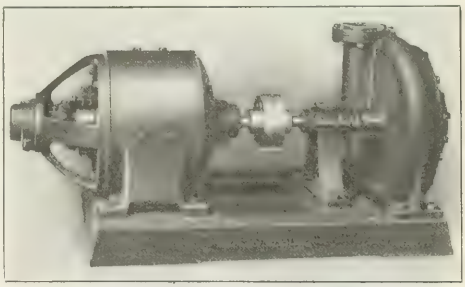


Fig. 2.—The Single-Stage Single-Suction Pump Direct Connected to an Electric Motor.

to the interior parts of the pump for easy inspection without disturbing the pipe connections. The impeller is of the inclosed type and is said to develop an exceptionally high efficiency when operated against heads having a maximum of 150 ft. The bearings are of the ring-oiling type, are independent of the stuffing boxes and have removable shells lined with anti-friction metal. Brass water sealing rings are provided for the stuffing boxes of both pumps.

The impeller of the single-suction pump illustrated in Fig. 2 is of the open type. This part is accurately machined in order to minimize the clearances between it and the side covers, a feature which plays an important part in securing high efficiency. A feature of the impeller is that the end thrust has been almost entirely eliminated. The maximum head against which the single-suction pump will operate is 100 ft.

Sprinklers in Knock-Down Form

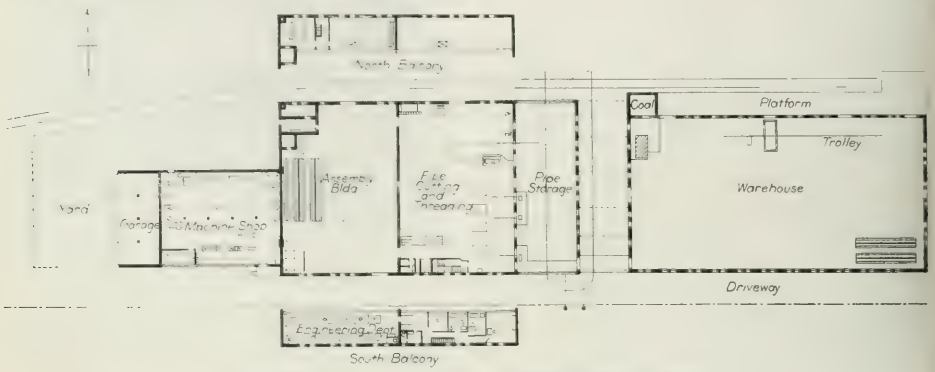
How the Rockwood Sprinkler Company Has Arranged and Equipped Its Chicago Works

A factory for turning out the parts of an automatic fire-extinguishing sprinkler system ready to erect has been built in Chicago by the Rockwood Sprinkler Company. Besides the interest which lies in the method of installing sprinklers, the works for handling the pipe, fittings and devices is unusually instructive. Continuous movement of material from department to department, economical and modern methods of handling the work and attractive and safe surroundings for the work people have been emphasized. The accompanying plan and reproductions of photographs taken in the factory will help in gaining an idea of the features contributing to efficient operation.

The plant covers an area of 450 by 114 ft. The output consists of complete automatic sprinkler equipments in knock-down form, and the fundamental idea in establishing the plant was to permit the building and assembly of a sprinkler equipment in all its many parts at the works and to ship it complete in a knocked-down form ready for installation by a traveling construction crew. The initial step in such work is the preparation of detailed working plans made from careful survey of the manufacturing, mercantile or warehouse property to be protected. Such plans show the pipe lines, every piece of pipe dimensioned, and also locate all the special fittings, valves, devices, etc., together with air compressors, tanks, towers and pumps.

The shop orders, with various parts classified for different departments, cover necessarily a wide range of material, and for the average equipment, say one requiring 1000 sprinklers, may total a full carload of 30,000 lb. A large plant or group of buildings will take possibly 20 cars of manufactured material. For much material the plant is solely a distributing station. The assembled material includes cast-iron, bell and spigot pipe and fittings, cut and threaded steel pipe and long and short turn water fittings, pipe hangers, valves of many types and sizes, tank, hydrants, slip joints, pumps, compressors, special automatic sprinkler devices, etc.

The several buildings are named on the ground plan. Adjacent to the garage are a cast-iron pipe yard and a steel-pipe storage, while a roomy yard for rough fittings storage is provided alongside the machine shop. The balconies shown are used for shop offices, sprinkler engineering department and also for storage of brass goods, road tool storage, repair department, etc. A brick tower supporting a sprinkler tank is equipped with two fireproof storage vaults.



General Plan of Chicago Works of the Rockwood Sprinkler Company.



Method of Unloading Pipe.

The warehouse, pipe and assembly buildings have girder-supported roofs without interfering columns, which would prevent easy handling of pipe. Areas requiring special light have saw-tooth windows. The machine shop has Detroit Fenestra frames and wired glass in metal frames is used throughout. Kinnear rolling shutters protect openings between buildings and are also used in ends of pipe storage building which open up to permit passage of crane with its load. Storage bins for fittings, nipples and parts, as used throughout the several buildings, are of steel, built at the Lyons Metallic Mfg. Company, Aurora, Ill. Tungsten lamps arranged in clusters furnish light. The fire protection equipment is complete, consisting of the Rockwood system, with hose connection to standpipes, steamer connections and 20,000-gal. gravity tank and filling pump.

Electric power is furnished by the Sanitary District of Chicago and is reduced from 10,000 volts through the customary static transformer. All larger machines have direct motor drive, while the group system is used to some extent in the machine shop. A Pawling & Harnischfeger electric traveling crane, with Cutler-Hammer Clutch Company's lifting magnet, is used for unloading and handling materials. A hinged extension of the trolley track overhangs the private railroad spur, and the crane serves the steel pipe storage building as well as cast-iron pipe yard and is used also for loading vehicles. A Westinghouse motor generator transforms the current from alternating at 220 volts, three-phase and 60-cycle to direct at 220 volts for the magnets.

It may be here mentioned that this plant is in the central manufacturing district of Chicago, on the Chicago Junction Railroad, and has transportation service which

the Junction road's direct connection affords with the 33 trunk lines entering Chicago. All steel pipe is received loaded lengthwise in gondola or flat cars, from which it is carried by the magnetic lift direct to the storage building. A special compartment is provided for each size and the building has some 20 carloads' capacity.

Passing endwise directly to a series of rapid roller cutters, with measuring gauge attached, the proper lengths are secured and again without change of direction the pipe passes to a battery of threading and reaming machines made by the Murchey Machine & Tool Company, Detroit. The smaller sized machines have double heads and operate at high speed. For larger sizes of pipe single head Bignall & Keeler machines are used and a cutting device is attached. A trolley and lift for handling the pipe easily are installed over machines threading pipes 5 in. and larger. All sizes of both cutting and threading machines are located opposite their respective sizes of pipe in storage bins and the minimum of handling results throughout the entire preparation of the pipe. All machines so far mentioned have separate direct motor drive.



Pipe Storage, Showing Magnetic Trolley Hoist.

The pipe is now placed on trucks and after bundling and tagging is wheeled directly to the loading car. The bundling provides that the several pieces of a sprinkler line (the branch pipe extending from a cross main with openings for sprinkler heads up to eight in number) as required in accordance with the plan of installation, are tied together and marked for final location in the building under course of protection. This tag may, for example, read: "Building C, fourth floor, third bay," and upon arrival, the bundle is immediately moved to its destination, saving much time on the job.



View in the Pipe Shop.

The machine shop equipment affords economy of operation. Here are employed Baush multiple spindle high speed drills and Dreses tapping machines equipped with special rotating chuck and collapsing taps. There are also facing, shaping and testing machines, as required for the special product, like valves, fittings, etc., having many flanges. The entire plant impresses one as unusually complete in its minor equipment, having devices which



Drilling and Tapping in Machine Shop.

make for accuracy and economy of manufacture and for the welfare of the workers.

Because of the bulk and weight of materials, all the work is done on one floor, which is unusually light and pleasant. H. M. Pulsifer, president of the company, member of the American Society of Mechanical Engineers, designed the plant. It is understood to be the only specially constructed plant for the manufacture of fire protective equipment in Chicago or the middle West. The results of operation have proved, it is asserted, that a plant of its size, through consideration of every detail in its planning and operation, may get those benefits of a well



Sprinkler System Assembly Room.

perfected shop system which are generally supposed to accrue only to large establishments.

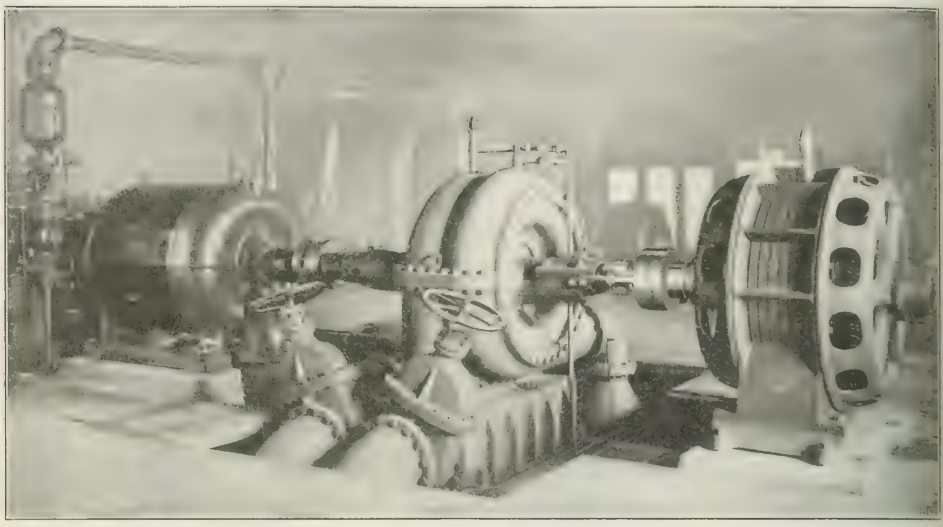
The Rockwood company, having solved to its satisfaction the details of this work, is now proposing to repeat the pipe-cutting plant in the several centers covering the territory in which it operates and it will probably make St. Louis the site of the next plant, the business having increased considerably within the past year in the central South. The executive offices of the company are in Chicago.

The McLauchlin patent steel conveyor cleat is now made by the American Supply Company, Commerce street, Mobile, Ala. It comprehends the use of angles fixed at desired distances to a chain, the angles lying perpendicularly to the direction of the chain, which is hauled in say a trough. The angles sweep the trough, catching the articles to be conveyed. The feature of the cleat is the way the angle is fixed in a link of the chain without rivets or bolts.

Minimizing Peak Electric Loads

Steam or Electric Pump Driving According to the Season

A method of solving the peak load problem has been devised and put in successful operation at the municipal lighting and water works plant, Lachine, Que., Canada.



An Electric Motor and Steam Turbine Driven Pumping Installation Made at Lachine, Canada, by the John McDougall Caledonian Iron Works Company, Ltd., Montreal, Canada.

The city purchases current on a peak load basis, that is, pays for a certain fixed amount of current which cannot be exceeded, but must be paid for whether entirely used or not. The amount of current purchased is sufficient to light the city and operate the pumping station at all times except during the three winter months, when the lighting load is the heaviest. A pump is utilized to provide water supply and fire protection for the city, the pressure being ordinarily 80 lb. per sq. in., while that for the fire service is 40 lb. higher. Calculations showed that operating the pump by steam for four or five hours each day during the winter months would be cheaper than buying sufficient additional current for entire electrical operation. A contract was accordingly placed with the John McDougall Caledonian Iron Works Company, Ltd., Montreal, Canada, covering the installation of a 14-in. two-stage, 5,000,000-gal. Worthington turbine pump, a 400-hp. steam turbine built by the Kerr Turbine Company, Wellsville, N. Y., and an Allis-Chalmers-Bullock motor of the same size.

In addition to securing a lessened cost of operation, another advantage derived from this combination was a reduction in the insurance rate on the pumping station. It was decided to install the pump for operation by the induction motor for the greater part of the time, while the steam turbine was to be used during the peaks in the lighting load in winter and in case of any trouble with the motor. This arrangement was made possible by the use of two clutches on the shaft which are located on either side of the pump, the arrangement being indicated in the accompanying engraving, which shows the pump being driven by the electric motor.

One of the special features of the turbine pump is the use of a double suction which is patented by the contractor, the John McDougall Caledonian Iron Works Company, Ltd. By an ingenious application of the double suction it is possible to operate the same pump for either fire or domestic purposes at two different pressures, namely, 120 lb. per square inch for the former and 80 lb. for the latter, and still maintain the pump speed constant. The pressure for domestic purposes is secured by closing one valve and operating only one stage of the pump, thus changing it in reality from a two-stage to a single-stage unit. For fire service, where the higher pressure is required, both of the gate valves shown in the engraving are opened, and both stages of the pump are used. Another feature of the unit, which has a capacity of 5,000,000 Imperial gal., or 6,000,000 United States gal., per 24-hr. day, is the use of a split casing. In this way the chambers and the impellers can be examined without moving either the electric motor or the steam turbine. Ordinarily access to the interior of the pump is secured by removing the outer head, but this was out of the question in this instance as there was a prime mover on either side of it.

A New Pratt & Whitney Vise

Recently the Pratt & Whitney Company, Hartford, Conn., has placed upon the market a new type of quick-acting manufacturers' vise. The appliance has been given a very extensive trial by the maker on milling equipments

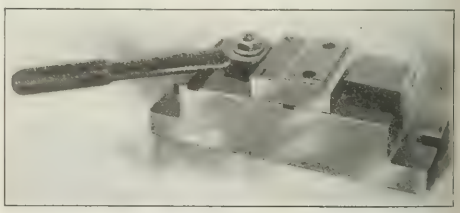


Fig. 1. -The Single Type.

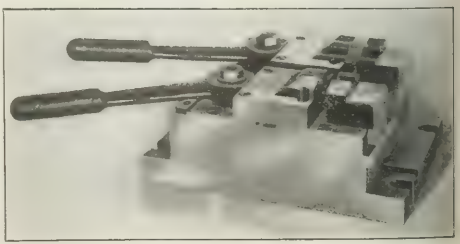


Fig. 2.—The Double Type.
The New Quick Action Manufacturers' Vise Made by the Pratt & Whitney Company, Hartford, Conn.

designed especially for gun work and has been very satisfactory. Two styles of vise are made, a single and a double one in different sizes for use in connection with maker's hand, No. 2 column power and Lincoln milling machines. Figs. 1 and 2 show the two styles, while the method of application of the vise is clearly illustrated in Fig. 3.

The design is very compact and in operation it has practically the rigidity of a solid casting. In use the action of the vise is directly opposite to that of the ordinary screw type. The outer jaw is the movable part and the inner one, against which practically all the working strains come, is

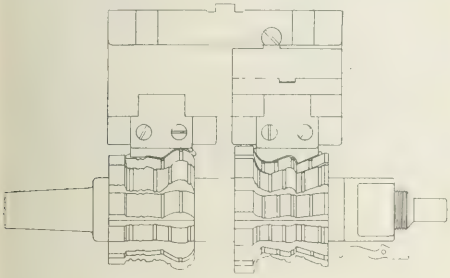


Fig. 3—Method of Application of the Vise.

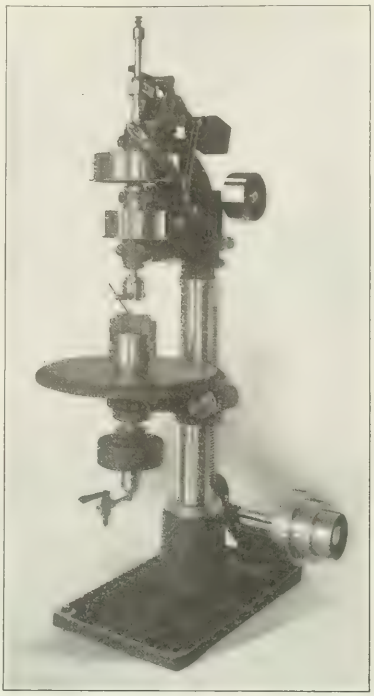
bolted stationary. A steel forging is used for the outer jaw holder which passes underneath and is supported by the stationary jaw. A hardened cam which is forged integral with the operating lever actuates the outer jaw holder, the cam being of such a shape as to give a wide jaw opening combined with a rapid and efficient binding action. The vises are regularly furnished without jaws, but can be arranged to accommodate a large variety of work easily by the use of special jaws, the construction of the vise being such as to permit their easy removal and insertion. In the double vise one of the sets of jaws is supported by a wedge, which also provides a vertical adjustment to compensate for any variation of the milling cutters due to uneven wear.

The Garvin Automatic Tappers

Two more machines have been recently added to the line of automatic tapping machines made by the Garvin Machine Company, Spring & Varick streets, New York City. Both are modifications of the company's standard No. 2 tapper. One, which is not shown, is designated as the No. 2 back-geared type, while the other which is known as the No. 2-A tapper possesses extra capacity as compared with the standard machine. The special features of the 2-A machine are the use of a special chucking arrangement mounted on the table and the ability of the tool to operate satisfactorily at high speed and to trip and reverse after being set, although the operator should continue to depress the starting lever.

The capacity of this new machine is ¼ to ⅞ in. in cast iron, and ¼ to ¾ in. in steel. Pipe taps up to the ½-in. size can be satisfactorily handled in cast iron, while for steel the maximum size is ⅜ in. less. A continuous belt drives the two friction pulleys with which the spindle is fitted in opposite directions, while a friction clutch keyed to the spindle is located between the pulleys. This clutch is connected with a lever at the right by a toggle arrangement, which can be adjusted to give the desired tension, so that an extra safety device to prevent the breakage of the taps is not required. This lever at the right controls the starting and the stopping of the tap which can also be tripped and reversed automatically at any point by an adjustable screw stop on the upper end of the spindle coming in contact with the tripping lever on the top of the machine. The spindle is balanced and fitted with a positive drive chuck for holding the taps.

The special chucking arrangement which is mounted on the table consists of one of the maker's standard automatic wrenchless two-jaw air-operated chucks of the type illustrated in *The Iron Age*, March 9, 1911. By using this style of chuck the productive capacity of the machine is greatly increased since there is no time lost in clamping and unclamping the parts being operated on. Moving the air valve in one direction causes the chuck jaws to open instantly, while a turn of the valve in the opposite direction grips the work securely. The tap is started for a couple of threads by the hand lever after which no further attention



The No. 2-A Automatic Tapper with Wrenchless Air-Operated Chuck Built by the Garvin Machine Company, New York City.

is required, as the tool will go to the bottom of the hole, trip and return automatically.

The capacity of the back-geared machine is from ½ to 1¼ in. in cast iron, ½ to 1 in. in steel and ¾ and ½ in. pipe taps in cast iron and steel respectively.

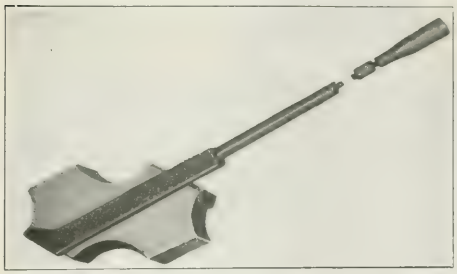
Automatic Sprinkler Efficiency.—Statistics recently compiled by the National Fire Protection Association show that of 11,257 fires in buildings equipped with automatic sprinklers the protection was successful in 95.01 per cent., or 10,695 instances. In these cases the sprinklers either extinguished the incipient blaze or held it in check, the operation of a single sprinkler head being sufficient in 3286 fires. In 6146 blazes two or three heads put out the fire before a larger number were opened by the heat. Approximately 59 per cent. of the fires occurred during the daytime or between the hours of 6 a. m. and 6 p. m. and 6 per cent. were discovered by employees. The failures or unsatisfactory fires in buildings equipped with automatic sprinklers, which amounted to 4.99 per cent. of the entire number reported, were for the most part due to preventable causes.

The W. R. Beatty Machinery & Equipment Company, dealer in new and second-hand machinery, specializing in forging equipment, has moved its office from 30 Carson street to 907 People's Bank Building, Pittsburgh, while its warehouse will be continued at the first address. Wm. R. Beatty, manager, will devote most of his time to the business of the Blaisdell Machinery Company, Bradford, Pa., builder of air compressors, he being its representative in the Pittsburgh district.

The Asbestos Protected Metal Company, formerly of Canton, Mass., which early this year moved part of its plant to Beaver Falls, Pa., has recently brought the remainder of it to that place. The company manufactures a patented asbestos covered metal, used for weatherproof skylights, roofing and siding, and is running full time.

The Heely Boiler Tools

Under patents recently granted to Patrick Heely, the Heely Tube Spreader Company, 340 Broadway, New York City, is manufacturing two new types of boiler tools, one



A New Tool for Placing Baffle Brick in Position in Water Tube Boilers Made by the Heely Tube Spreader Company, New York City

for spreading the tube and the other for placing the baffle brick in position, the latter being the one illustrated. The efficiency of water-tube boilers is maintained in part by keeping intact the baffle walls which deflect the hot gases. As these walls are built of fire brick between the tubes when the boiler is being erected, it is a difficult matter to replace the brick when it disintegrates or it is removed to insert new tubes. Formerly it was necessary to employ split brick or chip the edges to upset the new brick into place when making repairs.

The general construction of the two tools is the same. Each has a movable head which is operated by a threaded stem that screws into a nut on the inside of the handle, and is controlled by a rod on the end. The working heads of the spreader are provided with large faces to prevent injury to the tubes. When this tool is used in conjunction with the one for replacing the baffle bricks it is a simple matter to remove an old baffle wall and replace it with new bricks. The head of the tool employed for replacing the fire brick has four gripping jaws which hold the brick. The tool is inserted between the boiler tubes, and when it reaches the proper location the movable jaw is drawn back through the action of the rod and the tool removed, leaving the brick in place in the baffle wall.

The Pusey & Jones Company, Wilmington, Del., has brought out a new monthly house organ entitled the Super-Calender. It is devoted to the paper-making machinery manufactured by this company. Mention is made of the quick building and erection of a complete Fourdrinier manila paper machine. The order for the machine, which was to have an output of not less than 60 tons a day, was received January 23, 1911. The erection of the machine was begun on April 30 and on June 3 it was ready for operation at the Fenimore Mills of the Union Bag & Paper Company, Hudson Falls, N. Y. Approximately 700 tons of raw material was converted into a paper machine and erected in place in 120 days.

An Improved Corliss Valve Gear

A Recent Type Developed by the Bates Machine Company

A new type of admission valve mechanism known as the inertia gear has been developd by Ernest A. Moore, chief engineer of the Bates Machine Company, Joliet, Ill., and is now being regularly used on all the Corliss engines built by the company. This mechanism is said to overcome the inherent faults in the existing types of admission valve gears, the special differentiating feature being that the disengaging parts instead of being forced into and held in their path by springs, rollers or other devices travel in the desired path by the natural force involved in the movement. Fig. 1 shows an engine equipped with this new type of valve gear, while Fig. 2 is a view of the gear, and Fig. 3 gives details of it.

Referring to Fig. 3 the dash pot arm *a* is in the form of a bell crank, one arm carrying the dash pot *b* and the other the latch block *c*. This arm is keyed to the valve stem *d*, and a sleeve on its inner side fits into a bored recess in the steam bonnet, thus giving an ample bearing surface. The steam arm *e* is driven by the valve rod *f* in the usual way, and has a large bearing surface on the bonnet. The latch shaft *g* is carried by a substantial boss on the steam arm, and the knock-off bar *h* is firmly mounted on the inner end of this shaft, the two parts thus forming practically a solid piece of metal. The knock-off ring *i* carries the knock-off cam *j*, and is controlled by the governor rod *k*. A safety cam, which comes into operation only in the event of some accident to the governor, is also mounted on the knock-off ring. When an accident occurs this cam is thrown into such a position that the valve cannot be opened.

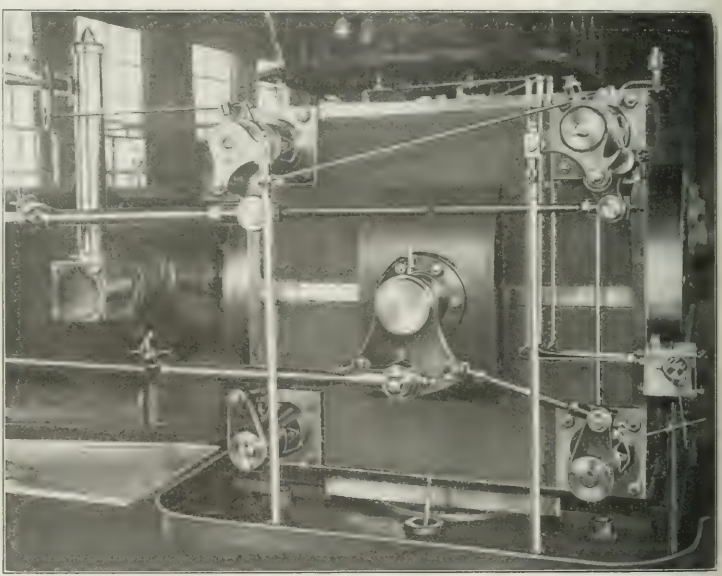


Fig. 1. A Corliss Engine Equipped with a New Type of Valve Gear Made by the Bates Machine Company, Joliet, Ill.

In opening the valve in operation the valve rod moves to the left and the latch shaft engages with the block in the position shown in Fig. 3. It continues in this path until the knock-off bar comes into contact with the knock-off cam, when it is forced outward, thus raising the latch until the block is released. At that instant the dash pot comes into action and returns the arm to which the block is attached to its original position. The follower pin is fastened firmly to the steam arm, and acts only when the dash pot fails to close the valve. The construction and the balancing of the latch shaft and the knock-off bar attachment are such that the inertia due to the reciprocating motion and the weight of the parts insures an automatic latching action between the shaft and the block at

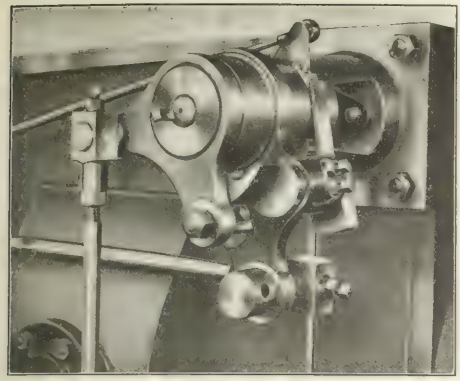


Fig. 2.—The New Valve Gear.

the end of the return stroke without employing a spring or mechanical device of any kind, and in turn assists the unlatching at the point of cut-off, thus reducing the reaction on the governor. The depth of the latching and the amount of clearance of the block can be set to any desired degree of precision by two adjusting screws while the engine is running at full speed.

The dash pot now used on the Bates Corliss engine is also of a special design, and quick action, noiseless operation and durability are claimed for it. It is made without packing or leather of any kind, and is set beneath the soleplate, while the manner of cushioning enables it to act over a wide range of lifts without necessitating readjustment. The dash pot cylinder and the plunger are of two diameters, ground to fit each other. When the plunger is at its lowest position there is an annular internal chamber which is full of air, and a passage is

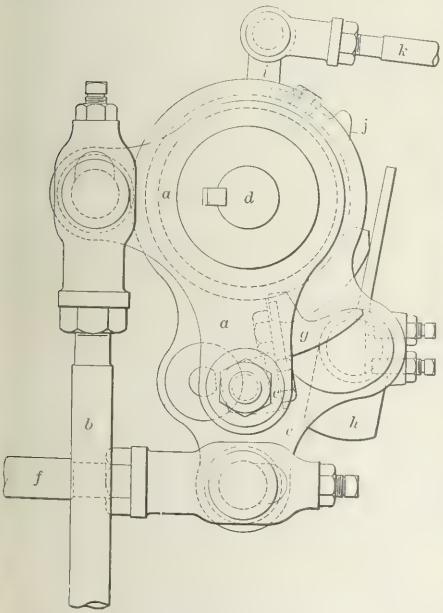


Fig. 3.—Details of the Gear.

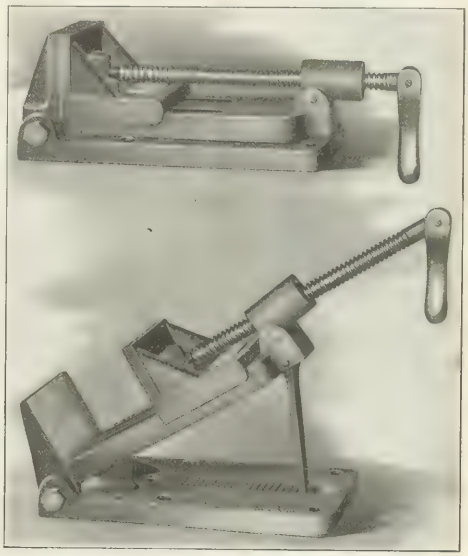
provided from this chamber to a point below the plunger, the area of this passage being varied by a needle valve to regulate the amount of air transferred to the lower chamber. In operation the air is expelled from the annular chamber to the vacuum chamber below the plunger in exact proportion to the lift of the dash pot, the air transferred forming a cushion. In this way the cushioning effect is always proportionate to the work, and the air is driven back and forth within the dash pot without noise, instead of escaping to the atmosphere with a hissing sound.

In addition to the changes in the valve gear and the dash pot other changes recently made in the design of the Bates engine have been made which had for their object the keeping in line as far as possible all the working strains in the valve drive, and the drives for both the steam and the exhaust valves are fitted with a telescopic detaching device to enable the valve gear to be worked by hand when necessary. Another improvement was the use of a heavier casting for the engine frame and the employment of the full Tangye type of construction.

The Schulz Tilting Vise

For use on a drill press, shaper or miller, F. A. Schulz, 218 North Jefferson street, Chicago, Ill., is manufacturing a quick-action tilting vise which in many cases will also take the place of several jigs for different operations. The vise is adjustable to a number of positions at angles varying from 0 to 45 deg., while the maximum opening of the jaws is 10 in., the limits of the tilting and the opening of the jaws being shown in the two portions of the accompanying engraving.

The vise is said to be simple in action and the adjustment is practically instantaneous. A clutch nut is pro-



A New Quick-Acting Tilting Vise Made by F. A. Schulz, Chicago, Ill.

vided for opening the jaws, and a quarter turn of the former is sufficient to release it and permit the screw to slide forward and backward freely. In addition to being adapted for drilling and facing operations, one size of vise is suited for attachment to hack saws where mitre work is being done. In addition to the regular type of jaws removable tool steel V-shaped jaws can also be furnished. Three sizes in all of vise are manufactured, the weight varying from 20 to 75 lb.

Repairs are being made to the De Bardeleben furnaces of the Tennessee Coal, Iron & Railroad Company, at Bessemer, Ala., and both stacks will be ready for operation at an early date.

The Kilby Locomotive & Machine Company, Anniston, Ala., has leased the plant of the former Western Steel Car & Foundry Company, located in that city, and is now operating part of it in the construction of locomotives and mine equipment.

The Warren Iron & Steel Company, Warren, Ohio, has increased its capitalization from $100,000 to $200,000.

New Tools and Appliances

This is essentially a news department for which information is invited.

Safety Device for Stamping Presses.—The W. H. Hibbard Mfg. Company, 79 Washington street, Brooklyn, N. Y., is manufacturing under patents granted to Mr. Hibbard a safety device for stamping presses which is designed to prevent the operators from having their hands or arms injured by not moving them quickly enough from below the slide of the press. This device consists of a guard in the shape of a rod or any other desired form which moves across under the slide toward the operator during the descent of the latter and pushes the arm or hand out of the way. When the slide is in the upper position this rod is in the rear of the path of the slide and above the bed plate. As the slide descends the bracket and the arm supporting the guard are carried downward by the slide and the arms are rocked forward through the action of links so that the rod is driven forward below the slide and forces the hand of the operator out of danger. When the slide returns to its upper position the arms move in conjunction with it and the rod is carried to its position in the rear of the slide.

A Three-Spindle Vertical Miller.—Hanford & Barkely, Rochester, N. Y., have recently built a vertical three-spindle milling machine which has a rather novel construction and also a great capacity for the production of parts requiring surface milling. The machine consists of a cylindrical base having a circular horizontal table with one T-slot and a vertical cylindrical table with two T-slots. The three spindles with their driving mechanism are located above the table and are spaced at equal distances. The electric motor supplying power to the machine is located over the three spindles and its shaft is directly connected to the vertical driving shaft by a sleeve. The three cutter heads are driven from a single worm cut on this shaft through three worm gears running in oil. From this point the drive is through a set of bevel gears, the driven one being splined onto the cutter-head spindle. A hand wheel enables each cutter head which has a long bearing surface to be adjusted for hight. Power for the table feed is transmitted to the platens by the vertical shaft running direct from the motor, the connection being through a worm and worm gear to a cone of three change gears, and thence through spur gears to a worm which in turn meshes with a 48-in. gear bolted to the bottom of the horizontal platen. A feed range of from 4 to 11 in. per minute measured at the circumference of the 60-in. horizontal platen is available. In operation fixtures are fastened to one or both platens and as many as can be located around the machine are used. On account of the spacing of the cutter heads at 120 deg. one or more fixtures will always be in the opening between two adjacent heads, and work can be removed and other work substituted before the fixture comes under the next working head, an arrangement which eliminates all loss of time. The heads can work continually, and the operator does not have to wait for the pieces to come from under the heads, as there are always one or more fixtures ready to receive new work. This machine has been given a trial of making car journal boxes and the average production is very nearly one box per minute, which is a marked increase over the old method of machining on a rotary side planer which had a capacity of about 450 pieces per day.

Horizontal Boring Machines.—An addition to the line of drilling and boring machines made by the Rockford Drilling Machine Company, Rockford, Ill., includes a horizontal boring machine and a double-ended machine that is especially adapted for boring the crank shaft bearings of gasoline engines. In the former machine a screw and hand wheel are employed for traversing the column instead of a rack and pinion. This screw is double threaded, which gives a quick movement to the column, and its use instead of the rack and pinion makes it possible to apply power feed for the traverse movement if necessary. The machine table is solidly supported by the bed, and the projecting end has a bracket to prevent any possibility of springing. The machine is belt driven by four-step back geared cone pulley, giving eight speed changes. Bevel gears transmit the power to a vertical shaft, which in turn connects through a second set of bevel gears with an intermediate shaft carrying a pinion that meshes with the large spur gear of the boring bar. A positive geared feed which is similar in principle to that applied to the company's upright drills is used, the feeding movement being taken from the spindle and transmitted through a gear box to worm gearing located at the right of the saddle. This box contains a cone of four gears and a tumbler gear mechanism controlled by a lever. The two boring heads or columns of the second machine are rigidly held together by a tie bar extending from one to another at the top. The boring heads cannot be adjusted on the bed, as is the case with the other machine, there being simply a vertical adjustment for the saddle. For locating the boring bars accurately when boring the bearings of different sized engines special index plates which are attached to the saddle are used. These plates contain a number of holes and are fitted to the saddle by inserting plugs through the holes of the plate into a second series of holes in the column. For finishing engine cylinders which require tapping operations on the upper part of the casting the regular sliding head drill press without the arm and the table is placed at the rear of the machine. The base of the press projects beneath the base of the boring machine and a rotary table can be placed upon the machine table for holding the jig containing the gas engine casting. If desired, a regular gang drill head of the proper size can be placed on the subbase of the horizontal machine.

Flexible Shafting Coupling.—For connecting two shafts set at an angle to each other or shafts out of line in varying degrees the Victor Appliance Company, Watervliet, N. Y., has recently produced a flexible coupling that is entirely devoid of externally projecting parts. In the construction of this coupling bolts and screws have been entirely dispensed with and the coupling can be readily dismounted without disturbing the bearings and alignment of either shaft by simply pressing a spring plunger which releases the housing. For oiling this plunger is depressed and the oil or other lubricant placed in the opening thus formed. There is a large cavity around the body and underneath the housing from which this lubricant is automatically fed through suitable grooves to the working parts by centrifugal force and the lubricant is prevented from spattering by the spring plunger which seals the cavity. A sheet steel dust cap is placed over the ends of the coupling and is held against the housing by a slight spring pressure. In this way foreign substances are prevented from entering the working parts of the coupling and the lubricant is retained inside. These couplings can be furnished in both single and double types for shafts ranging in diameter from 5/8 to 1 5/8 in.

Duplex Driller for Pipes and Channels.—The Moline Tool Company, Moline, Ill., has recently developed a small drilling machine built on the duplex principle. The spindles are equipped with chucks for holding straight-fluted drills, and are hollow. A threaded rod is placed inside the spindle to prevent the drill from forcing back and to set it out the required distance to pierce the wall of the pipe or the side of the channel. Vertical adjustment for the tables enables different heights of jigs to be accommodated, and the only one required is a fixture for holding the piece to be drilled in place and a notched or drilled bar for spacing the holes. The spindles are driven by steel spur gearing, run in bronze bushings, and are equipped with ball thrust bearings. Rapid production is secured by having the drills operate simultaneously from both sides of the work, which also tends to eliminate drill breakage. As the drilling is done from the outside, the burrs are all on the inner surface of the piece, where they require no alteration. The largest size of drill accommodated by the machine is 5/8 in. in diameter, and the maximum size of pipe handled is 3 in.

Jack Screw.—W. A. Peck, 141 Brewery street, New Haven, Conn., is manufacturing a jack screw with a telescoping base which possesses a wide range of adjustment. The tilting top has a milled V-slot which is adapted for use under round work and when this is removed the base can be used as blocking, the range varying from 1 5/16 in. low to 2½ in. high. All parts of the jack screw are made of machine turned and case hardened steel.

The Machinery Markets

A heavy export business in machine tools is being done. A French railroad is inquiring for a large amount of metal-working machinery, and some German car and locomotive builders are buying in New York. The machinery trade is considerably encouraged over the large orders for locomotives and car equipment placed by the railroads during the week, which is expected to result in machinery buying on the part of car and locomotive builders. Trade is somewhat better in New England. Inquiries are more numerous in Cincinnati, but actual business is rather irregular. Pending water-power projects are creating an active demand for that class of machinery in Cleveland, and there is an improved call in that market for steel-plant equipment and ore-handling devices. In Chicago the American Bridge Company is expected to award contracts for $14,000 worth of machinery for its Gary, Ind., plants within a few days, but the local volume of business is only about 50 per cent. of normal. Inquiries are good in Detroit, but business is somewhat scattered. A better demand is noted in St. Louis, where a good business in small lots of machinery is being done. The demand is about normal in Texas, but an improvement is looked for in the trade from Mexico. On the Pacific coast the demand for small pumping units for mining work is said to be unprecedented, but there is no great sale for metal-working machinery. The call for refrigerating machinery continues heavy in the South, and a better demand has developed for machine tools.

New York

NEW YORK, August 23, 1911

Machinery dealers who handle a general line of metal-working equipment found business considerably better last week, but machine tool manufacturers' agents who handle one or two types of machines say that they find no signs of improvement. The orders that came to the large machinery dealers were principally scattered, although the General Electric Company placed a good deal of business against the large list it issued during the latter part of July. It may be that the manufacturers' representatives will get some of this business later on, as there is more to come. The buying so far done, from all accounts, does not complete the requirements called for in the list which aggregated about $80,000 worth of machinery. Dealers are taking heart over the recent activity on the part of the railroads which placed heavy orders for car and locomotive equipment during the week. It is thought that the car and locomotive builders will have some machinery requirements to fill in order to turn out the equipment they have contracts for, and as some of the railroads are intending to build cars and locomotives in their own shops, business is looked for in that quarter. The Delaware, Lackawanna & Western Railroad is inquiring for a few machines and the Erie Railroad shows signs of making purchases for replacements. Export trade continues unusually good. A French railroad is inquiring in this market for a large number of machine tools for its car shops. The list calls for an expenditure of more than $3,600. German car and locomotive manufacturers are also buying good round lots of machine tools and the Canadian car builders are contributing some good trade to this country. Most of this business is coming through New York export houses.

The Ingersoll-Rand Company, 11 Broadway, New York, has let contracts for the construction of a concrete brick and steel building, 100 x 600 ft., to be erected at Phillipsburg, N. J. When the building is completed the A. S. Cameron Steam Pump Works, now in New York, which is operated by the Ingersoll-Rand Company, will be housed in the structure. The machinery now in the Cameron plant will be moved to Phillipsburg and additional equipment will be bought so as to double the company's present manufacturing facilities. The structure for which contracts have been let will be used entirely for machine shop purposes and it will be served by two cranes of about 30 tons' capacity. A power house will also be erected, the size of which has not been determined.

The new plant which the Terry & Tench Company, now at Lexington avenue and 131st street, New York, is building on the Newark meadows, N. J., is now well under way and the company expects to occupy it October 1. The plant includes a structural shop, 80 x 210 ft., a large machine shop, blacksmith shop, template room, boiler and engine house and store room. The company has bought no machine tool equipment and the machinery at its present plant will be moved and will be added to after the new plant is in running order.

The Niagara Falls Metal Stamping Works, Niagara Falls, N. Y., has nearly completed enlargements to its factory, which will about double its manufacturing facilities. The company will add one or more drop hammers, several power presses, some wire-working machinery and later on a few machine tools. It will also be in the market for shafting, couplings, belting, etc.

The Heller Brothers Company, Newark, N. J., manufacturer of files, rasps and small tools, is increasing its file department by installing two simplex boilers of 500-hp. capacity, which will give power to run additional file machines. The company is adding a new department for the manufacture of a line of Swiss pattern files. The new addition and alterations will be completed by the middle of September.

The Buffalo Steam Pump Company, Buffalo, N. Y., has purchased property adjoining its present plant at North Tonawanda, N. Y., on which are buildings giving the company an additional floor space of about 35,000 sq. ft. Later other buildings will be erected.

The Hollow Metal Construction Company has been incorporated with an authorized capital of $150,000 to manufacture metal trim for construction work. The company has offices at 45 Webster avenue, Jersey City, N. J., and is now looking for a site to locate its proposed plant.

K. Kaufmann & Co., 169-171 Murray street, Newark, N. J., manufacturers of traveling bags, have had plans prepared for an addition to their factory to cost about $6,000.

The Lewiston & Lake Ontario Shore Power Company has been incorporated at Lewiston, N. Y., and will build a power plant to furnish light and power to the village of Lewiston and the towns of Wilson, Porter and Newfane. The directors are J. B. Scovell, Lewiston, J. B. Coit and H. M. Coit, Niagara Falls; Arthur Mackey, Youngstown; A. T. Ransom, Ransomville; Charles H. Tugwell and Harvey Sanford, of Wilson, N. Y.

The Weymer Company, Syracuse, N. Y., has completed plans for a three-story factory building, 30 x 102 ft., of brick, tile and steel construction, which it will erect at Division and Solar streets.

The Union Cutlery Company, Tideoute, Pa., has completed its new factory at Olean, N. Y., and will move its plant to the new location at once.

Bids are being received by W. W. Cheney, president board of managers, Syracuse State Institution for Feeble-Minded Children, Syracuse, for two new boilers and piping for the power house and reconstruction of electric light wiring system.

The Water and Sewer Board, Rome, N. Y., has adopted plans for a sewage-disposal plant. An issue of bonds to the amount of $128,000 to defray the expense of construction is being arranged for.

Plans for a water-works system to be constructed by the village of Churchville, N. Y., are being prepared by Witmer & Brown, contracting engineers, Buffalo, N. Y.

The Hurwitz Bros. Coal & Iron Company has purchased at bankruptcy sale for about $32,000 the plant, equipment and stock of the General Foundry & Machine Company, at Sand street and West Belden avenue, and will reopen and operate the foundry, employing from 50 to 100 molders.

The Utica Knitting Company, Utica, N. Y., will build a brick addition to its plant on Erie street.

THE MACHINERY MARKETS

The Allentown Boiler Works, Allentown, Pa., has been awarded the contract to erect and overhaul the blast furnace at Standish, N. Y. The material for the work is now being furnished and the men under Superintendent Frank Collum will start work in two weeks.

Business Changes

The Alberger Condenser Company and the Alberger Pump Company, 140 Cedar street, New York, have opened a branch office at 97½ Peachtree street, Atlanta, Ga., to be in charge of R. S. McMichael. The Pacific branch office of these companies, located at 1503 Market street, San Francisco, is now in charge of C. F. Braun & Co., Inc.

New England

BOSTON, MASS., August 22, 1911.

Little that is new has developed in the machinery market. Probably more people are now on vacation than at any time during the summer, which naturally has its influence upon buying of all descriptions. The feeling of confidence continues and is borne out by the experience of some of the manufacturers of machinery, though not by all of them. Foreign business continues good, and on the whole the domestic demand is slightly better. The tying up of British shipping is regarded with some concern and the influence is already felt in Boston, where freight is delayed.

The large shops of the Potter & Johnston Company, Pawtucket, R. I., are fairly busy, a large percentage of the orders for machine tools coming from abroad, chiefly from automobile builders. However, increased business is noted from American buyers, chiefly in the automobile trade. The company has begun the manufacture of textile machinery, comprising cards and pickers, which will constitute a new department.

The American Emery Wheel Works, Providence, R. I., has started the erection of a new building 45 x 95 ft., one half having a basement and two stories, the other half an additional floor. The building will be used largely for the storage of raw and finished material, with the ground floor as an addition to the molding room.

The business of the American Ship Windlass Company, Providence, R. I., is being gradually moved to the works of Williamson Bros. Company, Philadelphia, which controls the company. The capstan department has already left Providence. The works there are still engaged in the manufacture of the company's mechanical stoker.

The Jacobson, Brandow Company, Pittsfield, Mass., manufacturer of spark coils, proposes to double its business and will add $50,000 to its capital stock. The expectation is that the factory will remain in Pittsfield, but this is contingent on the action of the townspeople in subscribing the additional funds.

The L. S. Starrett Company, Athol, Mass., manufacturer of machinists' tools, has converted its factory into an open shop and has abandoned the union label.

The New York, New Haven & Hartford Railroad will erect a boiler house and a small workshop at Worcester, Mass.

William C. Shute has been made the director of the Westfield, Mass., Independent Industrial School. He comes from the manual training school at Denver, Col.

The Southern New England Railroad Company, the New England branch of the Grand Trunk, is making active preparations for the building of its new line from Palmer, Mass., to Providence, R. I., where it will have important shipping advantages. The Massachusetts portion of the system, entering Rhode Island at Woonsocket, will pass through Palmer, Brimfield, Sturbridge, Southbridge, Dudley, Webster, Douglas, Blackstone and Uxbridge and will be 58 miles long.

The Hoosac Cotton Company, North Adams, Mass., announces that it will spend $1,000,000 in enlarging and improving its plant in that place. The Gorton-Pew Fishery Company, Gloucester, Mass., will establish a packing plant at Burling, N. F., to take care of the product of 12 fishing stations just purchased.

The H. B. Smith Company, Westfield, Mass., manufacturer of heating apparatus, will erect a core building at the north side plant 80 x 150 ft.

The South Norwalk Engineering Company, South Norwalk, Conn., manufacturer of special tools and machinery, will be in the market in the late fall for the purchase of additional equipment with a view to increasing its output about 20 per cent.

Hemming Bros., Inc., New Haven, Conn., have purchased the business of the Charles Greiner Company of that city and will continue the manufacture of that company's line of automatic wire straightening machines and riveters and automatic grinding and polishing machines. Both the Messrs. Greiner, senior and junior, have become connected with Hemming Bros. and will have charge of the department of the business which will manufacture the Greiner machinery.

Philadelphia

PHILADELPHIA, PA., August 22, 1911.

Current business is still largely confined to small and moderate sized single tools for early delivery, together with an occasional order involving some two or three machines. Inquiry has not broadened very materially, although several small lists for special shop equipment are being quietly considered by some dealers. The railroad demand is practically at a standstill. Industrial plants generally are going at a slightly better basis. Conditions in the shipbuilding trade are more promising and a better volume of business is coming to the locomotive builders. Machine tool builders report orders as being scattered and not in sufficient volume in the aggregate to increase plant activities very greatly. Manufacturers of special power transmission equipment report the volume of business for export as being fairly well maintained. A fair amount of buying is reported in power equipment, largely confined, however, to that of the smaller horse powers. The second hand machinery market drags; some little business in equipment of that class has been done by machinery merchants, but regular dealers in equipment of that nature report business as being of a desultory character. Some spotty improvement, both in the demand for gray iron and steel castings, is reported, but business continues far below normal.

The Pennsylvania Railroad Company has sent out an inquiry for a moderate sized special drilling machine.

The Southwark Foundry & Machine Company is giving notice of a special meeting of its stockholders to be held on August 23 at its offices in this city for the purpose of considering an increase in its capital stock from $500,000 to $750,000.

The Philadelphia Rapid Transit Company has taken city permits for the erection of a two-story brick power house 65 x 93 ft. at 1823 to 1829 East Letterly street.

Sealed proposals will be received by Joseph F. Hasskarl, acting director department of wharves, docks and ferries, 555 Bourse Building, for two bottom dump scows of not less than 500 cu. yd. capacity.

The city of Philadelphia will receive bids until August 31 for the erection of a municipal convention hall three stories, of brick, terra cotta and steel, from plans by J. T. Windrim, architect. The estimated cost is $1,500,000.

Daniel Weaver purchased the plant and greater part of the equipment of the late firm of Weaver & Wittle, Lebanon, Pa., at a trustees' sale August 15. He expects to operate both the foundry and machine shop.

A State charter has been granted the Manatawny Railroad Company with a capital stock of $100,000. The company proposes to construct an eight-mile road between Douglassville and Spangsville, Berks County, Pa. The incorporators named are Milton J. Pierson, Bethlehem, Pa.; John Palmer, Jr., Jersey City, N. J.; Stephen Robinson, Jr., Lewis F. Hutmacher, Bethlehem, Pa.; Charles M. Allen, Bayonne, N. J.; Daniel J. Driscoll, Reading, Pa., and Robt. L. Runyon, Allentown, Pa.

A. L. Rhoads, county controller, Berks County, Reading, Pa., will receive bids until September 14 for the building of a reinforced concrete viaduct over the Schuylkill River at the foot of Penn street, reading, Pa. The structure will be 1350 ft. long, 80 ft. wide and composed of nine 48-ft. and five 110-ft. arches and retaining walls. Plans and specifications may be obtained from the county controller or from Charles F. Sanders, county engineer, Reading, Pa. The same official will also receive bids until September 5 for the erection of a reinforced concrete bridge in the borough of Topton, Berks County, Pa., over Toad Creek, plans and specifications for which may be obtained on application to the county commissioners, Reading, Pa.

The Baldwin Locomotive Works reports a slightly better demand for locomotives and feels more encouraged with the outlook for business for the remainder of the year. It now has on its pay rolls nearly 11,000 employees, which closely approximates the number prior to the labor trouble several months ago. Denials

THE MACHINERY MARKETS

are made by officials of the company that any plan to establish branch plants or remove the local plant to other cities, as has recently been noted in public prints, is being considered or contemplated.

The Emmert Mfg. Company, Waynesboro, Pa., manufacturer of vises, etc., has had plans prepared for an addition to its works 40 x 45 ft. The company will install an air compressor for air chipping, etc. A number of other improvements will be made for the handling of work rapidly. Much of the equipment has been purchased.

Work on the large brick broom factory which is being erected by W. E. Schmick, at Hamburg, Pa., is being pushed rapidly. When finished it will be equipped with the most improved machinery for the manufacture of brooms and will give employment to at least 150 persons.

Edgar Amole and Frank Hopel, both of Reading, Pa., are having plans prepared for a foundry to be built of brick, one story, to be erected at West Hamburg, Pa. The cost will be about $10,000, and the firm will be known as the A. & H. Foundry Company.

Chicago

CHICAGO, ILL., August 22, 1911.

Machinery dealers in this market report the general trade in machine tools as less active at the present time than for many months and that the total volume of business is less than 50 per cent. of normal. The week was not entirely lacking in business as the Chicago & Northwestern Railway is understood to have placed orders for approximately $30,000 of tools to be installed at its various roundhouses. The American Bridge Company will award this week the orders for some $14,000 of machines for its Gary, Ind., plant. The International Harvester Company has not yet purchased machines for which it has been in the market for some time. The Chicago, Burlington & Quincy Railroad is inquiring for a large lathe. A western Illinois gas engine builder is about to place an order for a number of radial drills and an additional sale of tools to the amount of $2,000 is recorded.

The Automobile Construction Company, Chicago, has been incorporated with a capital stock of $27,000 by Harry M. Wells, Albert T. Graham and William E. Fuller.

The Simplex Auto Cranker Company, Chicago, organized to manufacture and deal in automobiles and machinery, has been incorporated with a capital stock of $100,000 by Edwin A. Gardner, Ignatius E. Halton and Willard Patrick.

The Goulds Mfg. Company, Chicago, has been incorporated with a capital stock of $10,000 by James C. Jerrery, Herbert J. Campbell and Charles V. Clark.

Joseph T. Ryerson & Son will erect a one-story brick building on West Eighteenth street, Chicago, to be used as a pattern shop.

The Central Iron & Metal Company, Chicago, has purchased a tract of land at Thirty-sixth place and Rockwell streets on which it is intended to build a plant to cost $60,000.

The Coey-Mitchell Automobile Company, Chicago, is seeking a plant in which to build automobiles and has under consideration buildings at Anderson, Ind.

The B. C. Small Mfg. Company, Centralia, Ill., is to begin the manufacture of a corn-husking device at Rockdale. It is expected that a new plant will be started in the near future.

The Rockford Machine Tool Company, Rockford, Ill., has let the contract for the building of its new factory. It is to be of reinforced concrete and construction has been started.

The Country Traction Company's power house at Oak Park, Ill., was damaged by fire recently to the extent of $10,000. The principal damage was to hoisting machinery.

The Donmeyer-Gardner Company, Peoria, Ill., has been incorporated with a capital stock of $150,000 and will do a general milling business. Incorporators are Ellen C. Donmeyer, R. G. Gardner and Charles R. Wheeler.

E. M. Burr & Co. are planning to erect a foundry at Champaign, Ill.

The city of Paxton, Ill., has authorized the issuance of bonds to the amount of $17,000 for the construction of an electric light plant and the purchase of machinery. The matter is in charge of the city clerk.

Geo. M. Limbert & Co. have established a foundry at East Chicago, Ind.

Keck, Gonnerman & Co., Mount Vernon, Ind., are about to erect a two-story brick addition to their foundry and machine shop.

The Losbough-Jordan Tool & Machine Company, Elkhart, Ind., manufacturer of special machinery, has recently contracted to build a number of large machines for match making. This will necessitate an increase in its equipment as the work progresses and quite an addition to its working force.

The city clerk of Mobridge, S. D., will receive bids covering the construction of a 100,000-gal. steel tank and 100-ft. steel tower.

The Colorado Ingot Iron Pipe & Culvert Company, Colorado Springs, Col., has secured a new plant location and will erect a steel factory building in which new machinery will be installed. This company is associated with the American Rolling Mill Company, Middletown, Ohio.

Cleveland

CLEVELAND, OHIO, August 22, 1911.

The demand for some lines of machinery shows an improvement. Pending water power projects in various sections of the country are making an active demand for hydraulic turbines and in addition to orders placed a good volume of business in water wheels is pending. The demand for steel plant equipment, which has been light for some time, also shows an improvement. Heavy handling machinery is not moving rapidly, but some orders are being placed for small installations for coal and ore handling plants.

Some machine tool builders are getting a better volume of business than a few weeks ago, but this improvement does not appear general. One Ohio manufacturer reports a very marked improvement in the demand for hydraulic presses. With local machinery dealers conditions are very quiet. No good sized inquiries are pending and small lot sales are scarce. Railroads in this territory are buying practically no machinery equipment and there are no prospects that more than a very limited amount of business will come from this source for some time.

There is considerable construction work in manufacturing plants and extensions going on at present and in prospect in the northern part of Ohio, but it is largely outside of metal working lines. Pottery manufacturers appear to be particularly active in this regard at present.

The Board of Commissioners for the erection of the Lima State Hospital, Lima, Ohio, will receive proposals for the mechanical equipment for that new State institution September 15. Plans and specifications are on file at the office of the architect. Frank L. Packard, New Hayden Building, Columbus, Ohio.

The Shull Steel Castings & Mfg. Company, Canton, Ohio, has let a contract for the erection of a fireproof pattern storage building 140 x 60 ft. and 36 ft. It will be built of brick and concrete. This company just completed some improvements to its plant. One 35-ton and one 10-ton electric overhead traveling crane have been installed and its acid open hearth furnace has been enlarged from 15 to 25 tons capacity.

The Globe Wire & Fence Company, Cleveland, has been incorporated with a capital stock of $20,000 to manufacture wire fence and fence making machines. The company is located at present on Columbus road. William C. Smith is the manager. Other incorporators are Clewell M. Smith, S. E. Williams, E. G. Steipel and S. C. Davis.

The Samuel Austin & Son Company, Cleveland, has the contract for the erection of a large addition to the plant of the Banner Electric Company, Youngstown, Ohio. Work on the foundations has been started and it is the intention to have the extension completed early in the spring.

The Gem Incubator Company, now located at Trotwood, Ohio, will build a new plant in Greenville, Ohio, for the manufacture of incubators and other products used in the poultry industry. Two buildings will be erected, one 100 x 200 ft. and the other 40 x 60 ft. John Somers is the president.

The Lorain Metal Products Company, Lorain, Ohio, has been incorporated with a capital stock of $30,000 to operate the plants of several concerns in that city engaged in the manufacture of brass and iron products that were recently combined.

Plans for a new power builder to be erected in Toledo, Ohio, are being prepared by Architects Schenk & Williams, Dayton, Ohio.

The Climax Nutlock & Bolt Mfg. Company, Cleveland, has been organized with a capital stock of $15,000

THE MACHINERY MARKETS

by C. L. Dunham, V. C. Walker, J. S. Walker and others.

The contract for the erection of a large hydroelectric plant to be built near Defiance, Ohio, by the Auglaise Power Company has been let to the Hydraulic Construction Company, 88 Pearl street, Boston, Mass.

A new plant will be built in Bryan, Ohio, for the manufacture of various novelties as the result of a contract closed between the Bryan Chamber of Commerce and Henry S. Winzeler, of Archbold, Ohio. A plant now located in Archbold will be moved to Bryan.

The Superior Metal Products Company, Elyria, Ohio, has outgrown its present capacity and is planning the erection of a new plant. H. E. Hall is the manager.

A paper mill will be established in Franklin, Ohio, by a new concern at the head of which is A. B. Smith, which has purchased the plant of the Union Wax & Paper Company. The plant will be rebuilt.

The Saxon China Company, Sebring, Ohio, has commenced the erection of a large 9-kiln pottery for the manufacture of porcelain ware. The plant will cover a ground space of 170 x 500 ft.

The Hoblit Nut Lock Company, Dayton, Ohio, has been incorporated with a capital stock of $10,000 by Boston F. Hoblit, Gilbert T. Brown and others to manufacture nut locks for steam railroad and traction line rails.

Cincinnati

CINCINNATI, OHIO, August 22, 1911.

The latter part of the month bids fair to show up better, so far as the machine tool industry is concerned, than did the first two weeks. Inquiries are more numerous, but actual business booked continues rather irregular. However, a few firms are receiving a sufficient number of orders to warrant keeping their plants running on full time and with full working forces. The export trade continues fairly satisfactory.

Manufacturers of engineering specialties, such as valves, etc., are experiencing a lull, though this is seasonable, and the present letup will enable them to catch up with orders already booked, as well as make up future plans.

Gasoline engine manufacturers are very busy, this class of motive power being now very much in demand in the South for operating pumping machinery.

Ig. Grimm & Co., Cincinnati, have changed the firm name to the Grimm Iron Works. This company makes a specialty of structural and ornamental iron work and has recently moved from its old location on McMicken avenue to a large newly constructed plant at 2431-33-35 Spring Grove avenue.

The Sidney Tool Company, Sidney, Ohio, announces an increase in its capital stock from $50,000 to $100,000.

It is reported that the Eagle Paper Mill, near Franklin, Ohio, that has been shut down for several years, will soon be rebuilt and put in operation. Considerable new equipment will doubtless be needed. A. B. Smith, of Middletown, Ohio, is said to be the principal party interested.

The Imperial Machinery Company, a new Cincinnati incorporation with $50,000 capital stock, manufactures only dry cleaning and pressing apparatus and is not in the general machinery business, as reported in a few of the trade papers.

The Air Friction Carbureter Company, Dayton, Ohio, has recently increased its capital stock from $10,000 to $20,000. Nothing is yet known as to plans for any increase in manufacturing facilities.

The necessary tools for the machine shop department of the Ohio Mechanics Institute have been donated by the machine tool builders of Cincinnati, through the National Metal Trades Association. The interior work of the institute's new building is progressing rapidly and a number of departments will soon be ready for occupancy.

The Herr Engine Company, Portsmouth, Ohio, manufacturer of gasoline traction and pumping engines, now has its new plant in full operation. The building is 80 x 160 ft., two stories and of monitor type construction. The company has lately installed a 24-in. Libby turret lathe, two radial drills, a large milling machine, etc.

The Fosdick Machine Tool Company, Cincinnati, manufacturer of radial drills and drilling machines, has begun the erection of an addition to its plant which will greatly increase its manufacturing facilities. The company states that no equipment will be required at the present time.

The Preston County Development Company, Cascade, W. Va., has been incorporated with $100,000 capital stock to erect a plant for furnishing light and power to three nearby municipalities. Among the incorporators are Everhart Bierer, of Morgantown, and Roy Clear and D. B. Davis, of Cascade.

The United States Electrical Tool Company, Cincinnati, now has its new plant in the western part of the city in full operation.

Detroit

DETROIT, MICH., August 21, 1911.

The Detroit machinery market exhibits no noticeable change over last week's conditions. Orders have been somewhat under normal expectations, averaging small amounts and generally scattered. Inquiries are good, however, and prospects for fall machinery demands are excellent.

The automobile industry in the past year has passed through one of the most serious crises that has ever faced a new enterprise and is now firmly and safely established with the confidence behind it of the most conservative business interests and the public at large. Indications are that the 1912 season will surpass any previous year. Large expectations are indulged in freely by the manufacturers and many tangible additions to plants and equipment have been made or are under way.

Flint, Mich., seems destined to adorn the map as a manufacturing city of more than passing notice. A number of large industries have been recently started there and others are in contemplation.

Building conditions seem to be improving. During the past week awards on new work were many, corroborating the theory already advanced of there being a large volume of awards to be made on work previously figured. Awards of contracts have been made on the large new buildings of the Continental Motor Company, a branch Carnegie library, a four-story commercial building for John Bornman and a church edifice. A fair amount of new work has been figured upon.

The Brenkert Light Projection Company, Detroit, has been incorporated with a capital stock of $20,000.

The Chas. J. Yunk Aeroplane Company, Detroit, has been incorporated with $25,000 capital stock.

Automobile Mfg. & Engineering Company, Detroit, has increased its capital stock from $1,000 to $50,000.

Definite announcement has been made by Hugh Chalmers, president of the Chalmers Motor Company, and Lucius E. Wilson, secretary of the Board of Commerce, that the American Cash Register Company will move its plant from Columbus, Ohio, to Detroit and consolidate with the Michigan Cash Register Company, with Mr. Chalmers as president of the merged concerns. A site for factory buildings has been secured and the location will be made public as soon as the selection is approved by the board of directors.

The Metzger Motor Car Company has just contracted for the erection of a building which will triple the capacity of its present plant at Milwaukee avenue and the Grand Trunk Railroad, Detroit. In addition to this the company is putting up a heat treating plant where the metals used in the construction of Everitt cars will be subjected to the Metzger company's own process of hardening. The larger of the two additions will be a structure four stories 68 x 550 ft. and is to be ready for use within 90 days. The heat treating building is to be one story and 35 x 150 ft.

The Bonsfield Woodenware Company, Bay City, Mich., has been incorporated for the continuation of its woodenware business, the capital stock being $125,000. The stockholders are C. J. Bonsfield, A. E. Bonsfield, R. E. Bonsfield, Charlotte R. Hannum and Emma B. Darby.

The Cable-Nelson Piano Company, South Haven, Mich., has begun work on a two-story addition that will add one-sixth to the floor capacity of the factory. The addition extends from the present building to the railroad track and will be about 80 ft. deep, of the same general style of design and construction as the main factory building. October 1 is the date set by the company for occupying the new part.

The proposed pumping station at Verona, Mich., to supply the city mains of Goguac, Mich., with water from the Verona wells will cost the city from $20,000 to $30,000, according to an estimate furnished the city Common Council by Superintendent Brigden, of the Board of Public Works. Two centrifugal pumps are proposed for the auxiliary station, the building, about 20 x 20 ft., to be of brick with metal roof.

THE MACHINERY MARKETS

The county road commissioners of Manistique, Mich., are in the market for a stone crusher large enough for any purpose and of the portable type.

The Forest Hill Elevator Company has been incorporated at Forest Hill, Mich., with a capital stock of $15,000. Otis A. Post is president and Elmer A. Post secretary and treasurer.

The plant of the Detroit, Mich., Reduction Company at French Landing was wrecked last Wednesday morning by an explosion of one of the garbage incinerating tanks. The loss of the building is about $125,000 and valuable machinery which it contained was damaged beyond repair.

It is announced that the Olds Motor Works, at Lansing, is to have a new addition that will increase the facilities of the plant about 50 per cent., made necessary by increasing business. The contemplated addition will include three stories and a basement, 74 x 750 ft., and will be used for the assembling of frames, complete motors and machine parts. The testing and shipping facilities will also be improved.

The Water & Electric Light Commission of Lansing has under consideration the installation of an air lift to increase the city's water supply. Besides the air lift it will be necessary to construct a reservoir of over 1,000,000 gal. capacity.

The city of Battle Creek, Mich., desires proposals for a filter plant of 4,000,000 to 8,000,000 gal. capacity per 24 hours. Information may be had by addressing F. M. Metcalf, M. E., Battle Creek.

A large addition to the building occupied by F. W. Prentiss & Co., Adrian, Mich., manufacturers of screen doors, is under construction. The new addition will make this one of the largest factories in the city.

W. T. Webb, representing the Richmond Iron Works Corporation, Richmond, Va., recently paid a visit to Grand Rapids, Mich., looking up prospects for the possible location of a branch of that company there. Mr. Webb said that while the company is now manufacturing the Virginian automobile, it is intended to go into the truck manufacture, and it is proposed to have a branch in Michigan within a year, either in Detroit or Grand Rapids.

The Harrow Spring Company, Kalamazoo, manufacturer of steel and springs, is contemplating quite a number of additions to its rolling mill division, consisting of extensions to its 9-in. and 11-in. mills, greater rolling capacity and increasing its water supply plant.

The South

LOUISVILLE, KY., August 22, 1911

Although the naturally dull season is having an effect on the volume of business being handled, the situation is comfortable, and a satisfactory record in point of sales is being made by machinery manufacturers and dealers. Inquiries for refrigerating equipment continue coming out in large number, and it is expected that manufacturers of apparatus of this kind will have their hands full during the fall and winter. There is a better demand for machine tools, and the number of shops in Louisville and vicinity is continuing to grow.

S. Weber & Son, Louisville, who have conducted a scrap-iron business for a long time, have entered the used machinery trade. They have purchased the business of Herman Joseph, dealer in scrap and second-hand equipment, and intend developing the latter line considerably.

The Henry Vogt Machine Company, Louisville, Ky., is planning to make additions to its plant within the next few months. The company is now asking for separate prices on 14 and 16-ft. heavy boiler roll to handle ¾-in. plate, and a jolt-ramming machine, 60 x 72 in., with a capacity of 18,000 lbs.

The Sunny Brook Distilling Company, Twenty-eighth street and Broadway, Louisville, said to operate the largest distilling plant in the country, has installed a machine shop, most of the equipment for which has been purchased. The purchases include a lathe of Greaves, Klusman & Co. manufacture and a Smith-Mills shaper. A drill press was also ordered.

The Mengel Box Company, Louisville, has ordered a 100-ton track scale for installation at its Hickman, Ky., plant. The scale will be one of the largest ever installed in this territory. E. D. Morton & Co., Louisville, made the sale.

The Kentucky Public Elevator Company, Louisville, which operates one of the largest grain elevators in the South, has announced plans for the expenditure of $100,000 in enlargements and additions. Power and conveying equipment will be required. Oscar Fenley, president of the National Bank of Kentucky, is head of the elevator company.

R. O. Rubel, Jr., & Co., who have a factory for the manufacture of aeroplanes at 130 North Fourth street, Louisville, will file articles of incorporation shortly, it is stated. R. O. Rubel, Jr., has purchased the interest of his partner, E. L. Gray, in the business. A woodworking department has been installed and equipped with a planer, band-saw, cut-off saw, etc.

V. Neirmaier, proprietor of the State Street Brewery, of New Albany, Ind., is to erect an ice factory in connection with his brewing establishment, and will be in the market for equipment in the near future.

The American Machine Company, Louisville, reports a heavy demand for elevators, for both freight and passenger service. Contracts have been received recently from the Bell Bros. Piano Company, Muncie, Ind.; Old Crow Distillery, Glen Creek, Ky.; B. F. Avery & Sons' branch warehouse at Atlanta, and the Eminence Distillery Company, Eminence, Ky.

C. J. Walton & Son, Louisville, have installed a 150-hp. boiler in the sawmill of the Edward L. Davis Lumber Company, Louisville.

The Greenbaum Distilling Company has purchased a coal-crushing and conveying outfit for installation at its Midway, Ky., plant, from the Jeffrey Company, Columbus. The sale was made through Fred Wehle, the Louisville representative of the company.

The Midway Lighting Company, Midway, Ky., is making some improvements in its plant. Contracts have been let for the installation of an engine, additional dynamos, etc. The changes are to be completed by September 15.

The Kentucky Traction & Terminal Company, Lexington, Ky., has decided upon the erection of an ice factory in connection with the large power house which it is preparing to erect. The cost of the latter will be $500,000. F. W. Bacon is vice-president of the company.

The Franklin Mining Company, Marion, Ky., which is developing a deposit of fluorspar in the Crittenden County field, has purchased an Ingersoll-Rand air compressor and air tools. The sale was made through the Brandeis Machinery & Supply Company, Louisville.

The Peerless Mfg. Company, Louisville, maker of grates, has purchased an Ingersoll-Rand air compressor for installation in its foundry.

The D. E. Hewitt Lumber Company, Huntington, W. Va., has purchased a tract of 17,000 acres of fine poplar and oak, and will erect a band-mill at Huntington for the manufacture of the logs.

The list of machinery wants of the Livermore Chair Company, Livermore, Ky., the incorporation of which was recently noted, includes a 72 in. x 16 ft. boiler and two engines. K. J. Meyer is president of the company.

The State Board of Control of Charitable Institutions, Frankfort, Ky., has under consideration plans for the construction of an electric railway from Hopkinsville to the Western Kentucky Insane Asylum. If the plan is approved some additional equipment will be installed in the power-house at the asylum. The estimated cost of the line is $55,000.

The Harlan Commercial Club, Harlan, Ky., is developing a plan for the organization of a stock company to erect a water-works plant.

C. C. Hinton, Evansville, Ind., who is building a sawmill at Bowling Green, Ky., will require electric equipment, having decided upon that character of drive for the mill. J. Rowland Madison is in charge of the construction of the mill.

James C. Lawrence, Memphis, Tenn., is designing the plant of the Forest Products Chemical Company, recently incorporated with $100,000 capital stock for the utilization of the waste products of wood-working plants and sawmills. The company is in the market for equipment for a 120-hp. power plant, still, condensers, etc.

The municipal officials of Gallatin, Tenn., have closed a contract with the Crocker-Wheeler Company, Ampere, N. J., for practically all of the machinery to be installed in the water works and electric light plants. The equipment includes one 125-k.v.a. engine-type generator, one 100-k.v.a. heated-type generator, with switchboards and accessories; two 50-hp. Crocker-Wheeler motors; two Alberger centrifugal pumps, 250 gal. per min. capacity; one 50-gal. pump and motor, and one 4-valve, non-releasing, 180-hp. Corliss engine. The contract price was $8,165. A site for the plant has been secured, and work will start at once.

The Knox County High School Board, Knoxville, Tenn., has decided upon the enlargement of the manual training department of the Knoxville high school, and

THE MACHINERY MARKETS

will probably require additional wood-working machinery and machine tools.

The Nashville Adding Machine Company, Nashville, Tenn., which is headed by Charles Wales, inventor of a patented device, has acquired a temporary factory building in Nashville, formerly occupied by the Hinds Shoe Company. The final designs of the machine are being worked on, after which machinery will be ordered and manufacture begun on a large scale. The company intends to have its machines on the market by the spring of 1912.

James and Harry Cox, Detroit, Mich., have purchased the Big Stone Gap Machine Shop, Big Stone Gap, Va., and have installed additional equipment. They have also equipped a foundry with a capacity of five tons a day. Automobile repair work is to be made a feature, and machine tools for this have been installed. The business, which will be conducted under the name of Cox Bros., was brought to Big Stone Gap through the Board of Trade.

L. H. Gammon, Mayor of Bristol, Tenn., has recommended that the City Council consider the question of establishing an electric light plant. He suggests that the consumption of current by the municipality would justify the erection of a plant costing $200,000.

The Watauga Power Company, which is completing the construction of a hydroelectric plant near Bristol, Tenn., is now installing machinery, practically all of which is of Westinghouse manufacture. The power house has been completed. The company will begin to deliver power in Bristol, September 15.

The Jackson Lumber Company, Jackson, Tenn., is in the market for machinery for the manufacture of cigar boxes. G. O. Worland is manager of the company.

The Jackson Ornamental Iron & Bronze Works, Jackson, Tenn., is in the market for steel and wire-working machinery. It is also equipping a department for plating operations.

The Johnson City Traction Company, Johnson City, Tenn., has made plans for the enlargement of its power plant. A new boiler house is being erected, and contracts will be let shortly for two additional boilers. A new turbine has already been purchased. The company is anticipating the probable construction of an interurban line between Johnson City and Jonesboro, Tenn.

The Marathon Motor Works, which recently succeeded to the Southern Motor Works, Nashville, Tenn., is in the market for a few machine tools, and expects to issue quite an extensive list later. Its present requirements are one plain grinder, 6 x 30 in., Landis or Norton; some lever arbor presses, 3½ in., Greenerd preferred; one 24-in. surfacer, one 36-in. band saw, one mortiser and one LaPorte broaching machine No. 4 or No. 5.

St. Louis

ST. LOUIS, MO., August 19, 1911.

In the machine tool market there has been quite a notable improvement, in a general way, in consequence of a considerable number of purchases of selected machinery, though no large lists have made their appearance and no large individual orders have been placed. Inquiries are beginning to come in and there seems to be every prospect that September will be a good month. Most of the business of the present month has been inside the city, the inquiries and purchases from outside territory having been limited. The sales of the past week have included a number of American tools, Cleveland open side planers, Kempsmith milling machines and Reliance bolt cutters.

Inquiries are out from the Missouri Pacific, the Wabash and the Missouri, Kansas & Texas Railroads for locomotives of various sizes and types aggregating about $2,500,000 in all, with prospects of the complete requirements being closed within a short time.

The Wabash is in the market for an outfit of machine tools for its new roundhouse and local repair shop at Decatur, Ill.

The McKinley Traction Cultivator Company, whose plan to erect a plant in St. Louis was recently announced, is in the market for its machinery and has placed a part of its order.

Construction work has been begun on the plant of the Matthews-Davis Company, which is to manufacture the Davis expansion boring tool and the new equipment required will be placed soon.

The American Brake Company is rapidly finishing the extensive improvements in its large North Broadway plant, and the additional equipment required is being ordered and placed as received.

The Hall & Brown Wood Working Machinery Company, manufacturing a large line of planing mill machinery, reports an excellent run of business in that particular line.

The steel foundry and air-compressor departments of the Curtis & Co. Mfg. Company are reported especially active at the present time on recently received orders.

The Fulton Iron Works plant on the western city limits is being pushed toward completion, and in consequence of plans to make it thoroughly modern it will install a large amount of new equipment. The plant will, when completed, have the largest gray iron foundry in St. Louis.

The Columbia Incandescent Lamp Company, which recently built a new plant on the western city limits, tripling its capacity, has moved into the new buildings.

The American Oil Refining Company, St. Louis, has purchased a five-acre site near Belleville, Ill., and has issued $250,000 bonds with which, in addition to the capital in hand, it will construct a large oil refinery.

The Brooks-Latta Automobile Company, St. Louis, has purchased a site in St. Louis and will at once build a plant for the manufacture of automobile delivery wagons. The company, which is new, has $150,000 capital stock. Charles E. Brooks is president, Allen T. Latta, vice-president; Charles Latta, secretary and treasurer.

The Imperial Clock Company, which recently moved to St. Louis from Illinois, has begun the construction of a new factory building to increase its manufacturing capacity and will equip it with additional machinery.

The Tuller Mfg. Company, Kansas City, Mo., has been incorporated with $50,000. The incorporators are B. H. Tuller, W. L. Correll and F. M. Hayward.

The Grand Haven Mining Company has been incorporated in Arizona with $25,000 capital stock, but will operate in the Joplin, Mo., district, and will equip its property with mining machinery at once.

The Boehnker Motor Plow Mfg. Company, St. Charles, Mo., has been incorporated with $24,000 capital stock and will equip a plant for the manufacture of a patented plow. The incorporators are H. H. Boehnker, Louis Ringe, J. C. Wilbrand, and others.

The Car Mfg. Company, Kansas City, Mo., has increased its capital stock from $50,000 to $150,000 for the purpose of increasing its mechanical capacity.

The Commonwealth Steel Company is modernizing its plant at Granite City and will erect a new machine shop, new electrical department, chemical laboratory, engine roundhouse, blacksmith shop and pattern shop.

The city of Kirkwood, Mo., voted August 19 on the question of issuing bonds for the construction of a plant for supplying electricity to the city lights and also to the residences and business buildings.

Visiting buyers from Wichita Falls, Tex., the past week bought equipment for a complete machine shop at that point, from St. Louis dealers, scattering their orders to several dealers.

The machine shops of the Wabash Railroad at Moberly, Mo., suffered a fire loss of $15,000 as a result of a boiler explosion.

The Standard Machine Mfg. Company, Carthage, Mo., has purchased foundry and machine works of the Stout-Park Company, of that city. The company has made alterations to the plant and will manufacture well-drilling machines and deep-well power pumps of a new design. The company is planning to build a new plant after the first of next year.

The Pacific Coast

SAN FRANCISCO, CAL., August 16, 1911.

Sales of machine tools are limited almost entirely to tools of a small nature, with scarcely any inquiry for heavy equipment. A number of shops in this vicinity are considering plans for expansion, but such plans are by no means complete, and present conditions do not seem very favorable for their consummation. More business is coming from the oil fields than from any other single locality. The Government will take figures September 5 on a list of tools for the Mare Island Navy Yard, but otherwise there is nothing of special interest in the market.

The feature of the machinery market is an extremely active movement of small equipment of nearly all descriptions, with comparatively little business in heavy machinery. This is most noticeable in the line of pumps, one local manufacturer reporting that, while

THE MACHINERY MARKETS

nothing of much individual importance is under construction, the demand for small units is stronger than ever before. The mines, for the most part, are using small electrically driven pumps, which can be distributed to better advantage than the large units formerly used, and the same tendency is noted in irrigation.

The placing of orders by the Yosemite Lumber Company is the only item of much interest in woodworking machinery, though there is a fair demand for single machines in various parts of the State. There are, however, a few important inquiries for mill machinery, as well as for hydroelectric equipment, on which business is expected within a few weeks. Rock-crushing machinery is less active than last summer, as the capacity of plants installed at that time is apparently in excess of requirements.

It is reported that the Santa Fé carshops at Richmond, Cal., are to be enlarged in the near future.

The Corliss Gas Engine Company is working on plans for the installation of a foundry in connection with its shop at Petaluma, Cal.

Dredging operations in California are more active than for some time, both in connection with placer mining and in harbor work. The Standard American Dredging Company has taken another large contract in southern California, and is furnishing considerable work to local shops in the way of repairs and extra parts. A number of large steel cutter-head castings for this company have been made by the C. L. Best Gas Traction Company, the machine work being done by the Union Iron Works.

The North Star Iron Works, this city, has moved its plant from Folsom street, near Ninth, to 1311 Harrison street.

The Summit Copper Company has selected a site for its proposed ore mill near Miami, Ariz., where it will install a large crushing and screening outfit, and an electric light and power plant.

The city of Honolulu, T. H., is planning to install an auxiliary pump in the municipal waterworks, with a capacity of 3,000,000 gal. per day.

The Telluride Power Company, now operating in Colorado, is planning to install a hydroelectric plant of 3000-hp. capacity on Cleve Creek, Nev.

The Sperry Flour Company is planning a new mill to be erected at Vallejo, Cal.

A. L. New is in San Francisco to place orders for mining machinery for his property in Mexico.

The city of San Bernardino, Cal., is taking figures on electrically driven pumping equipment.

The United Iron Works, San Francisco, has taken an order for a pumping station for the town of San Mateo, Cal.

The Board of Supervisors of Los Angeles County are considering figures on a power plant for the Hall of Records Building, the lowest bid being $15,735.

The distribution of agencies formerly held by Renshaw, Bulkley & Co., this city, is about complete. B. J. Smith, formerly head of the machine tool department of that company, has taken over the agencies for the American Tool Works Company, the John Steptoe Shaper Company, Greaves, Klusman & Co., Mitz & Merrill, the Kempsmith Mfg. Company, W. F. & John Barnes Company, and a number of other tool manufacturers. Mr. Smith is now associated with the Rix Compressed Air & Drill Company, and in conjunction with that firm will carry a stock of lines represented at 219 Spear street. The Austin Weston Company has opened its office at Front street and Broadway, and the Lidgerwood Mfg. Company has opened an office at 773 Monadnock Building, in charge of T. L. Williams. The Berlin Machine Works will be represented by C. H. Mitchell.

The Southern Pacific Railroad shops at Sacramento, Cal., will build 2500-hp. engines for two new ferry boats which will be put in service next summer.

The Trent Engineering Works, Reno, Nev., has a contract for a large ore mill at Virginia City, Nev.

The Western Water Company, operating near Taft, Cal., is preparing to install two 250-hp. gas engines to drive its pumping equipment.

The Horton Portable House Company has completed plans for a factory to be erected at Wilmington, Cal.

A new air compressing outfit is to be installed at the Omega mine, near Nevada City, Cal.

C. F. Braun & Co., 503 Market street, San Francisco, Cal., has been organized to take over the business of Braun, Williams & Russell at that address. The company's new officers are Carl F. Braun, president; George C. Singletary, vice-president, and Emory Singletary, secretary.

The Portland Commercial Club, Portland, Ore., announces the acquisition for that city of a big branch plant of the Berlin Machine Works, Beloit, Wis. The company has secured a site in the heart of the city comprising about 11 acres, and will soon begin the erection of a plant which will duplicate the one at Hamilton, Ont., with some improvements. The Berlin Company has been developing its trade in the Orient and has selected Portland on account of its shipping facilities and its proximity to the woodworking industry.

Texas

AUSTIN, TEXAS, August 19, 1911.

Deterioration of the cotton crop during the last week, due to insect pests in some sections and an unbroken drought in others, is having a depressing effect on business. The prospects for an unusually large cotton production, however, are very bright. Machinery trade is holding up well, particularly in the western and southern portions of the State, where the wonderful strides of growth and development continue unabated. An improvement of conditions in Mexico is looked for soon.

The Missouri, Kansas & Texas Railroad is planning a number of improvements for its yards at Greenville, to include the erection of a new roundhouse and machine shop.

A large system of irrigation is to be installed near Alpine by H. J. Gray, of that place, and associates. It is planned to construct a dam which will be 800 ft. wide at the base, 1800 ft. at the crest and 80 ft. in depth. This structure will be built of reinforced concrete and will form a storage reservoir sufficient to water 23,000 acres of land. A town will be laid out upon the property which the syndicate has purchased.

Joseph Whala is erecting a grist mill and cotton gin near Hockley, Texas.

The stockholders of the Brenham Cotton Mills, of Brenham, have decided to rehabilitate the mill and place it in operation this fall. Considerable new machinery will be installed.

The Smithville Light, Power & Water Company, Smithville, will sink two 10-in. artesian wells to supply the town with pure drinking water.

The Farmers Gin Company has been organized at West, Texas, with a capital stock of $14,500. The incorporators are F. E. Denton, C. W. Cowan and E. Lumpkin.

C. T. Jackson will install new machinery and make other improvements to the cotton oil mill at Cleburne, which he recently purchased.

The Cherokee Saddlery & Harness Company has been organized at Jacksonville with a capital stock of $30,000 for the purpose of manufacturing saddles and harness.

G. S. Combs, of San Antonio, and associates will install an irrigation system upon a tract of 1200 acres of land that they have bought near Luling. A pumping plant will be installed and a water supply obtained from the San Marcos River.

The corn shelling plant of Harry Landa at New Braunfels that was recently destroyed by fire here will be rebuilt.

The Clay County Cotton Oil Company has formed at Henrietta with a capital stock of $67,000. The incorporators are W. B. Worsham, J. B. Dale and E. P. Neville.

The Italian Gin Company has been formed at Highlands with a capital stock of $9,800. The incorporators are Vincenso Tusa, Jr., Tony Loria and Joe Louise.

The J. E. Pierce Gin & Milling Company, Blessing, has been formed with a capital stock of $5,000. The incorporators are J. E. Pierce, A. B. Pierce and John H. Roach.

D. B. Chapin and associates, who are preparing to construct a great system of irrigation near Del Rio, Texas, at a cost of about $4,500,000, will also erect a large cotton factory in connection with the irrigation and cotton growing enterprises.

A. J. Perlstein and associates will install a cotton gin at Beaumont at a cost of about $5,000.

Work is now in progress erecting the building for the electric power plant that is to be installed by the Federal Government at the site of the proposed dam at Elephant Butte, N. M. The machinery will cost about $100,000. William C. Beatty is superintendent of construction.

The Mexico Northwestern Railroad Company will install machine shops, foundry, roundhouse and car re-

THE MACHINERY MARKETS

pair shops at Madera, state of Chihuahua, at a cost of $1,500,000. The extension of this railroad that is now being constructed between Terrazas and Madera will be finished by December 1.

La Union, S. A., will install a large amount of machinery in its soap factory at Torreon, Mexico. O. G. Neumann is manager.

The El Paso Electric Railway at El Paso is increasing the capacity of its power plant about 40 per cent. and will install new machinery, the improvements to cost a total of $300,000.

The Southern Steel Products Company, Dallas, manufacturer of metal specialties, is about to erect a new factory building in which new machinery will be installed.

Eastern Canada

TORONTO, ONT., August 19, 1911.

Expressions of surprise at the sustained activity of trade and industry at the high line are very frequently heard in these days of hot political campaigning. The elections are still between four and five weeks distant, but they very greatly occupy the public mind. Not only are people's thoughts much taken up with the subject but the interests at stake are commercial and industrial. If the government receives a fresh lease of power the reciprocity agreement will be established between Canada and the United States. While this agreement relates chiefly to natural products there are some manufactured products covered by it. In these the competition of the United States would be increased on the Canadian market. By facilitating the exportation of Canadian raw material, such as lumber, wheat, meat animals, minerals, etc., to the United States the arrangement may cause some difference to the Canadian manufacturing plants utilizing such raw material. For this reason it might be supposed that there would be some hesitation in the operation of these Canadian industries at the present time. In similar situation manufacturers have been known to shut down some time before elections so as to give what they wish to be regarded as a foretaste of the effects if the policy to which they are opposed should be carried. There is certainly no sign of any tactics of that kind for the influencing of the vote. The further fact that business is much less lively in the United States at the present time than it is when at its best is also commented on as having no effect to cause a slowing down here. There is not an unfavorable feature in the current trade of Canada.

Up to September 15 tenders will be received at the office of the chief engineer of the Department of Railways and Canals, Ottawa, for the construction of the Greysborough-Country Harbor line.

The City Council of Ottawa has at last decided to place with Laurie & Lambe, of that city, the contract for the erection of a Heenan Froude type of garbage destructor.

A large American company, of which the name has not yet been given to the public, has written to the Publicity Commissioner at Ottawa making inquiry as to the prospects for locating in Ottawa a branch of its power generating machinery works and of raising $1,000,000 capital there on account of such works.

The Monarch Knitting Company is enlarging its plant at Chatham, and worsted and machinery to manufacture worsted goods will be shipped from Keighley, Yorkshire, England, on September 1. Machinery is costing $48,000.

It has been decided by the publicity bureau of Ottawa to recommend that a by-law be submitted to the ratepayers to authorize the expending of $75,000 upon factory sites.

The Kennedy Construction Company, with a capital stock of $250,000, has been incorporated. Its headquarters are in Montreal.

The Mann Axe Company, St. Stephen, N. B., formerly the Maritime Edge Tool Company, has expended $40,000 in the improvement of its plant there.

The Harbor Commissioners of Montreal have decided to make an extension to the grain elevator now under construction, so as to bring its capacity up to 1,772,000 bushels. The equipment will be of the most modern character.

A bridge to cost about $300,000 will be built by the Government of Nova Scotia across the reversing falls at St. John City, where the existing suspension bridge has reached an age at which its abandonment has become advisable.

The National Cash Register Company has secured options on properties in the northern part of Toronto, on which it is proposed to build a factory on the model of the company's factory in Dayton, Ohio. The company has now a plant in Toronto in which 150 hands are employed. Twice as many would be employed in the new works.

A building site has been bought in Toronto by a real estate firm that is said to be acting for Rockwood & Co. of New York. The company is credited with the intention of building a six-story factory for the manufacture of chocolate in Toronto.

The Jules Motor Company will begin work on the construction of its plant in Guelph toward the end of September.

The New Brunswick Portland Cement Corporation is about to be incorporated for the purpose of utilizing the oil shales in Albert County, N. B., for the manufacture of cement. Senator Domville, Rothesay, N. B., is at the head of the undertaking.

Three tenders from British firms have been received by the Canadian Department of Public Works for the carrying out of the proposed harbor improvements at Courteney Bay, St. John, N. B. The contract includes dredging work, the building of the docks for the Grand Trunk Pacific, and the construction of a drydock and ship repair plant. It is estimated that the work will cost about $4,000,000. The British firms are that of Sir John Jackson, that of Norton Griffiths & Co., and that of Sir Weatman Pearson. Each tender was accompanied by a deposit of $500,000.

The contract for the dam of the new city reservoir, Moncton, N. B., has been given to John W. McManus & Co. for $128,000.

Merritt Bros. of Woodburn, Ont., are arranging to establish a basket factory in St. Catherines, Ont.

Shearer, Brown & Wills, St. Paul, Montreal, are erecting three large buildings for the manufacture of bolts and nuts in connection with the new plant of the Canadian Tube & Iron Company. The latter company has just received from the London Machine Tool Company, Hamilton, Ont., a turning lathe 10 tons in weight.

The Diamond Flint Glass Company, Hamilton, Ont., has begun the construction of a new building to cost $50,000.

The Rhodes-Curry Company, Amherst, N. S., has begun the construction of the new general office building for the Intercolonial Railway at Moncton, N. B. It is to cost $100,000.

Plans have been accepted by the city of Windsor, Ont., calling for 640 ft. of 60-in. steel water pipe in the bed of the Detroit River. It will cost about $30,000.

The Board of Governors of Hamilton Hospital, Hamilton, Ont., has decided to add to the equipment and will buy one feed pump and two vacuum pumps for boilers.

Machinery of a total value of about $100,000 will be required for the branch works the Schacht Auto Company's Canadian offshoot is establishing in Hamilton, Ont.

The Spectator Publishing Company and the Herald Publishing Company, both of Hamilton, Ont., are making additions to their plants, and will be in the market for linotype machines and other equipment.

The Sawyer Massey Company, Hamilton, Ont., is making two additions to its existing agricultural implement factory.

The Otis-Fensom Elevator Company, Toronto, is about to call for tenders for the building of a $50,000 factory in Hamilton.

Ritchie & Rumsay, New Toronto, have prepared plans for addition to factory.

The Reinhardt Salvador Brewery, Ltd., is about to build a large brewery in Toronto.

The Tallman Brass Company, Hamilton, Ont., is building a new factory.

Tenders will be received up to August 28 by the municipality of St. Jerome, Que., for complete hydro-electric power and distribution system.

The Fire, Police and Jail Committee, Hamilton, Ont., contemplates the purchase of an automobile and motors for fire trucks.

W. E. Seagrave, Walkerville, Ont., has obtained the contract of the city of Toronto for new fire fighting apparatus.

The Positive Clutch & Pulley Company, Ltd., Toronto, Ont., has completed plans for a factory building which it will erect at Aurora.

The Gem Knitting Company, Ltd., has been incorporated at Woodstock, Ont., with a capital stock of $100,000 to manufacture knitted goods. K. W. Harvey.

THE MACHINERY MARKETS

G. E. Mahon and W. W. Barrowclough of Woodstock are the incorporators.

The Verity Plow Company, Brantford, Ont., is planning to make additions to its plant which will double its capacity.

The Woodstock Automobile Mfg. Company, Ltd., has been incorporated at Woodstock, Ont., with a capital stock of $50,000 and will establish a plant there. The directors are Alexander C. Applebaum, Herbert H. Thorpe and H. F. Greene.

The Waterous Engine Works Company, Brantford, Ont., will build an extensive addition to its plant at an estimated cost of $60,000.

Western Canada

WINNIPEG, MAN., August 19, 1911.

In western Canada more is heard of preparations in the United States to push trade more aggressively in Canada if the Knox-Fielding pact is established. It is reported that prices on American articles of machinery and equipment are being quoted on a basis that seems likely to secure much business. The West will absorb a vast amount of such apparatus in the next few years. The construction activity of the last five years there has been chiefly in the way of railroad building and town expansion. In the near future there will be a very large extension of hydro-electric systems, and unless the tariff conditions are made less favorable there will be a great development of manufacturing industries at several western Canada centers.

The Sandstone Brick & Sewer Pipe Company, with a capital stock of $80,000, has completed its plant in Calgary, Alberta, and begun to turn out product.

The Puget Sound Lumber Company, Victoria, B. C., has let the contract for a new refuse burner 121 ft. high and 33 ft. in diameter. The Muskegon Boiler Company of Muskegon, Mich., has the contract, which is to be carried out for about $25,000. Several other improvements are contemplated.

M. J. Costello, general traffic manager for the Great Northern Railway Company, stated in Vancouver some days ago that his company is going ahead with plans of improvement in British Columbia that will call for an expenditure within the next two years of from $7,000,000 to $10,000,000. Three docks will be built, new depots and terminals will be constructed at Vancouver.

Elliott Bros., Minneapolis, have the general contract for the erection of the cold storage plant for the Canadian Swift Company at Fort William.

The Kenora Mining Record, Kenora, Ont., says that plans are being completed for the establishment there of large iron smelting works to be operated by electricity. It mentions Cawthra Mulock, a Toronto capitalist, D. L. Mather, a Winnipeg capitalist, and D. C. Cameron, Lieutenant-Governor of Manitoba, as the leading spirits in the enterprise. It says that $30,000,000 will be expended on the development of water power and the construction of plant. The iron fields to be drawn from are about 20 miles south of Dinorwick, on the Canadian Pacific Railway main line, not far away from the Atikokan range.

The Canadian Bread Company, Winnipeg, is about to erect a bakery plant to cost $250,000.

The car shops of the B. C. Electric Railway Company, New Westminster, B. C., are busy turning out new passenger cars, flat cars, box cars and working on repairs. There are 115 men employed in the shops.

The city of Calgary, Alberta, is preparing to instal a sewage disposal system. It has recently awarded a $200,000 contract for the construction of a trunk sewer.

The city of Kamloops, B. C., is preparing to spend $200,000 in developing 5000 hp. on the Barrier River.

The total value of the buildings for which permits have been issued this year in Winnipeg is $14,368,650.

The contract for the waterworks of Burnaby, B. C., has been awarded to Evans, Coleman & Evans, Vancouver, B. C. The pipes are to be supplied by Stewart & Lloyd, England. The Robertson, Godson Company, Vancouver, supply the valves. The total cost of the work is to be $160,000.

Washing chimney gases to eliminate smoke and dust is practised at a cocoa works at York, England. The pea slack coal used averages about 40 per cent. dust. A fan draws the gases from the boilers and discharges them through a relatively short stack. Before reaching the stack the gases pass through a brick lined chamber in which water sprays are located and in which by the use of baffles the gases are made to take a tortuous path. About 1 gal. of water is used for 300 cu. ft. of hot gases treated per hour, and about 15 per cent. of the water used on the gases entering the chamber is hot. In 24 hr. 1600 lb. of grit has been collected, or about 1.5 per cent. of the weight of the coal burned.

Reinforced concrete construction for industrial buildings costs 6.4 per cent. less than fireproofed structural steel and 6.7 per cent. more than mill construction, according to J. P. H. Perry in a paper presented to the National Association of Cement Users. The figures are based on buildings of various sizes erected in different parts of the country. Cases are cited of steel buildings costing 10 to 13 per cent. more than the concrete structures and of concrete buildings costing even 27 per cent. more than mill construction.

The N. P. Bowsher Company, South Bend, Ind., recently finished the installation of considerable new machinery in connection with its steam plant. This includes a new heavy duty Corliss engine, oil and steam separators, Swarthout water gauges, etc. A fine new dry lumber storage has also been provided, with departmental racks for piling all the different sizes used in the company's business. Cement walkways in yards were also built, and the entire plant was sewered and drained. In the spring the company will put in a new boiler and live steam feed water purifier.

A shear for cold cutting blooms of 6 x 7½-in. cross-section and of metal having a shearing resistance of 64,000 lb. per square inch is in use at the Oeking Steel Works at Düsseldorf-Lierenfeld. The machine thus requires a working force of over 1,400 tons. As described in Stahl und Eisen, it is electrically driven by a 90-hp. motor, and has two flywheels each weighing 6600 lb. The total weight of the machine is about 60 tons.

Depreciation of electrical properties has been given special study by Henry Floy, consulting engineer, New York, and at the June meeting of the American Institute of Electrical Engineers he contributed a paper which has been called a classical treatment likely so to stand for some time. He compiled tables of the percentage depreciation to be allowed to the detail component parts of a plant handling electricity, such, for example, as air compressors, arc lamps, belting, boilers, breeching, coal and ash-handling machinery, paving, piping, stokers, telephones and track. The paper in full may perhaps be obtained from the Institute, 29 West Thirty-ninth street, New York.

Adelbert Sauer, president of the Sauer Power Generating Company, 5115-19 Rosetta street, Pittsburgh, has been granted American patents and also patents in England, Canada, Germany, and France, covering the Sauer improved steel turbine. The company is now trying to locate a new plant for the manufacture of the turbines in greater numbers than its present facilities permit, in addition to its line of patented shaft bearings, gas burners, etc. It proposes to build generators in sizes from 1 hp upward, for a variety of uses. The Sauer Company intends increasing its capital stock to take care of increased business and will shortly hold a board meeting to decide where its new plant will be located.

An infringement suit brought against the Houston, Stamwood & Gamble Company, maker of steam engines and boilers, Cincinnati, Ohio, by the Casey-Hedges Company, Chattanooga, Tenn., was dismissed on July 8 by Judge A. M. Cochran, of the United States Circuit Court of the Eastern District of Kentucky, on the ground that there is no infringement. The question arose over steel casings, especially those for boilers set with Dutch ovens.

The Westinghouse Electric & Mfg. Company now has 8500 stockholders against about 2800 five years ago.

Current Metal Prices.

The following quotations are for small lots, New York. Wholesale prices, at which large lots only can be bought, are given elsewhere in our weekly market report

IRON AND STEEL—

Bar Iron from Store—

Refined iron:
1 to 1⅞ in. round and square ₤ lb 1.70¢
1½ to 1¼ in. x ⅝ to 1 in. ₤ lb 1.70¢
1 to 1¼ in. x ¼ to 3 in. ₤ lb 1.80¢
Rods, ¼ and 11-16 round and square ₤ lb 1.80¢
Angles: Cts. ₤ lb
¾ in. x ¼ in. and larger 1.90
3 in. x 5-16 in. and ¼ in. 2.00
1½ to 2½ in. x ⅛ in. 2.05
1½ to 2½ in. x 5-16 in. and thicker 1.95
1 to 1¼ in. x 3-16 in. 2.05
1 to 1¼ x ⅛ in. 2.10
⅝ x ⅛ in. 2.20
¾ x ⅛ in. 2.45
¾ in. x ⅜ in. 2.45
1½ x 3-32 in. 2.90
Tees:
1 in. 2.25¢
1¼ in. 2.20¢
1½ to 2½ x ¼ in. 2.00¢
1½ to 2½ x 5-16 in. 2.10¢
3 in. and larger 2.25¢
Beams 1.90¢
Channels, 3 in. and larger 1.90¢
Bands, 11½ to 6 x 6-16 to No. 8 2.10¢
Burden's "H. B. & S." iron, base price 2.95¢
Burden's "Best" iron, base price 3.15¢
Norway bars 3.60¢

Merchant Steel from Store—

per lb
Bessemer machinery 1.90¢
Horse calk, tire and sleigh shoe 2.50@3.00¢
Best cast steel, base price in small lots 7¢

Sheets from Store—

Black

	One pass, C. R. soft steel.	R. G. cleaned.
No. 16	₤ lb 2.45¢	2.75¢
Nos. 18 to 20	₤ lb 2.50¢	2.85¢
Nos. 22 and 24	₤ lb 2.55¢	2.95¢
No. 26	₤ lb 2.60¢	3.05¢
No. 28	₤ lb 2.95¢	3.30¢

Russia, Planished &c.

Genuine Russia, according to assortment ₤ lb 12 @14½¢
Imitation planished, W. Dewees Wood ₤ lb A. 10¢; B. 9¢ net

Galvanized

Nos. 12 and 14 ₤ lb 2.75¢
No. 24 ₤ lb 3.10¢
No. 26 ₤ lb 3.30¢
No. 28 ₤ lb 3.60¢
No 20 and lighter 36 inches wide, 25¢ higher.

Genuine Iron Sheets—

Galvanized

Nos. 22 and 24 ₤ lb 5.50¢
No. 26 ₤ lb 6.00¢
No. 28 ₤ lb 7.00¢

Corrugated Roofing—

2½ in. corrugated.	Painted.	Galvd.
No. 24 ₤ 100 sq. ft.	$3.75	$4.70
No. 26 ₤ 100 sq. ft.	2.85	3.50
No. 28 ₤ 100 sq. ft.	2.50	3.05

Tin Plates—

American Charcoal Plates (per box)

"A.A.A." charcoal:
IC, 14 x 20 $6.65
IX, 14 x 20 7.90
A. charcoal:
IC, 14 x 20 $5.60
IX, 14 x 20 6.70

American Coke Plates—Bessemer—
IC, 14 x 20 107 lb $4.50
IX, 14 x 20 5.50

American Terne Plates—
IC, 20 x 28 with an 8 lb. coating $8.70
IX, 20 x 28 with an 8 lb. coating 10.70

Seamless Brass Tubes—

List November 13, 1908. Base price, 18¢

Brass Tubes, Iron Pipe Sizes—

List November 13, 1908. Base price, 18¢

Copper Tubes—

List November 13, 1908. Base price, 21¢

Brazed Brass Tubes—

List February 1, 1911. 19½¢ ₤ lb

High Brass Rods—

List February 1, 1911. 14⅜¢ ₤ lb

Roll and Sheet Brass—

List February 1, 1911. 14⅜¢ ₤ lb

Brass Wire—

List February 1, 1911. 14⅜¢ ₤ lb

Copper Wire—

Base price, Carload lots mill 14¢

Copper Sheets—

Sheet copper hot rolled, 16 oz. (quantity lots) ₤ lb 18¢
Sheet copper cold rolled, 1¢ ₤ lb advance over hot rolled
Sheet copper polished 20 in. wide and under, 1¢ ₤ square foot.
Sheet copper polished over 20 in. wide, 2¢ ₤ square foot.
Planished copper, 1¢ ₤ square foot more than polished

METALS—

Tin—

Straits pig ₤ lb 50 @51 ¢

Copper—

Lake ingot ₤ lb 14 @14¼¢
Electrolytic ₤ lb 13¾@14 ¢
Casting ₤ lb 13¾@14 ¢

Spelter—

Western ₤ lb 6⅞@ 7⅛¢

Zinc—

No. 9, base, casks ₤ lb 8½¢ Open ₤ lb 8¼¢

Lead—

American pig ₤ lb 5½@5¾¢
Bar ₤ lb 6⅝@6¾¢

Solder—

½ & ½, guaranteed ₤ lb 28½@28¾¢
No. 1 ₤ lb 26½@26¾¢
Refined ₤ lb 24⅜@25⅜¢
Prices of solder indicated by private brand vary according to composition.

Antimony—

Cookson ₤ lb. @ 9¾¢
Hallets @10 ¢
Other brands 9@ 9½¢

Bismuth—

Per lb $2.00@$2.25

Aluminum—

No. 1 aluminum (guaranteed over 99% pure), in ingots for remelting 21¢ and 22¢
Rods and Wire Base price 31¢
Sheets Base price 33¢

Old Metals—

Dealers' Purchasing Prices Paid in New York.

	Cents.
Copper, heavy and crucible	10.75 to 11.00
Copper, heavy and wire	10.50 to 10.75
Copper, light and bottoms	9.50 to 9.75
Brass, heavy	7.25 to 7.50
Brass, light	5.75 to 6.00
Heavy machine composition	9.25 to 9.50
Clean brass turnings	7.00 to 7.25
Composition turnings	8.00 to 8.25
Lead, heavy	3.75
Lead, tea	3.50
Zinc, scrap	4.00



THE IRON AGE

Established 1855

New York, August 31, 1911

VOL. 88: No. 9

Published Every Thursday by the

DAVID WILLIAMS COMPANY

239 West 39th Street, New York

Entered at the New York Post Office as Second-Class Mail Matter.

Subscription Price, United States and Mexico, $5.00 per Annum; to Canada, $7.50 per Annum; to Other Foreign Countries, $10.00 per Annum. Unless receipt is requested, none will be sent. Credit for payment will be shown by extending the date on the wrapper of your paper.

W. H. Taylor, - - - - - President and Treasurer
I. A. Mekeel, - - - - - - First Vice-President
Harold S. Buttenheim, - - - - Second Vice-President and Secretary

Geo. W. Cope, - - - - } Editors
A. I. Findley, - - - - }
W. W. Macon, - - - - }

M. C. Robbins, - - - - Manager
Charles S. Baur, - - - Assistant Manager

Branch Offices

Philadelphia, Real Estate Trust Building
Pittsburgh, Park Building
Boston, Compton Building
Chicago, Fisher Building
Cleveland, American Trust Building
Cincinnati, 807 Andrews Building

CONTENTS.

Structural Steel Leading 445
Germany's Industrial Policy as a Model 446
Cotton Planters Combine to Maintain Prices 446
Labor and the Efficiency System 447
Lake Shipbuilding at Low Ebb 448
Correspondence 448
The Hopkins & Allen Arms Company's New Officers 448
The Steel Corporation's Current Business 449
Personal 449
American Iron and Steel Institute Directory 449
The Iron and Metal Markets 450
Customs Decisions 460
New Tools and Appliances 460
Obituary 461
Metal Corrosion in Gaseous Atmosphere 461
Lake Superior Mining Institute 462
Chrome Steel Rails in Tunnels 463
The National Bridge Company of Canada 463
Two Thomas Meter Installations 464
Motion Pictures for Selling Machinery 464
Railroad Equipment Orders 464
Fire Protection in Factories 465
Open Hearth Steel Furnaces in Great Britain 465
Employees Demand Control of Harriman Lines Shops 466
The Labor Union View of Lifting Magnets 466
Judicial Decisions of Interest to Manufacturers 466
Handling Freight with a Gantry Crane 467
Ingersoll Cutter Grinder 468
The Rockford Machine Tool Company's New Plant 469
The Census Bureau's Report on Iron and Steel 470
American and German Steel Displaces Welsh Workers 471
Welding and Cutting Machine 472
The New Sibley Motor-Driven Drills 473
Lathe Relieving Attachment 474
New Queen City Punch 475
New Cleveland Four-Piston Air Drill 476
New Gould & Eberhardt Hobbing Attachment 477
The Production of Graphite in 1910 477
American Rolling Mill Company 478
The Rolling of Automobile Rims 488
Heavy 15-Inch Engine Lathe 488
Avery Automatic Scale 490
The United States Motor Company's Output 490
Brown & Sharpe Castellating Attachment 491
Electrolytic Generation of Oxygen and Hydrogen 491
Lake Iron Ore Property Values Keep Up 492
The Krupp Research and Chemical Laboratories 493
Notable Tunnel Ventilating Plant 493
The Machinery Markets 494

Structural Steel Leading

A New Tonnage Record for 1911

Marked Activity of Steel Corporation Mills—Further Price Cutting

More emphasis has been put this week on the continued operation of Steel Corporation mills at a better rate than the average of its competitors' plants. As has been previously pointed out, this is due in large part to the excellent export trade of the Corporation, but in some lines it appears to have been increasing in recent weeks its share of the domestic business. An official statement issued on Tuesday says that the Steel Corporation has received larger specifications for prompt shipment in August than in any previous month this year and intimates that unfilled orders for the month will show a "fair increase."

Structural steel shapes are easily the most active of finished products. The mills, however, get more satisfaction from the volume of business than from the prices which underlie recent large contracts for buildings and bridges. It is estimated that, with the maintenance of the present rate through the year, the 1911 total will exceed that of the record year 1906 in fabricated steel contracts by 10 to 15 per cent. In view of their very heavy bookings, leading fabricators are now naming figures more in line with a 1.35c. basis for shapes.

At Chicago the ordinance limiting the height of buildings goes into effect this week and this has hastened the taking out of permits on several large projects. These, together with new office buildings now under construction, represent a total value above $18,000,000.

Further evidence of the strictness with which railroads are limiting expenditures has appeared this week in the frog and crossing and track supply trades, where specifications, conspicuously in the case of the Eastern lines, have been cut sharply. Three rail sales are reported by Steel Corporation mills—4500 tons to the Chesapeake & Ohio, 9450 tons to the Illinois Central and 5900 tons to the Texas & Pacific. The Grand Trunk is in the market for 10,000 tons of rails which may go to a seaboard mill as they are wanted for delivery in New England.

Reports from the wire trade show that August has been a month of greater activity than has been indicated in market reviews of the past few weeks. Much of the selling has been done with a quietness bearing out reports of concessions by certain producers. On wire nails a $1.65 price per keg, representing a reduction of $1 a ton, has been announced by one seller as applying to prompt orders, but it only met quiet cutting already in progress.

The Eastern plate trade is taking a keen interest in the four vessels which are to be built for the trade between the Atlantic and Pacific coasts. The plates will amount to 30,000 tons and the shapes to 10,000 or 12,000 tons.

The lower prices lately reported in wrought pipe and tubes appear to be largely made by jobbers. The guarantee on prices recently made by certain mills extends to October 15 and applies to business closed after August 15.

The competition on steel bars has been sharper in the Chicago district, and the Pittsburgh base has been quite generally disregarded. As low as 1.33c. delivered is reported, or the equivalent of 1.15c., Pittsburgh. In general 1.20c., Pittsburgh, is the basis in Central and Western districts and a good part of the bar sales in the East has been at 1.25c., Pittsburgh.

In semi-finished steel there has been no important business, but the $21 Pittsburgh basis has been shaded and mills have absorbed a $1 extra in some cases.

The situation in foundry pig iron for 1912 is developing slowly. More consumers are testing the market, but furnaces are not meeting their views. Some sales have been made at current prices, for the remainder of the year, with the privilege of taking some of the iron in January and February. From Buffalo sales of several thousand tons have been made to Canadian foundries, American iron being preferred even at $1.50 to $2 a ton above the delivered price of the higher phosphorus Middlesbrough, England, grades. Southern iron has made a hard pace for Northern furnaces in central territory recently and has prevented the latter from establishing advances.

The old material market is weaker, particularly in the East, where steel works, with two or three months' stocks on hand, have reduced their bids by 50 cents. In the Chicago district much more railroad material is offered than the market can absorb.

Germany's Industrial Policy as a Model

A well-known New York financier who returned last week from Europe referred in an interview to the industrial and commercial expansion of Germany. He spoke particularly of the evident satisfaction of German labor with existing conditions and of the steady increase in the country's wealth and added: "In Germany the law and government favor the plan of industrial combinations. Trade and commerce are encouraged and not harassed or stifled by vexatious governmental methods. I believe we can learn considerable from careful study of German economic methods and particularly from the manner in which Germany deals with labor problems."

If the iron and steel trades of Germany are an index of what is going on in other industries in that country, it will not be long until the soundness of the expansion there will cause serious questioning. The government's toleration if not actual encouragement of the pools in the steel industry which have controlled an important part of the production for a number of years has sometimes been referred to as an example for the United States. That the methods of the German Steel Works Union have encouraged the building of plant beyond the requirements of the country and a normal export trade will hardly be questioned. In the past year attention has been called repeatedly to the new capacity in blast furnaces, steel works and rolling mills which is coming forward against the expiration of the present agreement among the manufacturers next year.

Some of these additions have been spoken of as the preparation of various members of the Steel Works Union to secure larger allotments in any agreement which may be made in 1912. This can only be a secondary reason for the building of so great an amount of new plant. Undoubtedly the large firms which are competing in plant extension are counting on a continuance of the scale of increase in the consumption of German iron and steel products which has been so marked in the past five years, as indicated by a production of 10,875,000 metric tons of pig iron in 1905 and 14,227,000 tons in 1910, with a rate so far this year of 15,400,000 tons. Apart from the special conditions governing the German iron and steel trade which make it possible to control the prices of most products at home and thus to make sharply competitive prices in outer markets, the expansion of the industry in Germany has shown a parallel to that in the United States. There has been unbounded confidence apparently in the indefinite continuance of the rate of increase shown in the curves of the statistical charts. It seems inevitable, therefore, that the German steel manufacturers will yet find themselves in the condition now so embarrassing here, with a capacity more than one-half greater than home consumption plus exports.

Just how far the measure of control of the steel market exerted in this country in the past few years has affected the building of new capacity it would be difficult to say. It is certainly early to hold up the German policy of encouraging control of an industry by the producer as an example for imitation. The full story of syndicate operations in the steel industry there has not yet been told. From present indications, however, data will soon be available that will put a less favorable aspect on this method of expansion. The preliminary fencing for position against the renewal of the Stahlwerks Verband agreement in 1912 may show that the industry has even now gone past the danger line.

Cotton Planters Combine to Maintain Prices

It is not surprising that cotton planters are so worried by the rapid decline in the price of their product that they are combining to check the downward movement. They always have a hard fight with nature in endeavoring to raise a crop and deserve to secure good returns for their labor and the hazard of their capital. The individual planter has the sympathy of his fellow countrymen in his struggle for existence, and the nation itself is benefited when planters as a whole are prosperous and able to supply themselves and their families with not only comforts, but luxuries. The short crops of the last two years brought very good prices, and those who were not compelled to sell their product as soon as it was marketable enjoyed the satisfaction of making a good profit. But a great change has occurred this year. An unusually large cotton crop seems to be assured and this has adversely affected the price. At this time last year the price of cotton was about 16½ cents per pound for spot and 13½ to 14½ cents for futures, while the past week the price was 12½ to 13 cents for spot and 11¼ to 11¾ cents for futures. The decline is so heavy that the planters are dismayed. They are convinced that stocks of cotton are so small everywhere that even if the United States does produce an exceptionally large crop this year it will all be needed to put the world's stocks in normal shape. It is therefore

quite natural that they should feel like taking concerted measures for maintaining prices until the crop can be distributed.

The remarkable feature of this movement to hold up cotton prices, however, is that it was not started by planters in private life, but by men of official prominence who have been active in working up public opinion in direct opposition to such a procedure. At the recent session of Congress much concern was manifested with regard to the disposition of manufacturers to maintain prices, either through some kind of an understanding with one another or because a high tariff was presumed to enable them to do so. The impression was then sought to be made upon the public that this concern grew out of the deep sympathy felt for that rather indefinite but widely-known individual, the consumer. We may be mistaken, but according to our recollection the ostensible aim of those in control of Congressional activity was to secure lower prices for every consumer. It seems to us that the purpose of the "farmers' free list" was to make certain articles cheaper for the farmer and planter; the object of the wool bill was to give the consumer cheaper woolen goods; the point of the cotton bill was to secure cheaper cotton goods for the consumer, and the object of numerous investigations was to break up combinations of capital or amicable relations among manufacturers so that the consumer might secure cheaper manufactured products generally. It would therefore be presumed that those who were prominent in this Congressional activity would frown upon any movement that would prevent a commodity of such general consumption as cotton from becoming as cheap as nature and unrestrained trade conditions might permit. But the remarkable spectacle is presented of some of these Congressmen taking the lead in the movement to hold up the price of cotton.

Announcement is made that in Washington, D. C., on August 23, the very next day after the adjournment of Congress, the Representatives and Senators from seven cotton-growing States held a meeting and resolved to send out circulars urging all planters to hold their cotton for 13 cents a pound, and other circulars to Southern banking houses requesting that every possible aid be given to the planters to enable them to maintain this policy. Although cotton brokers assert that Southern planters themselves are selling ahead through cotton exchanges as a hedge, lest when their cotton is ready for shipment the price may be lower than can now be obtained on future contracts, yet the Congressmen who participated in this conference claim in an open statement that an effort is being made, "principally through the instrumentality of the speculative element of the New York Cotton Exchange, to break down the price of cotton," and this they now seek to prevent. They even go so far as to ask the president of the Farmers' Union and officials of other cotton planters' organizations to get their local unions and other subordinate bodies to advise the growers generally to hold their cotton for 13 cents "and to continue to demand that price until by a convention or agreement a different way shall be suggested."

It would seem almost incredible that men who had for months been engaged in a campaign to upset industries and break down prices would be able to effect such a speedy change in their mental attitude. Even though their personal fortunes may be threatened by the fall in cotton, it would appear that respect for public opinion would prevent them from taking the lead in urging action which, although it may not be contrary to statute, is nevertheless in defiance of the spirit of the law which they have so zealously been endeavoring to have enforced against others. It seldom happens that persecutors have the tables turned so quickly upon themselves. Perhaps the unpleasant position in which the cotton-growing Congressmen now find themselves may modify their views with regard to other business interests when they again assemble to make laws for the nation. They will unquestionably be on the defensive if their scheme to make cotton dear should prove successful.

Labor and the Efficiency System

Molders employed at the United States Arsenal at Watertown, Mass., have gone on strike because of the presence in the foundry of efficiency experts. In explanation of their action one of the strikers is quoted as saying: "When a skilled mechanic of years' experience in the work in hand is stood over by a man who is incapable of performing the task himself, or even of intelligently directing a workman how to perform such a task, and is told by that man that he should have accomplished the task in less than half the time taken to do it, the limit of human endurance is reached."

Such an attitude toward improved methods of production is regrettable, not only on the part of the owner, in this case the Federal Government, but on the part of the workmen themselves. An engineer rarely is able to do the work of the men whom he directs in their efforts, but he understands better than most of them methods and conditions attending production. The efficiency expert is an engineer trained along special lines, in order that he may discover and apply means of shortening the time of producing given results, and at the same time of maintaining or improving the quality. The men whose labors come under his eye are benefited if they have the ability and willingness to meet the new conditions. The incompetent may be put aside to make place for more able material. But the survivors, who in most works constitute the large majority of the force, become a more valuable unit industrially, and in the long run each will receive a larger return for his labor, provided, of course, he will continue to apply the knowledge gained from his contact with the efficiency engineer. Workmen will realize this better as time goes on.

The workman quoted above omitted to say, and may not have known, that a chief use of the stopwatch is to inform the operator himself of the variations in his own speed. It has been shown that a workman in one case will take two or three times as long to perform one of the series of operations entering into the finishing of a piece, as he takes to perform the same operation on the succeeding piece. The stopwatch man, by comparing the sum of the minimum components with the average time required to do a piece, is often able to show the workman that on his own record he can turn out more work by studying to bring his average time for a piece closer to the sum of his minima. There may be unreasonable time rating, and often is, and it will not do to start out with any expectation that a workman can reduce his average on a series of operations to the sum of his minima; but the history of studies with the stopwatch

is that many workmen have been surprised at what they have been shown of their own capacity to increase output and have gladly made use of the information to add materially to their earnings.

The details of the cause of the Watertown strike are not available, but it may be stated as a general proposition that the owner and his efficiency man should handle the application of the system with all possible consideration for the men. It is difficult to imagine an industrial relationship in which more tact is necessary for the avoidance of misunderstanding and friction. Criticism should be meted out quietly and only after mature decision. The co-operation of the workman should be sought, and his suggestions should be given their full value and the credit should be frankly given him if his ideas are adopted. These factors seem self-evident; nevertheless in some cases they are not given due prominence.

Lake Shipbuilding at Low Ebb

The outlook for the shipyards on the Great Lakes is far from bright. An officer of the leading shipbuilding company has been credited with the prediction that in the next 12 months not a new lake carrier will be built. It is to be doubted if any such statement was made, for the year has not been known, since lake traffic assumed important proportions, when no addition to the fleet was made. Moreover, it is the history of lake vessel building that when the outlook is darkest and the cost of new boats the lowest, capital has been attracted to invest in floating property. At the same time the conditions in the lake freight market, which were acute in 1910, have been even more unpromising this year, and it must be admitted that the prospect that 1912 will be a year giving full employment to the ore fleet is far from good.

Twenty bulk freighters were launched on the lakes in 1910, with a carrying capacity of 3,900,000 tons in a season. In the nine years ending with 1910 the vessels carrying coarse freight which were added to the fleet had a capacity for carrying over 41,000,000 tons of iron ore in a season. The boats built this year have probably added 500,000 tons to this total. Here is an addition to the ore fleet in ten years capable of bringing down all the ore shipped by water in 1909 and within 1,000,000 tons of the record water shipments of 1910. Vessel building, like blast furnace and steel works building, has been overdone and there must be a period of rest for the absorption of the surplus. At the same time it is to be remembered that pessimism is nowhere deeper dyed than in the lake trade, when conditions are forbidding, and that in 1904 and in the dark years following the panic of 1893 new work was placed just at the time when prophecies gave least room for hope. Today, with so much of the ore going to consumers whose carrying capacity is considerably short of their shipments, there should continue to be additions to the fleets of the steel companies. And this may be expected to go on even at the expense of the merchant vessel interests, just as the steel companies have increased their blast furnace capacity with the certainty that merchant furnaces which had been selling them iron would lose their market in large part, if not altogether.

The Des Moines Bridge & Iron Company, Pittsburgh, has received a contract for the building of a 160,000-gal. hemispherical bottom steel tank on a 150-ft. steel tower at Lakeland, Ky., where the State Insane Asylum is located.

Correspondence

Mr. Thyssen's Remarks at the Brussels Conference

To the Editor: In Vol. 88, No. 5, of your paper you give a report of the proceedings of the conference at Brussels. As far as my personal remarks are concerned, their meaning is not given quite clearly. Consequently I have the pleasure to repeat them to you more accurately, viz.:

"I ask your kind permission to address a few remarks to you just to say a few words of excuse for the bad behavior we showed, perhaps, in the past, when our competition, following the ideas of Judge Gary, was perhaps too sharp. (This remark is, of course, meant somewhat ironically.) In order to make this excuse more clear to you, I should like to compare the activity of each country with a boiler. Each line of public activity is represented by a pipe line. There are countries which have big colonies; there are countries which have free land to develop; and other countries, again, which have no colonies and no land to develop. It is natural that in the country having large colonies the pipe line which this line of activity runs through must be very big; and other countries which have no colonies and consequently not this pipe line must have a bigger pipe line, for instance, for their industrial activity in order to have an outlet for their surplus of steam. I think your committee should try to come to an arrangement so that there never should be any undue pressure in any boiler representing the activity of each nation. Then you will have a perfect result." FRITZ THYSSEN.

Gewerkschaft Deutscher Kaiser, Bruckhausen-Rhein, August 18, 1911

The Hopkins & Allen Arms Company's New Officers

The Hopkins & Allen Arms Company, Norwich, Conn., effected its reorganization with the new owners August 22. President A. H. Brewer resigned as president and director, and Gardiner Hall, John Eccles, John C. Averill, E. E. Perry and Archibald Mitchell, directors, also resigned. New directors were chosen as follows: William A. Watts, New Haven; George E. Matthies, Seymour; M. C. Mason, Rockville; George E. Avis, New Haven; Charles E. Roberts, New Haven; Franklin S. Jerome, Norwich. Harris Briggs and Charles B. Lee, members of the old board, were continued

The following officers were elected by the directors: William A. Watts, president; George E. Matthies, vice-president; Charles B. Lee, secretary; M. C. Mason, treasurer; George E. Avis, general manager. Mr. Watts is president and treasurer of the Bronson-Townsend Company, wholesale hardware, New Haven; Mr. Matthies is assistant treasurer of the Seymour Mfg. Company and secretary and treasurer of the Seymour Trust Company; Mr. Mason was purchasing agent of the Hockanum Mills Company, Rockville; Mr. Avis was for years connected with the Winchester Company as foreman in the barrel-making department, later succeeding his father as contractor of this department, which is one of the most exacting and important branches of gun manufacture; Mr. Lee has for years held the position of secretary of the old company. E. E. Perry has resigned and Charles E. Roberts, a former salesman for the Winchester Company and latterly in like capacity for the J. Stevens Arms & Tool Company, has been appointed sales manager. Frank Jewett, of Hartford, stated to be one of the best gunmakers ever employed in the Winchester plant and a mechanic of unusual ability, has been appointed superintendent. The newly-elected officers took charge of the management at once

The Cincinnati Iron & Steel Company, Cincinnati, Ohio, is distributing a large sheet entitled "Cincinnati's Official Package Car Guide No. 1." This is compiled by the Receivers' and Shippers' Association of Cincinnati, and is the forerunner of a book to be gotten out by that association for the purpose of showing the railroad lines by which delivery can be made in practically every town in the United States of package cars.

The Steel Corporation's Current Business

Following the monthly meeting of the directors of the United States Steel Corporation August 29, President James A. Farrell issued a statement showing operations for the first three weeks in August, which is as follows:

"The unfilled orders as at August 1 showed 3,584,000 tons (exclusive of intercompany business of 850,000 tons), a gain over June 30 of 225,000 tons. Since August 1 new business has been freely offered, and, notwithstanding shipments in August have been large, the bookings up to the 20th (the latest date to which data have been compiled) show a fair increase.

"The steel-producing plants of the corporation are operating about 78 per cent. of their capacity, while a number of the finishing departments of the various companies are operating 85 per cent.

"The daily bookings of the corporation from January 1 to August 20 show an average increase of 7750 tons, as compared with the same period in 1910.

"Specifications for prompt shipments in August are larger than for any previous month this year, and the outlook is all that can be desired."

A number of patents were granted August 8 to William H. Bristol, of the Bristol Company, Waterbury, Conn. One covers a speed recorder, comprehending a circular revolving chart on which a continuous speed record may be obtained. Another covers a belt fastener for round belts and the essential feature comprises an internally threaded sleeve provided with a slot intended to cut the threads on the end of the belt as it is turned into the fastener. A third covers a combined clock and shock recorder, this similarly having a rotatable chart and a flexible vibrating arm with a marking point at one end of it. The fourth covers a temperature compensating device for use in electrical apparatus adapted for minute currents such as electric pyrometry. A patent was also granted to Mr. Bristol August 15 on a pressure indicating and recording apparatus, in which pressure changes are made to cause fluctuations to a contained liquid carrying a float with indicating and recording devices.

A piped rail, which was broken into a number of pieces, was responsible for the wrecking of a fast passenger train of the Lehigh Valley Railroad on a trestle at Manchester, N. Y., August 25. Thirty-seven lives were lost. The railroad's chemists have taken pieces of the broken rail for analysis. The New York State Railroad Commission also had an expert at the scene of the wreck and will make an independent examination of a portion of the rail. Near Kirkwood, Ohio, five coaches of a Cincinnati, Hamilton & Dayton train were derailed on August 27. It is stated that the engine struck a defective rail and was thrown from the track.

A cablegram of August 27 reported a more serious aspect of the labor troubles in the metal-working industries of Germany. The employers last week locked out 60 per cent. of the metal workers at Dresden and at Chemnitz. The trouble started early in the present month when 10,000 metal workers at Leipzig and 9000 in the Thuringian district were locked out because some of the employees had gone on a strike. The national organizations of employers and employees took up the matter, but failed to make a settlement, and the extensive lockouts at Dresden and Chemnitz resulted.

The one Niagara furnace at North Tonawanda, N. Y., which is now in blast will be blown out about September 15. Of the three Buffalo Union Furnace Company stacks two are now running, and both Wickwire and both Buffalo & Susquehanna furnaces are active. The Lackawanna Steel Company has had three out of seven furnaces in blast this month. The New York State Steel Company furnace, which blew out July 2, is still idle and the steel plant is shut down.

The American Railway Association report shows that the number of idle freight cars in the United States declined from 128,088 on August 2 to 104,170 on August 16, a falling off of 23,918. On August 17, 1910, the total number of idle cars was 73,679.

Personal

J. B. Keiser, vice-president and general manager, and H. S. Geismer, Chattanooga district manager of the Southern Iron and & Steel Company, who have tendered their resignations, will organize September 1 the Keiser-Geismer Engineering Company with offices in Birmingham, Ala., and Chattanooga, Tenn., for consulting work covering coal and iron mines, blast furnaces and steel plants in Alabama, Georgia and Tennessee.

Arthur R Shurtleff, president of the Imperial Belting Company, 166-68 West Kinzie street, Chicago, is at present combining business with pleasure on a trip to Europe.

John M. Manley, who was recently elected manager of the Cincinnati Commercial Association of Cincinnati, Ohio, has decided not to accept this position, but will retain his present one as local secretary of the National Metal Trades Association.

S. Severance, who has been president and manager of the S. Severance Mfg. Company since its formation, manufacturing spikes and rivets at Glassport, Pa., will sever his connection with that company September 1.

John Fritz, Bethlehem, Pa., whose active interest in engineering developments in iron and steel has long been so surprisingly sustained, entered upon his 90th year August 21.

J. Campbell Maben, Jr., has been elected a director of the Sloss-Sheffield Steel & Iron Company to succeed H. O. Seixas, deceased.

James Campbell, St. Louis, a vice-president of the Frisco Lines, with important interests in the Laclede Gaslight Company and other enterprises, has been elected to fill a vacancy on the board of directors of the Republic Iron & Steel Company and has been made a member of its executive committee. The vacancy on the board of directors caused by the death of John W. Gates will not be filled until the annual meeting of the stockholders in October.

J. H. Sheadle, of the Cleveland-Cliffs Iron Company, Cleveland, Ohio, sailed August 29 for a several weeks' European trip.

A. W. Dee has resigned his position as secretary and general manager of the National Rolling Mill Company, Mansfield, Ohio. His successor has not yet been appointed.

George R. Bentley, who has been connected with the Central Iron & Steel Company, Harrisburg, Pa., for the past 12 years as general superintendent, will sever his connection with the company October 1.

The Pittsburgh Testing Laboratory, Pittsburgh, Pa., announces that it appointed, on August 26, R. T. Miller acting manager of its Chicago office, 1330 Monadnock Building, succeeding James A. Lister, whose connection with the company ceased on that date.

American Iron and Steel Institute Directory

The American Iron and Steel Institute has sent out a biographical directory, prepared by Hon. James T. McCleary, its secretary, and Assistant Secretary Howard H. Cook. It contains 266 pages 4¾ x 7 in. and is handsomely bound in flexible leather. Sketches with portraits are given of 243 members of the institute and there are 14 additional sketches unaccompanied by portraits. The frontispiece is a portrait of the president of the institute, Judge E. H. Gary. Only those familiar with the difficulty of extracting such information about themselves from busy men can appreciate the labor involved in the preparation of this volume, and the compilers have done the iron and steel manufacturers of the country a service in thus acquainting them with each other. It is stated in the preface that the circulation of the directory will be limited to the members and to some of the leading iron and steel manufacturers of Europe.

The Griscom-Spencer Company, 90 West street, New York, is now selling agent for the Bundy steam trap and other specialties manufactured by the Nashua Machine Company, Nashua, N. H.

The Iron and Metal Markets

A Comparison of Prices

Advances Over the Previous Week in Heavy Type, Declines in Italics.

At date, one week, one month and one year previous.

	Aug. 30, 1911.	Aug. 23, 1911.	July 26, 1911.	Aug. 31, 1910.
PIG IRON, Per Gross Ton:				
Foundry No. 2 standard, Philadelphia	$15.00	$15.00	$15.00	$16.00
Foundry No. 2, Valley furnace	13.50	13.50	13.50	14.00
Foundry No. 2 Southern, Cincinnati	13.50	13.50	13.25	14.25
Foundry No. 2, Birmingham, Ala.	10.25	10.25	10.00	11.00
Foundry No. 2, at furnace, Chicago*	14.50	14.50	14.50	16.50
Basic, delivered, eastern Pa.	14.75	14.75	14.50	15.00
Basic, Valley furnace	13.00	13.00	13.00	14.00
Bessemer, Pittsburgh	15.90	15.90	15.90	15.90
Gray forge, Pittsburgh	13.90	13.90	13.90	14.15
Lake Superior charcoal, Chicago.	16.50	16.50	16.50	18.50
COKE, CONNELLSVILLE, Per Net Ton, at Oven:				
Furnace coke, prompt shipment.	1.50	1.50	1.50	1.60
Furnace coke, future delivery.	1.60	1.60	1.65	1.75
Foundry coke, prompt shipment.	1.85	1.85	1.85	2.15
Foundry coke, future delivery.	2.10	2.10	2.00	2.25
BILLETS, &c., Per Gross Ton:				
Bessemer billets, Pittsburgh	21.00	21.00	21.00	24.50
Forging billets, Pittsburgh	26.00	26.00	26.00	29.00
Open hearth billets, Philadelphia	23.40	23.40	23.40	27.50
Wire rods, Pittsburgh	27.00	27.00	27.00	28.00
OLD MATERIAL, Per Gross Ton:				
Iron rails, Chicago	14.00	14.00	14.00	16.00
Iron rails, Philadelphia	*17.00*	17.50	17.50	18.00
Car wheels, Chicago	13.00	13.00	12.50	14.00
Car wheels, Philadelphia	13.00	13.00	13.00	13.75
Heavy steel scrap, Pittsburgh	*13.00*	13.25	13.25	14.25
Heavy steel scrap, Chicago	11.00	11.00	10.50	12.25
Heavy steel scrap, Philadelphia	*13.25*	13.50	13.50	13.75
FINISHED IRON AND STEEL, Per Pound:	Cents.	Cents.	Cents.	Cents.
Bessemer rails, heavy, at mill	1.25	1.25	1.25	1.25
Refined iron bars, Philadelphia	1.27½	1.27½	1.27½	1.40
Common iron bars, Pittsburgh	1.25	1.25	1.25	1.45
Common iron bars, Chicago	1.20	1.20	1.20	1.37½
Steel bars, Pittsburgh	1.20	1.20	1.20	1.40
Steel bars, tidewater, New York.	1.36	1.36	1.36	1.56
Tank plates, Pittsburgh	*1.30*	1.35	1.35	1.40
Tank plates, tidewater, New York	*1.46*	1.51	1.51	1.56
Beams, Pittsburgh	1.35	1.35	1.35	1.40
Beams, tidewater, New York	1.51	1.51	1.51	1.56
Angles, Pittsburgh	1.35	1.35	1.35	1.40
Angles, tidewater, New York	1.51	1.51	1.51	1.56
Skelp, grooved steel, Pittsburgh.	1.20	1.20	1.25	1.45
Skelp, sheared steel, Pittsburgh.	1.30	1.30	1.35	1.55
SHEETS, NAILS AND WIRE, Per Pound:	Cents.	Cents.	Cents.	Cents.
Sheets, black, No. 28, Pittsburgh	*1.95*	2.00	2.00	2.15
Wire nails, Pittsburgh†	*1.65*	1.70	1.70	1.70
Cut nails, Pittsburgh†	1.60	1.60	1.60	1.65
Barb wire, galv., Pittsburgh†	2.00	2.00	2.00	2.00
METALS, Per Pound:	Cents.	Cents.	Cents.	Cents.
Lake copper, New York	12.75	12.75	12.75	12.87½
Electrolytic copper, New York.	12.50	12.50	12.60	12.62½
Spelter, St. Louis	*5.90*	5.95	5.60	5.20
Spelter, New York	*6.05*	6.10	5.80	5.35
Lead, St. Louis	4.42½	4.42½	4.45	4.30
Lead, New York	4.50	4.50	4.50	4.40
Tin, New York	*42.87½*	45.00	42.00	35.70
Antimony, Hallett, New York	*7.75*	7.75	8.00	7.87½
Tin plate, 100-lb. box, New York	$3.94	$3.94	$3.94	$3.84

* The average switching charge for delivery to foundries in the Chicago district is 50c. per ton.
† These prices are for largest lots to jobbers.

Prices of Finished Iron and Steel f.o.b. Pittsburgh

Freight rates from Pittsburgh in carloads, per 100 lb.: New York, 16c.; Philadelphia, 15c.; Boston, 18c.; Buffalo, 11c.; Cleveland, 10c.; Cincinnati, 15c.; Indianapolis, 17c.; Chicago, 18c.; St. Paul, 32c.; St. Louis, 22½c.; New Orleans, 30c.; Birmingham, Ala., 45c. Rates to the Pacific coast are 80c. on plates, structural shapes and sheets, No. 11 and heavier; 85c. on sheets, Nos. 12 to 16; 95c. on sheets, No. 16 and lighter; 65c. on wrought boiler tubes.

Plates.—Tank plates, ¼ in. thick, 6¼ in. up to 100 in. wide, 1.30c. to 1.35c., base. Following are stipulations prescribed by manufacturers, with extras to be added to base price (per pound) of plates:

Rectangular plates, tank steel or conforming to manufacturers' standard specifications for structural steel dated February 6, 1903, or equivalent, ¼ in. thick and over on thinnest edge, 100 in. wide and under, down to but not including 6 in. wide, are base.

Plates up to 72 in. wide, inclusive, ordered 10.2 lb. per square foot, are considered ¼-in. plates. Plates over 72 in. wide must be ordered ¼ in. thick on edge, or not less than 11 lb. per square foot, to take base price. Plates over 72 in. wide ordered less than 11 lb. per square foot down to the weight of 3-16-in. take the price of 3-16-in.

Allowable overweight, whether plates are ordered to gauge or weight, to be governed by the standard specifications of the Association of American Steel Manufacturers.

	Cents per lb.
Gauges under ¼ in. to and including 3-16 in. on thinnest edge, extra	.10
Gauges under 3-16 in. to and including No. 8	.15
Gauges under No. 8 to and including No. 9	.25
Gauges under No. 9 to and including No. 10	.30
Gauges under No. 10 to and including No. 12	.40
Sketches (including all straight taper plates) 3 ft. and over in length	.10
Complete circles, 3 ft. in diameter and over	.20
Boiler and flange steel	.10
"A. B. M. A." and ordinary firebox steel	.20
Still bottom steel	.30
Marine steel	.40
Locomotive firebox steel	.50
Widths over 100 in. up to 110 in., inclusive	.05
Widths over 100 in. up to 115 in., inclusive	.10
Widths over 115 in. up to 120 in., inclusive	.15
Widths over 120 in. up to 125 in., inclusive	.25
Widths over 125 in. up to 130 in., inclusive	.50
Widths over 130 in.	1.00
Cutting to lengths or diameters under 3 ft. to 2 ft., inclusive	.25
Cutting to lengths or diameters under 2 ft. to 1 ft., inclusive	.50
Cuttings to lengths or diameters under 1 ft.	1.55

No charge for cutting rectangular plates to lengths 3 ft. and over.
TERMS—Net cash 30 days.

Structural Material.—I-beams and channels, 3 to 15 in., inclusive, 1.35c. to 1.40c., net. Other shapes and sizes are quoted as follows:

	Cents per lb.
I-beams over 15 in.	1.45 to 1.50
H-beams over 18 in.	1.50 to 1.55
Angles, 3 to 6 in., inclusive, ¼ in. and up	1.35 to 1.40
Angles over 6 in.	1.45 to 1.50
Angles, 3 in. on one or both legs, less than ¼ in. thick, plus full extras as per steel bar card Sept. 1, 1909	1.40 to 1.45
Tees, 3 in. and up	1.40 to 1.45
Zees, 3 in. and up	1.35 to 1.40
Angles, channels and tees, under 3 in., plus full extras as per steel bar card Sept. 1, 1909	1.40 to 1.45
Deck beams and bulb angles	1.65 to 1.70
Hand rail tees	2.45
Checkered and corrugated plates	2.45

Sheets.—Makers' prices for mill shipments on sheets of U. S. standard gauge, in carload and larger lots, on which jobbers charge the usual discounts for small lots from store, are as follows:

Blue Annealed Sheets.

	Cents per lb.
Nos. 3 to 8	1.35 to 1.40
Nos. 9 and 10	1.45 to 1.50
Nos. 11 and 12	1.50 to 1.55
Nos. 13 and 14	1.55 to 1.60
Nos. 15 and 16	1.65 to 1.70

One Pass, Cold Rolled, Box Annealed Sheets.

Nos. 10 to 12	1.60 to 1.65
Nos. 13 and 14	1.65 to 1.70
Nos. 15 and 16	1.70 to 1.75
Nos. 17 to 21	1.75 to 1.80
Nos. 22, 23 and 24	1.80 to 1.85
Nos. 25 and 26	1.85 to 1.90
No. 27	1.90 to 1.95
No. 28	1.95 to 2.00
No. 29	2.00 to 2.05
No. 30	2.10 to 2.15

Three Pass, Cold Rolled, Box Annealed Sheets.

Nos. 15 and 16	1.80 to 1.85
Nos. 17 to 21	1.85 to 1.90
Nos. 22 to 24	1.90 to 1.95
Nos. 25 and 26	1.95 to 2.00
No. 27	2.00 to 2.05
No. 28	2.05 to 2.10
No. 29	2.10 to 2.15
No. 30	2.20 to 2.25

Galvanized Sheets, of Black Sheet Gauge.

Nos. 10 and 11	1.95 to 2.00
Nos. 12, 13 and 14	2.05 to 2.10
Nos. 15, 16 and 17	2.20 to 2.25
Nos. 18 to 22	2.35 to 2.40
Nos. 23 and 24	2.45 to 2.50
Nos. 25 and 26	2.65 to 2.70
No. 27	2.80 to 2.85
No. 28	2.95 to 3.00
No. 29	3.05 to 3.10
No. 30	3.25 to 3.30

All above rates are f.o.b. Pittsburgh, terms 30 days net, or 2 per cent. cash discount 10 days from date of invoice, as also are the following base prices per square for painted and galvanized roofing sheets, with 2½-in. corrugations:

Gauge.	Painted.	Galvanized.	Gauge.	Painted.	Galvanized.
29	....	$2.40	23	$2.40	$3.50
28	$1.40	2.55	22	2.60	3.70
27	1.55	2.60	21	2.80	4.05
26	1.65	2.65	20	3.05	4.35
25	1.85	3.05	18	4.05	5.70
24	2.10	3.15	16	4.90	6.50

THE IRON AND METAL MARKETS

Wrought Pipe.—The following are the jobbers' carload discounts on the Pittsburgh basing card on wrought pipe, in effect from October 1, 1910:

	Steel		Iron	
Butt Weld.	Black.	Galv.	Black.	Galv.
1 to 1½ in.	..	..	49	43
½ in.	75	63	71	59
¾ to 1½ in.	79	69	75	65
2 to 3 in.	80	70	76	66
Lap Weld.				
2 in.	76	66	72	62
2½ to 4 in.	78	67	74	64
4½ to 6 in.	77	67	73	63
7 to 12 in.	75	59	71	55
13 to 15 in.	51½	..	..	..
Butt Weld, extra strong, plain ends, card weight.				
⅛, ¼, ⅜ in.	69	59	65	55
½ in.	74	68	70	64
¾ to 1¼ in.	78	72	74	68
2 to 3 in.	79	73	75	69
Lap Weld, extra strong, plain ends, card weight.				
2 in.	75	69	71	65
2½ to 4 in.	77	71	73	67
4½ to 6 in.	76	70	72	66
7 to 8 in.	69	59	65	55
9 to 12 in.	64	54	60	50
Butt Weld, double extra strong, plain ends, card weight				
½ in.	64	58	60	54
¾ to 1½ in.	67	61	63	57
2 to 3 in.	69	63	65	59
Lap Weld, double extra strong, plain ends, card weight.				
2 in.	65	59	61	55
2½ to 4 in.	67	61	63	57
4½ to 6 in.	66	60	62	56
7 to 8 in.	59	49	62	56
Plugged and Reamed.				
1 to 1½, 2 to 3 in. Butt Weld } 2, 2½ to 4 in. ..... Lap Weld }	will be sold at two (2) points lower basing (higher price) than merchants' or card weight pipe. Butt or lap weld, as specified.			

The above discounts are for "card weight," subject to the usual variation of 5 per cent. Prices for less than carloads are three (3) points lower basing (higher price) than the above discounts.

Boiler Tubes.—Discounts on lap welded steel boiler tubes to jobbers in carloads are as follows:

	Steel.
1¼ to 2¼ in.	65
2½ in.	67½
2¾ to 3¾ in.	70
3½ to 4½ in.	72½
5 to 6 in.	65
7 to 13 in.	62½

Less than carloads to destination east of the Mississippi River will be sold at delivered discounts for carload lowered by two points for lengths 22 ft. and under; longer lengths f.o.b. Pittsburgh. Usual extras to jobbers and boiler manufacturers.

Wire Rods and Wire.—Bessemer, open hearth and chain rods, $27. Fence wire, Nos. 0 to 9 per 100 lb., terms 60 days, or 2 per cent. discount in 10 days, carload lots, to jobbers, annealed, $1.50; galvanized, $1.80. Carload lots, to retailers, annealed, $1.55; galvanized, $1.85. Galvanized bar wire, to jobbers, $2; painted, $1.70. Wire nails, to jobbers, $1.70.

The following table gives the price to retail merchants on wire in less than carloads, including the extras on Nos. 10 to 16, which are added to the base price:

Fence Wire, Per 100 lb.

No.	0 to 9	10	11	12 & 12½	13	14	15	16
Annealed	$1.65	$1.70	$1.75	$1.80	$1.90	$2.00	$2.10	$2.20
Galvanized	1.95	2.00	2.05	2.10	2.20	2.30	2.70	2.80

Market and Stone Wire in Bundles, Discount from Standing List.

Bright and Annealed:	
9 and coarser	80
10 to 18	80 and 10
19 to 26	80 and 10 and 2½
27 to 36	80 and 5
Galvanized:	
9 and coarser	75 and 10
10 to 16	75 and 10
17 to 26	72½ and 10
27 to 36	72½
Coppered or Liquor Finished:	
9 and coarser	75 and 10
10 to 26	75 and 10
27 to 36	70 and 10 and 5
Tinned:	
6 to 18	75 and 10 and 10

Pittsburgh

PITTSBURGH, PA., August 30, 1911.—*(By Telephone.)*

Pig Iron.—The recent purchase of Northern foundry and forge iron by the Standard Sanitary Mfg. Company for the remainder of this year was 11,000 tons, instead of 7000 as stated in this report last week. The local market on Bessemer and basic iron is very dull, but there is a fair amount of new inquiry for foundry iron for delivery over the remainder of the year. A local interest representing Valley furnaces reports sales this month of upward of 20,000 tons of Northern foundry iron for delivery over the remainder of the year on the basis of $13.50, Valley furnace, for No. 2. The Bessemer Pig Iron Association reports two sales of 500 tons each of its standard Bessemer iron for September delivery at $15, Valley furnace. We quote as follows: Bessemer, $15; basic, $13 for early delivery and $13.25 for extended delivery; No. 2 foundry, $13.50 to $13.75; malleable, $13.25 to $13.50; gray forge, $13, all at Valley furnace, the freight rate to Pittsburgh being 90c.

Steel.—New inquiry is dull, nearly all consumers' billet and sheet and tin bar requirements being covered by sliding scale contracts. Mills report that specifications against contracts are coming in at a fairly satisfactory rate. The billet and rail sales department of the Carnegie Steel Company reports that its actual orders sent through the mills for rolling this month will exceed July by about 50,000 tons, a part of this business being for export. Prices on billets and bars are reported firm. We note a sale of 300 tons of forging billets for September shipment at $26, delivered, Pittsburgh district. We quote Bessemer and open hearth billets, 4 x 4 in. and up to but not including 10 x 10 in., $21, base, and sheet and tin bars in 30-ft. lengths, $22; 1½-in. billets, $22; forging billets, $26, base, usual extras for sizes and carbons, all prices being f.o.b. Pittsburgh or Youngstown district, with freight to destination added.

(By Mail.)

The present activity in the structural steel branch is the most prominent feature in the iron trade. Bids have gone in on a very large amount of work, while a good deal has been placed in the past week. This is in strong contrast with the rather quiet condition existing in nearly all other lines. In fact general developments in the steel trade have recently been of a discouraging nature. The wire trade is disturbed by reason of a letter recently sent out by one of the leading makers offering wire nails for immediate specification at $1.65 per keg at mill. This price had been quietly made for some time, but the fact that such a letter has gone to the general wire trade has upset conditions considerably. The feeling regarding the last three or four months of the year is not so cheerful as it was two or three weeks ago, and the belief is gaining ground that the expected improvement may not develop to the extent anticipated. The consuming trade is still pursuing the policy of placing orders only for such quantities of material as are actually needed to meet current wants, and there is no desire whatever to buy ahead. Prices on the whole are weak and concessions are more easily obtainable than was the case a month ago. The mills seem to be going after new business more aggressively. The pig iron market has been very quiet, but two small sales of Bessemer were reported at the full price of $15 at Valley furnace. Specifications against contracts for billets and sheet bars are fairly heavy, but new inquiries are light. It is claimed that regular prices are being obtained on such steel except in cases where consumers have special contracts on a sliding scale basis. The scrap iron trade is stagnant. While prices on furnace coke for prompt shipment are a little stronger, the new demand is very quiet.

Ferromanganese.—A sale of 1200 tons of ferromanganese to a consumer outside of the Pittsburgh district, deliveries 200 tons a month over the first half of next year, is reported. Efforts to obtain better than $37, Baltimore, for first half delivery have not succeeded. We quote foreign 80 per cent. at $36.50 for the remainder of the year and about $37 for first half of 1912, the freight rate to Pittsburgh district being $1.95 a ton.

Ferrosilicon.—Two or three fairly large inquiries for 50 per cent. are in the market for delivery over the first half of 1912, but the higher prices asked by sellers have so far prevented the business from being placed. We continue to quote 50 per cent. ferrosilicon at $53 to $54 and blast furnace silicon as follows: 10 per cent., $23; 11 per cent., $24; 12 per cent., $25, f.o.b. cars Ashland and Jisco furnaces.

Muck Bar.—In the absence of actual sales we continue to quote best grades, made from all pig iron, at $28.50 to $29, Pittsburgh.

Skelp.—A fair amount of inquiry is being received and a sale is reported of about 1500 tons of sheared iron plates for September and October delivery on the basis of about 1.65c., Pittsburgh. We quote: Grooved steel skelp, 1.20c.; sheared steel skelp, 1.30c.; grooved iron skelp, 1.45c. to 1.55c., and sheared iron skelp, 1.65c. to 1.70c., all for delivery at consumers' mills in the Pittsburgh district.

Wire Rods.—New inquiry for wire rods is very light, most consumers being covered by contracts, against which specifications are not coming in very freely. We continue to quote Bessemer, open hearth

THE IRON AND METAL MARKETS

and chain rods at $27, Pittsburgh, but this price might be shaded on a desirable order.

Steel Rails.—Several fairly large inquiries for standard sections are in the market and will probably be closed this week. The Carnegie Steel Company received new orders and specifications in the past week for a little over 2500 tons of light rails. Prices on light rails are as follows: 12-lb., 1.25c.; 16, 20 and 25-lb., 1.21c. to 1.25c.; 30 and 35-lb., 1.20c., and 40 and 45-lb., 1.16c. These prices are f.o.b. at mill, plus freight, and are the minimum of the market in carload lots, small lots being sold at a little higher price. Standard sections are held at 1.25c. per lb. for Bessemer.

Plates.—New car orders have been rather slow in coming out in the past week or 10 days. The Pressed Steel Car Company has taken a contract for 100 steel hopper cars for the Buffalo Creek & Gauley Railroad, 100 steel gondolas for the Havana Central Railroad of Cuba, 691 composite gondola cars and 26 composite flat cars for the Pennsylvania Lines West and to steel ore cars for the Northwestern Iron Company. The largest inquiry in the market at present is that of the Missouri Pacific Railroad for 2000 steel gondola cars, 1000 steel underframe ore cars and 1000 mixed cars. Prices on plates continue rather weak and 1.30c. is being named on desirable orders. We quote ¼-in. and heavier plates at 1.30c. to 1.35c., f.o.b. Pittsburgh.

Structural Material.—Inquiries are heavy and some work has been placed. The Jones & Laughlin Steel Company has taken 150 tons for a new foundry building for Munson Brothers at Syracuse, N. Y., and 150 tons for a brewery in Santiago. Bids have gone in on 2600 to 3000 tons of steel for an addition to the First National Bank Building, in this city, of 20 stories. The Youngstown Sheet & Tube Company will soon place contracts for 6000 to 7000 tons of steel for new buildings to house its open hearth plant and other departments. We continue to quote beams and channels up to 15 in. at 1.35c., Pittsburgh.

Merchant Steel.—New orders are fairly active, but mostly for small lots to cover current needs, while specifications against contracts are coming in at only a moderate rate. Regular prices, which are more or less shaded, are as follows: Iron finished tire, ¼ x ½ in., and heavier, 1.40c., base; under these sizes, 1.55c.; planished tire, 1.60c.; channel tire, 1.80c., base; toe calk, 1.90c.; flat sleigh shoe, 1.55c.; concave or convex, 1.75c.; cutter shoes, tapered or bent, 2.25c.; spring steel, 2c.; machinery steel, smooth finish, 1.90c.

Hoops and Bands.—Specifications against contracts are better, new orders are coming in at a fairly heavy rate and shipments by the mills this month will show an increase over July. We quote steel hoops at 1.40c. and bands at 1.25c., with extras on the latter as per the steel bar card.

Sheets.—The new demand for sheets continues quite heavy from all sections of the country, and specifications are coming in rather freely, but there still continues to be some shading in prices, notably in the Western and Southwestern territories. In most cases the cutting is about $1 per ton, but when a nice specification comes up, either in black, galvanized or roofing sheets, some mills shade regular prices $2 per ton. However, makers state that prices on galvanized sheets are a little stronger, due to the recent heavy advance in spelter. The outlook is that shipments of sheets by the mills in August will be heavier than last month. The prices now in effect on black, galvanized and roofing sheets are printed on a previous page.

Tin Plate.—Specifications from can makers will likely slow up soon, but reports are that specifications for bright plate from the salmon packers are expected for the next six weeks or longer. Shipments by the mills this month have been heavy and will exceed those in July. The American Sheet & Tin Plate Company reports that its tin plate business this year will be the largest in its history, and several of the leading independent mills also report that their shipments this year are likely to exceed those of previous years. In regard to prices it can be stated that if any large new business in tin plate was being offered it could probably be placed at $3.60 per base box, but all the leading makers, including the American Sheet & Tin Plate Company, have large contracts for tin plate on their books on the $3.70 per box basis, and against which consumers are specifying freely. The mills are operating close to 80 per cent. of capacity and expect to maintain this rate of operation for the next month or six weeks. We quote 100-lb. cokes at $3.70 per base box, f.o.b. Pittsburgh.

Bars.—A fair amount of business is being placed, but most consumers, large and small, have pretty well covered their requirements for some time ahead and are specifying quite freely against these contracts. There is still some weakness in prices of steel bars, and on desirable orders 1.20c. at mill is still being named in some cases, but several large makers report they are pretty well filled up and are holding at 1.25c. The market on iron bars is quiet, new demand being dull and only for small lots, with the mills not operating to more than 50 to 60 per cent. of capacity. We quote steel bars at 1.20c. to 1.25c. and iron bars 1.25c. to 1.30c., Pittsburgh.

Rivets.—The new business being placed is mostly in small lots to cover actual needs, but specifications against contracts have been coming in a little better this month than in July. We quote structural rivets at 1.70c. to 1.75c., and boiler rivets at 1.80c. to 1.85c., but in very exceptional cases and for desirable business these prices are slightly shaded.

Wire Products.—A few days ago one of the leading wire nail mills sent out a letter to the trade offering to accept orders for wire nails for immediate specification at $1.65, base, and this has disturbed the whole situation in the wire trade. The demand for wire and wire nails is quiet, and only for small lots to cover actual needs. Regular prices are as follows: Galvanized barb wire, $2 per 100 lb.; painted, $1.70; annealed fence wire, $1.50; galvanized, $1.80; wire nails, $1.70, and cut nails, $1.60, all f.o.b. Pittsburgh, with full weight added to point of delivery.

Spelter.—The market is quiet and prices have gone off in the past week. We quote prime grades of Western at 5.80c., East St. Louis, equal to 5.92½c., Pittsburgh, for prompt shipment. Futures are quoted at lower figures.

Railroad Spikes.—In the past week or two the Baltimore & Ohio Railroad has placed orders for 2000 kegs with a local maker and the Louisville & Nashville is reported to have placed about 6000 kegs, but none of this business came to local mills. We quote railroad spikes at $1.50 per 100 lb., base sizes, f.o.b. Pittsburgh.

Shafting.—The new demand is only for small lots to cover actual needs, while specifications from automobile builders and other large consumers are not coming in at a satisfactory rate. In fact, the general condition of the shafting trade, both as regards new demand and prices, is not good, and has not been for some time.

Merchant Pipe.—Last week the National Tube Company took an order from the Medina Gas & Fuel Company, Lima, Ohio, for 68 miles of 10-in. pipe for a gas line, to be used in conveying natural gas from the Lima gas fields to Mansfield, Ohio. Mills report that the current demand for iron and steel merchant pipe is fairly heavy, being larger so far this month than in July, with the outlook for fall trade very good. Leading mills continue to run to about 70 per cent. of capacity, or slightly more. Regular discounts on both iron and steel pipe are being shaded to more or less extent.

Boiler Tubes.—The new demand for railroad tubes is fairly active, but on merchant tubes is still very dull, as it has been for some months. Regular discounts are being more or less shaded, and the general condition of the boiler tube trade is very unsatisfactory to the mills.

Coke.—A local producer of Connellsville coke reports a sale of about 10,000 to 12,000 tons for September shipment at $1.50 per net ton at oven. Two Valley blast furnace operators have inquiries out for 40,000 to 50,000 tons of coke for shipment over the next several months, and this will likely be closed within the next few days. The output of coke is increasing and is slightly higher now than for some time. The Upper and Lower Connellsville regions in the past week turned out 313,722 tons, an increase over the previous week of 9700 tons. We quote standard makes of furnace coke for prompt shipment at $1.50, and for remainder of the year at $1.60 to $1.65 in net tons at oven. We quote standard 72-hr. foundry coke for prompt shipment at $1.85 to $1.90, and for future delivery at $2.10 up to $2.25 per net ton, at oven.

Iron and Steel Scrap.—The scrap market is practically stagnant, very little material moving from dealers to consumers. Prices on all grades are decidedly weak, particularly on borings and turnings. We note a sale of 1000 tons of cast iron borings at about $9.50 delivered to buyer's mill, and 1000 tons of machine

THE IRON AND METAL MARKETS

shop turnings at about $9.75, delivered in Pittsburgh district. Dealers now quote as follows, per gross ton, f.o.b. Pittsburgh, unless otherwise noted:

Heavy steel scrap, Steubenville, Follansbee, Sharon, Monessen and Pittsburgh delivery	$13.00 to $13.25
No. 1 foundry cast	13.25 to 13.50
No. 2 foundry cast	12.75 to 13 00
Bundled sheet scrap, f.o.b. consumers' mill, Pittsburgh district	11.75 to 12.00
Rerolling rails, Newark and Cambridge, Ohio, Cumberland, Md., and Franklin, Pa.	13.50 to 13.75
No. 1 railroad malleable stock	12.75 to 13.00
Grate bars	10.75 to 11.00
Low phosphorus melting stock	15.75 to 16.00
Iron car axles	23 00 to 23.50
Steel car axles	17.50 to 18.00
Locomotive axles	23.00
No. 1 busheling scrap	12.00 to 12.25
No. 2 busheling scrap	8.50 to 8.75
Old car wheels	13.00 to 13 25
Sheet bar crop ends	15.25 to 15.50
*Cast iron borings	9.50
*Machine shop turnings	9.75
Old iron rails	15.50 to 15.75
No. 1 wrought scrap	13.50 to 14.00
Heavy steel axle turnings	10.00 to 10.25
Stove plate	10.50 to 10.75

*These prices are f.o.b. cars at consumers' mills in the Pittsburgh district.

Chicago

CHICAGO, ILL., August 29, 1911.

The tonnage of fabricated steel awarded under contract during the past week stands out among market considerations very prominently. A total of nearly 35,000 tons, of which over 31,000 tons was taken by the American Bridge Company, was placed. These lettings do not include any of the steel that will be required for the several new office buildings to be erected in the loop district of Chicago, for which permits were issued during the week. With the office building construction now in progress, the new buildings contemplated, having a valuation aggregating over $18,000,000, will give to Chicago an unprecedented period and tonnage of steel construction. There is less occasion for optimism in connection with railroad buying. The generally accepted reports of retrenchment by railroad systems, both east and west of the Mississippi, have had concrete support the past ten days in a marked decrease in specifications received. The leading steel bar interests are apparently well satisfied with the situation and with their mill bookings as far ahead as January 1, but among those mills dependent upon current business the shading of prices to secure orders continues without abatement. Plate and sheet tonnage is being booked in about the same volume as in the past three or four weeks, but it is not expected that August will show up as well as July. Pig iron buying is very moderate, with Birmingham prices firmly maintained, and local iron prices unchanged for lack of sufficient business to excite keener competition. The scrap iron market shows some tendency toward weakness in keeping with the limited demand from melters and the constant inflow of railroad offerings.

Rails and Track Supplies.—Rail business for the past week was reported as disappointingly light. A lot of 500 tons of open-hearth rails was placed and also one of 2500 tons of Bessemer. Several of the railroads have inquiries out covering equipment, but the placing of this business is delayed from day to day, and one inquiry for 2000 cars has been withdrawn. The demand for spikes and bolts is less active, and prices are inclined to be less firm. It is possible to obtain track spikes freely at our minimum quotation. We quote standard railroad spikes at 1.65c. to 1.75c., base; track bolts with square nuts, 2.10c. to 2.20c., base, all in carload lots, Chicago; standard section Bessemer rails, 1.28c.; open hearth, 1.34c.; light rails, 40 to 45 lb., 1.16c. to 1.20½c.; 30 to 35 lb., 1.19½c. to 1.24c.; 16, 20 and 25 lb., 1.20½c. to 1.25c.; 12 lb., 1.25c. to 1.30½c.; angle bars, 1.50c. to 1.60c., Chicago.

Pig Iron.—While displaying an active interest in the market, as evidenced by an undiminished volume of inquiry, pig iron melters are slow to place orders. Such business as is closed evidently follows only upon the closing of contracts for castings. There is practically no buying to provide for possible requirements, and apparently all those in a position to do so took in as much as possible of the low-priced iron of a month ago. Buying, therefore, has been moderate and in small lots. The price of standard Birmingham iron continues firmly at $10.50 for deliveries through the balance of the year, with $11 asked for two or three of the high-grade brands. It is understood that some high phosphorus iron may still be obtained on the basis of $10, Birmingham. These prices with freight added for delivery in Chicago permit local iron to be sold slightly under the Southern price, but for delivery to Fox River and Mississippi River points they give to Southern iron a slight advantage over the output of Chicago furnaces. The distribution of sales has followed very largely these price advantages. We quote for Chicago delivery, except for local irons, which are f.o.b. furnace, the following prices:

Lake Superior charcoal	$16.50 to $17.00
Northern coke foundry, No. 1	15.00 to 15.50
Northern coke foundry, No. 2	14.50 to 15.00
Northern coke foundry, No. 3	14.25 to 14.50
Northern Scotch, No. 1	16.00
Southern coke, No. 1 foundry and No. 1 soft	15.10
Southern coke, No. 2 foundry and No. 2 soft	14.60
Southern coke, No. 3	14.35
Southern coke, No. 4	14.10
Southern gray forge	13.85
Southern mottled	13.85
Malleable Bessemer	14.50 to 15.00
Standard Bessemer	17.40
Basic	15 50
Jackson Co. and Kentucky Silvery, 6 per cent.	17.90
Jackson Co. and Kentucky Silvery, 8 per cent.	18 90
Jackson Co. and Kentucky Silvery, 10 per cent.	19.90

Structural Material.—The market situation as to structural steel offers greater occasion for optimism than any other current phase. During the past ten days contracts for fabricated work aggregating nearly 35,000 tons were awarded, of which the American Bridge Company secured over 31,000 tons. Of this business, the 5300 tons for the Northwestern Mutual Life Building at Milwaukee was previously reported. In addition to the tonnage above mentioned the American Bridge Company will fabricate 2220 tons for the Kansas City Terminal Railway Company street crossings, 7230 tons for the municipal bridge at St. Louis, 14,154 tons for the Kansas City Terminal Station, 2000 tons for the Los Angeles Investment Company Building, and 441 tons for a high school building at Seattle, Wash. Other contracts include 310 tons for the Chicago Great Western Railway at Oelwein, Iowa, to the Vierling Steel Works, 3000 tons of deck girder spans for the Missouri Pacific Railroad, to the Virginia Bridge & Iron Company, and 404 tons for the International Trust Company Building at Denver, Col., to the Jackson-Richter Iron Works. The ordinance limiting the height of buildings in the Chicago loop district, which goes into effect the coming week, has been the occasion for the hurried beginning of a number of buildings, the aggregate cost of which will be over $18,000,000. These include the Continental and Commercial National Bank, Marshall Field & Co. office building, a second Marshall Field estate building, Henry C. Lytton store and office building, Chicago, Burlington & Quincy Railroad office building, Boston Store addition, Kesner building, and Morrison Hotel. This new construction, added to the seven similar buildings now in process of erection, constitutes the most remarkable building record Chicago has experienced. Local fabricating shops have work for little more than 60 days in advance, but most of the structural mills are filled practically to capacity for several months to come. Prices of plain material are said to be well maintained. We quote plain material, mill shipment, for Chicago delivery, at 1.53c., and from store, 1.75c.

Plates.—Local mills report that plate tonnage booked continued at about the same rate as during the entire month of August. Indications based upon the activity of plate fabricators point to a consumption somewhat below the average. In competition with Eastern plate mills local interests report a tendency to shade prices. We continue to quote for Chicago delivery, from mill, 1.53c., and from store 1.65c.

Sheets.—No improvement is apparent in the matter of prices prevailing for sheets. Notwithstanding the low prices obtainable buyers continue to avoid buying beyond actual needs. Inasmuch as present quotations are the lowest offered in years the lack of confidence can hardly be attributed to an expectation of still lower prices, but must rather arise from uncertainty as to the continuity of satisfactory business conditions. While calling attention to the more or less freely offered concessions of $1 to $1.50 per ton, we continue to quote, nominally, the following prices for Chicago delivery: Carload lots, from mill: No. 28 black sheets, 2.18c.; No. 28 galvanized, 3.18c.; No. 10 blue annealed, 1.68c. Prices from store, Chicago, are: No. 10, 1.85c. to 2.05c.; No. 12,

THE IRON AND METAL MARKETS

2c. to 2.10c.; No. 28 black, 2.45c. to 2.55c.; No. 28 galvanized, 3.45c.

Bars.—Bar iron manufacturers in this territory claim to be taking no contract business at lower prices than $1.25c., Chicago. The only exceptions to this are such slight concessions as are made on immediate shipment orders. The price situation as regards steel bars is decidedly in contrast and quotations as low as 1.33c., Chicago, are reported. Steel bar tonnage is moderately active. We quote as follows, f.o.b. Chicago: Soft steel bars, 1.43c.; bar iron, 1.20c. to 1.25c.; hard steel bars, rolled from old rails, 1.20c. From store, soft steel bars, 1.70c. to 1.80c., Chicago.

Wire Products.—The approach of what promises to be an early fall season is accompanied by a very apparent improvement in wire nails and the fence wire trade. The reawakening of activity in these products has lessened the stress as to prices, and shading is correspondingly less common. Jobbers' carload prices, which are quoted to manufacturing buyers, are as follows: Plain wire, No. 9 and coarser, base, 1.68c.; wire nails, 1.88c.; painted barb wire, 1.88c.; galvanized, 2.18c.; polished staples, 1.88c.; galvanized, 2.18c., all Chicago.

Cast Iron Pipe.—The lettings of the past week included 700 tons of culvert pipe for the Great Northern Railway and 4000 tons for Coronado, Cal., to the United States Cast Iron Pipe & Foundry Company; at St. Louis 700 tons was awarded to the Lynchburg Foundry Company and 1100 tons awarded at Los Angeles was distributed among the Lynchburg Foundry Company, American Cast Iron Pipe Company and United States Cast Iron Pipe & Foundry Company. We quote as follows, per net ton, Chicago: Water pipe, 4-in., $25.50; 6 to 12-in., $24.50; 16-in. and up, $24, with $1 extra for gas pipe.

Old Material.—The local scrap market has been called upon to absorb a large tonnage of material offered on recent list by the railroads, and on the other hand melters show little eagerness in taking their average requirements. Some melters are in the market only at prices considerably below market quotations. The Chicago, Rock Island & Pacific sells 4000 tons of scrap this week, and the Chicago, Burlington & Quincy Railroad has a list of 2000 tons. The Baltimore & Ohio Railroad has in the neighborhood of 1500 tons for sale at East Chicago. We continue to quote for delivery to buyers' works, Chicago and vicinity, all freight and transfer charges paid, per gross ton, as follows:

Old iron rails	$14.00 to $14.50
Old steel rails, rerolling	12.75 to 13.25
Old steel rails, less than 3 ft	11.50 to 12.00
Relaying rails, standard sections, subject to inspection	24.00
Old car wheels	13.00 to 13.50
Heavy melting steel scrap	11.00 to 11.50
Frogs, switches and guards, cut apart	10.75 to 11.25
Shoveling steel	10.50 to 11.00
Steel axle turnings	8.50 to 9.00

The following quotations are per net ton:

Iron angles and splice bars	$12.50 to $13.00
Iron arch bars and transoms	13.75 to 14.25
Steel angle bars	10.25 to 10.75
Iron car axles	18.00 to 18.50
Steel car axles	16.00 to 16.50
No. 1 railroad wrought	11.00 to 11.50
No. 2 railroad wrought	10.00 to 10.50
Steel knuckles and couplers	10.00 to 10.50
Locomotive tires, smooth	15.00 to 15.50
Machine shop turnings	6.25 to 6.75
Cast and mixed borings	6.00 to 6.50
No. 1 busheling	8.75 to 9.25
No. 2 busheling	6.75 to 7.25
No. 1 boilers, cut to sheets and rings	7.50 to 8.00
Boiler punchings	12.00 to 12.50
No. 1 cast scrap	10.50 to 11.00
Stove plate and light cast scrap	9.00 to 9.50
Railroad malleable	10.25 to 10.75
Agricultural malleable	9.25 to 9.75
Pipes and flues	8.00 to 8.50

The Oakdale Iron Company has been incorporated to do a general business in iron and steel scrap and relaying rails, and has established a yard at Oakdale, Ninety-first street and the Western Indiana Belt Railroad, Chicago. The offices of the company will be located at 1119 McCormick Building. Louis Benjamin is president and Theo. A. Schwengel is secretary and treasurer. Both were formerly connected with the Block-Pollak Iron Company, Mr. Benjamin as vice-president.

Philadelphia

PHILADELPHIA, PA., August 29, 1911.

The business of the past week has been of the quiet, routine, hand-to-mouth buying, which covered only immediate requirements for prompt delivery, there being no inclination on the part of sellers to stimulate inquiry beyond requirements for immediate needs. All business placed has been on small orders, but the aggregate of these gives a very fair volume of business. Prices have remained stationary, excepting a tendency to shade steel bars for immediate shipment, where a concession of $1 a ton has been made, and in the old material market a recession of from 25c. to 50c. is noted all along the line. The chief item in prospective business developing in the past week has been four new steel ships, for which bids will be asked within a short time. It is estimated that the plates for these ships will amount to 30,000 tons and the shapes between 10,000 and 12,000 tons. This is taken as an indication of the stimulation that will come to shipbuilding because of the Isthmian Canal.

Iron Ore.—Interest is centered in a transaction involving heavy tonnage, which will not be closed for a month or six weeks. Arrivals of foreign ore reported in the past week include 12,600 tons from Newfoundland and 10,775 tons from Cuba.

Pig Iron.—The only transaction of note has been the purchase by local interests of approximately 5000 tons of Bessemer iron, about half of which was supplied by a furnace not usually making this grade. Deliveries extend through the remainder of the year. Basic iron has not been in demand, but there has been a fair movement in foundry iron, the total for Northern grades being estimated at about 1200 tons in lots running from 50 tons to 100 tons. Prices are firm, with a tendency to stiffen for future deliveries. There have been one or two inquiries running into next year, but furnaces are discouraging such inquiries and are not prepared to quote beyond last quarter. The feature of the week in foundry iron has been the pressure for deliveries on immediate shipment iron, which is the result of low stocks in consumers' yards. Some Virginia furnaces are asking $12.50 for last quarter foundry iron, but most of them are selling at $12.25 for last half. A Birmingham interest has refused to take on 1000 tons of foundry iron at $10.10, Birmingham, but has accepted about 1500 tons in the past week, in about 100-ton lots, on the basis of $10.25, Birmingham. It is also reported that another company made a sale at Baltimore on the basis of $10. Two or three small lots of low phosphorus Northern iron were sold, the price being between $20 and $20.50, delivered, for standard analysis iron. The following range of quotations is named for standard brands, delivered in buyers' yards in this vicinity, shipment ranging from prompt to the remainder of the year:

Eastern Pennsylvania No. 2 X foundry	$15.00 to $15.25
Eastern Pennsylvania No. 2 plain	14.75 to 15.00
Virginia foundry	15.00 to 15.50
Gray forge	14.25 to 14.50
Basic	14.75 to 15.00
Standard low phosphorus	20.00 to 20.50

Ferroalloys.—In the past 10 days a round tonnage of 80 per cent. ferromanganese has been sold on the basis of $36.50, Baltimore. This is stated to be speculative material not representing the market, which is now held at $37, Baltimore. For 50 per cent. ferrosilicon the quotation is $57, with a tendency to strengthen. Furnace ferrosilicon is quoted at $23 for 10 per cent., $24 for 11 per cent., $25 for 12 per cent., f.o.b. cars at furnaces, plus a freight of $3.30 to Philadelphia points. Specifications are within Bessemer limits as to phosphorus and sulphur.

Billets.—New business has been light and confined to small sales for early delivery, and little tendency is shown by consumers to contract at this time for extended shipment. Quotations are $23.40 for open hearth rolling billets and $28.40 for ordinary forging billets, delivered in buyers' yards in this vicinity.

Plates.—Announcement that within the next week or 10 days bids would be asked for material for four steel vessels has put a little life into the plate market. It is estimated that these ships will require at least 30,000 tons of plates. They will enter the Pacific coast trade via the Panama Canal. Plate mills in this territory report business for the first three weeks of the present month to be considerably larger than for the entire month of July. Quotations are firm at 1.50c., delivered here.

Structural Material.—The low prices being quoted on fabricated steel erected, averaging between $38 and $40 a ton, have not stimulated business to the extent of bringing out any large new projects; several fair sized buildings which have been contemplated are slow in coming out. The contract for the Savannah Hotel, in which 1500 tons of steel will be used, has been let

THE IRON AND METAL MARKETS

to a local contractor. The Elkins Y. M. C. A. Building has not progressed beyond the drawing boards. A local fabricator has taken about 1600 tons of bridge work on various railroads. Inquiries have been light as far as tonnage is concerned, but have been fair in number. Plain shapes are 1.50c., delivered in this district.

Bars.—Steel bars have been shaded in this market to 1.35c., delivered. Rumors that lower than this has been done cannot be confirmed. Quotations on iron bars are 1.20c., Eastern mill, on desirable business, and 1.22½c. on less desirable specifications. Business has been confined to small lots for immediate shipment. Reports of more extended shading in the steel bar prices have been heard, but probably were the result of a slight concession on twisted steel bars for reinforced work, which went on the regular card without charge for twisting. While, as in other lines, the total tonnage placed during the week past has been in keeping, if not slightly ahead of previous weeks, it was made up entirely of small orders, and for near-by delivery.

Sheets.—Eastern mills are holding firmly to their quotations, although the volume of new business is very light, and some of the mills are running on easy schedule. The price-cutting of Western mills has not affected the local situation, freight rates operating as an effectual barrier against invasion from the Pittsburgh and Youngstown districts.

Coke.—A better feeling pervades the coke market and there is a tendency to strengthen prices on standard brands, in line with the stronger demand and increased shipments, which are, for the most part, for spot shipment. We note the sale during the past week of 2000 tons of heating coke at $1.50, at oven. Furnace coke for prompt shipment is quoted at $1.50 to $1.60 at oven, and on contract coke for six months or a year, $1.60 to $1.70. Foundry coke, for which a few fair-sized contracts covering the remainder of the year have been placed, is quoted $2 to $2.10 for spot, and $2.20 to $2.35 on contract. The following range of quotations is named, per net ton, for deliveries in this vicinity:

Connellsville furnace coke	$3.75 to $3.95
Foundry coke	4.25 to 4.60
Mountain furnace coke	3.35 to 3.55
Foundry coke	3.85 to 4.20

Old Material.—The scrap market has undergone a decided slump the past week, and lower prices are quoted on nearly every kind of old material. Many of these quotations are nominal and do not represent actual sales, but rather the ideas of the large consumers who have bid on the material. Few sales have been made and dealers are awaiting developments, feeling that the present is essentially a buyer's market. The softening in prices is attributed to the fact that most of the steel works have large stocks on hand, ample to meet their requirements for 60 or 90 days, and have reduced their offering price to secure a lower average. There is practically no speculative buying or selling. The following range of prices about represents the market for early deliveries in buyers yards, eastern Pennsylvania and nearby points, taking a freight rate from Philadelphia, varying from 35c. to $1.35 per gross ton, for shipment, ranging from prompt to the remainder of the year:

No. 1 railroad heavy melting steel scrap	$13.25 to $13.50
No. 1 yard heavy melting steel scrap	12.75 to 13.00
Old steel rails, rerolling (nominal)	14.00 to 14.50
Low phosphorus heavy melting steel scrap	16.75 to 17.25
Old steel axles (nominal)	19.50 to 20.00
Old iron axles (nominal)	24.50 to 25.00
Old iron rails	17.00 to 17.50
Old car wheels (nominal)	13.00 to 13.50
No. 1 railroad wrought	15.50 to 16.00
Wrought iron pipe	12.75 to 13.00
No. 1 forge fire	11.00 to 11.50
No. 2 light iron (nominal)	6.75 to 7.25
Wrought turnings	8.75 to 9.25
Cast borings	8.25 to 8.75
Machinery cast	13.00 to 13.50
Railroad malleable (nominal)	11.50 to 12.00
Grate bars, railroad	10.00 to 10.50
Stove plate	10.00 to 10.50

St. Louis

ST. LOUIS, MO., August 28, 1911.

Pig Iron.—The movement in this line is very largely of the carload lot order, but the number of orders is sufficient to make a good aggregate tonnage. The furnaces have assumed so firm an attitude on prices that consumers are buying only for immediate requirements. No. 2 Southern continues firm at $10.50 to $11, Birmingham, and little if any $10 iron is now to be found here. Southern No. 4 foundry and gray forge iron are almost impossible to get and there is very little No. 3 to be found. No inquiries of consequence are out and only three sales larger than the carload lot class are reported, one of 500 tons for last quarter delivery, one of 1500 tons for the same delivery, both No. 2 Southern, and 1000 tons of high silicon. There is nothing doing here on Northern foundry, basic or malleable.

Coke.—The demand, while fair in the aggregate, is largely made up of small orders for immediate requirements and requisitions on contracts. There is practically no change in prices, though they may be said to be a little more firmly held than has been the case recently. One sale of 5000 tons of Virginia coke at the market constitute the only really sizable order for the week. Reports generally show that practically none of the melters are asking that shipments of coke be held back on their contracts.

Finished Iron and Steel.—Fabricators are actively in the market and are ordering principally for specific jobs and emphasizing the necessity for quick shipment. In this latter respect the competition is becoming keen and the outlook seems to be for further improvement in already good business. In bars the agricultural and wagon trades are active and are placing liberal specifications. Plates are quiet and very little moving. In standard rails the transactions include 1210 tons for the Oklahoma Railway Company and another order of 1000 tons for another Oklahoma system. It is also announced that the Kansas City & St. Joseph Interurban has completed its financing and is ready to make contract for rails, which will bring it into the market for 7500 to 10,000 tons within the next 30 to 60 days. Track fastenings are inactive, but prices are firm. In light rails the coal trade demand is quiet and very little tonnage is being placed. The demand from the lumber companies is practically nil. In general, in this division of trade there is little complaint as to the aggregate of business.

Old Material.—The flurry in steel scrap, which has occupied the attention of the market for several weeks, seems to have passed and there has been a softening of the situation. This is also the case with iron scrap. There has been somewhat of an increase in the requests for relaying standard section rails. None of the railroad lists is out as yet, but several are expected before the end of the week. Dealers are buying now against a renewed demand, and this is preventing quotations from sagging off to any serious extent. Further activity is looked for after the first of the coming month. Dealers' prices, per gross ton, f.o.b. St. Louis, are as follows:

Old iron rails	$13.00 to $13.50
Old rails, rerolling	13.00 to 13.50
Old steel rails, less than three feet	11.50 to 12.00
Relaying rails, standard section, subject to inspection	23.00 to 23.50
Old car wheels	13.00 to 13.50
Heavy melting steel scrap	11.50 to 12.00
Frogs, switches and guards cut apart	11.50 to 12.00

The following prices are per net ton:

Iron fish plates	$11.00 to $11.50
Iron car axles	19.50 to 20.00
Steel car axles	18.50 to 19.00
No. 1 railroad wrought	11.25 to 11.75
No. 2 railroad wrought	10.25 to 10.75
Railway springs	9.75 to 10.25
Locomotive tires, smooth	14.50 to 15.00
No. 1 dealers' forge	8.50 to 9.00
Mixed borings	6.50 to 7.00
No. 1 busheling	9.50 to 10.00
No. 1 boilers, cut to sheets and rings	8.00 to 8.50
No. 1 cast scrap	10.00 to 10.50
Stove plate and light cast scrap	8.00 to 8.50
Railroad malleable	8.50 to 9.00
Agricultural malleable	7.50 to 8.00
Pipes and flues	8.50 to 9.00
Railroad sheet and tank scrap	8.50 to 9.00
Railroad grate bars	8.00 to 8.50
Machine shop turnings	7.50 to 8.00

Cincinnati

CINCINNATI, OHIO, August 30, 1911.—*(By Telegraph.)*

Pig Iron.—The market is featureless, the inquiry is much lighter and only very small lots of iron are sold, an indication that melters in this territory are well provided for this year. No change in the situation is anticipated until the furnaces open their books for next year's requirements. While it is true that nominal quotations are out around $11, Birmingham, for the first quarter business, this figure is considered prohibitive. Southern iron continues to show more strength than that from the Ironton district, and in the face of the light demand the recent Southern price advance is understood to be observed by the majority of producers. About

THE IRON AND METAL MARKETS

400 tons of Southern No. 2 foundry was taken by an Indiana firm at $10.25 for August-December shipment. Smaller lots for the same delivery and at the same price go to nearby melters for shipment in the last quarter. A northern Ohio consumer contracted for 100 tons of No. 1 soft at $10.75, Birmingham. A central Ohio manufacturer bought 2000 tons of Northern foundry from a nearby furnace at the prevailing market price, but it is rumored that deliveries were extended into the first part of next year. No large inquiries are out for either Northern or Southern iron, and, contrary to the usual custom at this time of the year, consumers are not even feeling around to see what can be done for next year. Northern foundry No. 2 is quoted around $13 to $13.25, with the first named price representing the figure generally inserted in last quarter contracts. Malleable remains quiet, and is quoted around $13.25, Ironton. It is reported that two furnaces in the Hanging Rock district will be blown in next week on foundry iron. Based on freight rates of $3.25 from Birmingham and $1.20 from Ironton, we quote, f.o.b. Cincinnati, as follows:

Southern coke, No. 1 foundry and 1 soft	$14.00 to $14.25
Southern coke, No. 2 foundry and 2 soft	13.50 to 13.75
Southern coke, No. 3 foundry	13.00 to 13.25
Southern coke, No. 4 foundry	12.75 to 13.00
Southern gray forge	12.75 to 13.00
Ohio Silvery, 8 per cent. silicon	16.95 to 17.20
Lake Superior coke, No. 1	14.70 to 14.95
Lake Superior coke, No. 2	14.20 to 14.45
Lake Superior coke, No. 3	13.70 to 13.95
Basic, Northern	14.20 to 14.45
Standard Southern car wheel	25.50 to 25.75
Lake Superior car wheel	19.00

(By Mail.)

Coke.—For gas-producing purposes a few medium-sized contracts for coke have lately been closed and there has also been some buying of furnace coke. Foundry grades are moving slowly, as far as new contracts are concerned, but prices in all three districts are firmer. The curtailment in production in the Wise County field has given producers there an opportunity to get more money for their coke, and it is stated that standard brands of 48-hr. coke are not now obtainable below $1.65 per net ton at oven, for prompt shipment, with the usual premium of 10c. to 25c. per ton asked on contract business. Pocahontas furnace coke is quotable around the same figures, but Connellsville furnace grades do not show up so strong, and as low as $1.55 at oven has been done in that territory. Foundry coke is quotable around $2 to $2.35 in all three fields.

Finished Material.—There has been practically no change in the market conditions previously reported, with the exception of a slightly better demand for structural material. Warehouse prices remain steady at 1.70c. for steel bars and 1.80c. for structural material. For a carload quantity of steel bars the regular Pittsburgh quotation of 1.25c. could possibly be shaded. Railroad track material shows some improvement and there is also a better demand for sheets, with prices in this territory ruling very much firmer.

Old Material.—Buyers and sellers appear to be unable to get together, and, as a consequence, prices are not quite so firm. The railroads are understood to be offering large tonnages, with very little disposition shown by dealers to take on any additional stocks. The approximate prices paid by buyers delivered in their yards, southern Ohio and Cincinnati, are as follows:

No. 1 railroad wrought, net ton	$10.25 to $10.75
Casting borings, net ton	4.50 to 5.00
Steel turnings, net ton	5.50 to 6.00
No. 1 cast scrap, net ton	9.25 to 9.75
Burnt scrap, net ton	6.25 to 6.75
Old iron axles, net ton	16.25 to 16.75
Bundled sheet scrap, gross ton	7.25 to 8.25
Old iron rails, gross ton	13.25 to 13.75
Relaying rails, 50 lb. and up, gross ton	20.75 to 21.50
Old car wheels, gross ton	10.00 to 10.50
Heavy melting sheet scrap, gross ton	9.75 to 10.25

Cleveland

CLEVELAND, OHIO, August 29, 1911.

Iron Ore.—No sales are reported, and the only new inquiry is for only about 25,000 tons. The only thing that can stimulate any kind of a buying movement before the end of the season, in the opinion of some of the leading ore firms, is the development of considerable activity in the pig iron market during the next month. There is little expectation, however, that there will be enough improvement in the demand for pig iron to bring out orders for ore in blocks of any size. Ore shipments are being made at about the same rate as a month ago and vessel men have given up hope of any improvement this season. Shippers are having about all they can do in taking care of their own tonnage, and there are indications that the movement will begin to slow down about October 1. We quote prices as follows: Old range Bessemer, $4.50; Mesaba Bessemer, $4.25; old range non-Bessemer, $3.70; Mesaba non-Bessemer, $3.50.

Pig Iron.—The market is extremely dull. Sales have been limited to a few small lots for prompt shipment, and for the last quarter. Not many new inquiries have come out, these being mostly for lots ranging from 200 to 400 tons for delivery the remainder of the year. Consumers are taking no interest in the market for the first quarter of next year, and some seem to prefer to place orders for small lots for spot shipment, rather than contract for future delivery. Following the recent spurt in buying Southern iron, there is practically no inquiry for Southern grades. The foundry melt shows little change. Foundries generally have bought conservatively in the past few months and are taking all of the iron they have contracted for. Prices on foundry grades are stationary and firm, No. 2 foundry being generally held at a minimum price of $13.50 for No. 2 for shipment from Cleveland and Valley furnaces. For Cleveland delivery we quote as follows, delivered, for prompt shipment and for the last half:

Bessemer	$15.90
Basic	$13.75 to 14.00
Northern foundry No. 2	13.75 to 14.00
Gray forge	13.25
Southern foundry No. 2	14.60 to 14.85
Jackson Co. silvery, 8 per cent. silicon	14.00 to 17.55

Coke.—There is no demand for furnace grades. The foundry coke market is quiet, sales being limited to small lots for early shipment. Prices are stationary and firm. We quote standard Connellsville furnace coke at $1.50 to $1.60 per ton, at oven, for prompt shipment, and $1.60 to $1.70 for the remainder of the year. Connellsville 72-hr. foundry coke is held at $1.85 to $2.15 for prompt delivery and $2.10 to $2.40 for contract.

Finished Iron and Steel.—The demand is fair, the tonnage in specifications and contracts being about the same as in the previous few weeks. Orders are quite numerous, but they are nearly all for quite small lots. With the general lack of firmness, buyers not already under contract, as a rule, are buying material as they need it. The steel bar price situation shows little change. Orders for carload lots and over are being taken on the basis of 1.20c., Pittsburgh, for immediate specification, but mills are not disposed to take contracts at this price for the remainder of the year. Hard steel bars are quoted at a minimum price of 1.10c. There is not much activity in the plate market; much of the business is being taken at a concession of $1 a ton, although boiler plates are firmer than tank plates. The demand for structural material is less active than a few weeks ago, and local fabricating plants are not very well filled with work. There are occasional rumors of price cutting on structural material, but as far as this territory is concerned they appear to be unfounded. No new structural work of any size has come out. The McMyler Interstate Company, Bedford, Ohio, has taken 500 tons for a power house for the Lake Shore Railroad at Elkhart, Ind., 350 tons for the Kelly Island Lime & Transportation Company, Marblehead, Ohio, and 200 tons for a plant for the Sunshine Cloak & Suit Company, Cleveland. The demand for sheets is not active and concessions of $2 a ton are now quite prevalent. A local mill reports the sale of 2000 tons of billets to a northern Ohio consumer. Rivet prices are irregular and the demand is not active. Local bar iron mills are booking only a moderate tonnage in orders. The Empire mill has resumed operations after a shutdown of a week. We quote iron bars at 1.25c. to 1.30c., Cleveland.

Old Material.—With liberal offerings by both dealers and producers, and a falling off in the demand because mills generally are under contract for their requirements for some time, the market has become dull and prices on several grades show a further decline of from 25c. to 50c. a ton. Two or three mills have placed an embargo on scrap, and this also has had a depressing effect. With no demand for busheling, that grade is particularly weak. Although mills are generally well

THE IRON AND METAL MARKETS

supplied, some will take on additional tonnages of steel-making scrap if sellers quote prices that are regarded as satisfactory. Dealers' prices, per gros ton, f.o.b. Cleveland, are as follows:

Old steel rails, rerolling	$13.00 to $13.25
Old iron rails	15.00 to 15.50
Steel car axles	17.50 to 18.00
Heavy melting steel	11.75 to 12.00
Old car wheels	12.00 to 12.25
Relaying rails, 50 lb. and over	22.50 to 23.50
Agricultural malleable	10.75 to 11.25
Railroad malleable	12.25 to 12.75
Light bundled sheet scrap	10.00 to 10.50

The following prices are per net ton, f.o.b. Cleveland:

Iron car axles	$20.50 to $21.00
Cast borings	6.50 to 6.75
Iron and steel turnings and drillings	7.00 to 7.25
Steel axle turnings	8.25 to 8.75
No. 1 busheling	9.50 to 10.00
No. 1 railroad wrought	11.75 to 12.00
No. 1 cast	11.25 to 11.75
Stove plate	9.50 to 10.00
Bundled tin scrap	11.00 to 11.50

Birmingham

BIRMINGHAM, ALA., August 28, 1911.

Pig Iron.—It is now practically certain that the proposed addition to the output of foundry iron mentioned in last report will not be made in the near future. The quantity of iron so far sold this month has been rather disappointing to producing interests generally, and especially noticeable is the small percentage of sales effected at a higher basis than $10, Birmingham, for No. 2 foundry. Of the inquiries pending at the time of last report a very small proportion has so far resulted in sales, but the $10.50 basis has no doubt been fully maintained. A lot of 750 tons of high silicon iron with a very high manganese content, for shipment in the last quarter, was sold at $12.50, Birmingham. Of the sales reported at the $10.50 basis, a lot of 700 tons of No. 2 soft for shipment covering the remainder of the year was the largest. A lot of 600 tons of No. 1 soft for immediate shipment was sold at $11, and 300 tons of No. 3 foundry for shipment over the next sixty days brought $10. With the exception of the several lots just mentioned the demand was largely for carloads and lots of 100 to 150 tons, all of which was for early delivery. There has been some complaint the past fortnight of inability to ship against contract at the rate originally agreed upon, although the actual melt is not believed to have been decreased. At this time a few lots of 1000 to 1500 tons each for shipment over the remainder of the year are pending, and considerably more interest in first quarter deliveries is being manifested by the large melters. The attitude of the producing interests as to first-quarter commitments is accounted for largely by the comparatively small tonnage now on order books for shipment during the last quarter, and the consequent expectation of a fairly heavy buying movement for that requirement. It is conceded that with the further reduction in stocks which reports of September 1 are expected to show, as made during the month of August, and the rate of production unchanged, the $10.50 schedule will necessarily be maintained. However, in certain directions developments as to the extent the trade has provided for advanced requirements at the $10 basis are awaited with considerable interest. For prompt shipment or delivery over the remainder of the year we quote the schedule below, per gross ton, f. o. b. cars Birmingham furnaces:

No. 1 soft and No. 1 foundry	$11.00
No. 2 soft and No. 2 foundry	10.50
No. 3 foundry	10.00
No. 4 foundry	9.75
Gray forge	9.50
Mottled	9.25
Off basic	$10.00 to 10.50
Standard basic	10.25 to 10.75
Charcoal car-wheel iron	22.50

Cast-Iron Pipe.—Mention is now made of a lot of 4000 tons of water pipe soon to be placed at San Diego, Cal., and specifications for additional requirements at San Francisco are soon to be submitted for bids. The past week some 1200 tons of water pipe was placed by the city of Los Angeles, Cal., and 700 tons for St. Louis, Mo., was also awarded. This last mentioned went to Eastern producers, while the Los Angeles contract was divided between the American Cast Iron Pipe Company and the United States Cast Iron Pipe & Foundry Company. A number of small contracts are soon to come up, and order books generally are fairly well taken care of. A local plant is practically out of the market for certain sizes, and as a result there is some variation in prices being submitted. We continue to quote the market as follows, per net ton, f. o. b. cars here, for water pipe: 4 to 6 in., $23; 8 to 12 in., $22; over 12 in., average $21, with $1 per ton extra for gas pipe.

Old Material.—The sale of 100 tons of melting steel scrap is reported, and several carloads of light cast and machinery cast changed hands. The consumption has not increased materially, although a fair tonnage is being moved to Atlanta, Ga., and Knoxville, Tenn., mills. It is not known when the Alabama City plant will be put in operation. We continue to quote dealers' asking prices as follows, per net ton, f. o. b. cars here:

Old iron axles (light)	$13.50 to $14.00
Old steel axles (light)	12.50 to 13.50
Old iron rails	12.50 to 13.00
No. 1 railroad wrought	11.00 to 11.50
No. 2 railroad wrought	9.50 to 10.00
No. 1 country wrought	7.50 to 8.00
No. 2 country wrought	7.00 to 7.50
No. 1 machinery	9.50 to 10.50
No. 1 steel	8.50 to 9.00
Tram car wheels	8.00 to 8.50
Standard car wheels	9.50 to 10.50
Light cast and stove plate	7.00 to 7.50

Buffalo

BUFFALO, N. Y., August 29, 1911.

Pig Iron.—The week has developed more activity and larger inquiry, the situation thus showing features of improvement. Most furnaces in this district now have bookings covering a large percentage of their capacity over the remainder of the year and are not seeking spot shipment business as eagerly as they were and the prices of such furnaces are again closely approximating the advanced figures asked a month or so ago. The generally established price for No. 2X for spot and fourth quarter is $13.50, with some furnaces asking $13.75, Buffalo. The bulk of the inquiry now being received is for 1912 delivery; but furnaces will not take on such business at present prices and are asking about 50 cents per ton additional over current schedules for first half delivery. Sales for the week aggregate a good tonnage, including a number of orders for 1000 tons and over and several only slightly smaller and one good-sized order for malleable, all for fourth quarter delivery. Shipments on contracts are large and from most furnaces equal or exceed the current production. We quote as follows, f.o.b. Buffalo, for spot and fourth quarter shipment:

No. 1 X foundry	$13.75 to $14.00
No. 2 X foundry	13.50 to 13.75
No. 2 plain	13.50
No. 3 foundry	13.25 to 13.50
Gray forge	13.25 to 13.50
Malleable	13.75 to 14.25
Basic	13.75 to 14.25
Charcoal	16.50 to 17.50

Old Material.—The market is a little less active as compared with last week, with a smaller demand for most grades except railroad malleable, and prices are not quite so firm. The demand from outside districts for turnings and borings has fallen off and prices on these two commodities have dropped slightly. We quote as follows, per gross ton, f.o.b. Buffalo:

Heavy melting steel	$13.00 to $13.50
Low phosphorus steel	16.00 to 16.50
No. 1 railroad wrought	14.00 to 14.50
No. 1 railroad and machinery cast scrap	13.75 to 14.25
Old steel axles	18.50 to 19.00
Old iron axles	22.00 to 22.50
Old car wheels	13.00 to 13.50
Railroad malleable	13.00 to 13.25
Boiler plate	12.50 to 13.00
Locomotive grate bars	11.00 to 11.50
Pipe	9.25 to 9.50
Wrought iron and soft steel turnings	7.25 to 7.50
Clean cast borings	7.00 to 7.25

Finished Iron and Steel.—Most lines show a slight improvement. The demand is better for plain structural material and prices are a little firmer. The general situation as to all products, including steel bars, is one of hopefulness. There is a disposition on the part of some large buyers of sheets to come into the market for their requirements for the first quarter of next year, and in one or two instances an offer has been made for the first six months of the year. These inquiries came from the closest buyers, which would be an indication that they felt that the bottom had been reached. The marked activity in fabricating shops continues and is the distinctive feature of the market. Many shops are working overtime and some are working double shift, and prices are firmer. Plans have been completed and bids are soon to be received

THE IRON AND METAL MARKETS

for the New York Telephone Company's 15-story office building in Buffalo, which will require about 2000 tons of steel; the Washington B. French store and office building, 150 tons; the Magnus Beck Café building, Layfayette square, 100 tons, and an addition to the Flint & Kent department store, 200 tons. Bids are being received this week for the steel for St. Mary's Hospital, Niagara Falls, 600 tons; St. Vincent's Hospital, Erie, Pa., 100 tons, and the Great Meadows prison at Comstock, N. Y., 800 tons.

New York

NEW YORK, August 30, 1911.

Pig Iron.—A number of inquiries have appeared in the past week for pig iron for the first quarter and the first half of 1912. As a rule the furnaces are not seeking business for these deliveries, but it is known that some sales have been made carrying, for the most part, deliveries in the last four months of this year, but with the privilege of extending them for a month or two into 1912. Prices in these cases were not above what have been current for 1911 delivery. One New Jersey interest has bought 400 tons for this year in the past week, and another, a large consumer, came into the market on Monday for about 800 tons. This latter company has been buying from time to time in the past month for both Eastern and Central Western plants. Foundries in this district are not disposed to pay the advances furnaces want to get for next year, and seem content to wait a little longer. A year ago a considerable amount of iron for the early part of this year was under contract, the buying having begun in June. There has been some activity in the Buffalo district and sales have been made in a few cases for delivery over the first quarter and the first half of next year. Several thousand tons of this iron will go to Canada, where, with a duty of $2.80 on American pig iron as against $1.68 for British iron, the former is sold at $1.50 to $2 a ton above the possible delivered price of Middlesbrough iron. The latter being high in phosphorus is only desired in a small percentage in the mixtures of foundries which depend largely on the Buffalo district. For delivery this year there is still a variation of nearly 50 cents between the lowest and highest quotations on shipments out of Buffalo. As low as $13.25, Buffalo, on No. 2 has been named in the past week for this year's iron. We quote Northern iron for tidewater delivery as follows: No. 1 foundry, $15.50 to $15.75; No. 2 X, $15 to $15.25; No. 2 plain, $14.75 to $15. Southern iron is quoted at $15.25 to $15.50 for No. 1 foundry and at $14.75 to $15 for No. 2.

Finished Iron and Steel.—A diminishing demand for finished steel is the disturbing element at the present time and is regarded as forecasting an extended period of dullness. A fair volume of steel work for structural purposes was closed during the week, but the largest single contract was one of 2500 tons for an apartment house at Park avenue and Fifty-second street, New York, given to the American Bridge Company. A few large propositions are still undecided and practically all that remains is the general run of small business, which is holding up fairly well. No features of importance have developed in plates, which are moving in the same volume which has obtained for several weeks. Steel bars again show weakness, but not enough sales have been reported to gauge the extent of the price cutting. Business in bar iron is being maintained at last week's improved rate and prices seem to be firm except that one case is known of a large buyer securing a carload of bar iron at 1.28c. Among the structural awards made are the following: Brigham Hospital, Boston, 970 tons, to Lackawanna Steel Company; bridge for the Central Railroad of New Jersey at Cranford, N. J., 300 tons; two bridges for the same railroad at Roselle, N. J., 200 tons, and the Park street bridge of the New York, New Haven & Hartford Railroad, 200 tons, all three contracts to the Pennsylvania Steel Company; the Chase Rolling Mill building, Waterbury, Conn., 250 tons, to Jones & Laughlin Steel Company; a loft building on West Sixteenth street, New York, 550 tons, to the Harris-Silvers Company; an apartment house on West Seventy-first street, 300 tons, to Ravitch Brothers, and to L. F. Shoemaker & Co., coal pocket at Truesdale, Pa., for the Delaware, Lackawanna & Western Railroad, 700 tons; three bridges for the New York Central, 250 tons, and Boston Elevated extension, 300 tons. The reconstruction of the burned portion of the Capitol at Albany, N. Y., will probably require not more than 400 tons of steel, but of relatively difficult character. It is probable that the garage in New York for the Locomobile Company will require 1700 or 1800 tons of steel. A three-story boiler house has been projected for the Metropolitan Museum of Art in New York, McKim, Mead & White, architects. Quotations are: Plain structural materials and plates, 1.51c. to 1.56c.; steel bars, 1.36c. to 1.41c.; bar iron, 1.30c. to 1.35c., all New York. Plain material and plates from store, New York, 1.80c. to 1.90c.

Cast Iron Pipe.—The demand from private buyers continues to show fair activity. Quantities purchased in this manner, however, have not been large, although the total tonnage thus booked is quite considerable. Public lettings are few and far apart. Carload lots of 6-in. continue to be quoted at $21 to $22 per net ton, tidewater.

Old Material.—The market has weakened decidedly. Large consumers of steel scrap and rolling material are becoming overstocked and are requesting dealers to suspend shipments on contracts for the present. Under such circumstances buying is practically at a standstill. On some classes of old material absolutely no demand can be found and prices are therefore completely nominal. The foundries are buying but sparingly, so that all grades of cast scrap are abundant and weak. The supply of scrap of all kinds appears to be excessive. Quotations are as follows, per gross ton, New York and vicinity:

Old girder and T-rails for melting	$10.25 to $10.50
Heavy melting steel scrap	10.25 to 10.50
Relaying rails	20.50 to 21.50
Rerolling rails (nominal)	12.00 to 12.50
Standard hammered iron car axles	21.50 to 22.00
Old steel car axles	16.00 to 16.50
No. 1 railroad wrought	12.75 to 13.25
Wrought iron track scrap	11.00 to 11.50
No. 1 yard wrought, long	11.00 to 11.50
No. 1 yard wrought, short	10.00 to 10.50
Light iron	4.25 to 4.75
Cast borings	6.00 to 6.50
Wrought turnings	6.50 to 7.00
Wrought pipe	10.00 to 10.50
Old car wheels	10.50 to 11.00
No. 1 heavy cast, broken up	10.50 to 11.00
Stove plate	8.50 to 9.00
Locomotive grate bars	8.50 to 9.00
Malleable cast	10.50 to 11.00

Ferroalloys.—Dealers here are quoting 50 per cent. ferrosilicon at $57, Pittsburgh. Some resales of ferrosilicon are rumored to have been made at $55, but these cannot be confirmed. There is very little call for ferromanganese in this vicinity, but some excellent inquiries are out from other localities for next year's delivery. The market here is firm at $37, Baltimore, for the remainder of the year and $37.50 for delivery over the first half of 1912.

Metal Market

NEW YORK, August 30, 1911.

The Week's Prices

Cents Per Pound for Early Delivery.

	Copper, New York.			Lead.		Spelter.	
		Electro	Tin.	New	St.	New	St.
Aug.	Lake.	lytic.	New York.	York.	Louis.	York.	Louis.
24	12.75	12.50	45.00	4.50	4.42½	6.10	5.95
25	12.75	12.50	44.00	4.50	4.42½	6.10	5.95
26	12.75	12.50	.....	4.50	4.42½	6.10	5.95
28	12.75	12.50	42.87½	4.50	4.42½	6.05	5.90
29	12.75	12.50	42.87½	4.50	4.42½	6.05	5.90
30	12.75	12.50	42.87½	4.50	4.42½	6.05	5.90

Dullness still prevails in the copper situation. Expected arrivals of pig tin are having their effect on the market, and the premium recently asked is about off. Spelter is 5c. per 100 lb. lower. Antimony is plentiful with but few sales. Lead is dull and uninteresting.

Copper.—The quietness in the demand for copper which prevailed last week is still felt. There are some rumors of large sales of electrolytic having been made by important interests for delivery in October, but these cannot be confirmed. Prices remain unchanged, with Lake quoted at 12.75c. and electrolytic at 12.50c. The exports so far this month are 24,148 tons. The London market this morning was steady, with spot copper offered at £56 2s 6d and futures at £56 15s.

Pig Tin.—The market in pig tin is steady. The supplies are very low and the arrivals of tin afloat are anxiously awaited. It is reported that there are 1200 tons on the steamers Mesaba and Minnetonka and about 900 tons on steamers unknown which are expected to arrive before September 10. It is believed that this will not materially help the situation,

THE IRON AND METAL MARKETS

as these stocks are expected to be absorbed on account of the shortage. Spot tin is being quoted at 42.87½c. cash, and deliveries dated ahead 10 to 12 days are bringing 42.15c. The London market this morning is reported easy, with spot tin offered at £189 15s. and futures at £187 5s. The arrivals of tin so far this month were 3212 tons.

Tin Plates.—There is no material change in the market for tin plates. The mills are expected to continue at about the same rate of production as earlier in the month for a few weeks, at least. The demand for small quantities is fair, and prices remain unchanged at $3.94 for 100 lb. coke plates. Foreign tin plates are quoted at 13s. 9d. at Swansea, Wales.

Lead.—The New York and St .Louis markets are easy and some small sales are reported but not enough business is being done to change the quotations made last week of 4.50c. New York, and 4.42½c. St. Louis.

Spelter.—The price of spelter dropped 5c. per 100 lb. early in the week, and this price has not advanced since. The demand is for prompt shipment and only for small lots, and consumers show no intention of stocking up. Spelter is quoted at 6.05c. New York, with the St. Louis quotation at 5.90c.

Antimony.—Before the rise a great many consumers stocked up and the fluctuations caused by the attempted corner did not affect them very much. The metal is cheap at present prices, but there is practically no demand and quotations are nominal. Hallett's is offered at 7.75c., Cookson's at 8.37½c., and for other brands 7.37½c. is being asked.

Old Metals.—Business is very quiet. Dealers' selling prices, New York, are unchanged, as follows:

Copper, heavy cut and crucible	$12.00 to $12.25
Copper, heavy and wire	11.50 to 11.75
Copper, light and bottoms	10.75 to 11.00
Brass, heavy	8.00 to 8.25
Brass, light	6.75 to 7.00
Heavy machine composition	10.50 to 10.75
Composition turnings	8.75 to 9.00
Clean brass turnings	8.00 to 8.25
Lead, heavy	4.20 to 4.25
Lead, tea	3.95 to 4.00
Zinc, scrap	4.25 to 4.30

Chicago

AUGUST 28.—Copper yielded slightly under pressure during the week, and the price for Lake is slightly lower. Tin quotations were marked by violent fluctuations, following the strained situation of a week ago. Trade in general is dull. We have revised our quotations for Chicago delivery as follows: Casting copper, 12.05c.; Lake 12⅞c., in carloads, for prompt shipment; small lots, ¼c. to ⅜c. higher; pig tin, carloads, 44c.; small lots, 46c.; lead, desilverized, 4.45c. to 4.50c. for 50-ton lots; corroding, 4.72½c. to 4.75c. for 50-ton lots; in carloads, 2½ c. per 100 lb. higher; spelter, 5.90c. to 5.95c.; Cookson's antimony, 9¼c., and other grades, 8¼c. to 8¾c., in small lots; sheet zinc is $8 f.o.b. La Salle, in carloads of 600-lb. casks. On old metals we quote for less than carload lots: Copper wire, crucible shapes, 10¾c.; copper bottoms, 9½c.; copper clips, 10¼c; red brass, 9½c.; yellow brass, 7½c.; lead pipe, 4c.; zinc, 5c.; pewter, No. 1, 26c.; tinfoil, 33c.; block tin pipe, 37c.

St. Louis

AUGUST 28.—The metal market shows a softening tendency pretty much all along the line. Tin is off to 43.85c., while antimony is barely held at 8.72½c. for Cookson's. Lake copper is 13.05c., which is unchanged, but electrolytic is off to 12.90c. There was a good volume of business all the past week and the new week has started off at a fair gait. Lead is quotable at 4.42½c. bid and 4.45c. asked, while spelter is quoted at 5.85c. to 5.90c. In the Joplin zinc market the top price was $48 per ton, some selling as low as $44. Practically all the ore in the camp was cleaned up in the Galena, Kan., district. Ore producers in the Joplin camps are showing a disposition to hold for an improvement in the spelter market. Calamine has been firm at $22 to $24 per ton, with $30 as the top price. Lead ore has been strong at $60 to $63 per ton. Following are the prices on old metals: Light brass, 5c.; heavy brass and light copper, 8c.; heavy copper and copper wire, 9c.; zinc, 3c.; lead, 3¼c.; pewter, 20c.; tin foil, 29c.; tea lead, 3c.

The General Vehicle Company, Long Island City, last week sold more than $1,000,000 worth of electric motor trucks to brewers. One large brewer bought 19, and now has 43 such trucks in service.

Iron and Industrial Stocks

NEW YORK, August 30, 1911.

Persistent liquidation, which continued until Saturday, caused prices of numerous stocks to sag decidedly. While the sales were heavy on some days, at no time did the movement take on an appearance of demoralization. A check to the selling occurred on Monday of this week, when most prices advanced, but on Tuesday they again declined. The range of prices on active iron and industrial stocks from Wednesday of last week to Tuesday of this week was as follows:

Allis-Chalmers, pref.	17 - 18	Pressed Steel, pref..	97
Beth. Steel, com....	29 - 30⅝	Railway Springs, com	30 - 32
Beth. Steel, pref...	58½ - 60⅝	Railway Springs, pref....	100⅞
Can. com.....	9¾ - 10	Republic, com.....	24⅝ - 27
Can. pref.....	82¼ - 84½	Republic, pref.....	89 - 92
Car & Fdry, com...	48⅝ - 50½	Sloss, com.....	36 - 42
Car & Fdry, pref...	115½	Pipe, com.....	13 - 14¼
Steel Foundries.....	33 - 35	Pipe, pref.....	46½ - 48⅝
Colorado Fuel.....	28 - 29⅜	U. S. Steel, com....	69⅛ - 73
General Electric....	150¾ - 153	U. S. Steel, pref...	114 - 115⅜
Gr. N. Ore Cert....	47⅝ - 48¼	Westinghouse Elec..	63⅞ - 66
Int. Harv., com....	108⅛ - 115	Am. Ship. com.....	56
Int. Harv., pref....	121½ - 122	Chic. Pneu. Tool...	47 - 47¼
Int. Pump, com....	32⅞ - 34½	Cumbria Steel.....	44 - 44½
Locomotive, com....	34½ - 36¼	Lake Sup. Corp....	23 - 24½
Locomotive, pref....	104¾ - 105	Crucible Steel, com.	11⅝ - 12
Pressed Steel, com..	30 - 31	Crucible Steel, pref.	79½ - 81⅛

Dividends Declared

The American Locomotive Company, regular quarterly of 1¾ per cent. on the preferred stock, payable October 21.

The Railway Steel Spring Company, regular quarterly dividend of 1¾ per cent. on the preferred stock, payable September 20.

The Republic Iron & Steel Company, regular quarterly of 1¾ per cent. on the preferred stock, payable October 2.

The American Can Company, regular quarterly of 1¾ per cent. on the preferred stock, payable October 2.

Trade Publications

Fluxes.—International Flux Company, Inc., Evansville, Ind. Pamphlet. Concerned with the Keystone thermal flux for general foundry work and the Jewett bronze alloy flux, the uses of which are discussed at length together with the advantages resulting from their use.

Steam Specialties.—John Acton, 118 John street, Brooklyn, N. Y. Pamphlet. Illustrations and descriptive matter explain the operation of an extensive line of automatic steam, water, air and vacuum specialties. These include reducing and relief valves, turbine vacuum valves, an automatic pump receiver and regulator, grease extractor, thermostat, governor and steam traps.

Linseed Oil.—Sterling Varnish Company, Pittsburgh, Pa. Folder entitled, "The Improvement of Linseed Oil and Its Effect on Paint." Discusses the advantages of the company's refined linseed oil from which the mucilaginous and watery impurities have been eliminated with the result that cracking of the paint due to the dissolution of the soluble impurities has been overcome. One of the special features of paint made with this oil is that there is nothing in the oil film which is soluble in water. In this way it is not possible for destructive agents to penetrate a paint coating in which this oil is used and a very hard film that is said to be the nearest practical approach to flexible glass is secured.

Friction Clutch.—Dodge Mfg. Company, Mishawaka, Ind. Pamphlet. Pertains to the Orton type of solid friction clutch, which is made in a wide range of sizes for transmitting from 2 to 50 hp. at 100 r.p.m. Phantom and sectional views showing the construction of the clutch are given together with brief dimension tables. An illustrated list of repair parts with prices completes the pamphlet.

Dynamometers and Small Electric Motors.—Sprague Electric Works of the General Electric Company, 527 West Thirty-fourth street, New York City. Two bulletins. The first, No. 112, superseding No. 108, deals with the Sprague electric dynamometers for measuring the power generated by gas and steam engines, turbines and motors or the power required to drive any piece of apparatus. Its construction and use are described at length and the text is supplemented by half-tone engravings. No. 236 describes and illustrates a line of small motors for direct and alternating current.

Metal Sheets.—Newport Rolling Mill Company, Newport, Ky. Mailing card. Pertains to the line of genuine open-hearth iron sheets made by this company, which are said to be rust-resisting and anti-corrosive. A number of illustrations of the different types of sheets, which can be furnished with either black or galvanized finish, are included.

Customs Decisions

Earthenware and Metal Steam Exhausters

The Board of United States General Appraisers has decided that steam exhausters made of earthenware and metal should be given lower duty. They were assessed under paragraph 96 of the tariff act of 1897 at 55 per cent. and were claimed dutiable at various lower rates. The chief claim made by the Didier-March Company, the importer, is that the merchandise should be admitted at 20 per cent. ad valorem under the provision for non-enumerated articles under section 6. Judge Hay, in his decision for the Board, states that the testimony shows that the earthenware is of chief value, and that the articles are not according to the usual commercial practice susceptible of decoration. The General Appraiser says that the articles in question not being susceptible of decoration are not classifiable under the paragraphs assessed. The articles must, according to Justice Hay, be relegated to Section 6, which propides for "non-enumerated articles." The protest is sustained and the collector reversed.

Metal Drums

Arnold, Hoffmann & Co., and others were successful in securing from the Board lower duty on metal drums used in the conveyance of chemicals. The drums are made of sheet steel and are cylindrical. They were assessed at 30 per cent. ad valorem as "unusual" coverings. It is claimed that the coverings are "usual," and therefore free of duty, or that they are dutiable at the rate applicable to their contents. It is held that as the containers or coverings are of no commercial value after being used they possess no assessable value.

The David Lupton's Sons Company, Philadelphia, Pa., through its Pittsburgh office, 1415 Oliver Building, has closed a contract with the Pressed Steel Car Company for steel sash for its new shearing and light pressing building, which will be 532 ft. long and will have Lupton counterbalanced steel sash in the side walls with Pond continuous sash operated by Pond operating device in the monitor, and will be one of the first buildings in the Pittsburgh district having this construction for light and ventilating effect.

The necessity of purchasing torpedoes for the American Navy in foreign countries is past, in the belief of officials of the Navy Department. The government torpedo station at Newport, R. I., and the private manufacturers of torpedoes in this country are thought now to be in a position to meet all the requirements of the United States.

A Philadelphia dispatch says that the strike at the Baldwin Locomotive Works, which began on June 8, was officially called off August 28 by the Executive Committee of the Locomotive Builders' Council. Of the 12,000 men who went out it is stated that only about 2000 are now idle. The international officers of affiliated unions advised against the strike on the ground that these unions were not in position to pay strike benefits.

The Ball Engine Company, Erie, Pa., builder of automatic cut-off engines, is adding a connecting building to its plant, 40 x 160 ft., of brick and steel construction. It will be equipped with a 20-ton crane which has been purchased.

The Skinner Engine Company, Erie, Pa., builder of high-grade automatic engines, has recently built a new foundry of about 15 tons daily capacity, entirely for its own work. It expects to make some additions to its machine shop next year, but plans have not yet been fully drawn.

Linsine is a product manufactured by the Red Star Oil Company, 1307 Pearl street, Philadelphia, Pa., as a substitute for linseed oil for painting of all kinds. It is explained that the cost is low and that it is a firm-drying, waterproof vehicle for pigments. Special emphasis is placed on its availability for protecting structural metal.

The Columbia Novelty Mfg. Company, 143-1433 North Eighth street, St. Louis, Mo., has purchased adjoining ground and will erect an addition this fall, doubling its floor space. The company is building special automatic machines to produce belt hooks from wire and also machines for increasing its output of Stag steel belt hooks. Business at present is only fair, but indications point to an improvement at an early date.

The Crocker-Wheeler Company, Ampere, N. J., has opened offices in San Francisco, Cal., located in the First National Bank Building, room 401. John S. Baker, well known in the Pacific Coast electrical trade, has been placed in charge, and motors, generators and transformers of various sizes will be carried in stock for immediate shipment.

The Sheffield Tool Steel Company, 60 Elm street, Cincinnati, Ohio, has been appointed exclusive sales agent for Toledo tool steel, manufactured by Jno. Hy. Andrews & Co., Ltd., Sheffield, England, for Cincinnati and surrounding territory, and will carry complete stocks of all grades, including Toledo high-speed steel.

New Tools and Appliances

This is essentially a news department for which information is invited

Quick-Acting Clamp.—George H. Wrigley, 47 South Sixty-first street, Philadelphia, Pa., is manufacturing a quick-acting clamp for structural and general machine shop use. The clamp is operated by a screw having a lock nut above the head which can be set for any given size and will retain its setting. The clamp is applied or released by a lever on the opposite side from the lock nut which enables considerable time to be saved and gives the clamp its name. The head has a recess in it which enables the button on the end of the screw to recede and give the full working capacity of the clamp, which varies from zero to 7½ in.

Saw Blade with Inserted Teeth.—The Hunter Saw & Machine Company, Pittsburgh, Pa., has recently placed on the market an inserted tooth saw blade for cutting bars, forgings, steel castings, rails, frogs and switches. A vanadium alloy tool steel is employed for the body of the blade, while the teeth are made of high-speed steel, and both parts are hardened and treated. Interchangeable tool-steel wedges bearing against a brass adjusting screw hold the teeth in place and at the same time secure a uniform height.

Compression Grip Drill Socket.—McFarlane & Little, 15 North Seventh street, Philadelphia, Pa., have recently placed on the market a new type of grip socket for taper shank drills and reamers. The socket is made of steel and the coiled steel grip is tempered and ground to a correct taper both externally and internally. The socket works on the same principle as a coil clutch, and will hold and drive taper shank tools the tangs of which have been broken.

Two New Drill Holders.—Two new types of quick acting drill holders have been brought out by the Krieger Tool & Mfg. Company, Grand Rapids, Ill. In one of these holders a floating center is used which will hold drills having either straight or taper shanks and varying in diameter from ¼ to ¾ in. In the second type of holder a swiveling tongue dog is used as well as the floating center.

Wet Tool Grinder.—Guy G. Townsend, Winchendon, Mass., has recently designed a wet tool grinder with an exceptionally large pan for retaining the water used. The machine is equipped with a pump and the supply of water is regulated by a valve controlled by a long handle extending out underneath the pan. The grinding wheel used has a diameter of 16 in. and a face 12 in. wide. All the parts of the machine have been machined and fitted and the nuts and screws are case hardened. The complete weight of the machine, including the crucible steel countershaft, is approximately 100 lb.

Obituary

James Christie

James Christie, of Philadelphia, one of the foremost mechanical engineers of the country, president of the Engineers' Club of Philadelphia and vice-president of the Franklin Institute, died at his Atlantic City home August 24, as the result of a stroke of apoplexy. He was born at Ottawa, Canada, August 28, 1840, and was educated in the local public schools. When he was 16 years old he became a machinist's apprentice at the locomotive works at Detroit, Mich. This establishment failed soon afterward and he went to Missouri, where he spent the year 1858 in the engineering and construction corps of what was then the Southwest branch of the Missouri Pacific Railroad, now the St. Louis & San Francisco Railroad. The following year he entered the service of the I. P. Morris Company, Philadelphia, where he remained for five years as a machinist and mechanical draftsman. During the Civil War he participated in the battle of Antietam and in the following year enlisted with the Engineer Corps. In 1865 he went to Pittsburgh, where his first work was on designs in connection with the building of the Cyclops Iron Works, since then becoming the Thirty-third Street mill of the Carnegie Steel Company. Bridgebuilding next attracted his attention, and in 1870 he came associated with Alfred P. Boller in establishing bridge works at Phillipsburg, N. J., and also served as a member of the City Council and as mayor. Attaining a reputation as a builder of bridges he was, in 1876, appointed chief engineer of the Pencoyd Iron Works of A. & P. Roberts & Co., Philadelphia, retaining that position after the consolidation with the American Bridge Company, resigning in 1905. He was an active member of the American Society of Civil Engineers, the American Association for the Advancement of Science and the American Society of Mechanical Engineers. He also served, in 1907, as a member of Select Council of Philadelphia. He leaves a widow and four children.

WALTER HUBBARD, Meriden, Conn., founder and for years head of the Bradley & Hubbard Mfg. Company, died suddenly August 24, aged 83 years. He was born in Middletown, Conn., and in his younger days was engaged in mercantile business, conducting a store at Meriden, from 1852 to 1860. The business of the Bradley & Hubbard Mfg. Company was established in 1854 for the manufacture of hardware specialties, his partner being N. L. Bradley, his brother-in-law. For 25 years he was the president of the corporation and head of the business, and built up the industry to one of large magnitude. He had been president of the Meriden Gas Light Company, the Meriden Electric Light Company and the Meriden Trust & Safe Deposit Company, and was interested in other banking and industrial institutions. He was a member of the Union League Club of New York, the New England Society of New York and the American Geographical Society. His philanthropic munificence was noteworthy, including the gift of a magnificent park to Meriden.

ORRIN BRYANT, head of O. Bryant, Sons & Co., manufacturers of special radiator machinery, Buffalo, N. Y., died at his residence in that city August 14, aged 74 years. He went to Buffalo from Westfield, Mass., in 1886, and with John B. Pierce and Joseph Bond built the radiator plant now known as the Pierce plant of the American Radiator Company. He continued that as master mechanic until 1893, when he withdrew and later established with his sons the business with which he continued active until his last illness. He acquired considerable reputation as an inventor.

FREDERICK LEWIS WAGNER, New York, Eastern manager for the Carpenter Steel Company, died August 22, after a long illness, aged 27 years. He was the son of the late Albert Wagner, a well-known architect. He leaves a widow.

JOHN H. KING, a retired steel and iron manufacturer, died at his home in Fair Haven, Conn., August 29, from chronic nephritis, aged 71 years. He was a friend and business associate of John D. Rockefeller and John D. Archbold. He was senior partner in the firm of King, Gilbert & Warner, at Columbus, Ohio, operating a steel plant which was absorbed by the National Steel Company and afterward by the United States Steel Corporation. Twelve years ago Mr. King retired from active business and went to live in Fair Haven. He leaves a widow and daughter.

W. H. LATSHAW, for many years vice-president of the Pennsylvania Tube Works, died at his home in Pittsburgh, Pa., August 29, aged 56 years. He was born in Pittsburgh. Until 1903, when he retired from active business on account of failing health, he was one of the most prominent figures in the industrial and commercial life of that city.

Metal Corrosion in Gaseous Atmosphere

Some tests of the rate of corrosion of metals exposed in a gaseous atmosphere were made the subject of a paper by A. W. Carpenter, engineer of structures, New York Central & Hudson River Railroad, presented to the annual meeting of the American Society for Testing Materials. Pieces of the metals, generally in the form of thin sheets, were exposed in two places, one in a tunnel where the atmosphere is very highly charged with locomotive gases and steam, the other the interior of a smoke-jack in an engine house. In the tunnel exposure the specimens were attached to a wooden frame fastened to one side of the tunnel, in which location they received no blast action from locomotives and it was thought that all would be exposed to equal conditions. In the smoke-jack the plates were hung inside the jack so that the conditions would probably be equal for all plates.

A plate of special iron exposed in the smoke-jack for 189 days corroded at the rate of about 1/32 in. per annum for each surface, or 1/16 in. per annum for a plate with both sides exposed.

The tunnel test showed resistances to corrosion in the following order, beginning with the most resistant, and with a loss after 289 days total exposure as given:

Corrosion of Metal 289 Days in Tunnel

	Loss, grams per sq. in surface.
Special-coated metal	0.51
Soft steel, uncoated	0.55
Special galvanized iron	0.67
Special iron, uncoated	1.72

The excessive corrosion of the special uncoated iron over that of the others will be noted. The amount of this corrosion, compared with that of the similar material in the smoke-jack tests, showed the tunnel conditions to be very much less severe than those of the smoke-jack.

In the smoke-jack one of the special-coated plates, one special iron galvanized plate and one special iron plain plate were exposed. At the first examination, after 65 days' exposure, the special-coated metal showed very much less corrosion than the special iron plates, but this plate was lost before the second examination took place, leaving only the special iron plates, one plain and one galvanized, in this test. The galvanizing was pretty well removed during the first period of exposure (65 days) and thereafter did not assist much (although it did a little). The last examination, after a total exposure of 193 days, showed a loss about the same as that in the first series (189 days' total exposure).

A third and more extensive series of tests has been inaugurated this year, and one examination of one exposure (in tunnel, 58 days) has been made. This series includes special irons, ordinary wrought iron, various steels and some special non-ferric metal. Some of the irons and steels have galvanized coatings and some have lead coatings over the galvanizing.

Some of the results of the one examination so far recorded for this series were unexpected. The galvanized plates show the greatest loss of the ferric metals. The loss of one lead-coated plate was some 75 per cent. greater than that of the other, which might be accounted for by the difference in thickness of the respective lead coatings as indicated by the chemical analyses of the two plates, but the author does not wish to put too much weight upon this point. The average loss of the two lead-coated plates was greater than that of one of the special plain irons and the open-hearth steel angles. The special iron was accepted as the same material as the special iron of previous tests; in this examination it reversed its previous record, being the most resistant, for the short period exposed.

Lake Superior Mining Institute

Sixteenth Annual Meeting Held on the Menominee Range

Members of the Lake Superior Mining Institute to the number of 230 gathered at Crystal Falls, Mich., on the Menominee range, Tuesday, August 22, for the sixteenth annual meeting. As is the custom of the Institute, attention was given almost entirely to the developments and features of the local district. Automobiles were furnished and in these all who wished were taken, not only to the mines mentioned in the programme schedule, but to other points of individual interest. Business and technical sessions were held at Crystal Falls on Tuesday evening, and at Iron River on Wednesday afternoon.

The Menominee range divides itself naturally both as to location and ore formations into three districts, and to each locality one day of the meeting was given. On no other of the Lake Superior ranges are so diversified mining problems presented, arising in part because of the character of the ore formation and in part because of the difficulties encountered in many places in handling the overlying drift. In consequence the various methods of caving, slicing and stoping are most interestingly presented. If the meeting may be said to have had a particular trend, it was in the direction of further enlightenment as to the proper adaptation of these several systems of mining. With the exception of a few of the hard, siliceous ore mines, such as the Antoine and Munro, which are worked in the open, operations on this range are exclusively underground and the brief visits to the several properties were confined to inspections of the surface equipment.

Crystal Falls Iron Mines

At Crystal Falls on Tuesday, following lunch, which was served on the train that furnished hotel accommodations during the meeting, the first visit was made to M. A. Hanna & Co.'s Hollister mine. This property has been producing a very wet and therefore somewhat undesirable ore, and the object of particular interest was an inspection of the tube mill ore drying plant which has been installed. The mill has a capacity of 15 tons per hour, or 300 tons per day of two ten-hour shifts. Results thus far obtained show a reduction of the moisture to about 6½ per cent, and it is expected that a maximum moisture of 5 per cent will soon be possible. From the Hollister, trips were made to the Bristol, operated by Ogleby, Norton & Co., and to the Tobin mine, owned by Corrigan, McKinney & Co. The Bristol is one of the older mines of the range and has yielded about 2,500,000 tones in two grades of ore, one of high manganese analysis. A new steel-lined four-compartment shaft is now being sunk to a depth of 1000 ft. to replace the present timber-framed shaft that has been in service almost since the opening of the mine. The Tobin is one of the most prominent of the Corrigan, McKinney & Co. group at Crystal Falls. In the past few years the ore body has been considerably extended and the mine is now being opened up on the twelfth level at a depth of over 1200 ft. The equipment is unusually good, including an electric haulage system below ground, a twin Nordberg Corliss first-motion hoisting plant and a boiler plant equipped with a Green fuel economizer, an auxiliary rarely used in the mining district.

The evening meeting was held at eight o'clock in Crystal Falls, with President W. J. Richards presiding. Following the appointment of the customary auditing and nominating committees a paper was presented by C. E. Lawrence, general superintendent for Pickands, Mather & Co. in the Iron River-Stambaugh district, in which he described the welfare work done by that company. A commodious and well-appointed club house was built near the Baltic and Caspian mine locations by this company about three years ago for the use of its employees. Mr. Lawrence told of the regulation of this institution and of its influence in building up and harmonizing the working organization. This paper was followed by a very interesting description of the work being done to safeguard employees and of the safety devices being installed and developed by the Oliver Iron Mining Company. It was presented by A. M. Gow, assistant mechanical engineer of that company, and stereopticon views were used to illustrate it.

In the Iron River District

On Wednesday morning a cross country automobile drive was made from Crystal Falls to the Iron River district. This district has been especially prominent during the past few years as an attractive field for the extension of ore holdings and the list of those new engaged in development work includes almost every prominent ore interest. Among those who have more recently entered this field are the Republic Iron & Steel Company, Jones & Laughlin Steel Company, Wickwire Steel Company, and the New York State Steel Company. The Cleveland-Cliffs Iron Company has been exploring for three years, the Rogers Brown Ore Company is sinking a concrete shaft under contract with the Foundation Company at the Rogers mine, and Corrigan, McKinney & Co. have been endeavoring under great difficulties to sink a shaft at the Tully. These operations continue to make this district perhaps the most active on the old ranges.

The second Institute meeting was held on Wednesday afternoon. A considerable portion of the time was given to a discussion in which it was attempted to bring out more clearly the distinctions between the methods of mining employed at the several mines, and, on the other hand, to show that mining systems considered locally to be peculiar to certain mines were essentially forms of the generally practiced systems. An analysis of two papers presented, one by W. A. MacEachron describing the top-slicing and caving systems in operation at the Caspian mine, and the other the sub and caving system practiced at the Tobin mine, by F. C. Roberts, was offered by Prof. F. W. Spurr, of the Michigan School of Mines at Houghton. In connection with Professor Spurr's statement that after caving it was necessary to draw on all of the chutes evenly, because, instead of the ore following in from the sides, it remained standing and the movement was vertical from the surface, with the result that the surface is pulled into the ore. President Richards gave an extended outline of the method used in preventing this at Crystal Falls. Mr. Richards also described the method of opening up a room where the surface failed to come down, by under cutting along each side and caving. It was brought out that such a method as this, although somewhat similar to stoping, could not be properly characterized as such.

E. E. White of Ishpeming described the results obtained by the use of the clinometer, a device perfected and extensively tested by the Cleveland-Cliffs Iron Company in surveying diamond drill holes. Thos. B. Wyman, of the Forestry Service, presented a paper in which he analyzed the several causes of forest fires and the proportion of fires for which each was responsible. Mr. Wyman also called attention to the fact that there are extensive tracts of land from which timber has been cut which are now lying idle but upon which taxes are being paid every year. On one tract Mr. Wyman estimated that in the course of 20 years, during which time a new yield of mine timber could be raised, taxes will be paid to the amount of nearly $75,000, for which, unless new trees are raised, there will be absolutely no return. Other papers included in the programme were read by title only.

In offering a resolution submitting to the Institute the question of closer affiliation with other societies, William Kelly introduced Charles Kirchhoff, New York, president of the American Institute of Mining Engineers. Mr. Kirchhoff spoke of the advantages of team work among the various societies by means of which the local advantages of each might be pooled to the profit of all. The meeting closed with a business session, during which, by unanimous acceptance of the report of the Nominating Committee, F. W. Denton, of Houghton, Mich., was elected president for the ensuing year and E. W. Hopkins and A. J. Yungbluth were re-elected treasurer and secretary respectively. In the evening the members were entertained by the Iron River committee at Sunset Lake with a clam bake dinner.

Eastern Menominee Properties

On the last day the trip included visits to the Loretto mine at the east end of the range, to the Penn Iron Mining Company's group at Vulcan and to the Chapin mine at Iron Mountain. The Loretto mine workings extended directly under the Sturgeon River and it became necessary, both from the standpoint of safety and to save the pillars of ore supporting the roof of the mine, to divert the river. A new channel running around the mine to the west was

completed in 1909, in connection with which a number of interesting problems were presented. At the Vulcan group advantage has been taken of the waterfall where the Sturgeon river joins the Menominee, and a water-driven electric generating station has been built. Current is carried the few intervening miles to the mines where the hoisting plants are driven by motor and rope drives, and the pumps are direct-connected motor-driven centrifugals. This plant, which has been described previously, is interesting as contrasted with the water-power plant at Quinnesec Falls, where compressed air is generated and transmitted to the Chapin mine through steel pipe line to be used for operating the hoists and pumps. At the Brier Hill mine, which is a part of the Vulcan group, rather bad surface conditions made advisable the lining of the shaft with concrete. This work was not of the same nature as involved in the concrete shafts put down by the Foundation Company, but consisted simply of lining the shaft as it went down with concrete instead of timber. It was interesting as a novel procedure in this respect.

Although completed in 1908, the C Ludington shaft of the Chapin mine has been sunk since the last visit of the Institute. It was one of the first of the steel frame shafts on this range and was put down to handle the entire output of the Chapin mine, the trend of whose ore bodies is deeper in the direction of this shaft. It is down to the 17th level at a depth of 1522 ft. Of particular interest at this shaft is the old Cornish pump, known almost as widely as the Chapin mine itself. It is a compound, walking-beam engine with a capacity of 3000 gals. per min. pumping from a depth of 1500 ft., and is still in active service while at the same time a relic of earlier practice.

The Institute will meet in the copper country next year.

Chrome Steel Rails in Tunnels

Corrosion of rails exposed to tunnel gases has been found to reduce the life materially in the case of the long tunnel at Sand Patch, Pa., on the Baltimore & Ohio Railroad, says the Engineering Record. This tunnel is 4775 ft. long and is operated with double-track traffic on a single-track line. The interior condition is one of practically continual dampness, with locomotive gases present. Plain Bessemer rails have a life of about 18 months in the tunnel. Deterioration proceeds in the flaking of a scale from the rail until the edges of the base become quite sharp and removal is necessary. Chrome alloy rails, substituted for the Bessemer rail at the last renewal, have now been in service nearly three years. In addition to the increased length of life resulting from the ability to resist corrosion, the breakages in this latter class of rail have been less than one-fourth of the number for the plain rail, according to M. J. Corrigan, general inspector of tunnels of the Baltimore & Ohio.

The Strauss Bascule Bridge Company, Fort Dearborn Building, Chicago, reports the adoption of its design of bascule bridge by the Department of Railways and Canals, Ottawa, Canada, for a 156-ft. single-leaf, highway bridge over Lachine Canal, near Rockfield, Canada, for which it will receive bids in about six weeks; New York, New Haven & Hartford Railroad, New Haven, Conn., for a 40-ft. single-leaf, double-track railroad bridge over Cohasset Narrows, near Buzzards' Bay, Mass., for which bids will shortly be invited by the railroad company; Port Arthur Pleasure Pier Company, Port Arthur, Texas, for a 104-ft. single-leaf, highway bridge, for which bids will shortly be invited by the company.

The Bridgeport Metal Treating Company, Bridgeport, Conn., whose specialty is the treating of high-speed steel, has found its business showing a steady increase, and since the first of this year has added about 25 per cent. to both its buildings and equipment.

The total population of London is placed by its latest census at 7,252,965, this including 2,730,002 in the outer ring.

The National Bridge Company of Canada

The following description of the plant of the National Bridge Company at Montreal, Canada, erected at a cost of about $1,000,000, is taken from the Contract Record of Toronto:

Power has been turned on and the work in the shops started for this, the newest of the large steel companies in Canada. As first stated to the Contract Record last January, the plant was expected to be complete and in working order about July 1, or just six months from the date that ground was first broken for the main buildings. The machinery is all installed and all parts of the shops are now working full time. Power is supplied by the Shawinigan Falls lines of the Montreal Light, Heat & Power Company. No steam is used except for the heating of the buildings in winter. The staff organism is complete, even to the smallest detail, and a large number of draftsmen are now engaged on contracts for a number of buildings and bridges.

The plant is located directly on the Canadian Northern Railway lines near Dominion Park, in the eastern section of Montreal, and also has access to the St. Lawrence River wharves adjoining the company's property. Very rapid construction has been made, and this is creditable also to Canadian manufactures, as the manager has stated that about 80 per cent. of the machinery has been manufactured in Canada.

The present capacity of the plant is 20,000 tons, which will be increased to 40,000 tons by the erection of No. 2 bridge shop during the coming winter. This will bring the new plant to first or second place in the ranks of the bridge and structural companies in Canada for size and capacity.

The buildings now complete and in use are the main No. 1 structural shop, 137 x 350 ft., and the power house, machine shop, template shop, erection and paint houses, the stock yard crane runway of 80-ft. span and 400-ft. run, and the shipping yard crane runway, 50 ft. x 150 ft.

Among the numerous contracts already booked and going through the shops are the steel work for the Arena Gardens Company's rink, Toronto; the new power house for the Canadian Westinghouse Company, Hamilton; the St. Henry car barns for the Montreal Street Railway Company, the Strachan Building, the Walter Baker Company's Building, extension to Macdonald College at St. Anne's, and the Beauchemin foundry at Sorel.

The plant and mechanical equipment were designed and the construction carried out under the supervision of the general manager of the company, J. L. Brower, who is well known in the steel business. The general contractors for the building were Peter Lyall & Sons, to whom great credit is due for the rapid construction during the severe weather of the winter months.

The National Bridge Company is capitalized at $4,000,000, only a part of which has been issued. The directors are all men of large means and prominent in the financial world, and include J. N. Greenshields, Wm. Lyall, W. G. M. Shepherd, H. W. Beauclerk and Robert Mackay.

The New Jersey Machinery Exchange has engaged in business at 349 Market street, Newark, N. J., with a full line of new and second-hand machinery and appliances, consisting of lathes, shapers, milling machines, screw machines, power drills, foot and screw presses, planers, drop hammers, jewelers' rolls, woodworking machinery, blowers, buffers, grinders, shafting, hangers, pulleys, belting, etc.

The Society of Automobile Engineers, 1451 Broadway, New York, has issued a data sheet giving its standard sizes of lock washers just adopted. This standardization has been accomplished after a great deal of conference and committee meeting. The number of stock sizes has been reduced to 28, as against several hundred in general use. One firm alone has been making as many as 700 different sizes. The sheet referred to also gives suitable tests for determining the temper and toughness of the washers when made.

Two Thomas Meter Installations

Two installations of the Thomas meter which was illustrated in *The Iron Age*, March 16, 1911, have been made by Cutler-Hammer Mfg. Company, Milwaukee, Wis., that are of a diverse character. One is at the West Side plant of the Milwaukee Gas Light Company, where all the gas supplied to that city for heating and lighting passes through a single 30-in. main and is measured by one of these meters, which is an electrical device for measuring the flow of gas, while the other is almost as novel, being located at the Brave, Pa., pumping station of the Peoples Natural Gas Company of Pittsburgh and is used for measuring the natural gas passing between the wells and the pump.

The Milwaukee installation is a very striking example of the flexibility of the location of the parts of the meter and its enormous capacity compared with the space occupied, the maximum capacity being 3,000,000 cu. ft. of free gas per hour and an accurate minimum capacity of 50,000 cu. ft. The use of the Thomas meter was decided on in this case as the enormous quantity of low-pressure gas flowing through the main could not be measured accurately except by the displacement type of meter, and the large number of these units necessary for the work made measurement in that way entirely impracticable. The only available space in the pipe line for the meter casing was a vertical section 5 ft. 10 in. long located directly between two elbows. A special casing occupying no more space in the pipe line than the section of pipe which it replaced was designed, and the inner barrel, containing the heater and the thermometer units, is so constructed as to be removed for cleaning easily.

The recording instruments had to be placed on the pumping station floor where the space was exceedingly limited and for that reason the heater rheostat and the control mechanism were separated from the recording panel and placed in a corner of the basement. The rheostat measures 34 x 42 x 40 in. and the recording panel, which has mounted upon it a recording instrument and the control switches, is only 36 x 44 inches. This panel is located on the wall, where it can be conveniently operated from the floor of the station. In this way it has been possible to install in a plant already built and in operation a meter which will measure the total output of the plant and occupies practically no space that could have been utilized for other purposes.

While the pressure at the Milwaukee installation is approximately constant, at Brave the pressure varies from 50 to 200 lb. gauge and the temperature also varies with the weather conditions, which is not the case in the other installation. The meter at Brave gives a continuous graphical record as well as the integrated value of the flow of gas through the line in which it is installed directly in standard cubic feet at an absolute pressure of 15.025 lb. and a temperature of 60 deg. F., although these conditions vary widely, as stated above. The meter casing is installed in a field just above the ground level directly between two risers from an underground main and close to the fittings and gate valves. The pipe in which the meter is installed is a 10-in. suction line within about 200 ft. of the suction header of the pumping station and wires lead from the meter into the lighting plant of the station which supplies the meter with the energy necessary for its operation. In this case also the recording panel is situated at some distance from the meter, its location being alongside of the lighting switchboard.

An unusual opportunity is afforded by this installation for checking the accuracy of the meter because of the very wide variations in pressure and rate of flow of the gas through the line in the ordinary operation of the system. Brave is approximately 50 miles southwest of Pittsburgh, and Bula, the other terminus of the pipe line, is just across the boundary between the states of Pennsylvania and West Virginia. At the latter point there is a very complete and thoroughly calibrated Pitot tube station, one tube of which is in the same line with the Thomas meter. In this way it is possible to run the two meters in series although they are separated by approximately 1½ miles of 10-in. pipe. Readings of pressure and velocity head are taken on the Pitot tube every 15 min., night and day, and from these readings the value of the gas flow in standard cubic feet is obtained by the use of carefully prepared tables. Since these tables reduce the Pitot tube readings to the same standard units that the Thomas meter is designed to read the results can be easily compared.

After the meter was installed very thorough tests were made under service conditions to determine the degree of accuracy with which it would give continuous results directly in standard cubic feet with variable pressures, temperatures and rates of flow as compared with the results obtained by very frequent and careful observations on the Pitot tube. One of these tests was of 22 hr. duration and during a large part of the time the rate of flow was kept nearly constant and the temperature of the gas remained the same, although the pressure varied from 72 to 123 lb. gauge. After this test the meter was put into continuous service in series with the Pitot tube and ran with but very few interruptions in the gas flow for 45 days. During this time the rate of flow varied from 90,000 to 640,000 cu. ft. per hour, the pressure ranged from 46 to 185 lb. gauge and the temperature from 45 to 65 deg. F. Readings were taken on the Pitot tube as before and results were obtained from the Thomas meter by continuous records and by reading the integrating instrument at 3-hr. intervals. These two tests, one for a comparatively short period of time under quite steady conditions of flow, pressure and temperature, and the other for a longer period under the widely varying conditions, gave results with the two instruments that checked within 0.2 per cent.

Motion Pictures for Selling Machinery

To bring a machine to the buyer's office and to show it in action without the noise and grime of the factory is virtually what is suggested by the Motionscope Company, Indianapolis, Ind. The company manufactures a motion-picture machine of a size fitting into a salesman's traveling case, but in addition to enabling the salesman to enter a prospect's office and give a demonstration of the machine in operation, it is pointed out that films may be shipped to prospective buyers when it may not be necessary to send the entire machine. Then the film can be shown at the regular motion-picture institution of the neighborhood at little cost.

The picture machine is equipped with an attachment for showing single slides, which of course may be colored or may be reproductions of drawings to elucidate features of the design not conveniently explained with the motion picture. Of course, with a motion-picture machine the reels may be stopped at any point and a definite operation studied with care. The possibilities of the application of the motion-picture machine are of course great, and it is interesting to add that the company has had such a degree of success in introducing the machine that on October 1 it expects to have a plant of double present capacity for turning out films, slides and picture machines. It has prepared an illustrated booklet covering at length the argument for the use of the motion picture for machine selling.

Railroad Equipment Orders.—The St. Louis & San Francisco is reported to have ordered 250 flat cars from the American Car & Foundry Company and the Pennsylvania Railroad 700 gondola and 35 flat cars for its lines West from the Pressed Steel Car Company. The Queen & Crescent has been taking prices on 356 cars and the Havana Central has been in the market for 75 all-steel coal cars. Among cars under negotiation are 2000 for the Illinois Central, 1200 for the Wabash, 1000 for the Seaboard Air Line and 1000 for the Monon. The Pennsylvania and Baltimore & Ohio are reported in the market for passenger coaches. The Kansas City & Southern is about to place an order for 29 locomotives and the St. Louis & San Francisco has bought 20 locomotives from the American Locomotive Company.

The indices for each volume of *The Iron Age* are desired from January, 1904, to June 30, 1911. If any of our readers can spare copies of the index for any one of the volumes referred to, the Circulation Department of the David Williams Company, 239 West Thirty-ninth street, New York, would be pleased to be advised.

Fire Protection in Factories *

Some of the Measures Which a Thorough-Going Study Has Developed at One Plant

BY CHARLES E. MEEK.

As an example of the application of intelligence and diligence to fire protection in an individual house you will find interesting a report of one of the leading members of the Credit Men's Association, of his efforts to strengthen conditions at his plant. This man evidently realized that the destruction of a plant cannot be compensated for by insurance, but that the demoralization which follows in the wake of fire brings losses which are irreparable.

He says for many years his concern occupied as co-tenant one-half of a large building located in the "congested district" of his city. The building had been erected as strictly fireproof—as such construction was understood at the time of building. Between the two tenants was a division wall with no openings, so that the hazard of one tenant did not affect that of the other. Care was taken to provide fire shutters for the three exposed sides. Each floor was equipped with extinguishers, barrels, pails, fire-fighting and fire-preventing devices, but it was not a sprinkler risk, and because the owners of the building refused to make it so the concern decided to build a factory for itself.

In doing so the purpose was to provide the best fire risk that the location would permit, for the business could not well be taken from the so-called "congested district." Nothing was spared in the erection of the new building which would help reduce fire hazards. All windows on exposed sides were equipped with wired glass and metal frames. The elevator wells and stairway areas were placed on opposite sides of the building and protected with brick walls, and all openings protected by standard fire doors. The building throughout was equipped with the sprinkler system, each floor having its separate cut-off, so that in the event of leakage it would be necessary only to abandon sprinkler protection on that particular floor, while repairs were progressing. Electric power was used, but the heating plant was installed in the sub-basement, and entirely protected with brick. The owners of the business gave the firm free hand to install other improvements, and our member decided to erect a standpipe equipped with 50 ft. of hose on each floor, carry it to the roof, where a twin coupling of standard size was attached with 100 ft. of standard fire hose, interchangeable with the city equipment, in order that fire in an adjacent building might be fought from the roof. This provision, he says, has already proved wise, fire having been fought in a building across the street by using these twin couplings. The number of extinguishers requested by the Board of Underwriters has been installed, the member making it a rule to co-operate rather than oppose, when suggestions which seem reasonable are made, and the adoption of which would appear to make the risk better.

Not satisfied with the mere installation of the sprinkler system, our member made it his business to familiarize himself with all its mechanical parts and had every man of authority in the plant become equally familiar with it. A chart of the system was prepared for reference and to fix the various devices, valves, etc., firmly in the minds of all concrened. It occurred also to our member that printed tags explaining the purpose and manner of using the valves, cutoffs, draincocks, etc., would facilitate the use of the apparatus when suddenly needed. Therefore a tag explaining the use of each device in connection with the sprinkler system was attached thereto, with printed instructions where necessary. On each floor, over the main aisles and cross aisles, were hung signs pointing in the direction of the sprinkler cutoffs, so that in case of confusion from fire or leakage, there would be no waste of time in finding the main supply valve. Precaution was taken to add outside sprinklers, which, by the way, were not required by the State Board of Underwriters, and our member says he has made it his business to take charge of all tests of these sprinklers, in order to become thoroughly familiar with every device. Another precaution was taken in the shape of inviting the captain and his men from the nearest fire house to inspect the plant and become thoroughly familiar with its interior and particularly with its fire-prevention devices.

Our member ends his description by stating that he made it his business to co-operate with inspectors and with the State Board of Fire Underwriters through their sprinkler committee, and the result was eminently satisfactory on both sides; for after the equipment was complete, a rate of 25 cents on contents and twenty cents on building and fixtures was secured.

Supervisory Alarm System

In connection with the sprinkler system, attention was directed to the matter of watchman service, which was found to be a difficult question until it was decided to install the supervisory alarm system approved by the National Board of Fire Underwriters, connecting the plant with the local office of the American District Telegraph Company, which will know immediately of any flow of water caused either by leakage or fire, the lowering of water in the tank below a certain point, the flow of water into the tank above a certain point, the temperature, whether too low or too high, or tampering with valves anywhere in the building. This was felt to be better than a watchman, who may not be where needed when accident occurs. The supervisory alarm system is required to be inspected and tested weekly, and our member requires that a signed report of each inspection be laid before him. By this system it is not necessary to have valves either locked or strapped open, for it is positively known if they are open, for if one were closed there would be a signal to that effect, so that there cannot be any tampering with the various devices of the system anywhere in the building without knowledge thereof.

Our member says the best result of the pains taken thus far is that there is a feeling of security, which has been purchased at the expenditure of a nominal sum. He says that if business men would but awaken to the value in comfort and dollars of going to the pains his concern has, rates would not only be decreased, but the danger of a business or a city becoming wrecked by fire would cease. Another result to which he calls attention is that he has established so high a grade of insurance risk that he is able to dictate somewhat as to lines of insurance he will accept, the size of his policies and the companies he will insure in.

*Extracts from an address before the convention of the National Fire Protective Association. Mr. Meek was formerly secretary and treasurer and is now a vice-president of the National Association of Credit Men.

Open Hearth Steel Furnaces in Great Britain

The status of the open hearth steel industry in Great Britain is shown in statistics recently collected by the Iron and Coal Trades Review of London. There are 104 firms in Great Britain owning 535 open hearth furnaces, of which number 422 are now being operated. Similar statistics gathered in 1903 showed 94 firms owning 512 furnaces. The number of acid furnaces has fallen off from 417 in 1903 to 407, whereas in the eight years the number of basic furnaces has increased from 95 to 128. The Northeast Coast, Wales and the Midlands are the principal centers of the basic steel industry and the two first named districts have made substantial increases. A number of Talbot furnaces have been built in the Northeast Coast district, with a capacity of 175 to 250 tons. It is found that the total capacity per heat of open hearth steel in the various districts is 16,390 tons. The Northeast Coast district has made the largest advance, or from a capacity of 3650 tons per heat in 1903 to 5300 tons at the present time.

A comparison is made between the total capacity per heat of German open hearth furnaces. In 1909 Germany had 436 furnaces, with a capacity of 8240 tons per heat. It is estimated that the present capacity of the German open hearth furnaces is 10,000 tons against 16,390 tons in Great Britain. The Review says that "taking the production in 1910 of open hearth steel ingots, which was 5,113,758 tons in Germany, and 4,231,569 tons in Great Britain, a very striking contrast is shown in the degree of employment of the available plant."

Employees Demand Control of Harriman Lines Shops

A serious situation has been created in the machine shops of the Harriman Lines in the past week by the demands of the Federation of Shop Employees, representing machinists, boilermakers, car men, blacksmiths and sheet-metal workers employed in these shops. While an advance in wages is asked, the chief demand is recognition of the Federation. Vice-President Kruttschnitt has thus far refused this, but has appointed a meeting for this week at San Francisco with the presidents of the five unions which the federation includes. He issued a statement giving at length the demands of the federation and in each case the reason by officials of the Harriman lines are opposed to granting what is asked. The closed shop is one demand, all employees being required to join the federated association within 30 days. Other demands are that no employee shall work by piece, premium or bonus system; that all grievances of the employees shall be settled through a federated committee so that the workers in all crafts shall be behind the demands made by any one; the abolition of any requirement of physical examination or a statement of personal record by an employee; allowing employees to indicate who shall be laid off when forces are reduced; requiring the consent of the employees' committee before an employee can be discharged or suspended; increases in wages ranging from 15 to 28 per cent., adding about $7,000,000 a year to the pay rolls of the Harriman Lines. Vice-President Kruttschnitt says very positively that the commands cannot be granted, since they involve control of the shops by the employees. For many years the officials of the Harriman Lines have met organized and unorganized employees in conference. In concluding his statement Mr. Kruttschnitt says:

> Under the changes proposed by the federated employees and opposed by the companies, an issue raised on a small road in the system in Louisiana or Texas might stop all shop work throughout the system by requiring members to strike in distant California or Washington or Nebraska. To settle the question, the company involved might have to meet a committee representing all of its craftsmen, which committee would owe allegiance to the General Committee composed of all craftsmen of all lines of the Harriman system. Such an arrangement would mean chaos, would abridge or deprive the corporations of ability to fulfill their duties imposed upon them by the law, and officers deliberately so betraying their trusts would be justly condemned by public opinion.
>
> These are the reasons why we decline to surrender to irresponsible committees of federated employees representing a very small portion of the public trusts confided to us by the entire public, and why we will not concede to such committee the right to dictate whether our companies shall or shall not fulfill for twenty millions of people in seventeen States of the Union the duties clearly prescribed by law.

The employees represented by the unions mentioned above have voted to strike in case the demand for recognition of the federation is not granted.

The Labor Union View of Lifting Magnets

While general statements have been made from time to time as to the saving of labor at iron and steel works and elsewhere by the use of lifting magnets, more specific data are given in an article prepared by a labor union leader for the Social Democratic Herald of Milwaukee. The purpose of the article is to emphasize the displacement of labor by machinery of this character as one of the means of hastening the "day of emancipation for labor," though without any such design on the part of capital. The time of such emancipation, the article intimates, will come "when the workers own the magnet." The writer tells how at the Homestead works of the Carnegie Steel Company two young men, each operating a lifting magnet from the cage of a traveling crane, are now unloading an amount of scrap and pig iron which formerly required 25 men. It is added that the two operators of the cranes and magnets are employed only part of the time on this work while the 25 men displaced were employed all the time. The same article gives a record made in unloading pig iron at the dock of the Inland Steel Company at Indiana Harbor, Ind. In 10½ hours 2000 net tons of pig iron was taken from the vessel by two cranes operating lifting magnets. It is stated that before the introduction of the magnets the services of 28 men working two days and two nights were required to unload an equal tonnage.

Judicial Decisions of Interest to Manufacturers

ABSTRACTED BY A. L. H. STREET

Proof Required of Employee Suing for Personal Injury.—An employee suing for injury caused by being struck by a car running down an incline must show necessity for being so close to the track as to be struck. (Indiana Apellate Court, Livezey vs. Indiana Rolling Mill Company, 94 Northeastern Reporter 732.).

Risk Not Assumed by Machinist.—A machinist did not assume the risk of being injured at a machine used to cut slots in heavy steel frames, through the accidental revolution of a lever, where the lever could have been equipped with a safety device or a wheel could have been substituted. (United States Circuit Court of Appeals, Third Circuit, Deninger vs. American Locomotive Company, 185 Federal Reporter, 22.)

Liability for Injury to Workman Caused by Emery Wheel Breaking.—An employee cannot recover for injury caused by the breaking of an emery wheel on which he was grinding tools, where he selected the wheel and was in as good position as the employer to know whether it was dangerous. (Pennsylvania Supreme Court, Rodell vs. Adams, 80 Atlantic Reporter, 253.)

Liability for Injury Resulting from Defective Appliances.—An employer is liable for injury to a workman resulting from the former's failure reasonably to inspect and keep safe an appliance which the employee must use, unless the workman himself fails to exercise due care. An employee need not inspect closely and make sure of the condition of an appliance, and is chargeable with notice of such defects only as are, or should be, known to him. (West Virginia Supreme Court of Appeals, Denny vs. American Car & Foundry Company, 71 Southeastern Reporter, 706.)

Liability for Injury Caused by Defective Scaffold.—Under the provisions of the New York labor law, requiring an employer to provide safe scaffolding, he cannot avoid liability for injury to a workman by showing that the defects were latent and not discoverable by inspection. (New York Supreme Court, Erie County Trial Term, Smith vs. Variety Iron & Steel Company, 130 New York Supplement, 277.)

Employer's Liability for Employee's Acts During Rest Period.—A steel company's liability for injury to a mill employee is not affected by the fact that the employee, through whose negligence in throwing an electric switch at the wrong time the accident resulted, was off duty when he threw the switch; the work being conducted under a plan whereby the negligent employee worked and rested thirty minutes in alternating periods. (Illinois Supreme Court, Tijan vs. Illinois Steel Company, 95 Northeastern Reporter, 627.)

Liability for Personal Injury Sustained While Unlawfully Working On Sunday.—A workman injured through the negligence of an incompetent fellow employee, the incompetency being unknown to him, can recover his damages on the theory that the employer was negligent in retaining the negligent workman, though at the time of the accident all three persons were engaged together in violating a law prohibiting work on Sunday. (Georgia Supreme Court, Hughes vs. Atlantic Steel Company, 71 Southeastern Reporter, 728.)

Amount Recoverable for Personal Injury.—The amount of $11,916 is not excessive recovery for personal injury to a robust employee, 30 years old, who earned about $14 a week, where his right arm was amputated, and he suffered great pain for some time after the accident and has probably sustained a permanent shock to his nervous system. (Rhode Island Supreme Court, Chobian vs. Washburn Wire Company, 80 Atlantic Reporter, 394.

Effect of Breach of Warranty as to Capacity of Machinery.—By retaining an elevator for nearly two years, though it failed to possess the capacity required by the contract of sale, the buyer accepted it in his defective condition. He is, however, entitled to a deduction from the contract price to the extent that the value of the elevator is less than it would have been had the contract been complied with. In other words, he is bound to pay what the elevator installed is reasonably worth. (New Jersey Supreme Court, Otis Elevator Company vs. Headley, 80 Atlantic Reporter, 109.)

Handling Freight with a Gantry Crane

Savings Effected by Its Use at Cleveland Lake Shore Yard

A stiff-leg hand crane rated at 15 tons, but capable of handling 20 or 25 ton loads, was formerly employed for handling heavy freight in the Lake Shore & Michigan Southern Railroad yards at Cleveland, Ohio. The radius of the boom was sufficient to allow it to operate over four cars, while for more than that number the assistance of a switch engine was required. The installation required the services of a crane operator and a crew of five assistants and a foreman for loads of more than 15 tons, which one could only be used with four. This saves a large amount of time, together with the services of a switch engine and crew. Handling the load with the new crane takes about one-third the time required previously. Thirteen heavy loads have been handled by the gantry crane in 20 min., a feat which would have required 2½ hr. and a crew of six with the old stiff-leg crane.

The average amount of freight handled per day in July, which is one of the four light months, was about 30 tons. The remainder of the year, which is known as the rush season, has more than twice as much freight every day. On a basis of 100 light days with 30-ton loads and 70 tons for the 200 other working days of the year, the yearly tonnage is 17,000 tons. Three hand-operated cranes would be required to do the same amount of work in the same time, so that the gantry crane does away



A Self-Propelled Gantry Crane for Handling Freight in a Railroad Yard. Installed by the Cleveland Crane & Engineering Company, Wickliffe, Ohio.

called for the use of rollers and crowbars to move the freight in and out of the cars. During periods of heavy traffic considerable time and extra labor were required for handling the large loads.

About six months ago the railroad installed a self-propelled gantry crane built by the Cleveland Crane & Engineering Company, Wickliffe, Ohio. The two hoists of this crane, the main one of 30-tons capacity and the auxiliary which is rated at 5 tons, are both said to be capable of sustaining 50-per cent. overloads. The crane spans two sidings at a hight of 30 ft., the clear distance between the supports being 64 ft. These two sidings can accommodate 12 cars, six on each track, and in addition there is a wide space for trucks to drive under the crane near the sidings. Electricity is employed and at the middle of the bridge is a 25-hp. motor. The armature of this motor connects at right angles with the shafts of the two front trucks, there being four two-wheel trucks in all. In this way the power is transmitted from the motor to the wheels for propelling the crane along the track. An inclosed four-wheel trolley is mounted on the bridge and accommodates the two hoisting motors and the motor for the rack on the crane. In the front of the crane is located the operator's cab where the controlling apparatus for the different motors and the brake is located.

As compared with the former method of handling freight the savings are very apparent. Instead of seven men to handle the freight only one, the crane operator, is required, the hoist being attached to the load by the teamster who calls for it. The range of the crane is three times as large as the one which it replaced, the new crane being capable of operating over 12 cars, while the old with the services of two extra operators and thus saves about $1,800 a year. Under the old system about 18 overloads a week would have had to be carried by the three hand cranes and each would have necessitated the services of a gang of six men, at 20 cents per hour each and also a foreman at $65 per month. The saving in labor effected by the use of the new crane can safely be figured at $1,200 per year. In addition the new crane does away with much extra engine work and the saving from this source is probably enough to cover the cost of maintenance and repairs. The cost of the electricity for operating the crane is $500 a year, which, when deducted from the savings in the salaries of crane operators and laborers dispensed with, leaves an estimated net saving per year of $2,500.

The Locomobile Company of America, Bridgeport, Conn., furnishes us with a copy of the menu of the sixth annual dinner of the Locomobile Fire Brigade, which took place at the Old Homestead, Savin Rock, August 26. The menu is unique, one of its features being a photographic reproduction of the automobile fire engine used by the brigade.

The Steward & Romaine Mfg. Co., 124 North Sixth street, Philadelphia, Pa., manufacturer of expansion bolts, toggle bolts and kindred articles, has purchased the four-story and basement building, to which it intends to make considerable alterations, as in addition to its old line it has started to manufacture special bolts, screws and studs of all kinds. The company has in press a new catalogue.

Ingersoll Cutter Grinder

A Recently Developed Machine to Grind Milling Cutters at One Setting

About ten years ago the first cutter grinder for sharpening inserted tooth milling cutters was placed on the market by the Ingersoll Milling Machine Company, Rockford, Ill. Since that time improvements have been made

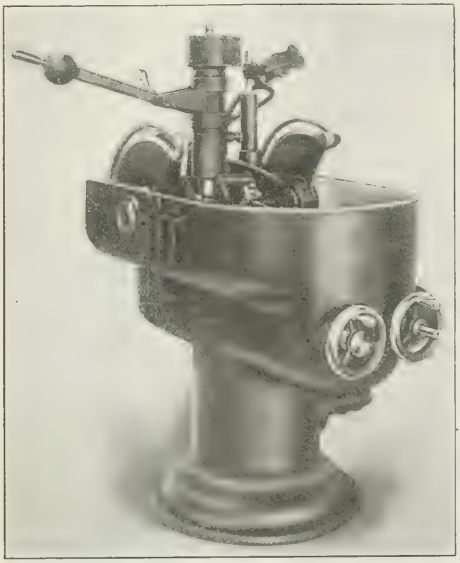


Fig. 1.—Operating Side of 24-in. Cutter Grinder Built by the Ingersoll Milling Machine Company, Rockford, Ill.

until in the latest machine, which has just been brought out, a number of original features have been embodied to produce a handy, convenient and accurate face mill grinder. Among those are rigidity of construction, ability

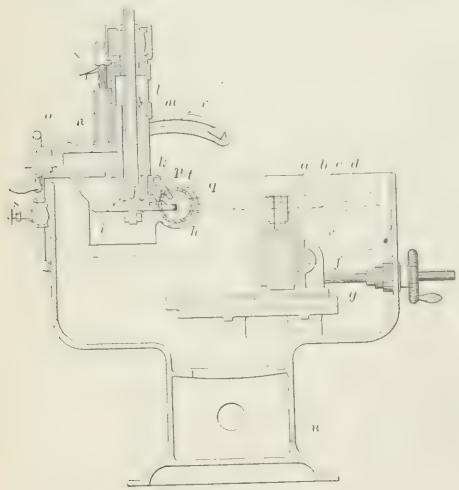


Fig. 2.—Sectional Elevation of the Grinder.

to grind cutters of any shape at one setting and convenience of operation due to a centralized control. Fig. 1 is a general view of the grinder, Fig. 2 gives details of its construction and Figs. 3 and 4 show different types of cutters being sharpened. In the first of these an angular cutter is being ground, and in Fig. 4 the sides of an 18-in. inserted tooth heavy type of face mill are being operated on. Fig. 5 shows the finger gauge which is employed to secure the required amount of clearance when grinding right and left hand cutters.

In designing the grinder an effort has been made to secure the rigid construction so necessary if accurate work is to be turned out, with the result that a machine has been produced to grind either a 24-in. or a 6-in. face mill with equally good results. In addition provision has been made for wet grinding and as there is a large space at the top of the base casting, as shown in Fig. 1, practically all danger of the cutting fluid being thrown by the grinding wheel and spattered on the floor is eliminated. The entire grinding mechanism is supported by a heavy base casting which contains the water tank used for wet grinding work. The saddle carrying the cutter being ground has horizontal and vertical adjustments for regulating the position of the cutters within the capacity of the machine, which will handle milling cutters varying from 4½ to 24 in. in diameter and having faces ⅛ to 4 in. wide. These adjustments have ranges of 10 and 3 in., respectively, and are provided with micrometers for fine work.

The grinding wheel, which is 10 in. in diameter, is carried on a yoke that turns on roller bearings through an arc of 90 deg. from the horizontal to the vertical position, and it is this arrangement that makes it possible to grind cutters without resetting. The corners may be ground round, square or at any desired angle. Three gauges having radii of ⅛, ¼ and ⅜ in., respectively, are furnished for grinding round corners and a fourth is employed for quickly setting the cutter to grind square cor-

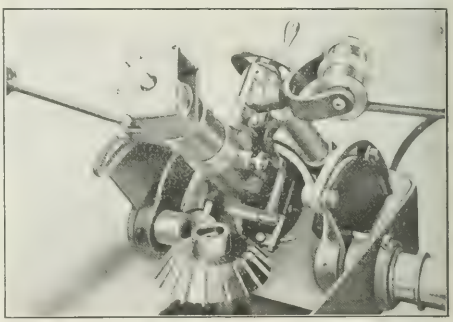


Fig. 3.—Grinding an Angular Cutter.

ners. The first three of these gauges have right-angle sections milled from their ends at these different distances off center. Additional gauges can be furnished for any other desired radius within the capacity of the machine and stops are provided which enable the operator to grind cutters having any angle from 0 to 90 deg. The grinding wheel spindle is 1¾ in. in diameter at the larger end. It is made of high carbon machinery steel and runs in phosphor bronze boxes having a taper cone for taking up wear. The spindle has a 5-in. hand adjustment and also one of 1½ in. to compensate for the wear of the grinding wheel, both graduated to thousandths of an inch in common with all the other adjustments furnished.

Operation of the Machine

In operation the cutter is mounted on an arbor, *a*, Fig. 2, which is carried in the spindle *b*. This spindle revolves in ball bearings *c*, an arrangement which makes it very sensitive and enables the cutter tooth being sharpened to be guided against its directing finger *h*. The quill *d*, which supports the spindle, is adjusted vertically by the pinion *e*, the worm wheel being carried in the saddle *f*. The horizontal adjustment of the saddle is along the slide *g*. Both of these adjustments are graduated in thousandths of an inch and are all that are necessary to place the cutter in the proper position for grinding. The grinding wheel *i* is mounted on a spindle, *j*, which revolves in bronze bushings with a taper cone, *l*, to take up any lost motion that may occur. The spindle car-

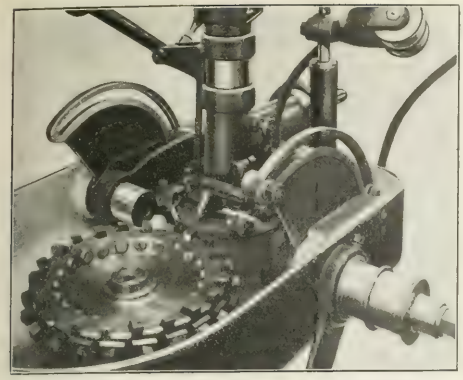


Fig. 4.—Grinding a Heavy Face Mill with Inserted Teeth.

rying sleeve *m*, which has a hand adjustment of 5 in. with a counterweighted lever, is carried in the saddle *n*. A 1½-in. hand adjustment of the saddle is provided by the hand wheel *o*, which is graduated in thousandths of an inch. The saddle in turn is carried in the yoke *p*, which is counterweighted and revolves on roller bearings through an arc of 90 deg. from a horizontal to a vertical position, the exact angle at any intermediate point being indicated on the quadrant *r*. The fluid employed when wet grinding is being done is directed against the cutter through the nozzle *t*, the force being regulated by the valve *s*. From the top of the machine the fluid drains off to the tank *u*, from which it is again pumped through the machcine. All of the controlling attachments and adjustments are within easy reach of the operator's regular position.

When grinding angular cutters the machine is set as shown in Fig. 3, the yoke carrying the grinding wheel being set to the angle of the cutter as indicated on the graduated quadrant. For grinding round corners, for example those having a radius of ¼ in., the rod gauge having the right angle section ¼ in. off center is inserted through the hollow bearing of the yoke. The cutter tooth is set into the milled section of the gauge by its adjustment on the slide and the spindle. When this has been done the gauge is withdrawn and the cutter is ready for grinding. While the grinding is being done the sleeve is automatically locked and the entire yoke swung over each tooth. The yoke can also be set for grinding corners of any angle between 0 and 90 deg., the angular position in degrees being indicated on the quadrant. For grinding square corners the gauge having a zero radius is substituted, but otherwise the operation is the same.

The machine set for grinding the sides of an 18-in. face mill of the heavy type with inserted teeth is illustrated in Fig. 4. A center gauge is furnished with the machine to facilitate setting the fingers for grinding the clearance on right and left hand cutters. This gauge, which is shown in Fig. 5, is inserted through a hollow bearing supporting the yoke and its end lies in a vertical plane passing through the grinding wheel and the cutter supporting spindle centers. The distance from the end of the gauge to the index finger regulates the clearance of the tooth being ground. The following table gives the distance between the center gauge and the finger for different degrees of clearance for the most commonly used sizes of cutters:

Clearance, deg.	Diameter of cutter, in. 6	8	10	12	14	16	18	20	24
	Approximate distance between center gauge and finger, in.								
1	1/16	1/16	5/64	5/64	5/64	3/32	3/32	3/32	7 64
1½	1/16	5/64	5/64	3/32	3/32	3/32	7/64	1/8	1 8
2	5/64	3/32	3/32	7/64	7/64	1/8	1/8	9/64	5/32
2½	3/32	7/64	7/64	1/8	9/64	9/64	5/32	11/64	3/16
3	3/32	7/64	1/8	9/64	5/32	11/64	3/16	7/32	1/4

When the cutter has been set and the finger and the radius gauge adjusted the operation consists of bringing the tooth to the finger stop with one hand and drawing the grinding wheel across the face of the tooth with the other hand, repeating until each tooth is ground. The yoke is then swung to the angle corresponding to that of the side of the tooth and that part finished.

The grinder is regularly arranged for belt drive from an overhead countershaft by a 2¼-in. belt. If desired a 1-hp. motor can be employed instead. The shipping weight of the machine is approximately 1300 lb.

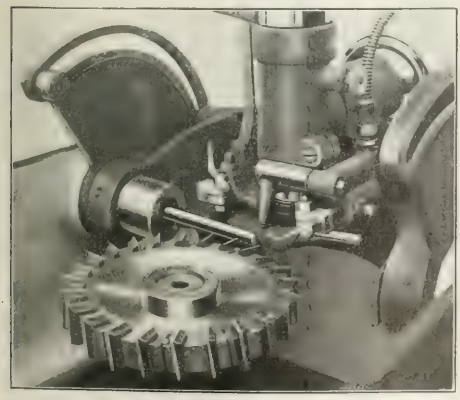


Fig. 5.—Setting the Finger Gauge Employed for Grinding Clearance on Right and Left Hand Cutters.

The Rockford Machine Tool Company's New Plant

The Rockford Machine Tool Company, Rockford, Ill., states that the construction of its new plant is progressing rapidly, and it is expected to be ready for occupancy about October 1. The new buildings are well located on a four-acre tract recently purchased. The plant throughout is of reinforced concrete construction, including all the roofs, and will be practically fireproof. Little or no fire insurance will be carried. The main building is 100 x 200 ft., with 15-ft. ceilings at the sides. A 15-ton traveling crane, with 40-ft. span, will be installed, having a hight of 20 ft. from the hook to the floor. All windows will be fitted with Detroit Fenestra steel sash, which will be set with ¼-in. wire glass. The power house adjoins the main building on the south. It is 48 x 60 ft., including coal storage room. The equipment will consist of two boilers, a Corliss engine and electric generators.

Adjoining the main building on the north are the locker and wash rooms, in which will be installed a system of steel lockers and wash bowls for the convenience of the employees. The blacksmith and pattern shops are also on this side but separated from the main building. They will be constructed of concrete with steel sash, the same as the machine shop. All partitions will be eliminated in the main shop except in the tool and stock room, which will be inclosed by netting. The inclosure will have a complete equipment of steel racks for tools and stock.

The office will be in a separate building in front. It will be constructed of dark pressed brick with concrete roof, the interior finished in oak. There will be a large fireproof vault and storage room for printed matter, etc. The entire plant will be heated in winter by a vacuum steam-heating system, using the exhaust steam during the day. The buildings are being erected by the Frederick A. Little Company, Fond Du Lac, Wis. The products manufactured are shapers, planers and special machinery.

The National Spring & Wire Company, Albion, Mich., which is now operating a branch plant at St. Catharines, Ontario, is erecting a new concrete and steel factory building at Windsor, Ontario, 90 x 140 ft., one story, which will have a cement roof and be as nearly fireproof as it can be made. The equipment will be removed from St. Catharines to Windsor about the last of September. The company is getting out a new line, which will be manufactured in its plant at Albion, but under the name of the National Sanitary Shelf Company. This line will comprise bread racks, pan racks, dump racks and other specialties for the use of bakers.

The Census Bureau's Report on Iron and Steel

Production in 1909 by Blast Furnaces, Steel Works and Wire and Tin Plate Mills, with Values of Plant and Output

A preliminary statement has been issued in the past week by Census Director E. Dana Durand, showing the general results of the Thirteenth Census of establishments engaged in 1909 in the manufacture of iron and steel. Comparative statements are given of the quantity and cost of the principal materials used, and the quantity and value of products manufactured in 1909, 1904 and 1899 in the four classes of works designated as blast furnaces, steel works and rolling mills, wire mills and tin and terne plate mills. The report was prepared under the direction of William M. Steuart, chief statistician for manufactures, by Story B. Ladd.

Statistical Discrepancies

It is stated that the reports were taken for the calendar year 1909, wherever the system of bookkeeping permitted figures for that year to be secured, but in some instances where the business year of the establishment differed from the calendar year the reports relate to the business year falling most largely within the calendar year 1909. This mixing of 12-month periods accounts in large part presumably for the differences between the Census figures for production and those which appear in the statistics of the American Iron and Steel Association. It is unfortunate that the Census Bureau did not adhere strictly to the calendar year 1909. The result of the variations it has permitted is confusion, making comparisons difficult. In practically every case in which we have attempted to compare the Census figures with those of the American Iron and Steel Association the former were less. For example, the pig iron production in 1909, as shown in the Census statistics, was 25,652,000 gross tons, against 25,795,471 tons in the official statistics. The Census figures for steel ingots and castings are 23,523,000 tons, against 23,955,021 tons.

It is explained that the word "establishment" as used in the report may mean more than one mill or plant, provided they are owned or controlled and operated by a person, partnership, corporation or other owner or operator and are located in the same town or city and for which one set of books of account is kept. Separate reports, however, were made for the blast furnace department and the steel furnace and rolling mill department when these were operated in conjunction with one manufacturing unit. In like manner the tin and terne plate dipping department of a plant rolling the black plates has been treated as a separate establishment.

The explanation is necessary that while 1904 was a year of recession in the iron and steel trades 1909 was a year of record output. The difference in the two sets of figures, therefore, cannot be taken to represent an actual expansion of the industry to that extent. Furthermore, 1899 was a prosperous year. It should be said as to capitalization, moreover, that some of the consolidations, particularly the United States Steel Corporation, were formed after the Census of 1899. Their large capitalizations, as now reported for the Census of 1909, are not to be regarded as indicating that appraised value of plant actually increased in the decade to the extent indicated. A summation of the figures given in the preliminary statement is as follows:

The Pig Iron Industry

There were 208 establishments engaged in the manufacture of pig iron in 1909, a decrease of 16 from the number in 1899, but an increase of 17 over that of 1904. The capital reported in 1909 was $487,581,000; in 1904, $236,401,000; and in 1899, $143,329,000; an increase of 106.3 per cent for 1904-1909, and of 64.9 for 1899-1904. The employees, including salaried officials, clerks and wage earners, in 1909 numbered 43,013; in 1904, 37,414; and in 1899, 41,121, an increase of 15 per cent for 1904-1909, and a decrease of 9 per cent for 1899-1904.

The pig iron product in 1909, including ferromanganese, ferrosilicon, spiegeleisen, etc., was 25,652,000 tons, value $387,830,000; in 1904, 16,628,000 tons, value $228,978,000; and in 1899, 14,452,000 tons, value $206,579,000; an increase of 54 per cent in tonnage and 69 per cent in value for 1909 over 1904, and 78 per cent in tonnage and 88 per cent in value for 1909 over 1899. There was charged into the furnaces 50,337,000 tons of ore, mill cinder and scrap, 13,571,000 tons of flux and 29,258,000 tons of fuel in 1909, compared with 26,976,000 tons of ore, mill cinder and scrap, 7,327,000 tons of flux, and 16,697,000 tons of fuel in 1899, showing an increase for the decade of 87 per cent for ore and 75 per cent for fuel. The cost of these materials was $311,043,000 in 1909, $174,493,000 in 1904, and $118,962,000 in 1899, showing an increase for the decade of 162 per cent. On account, however, of differences in method of reporting freight on materials at the several censuses, the statistics in regard to cost of materials are not strictly comparable.

The heavy growth is in coke furnaces, pig iron made with bituminous fuel increasing for the decade from 12,254,000 to 24,609,000 tons, or 101 per cent, and in value from $173,763,000 to $369,684,000, or 113 per cent; whereas the increase in charcoal pig iron is small, and pig iron made with anthracite coal and coke mixed or with anthracite coal alone has decreased largely. The average value of the pig iron made per ton was $15.15 in 1909, compared with $14.29 in 1899.

Of the 1909 product, 15,858,000 tons, or 62 per cent, was produced for consumption in the works of the producer, against 9,926,000 tons in 1904, no figures being given for 1899. Of the 1909 amount 12,198,000 tons, or 77 per cent, was delivered in a molten condition, compared with 5,899,000 tons, or 59 per cent, in 1904.

The active establishments reported 388 completed furnaces with a daily capacity of 101,267 tons in 1909, compared with 343 completed furnaces with a capacity of 78,180 tons in 1904, and 343 with a capacity of 54,425 tons in 1899, an increase for the decade of 13 per cent in number and 86 per cent in capacity.

Steel Works and Rolling Mills

There were 446 establishments in 1909 equipped for the manufacture of steel or for the hot rolling of iron or steel, compared with 415 establishments in 1904 and 445 in 1899. The capital reported in 1909 was $1,004,735,000; in 1904, $700,182,000; and in 1899, $430,232,000; an increase of 43.5 per cent for 1904-1909, and of 62.7 for 1899-1904. The employees, including salaried officials, clerks and wage earners, in 1909 numbered 260,123; in 1904, 221,892; and in 1899, 190,703; an increase of 17.2 per cent for 1904-1909, and of 16.4 per cent for 1899-1904. The products of these establishments amounted in value to $985,723,000 in 1909, $673,965,000 in 1904, and $597,212,000 in 1899, an increase in value of 46 per cent for the period 1904-1909, and 65 per cent for the decade.

The principal materials used amounted in value to $529,952,000 in 1909, compared with $364,475,000 in 1904, and $322,269,000 in 1899, an increase for the decade of 64 per cent. The chief item is pig iron, of which there was consumed 19,077,000 tons, costing $297,471,000, in 1909, compared with 12,191,000 tons, costing $172,102,000, in 1904, and 10,480,000 tons, costing $151,042,000 in 1899. The above figure for the 1909 consumption of pig iron includes 365,000 tons of spiegeleisen, ferromanganese, ferrosilicon and other ferroalloys, costing $14,807,000; the ferroalloys consumed in 1904 and 1899 being included under "pig iron" but not reported separately.

The rolled, forged and other classified iron and steel products in 1909 aggregated 26,639,000 tons, compared with 18,217,000 tons in 1904, and 15,056,000 tons in 1899, an increase for the decade of 77 per cent; the value of the same for the several years being as follows: 1909, $861,165,000; 1904, $585,288,000; and 1899, $510,906,000; an increase for the decade of 69 per cent.

There has been very heavy growth in certain of the rolling mill products, notably in wire rods, the output of which increased from 917,000 tons in 1899 to 2,295,000 tons in 1909, or 150 per cent; structural steel, from 857,000 tons

in 1899 to 2,124,000 tons in 1909, or 148 per cent; and plates and sheets, not including black plates or sheets for tinning, from 1,488,000 tons in 1899 to 3,333,000 tons in 1909, or 124 per cent.

Steel Production

The total production of steel ingots and castings, including that of 24 establishments equipped for the manufacture of steel, but engaged primarily in the manufacture of other products, was 23,523,000 tons with a value of $482,947,000 in 1909, compared with 13,671,000 tons and a value of $261,232,000 in 1904, and 10,685,000 tons and a value of $212,539,000 in 1899; an increase for the decade of 120 per cent in tonnage and 127 per cent in value. In 1899 Bessemer steel formed 70 per cent of the steel production, and although it still exceeded in quantity all other steels in 1904, yet it only constituted 57 per cent of the total; during the decade ending with 1909 the production increased 22 per cent. In 1909 the production of open-hearth steel was 14,212,000 tons and formed 60 per cent of the steel production. The heavy growth has been in basic open-hearth steel, which increased from 2,154,000 tons in 1899 to 13,221,000 tons in 1909, an increase for the decade of 514 per cent. During the same period acid open-hearth steel increased 11 per cent, and crucible and miscellaneous steels 6 per cent. The steel production includes, for 1909, 549,000 tons of direct castings of a value of $42,607,000; for 1904, 292,000 tons, valued at $20,947,000; and for 1899, 177,000 tons, valued at $14,610,000, the balance being ingots.

Of the 1909 product, 523,000 tons of open-hearth steel was partly purified in Bessemer converters before finishing in open-hearth furnaces.

The daily capacity of rolled iron and steel on double turn of the rolling-mill establishments was 150,000 tons in 1909, 106,000 tons in 1904, and 87,000 tons in 1899, an increase for the decade of 73 per cent.

The Wire Industry

The total value of the products of the wire industry was $167,709,000 in 1909, about equally divided in value between mills drawing wire from purchased wire rods and the wire departments of rolling mills, which roll wire rods, viz., $84,486,000 and $83,223,000, respectively. Figures available for 1904 and 1899 are not fully comparable. Not including establishments drawing wire from purchased rods and making entire product into nails or other wire fabrications, the value of products was $112,719,000 in 1904 and $57,150,000 in 1899, the latter figure, however, not including the copper, brass and other metal-wire products of the wire departments of iron and steel rolling mills, which was not relatively a large item.

The capital reported in 1909 was $60,157,000; in 1904, $14,899,000; and in 1899, $4,242,000; an increase of 303.8 per cent for 1904-1909, and of 251.2 for 1899-1904. The employees, including salaried officials, clerks and wage earners, in 1909 numbered 19,931; in 1904, 5318; and in 1899, 1697; an increase of 274.8 per cent for 1904-1909, and of 213.4 per cent for 1899-1904.

There was consumed by the wire mills of the country 2,646,000 net tons of wire rods in 1909, costing $101,620,000, distributed according to metal, as follows: Steel, 2,515,000 tons, costing $67,440,000; iron, 4000 tons, $183,000; copper, 126,000 tons, $33,733,000; and other metal, chiefly brass, a little less than 1000 tons, $264,000. Of this material, 955,000 tons was used in wire mills that purchased the wire rods and 1,691,000 tons by the wire departments of rolling mills. There was also used by the wire mills 58,000 tons of purchased wire.

The wire industry in 1909 includes wire and products of wire to the value of $161,049,000, and other products to the value of $6,660,000. There were drawn, in the aggregate, 2,514,000 tons of wire, of which iron and steel constituted 2,389,000 tons; copper, 124,000 tons; and brass, bronze, white metal, etc., 900 tons, the latter being chiefly brass. The iron and steel wire products amounted in value to $120,533,000, of which $72,599,000 was the product of the wire departments of rolling mills and $47,934,000 was produced by wire mills which did not operate wire rod trains. The copper product was of the value of $40,032,000, of which $30,832,000 was by mills purchasing wire rods, and $9,200,000 was the product of the wire departments of rolling mills. Wire products of brass, bronze, white metal, etc., amounted in value to $484,000. The equipment of the establishments, 1909, comprises 42,799 wire-drawing blocks, of which 21,081 were reported in kind (rod, 4265; redrawing, 7043; and fine wire, 9773) and 21,718 with kind not reported, with a total annual capacity of 3,146,000 tons; 4428 wire-nail machines with an annual capacity of 18,757,000 kegs, and 446 woven-wire fence machines with an annual capacity of 481,000 tons of fencing.

Tin and Terne Plates

There were 31 establishments reporting the dipping of tin and terne plates in 1909, compared with 36 in 1904 and 57 in 1899; of these, 5 in 1909, 9 in 1904, and 22 in 1899 purchased their black plates, the balance rolling them. The capital reported in 1909 was $10,995,000; in 1904, $10,813,000; and in 1899, $6,650,000; an increase of 1.7 per cent for 1904-1909, and of 62.6 for 1899-1904. The employees, including salaried officials, clerks and wage earners, in 1909 numbered 5845; in 1904, 5131; and in 1899, 4004; an increase of 13.9 per cent for 1904-1909, and of 28.1 per cent for 1899-1904. There was used as material in 1909 black plates and metal for coating with a cost of $38,651,000, compared with $30,068,000 in 1904 and $25,596,000 in 1899, an increase for the decade of 51 per cent. This material included 1,321,072,000 pounds of black plates or sheets with a cost of $28,981,000 in 1909, 1,019,609,000 pounds with a cost of $22,992,000 in 1904, and 827,916,000 pounds, costing $20,669,000 in 1899, an increase for the decade of 60 per cent in quantity and 40 per cent in value. There was used in coating 31,078,000 pounds of tin, costing $9,236,000, in 1909, compared with 20,283,000 pounds, costing $4,528,000, in 1899, and 9,850,000 pounds of lead, costing $434,000, in 1909, compared with 6,871,000 pounds, costing $399,000, in 1899. These figures include the tin and lead contents of terne mixture purchased as such, of which, in 1909, there was purchased 9,633,000 pounds, at a cost of $1,062,000. In addition to the foregoing there was consumed 8,032,000 pounds of black plates and 388,000 pounds of coating metal by 3 establishments engaged primarily in the manufacture of other products.

The value of the products of the tin and terne dipping plants in 1909 was $47,970,000; in 1904, $35,283,000; and in 1899, $31,892,000; an increase for the decade of 50 per cent. In addition there was manufactured for consumption and sale by three establishments engaged primarily in the manufacture of other products, tin plate, terne plate and other sheet iron or sheet steel tinned or terne-plated products of a value of $399,000.

American and German Steel Displaces Welsh Workers

The workmen in the plant of the Ebbw Vale Steel, Iron & Coal Company, Ltd., Ebbw Vale, Wales, have asked the British Board of Trade and the Chancellor of the Exchequer to inquire into the shutting down of that company's steel works two months ago. About 4000 men are affected. The company gave as a reason for closing down the fact that last year 160,000 tons of steel, chiefly semi-finished, was imported at Newport, Wales, with indications that this amount would be exceeded this year. The managing director of the company, F. Mills, said to a deputation of the workmen that it was impossible for the company to compete in sheet bars and billets against German and American producers, the foreign manufacturers underselling the Ebbw Vale company by at least 5 shillings per ton. He added that it was impossible in spite of modernizing the equipment to secure sufficient orders to keep the plant going at anything like full time. The company says that it will give the Board of Trade full access to its books and all data. The workmen are not satisfied with the explanation given and hope that the official inquiry will result in the restarting of the works. It was stated when the plant was shut down two months ago that it would probably be idle for three months during which improvements would be made.

According to statistics gathered by the British Iron Trade Association, the production of Bessemer and open-hearth steel castings in Great Britain in 1910 amounted to 66,492 gross tons, of which 34,649 tons was Bessemer and 31,843 tons open-hearth steel; against 34,819 tons of Bessemer and 52,542 tons of open-hearth castings in 1909.

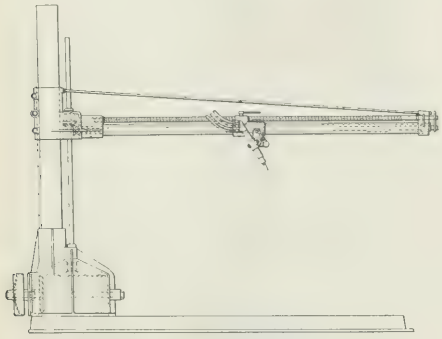
Welding and Cutting Machine

Interesting Development of Acetylene Blow Pipe Working

BY J. F. SPRINGER

Hand welding and hand cutting are now familiar operations to which the acetylene blow-pipe is highly adapted. Where straight-line operations have to be carried out, especially in connection with repetition work, a machine is often applicable and advisable. Where sheets are very thin, machine welding is very desirable because of the certainty with which it can be regulated. The machine can be advantageously used in sheet metal work, where the thicknesses range up to, say, 3/16 or 7/32 in. Straight cutting of both thin and thick work can be advantageously done with the machine because of the precision of the movement.

An acetylene welding and cutting machine has recently been built by the Davis-Bournonville Company, 90 West street, New York City, at its laboratory at Marion Station, Jersey City. The patent rights involved are held by this concern. There is a cylindrical upright perhaps 6 or 7 ft. in height. This carries a long, hollow arm, projecting 6 or 7 ft. on one side. By means of a rack and pinion, this arm may be adjusted to any height desired.

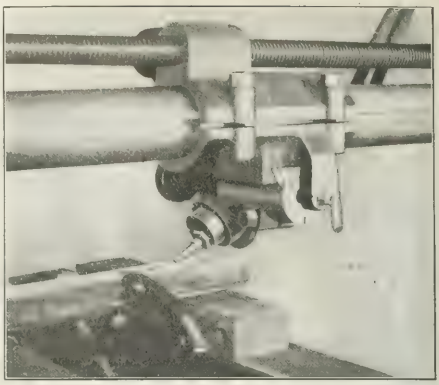


The Machine Rigged with Welding Torch.

The arm carries a long screw, rotatable and mounted horizontally in suitable bearings. Loose and tight pulleys are mounted at the base of the upright on a short horizontal shaft and are driven from an ordinary countershaft above. This latter shaft and a rotatable rod arranged in the hollow arm are put into driving connection by bevel gears. At the outer end of the arm, an arrangement of gears enables the inclosed rod to drive the screw. The turning of this screw operates a carriage back and forth horizontally along the arm. On the carriage, the torch and its controlling fixtures are mounted.

The work is placed or secured on a suitable fixed table. Flexible tubes bring the oxygen and acetylene to the torch. The tip is practically the ordinary form. It is arranged at an angle, say 40 or 45 deg., to the horizontal, this angle being to the rear of the welding movement. The torch then moves over the work much after the way a cowcatcher passes over a railway track.

The method of welding is often quite simple. Thus, if the weld is to be a flat one and of inconsiderable length, the two pieces are simply clamped in the exact relative positions they are to occupy finally. Room must, of course, be left for the tip to pass. The carriage with the torch moves evenly along at the proper rate of speed. The countershaft, running at say 140 r.p.m., operates the short horizontal shaft at about 70 r.p.m. It is possible to adjust the friction pinion to vary the angular speed of the vertical shaft from about 70 to about 35 revolutions. Still further reductions of speed may be made by the gears at the end of the arm. Indeed, quite a range of speeds may be obtained by suitable combinations of the gears. The screw has about 6 threads to the inch, and gives the carriage a speed which may be varied from 3 to 24 in. per minute. The carriage has a back-and-forth range of 5 ft.



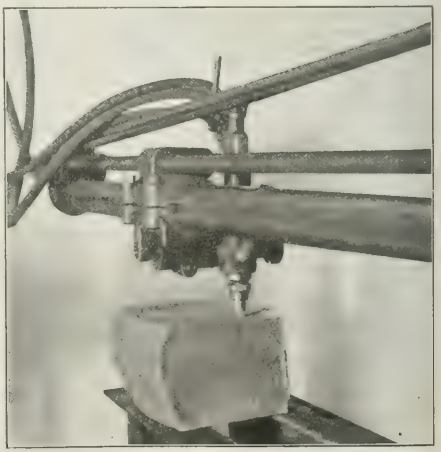
Angular Work in Welding Position

5 in., which means that a weld of approximately that length may be made. If an angular weld is to be formed, the only difference to be made is in the arrangement of the work.

Because of the enormous temperature of about 6000 deg. F., which is claimed for the working point of the little inner flame of the oxy-acetylene torch, the torch is very successful in bringing steel and other metals locally to or near the melting point. It is not necessary to do all the heating with gases like acetylene and oxygen. The consumption of the gases and time also may be saved. For example, certain work requiring a long seam and involving sheets 0.10 to 0.12 in. thick, can be welded on a European machine at the rate of about 12 in. per minute. Practical experiments where the work was pre-heated before passing under the torch showed, so it is said, that the work con be welded at a speed of 26 to 28 in. per minute.

The methods of pre-heating may be various. Thus, if it is a question of small repetition work, the pre-heating may in some cases be done subsequent to clamping, but prior to putting the work on the table. Other cases will require pre-heating with the work in welding position. In general, the pre-heating arrangements will not be difficult to provide. Pre-heating is to be recommended strongly for the two reasons — economy of oxygen consumption and reduction of effects of expansion and contraction.

The machine already described as a welding device may readily be used as a cutting apparatus. The high precision of the motion of the carriage recommends it for this purpose. In cutting, however, some variations are made. In the first place, the jet arrangements are different. But this is perhaps more a matter of simultaneous



Ready for a Heavy Cutting Operation.

development, as the new arrangement of jets will no doubt be effective as a hand tool. On the machine, three jets are arranged in a rigidly vertical position, the gases being driven directly downward. These are arranged in line with the direction of movement. Ahead is a heating jet of oxygen and acetylene; at the rear is another but smaller heating jet. Between the two, the cutting jet of oxygen is arranged. Three flexible tubes bring the gases. An oxygen and an acetylene tube together supply the gases for the two heating jets. Thus these jets are both supplied from the same sources. An independent oxygen supply is provided for the cutting jet, for the reason that ordinarily the pressure back of this jet is higher — and sometimes much higher — than is the case with the heating oxygen. It has been found that by providing an auxiliary heater behind, the work of cutting is facilitated. Its operation is probably as follows: The forward jet provides heat for the metal which is probably somewhat lost by the time the pure oxygen jet comes along. This jet may be only ⅛-in. behind. Still it would seem that conduction would carry off considerable heat while the cutting jet is getting to the spot, especially where the movement is a slow one, as with very thick steel. The rear jet provided additional heat and thus reduces dissipation by conduction. Its scene of operation is in the region where much of the wasteful conduction would take place. In the case of thin plates, the rear jet is scarcely necessary and may be shut off.

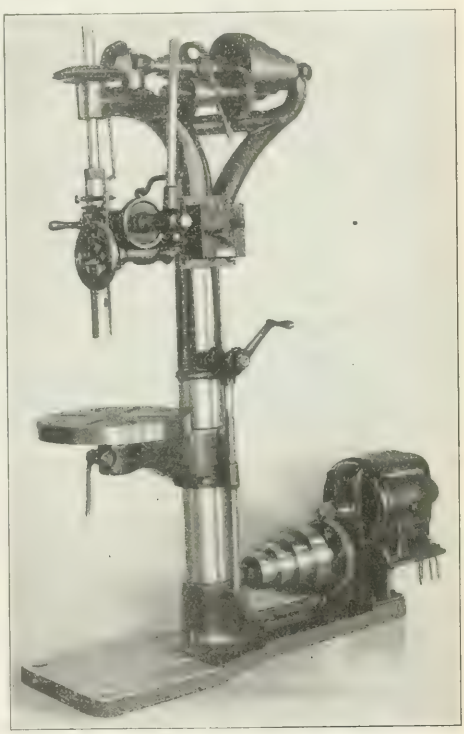
The Joliet Rolling Mill Company, Joliet, Ill., is now installing a large amount of new equipment recently purchased. Part of this equipment consists of an 8-in. mill complete, a large shear for cutting 6-in. square cold steel and four large busheling shears. It is also rebuilding its 22-in. mill so as to make all sizes up to 6 in. rounds and 12 in flats, and is erecting a large lathe for turning the rolls. It is further fitting up a complete machine shop. The company will then have one of the most complete bar-iron mills in the country, with a capacity of 175 to 200 tons per day, and will make all sizes, including rounds and squares, from ¼ in. to 6 in., and flats up to 12 in. wide, of all thicknesses. The company has experienced a decided improvement in the condition of business. A month ago shipments were being made within 48 hours after the receipt of orders, but the large amount of work recently received has made it necessary to ask for ten days or two weeks time on deliveries.

The list of active blast furnaces producing coke pig iron in Alabama this week showed a total of 18, or a net increase of 1 since August 1. The Tennessee Company has 6 furnaces in blast, the Republic Iron & Steel Company 3, the Sloss-Sheffield Steel & Iron Company 3, the Woodward Iron Company 2, the Birmingham Coal & Iron Company 1, the Alabama Consolidated Coal & Iron Company 2 and the Anniston Iron Corporation 1. Thirteen furnaces are running on foundry iron and 5 on basic —Alice and 4 Ensley furnaces of the Tennessee company. There are 28 furnaces idle in Alabama, fit and unfit, chiefly the latter.

The New Sibley Motor-Driven Drills

Simplicity which characterizes the entire line of drilling machines built by the Sibley Machine Tool Company, South Bend, Ind., is the most noteworthy feature of two new motor-driven drill presses which this company has recently brought out The driving motor is mounted directly on the base of the tool and the power is transmitted through a train of gears, an arrangement which brings the weight down as low as possible and adds very much to the stability of the tool. The solid, compact design and the ample proportions of all working parts which were features of the 24-in. stationary head drilling machine which was illustrated in *The Iron Age*, May 4, 1911, are also present in these new tools. Two sizes of drill press are built which are known as the 20 and 22½ in. drills, respectively, the former being the one illustrated.

The spindle is driven by a 2¼-in. belt which transmits its power through back gears having a ratio of approximately 4 to 1 and driving gears in the proportion of 2 to 1. The drive for the feed worm gear is through a steel worm running in an oil bath, which insures constant and thorough lubrication. The feed lever is light enough for sensitive quick drilling and at the same time possesses sufficient power for handling heavy work. Lever and wheel feeds, both of which are independent of each other, are provided and the change is made by a slight twist of the lever. The feed mechanism can be entirely disengaged as often as desired as it swings on a hinge pin. An adjustable automatic stop collar on the spindle sleeve trips a latch which releases the lever controlling the operation of the feed gears. This lever also provides a means for taking up any wear occurring in the worm or the worm gear. The vertical shaft is driven by a worm gear and a worm running in oil, the latter deriving its power from the top of the shaft through cone pulleys. There is practically no spring between the head and the table arm as both of these parts are designed to handle much heavier work than the capacity of the tool.



A 20-in. Drill with New Motor Drive Built by the Sibley Machine Tool Company, South Bend, Ind.

The following table gives the principal dimensions and specifications of the two sizes of drills:

	20	22½
Overall hight, in.	72	79
Morse taper of spindle	No. 3	No. 4
Feed of spindle, in	⅛	9/32
Maximum distance between spindle and base, in.	41½	44
Maximum distance between spindle and table, in.	24	23
Diameter of table, in.	16½	19
Diameter of spindle, in.	1¼	1 7/16
Diameter of column, in.	5	6¼
Ratio of bevel gears	23 to 45	25 to 45
Diameter of driving pulley, in.	9¼	10
Face width of driving pulley, in.	3	3
Speed of driving pulley, r.p.m.	300	300
Diameter of largest cone pulley step, in	8½	10
Diameter of smallest cone pulley step, in	4½	4
Floor space required, in.	17 x 45	18 x 48
Shipping weight, lb.	650	900
Boxed weight, lb.	900	1,150
Content of case, cu. ft.	37	48

These machines can be supplied either with or without back gears or power feed, geared or belted motor drive, reversing countershaft, or geared tapping attachment.

Lathe Relieving Attachment

Part of the Equipment of the Bradford 16-in. Lathe

As a part of the regular equipment of its line of lathes, the Bradford Machine Tool Company, Cincinnati, Ohio, is furnishing a lathe relieving attachment for straight or tapered work of any number of flutes from 2 to 24 inclusive. This attachment is used in conjunction with the maker's standard taper attachment and the combination is especially recommended for use on taps, hobs, end mills, etc. The special advantages of this attachment are the avoiding of abnormal gear ratios or a multiplicity of gear centers to provide the required number of movements per revolution of the spindle, ability to adjust the relief throughout the entire available range without stopping the lathe and freedom from interference with the traverse of the lathe carriage or the movements of the compound rest when the attachment is in use. Fig. 1 illustrates the attachment applied to one of the maker's 16-in. quick change gear lathes, while Fig. 2 shows the index plate furnished with the attachment to give the change gear combinations necessary for the different amount of relief.

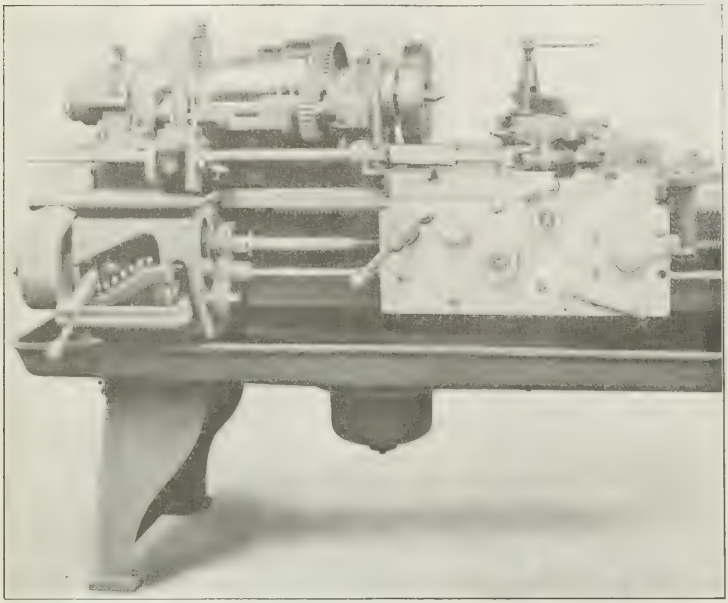


Fig. 1.—A 16-in. x 6-ft. Quick Change Gear Lathe Equipped with the New Relieving Attachment Made by the Bradford Machine Tool Company, Cincinnati, Ohio.

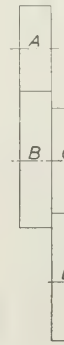
All the parts of the attachment are self-contained in a strong bracket, which is built as a unit and is calculated to insure permanent alignment and correct action for the different parts. This bracket is mounted on the headstock, as shown in Fig. 1, and this position was chosen as being convenient. The attachment is not only easily accessible and in plain view of the operator, but it is not necessary for him to go to the rear of the lathe in making adjustments or in removing and replacing change gears. A spur gear meshing with the face gear drives the attachment and this construction possesses the advantage that the speed of the attachment is varied in the same degree as the work. The required number of movements varies from 2 to 24 per revolution of the spindle. Using the face gear as the driver also insures more accurate work, it is emphasized, than would be possible if the spindle gear or the lead screw change gears were employed, as the strain imposed upon the relieving attachment by the work is so severe that if the change gears were used, the spindle would revolve while the screw remained stationary until the lost motion or spring of the parts was taken up. As the face gear is keyed to the spindle, the relieving attachment stops revolving if one part stops and the screw is thus entirely independent of the relieving attachment.

With this attachment only a single fixed cam is required and this is mounted on a large diameter shaft close to the bearings, an arrangement which insures the rigidity required in a device of this character. The cam is shaped to secure a uniform movement of the tool into the work, while it is quickly withdrawn by a strong spring in front of the headstock at the right of the gear. The tension of this spring can be adjusted by a nut and a washer.

The connection between the connecting rod and the rock shaft facilitates an easy longitudinal movement of the latter even though taps of coarse pitch are being used and heavy cuts are being taken. This arrangement consists of a slotted crank that is integral with an inner sleeve and is driven by an outer bush. The slotted crank is not restrained from a sidewise movement so that the inner sleeve driving the rock shaft by a key has an automatic limited longitudinal movement with reference to the shaft independent of the driving connection. A strong spring returns the inner sleeve to its original position after each cut is taken, and this construction is said to overcome binding or sticking of the rock shaft.

In securing any desired amount of relief with the attachment, the derived motion of the roller bearing against the cam is transmitted

Relieving Attachment Change Gears



No. of Divisions	A	B	C	D
2	24	48	32	48
3	"	"	32	32
4	"	"	40	30
5	"	"	40	24
6	48	24	24	48
7	"	"	28	48
8	"	"	32	48
9	"	"	24	32
10	"	"	40	48
11	"	"	44	48
12	"	"	32	32
13	"	"	26	24
14	"	"	28	24
15	"	"	40	32
16	"	"	32	24
17	"	"	34	24
18	"	"	48	32
19	"	"	38	24
20	"	"	40	24
21	"	"	42	24
22	"	"	44	24
23	"	"	46	24
24	"	"	48	24

Fig. 2.—The Index Plate Furnished with the Attachment Showing the Change Gear Combinations.

through the rocking lever and the connecting rod to the rock shaft, which in turn transmits the movement to the compound rest. At one end the connecting rod is attached to a sliding adjustable block which moves toward and away from the center of the rocking lever and controls the amount of motion transmitted to the rock shaft. This adjustment is regulated by a screw and knurled knob placed within easy reach of the operator so that the amount of relief can be precisely and quickly adjusted within the range of the attachment without stopping the lathe. One end of the rock shaft is carried in a bracket on the carriage, the movement of this shaft being transmitted through a telescopic sleeve and shaft and the knuckle joints to a set of spur gears in the compound rest. An eccentric hub on one side of these spur gears engages the bronze nut in the compound rest through which the top slide screw passes and transmits a rocking motion to the slide. To give the necessary variation in the number of movements per revolution of the spindle a set of change gears and an index plate, Fig. 2, which is simply and easily read are furnished.

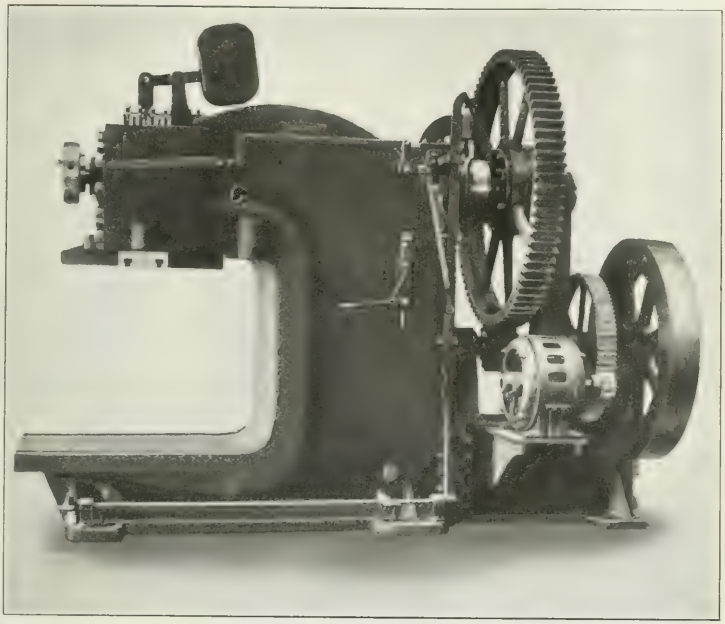
The gear which meshes into the face gear is adjustably fastened to a graduated flange that in turn is held on the shaft by a key and a set screw. In this way it is possible to secure an adjustment between the tool and the work to within 0.001 in. without disconnecting. The carriage of the lathe has full traverse between centers and the movements of the compound rest are always available. When doing ordinary work it is not necessary for the attachment to be removed, since simply locking the small quadrant of the attachment either up or down either disengages or engages it, or slides the driving gear off the shaft. This is not recommended, however, where the lathe is to be used for a considerable length of time for doing regular work, the preferred arrangement being to replace the attachment rest with the regular compound rest at that time. Exposed gears are covered by guards which can be readily removed when necessary.

The United States Geological Survey has published statistics on the recovery of copper, lead, zinc, tin and antimony from scrap metal, sweepings, drosses, etc. This class of metal is called "secondary" to distinguish it from the metal derived from ore, which is known as "primary" metal. The total value of the metal thus recovered in the United States in 1910 is estimated at $45,525,580 against $23,239,610 in 1909. The quantity of copper recovered was 51,000 net tons; brass, 62,000 tons; lead, 55,323 tons; spelter or zinc, including alloys other than brass, 43,932 tons; tin and tin in alloys, 13,903 tons; antimony, 2779 tons.

The Imperial Belting Company, 166-168 West Kinzie street, Chicago, has perfected a belt, in its Sahara brand, which has proved very effective when used for elevating or conveying hot sand or similar material. Some of these belts were placed in service carrying hot sand and other hot material about two years ago, and their present condition shows that the requirements for handling hot material have been satisfactorily met. This is claimed to be a distinct achievement.

New Queen City Punch

A very interesting punch has recently been completed by the Queen City Punch & Shear Company, Cincinnati, Ohio. Aside from the fact that this punch is said to be the first machine ever constructed which is solely adapted for punching and coping Bethlehem I-beams and H-sections, the frame casting is made of a mixture of machinery steel scrap and Northern and Southern iron. The machine was especially designed for the Nolke-Richards Iron Works, Indianapolis, Ind., and was sold by the builder's agent, the Cincinnati Iron & Steel Company.



Machine for Punching and Coping Bethlehem I-Beams and H Sections Built by the Queen City Punch & Shear Company, Cincinnati, Ohio

The machine will punch at one stroke six 1-in. holes through a 1-in. plate. The throat is 62 in. deep and 50 in. wide and has a 25-in. trough housing. Like the punch recently completed for the Quinlan Boiler Company, which was illustrated in *The Iron Age*, June 29, 1911, the clutch is of the manufacturer's patented cast steel, safety stop type. This clutch is engaged and disengaged automatically and is so designed as to provide safety for the operator while the punches and the dies are being adjusted without having the belt thrown off as is commonly the case. A foot treadle which acts through cams and a spring plunger to force the clutch into engagement with the driving gear is used, while, if desired, the clutch can be entirely disengaged by the small hand lever on the top of the frame .

The frame casting weighs over 63,000 lb. and was poured by the Bollman-Wilson Foundry Company, Cincinnati, Ohio. The mixture used was approximately 30 per cent. machinery steel scrap and Southern and Northern No. 2 foundry pig iron in equal proportions. It is claimed that in a piece of this size a stronger and clearing casting can be made by using a mixture in proportions given above instead of using pig iron only.

The American Emery Wheel Works, Providence, R. I., reports that its business, both foreign and domestic, has been extremely good for the past year, its foreign business having been particularly heavy. The company now has agencies in practically all foreign trade centers. It is running its plant full time, and its pay roll for the third week in August was the largest in its 15 years of business.

New Cleveland Four-Piston Air Drills

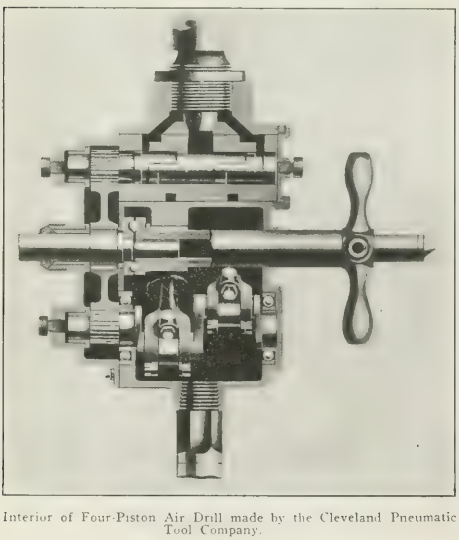
A number of new features are embodied in a new type of four-piston air drills that has recently been brought out by the Cleveland Pneumatic Tool Company, Cleveland, Ohio. The accompanying illustrations show the interior of the machine and an exterior view of one of the lever reverse drills. They are also made with the throttle handle reverse and non-reversible. The most important new feature is the mounting of the crank shaft upon annular ball bearings of the silent type in place of the plain bronze bearings heretofore used in drills of this type. Besides minimizing friction and wear and the heating of bearings.

The ball bearings serve to maintain the driving crank in a fixed position, without lateral motion which is injurious to pinions and large gears. It is claimed that extensive service tests of the ball bearing drill show a gain in power of more than 40 per cent. over the plain bronze bearing machines and a corresponding reduction in maintenance cost.

The valve is of the rotary duplex type, made of hardened steel and ground. It is placed between and equidistant from each vertical set of cylinders. As the valve is gear driven, it supplies air power automatically to each set of cylinders without variation. The top section of the valve controls the upper pair of cylinders and the lower section controls the lower pair. By having a single gear-driven valve controlling all four pistons a number of parts, such as eccentric straps, rocker arms, etc., are eliminated.

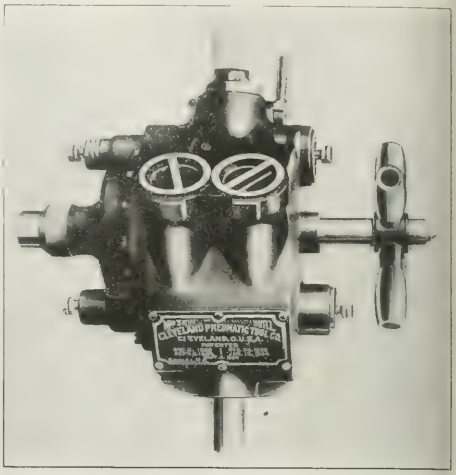
Another feature is in the construction of the pistons, which are secured to the connecting rods by a ball and socket joint, to allow universal motion and adjustment of wear, as well as the ready removal of individual parts. Still another feature is the enclosure of the gears in a chamber separated from the crank chamber by an aluminum shield plate, to protect the gears from accident and permit separate and permanent lubrication.

The machine has four single-acting pistons arranged in pairs, each pair of pistons being connected to opposite wrists of a double crank shaft. The body is a one-piece steel casting provided with hand holes through which



Interior of Four-Piston Air Drill made by the Cleveland Pneumatic Tool Company.

access is had to the crank and connections. The crank shaft is a drop forging, hardened and ground. The connecting rods are drop forged in one piece, minimizing the number of joints and connections. The main gear is also drop forged. The thrust or strain is not borne by the main frame of the machine, but passes directly from the drill bit to the feed screw by means of a spindle bearing in a fixed post mounted on a ball thrust bearing. By removing the feed screw the extractor pin can be inserted to drive out the drill bit or reamer. The spindle bearing is made extra long to protect the spindle and casing from heavy strain when the machine is used in a horizontal position. The handles are placed at opposite sides to balance the machine. One of these is the throttle handle to which the air hose is connected and is designed to regulate the speed. The throttle reverse drill



Cleveland Lever Reverse Air Drill.

is reversed by twisting the handle in either direction. The lever reverse drill is reversed by shifting the hand lever to the right or left.

The No. 30L lever reverse machine, which is shown in an accompanying illustration, has a capacity of 1¼ in. in drilling in steel, 1 in. in tapping and 2½ in. in flue rolling. It has a speed of 260 r.p.m. running light at 80-lb. pressure. The distance from the point of the feed screw to the end of the socket is 13 in., the distance from the center of the spindle to the outside of the casing is 4 in., and the length of the feed is 4 in. It weighs 37 lb. The same general details of construction are followed in the complete line of 40 odd air drills made by the company. These are designed to drive twist drills from ⅜ in. to 3 in.; they have a length of feed 2½ to 4½ in. and range in weight from 15 to 80 lb.

As an addition to its present line of air drills the Cleveland Pneumatic Tool Company has recently brought out a new compound drill designed for heavy drilling and reaming. These are also made with throttle and lever reverse as well as non-reversible. In design and construction the compound drills are similar to the company's line of standard drills, except that they are geared to lower speed to secure a great increase in power, extra gears being provided to reduce the speed. The gear case is constructed so that it fits on the body of the regular standard drill. In the standard machines the speed reduction is 5 or 6 to 1. In the compound machines a further speed reduction of approximately 3 to 1 is obtained. Each type of compound drill is made in two sizes with 1¼ to 2-in. and 2 to 3-in. capacity, and 3½ and 3¾-in. feed. The speeds of the non-reversible compound drills are 110 and 80 r.p.m. when running light with 80-lb. pressure. The speeds of the two sizes of throttle and lever reverse compound drills are 90 r.p.m. for the smaller and 65 r.p.m. for the larger machine.

The American Peat Society will hold its fifth annual meeting at Kalamazoo, Mich, September 21, 22 and 23. The president of this association is Dr. Eugene Haanel, Director of Mines, Ottawa, Canada, and the secretary is Julius Bordollo, Kingsbridge, New York City. A circular issued by the secretary extends a general invitation to the public. A peat fuel plant is to be shown at Kalamazoo in operation, under the direction of an experienced manager. The vicinity of the city will present an object lesson in the cultivation of peat bogs.

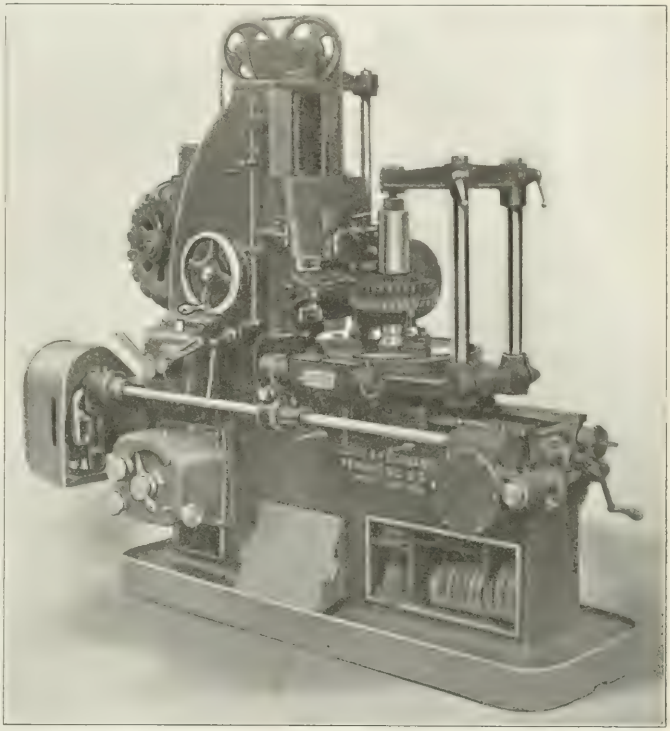
New Gould & Eberhardt Hobbing Attachment

An automatic worm wheel hobbing attachment and constant speed motor drive are two improvements recently made by Gould & Eberhardt, Newark, N. J., in its vertical gear cutter. The machine is designed for cutting spur and bevel gears 24 in. in diameter and having a face width of 8 in. The design of the cutter is such that it is well adapted for the hobbing attachment which in no way interferes with the regular operation of the machine. In the accompanying engraving the machine is shown cutting a steel worm wheel having 36 teeth of ¾-in. circular pitch and a 2½-in. face.

The hob is mounted on the vertical cutting cutter slide which is adjusted so that the center of the cutter arbor is in the line with the center of the blank to be cut, and it is then locked in position. A safety pin has been provided to hold the trip lever for the cutter slide feed and the return clutch in such position that the blanks are prevented from being spoiled by having the feed to the cutter slide or the return clutch engage and move the hob out of position. The direct reading cutter slide feed gear box dial can also be placed at zero, in which position the feed gears are disengaged and this serves as an additional precaution to keep the cutter slide from feeding.

A feed lever and a pawl, which receives its motion from the worm shaft through a worm and a worm wheel automatically care for the feeding of the blank, a cam and dial graduated in thousandths of an inch allowing the amount of feed per revolution of the blank to be changed easily. In this way the blank is fed to the proper tooth depth, and a dial graduated in thousandths of an inch is provided on the table feed screw as well as a scale and a vernier on the side of the machine, which allow the operator to ascertain the exact center distance between the cutter spindle and the work mandrel at any time.

A chart is furnished for the indexing mechanism to gear it according to the number of teeth in the worm wheel in the same way as for spur gears and means are provided for maintaining the proper relation between the hob and the work for the various numbers of revolutions of the cutter per minute. The arrangement of the indexing mechanism which is positive in action allows the work to revolve continuously. When the hobbing attachment is not required the worm on the worm shaft which imparts motion to the feeding mechanism can be easily disengaged. In this way the parts do not become worn by rotating while the machine is being used on spur or bevel gears. Safety precautions in the form of an adjustable guard over the driving pulley and the inclosing of all running gears are provided.



A New Hobbing Attachment for Spur and Bevel Gears Made by Gould & Eberhardt, Newark, N. J.

The Ashland Fire Brick Company, Ashland, Ky., is making extensive improvements, spending about $50,000 on its Ashland plant, practically rebuilding it, and expects then to have one of the most modern and complete plants for the manufacture of high grade fire brick in the United States.

The Production of Graphite in 1910

According to the United States Geological Survey, the production of natural graphite in the United States in 1910 was 35,945 net tons of amorphous graphite, mainly used for fertilizer filler, valued at $81,443, and 5,590,592 lb. (2795 net tons) of crystalline, valued at $295,733.

The production of artificial graphite at Niagara Falls, which had averaged 6,000,000 lb. (3000 net tons) for a number of years, increased to 13,149,100 lb. (6574 net tons) in 1910, being valued at $945,000.

The imports for consumption of graphite into the United States in 1910 came mainly from Ceylon and Mexico, and were nearly the same in quantity and value as in 1909. It is significant to compare the total value of the imports, $1,872,592, with the total value of the domestic product, both natural and artificial, which was $1,322,176. The domestic demand for graphite and graphite products is undoubtedly increasing, and it is encouraging to note that this demand is being met principally by increased domestic production rather than by increased importation. Domestic flake graphite is replacing the Ceylon graphite to some extent in the manufacture of crucibles for the metal industries. There appears to be no reason why this replacement should not increase, for in Germany flake graphite similar to much of the American product has for generations been successfully applied to this use.

The John A. Roebling's Sons Company, Trenton, N. J., states that the item appearing in the daily papers to the effect that its plant has shut down is misleading. The fact is that one of the company's wire rope shops has been temporarily closed. This is due to a slack demand for the sizes of wire rope made in that shop, a stock having been accumulated which is as large as it has been deemed advisable to carry under present conditions. The greater part of the plant is in active operation.

American Rolling Mill Company

New East Side Works at Middletown, Ohio

(With Supplemental Plate.)

Twelve years ago the American Rolling Mill Company began to roll sheets at Middletown, Ohio. At that time a 12-acre tract provided ample land for the mill in which operations were begun, but during the last decade business has been doubled each year. To keep pace with this growth the original building and site have been freely extended. With all of these additions the limitations of the original plant and of the original ideas in accordance with which the business was inaugurated have remained as fixed restrictions. In this present plant, which is known as the Central Works, sheet bars are the only semi-finished material rolled and 10 x 10-in. blooms are the largest size from which the mill is capable of rolling. It became apparent, therefore, that the future requirements of this company could not be met successfully by any continued enlargement of the old mills, but only by the inception of a new plant so planned as to have within it the nucleus and full possibilities for a natural and unhampered expansion. Thus in the growth of one decade the outlook and status of this company have changed from those of the small mill, engaged in light rolling mill practice, to a perspective large enough to embrace a self-contained plant working from the ore through to any and all of the finished products in the full range of sizes.

Proceeding on this broadest possible plan, a tract of land on the outskirts of the town and a comparatively short distance from the old plant was acquired. This site is approximately one mile long in a north and south direction, and about three-fourths of a mile wide. In addition for the possible future handling of iron ore, a strip of land was bought extending from the projected location of the blast furnaces on the plant site to the Ohio River canal which passes through Middletown and connects with Lake Erie at Toledo. In this manner a permanent water frontage was assured. The ground selected is high, commanding a view of the surrounding country, and required a considerable amount of grading to bring it to a uniform level. Building was begun in March, 1910, and the first sheets were rolled August 7 of this year. The general plan adopted and the furnace and mill units now being completed in the present building project are indicated in Fig. 1.

Arrangement and General Equipment of Works

The layout in its essentials is similar to that of the Indiana Steel Company's plant at Gary, modified in keeping with smaller capacity requirements. As distinguished from the Gary plant, however, the future blast-furnace installation will have its axis at right angles to the direction of the parallels in which the rest of the plant is arranged. The progress of the metal will be continuously in a forward direction from the open hearth to the shipping warehouse. The plans were drawn to provide for a free extension of all departments and at the same time to avoid having the distances between the original units so great as to result in a scattering of the plant. The plans were prepared and the erection supervised by A. B. Neumann, consulting engineer, Chicago.

The plant to be completed at this time includes an open-hearth building containing three 65-ton furnaces, with foundations for a fourth, a soaking-pit building, in which are 12 pits and space for an additional four, a 40-in. blooming mill, 24-in. billet and sheet-bar mill, eight 30-in. sheet mills, and two 30-in. jobbing mills. The monthly capacity of the sheet mills is 5000 tons, and of the jobbing mills, 3000 tons. The accessory facilities include conveyor, annealing, storage and warehouse buildings, boiler plant, electric power house, auxiliary machine and blacksmith shops and storehouse.

Output of the Works

The present manufacturing process begins from cold metal and scrap for the open-hearth charge. It continues through the blooming mill, which is so arranged as to make possible the delivery of slabs, billets or sheet bars from the one mill. It terminates with the delivery to the warehouse of plates up to No. 10 gauge, blue annealed and galvanized plain sheets in all gauges and corrugated galvanized sheets for roofing, siding and culvert purposes.

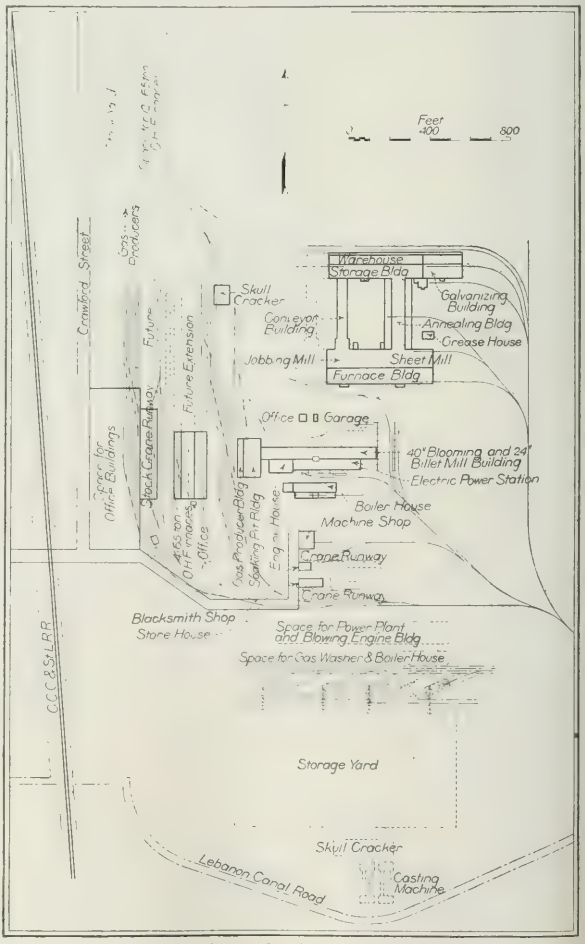


Fig. 1.—East Side Works of the American Rolling Mill Company, Middletown, Ohio.



Fig. 2.—Front of Open Hearth Furnaces, Showing Hydraulically Operated Doors.

In the nomenclature of the American Rolling Mill Company this plant is an "ingot iron" rather than a steel plant. The reasons and occasion for this distinction were given in detail in a paper presented before a meeting of the American Society for Testing Materials, by Dr. A. S. Cushman, and may be found in the July 13, 1911, issue of *The Iron Age*. In brief, the name Ingot Iron is construed as desirable and properly applied to a metal, which, in making, is handled mechanically, the same as mild or soft open-hearth steel, but in contrast is deliberately overoxidized to accomplish a maximum removal of impurities, particularly carbon and manganese. The discussion upon this particular subject can be found elsewhere, its significance here being confined to the point of the unusually high furnace temperatures involved. This high temperature at which the open-hearth furnaces are to be worked required the binding and lining to be specially designed.

Open-Hearth Building

The open-hearth building is 337 ft. 6 in. long, by 166 ft. 3 in. wide. Reference to Fig. 3 will illustrate the type of building and the layout. The building columns are of heavy double I-beam section and the roof trusses are liberally braced and very stiff. In the open-hearth building as in all other parts of the plant, the fabrication of the steel included all holes necessary for carrying the electric wires and cables, none of which were drilled in the field. The structural features include numerous galleries and platforms for crane men and others, the element of safety to employees being carefully considered. One provision of special interest, which has been called the safety platform, is intended as a refuge from flying hot metal for those who work on the pouring platform. As indicated, it is carried on the outside of the building columns, paralleling the pouring platform for a length of 150 ft. On the four bays included in this length the corrugated siding is carried down to the platform floor and the escape exits from the pouring platform to the safety platform are 3 x 7-ft. openings in this siding located in the center of each bay.

The cross-section of the open-hearth building provides a cold metal, scrap and refractories stock floor, 36 ft. 6 in. wide and carrying two standard gauge tracks; a charging floor bay which includes the open-hearth furnaces, 69 ft. 4 in. wide, and a pouring floor 60 ft. 5 in. wide. The charging floor is reached from the plant yard by but one trestle at present, but provision is made for a second when future furnaces are built. The charging floor is 12 ft. 6 in. above the yard level. A standard Morgan Engineering Company's charging machine is installed. As long as cold metal is used no crane will be necessary in this bay, but providing for a time when the plant will include blast furnaces the columns are designed to carry a 75-ton ladle crane with 15-ton auxiliary.

The pouring floor is traversed by two tracks for the handling of ingot molds and supplies, and is spanned by a 125-ton crane with a 25-ton auxiliary with a clearance from floor to runway rail of 38 ft. 11 in. For serving the furnaces, three 10-ton electrically operated jib cranes are hung from every second column. These cranes may be swung by a hand crank operating through a worm and worm-wheel which is arranged to be clamped rigidly to the crane post.

The three furnaces and the foundations for the fourth are spaced along the building at 75-ft. centers. The furnaces rest on a ¾-in. hearth plate, laid on 15 in. I-beams, spaced about 18 in. apart. These are carried on concrete piers which leave the space underneath the furnaces and around the regenerator chambers open and accessible. Around the entrance into each of the slag pockets, a pit has been built which affords ample room for entering and cleaning out. The furnace binding is very heavy and is entirely self-contained. At present the furnace is oil-burning and so the end brickwork around the ports is narrower than for gas burning. The furnaces are designed for the use of gas, however, and I-beam fillers are now used for supporting the end brickwork within the buckstays.

The furnace hearth is 34 ft. long and 14 ft. wide. The arched roof is made of 12 in. of silica brick with

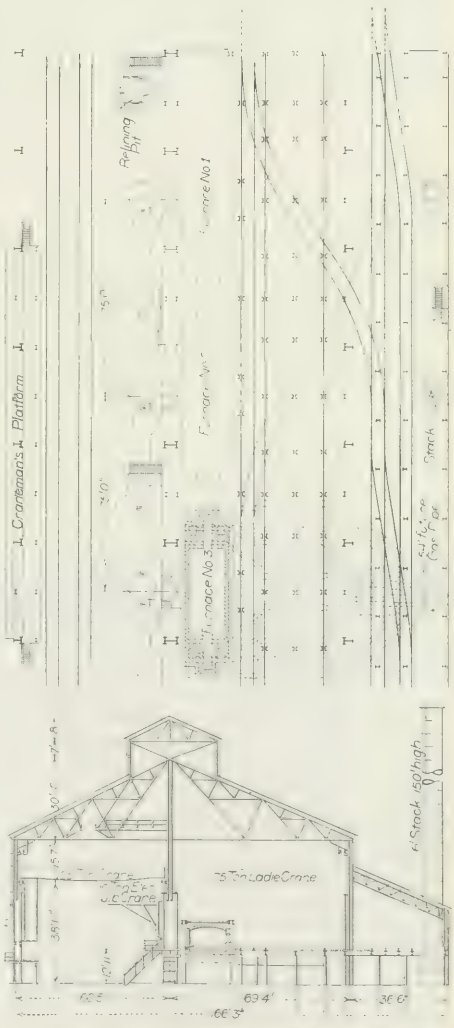


Fig. 3.—Plan and Sectional Elevation of Open Hearth Building.

18-in. side walls. The bottom of the hearth is made of 13 in. of magnesite, which, because of the high temperatures, is made to extend up on the sides with a thickness of 18 in. to the sill line, 3 ft. 5½ in. above the bottom. No neutral joint is used between the magnesite and silica brick. The furnaces are rated at 65 tons. There are three charging doors, 3 ft. 6 in. by 2 ft. 6 in., and one small door at each end. All are hydraulically operated. The regenerator chambers are of standard character providing usual heating and capacity ratios. Only air valves are at present required and they are of the standard Velte type, operated by special hydraulic device designed by the supervising engineer.

The pouring ladles are rated at 80 tons. They are of ordinary design, except in the locating of the tap hole 18 in. from the center of the ladle bottom, which throws it 3 ft. off the furnace center in pouring. This was done as a precaution against the cutting out of the tap hole plugs by the unusually hot ingot iron. Provision is made, however, for a tap hole in the center as ordinarily and conversion would be very simple. The slag ladles and cars were furnished by the Wm. B. Pollock Company, Youngstown, Ohio, and are of the type described in *The Iron Age* of August 17.

The open-hearth plant also includes a small plant for preparing the refractories for the lining. A stock yard for pig metal and scrap is located just west of the open-hearth building. This yard is spanned by a 10-ton crane carried on a self-supporting runway about 450 ft. long and 85 ft. wide. A noteworthy adjunct of this runway is a roof and housing which spans it and is of a length ample to cover the crane. The crane can thus be run under this protection when not in service and so be sheltered from the weather.

Soaking-Pit Building

The ingots are stripped in the soaking-pit building under a 100-ton Morgan Engineering Company's stripping crane. The general arrangement of this building is shown in Fig. 4. It is 192 ft. long with a main bay 84 ft. wide and a side bay in which the gas producers are located 30 ft. wide. In the soaking-pit building and the open-hearth as well, a runway is carried through the trusses for a 10-ton repair trolley. This can be reached by a ladder, railed walk and stairs.

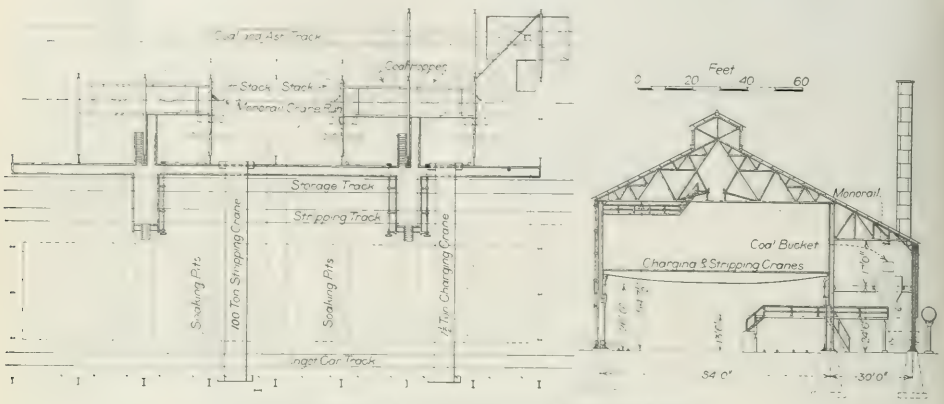


Fig. 4.—Part-Plan and Sectional Elevation of Soaking-Pit Building.

The soaking pits are built up on a solid concrete foundation and are 5 ft. 6 in. x 7 ft. inside, accommodating six 20 x 22-in. ingots. The covers are hydraulically operated. Experience with the flooring around the pits has shown that the ordinary steel plates warp after a time under the change of temperature. In this building the floor plates are of cast iron, 2½ in. thick. The pits are fired with producer gas generated in three Hughes mechanical gas producers built by the Wellman-Seaver-Morgan Company, Cleveland, and located as indicated in Fig. 4.

The air and gas valves controlling the supply to the soaking pits are opened and closed automatically by a

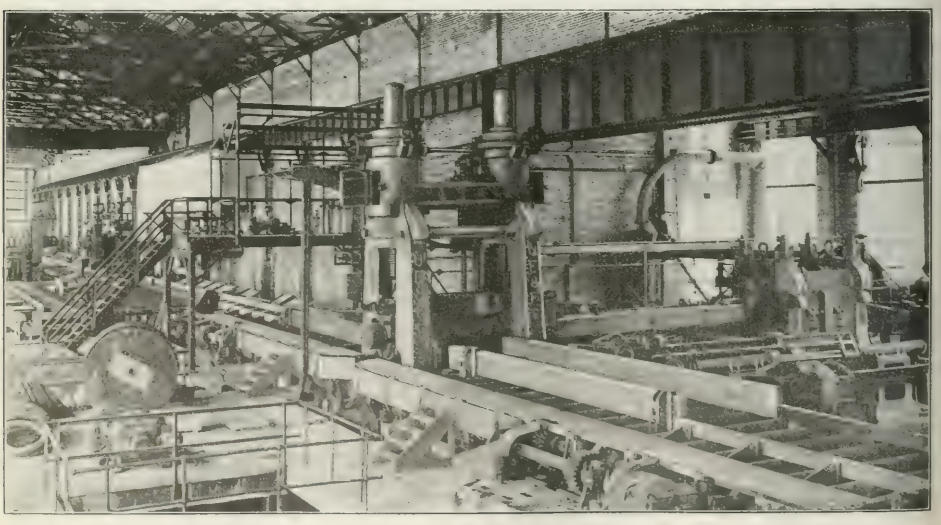


Fig. 5.—Reversing Mill Rolls, Manipulating Tables and Operators' Stand



Fig. 6.—Sheet Mill Stands, Showing Drive in Background.

specially designed alternating device. The gas valves are also of new design, particularly with respect to the external contour for baffling the cooling water. The gas producers are arranged in pairs and are fed from a 30-ton coal hopper over each pair having a spout into each producer. These hoppers are filled from a monorail grab-bucket carrier which traverses the producer bay and is loaded direct from cars on the coal and ash track which parallels the building or from the coal-track hopper, as illustrated, in plan, in Fig. 4.



Fig. 7.—View of the Annealing Furnaces.

The two tracks for the stripping and storage of ingots traverse the building between the producers and the soaking pits and are laid on steel ties set in concrete. Two bridges span the tracks and lead from the producer floor to the top of the soaking pits. The ingots are charged into the pits and loaded on the ingot transfer car by a 7½-ton Morgan charging crane. The ingot transfer car is of the tipping type and is electrically operated along the length of the soaking pits under control from the blooming-mill pulpit.

The Blooming, Billet and Bar Mills

The mill building opens directly off of the soaking pit building into which the mill approach table projects about 6 ft. In contrast to the more common type of mill building where the mill and its drive are housed in a transverse crane-runway bay at right angles to the run of the mill, this building is designed as indicated on the supplemental plate. The mill building proper is 575 ft. long and 60 ft. 6 in. wide. The general arrangement of the 40-in. blooming mill, the 24-in. billet and bar mills, and of the various tables, shears and conveyors, all of which were built by the United Engineering & Foundry Company, are illustrated. The engine drives for the blooming and bar mills and the location of the electric power station are likewise shown.

An analysis of the mill layout will make apparent the unusual flexibility of the mill. Taking an ingot 20 x 22 in. which is as large as good economy in heavy mill practice requires, the blooming mill will deliver 8 x 8 in., or 7½ x 5-in. blooms, the former for conversion into billets and the latter for sheet bars. In addition the mill will permit an arrangement of the rolls to roll down to slabs 34 in. wide or to 4 x 4-in. billets. On occasions when 4 x 4-in. billets are rolled on the bloomer, they may be transferred across from the blooming-mill run-off table to the approach table of a 6 x 35-in. shear from which the billets are run out and kicked off to a billet conveyor. This same table arrangement will serve in event of the mill being used at some future time for rolling heavier plates for handling slabs from the bloomer to a plate mill to be installed at that time.

Ordinarily the blooming mill will deliver blooms of the sizes mentioned above. These pieces will be carried through the 10 x 10-in. shear, (the butts dropping into the butt conveyor beneath) to the approach table of the 24-in. billet and bar mill. This shear is shown on the

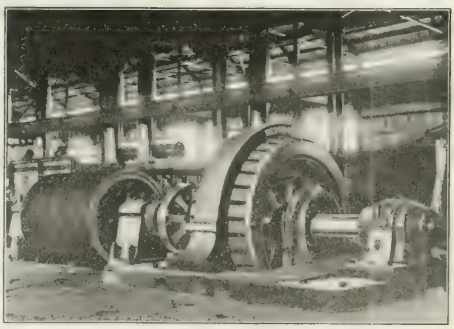


Fig. 8.—Motor for Driving Sheet Mill Roll Train.

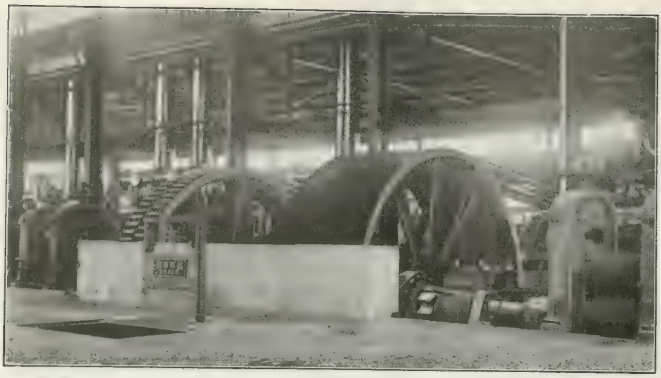


Fig. 9. Front View of Sheet Mill and Rope Drive.

plate opposite the 6 x 35-in. shear. The 8 x 8-in. blooms to be made into billets are given three passes through this stand, following which they are run out and transferred over to a billet shear and bar piler, from which they are picked up by the crane in the yard at the end of the mill building. The large sheet bars for the jobbing mill are run through in the same manner with the proper roll changes. In rolling 8-in. sheet bars the 7½ x 5-in. bloom is given but two passes in the first stand, when it is transferred over and goes through four passes in the second stand followed by one pass in the finishing stand. The run out delivers the sheet bars to the hot-beds from which they are delivered to a bar shear and bar piler, then to the storage yard.

The 40-in. blooming mill is a two-high reversing mill direct driven from a 55 x 60-in. double-reversing Mesta mill engine of 12,000 hp. The mill rolls are 40-in. diameter and 82 in. long. The driving spindle is 20 ft. long with a diameter of 16½ in. over the pole. The top roll has a lift of 34 in. The mill and pin housings, shoes, couplings and boxes are steel castings of very heavy, though not unusual, design. The screwdowns are motor driven. The mill tables are equipped with Wellman-Kennedy manipulators hydraulically operated under a pressure of 500 lb. The table motors throughout are Westinghouse mill-type direct current.

The blooming mill transfer table is of the rope drag and is designed to transfer a bar 70 ft. long and weighing about 8000 lb. The 10 x 10-shear and the 6 x 35-in. shear are motor-driven down-cut pattern, the former equipped with a tilting table, tilted by the motion of the shearing head and a stop gauged to shear up to 14-ft. lengths. The 6 x 35-in. shear is equipped with a tilting drawback table operated by hydraulic power and the shear delivery table is equipped with a motor-driven kick-off which throws the pieces into a conveyor.

The 24-in. combined billet and bar mill consists of three stands of rolls, two of them three high and the third, two high, with passes as outlined above. The first stand is essentially a bill.t mill with two sheet-bar passes, the second stand a sheet-bar mill with four passes, and the third a set of bullheads with a sheet-bar finishing pass. The speed of the 24-in. mill is about 85 r.p.m. The roll housings are of heavy cast-iron construction of the open-top pattern; the pinion housings of the enclosed type. The mill is driven by a 48 x 60-in. Wisconsin Corliss single-cylinder engine of about 2500 hp. The cooling beds are 150 ft. long, built with 60-lb. rails carried on structural posts and equipped with a rope and drum drags having 40-lb. rail buggies. The 54-in sheet-bar shear is motor driven, equipped with a quick adjustable stop and designed to shear five 8-in. bars at one cut. A bar piling cradle is installed in connection with the shear.

The table and mill of both mills are designed to free themselves readily of mill scale, and the table brackets and bearing stands permit access under the rollers for the purpose of removing the ordinary accumulations. The concrete foundations upon which the blooming mill shoes, mill and approach tables rest are designed so that for a considerable distance under the tables and under the full length of the mill shoes, the mill scale is washed down sloping concrete pockets and out into a water-filled scale pit. For easy access from one side of the blooming mill to the other, a concrete tunnel passing under the mill table, has been built.

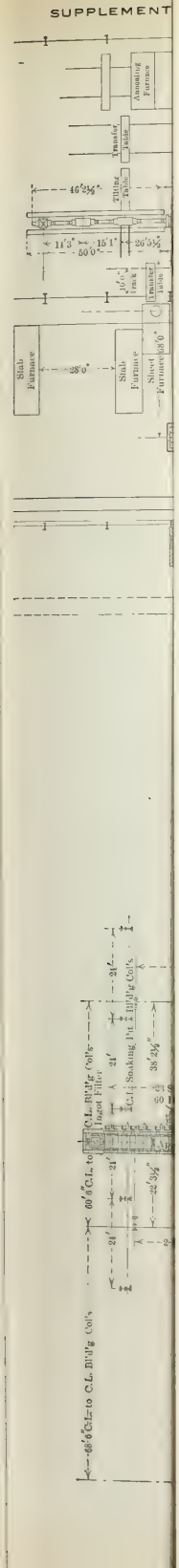
The Finishing Department of the Plant

The finishing department of the plant—that part which includes and is accessory to the 30-in. sheet and jobbing mills occupies a group of five buildings arranged in the form of a hollow square as shown in Fig. 1. The furnace building 535 ft. long and 881 ft. wide, parallels the mill building and is continuous with it, there being no partition along the common column line between the two buildings. The mill building is 92 ft. 4½ in. wide. At right angles to these buildings and connecting them with the storage and warehouse building are the annealing and conveyor buildings, each 340 ft. long. The former is 134 ft. 6 in. wide, and the latter 50 ft. The distance between the parallel center lines of these buildings is 278 ft. 9 in. The storage and warehouse buildings is 469 ft. 6 in. long and 119 ft. wide.

Reference to the general layout, Fig. 1, will show that the trackage layout from the storage yard at the end of the mill building provides for bringing the semi-finished material in on the track that traverses the furnace building at either end of the building. The stock track runs in on the floor in the rear of the furnaces where a clear width of about 45 ft. is available, spanned by a 15-ton crane with a lift of 35 ft. for handling material into the heating furnaces. The arrangement of the eight heating and pair furnaces is shown on the supplementary plate and their relative location with reference to the sheet and jobbing mills. The furnaces are of a special design developed by the American Rolling Mill Company, particularly with a view to rapid heating and



Fig. 10.—Cold Rolls with Slow Motion Device.



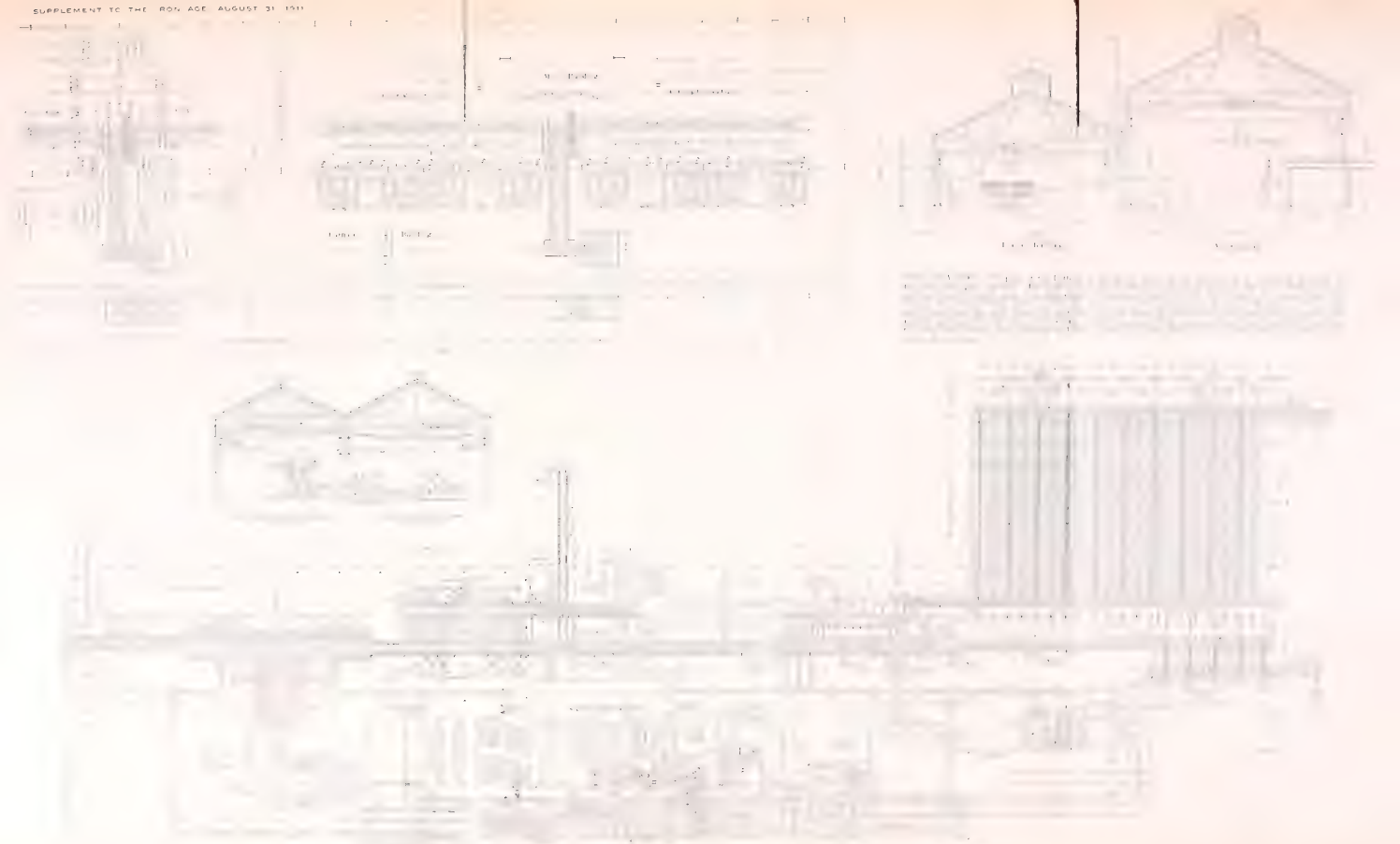
s of a 1500-hp.
with a full-
ugh a flexible
rty 2-in. ropes
orque two and
pe wheel is 24
geared down to
ear to a speed
rope sheave to
is 60 ft. The
-steel castings,
46-in. face, the

ling building a
ational Roll &
of four stands
1 shoes having
necks 17 in. in
driven from a
Westinghouse
shaft on which
d with a gear
the mill. The



ther reduction
supplied con-
-current motor
ted on a cast-
the mill shoes.
as to turn the
ve is arranged
self-contained
ise.

g mill, shown
et mill with a
tands on each
x 62 in. two-
x 72-in. two-
d of two-high,
the drive the
-high finishers,
roughers and
bedplates for
oll necks and
mill in dimen-
of the sheet
26 in. for the
ughing stands.



BLOOMING, BAR, SKELP AND JOBBING MILLS OF THE AMERICAN ROLLING MILL COMPANY, MIDDLETOWN, OHIO

economical handling. One heating and pair furnace is provided for each sheet mill. For the 48 x 44-in. mills the furnaces are 7 x 11 ft. inside and for the other mills 6 x 11 ft. The location of the furnaces in this manner each with individual stacks rising directly through the roof necessitated a special provision for the crane runway on this side of the building. By means of a structural crane work this runway was suspended 10 ft. out from the columns as illustrated in the sectional elevation on the supplement. The furnaces are oil fired.

The 30-in. sheet-mill plant consists of 8 mills arranged as shown in the plate, with four mills on each side of the mill drive. The mills are driven from a leading spindle in the ordinary manner. The mills are arranged with a 48-in. finishing mill immediately at the left of the drive followed by a 48-in. balanced roughing mill, just beyond which is a set of pinions. Beyond the pinions is a set of 38-in. balanced roughing rolls and a set of 38-in. finishing and jump-roughing mills. At the opposite side of the drive beginning with a 44-in. finishing mill, a 44-in. jump-roughing mill, three 38-in. jump-roughing mills and three finishing mills follow in order. This arrangement provides that the balanced-roughing rolls are on each side of the pinions from which both upper and lower rolls are driven while for the remainder of the mills only the lower rolls are driven from the spindle, the upper rolls being rotated by contact. It will also be noted that the mill is laid out with a set of roughing rolls for each finishing stand.

The bed plates for each set of eight mills are 140 ft. long. The spread of the shoes is 7 ft. high, the height 15 in., and the total width 3 ft. 3 in. The weight of the bed plate per foot is 625 lb. The spindles vary in length from 4 ft. 6 in. to 11 ft., the latter having two carriers. The wabblers for the spindles are of the four-pod type, 21 in. outside diameter. All of the spindles and coupling boxes are of annealed-steel castings. The rolls have necks 23 in. in diameter by 18 in. long. Four sets of roughing rolls 38 in. long are chilled-sand rolls; the rest are carbon-specified steel castings. The housings for the mills are steel castings of the I-section type with 15-in. flange and 20-in. webs for the roughing stands and 24-in. webs for the finishing stands. The total weight of the mill with the rolls approximates 2,500,000 lb. The sheet mills were furnished by the National Roll & Foundry Company, Avonmore, Pa.

The rope drive for the sheet mills is centrally located with respect to the mill. The drive consists of a 1500-hp., three-phase, 25-cycle Westinghouse motor with a full-load speed of 210 r.p.m., connected through a flexible coupling to a rope sheave grooved for forty 2-in. ropes. The motor is designed to have a pull-out torque two and a half times the full-load torque. The rope wheel is 24 ft. in diameter, weighs 200,000 lb. and is geared down to the driving shaft through a pinion and gear to a speed of 28½ r.p.m. From the center of the rope sheave to the center of the rope wheel the distance is 60 ft. The pinion and gear are acid open-hearth-steel castings, machine molded in halves, 7½-in. pitch, 46-in. face, the former with 44 teeth and the latter 98.

Between the sheet mills and the annealing building a 24-in. cold mill, Fig. 10, built by the National Roll & Foundry Company, is installed, consisting of four stands of 24 x 48-in. rolls, mounted on cast-iron shoes having an overall length of 90 ft. The rolls have necks 17 in. in diameter and 13½ in. long. The mill is driven from a 250-hp., three-phase, 25-cycle, 220-volt Westinghouse motor. The motor is coupled to a driving shaft on which is mounted a driving pinion which meshed with a gear on a jack-shaft that in turn is coupled to the mill. The gear drive is entirely enclosed. For a further reduction of the mill speed a slow-motion device is supplied consisting of a 20-hp., compound-wound, direct-current motor running at 975 r.p.m. This motor is mounted on a cast-iron-girder base, which can be bolted on the mill shoes. The motor has a gear drive of such ratio as to turn the mill rolls at a speed of ½ r.p.m. The drive is arranged to be located at one end of the mill and is self-contained so that it may be removed when not in use.

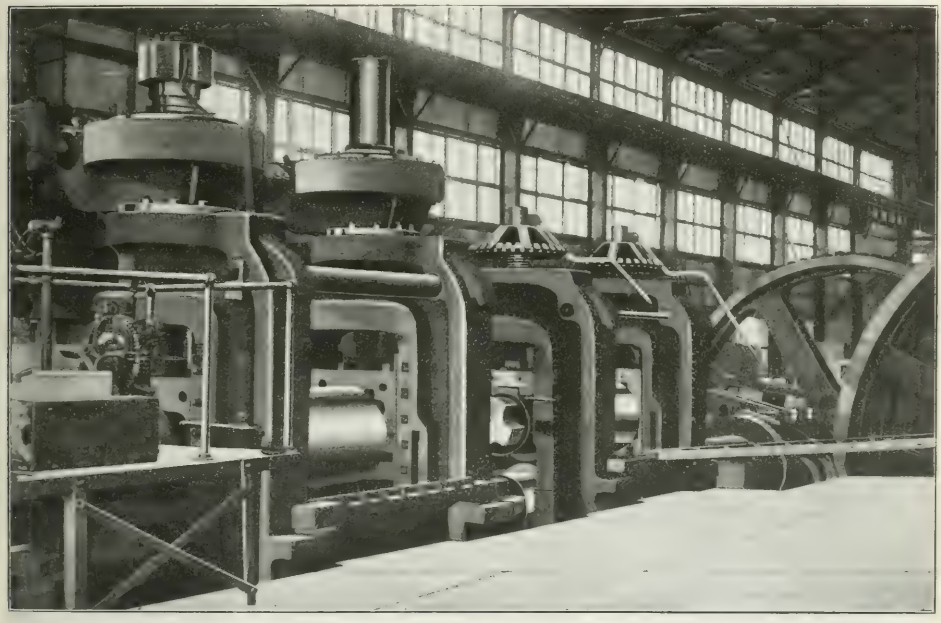


Fig. 11. Jobbing Mill Rolls and Drive.

The general arrangement of the jobbing mill, shown in the plate is similar to that of the sheet mill with a central-rope drive and one mill of two stands on each side. One mill consists of one stand of 30 x 62-in. two-high-jump finishers and one stand of 30 x 72-in. two-high, balanced roughing rolls, and one stand of two-high, 30-in. pinions. On the opposite side of the drive the mill comprises one stand of 30 x 68-in. two-high finishers, one stand of 30 x 72-in. two-high-balanced roughers and one stand of two-high, 30-in. pinions. The bedplates for these mills are each 50 ft. long. The roll necks and couplings are similar to those of the sheet mill in dimensions. The housings also are like those of the sheet mills having posts of I-beam sections, 15 x 26 in. for the finishing stands and 15 x 25 in. for the roughing stands.

The screw-down mechanism on the finishing stands consists of a bevel gear and handwheel equipped with a clutch for throwing one screw out of gear to permit a convenient aligning of the rolls. A motor-driven screw-down is used on the roughing stands with a speed adjustment between the screw and motor and an arrangement to permit of the individual adjustment of the screws by hand. For handling the pieces being rolled in this mill, lifting tables are provided at both sets of roughers and at the finishing mill there is a tilting table on the catcher's side of the mill and a stationary table on the roller's side. The handling is further facilitated by transfer tables. The jobbing mills were built by the Mesta Machine Company, which also furnished the rope drives.

For heating the material for the jobbing mills there are installed two sheet furnaces, one on each side of the drive and four slab furnaces, two on each side. Transfer tables arranged to be operated along 10-ft. gauge tracks are installed for the convenient handling of the steel to the furnaces and also to the four annealing furnaces located in front of the mill.

The rope drive for the jobbing mill is similar in design to the sheet-mill transmission. The driving motor is rated at 1000 hp. with a full load speed of 240 r.p.m. The rope sheaves are grooved for thirty 2-in. ropes and are of relative diameters to give through the driving pinion and gear a spindle speed of 31½ r.p.m. The distance from center to center of the sheaves is 68 ft. The motors for both drives were furnished by the Westinghouse Electric & Mfg. Company. The motors are enclosed in a housing, while the transformers and switchboards are located in small buildings outside of the furnace building, the wiring being carried in underground conduits. The mill building, also, is spanned by a 40-ton Morgan crane with a 15-ton auxiliary, which added to the floor-handling facilities afford a convenience and flexibility of movement that is expected to expedite greatly the mill operations.

The conveyor building, Fig. 12, through which the mill output is carried to the storage building is directly opposite the jobbing mill and its annealing furnaces. The conveyor building has a clearance of but 10 ft. under the bottom chord of the roof trusses and simply serves to house the two structural-frame, motor-driven, roller-table conveyors, one along each wall. At a distance of 20 ft. from the mill end, roller straighteners are inserted in each conveyor.

At the storage building end the conveyors extend out under the 40-ton crane which traverses that building, thus affording a very convenient means of delivery for the mill output. A third shipping spur enters the storage building at the end near the conveyors so that heavy material can be loaded directly into cars at that point instead of passing through the warehouse in the usual way. At the end of one of the conveyors there is installed a splitting and guillotine-type shear furnished by the Wheeling Mold & Foundry Company, and used for trimming the sheets and shearing scrap.

Annealing, Galvanized and Storage

The annealing building connects the mill and storage buildings at a point opposite the sheet mills. This building is designed with a center bay 65 ft. wide and spanned by a 40-ton crane and two side bays each 35 ft. wide in which the annealing furnaces are located. There are five oil-burning furnaces on each side with space remaining for the installation of an additional four. The furnaces are 19 ft. 3 in. x 21 ft. 3 in. over all and are arranged to receive the sheets for annealing on trucks rolling on wide-gauge tracks that extend into the center bay under the crane. The crane runway in the annealing building extends 24 ft. into the mill building at one end and the same distance into the storage building at the other end and at a height which allows the cranes in these latter buildings to pass directly over the annealing building crane. In this way the crane loads can be transferred directly.



Fig. 12.—Jobbing Mill Conveyor Building.

The galvanizing department occupies the enst end of the storage building and in addition to the 40-ton crane which operates the entire length of the building is traversed by a 10-ton crane mounted on a runway under that of the larger crane and extending from the east end of the building to the annealing building crane runway.

This additional seven-pot department will be automatically operated to the greatest extent possible. With the exception of the cars of the industrial railway system connecting the pickling house with the galvanizing house, no trucks will be used. The annealed sheets are delivered into the annealing building by the crane on false bottoms so that the sheets are handled as box units by the cranes until required for galvanizing. From the floor where these units are placed alongside of the industrial track, the sheets, stripped off, are placed on edge in the pickling cradles which are carried on the cars. The cars will then run by gravity to the pickling house. The

pickler located in the center of the pickling house is a four-arm, high-type, steam-operated, Mesta machine. The center of the track is tangent to the arc in which the end to the pickler arms swing and the cradles filled with sheets can be lifted directly from cars. The rotation of the arm which carries the cradle filled with black sheets over the pickling tank, simultaneously loads the cradle full of pickled sheets out of the now empty car.

The return track to the galvanizing house is also a gravity track, and, in crossing the galvanizing building, runs alongside of six large storage tanks in which a reserved supply of pickled sheets may be accumulated. The galvanizing pots are located centrally in the building and the sheets are placed in the tanks at each pot from the crane by means of a special device developed to eliminate hand labor with a resultant saving in the actual running time of the galvanizing machine of about 5 per cent.

The galvanizing machines are driven by individual 15-hp., alternating-current, Westinghouse motors. Power is transmitted through the highest-range, variable Reeves drive, the galvanizing machine being driven from the variable shaft and the leveler from the constant shaft. These drives are equipped with an especially designed indicator for controlling and regulating the speed changes. After being carried through the galvanizing pots by the machine the sheets are conveyed on chain conveyors to a heavy-type leveler furnished by the United Engineering & Foundry Company. This leveler delivers the sheets on to a table where they are inspected and cooled. With the present equipment it will be possible to pickle a sheet of any gauge up to a maximum size of 56 in. x 14 ft. for special black finish and blue stock. The galvanizing machines and equipment will permit handling specifications covering material from No. 10 to No. 30 gauge inclusive, in widths up to 48 in. and lengths from 66 in. to 14 ft.

The ventilating arrangement in the pickling room is of particular interest and importance. Instead of having the gases and vapors from the tanks drawn off from the upper part of the room, thus causing a contamination of the atmosphere in which the operators work, the working floor is built of an open grating through which the gases are pulled down and out into a flue by a 48-in. fan located in the flue opening.

In the storage and warehouse buildings the construction has been of a character intended to protect to the greatest degree possible the highly finished steel stored therein, and a splendid steel-frame brick building is the result. The floor of the storage building is paved with paving brick and the floor of the warehouse bay is made of asphalt blocks laid on a bedding of 8 in. of concrete. In this bay the material is handled at present on an industrial railway system, but the building columns are arranged for the future installation of a 10-ton crane runway. A covered loading platform extends the length of the building from which material can be loaded directly into cars on the parallel loading track without exposure of the sheets to the weather.

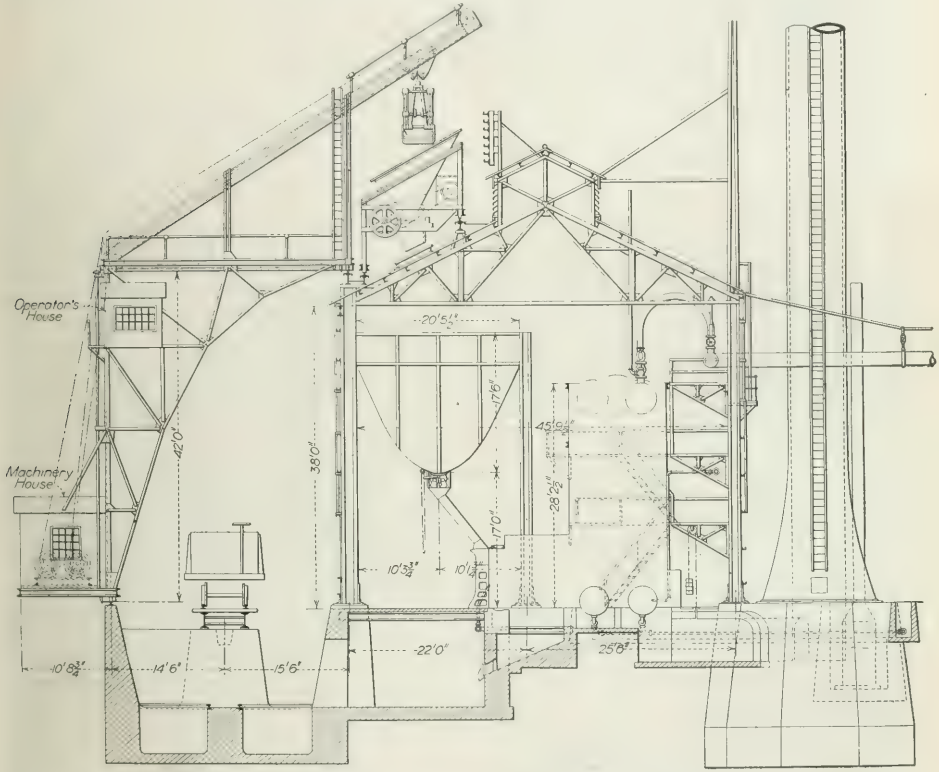


Fig. 13.—Section of Boiler House Showing Coal-Handling Gantry Crane.

The Power Plant

The electric power station is a Westinghouse installation throughout. The power building is an extension of the blooming-mill-engine building along the common-mill-building wall, as shown in the supplemental plate, and contains in addition to the generating station, the billet-mill engine and the mill-hydraulic pumps. It is 335 ft. long and 52 ft. wide and is served by a 40-ton Morgan crane. The pumps and condensing machinery are on the ground or mill-floor level; the generating units on a raised floor directly above. Electric power is developed by Westinghouse-Parsons turbo-generators of both high and low-pressure types. At present there are installed two 1500-kw., low-pressure sets, each developing three-phase, 25-cycle current at 2200 volts and one high-pressure set of the same capacity and rating. Provision is made for the installation of one additional low and one high-pressure set. The blooming-mill and billet-mill engines, which are run non-condensing, supply the steam for the low-pressure turbines through two 34-ton Sorge regenerators. The high-pressure steam is carried over



Fig. 14.—Corrosion Testing in Research Laboratory.

direct from the boilers. The steam lines are connected up so that the pressure of the exhaust steam may be augmented when necessary by live steam. The turbines are run condensing, the low pressure with No. 17 LeBlanc and the high pressure with No. 14 LeBlanc condensers. The regenerators and the hot and cold wells are located just outside of the power building.

Six stationary induction transformers step down the current from the generated voltage to 240 volts for plant use and six additional sets transform to 120 volts. For the table and crane-motor service the 120-volt, three-phase current is converted to 250-volt, direct current, through a 750-kw. Westinghouse rotary converter. The centrally located switchboard commands the generating-station floor. In addition to the station-control panels, the switchboards include a separate panel for each department of the mill, carrying a current-consumption-recording meter. From these readings the charges for current are made against the various departments. The leads for the plant distribution of current are carried directly up from the switchboards to the main-distributing tower. This tower is a structural-steel framework ingeniously built up from the mill and power-building-roof trusses.

Condensing and service water is obtained from a pumping station at the river a distance of 6000 ft. from the generating station. The pumping station pit is housed over with a brick building 20 x 49 ft. Two 20-in. Worthington volute pumps with a capacity of 18,000,000 gal., direct driven by 350-hp. three-phase motors at 450 r.p.m., are installed. The pit in which the pumps are placed is built of concrete, the forms for which were built around a ¼-in. reinforced steel-plate tank, 42 ft. long, 20 ft. wide and about 25 ft. deep. The tank is thus imbedded in the concrete walls and floor of the pit. The center line of the pumps is 5 ft. above low-water line, 10 ft. 8½ in. above the foot valve and 39 ft. below the mill-yard level. The foot valve and suction are 24 in. in diameter and the pump discharge is 20 in. Water is admitted from the river through a 7-ft. tunnel, passing a screen gate of ¼-in. mesh into the forebay from the bottom of which water is pumped through the foot valve.

Considerable attention has been paid to the design of the boiler house to the end that labor around the boilers be eliminated to the greatest extent possible. A cross section drawing of the boiler plant is shown in Fig. 13. The installation consists of ten stoker-feed, vertical, Rust boilers, spaced 12 ft. 11 in. between centers, each of 500 hp., affording an aggregate of 5000 hp. The building is of steel construction and the five 165-ft. stacks, one for each pair of boilers, are of self-supporting, steelplate type. The boilers are mounted on concrete footings with openings between so that the bottom drums and blow-off connections are readily accessible. Around the boilers platforms are built leading to all points where it is necessary for a man to go for cleaning the boilers or observing readings.

The boiler-house building is 47 ft. 6 in. wide and 266 ft. long. The clearance under the bottom chord of the roof trusses above the floor line is 38 ft. The location of the boiler plant in relation to the other buildings may be noted from the general plan, Fig. 1. The coal-handling arrangement provides for switching cars in on tracks at ground level over two concrete coal pockets, each 27 ft. wide, 12 ft. deep and having a combined length of 177 ft. These are immediately outside of the boiler house and have a total capacity of 1500 tons. Rails of 60-lb. section in 30-ft. lengths are imbedded in the bottom of the pockets. These pockets are spanned by an electrically operated gantry crane, carrying a 40-cu.-ft. grab bucket, which may be dropped into the coal pockets, raised and carried on an incline runway to the position indicated in Fig. 13, where the coal is discharged into a traveling scale hopper which operates along the roof of the boiler house. This hopper discharges through an opening in the roof into a steel parabolic type bin, having a capacity of 6 tons per lineal foot and extending the length of the building in front of the boilers. Through a foot valve and spout the coal is discharged into the several Roney stokers.

The ash from the grate drops off the bank end, down into a concrete, sloping pit, from which the ash is discharged into buggies. It is then carried to two ash pits, 9 x 13 ft. and 13 ft. deep, located centrally between the two coal pockets. The gantry grab bucket lifts them out into cars. The side of the building in front of the boilers for a height of 12 ft. is open between the columns, and the floor in front of the stokers for a width of nearly 15 ft. is entirely clear, giving to the plant an aspect of freedom and noteworthy cleanliness. At the west end of the boiler house is located a water-softening plant in which the Hoppes' system is employed.

At the end of the 66-ft. road, which will be the main entrance to the plant, are located a machine shop, blacksmith shop and store house. The machine shop is a substantial steel-frame brick building 82 ft. long and 90 ft. wide, carrying a 25-ton Niles-Bement-Pond crane. The equipment, while not extensive, includes heavy lathes, drills and a large boring mill, together with sufficient small tools to cover the general range of mill repair work. The blacksmith shop is 42 x 60 ft. in size and is equipped with heating furnaces, forges and a high-speed, steam-hydraulic-forging press. The store house is a two-story building in which miscellaneous small parts of all kinds are carried on the first floor, and electrical equipment, fixtures, etc., on the second floor. The store house is to be paralled by a 10-ton yard crane, which spans the stock and storage yard. The store-house system provides for the charging of all material into the store house and from the store house out to the various departments of the mill.

The entrance for the workmen is now located on the north line of the improved section of the property, at a point due north from the open-hearth building. An attractive brick structure has been erected and arranged for the accommodation of the labor-department offices, with an ante-room in which applicants for employment can wait. The building is so arranged that the only entrance for employees is directly in front of the gate-watchman's office where also a timeclerk and paymaster can be located. The watchman's office commands a view of a large part of the mill yard. Immediately opposite this building an extensively equipped mill hospital is to be erected, with an ambulance station to provide immediate and continuous service for the mill.



Fig. 15.—Physical Laboratory in Research Department Building.

The Research Laboratory

As a foundation for the development of the special qualities embodied in the product of these mills, the company has built and equipped a research laboratory of unusual excellence. This is not a mill laboratory but distinctly intended for experimental research and investigation. The effort of this company is directed toward the production of steels to meet special requirements and the laboratory equipment is designed to cover the development of improved properties in the steel for use in electrical, chemical and physical fields of service. The accompanying illustrations, Figs. 14, 15 and 16, clearly indicate the "precise" character of the



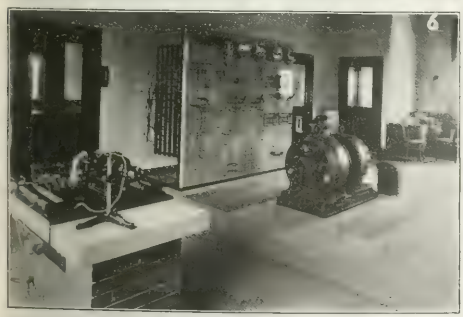
The metallurgical section of the laboratory occupies the entire second floor and is divided into a number of rooms including a distilling room, main chemical laboratory, balance room and microscopical room, a private research laboratory, a supply room and an office. In the basement a room is set apart for corrosion tests, and in addition to shelves on which jars are placed containing immersed specimens covering a wide variety of tests, an apparatus is set up as indicated in Fig. 14. This is a rotating shaft carrying radiating arms from which are suspended a number of sample sheets of steel, which, as the shaft intermittently revolves, are submerged in a trough and again removed to be exposed to













1.—Exterior of Building. 2.—Sheet Metal Testing Room. 3.—Standards Room. 4.—Main Chemical Laboratory. 5.—Private Research Laboratory. 6.—Main Electrical Laboratory. 7.—Microscopical Room.

FIG. 16.—VIEWS IN RESEARCH LABORATORY, AMERICAN ROLLING MILL COMPANY.

instruments installed and the provision for nicety of experiment which has been carried to the greatest possible degree. The greater portion of the first floor of the building is devoted to investigations of an electrical character, including the testing of instruments and magnetic tests upon the steel, to establish the characteristics of the metals. atmospheric action. Tests with this device are conducted for a long period and with different solutions and actual conditions are approximated almost exactly. The department for physical tests, Fig. 15, is equipped, among other things, with a 100,000-lb. Riehle testing machine and a Landgraf-Turner alternating impact machine.

The Rolling of Automobile Rims

About 15,000 Tons of Steel So Used in 1910

The very rapid growth of a Cleveland, Ohio, electric welding company, the addition to whose rim manufacturing plant was recently described, calls attention to the extent of the automobile rim manufacturing industry and to the value attaching to these rims among the rolled steel products. It has only been in the course of development that the automobile factories have come to be manufacturing plants as distinguished from assembling shops, but even now scarcely an automobile company manufactures or controls the making of wheels, rims or tires. While one or two of the automobile wheel making concerns, such as the Kelsey Wheel Company at Detroit, and W. K. Prudden & Co. at Lansing, Mich., have undertaken the manufacture of rims, the development of steel rims has largely been through the rubber tire interests. The making of rubber tires has little in common with the manufacture of steel rims, and it came about that the actual manufacture of the steel rims was let out by contract. The Standard Welding Company at Cleveland was one of the first to engage in this work under such an arrangement, and at the present time this company manufactures all of the rims for the United Rim Company, through which the sale of rims is handled for the United States Tire Company, the B. F. Goodrich Company, the Diamond Rubber Company and the Goodyear Tire & Rubber Company. Within a year the Firestone Tire & Rubber Company has built a large plant exclusively devoted to the manufacture of its own rims. At Cleveland the Booth Rim Company, a $200,000 corporation, has built a $100,000 plant for the manufacture of automobile rims only, and these of a particular type. Several other rim companies are also in existence promoting the sale of special types.

The earlier forms of rims were of comparatively simple shape. For solid tires the ordinary channel was of cross section generally similar to the structural channel, while for pneumatic tires a rim with a simple rolled clinch was used. The general uniformity of section and its simplicity made this business desirable from the rolling mill standpoint, despite the comparatively small tonnage. The prohibitive cost of machining has confined the form taken by most types of rims to rolled shapes and drop-forged fastenings. The demand for greater convenience in changing tires has resulted in the development of quick-detachable and quick-detachable demountable rims. These new designs have increased the weight of the rims, and, together with the great increase in the number required to supply the growing demands of the industry, have even more rapidly augmented the steel tonnage involved. The cost per pound, on the other hand, increased greatly, for the newer types of rims comprised more parts and introduced new shapes and small sections. These sections are required to be rolled accurately as to gauge, inasmuch as the great danger of tires being thrown off the wheel while a car is in motion, necessitates the rims being rolled to exact sizes insuring a perfect fit. The further limitations with reference to weight and the necessity for using a fairly high carbon steel to preserve stiffness contributed to a higher cost. Facing the problem of frequent roll changes and the necessity for carrying many different kinds of rolls, the mills were slow to cooperate. As a result the rim manufacturers found it necessary to buy the rolls themselves on an arrangement with the mills whereby the cost of the rolls was refunded after the rolling of a certain minimum tonnage. One rim company has about $40,000 invested in rolls alone.

The rim steel is furnished by the mills to the rim manufacturer only in straight lengths. At the rim plants these pieces are cold rolled into circles. In addition to these rolls the rim plant must include electric welders, sizing and tire-setting machines and a Sherardizing plant, beside being a complete machine shop.

It is estimated that 200,000 pleasure cars and about 10,000 commercial vehicles were manufactured in 1910. The rims for these cars would vary in weight from 100 to 200 lb. per car. Assuming a reasonable average weight, an approximate estimate would place the weight of steel used for this purpose at 15,000 tons. The manufacturing cost of the rims made from this steel would approximate $2,500,000 and their value at the prices at which they passed into the hands of the automobile owner would be but little less than $5,000,000. As compared with other forms of rolled steel it is therefore interesting to know that for the more recent types of automobile rims, of which the proportion is rapidly increasing, the automobile-owning public is paying something over 30 cents per pound.

Heavy 15-Inch Engine Lathe

A Recent Product of Greaves, Klusman & Co.

A new addition to the line of lathes built by Greaves, Klusman & Co., Cook and Alfred streets, Cincinnati, Ohio, has been made in the shape of a heavy quick change 15-in. engine lathe. This new tool in common with the regular 15-in. engine lathe which was illustrated in *The Iron Age*, October 27, 1910, is adapted for all classes of work met with in manufacturing and repair shops and in tool rooms. It is also characterized by possessing ample power for heavy reduction work while at the same time it is quick and convenient in operating on lighter classes of pieces. Fig. 1 is a front view of the new tool, while an end view showing the gears with the guards removed is given in Fig. 2.

In the construction of the bed a very wide and deep box has been secured in which the twisting strains on the Vs are taken care of by heavy reinforcements. These extend the full length of the bed and also below the top of the girts. The side walls above the top of the girts are three times as thick as below. The carriage which is of extra heavy construction has full length bearings on eac V and a wide flat one inside the front V, an arrangemer which not only shortens the bridge of the carriage bu also provides a substantial support directly under th

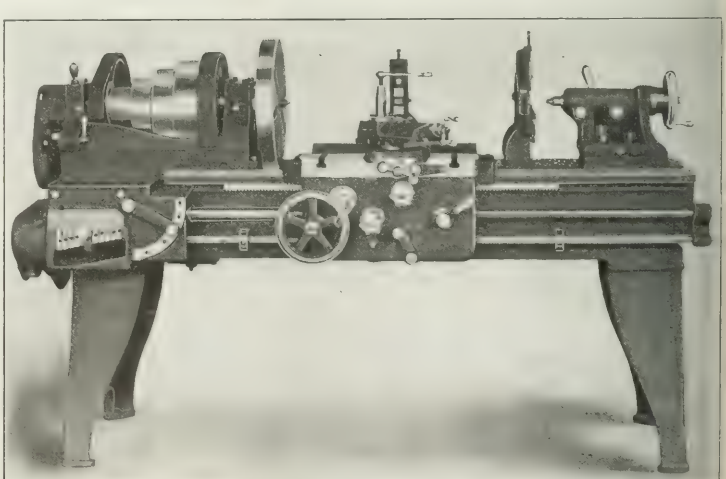


Fig. 1.—The New Heavy Quick Change 15-in. Engine Lathe with 6-ft. Bed Built by Greaves, Klusman & Co., Cincinnati, Ohio.

tool rest. A compound clamp which is conveniently operated locks the carriage, the bridge of which is exceptionally wide and deep. The construction of the double plate box-type apron is very rigid. Bearings at each end are provided for the studs. The gears are of ample proportions and are cut from solid steel. The teeth are of coarse pitch and the strength is equal to the driving power of the lathe. The studs upon which these gears run are hardened and ground. Frictions operate the longitudinal and cross feeds which are reversed by the lever shown at the front of the apron and the feed rod and the lead screw cannot be engaged at the same time. The feed rod is supported at each end of the apron, thus maintaining alignment and relieving the bearings of all strain due to the sagging of the feed rod when the carriage is at either end of the bed. The compound rest is securely held at any angle by four locking bolts and is very substantial in its construction. The cross feed and top slides have taper

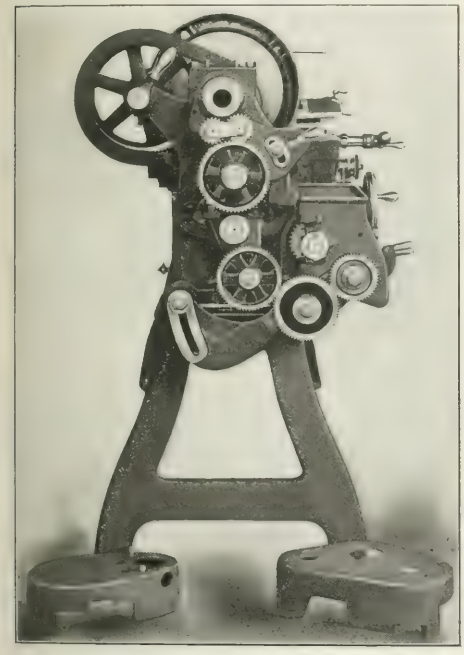


Fig. 2.—End View Showing Gears with Guards Removed.

gibs, and micrometer dials are fitted on the feed screws for these two parts.

Massive construction characterizes the headstock which is webbed throughout its entire length. The overhang of the tool when turning large diameters has been eliminated as far as possible by placing the center line of both the head and the tailstock back of the center line of the bed, an arrangement which permits a deep web between the headstock housings and a large diameter cone pulley, as shown in Fig. 2, and possesses ample driving power. High-carbon steel is used for the headstock spindle, which is accurately ground and runs in self-oiling phosphor bronze bearings of large dimensions. The design of the tailstock is such that a spindle one-third longer than those ordinarily employed is used. This telescopes through a thimble at the rear with a full length bearing in the barrel at the forward limit of its travel. Double plug clamps at both ends of the barrel grip the spindle and make it much more rigid than is the case with the ordinary tailstock. This double clamping device is operated by a single handle. If desired the compound rest can be set at an angle of 90 deg. when turning small diameter work, an arrangement which is made possible by the special shape of the tailstock. Three locking bolts secure the tailstock to the bed and set over screws and a graduated index are provided for taper work.

The lathe is fitted with a chasing dial for thread cutting which permits the thread to be caught at any point without reversing the lead screw. In this way both countershaft pulleys can run forward continuously, thus providing a wide range of speeds. All threads from 2 to 56, including an 11½ pipe thread, can be cut.

The following table gives the principal dimensions and specifications of the lathe:

Swing over bed, in.	16⅛
Swing over carriage, in.	11¼
Distance between centers, in.	36
Diameter of front spindle bearing, in.	2 13/16
Length of front spindle bearing, in.	4½
Diameter of rear spindle bearing, in.	2 5/16
Length of rear spindle bearing, in.	3¾
Diameter of hole through spindle, in.	1 7/16
Number of cone pulley steps	4
Diameter of smallest cone pulley step, in.	4⅛
Diameter of largest cone pulley step, in.	10½
Face width of cone pulley steps, in.	2⅞
Width of driving belt, in.	2¾
Back gear ratio	12¼ to 1
Minimum spindle speed, r.p.m.	5
Maximum spindle speed, r.p.m.	475
Diameter of spindle nose, in.	2⅛
Length of spindle nose, in.	2
U. S. standard threads on spindle nose, per in.	6
Morse taper of center	No. 4
Diameter of tailstock spindle, in.	1 13/16
Length of tailstock spindle, in.	13¼
Traverse of tailstock spindle, in.	6½
Minimum number of threads cut, per inch	2
Maximum number of threads cut, per inch	56
Minimum feed per revolution of spindle, in.	0.00595
Maximum feed per revolution of spindle, in.	0.16667
Length of carriage, in.	24⅝
Width of carriage bridge, in	6½
Travel of compound rest, in.	4
Diameter of countershaft pulleys, in.	12
Width of belt, in	3½
Minimum countershaft speed, r.p.m.	130
Maximum countershaft speed, r.p.m.	170
Size of tools taken, in.	⅞ × 1¼
Weight of machine on skids, lb.	2,200
Weight of machine boxed, lb.	2,600
Contents of case, cu. ft.	80

The regular equipment furnished with the lathe includes compound, steady and follow rests; large and small face plates, a set of change gears, a countershaft with two self-oiling pulleys and hangers with ring self-oilers and wrenches. A plain rest can be substituted for the compound one if desired without additional cost. Other accessories which can be furnished with a slight additional cost include a taper attachment, a turret on the carriage or shears, an oil pan bed, oil pump and tubing and a draw-in collet attachment.

John W. Gates left an estate valued at between $30,000,000 and $40,000,000, according to ex-Justice Henry A. Gildersleeve. It includes stocks in the United States Realty Company, Texas Company, Republic Iron & Steel Company and other companies which he had promoted. Mr. Gates was also a heavy holder of United States Steel preferred. He had a large block of bonds of a Texas railroad, beside some Government bonds. The estate will be divided between his widow and his son, Charles G. Gates, but a number of bequests to relatives, friends and institutions were made, amounting to about $700,000.

The Burke Electric Company, Erie, Pa., has installed machinery and put in operation an extension to its plant 75 x 400 ft. The equipment includes a crane runway the length of the building, and two 50-ton cranes with 35-ft. lifts. At present the building is being used for light work, but it is the purpose of the company eventually to make this the machine shop for heavy castings. It practically doubles the capacity of the plant, which had been augmented earlier in the year by eliminating the power plant and utilizing the space in the old works to increase the capacity of the machine shop and transformer departments. Power is purchased and individual motors are being installed to operate the machine tools. Last week the company awarded contracts for a duplicate of the latest extension, which will, of course, further increase the capacity of the machine shop.

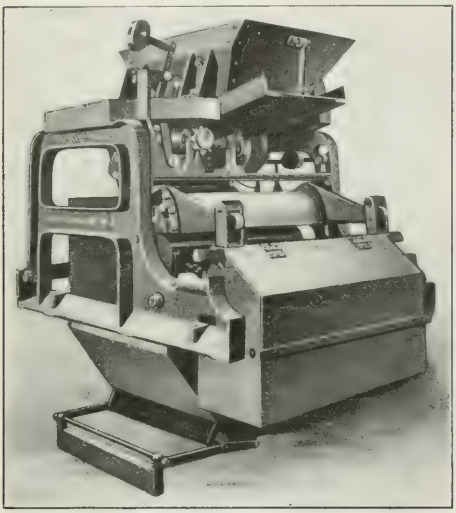
The Steel Car Forge Company, Frick Building, Pittsburgh, Pa., with works at Ellwood City, Pa., Butler, Pa., and Hammond, Ind., is making a specialty of designing forgings to take the place of castings, where it is found that a casting will not give satisfactory service. This has been successfully done in a number of instances, and the company's engineers are willing to give their services to manufacturers who may find it desirable to substitute a forging for a casting.

Avery Automatic Scale

A Coal Weighing Machine with a Patented Feeding Device

For weighing the coal supplied to the different units in a boiler house automatically the Avery Scale Company, Milwaukee, Wis., has developed a scale which is designed to be installed beneath the coal bunker and weigh the coal as it passes by gravity from the bunker to the mechanical stoker. The special features of the machine are ability to handle all grades of coal used in this country, the use of a patented feeding device and the employment of an even arm beam in its construction.

It is claimed for this scale that it will handle soft coal having a large percentage of moisture equally as well as the dryest anthracite or any of the intermediate grades. The feeding device is in the form of an oscillated tray moved forward and back by a crank. In this way it is possible for the feeding device to clear itself automatically by the shaking action which delivers the coal to the desired point. The operation of the feeding device is controlled by a clutch which is actuated by the motion of the weigh beam. This arrangement makes it impossible for coal to be delivered to the weigh hopper while the latter is discharging. In addition it is also possible for the scale to deliver coal to the spouts feeding the automatic stoker until the former are filled, when it will cease working until sufficient fuel has been removed to clear the scale outlet.



An Automatic Scale for Weighing Coal in Boiler Houses Built by the Avery Scale Company, Milwaukee, Wis.

The even arm beam employed in this scale is double-sided and has six knife edges arranged in pairs at the center and each end. The central pair forms the fulcrum of the beam and is supported by steel bearings, which in turn are attached to the main frames of the scale. The weigh hopper having a bottom discharge is suspended from one end of the beam while a weight box in which standard scale weights are placed is hung from the other. These two parts of the scale are suspended from the knife edges of the weigh beam by steel bearings of the same section as those placed under the beam fulcrum. When the box and the hopper are empty they are exactly balanced so that no compensation for the weight of the beam is necessary in placing the weights in the weight box. In this way when the coal in the weigh hopper balances the weights in the weight box an equal weight is assured without having to check it on another scale. In addition to the beam, the weight box and the weigh hopper there are the other necessary mechanisms for feeding the coal to the weigh hopper and discharging it after the desired amount has been weighed. The weigh beam controls both of these mechanisms although none of the parts are directly connected to the beam, which leaves the latter free to do its work at the proper time.

In operation the placing of weights in the weight box has a tendency to cause that end of the beam to descend, but a projection on the inlet mechanism restrains it. This contact imparts an upward pressure to this projection which is counteracted by an ordinary type of toggle joint. To start the machine it is simply necessary to break the toggle which enables the weights in the weight box to exert an upward pressure and start the inlet mechanism. This causes coal to pass to the weigh hopper, but before the desired amount has been passed the weight of the inlet mechanism is removed from the weigh beam and supported by a trigger. When the desired amount is in the weigh hopper that end of the beam descends and in its movement pulls aside the trigger supporting the inlet mechanism. This stops the delivery of coal to the hopper. There are two levers connected to the toggle joint which prevent the inlet mechanism from operating and these drop with the point as the trigger is pulled aside by the weigh beam in its descent. As these levers move down one of them liberates the toggle joint on the weigh hopper and allows the coal which rests on the outlet door at the bottom of the hopper to force the door open and discharge itself. As soon as the hopper is completely emptied the balance weight brings the door back to its original position as well as the toggle joint. In its movement the projection on the toggle joint strikes the same lever which opens the weigh hopper door and again places the feeding mechanism in service. While the weigh hopper is being filled the toggle joint on it is locked, thus preventing the door from opening while the weigh hopper is filling and there is a toggle joint attached to the inlet mechanism to prevent coal from being delivered to the hopper while it is discharging. On the larger machines the projection on the inlet mechanism which the weigh beams makes contact with is fitted with a spring and permits the weight box to return to its normal position quietly, but does not alter the operation of the scale in any way.

This scale adds to the efficiency of the boiler plant by giving an accurate check upon the coal consumption of each boiler. These scales are located immediately below the storage bunkers and a connection is made from them to the mechanical stokers by spouts that are either single or bifurcated, according to the number of stokers employed. If desired a machine of this character can also be used to weigh the coal as it is taken into the power plant or for knowing the amount of coal delivered at any fixed point. These scales can be equipped with a totalizing device for weighing, registering, totaling and counting the loads handled by the scale without any assistance. These scales are made in capacities ranging from 100 to 6000 lb., and for discharging their contents once each minute, although the speed can be set to suit the conditions under which each individual machine operates.

The United States Motor Company's Output

The United States Motor Company, whose main office is at Broadway and Sixty-first street, New York, with factories at Tarrytown, N. Y.; New Castle, Ind.; Providence, R. I.; Dayton, Ohio; Hartford, Conn.; Detroit, Mich., and Newark, N. J., produced in the 1911 season ended July 31 approximately 27,000 motor cars. For 1912 it is proposed to make 15,000 to 20,000 Maxwell cars, 10,000 to 15,000 Brush cars, 4000 to 6000 Stoddard-Dayton cars, 1000 Columbia cars, and 2000 Sampson trucks. President Benjamin Briscoe believes that, of the large American production of motor cars expected for the coming year, the major portion will be made by a comparatively small number of big producers, while the cars that will sell best are certain to be those of reputation that supply ample power and modern style at low prices. He further says that the automobile business is now down to a basis of stability that averages with any other business dealing in staple articles. His reports from the company's 1800 dealers in the various towns and cities indicate an active and steady demand for its products, the same as for other manufactured articles. In no previous year at this time has the company had so many orders on its books for immediate delivery.

Brown & Sharpe Castellating Attachment

For taking hexagonal nuts as they are cut from the bar and finishing them completely in one machine instead of employing a special machine for castellating them, the Brown & Sharpe Mfg. Company, Providence, R. I., has recently developed an attachment for use on its No. 2 automatic screw machine. This attachment is used for producing the lock nuts required on automobiles and other machines. Appreciable savings in the amount of time and labor required for this operation are effected by the use of this attachment, as a nut can be castellated while the slot is being milled and the blank indexes one-sixth of a revolution. It has been found that the time required for making the nut in the machine itself is ample for the sawing and the indexing. Figs. 1 and 2 give front and rear views of the attachment respectively.

The mechanism is compact and consists of a set of three saws for slotting the nuts, an indexing mechanism for locating the blanks in the proper positions for the slotting, a feeding mechanism for the cutters and a transferring arm for taking the nuts as they are cut from the bar and carrying them to the attachment. The cam shaft of the machine drives the mechanism, with the exception of the saws, which are driven directly by a belt from overhead. When it is desired to use the machine for other work, it is possible to remove the attachment easily and replace it as readily when more blanks are to be operated upon.

The nuts to be castellated are inserted in bushings held in a magazine plate fastened to a sleeve on the main spindle of the attachment. There are six bushings in the plate, and these vary in size with the different sizes of blanks accommodated, the limits being 9/16 in. across the flats and 3/8 in. in thickness, and 7/8 in. across flats and 5/8 in. in thickness, respectively. As the nut is cut from the bar, it is taken by the transferring arm A, Fig. 1, and swung to a position opposite one of the bushings in the magazine plate B, Fig. 2. When the arm swings into this position a flat spring, C, rotates the nut so that its position is correct in relation to the hole in the bushing of the plate. The arm then moves forward until the small pin that extends radially from the stud upon which the nut is carried, comes in contact with its stop.

The arrangement for carrying the nut consists of a stud inserted in a bushing and forced forward by a spiral spring. As the pin reaches the stop, the bushing is forced further forward by the arm. When the nut carried on the end of the stud is pushed off into the hexagonal hole in the bushing in the plate, it simultaneously pushes a finished one out at the back of the plate bushing. When this has been done, the mechanism indexes and the plate is moved to one-sixth of a complete revolution, which brings the nut in position to be slotted by the first cutter.

While this operation is being performed, the transferring arm is inserting another nut into the next hole in the bushing. The mechanism indexes a second time and the first nut is moved to a position midway between the first and the second cutters. The next indexing moves the plate one-sixth of a revolution further, or one-third in all, and brings the first nut in a position to be cut by the second cutter. Two more movements place it where the third cutter can operate, and at the completion of the next indexing movement, this nut is ejected from the plate at the starting point, by the insertion of a new one.

The indexing and feeding mechanism is driven by a chain and sprocket, shown at the left of Fig. 1. A segment of a gear mounted upon the shaft driven by the chain constitutes the indexing mechanism and each time this segment revolves the teeth mesh with a gear on the main spindle sleeve. The engagement of these gears moves the plate holding the nuts one-sixth of a revolution and when this movement has been made the cylindrical cam D on the sprocket wheel shaft feeds the geared head carrying the cutters forward, the plate holding the nuts being positively locked in position while this is being done. A pressure plate, E, is mounted on the geared head and holds the nuts securely in place while they are being slotted. This plate has three slight projections which bear upon the nuts as they are being operated upon by the cutters which extend through slots in this plate. The pressure plate is held firmly against the nuts by springs that automatically compensate for any variation in the nuts due to the amount of burr left by the cutting-off operation.

This attachment was given a thorough trial in the maker's shop before being placed on the market and an output of 1000 nuts per day has been secured from the saws that run for 10 days without being ground.



Fig. 1.—Front View. Fig. 2.—Rear View.

Two Views of the New Castellating Attachment for Lock Nuts Made by the Brown & Sharpe Mfg. Company, Providence, R. I.

Electrolytic Generation of Oxygen and Hydrogen.—The American Oxhydric Company, Milwaukee, Wis., calls attention to an erroneous statement which appeared in *The Iron Age* of August 17 relative to the recent introduction in this country of the electrolytic generation of oxygen and hydrogen. The electrolytic generation of these gases has been done for some years by the American-Oxhydric Company, which is the sole owner of the L'Oxhydrique Internationale patents for the United States and Canada and also manufactures apparatus for the cutting and welding of metals.

The Schuylkill Pipe & Mfg. Company, Conshohocken, Pa., has leased No. 1 mill of the Longmead Iron Works of that city, and will place it in immediate operation on the manufacture of both iron and steel pipe in sizes 1/8 to 1 1/4 in. The new company is capitalized at $60,000 and expects to make from 8000 to 10,000 tons of pipe annually. The officers of the new company are: Nelson C. Gressman, president; Abel Thomas, treasurer; Herman J. Kleinman, secretary, and John W. Moon, superintendent.

The condition of iron in lime concrete after a period of more than 200 years was determined when an opening was made recently in the concrete of the dome of St. Paul's Cathedral, London. A large chain used for reinforcement at the base of the dome was found to be as bright and perfect as when new. One reason advanced in explanation of the condition is that the oxide of iron chemically combines with the cement, forming a covering of ferrite of calcium, which is a protective agent.

Referring to the business recently before the British rail manufacturers the London Ironmonger says that inquiries include 20,000 tons for Siam, 31,000 tons for West Australia, 6500 tons for New South Wales, and 21,000 tons for Victoria. The order for 6000 to 7000 tons of 50 and 80-lb. rails for South Australia has gone to the Barrow Hematite Company.

Lake Iron Ore Property Values Keep Up

General Mining News

DULUTH, MINN., August 26, 1911.—While there is little indication of increased activity in mining throughout the Lake Superior region, there seems no especial diminution in the value of iron ore properties, as expressed by sales. Recently a sale of some 40,000,000 tons of lean, non-Bessemer ores on the western Mesaba was made at $6,000,000, or 15 cents a ton in the ground. This was for the fee to an ore deposit that will not become available for some years and will then be mined under a considerable thickness of soil and rock. For the class of ore and its availability, this sale is probably at as high a price as has been paid at any time. To be sure, blocks of ore, whatever their grades, are getting hard to buy on the Mesaba, especially in fee. It is quite likely that interest charges will have doubled the cost of this ore body before it can be mined.

Old ranges are exceedingly quiet, especially at properties operated by the Oliver Iron Mining Company. Other operators, as the Cleveland-Cliffs Company, the Breitungs, M. A. Hanna & Co. and a few more, are busier. But the Schlesinger Newport mine, which produces a high grade Gogebic ore, has reduced its force from a maximum of 1700 men early this year to about 500, and is producing correspondingly. The Breitung mines have taken on more than 450 men during the season and have now more than 1200 men busy at their various mines at Negaunee and Humboldt. At the latter point they have the Baron mine, idle for many long years until 1909, and then reopened and rehabilitated.

The Cleveland-Cliffs Company is making a very large and important mine out of its North Lake and is adding to its force there, while it is employing the usual number at its Negaunee, Ishpeming and Swanzey mines. The North Lake will next year cut quite a figure in production and can maintain a really big output for a long time. It is one of the new developments in which the Cleveland-Cliffs Company has been so active for some years. Another active property in the Cascade region is the old Volunteer, belonging to T. F. Cole and associates, which is working 200 men. This, while some reduction from previous anticipations, is the largest force that has been employed since resumption took place under Mr. Cole's new company two years ago. The mine will not make any especial effort to ship a large tonnage this year, but is blocking out ore and doing a large amount of development work for the future. The Volunteer is unique for its region in that it is a producer of high grade Bessemer ore, and some of this class of material is being sent forward this season.

One of the idlest of idle mines in the Lake Superior region has been the Champion, west of Ishpeming. But here extensive development is about to take place. This mine now enjoys the distinction of being the deepest iron ore property on Lake Superior and of having a shaft that, for a small part of its descent, has been developed as a corkscrew. The Champion is now 2000 ft. deep and its No. 7 shaft will be sunk 80 ft. more. This shaft changes its bearing some 44 deg. in a distance of 175 ft., just below the nineteenth level, it being the only example of that sort of thing in the Lake Superior region. The change was made to accommodate the shaft to a change in the dip of the vein and has been very successful in its operation.

J. R. Finlay and his associates in the investigation of the value of mining properties in Michigan, for the benefit of the State Tax Commission, have completed their work and filed their report. Had it not been for the co-operation of the mining companies, speaking generally, it would have been impossible for the engineers to complete their investigations in time for the session of the commission, for the work was a very great one and covered nearly 200 mining properties of various classes and minerals. It is understood that, almost without important exception, the mining companies met the engineers with open books and freely gave the desired information.

Explorations

There is still much exploration in the Iron River district and in other parts of the Menominee range. There are many old mines there, worked years ago and long abandoned, that look very promising and that would, if they were in some other parts of the Lake Superior region, be immediately investigated in a most thorough manner. Several mines have been brought in in this district in the past year or two and that there will be more, as the work now in progress draws to its conclusion, is quite probable. The conservatism of reports as to new mining ventures, emanating from the Menominee region, are in marked and refreshing contrast with those that come from the Vermillion. Some weeks ago a writer, inspired by the spirit of prophesy if by no other, gravely predicted that there were four new assured shipping mines next year on the Vermillion, three more "probable" and another four "promising." This sounds like a classification of ore tonnages and would be important if the writer knew anything about the facts. It is to be regretted that the only information investors in the stocks of many of these companies get is this sort of thing.

Some years ago F. H. Crergue, acting under the advice and direction of Raphael Pumpelly, sank the deepest drill hole on Lake Superior, in the Republic fold, near Marquette. The hole served its purpose, which was to give information as to formations at depth, but on account of the later difficulties in which Mr. Clergue's companies found themselves the information thus gained was not followed to its natural conclusion. There has just been organized at Negaunee the 46-30 Mineral Land Company to explore lands in the immediate vicinity of this old work, and operations will begin at once on the most promising of the 1400 acres held by this concern. These lands cover a distance of about three miles along the strike of the mineral bearing formation, and between portions of the lands are three sections that are now under exploration by the Oliver Iron Mining Company. J. P. Channing and Raphael Pumpelly are both very pronounced in the belief that merchantable ore is liable to exist on these lands, and the new company starts its operations with the good wishes of all mining men in the region.

More Ore Found in Gogebic Mines

MARQUETTE, MICH., August 27, 1911.—It is stated that at the Tilden and the Anvil mines on the Gogebic range deposits have been found which add greatly to the lives of the properties. The Tilden is directly south of the city of Bessemer and is controlled by the United States Steel Corporation. The Anvil is in Section 14, 47-46, east of the Tilden, and is operated by Ferdinand Schlesinger, of Milwaukee. The peculiarity of the geological formation of the Gogebic range is the presence of dykes of diorite, each holding its quota of ore. These dykes extend to very considerable depth and are of varied thickness, in some localities hundreds of feet. At Ferdinand Schlesinger's Newport mine the great ore body now being mined 2200 ft. under ground was not encountered until 1000 ft. of barren rock had been penetrated. The contrary was the experience at the Steel Corporation's Norrie property. Within 1500 ft. from the surface at the Norrie no less than six dykes were found. Both the Tilden and the Anvil, it appears, have found their new deposits at considerable depth, the former down 1500 ft. and the latter down 1800 ft. The Tilden, now operated by Corrigan, McKinney & Co., of Cleveland, formerly was one of the largest shippers of the range. The discovery of the new ore body means increased production. Much of the deposit, it is said, extends beneath the city of Bessemer. This fact is immaterial, however, for with 1500 ft. of rock intervening there will be no disturbance of the surface as the ore is taken out. The Anvil mine, although opened a quarter of a century ago, has been a small property. It has not been operated steadily and all told has produced only 750,000 tons. The Yale mine of the Lake Superior Iron & Chemical Company in Section 16 east of the Anvil is opening a new deposit at a depth of 1800 ft. and will prove a much better property than appeared likely a few years ago. Moreover, a number of new mines are in course of development on the Gogebic range. In fact there is reason for the statement that all three of the Michigan ranges—the Marquette, Menominee and Gogebic—are still a long way from attaining the zenith of their careers.

Greater Prospects of Marquette and Menominee Mines

In the Negaunee field of the Marquette range—the oldest in the Lake Superior region, its first mine having been opened more than six decades ago—there is asserted to be more ore in sight or known to exist than has yet been shipped. At Ishpeming three miles west, where some of the biggest mines of the region are located, the deposits

will not be exhausted half a century hence, according to the estimates of authorities. In the territory directly west of Ishpeming two large new mines are being developed, diamond drills have located other prospective producers and there is much land yet to explore. The Humboldt, Champion and Michigamme fields still to the westward and the Republic fold to the south all hold much of promise.

On the Menominee range the developments the past few years have been of great importance. New deposits aggregating millions of tons have been located in the Iron River district and it is not doubted that many more millions will be found within the next decade. In the Crystal Falls field, the old mines not only have more extensive reserves than at any time, but the diamond drills at work on undeveloped tracts are gradually adding to the number of future producers, the most notable recent cases of this kind being the success of M. A. Hanna & Co. at the Ravenna and Monongahela properties in Section 19, 43-32 and Section 36, 43-33, respectively. The Iron Mountain and Norway districts of the Menominee both possess large mines which will be active many years yet; the Florence field holds more ore than surmised some years ago, and there have been important discoveries in the Randville country.

The old ranges do not contain great, wide beds of ore capable of being mined by the steam shovel as does the Mesaba. Neither do they produce such tremenduos tonnages. Their deposits lie at much greater depth and must be mined wholly by underground systems—a much slower work, and for that reason the old ranges may be active long after the Mesaba has become exhausted.

The Krupp Research and Chemical Laboratories

In the issue of Stahl und Eisen of June 1, 1911, a profusely illustrated article was printed describing the new laboratories of Fried. Krupp, at Essen, Germany. These laboratories embrace not only those for the ordinary chemical work of the plant but very well equipped ones for chemical, metallurgical and physical research. The laboratories were started as long ago as 1863, were very largely extended in 1883, and in 1895 a special building was found necessary for physical testing. In connection with this latter laboratory, four years later, the first microscopic laboratory in Germany was instituted. The chemical laboratories in 1910 made 476,728 estimations.

The present magnificent new structure housing all these departments consists of a main building with two large side wings, covering a ground surface of 39,127 sq. ft. The total floor space is 118,400 sq. ft. Architects' drawings are given of the various floors, showing the arrangement of the rooms, and the purposes for which they are intended are carefully described in the article.

The northern wing is entirely occupied by the chemical laboratories, in which the following divisions are observed: A—steel analysis; B—special products, ore, etc.; C—gas, water analysis, etc.; D—oil testing; E—powder testing.

The chemical-physical testing laboratories are divided into chemical and physical divisions. The main chemical laboratories previously described are for the routine work, while these are for the special steels, etc. The physical division embraces metallographic testing, metallurgical testing, and physical testing proper. The very complete equipment of these various departments is given in detail and is as thorough as would be expected for this, the foremost of German steel companies. G. B. W.

The International Flux Company, manufacturer of Keystone thermal and basic flux for foundry use, is planning the erection of a large factory, to be well equipped for the manufacture and compounding of its different fluxes. Evansville, Ind., has been selected because of its excellent location for shipping. The company's mines are in Hardin County, Ill., within easy reach of Evansville, which is situated on the Ohio River and on the Big Four, Louisville & Nashville and other railroads, and is in the immediate vicinity of excellent deposits of coal. The president of the company, M. Jewett, in 1910 acquired patent rights in this country on a method for the melting and cleansing of iron and brass, which is claimed to be of great importance in cupola practice.

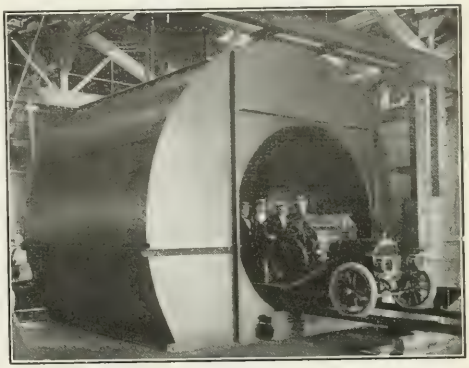
Notable Tunnel Ventilating Plant

Air Moved Faster than Trains Under Baltimore

The Pennsylvania Railroad Company is installing a large ventilating plant in one of the tunnels under Baltimore. The tunnel has a length of 4963 ft., with a cross sectional area of 432 sq. ft. The crown of the tunnel is 19 ft. high above the rails at the portals and the cubic feet of space from end to end amounts to 2,150,000. Above one of the portals is located a fan room measuring about 30 x 36 ft and 16½ ft. in height. The floor of the room is about 28 ft. above the tracks.

In this fan room are two Sirocco fans, each measuring no less than 15½ ft. high above the floor, 18 ft. in length and 14 ft. in width, together with electric motors and driving mechanism for transmitting the power from the motors to the fans. Some idea of the size of the fans may be gained from the photograph taken in the shops while the fans were under construction. The photograph shows an automobile in one of the inlets, which latter is 11½ ft. in diameter. On the other side of this fan is another inlet of the same size.

Both of the fans have outlets 8½ x 14 ft. which discharge downward through the floor into a chamber surrounding the upper part of the tunnel, the air being discharged from the chamber through a long tapering nozzle carried around the entire perimeter of the tunnel above the tracks in such a way as to direct the flow of air forward much the same as it would from an injector. Only



One of the Sirocco Ventilating Fans.

one of these fans is intended to be run at the same time, the other being held in reserve for use in case of accident.

It was determined that the tunnel would require 450,000 cu. ft. of air per minute. This volume will produce a velocity through the tunnel of 1040 ft. per minute. When a train is going through the tunnel in the same direction as the air current, the available area for the passage of air being so greatly reduced causes the air to travel faster than the train; hence it is held that any smoke from the locomotive is pushed before the train fast enough to give the engineer a clear view of the tracks.

Charles S. Churchill, chief engineer of the Norfolk & Western Railway Company, Roanoke, Va., designed the plant. Previous to the installation of the ventilating plant of his design at the Elkhorn tunnel at Coaldale, W. Va., on the Norfolk & Western Railroad, it required 17 to 55 min. to clear the tunnel of smoke; the temperature inside the tunnel was about 3 deg. higher than the outside temperature after a train had passed and during the four years immediately preceding the installation of the ventilating plant twenty-six men were asphyxiated in the tunnel. After the installation of the ventilating plant smoke would appear at the portal ahead of an engine 2 min. before the train appeared and in less than a minute after the engine had passed out the steam had vanished from the roof where it usually clings persistently. The installation of this ventilating plant made it possible to increase the load of east-bound trains about 100 tons, saving four east-bound trains per day on a run of 11 mi., or a saving above the cost of operation of about $1446 per month.

The Machinery Markets

With the exception of Chicago, where the demand for heavy equipment is good, the machinery-selling centers of the country are experiencing a very dull summer period. Pending purchases of machinery for a technical school are occupying the attention of the Cleveland dealers. In New York and Philadelphia the outlook is good on account of a number of inquiries for two and three-tool propositions, which in the aggregate will make a large amount of business when closed. The market is more quiet in Detroit, and the outlook there is not so cheerful except in power equipment and electrical machinery, for which the demand continues good. Texas is still a good market for irrigating machinery, but Mexico is not expected to give much business until after the presidential election in October. The European export demand is the one redeeming feature of the week's trade.

New York

NEW YORK, August 30, 1911.

Current business with the machinery houses so far as actual orders are concerned has been less active this week than early in the month. The outlook is very good, however, and judging from the number of inquiries, the majority of which are for two and three-tool propositions, the next 30 days should prove an unusually good month. Western promoters of hydraulic enterprises are placing a large share of their orders for water wheels and kindred equipment with New York houses handling those lines. With the exception of the Delaware & Hudson and the Delaware, Lackawanna & Western railroads, which are inquiring for a few single tools, the railroads are practically out of the market. The export trade is still holding up well.

The United Rubber Company, 5 Nassau street, New York, has been incorporated with $100,000 capital stock. The incorporators include A. A. Sands, E. C. Baker, Frank B. Vermilya. The affairs of the company are in the hands of Mr Vermilya.

The Harrold Mfg. Company, 393 High street, Newark, N. J., has had plans prepared for a new plant for the manufacture of paints and varnishes. Details as to equipment will be given as soon as a suitable site is selected.

The Cosmos Rubber Company, a New York corporation, has taken over the old plant of the Trenton Bone Fertilizer Company, Trenton, N. J., and will equip it for the manufacture of rubber specialties. The company will employ about fifty people.

The Zahm Mfg. Company, Buffalo, N. Y., has been incorporated with a capital stock of $50,000 to manufacture filtration and sterilization machinery for brewers', distillers' and manufacturing chemists' uses. A site for the manufacturing plant has been secured. The incorporators are E. Zahm, C. A. Strangmann and J. F. Nagel. Present offices, 988 Main street

The Jamestown Woodfinishing Company, Jamestown, N Y., recently incorporated with a capital stock of $50,000, is building a two-story factory at Blackstone and Driving Park avenues, on the Erie Railroad, East Jamestown, where fillers and stains for wood and metal furniture will be made. Ambrose E. Smith, of Olean, N. Y., is president of the company, and John Dahlquist, Jamestown, vice-president and secretary.

The J. & D. D. Miller Company has been incorporated at Binghamton, N. Y., with a capital stock of $100,000, to manufacture textile fabrics. The incorporators are J. Miller, D. D. Miller and O. Fowler, Binghamton.

The Fred. S. Todd Shoe Company has been incorporated at Rochester, N. Y., with a capital stock of $85,000. The company will manufacture shoes, and is arranging for a factory. The incorporators are Fred. S. Todd, T. P. Conley and O Clark.

The New York Central & Hudson River Railroad Company has let the contract for pump house, dam and suction reservoir, including interior piping and gravity pipe line, which it is to construct at Clinton Point, N Y.

The Durr Packing Company, Utica, N. Y., has completed plans for a two-story addition it will make to its packing plant on Schuyler street.

The Utica Steam Engine & Boiler Works, Utica, N. Y., has plans in preparation for a steel and concrete foundry building 50 x 150 ft., one story, which it will add to its plant. The new foundry will be used largely for the molding of columns and other structural work.

The Buffalo Leather Oil Company has been incorporated at Buffalo, with an authorized capital stock of $100,000, and will establish a plant for the production of oils. The incorporators are W. Foster, F. Stein and J. T. Lyman.

The Lake Shore Construction & Supply Company, of Dunkirk, N Y., have received contract from the Board of Public Works, Geneva, N. Y., for construction of a sand filter plant, comprising the placing of pipes, gates and other operating apparatus, and construction of an operating house and a concrete reservoir at a cost of about $54,000.

The Vassar Brothers' Hospital, Poughkeepsie, N. Y., is receiving bids for the building and equipment of a one-story brick boiler house and laundry building 43 x 120 ft.

The Poughkeepsie Foundry & Machine Company, Poughkeepsie, N. Y., has let the contract for a one-story addition to be made to its plant.

The C. H. Lynch Shoe Mfg. Company, Poughkeepsie, N. Y., will build a four-story addition to its factory on Market street.

The R. U. Delephena Company, Poughkeepsie, N. Y., has awarded the contract for the erection of its factory building to cost $120,000 to the Amsterdam Building Company, New York City.

The Holmes & Morris Mfg. Company, recently incorporated at Syracuse, N. Y., has taken over the business of the Precision Mfg. Company, and will merge it with its own. The principal specialty will be die casting. No new machinery equipment will be required for the present.

The Lakeside Forge Company, Erie, Pa., has taken over and will enlarge the business of the Lakeside Forge & Wrench Company. Considerable new equipment will be added to the company's plant, including a number of drop hammers.

The Watson Paper Mills Company, Erie, Pa., will build a concrete addition, 80 x 120 ft., four-story and basement, to its plant at Sixteenth and Holland streets, to cost $60,000. The plans also include a two-story office building, 40 x 70 ft. The contract has been awarded to the Henry Shenk Company, and work will soon be started.

The Pennsylvania General Electric Company, Erie, Pa., has awarded the general contract for the erection of its new six-story pattern shop and pattern storage building, 75 x 400 ft., to the Henry Shenk Company, Erie. The reinforcing steel to be used in the concrete work will be furnished by the Pittsburgh Steel Products Company, Pittsburgh, and the ornamental concrete work by the Neville Concrete Company, Pittsburgh.

The American Emery Wheel Works, Providence, R. I., is erecting an addition to its plant, approximating 50 x 100 ft., to be three stories for part of its length and four stories the remainder. This will be used to enlarge its general manufacturing facilities and to add to the storage room of the plant, particularly for new material. Orders have been placed for the only new equipment needed, consisting of a freight elevator and a conveying system (chain).

Philadelphia

PHILADELPHIA, PA., August 30, 1911.

Inquiries show no material increase and sales are largely confined to single-tool propositions. Occasional moderate orders are reported, but as the business is usually divided among both merchants and manufacturers the proportion coming to each is usually small. In a few cases manufacturers of special equipment report increased plant operations, but the gains have not been large, although in some instances a steady, slight gain is to be noted. Export business in power transmission specialties is holding its own, and in instances an improvement is reported, but there has been little in the way of export business offered in the standard types of machine tools. The second-hand machinery market is quiet, reflecting the general condition of the machinery trade.

The Bower Construction Company, this city, is to

THE MACHINERY MARKETS

erect a steel and brick engine house for the Philadelphia & Reading Railway Company at its St. Clair plant.

The Committee of Supplies of the School Board, Reading, Pa., has announced the purchase of the major portion of the machinery equipment to be installed in the new manual training department of its school system, which will be ready for operation at the opening of the coming fall term.

The Pennsylvania Equipment Company, West End Trust Building, is in the market for a second-hand 300 kw., 250-volt, direct-current generator, with steam turbine, steam pressure 150 lbs., vacuum 26 to 28 in., and of a known steam consumption per kilowatt-hour.

Contractors are estimating on a two-story steel and corrugated-iron factory building, 39 x 45 ft., for the Tygert & Allen Fertilizer Company, to be erected at Greenwich Point, also on a one-story steel and corrugated-iron warehouse, 96 x 138 ft., to be built for the D. B. Martin Company, at Thirty-sixth street and Gray's Ferry avenue.

The Keyoke Railway Equipment Company has been incorporated at Dover, Del., with an authorized capital stock of $500,000, to engage in the manufacture and sale of such equipment. Particulars as to the personnel of those interested in the company are not available.

H. N. Herr, engineer, Hershey, Pa., has received proposals for the roadbed and construction work for 9½ mi. for the New Lebanon & Campbellstown street railway. All materials for the work, except masonry, are to be furnished by the company. Contracts are to be awarded at an early date.

The Quaker City Iron Works, Inc., is building an addition to its plant at Richmond and Tioga streets. A plot of ground 102 x 225 ft., adjoining its present plant, has been purchased and a building 102 x 175 ft. is in course of erection, to increase its facilities for general manufacturing purposes. The company builds steel tanks and makes a specialty of riveted heavy steel and iron-plate work. No additional machinery will be required.

The American Pulley Company reports business as steadily improving. The volume of orders taken this month exceeds that for July, and from present indications a further improvement is expected. A good share of the recent business comes from the Pacific Coast and the northwestern part of the United States. Export business is growing, heavy shipments having been made recently to various South American countries, Holland and Australia. Plant operations have been increasing during the past few months, the demand covering the company's general line of pulleys rather than any special styles or sizes.

Consolidations and absorptions of a number of the smaller gas and electric lighting concerns, which have recently been incorporated in large numbers to operate in this and adjoining districts, are announced. Papers certifying two big combinations, with capitals aggregating $6,500,000, practically controlled by Philadelphians, have been recorded with the State authorities at Harrisburg. These include the Philadelphia Suburban Gas & Electric Company, with a reported capital of $4,542,500, which took over the following companies in this vicinity: Gas company of Delaware County, gas company of Rockledge, gas company of Delaware County; Horham, Southampton, Upper Dublin, Whitpain, Warminster and Warwick townships electric companies; suburban electric company of Upper Pottsgrove, West Pottsgrove, Lower Pottsgrove, Upper Providence, East Pikeland, Limerick, East Vincent and East Coventry. The Luzerne County Gas & Electric Company, with a reported capital of $2,090,000, took over the following Luzerne County concerns: West Wyoming, Warrior Run, Union Township, Hunlock Township, Sugar Notch, Shickshinny, Larksville, Pringle Township, Wyoming Lake Township, Lehman Township, Forty Fort and Jackson Township, and a gas company of the West Side. While particulars are not available, it is said that the offices of the two companies will be located in this city.

Chicago

CHICAGO, ILL., August 29, 1911.

A steady demand for electric lighting and water power plant machinery is maintained in this market, but machine-tool requirements continue below normal. At the same time a survey of the manufacturing center in Northern Illinois brings to light that builders of drills, shapers, punches and shears, milling machines, engines and hoists at Rockford, Freeport, Moline and Quincy are adding to their plant equipment and capital resources to a significant degree. At Beloit and Milwaukee new construction is also noteworthy. It may be noted with interest that serious attention is being given to the development of the oil engine, incentive for which is to be found in the increase in the supply of fuel oil, due to the tremendous growth of gasoline production.

The Granger Electric & Mfg. Company, Warren, Ind., has been incorporated with a capital stock of $50,000, to make household electrical devices, such as toasters, irons and similar articles. The directors are Francis Granger, R. L. Tobin and Frank Canady.

Fire destroyed a portion of the plant of the McKee & Blisten button factory at Keithsburg, Ill., August 20, entailing a considerable loss.

The J. B. Stone Company, Grand Rapids, Mich., manufacturer of belt lacing and other specialties, will build a 50 x 100-ft. plant of brick and steel construction in that city. Plans are being prepared.

The Hugo Mfg. Company, maker of vacuum-cleaning machinery, has arranged to move to Warsaw, Ind., from Chicago, and will occupy buildings in that city formerly used as a chair factory.

The E-Z Opener Bag Company, with branches at St. Louis and Taylorville, Ill., will consolidate and move its headquarters to Decatur, Ill.

The Indiana & Michigan Electric Company is doubling the capacity of its plant at South Bend, Ind. It is stated that $250,000 will be spent for new buildings and equipment.

The Garden City Spring Company, Chicago, has arranged to increase its capital from $7,000 to $50,000.

Waukegan, Ill., is considering the matter of building a municipal lighting plant.

The Woodland Clay Company, Woodland, Ill., is increasing the capacity of its plant and is in the market for a steam shovel.

The Schreiber Potato Machinery Company, Hammond, Ind., was damaged by fire. Many of the shop tools were injured by the heat and water, and the pulleys and shafting will require replacement.

The Kissel Motor Car Company, Hartford, Wis., has completed plans and awarded contracts for a 107 x 200-ft. addition to its factory. Specifications covering the new machinery for this plant have not been issued.

Permits have been issued at Chicago for the building of the Continental-Commercial National Bank building, to cost $7,000,000, a building for Henry C. Lytton to cost $1,600,000 and a building for the Marshall Field estate to cost $1,600,000. All will require extensive power plants.

The Fox Typewriter Company, Grand Rapids, Mich., is building an addition to its plant two stories in hight and 48 x 60 ft. in plant.

The Service Electric Company, Chicago, has been incorporated with a capital stock of $5000 to manufacture electric machinery. The incorporators are Gerald G. Barry, Andrew W. Little and Lee Cohn.

The Harris Typewriter Company, Fond du Lac, Wis., of which Julius Kellar is president, has been incorporated with a capital stock of $350,000. A factory already built has been purchased, and in addition to machinery to be moved from the company's former location in the East, a number of new machine tools will be purchased.

The Iten Biscuit Company, with factories at Omaha, Neb., and Clinton, Ia., will build a five-story reinforced concrete plant at Oklahoma City, Okla.

The Clarage Foundry & Mfg. Company, gray iron castings, Kalamazoo, Mich., has completed a new machine plant, giving added capacity and may add considerable new machinery in the near future. The company has recently taken up the manufacture of exhaust fans and steel-plate blowers.

Cleveland

CLEVELAND, OHIO, August 29, 1911.

Contracts for $30,000 worth of machine tools for the machine-shop equipment for the new West Technical High School in this city will be placed in a few days, bids having closed. Specifications are also out for the woodworking machinery and forge-shop equipment for this school, bids for which will be received in about two weeks. With the exception of this prospective business the local machine-tool market is very dull. August is usually regarded as about the quietest month of the year, and reports from dealers indicate

THE MACHINERY MARKETS

that the month just closing will be no exception. The volume of orders placed during the week was very light. One concern purchased several tools, aggregating about $5000, for enlargement of its repair department, but with this exception sales have been mostly in single tools, small lathes being more in demand than other tools. Few new inquiries are pending. Second-hand machinery is moving slowly and considerable is being offered. The demand for general machinery does not show much activity. Makers of heavy-handling machinery report a fairly good run of small orders but no contracts or inquiries for large installations. There is a good demand for ice-making machinery.

The Cleveland Board of Education will receive bids September 11 for the following machinery equipment for the woodworking shop and forge shop of the new West Technical High School:

Five wood turning speed lathes driven from one counter shaft, with 12-in. swing over bed and 24 in. between centers.
Thirteen motor head speed lathes with 12-in. swing and 24 in. between centers, and with direct current 220-volt motors.
One 30-in. band saw.
Two 30-in. band saws, motor driven by a 220-volt direct current 2-hp. motor.
One 36-in. band saw.
Four trimmers with 8-in. stroke and 4½ in. depth of cut.
Two revolving oilstone grinders, equipped with 1-hp motors.
One combination oilstone grinder.
One quick-sharpening oilstone grinder.
One 12-in. hand jointer.
One 18-in. patternmaker's lathe.
One universal saw bench.
One double-belted single-cylinder surfacer.
One swing cut-off saw.
One combination band saw filing, setting and jointing machine.
Fourteen double forges of single pedestal type, down draft.
One single forge.
Twenty-nine 120-lb. anvils.
Twenty-nine cast-iron anvil blocks.
One 20-in. upright drill.
One power shear.
One [illegible] furnace.
One 60 lb. power hammer.
One blower and one exhaust fan, both with motor equipment.
In addition a large amount of small equipment will be purchased for the forge shop.

The Aluminum Foundry Company, Sebring, Ohio, in which Fred. Bauch, Alliance, and others are interested, has let the contract for the erection of a 50 x 150-ft. brick foundry building. In addition to aluminum castings the company will make aluminum cooking utensils.

The Phoenix Ice Making Machine Company, Cleveland, will probably build a new plant, as the site now occupied by the company is needed by the city in the erection of a new viaduct over Superior avenue.

The Cleveland Trolley Wheel Company, recently organized with a capital stock of $50,000 by S. L. McAdams and others, has established a plant in a power block on High avenue for the manufacture of a new trolley wheel for street cars.

A large glass manufacturing plant will be built in Urbana, Ohio, by the Eagle Glass Company, which has been incorporated with a capital stock of $75,000. John F. Holland, of Noblesville, Ind., and others are interested in the company.

The Carnegie Coal Company has let contracts for the construction of a large coal-handling and storage docks at Duluth. The contract for the coal-handling machinery has been placed with the Mead-Morrison Mfg. Company.

The Ohio Electric Company is planning the fitting up of car-repair shops in Zanesville, Ohio, having secured an option on the Blandy plant in that city for that purpose.

The Cleveland, Barberton, Coshocton & Zanesville Railway Company announces that it has found a market for its bonds, and will shortly begin the construction of the first section of its proposed trolley system. This will be between Cleveland and Orrville, a distance of 52 miles. J. J. Breitinger, of Cleveland, is the president.

A large addition will be built to the Ransbottom Brothers pottery plant, Roseville, Ohio. Eight new 30-ft. kilns will be provided. The new buildings will be equipped with three elevators.

The Canton Pump Company, Canton, Ohio, has reduced its capital stock from $50,000 to $5000.

The Summit Brick Company, in which a number of East Liverpool, Ohio, and Wheeling, W. Va., men are interested, has been organized to build a plant at Summitville Columbiana County, Ohio, for the manufacture of paving brick and building block.

The Maryland Standard Lime & Stone Company announces that it will shortly begin the erection of a $1,000,000 cement plant in connection with its crusher plants now in operation near Rolesburg, W. Va.

George E. Linn, Springfield, Ohio, is preparing to organize a company, which will probably be known as the Duplex Molding Machine Company, to build a plant and manufacture a molding machine which he has recently invented.

A site has been secured for a plant to be built by the Ohio Art Company, Bryan, Ohio. It is the intention to erect a three-story building and have it ready for operation by the first of the year.

Cincinnati

CINCINNATI, OHIO, August 29, 1911.

Boiler makers are very busy, but considerable of this activity is attributable to the large amount of repair work being done, as well as to the demand for tanks. The machine-tool situation shows no change, with the exception of a slightly better inquiry. Tools now being shipped out are going to all parts of the country, although Eastern business probably shows up better than that from other sections. The export demand from Europe is very encouraging.

Electrical equipment is not moving so freely as reports 30 days ago indicated, but sufficient orders are being booked to keep local manufacturers running full time, without having to pile up any large stocks.

According to a report issued August 23 by the Cincinnati Chamber of Commerce, the total output of all Cincinnati manufacturing industries during 1910 carried an estimated valuation of $325,000,000. This is $75,000,000 ahead of 1908, the year of the panic, which only showed up with an estimated output value of $250,000,000.

The Board of Education, Norwood, Ohio, will open bids September 18 for the heating and ventilating equipment for a large proposed high school building. The ventilating equipment includes air washers. Walter G. Franz, Union Trust Building, Cincinnati, is consulting engineer, and plans may be seen at his office.

The Coddington Mfg. Company, West Middletown, Ohio, has leased a building at 2268 Spring Grove avenue, Cincinnati, and will soon move its shoe polish and sealing wax manufacturing plant to the new location. George L. Link, Cincinnati, is the principal owner of this company.

The Norwalk Motor Car Company, Martinsburg, W. Va., is a new incorporation with $300,000 capital stock. Manufacturing plans have not been given out. F. A. Minor and S. P. Hopkins are named among the incorporators

It is reported unofficially that the Licking Light & Power Company's plant at Newark, Ohio, has been purchased by the American Gas & Electric Company, of the same city, and that it will be enlarged in the near future.

The Grafton Foundry Company, Grafton, W. Va., will rebuild its foundry recently destroyed by fire. The new structure will be of reinforced concrete construction.

The Rukin Paper Box Company, Cincinnati, will enlarge its factory on Third street, and will probably be in the market soon for some special equipment, including pulleys, shafting, etc.

The new addition to the sheet-metal plant of the Edwards Mfg. Company, Cincinnati, is now under cover and will soon be fitted up as a galvanizing department.

The Lodge & Shipley Machine Tool Company, Cincinnati, is now occupying the new large addition to its plant, recently mentioned as being under construction.

The outside work on the new engineering building for the University of Cincinnati has been completed, and the utmost energy is now being used to finish the interior in time for the opening fall session.

The Elbinger-Meiss Shoe Mfg. Company has been incorporated with $50,000 capital stock for the purpose of erecting a shoe factory at Lebanon, Ohio. E. H. and K. M. Elbinger and Nathan and Isaac Meiss, all of Cincinnati, are understood to be the principal incorporators.

The Toledo Annealing Charging Truck Company, Toledo, Ohio, has been incorporated with $10,000 capital stock. John G. Blum, Toledo, is interested in the new incorporation.

Some additional woodworking equipment may be needed by the L. A. Strobel Company, Cincinnati, as it intends to erect a large five-story factory at Winton place.

The Alloy Steel Casting Company is a new incor-

THE MACHINERY MARKETS

poration at Wheeling, W. Va., with $100,000 capital stock. W. M. Carr, Wheeling, is said to be the principal incorporator.

Detroit

DETROIT, MICH., August 29, 1911.

The local machinery market is quieter, and the outlook is not quite so cheerful, although a fair amount of business is being done. The automobile trade has about completed its purchases for the season and is reported to be well supplied with standard lines of machine tools. What business will come from this source from now on will be for special equipment, which will probably be ordered direct from manufacturers, and local dealers will not profit thereby. Outside of the automobile trade the city is also quiet industrially, and current orders from manufacturers are small. Power machinery and electrical equipment seem to be selling fairly well, and mill supplies are also in good demand. The foundry trade is reported to be rather unsatisfactory and the demand irregular, both for iron and steel castings. Second-hand machinery is moving very slowly.

The chief award in building circles this week was for a large factory building for the Metzger Motor Car Company. A fair amount of new building work is being figured on.

The Auto City Brewing Company, which recently completed its main plant, has commenced the construction of a large bottling works, for which a considerable mechanical outfit will be required.

The Board of Education will receive bids until September 5 for an electric generator for the Central High School.

The General Motors Company has acquired ownership of the Lansden Electric Wagon Company and will continue the manufacture of electric trucks in a plant to be located in Pontiac, Mich. John M. Lansden, of Newark, N. J., will, it is reported, have general charge of the plant, and machinery and equipment for the manufacture of the trucks will be installed as soon as possible.

The American Motor Castings Company, maker of gray-iron castings, has increased its capital stock from $200,000 to $250,000.

The Ross Motor Company has been incorporated with a capital stock of $350,000, with Frank P. Ross, George D. Bailey and Robert R. McKinley as the principal stockholders. No manufacturing plans have been given out.

The Cleinat Motor Parts Company, with a capital stock of $50,000, has been incorporated by Harry E. Walter, Graham Duffield and Henry B. Baxter.

The Soo Machine & Engine Works, Sault Ste. Marie, Mich., is planning an additional department for the manufacture of gasoline engines.

The Staunton Dialectic Rubber Company, Muskegon, Mich., is doubling the capacity of its plant.

The Union Steam Pump Works, Battle Creek, Mich., is doubling the capacity of its foundry and building a three-story pattern storage warehouse. The company also contemplates the erection of a power house.

The Copeman Electric Stove Company has been organized at Flint, Mich., with a capital stock of $500,000, and will manufacture a patent electric heater. Samuel H. Abbott is the principal stockholder.

The Holland Sugar Company and the St. Louis Sugar Company, operating plants for the manufacture of beet sugar at Holland, Mich., and St. Louis, Mich., respectively, have consolidated, and the new company will, in addition to operating its present factories, soon erect a third plant at some point in this State yet to be decided upon.

The Duroy Mfg. Company, Park Lake, Mich., maker of utensil handles, is adding an enameling department. The improvement will involve an expenditure of $12,000 and will include the purchase of some special enameling machinery.

The Flanders Mfg. Company, Pontiac, Mich., is doubling the number of hammers in its drop-forge plant, which are used to make castings for automobiles and motorcycles.

The Charlotte Commercial Club, of Charlotte, Mich., have about concluded negotiations whereby a company manufacturing steel doors and other metal products will locate in that city. J. C. Potter and C. S. Brown, of Charlotte, may be addressed.

The Calumet & Hecla Mining Company has begun construction on a large regrinding plant to handle mill tailings near Ishpeming, Mich. The company plans the erection of two similar plants in the near future.

Richard Roubus has established a plant for the manufacture of vulcanizers at St. Louis, Mich.

The Muskegon Steel Castings Company, Muskegon, Mich., has just completed its new building. It is 50 x 75 ft. and will be equipped with modern machinery.

A new company is being organized in Adrian, Mich., by A. G. and Leland Wesley for the manufacture of a patent machine for measuring cloth.

The Pyle Pattern Mfg. Company, Muskegon Heights, Mich., has filed articles of incorporation, giving its capital stock at $15,000.

The Stopple Kook Kit Company has been organized at Alma, Mich., with a capital stock of $10,000, for the manufacture of a patent cooking outfit. W. W. Stopple and O. W. Hayes are president and secretary, respectively, of the new company

The Breed Mfg. Company, Detroit, has secured options on a site for a plant in Bay City, Mich., and will in all probability remove its plant there in the near future. The company is a large manufacturer of motorcycles.

The Kalamazoo Spring & Axle Company, Kalamazoo, Mich., has bonded for $55,000, for purposes of business extension.

It is reported that the Wolverine Turpentine Company will soon establish a plant in Clare, Mich. B. F. Gitchel, Evart, Mich., is president of the company.

The Port Austin Canning Company, Port Austin, Mich., will soon place a branch factory at Croswell, Mich.

The O. & W. Thum Company, Grand Rapids, Mich., manufacturer of fly paper, has plans under way for an addition to its plant to be 110 x 160 ft., four stories and of brick and steel construction.

The City Council of Saginaw, Mich., has appropriated $85,000 for the erection of a bridge across the Saginaw River, to be of the Scherzer rolling lift type. Bids will soon be advertised for.

The J. B. Stone Company, Grand Rapids, Mich., manufacturing belt lacing and other specialties, has plans in the hands of architects for the construction of a new factory building, 50 x 100 ft., one story.

The Olds Motor Works, Lansing, Mich., has placed an order for approximately $15,000 worth of tools and equipment for installation in the addition now being constructed, and it is understood that another order will soon be placed.

Indianapolis

INDIANAPOLIS, IND., August 29, 1911.

The Indiana Steel & Iron Company, Linton, Ind., has been incorporated with $150,000 capital stock, to manufacture iron and steel. The directors are W. J. Hamilton, M. K. Frank and S. R. Sobel.

The Leedy Mfg. Company, Indianapolis, maker of musical specialities, has increased its capital stock from $25,000 to $100,000.

The Oaktown Gas Company, Oaktown, Ind., has been incorporated with $6,000 capital stock, to manufacture and distribute gas. The directors are William J. Walker, J. F. Stoelting and M. R. Polk.

The Evansville, Henderson & Owensboro Railway Company, organized and incorporated at Evansville, Ind., is authorized by its franchise to create and supply electric and other heat, light and power, as well as to construct and operate an electric interurban railroad.

The Brown Straw Binder Company, Indianapolis, has increased its capital stock to $250,000.

The plant of the Vulcan Steam Shovel Company, in course of erection for several months at Evansville, Ind., will be ready for operation December 1. It is expected to employ 700 men at the start.

The insurance in the loss of the shovel department of the Indiana Rolling Mill Company at Newcastle, Ind., burned three months ago, has been adjusted and the factory buildings will be reerected and constructed of concrete. The loss was $200,000.

The Casmire Freezer Company, Indianapolis, has been incorporated, with $10,000 capital stock, to manufacture freezing machines. The directors are B. A. Casmire, C. E. Barrett and C. B. McCulloch.

The National Aluminum & Bronze Company, Indianapolis, has been dissolved.

The Clinton Electric Light & Power Company, Clinton, Ind., has increased its capital stock from $10,000 to $40,000.

The Carbo-Light Company, Anderson, Ind., has increased its capital stock to $40,000.

THE MACHINERY MARKETS

The Standard Cabinet Company, Peru, Ind., is erecting two two-story brick buildings, 40 x 90 ft., as an extension of its plant.

The Roberts Foundry Company, Indianapolis, has been incorporated with $10,000 capital stock, to do a general foundry business. The directors are W. H. Roberts, Emerson Davis and Elmer E. Wetzel.

The White River dam at Noblesville, Ind., has been sold by the trustees to D. P. Williams, attorney, Indianapolis, for unnamed buyers. The price paid was $30,000. The dam and power house have not yet been completed, but the purchase is supposed to imply the continuation of work.

The Adjustable Shade Holder Company, Bedford, Ind., has been organized with $10,000 capital stock, to manufacture shade holders and other articles. The directors are R. K. Wicker, James O'Connell, E. E. Mitchell, J. J. Quinn and J. R. Voris.

The Ideal Concrete Machinery Company, South Bend, Ind., has increased its capital stock to $500,000, and has leased another building in order to increase its output.

The Standard Mfg. Company, Peru, Ind., has let contracts for new buildings that will add 144,000 sq. ft. to the floor space.

The Middle West Coal Briquette Company, Gary, Ind., has been incorporated with $350,000 capital stock, to utilize "breeze" or coke oven dust, in connection with coal dust and pitch. The capacity of the plant will be 600 tons of briquettes a day. The directors are J. A. Brennan, J. McFadden and E. D. Missner.

The Wire Specialty & Machine Works, South Bend, Ind., has been incorporated with $40,000 capital stock. The directors are Thorwald Hansen, Gerald Mahony and Marion Campbell.

T. B. Dean, Chicago, has been granted a 25 year franchise at Gary, Ind., for a central heating plant.

The Rushville Furniture Company, Rushville, Ind., which is equipping a factory for the manufacture of furniture, is asking for bids on an engine and boilers to be opened September 5. Address A. L. Stewart, secretary.

The South

LOUISVILLE, KY., August 29, 1911.

Business in this market is improving somewhat, according to reports from machinery builders and dealers. The breaking of a severe drouth in Kentucky has helped the purely local demand. Manufacturers of refrigerating machinery report a good volume of inquiries, but add that comparatively few orders are being secured. Quarry-equipment manufacturers state that there is a lull in the stone trade which has affected their business. The enormous number of electric-light, water-works and other public-service projects on in the South has caused big business for the manufacturers of electrical equipment and power machinery. A few machine tools are being sold through the South in the equipment of manual training departments in local schools, this idea having been taken hold of with more vim in recent years. The export trade, which is handled by several Louisville manufacturers, is reported to be rather quiet at this time.

The Kentucky Wagon Mfg. Company, Louisville, has announced plans for the manufacture of motor-truck bodies, delivery wagons, carts and drays, in addition to farm wagons, which it has been making for 30 years. Additional equipment will be installed in the woodworking and blacksmith departments. W. C. Nones is president of the company, which has one of the largest plants of its kind in the country.

The Norman Woodworking Company, Louisville, has filed articles of incorporation, with $25,000 capital stock. It is erecting a planing mill, which will be operated electrically. The project has been previously referred to in connection with the Norman Lumber Company. A. E. Norman is the principal stockholder and president.

The Fairbanks-Morse Company has been given the contract for the installation of dynamos and other electrical equipment in the engineering building of the University of Louisville. W. M. Anderson is in charge of that department.

Daniel H. Burnham, Chicago, has been named by John P. Starks, Louisville, as the architect of the new building which Mr. Starks will erect at Fourth avenue and Walnut street.

Brinton B. Davis, Louisville, architect for the Inter-Southern Life Insurance Company's 18-story building, has issued specifications for the steel work. It will require 1100 tons.

The Kentucky State Fair will be held in Louisville September 11-16. Commercial organizations have arranged a display of Louisville manufactures for the occasion. A special section has been set apart for the exhibit.

The Harrison Improvement Company has been organized at Harrison, Ind., near Louisville, and will drill for oil wells. The company has leased a large amount of land. J. M. Doak, Terre Haute, is president of the company.

The Henry Vogt Machine Company, Louisville, reports trade good, though inquiries outnumber orders. A lot of promising business is in the market, in both refrigerating machinery and boiler lines, and an active fall is expected.

The James Clark, Jr., Electrical Company, Louisville, is pleased with the situation, and notes an improvement in trade, although the export demand is rather quiet at present.

E. F. Wheaton is organizing a company at Hickman, Ky., under the name of the Kentucky Southwestern Railway, Light & Power Company, which, it is stated, has been chartered in Delaware. The purpose of the company is to build a traction line from Paducah, Ky., to Hickman.

John W. Strahl, formerly connected with the mechanical department of the National Cash Register Company of Dayton, Ohio, has been appointed a superintendent at the plant of the Anglo-American Mill Company, Owensboro, Ky. The company is now completing the equipment of a plant for the manufacture of small flour mills, and expects to begin operations within 30 days.

J. F. Bullitt, Harlan, Ky., is president of a company which has been organized at Big Stone Gap, Va., for the purpose of operating a crushed-stone plant.

The St. Bernard Mining Company, Earlington, Ky., is completing plans for the erection of a tipple. John B. Atkinson is president of the company.

The Kentucky-Panama Coal Company, recently organized with $1,000,000 capital stock for the purpose of developing several thousand acres of coal lands in western Kentucky, is said to be ready for actual operations. Bids will be asked on power machinery, mining tools, etc., within 60 days, it is reported. Inkerman Bailey, Sr., 66 Broadway, New York, is head of the company.

The City Council of Owensboro, Ky., has appropriated $30,000 for the improvement of the electric-light plant owned and operated by the municipality.

The Selby Shoe Company, Ashland, Ky., is adding machinery for the enlargement of its factory.

Plans for the erection of a huge tobacco factory at Lexington, Ky., are still being discussed, although, in view of the fact that a receiver has been asked for the Burley Tobacco Society, it is not likely that the latter organization will carry out the plans which it had for the plant.

C. C. Hinton, Evansville, Ind., who is erecting a sawmill for handling cedar logs at Bowling Green, Ky., has decided to operate the plant electrically, and is buying motors and other equipment. J. Rowland Madison is in charge of the construction of the mill.

The Cayce-Jones Motor Company, Hopkinsville, Ky., has been organized with $10,000 capital stock by L. M. Cayce and Thomas C. Jones, of Rich, Ky. The company will equip a large repair shop, and will be in the market for lathes, shapers and other machine tools.

A $15,000 company is being organized at Midway, Ky., for the erection of an ice factory.

The Wasioto & Black Mountain Railroad has completed the construction of an extension to the coking ovens now being erected by Wisconsin Steel Company near Harlan, Ky.

A mill has been established at Nicholasville, Ky., for handling barytes. The ore is being secured from Jessamine, Mercer and adjoining counties in central Kentucky.

It is reported that a company is to be organized at Harrodsburg, Ky., for the establishment of a cement mill.

The American Traction Company, Indianapolis, is planning the construction of interurban lines in western Kentucky. A line from Henderson to Uniontown to Paducah is one of the first which will be built.

The Cahaba Coal Mining Company, Corydon, Ky.,

THE MACHINERY MARKETS

is planning increased operations, and is completing negotiations for the purchase of additional coal lands.

The W. W. Wynns Ice & Water Company is being organized at Sturgis, Ky., for the purpose of erecting an ice factory and water-works system. The initial capitalization is to be $15,000. W. W. Wynns is organizing the company.

The Isbell-Chapman Electric Company, Bowling Green, Ky., will install dynamos and some of the other equipment to be used in the new lighting plant of Gallatin, Tenn.

The department store of Miller Bros., Chattanooga, Tenn., is to install electrical equipment for the purpose of enabling current from a local central station to be used in lighting the building and operating the elevators.

Knoxville, Tenn., has given a franchise to the Eastern Tennessee Power Company, which is completing a plant on the Ocoee River, whereby the company may sell light and power in Knoxville during a period of 35 years. The company agrees to give consumers a decided reduction in the present rates for light and power.

The Maryville, Tenn., Electric Light, Heat & Power Company has been organized with $100,000 capital stock for the purpose of erecting a large hydroelectric plant on Abram's Creek, a distance of 25 miles from Maryville. The incorporators of the company are I. B. Zeigler, John M. Clark and James A. Goddard.

The Narragansett Machine Company, Providence, R. I., has been awarded a contract for the equipment of the gymnasium of the new building of the Y. M. C. A. at Nashville, Tenn.

A school of technology is to be established at Chattanooga, Tenn. Prof. George Bierly, of the University of Chattanooga, is organizing the institution.

An unconfirmed report from Knoxville, Tenn., states that the Chilhowee Mineral & Mfg. Company has purchased ore lands in Blount County and will erect a blast furnace near Knoxville.

The Maryville Hosiery Mills, Maryville, Tenn., the plant of which was destroyed by fire recently, is to be rebuilt in the immediate future. The building will be 35 x 135 ft. and will be fireproof. The cost of the new plant will be $40,000. R. B. Oliver is president of the company.

The Keiser-Geismer Engineering Company, Chattanooga, Tenn., has been incorporated with $10,000 capital stock by H. S. Geismer, S. R. Roddy and Alex W. Chambliss.

The Hamilton County Commission, Chattanooga, Tenn., is considering plans for the enlargement of the county jail.

A $40,000 bond issue is to be made by Bristol, Tenn., for the purpose of constructing a pipe line from Franklin to Bristol. The bond issue was authorized by the State Legislature.

The Arkadelphia Milling Company, Arkadelphia, Ark., will erect an ice factory, and will contract for the equipment within the next 60 days.

The Western Wheelbarrow & Mfg. Company, Ft. Smith, Ark., has taken over the plant of the Ft. Smith Stove Company. Both lines will continue to be manufactured.

The Tri-City Gas Company, Gadsden, Ala., will extend its mains to Alabama City and Attalla.

Meriden, Miss., is contemplating the equipment of a manual training department in its local schools. P. J. Krouse is interested in the plan.

The Tri-Cities Garage, Sheffield, Ala., is in the market for a 24-in. milling machine. E. Dowd is in charge of the garage.

Stevenson, Ala., is to have a water and electric-light plant. Plans are being drawn by the J. B. McCrary Company, Atlanta, Ga.

Palmetto, Fla., has voted a $20,000 bond issue for a water-works system.

Clarksville, Ark., will vote on a bond issue of $75,000 for the purpose of erecting an electric-light plant and a system of water works.

R. R. Chamberlain and others will construct a water plant at Malvern, Ark., a franchise for that purpose having been recently awarded.

Williamsburg, Ky., has under consideration a bond issue of $30,000, the proceeds of which will be used in the construction of water works. The vote will be taken in November.

The American Metallic Packing Company, Lexington, Ky., is in the market for an air compressor with a capacity of 100 cu. ft. Second-hand equipment is preferred.

William H. Gurd, Middlesboro, Ky., is considering plans for the establishment of a glove factory.

The Gainesville Iron Works, Gainesville, Ga., is in the market for a compound duplex steam pump, with 10-in. suction and 8-in. discharge.

The Southwestern Traction & Power Company, New Orleans, La., will let a contract shortly for the erection of a power house at New Iberia, La. The equipment will include two 250-hp. water-tube boilers, turbines, generators, etc.

Texas

AUSTIN, TEXAS, August 26, 1911.

Rapid deterioration of the cotton crop during the past week, due to the drouth and hot winds, had a depressing effect upon business. There is much activity in the sale of irrigation machinery in the more arid portions of the State in preparation for next season's crops. Machinery dealers look for little, if any improvement in the trade situation in Mexico until after the presidential election in October. Many mines are holding up orders for machinery until it is seen how the country comes through the election period.

It is announced that the new general office building of the Missouri, Kansas & Texas Railroad at Dallas will be equipped with a cold-water circulating system, a vacuum cleaning system, an electric light and power plant and other modern appliances.

The Houston Gas Company will install a new gas holder to cost $100,000. It is now installing a new gas machine with a daily capacity of 2,500,000 cu. ft. of gas. It has extended its gas-distributing system 12 miles during the last few weeks.

The Merchants' Gin Company has been formed at Gilmore, with a capital stock of $5000. The incorporators are W. R. Crim, W. M. Crim and Roy L. Laird.

The election of taxpayers on August 21 to vote on the proposition to issue $20,000 in bonds for the completion of the municipal water, light and sewer systems at Bryan resulted favorably.

Max Winfield, St. Louis, Mo., is considering the establishment of a $50,000 canning factory at San Antonio.

The O'Neil Engineering Company, Dallas, has been awarded the contract by the City Council of Hearne, for installing a water-works plant and distributing system.

The Flatonia Ice, Water & Electric Light Company, Flatonia, will install a cold-storage plant and make other improvements.

The Del Rio Water Company will install a 200,000-gal. steel storage tank and make other additions to its water-works plant and distributing system at Del Rio.

The Bonham Gas & Electric Company will erect a new power house and install new machinery at Bonham.

Morris & Co., Chicago, are considering the erection of a large meat-packing plant at El Paso.

Taxpayers of Alice have voted to issue $20,000 of bonds for installing a water-works plant.

An effort is being made by the people of Longview to secure the removal to that place of the general shops of the International & Great Northern, which are now at Palestine, and of the Texas & Pacific, now at Marshall. A bonus of $100,000 is offered to bring about the desired improvements.

The Indiana Co-operative Canal Company, Brownsville, has let the contract to J. C. Debruin, Brownsville, for the rebuilding of its canal system. The pumping plant will be equipped with new machinery.

The Texarkana Gas & Electric Company, Texarkana, recently petitioned to increase its capital stock from $200,000 to $600,000.

The Planters' Oil Company, Hearne, has increased its capital from $50,000 to $75,000.

The Tel-Electric Company, Houston, has increased the capital stock from $50,000 to $100,000.

The Zimmerman Land & Irrigation Company has been formed with a capital stock of $200,000, to construct an irrigation system in Pecos County. The incorporators are Davis Zimmerman, James W. Fogelman and Silas E. Rice.

The Arkansas Fertilizing Company, Little Rock, will erect a fertilizer plant at Houston. F. S. Williams is general manager.

C. E. Foster and J. D. Burkhart, Helene, N. M., will erect a factory for the manufacture of porcelain ware.

THE MACHINERY MARKETS

They own a deposit of kaolin 25 mi. east of Tucumcari, N. M.

The improvements under way at Galveston, Tex., for the Gulf, Colorado & Santa Fe Railroad, include a 16-stall roundhouse to be equipped with an 85-ft. turntable to cost $46,000, a brick machine and blacksmith shop to cost $9,500 and a power house and steel water tanks.

St. Louis

ST. LOUIS, MO., August 28, 1911.

The condition of the machine-tool market continues quiet so far as orders of large size are concerned, but there is a fair run of requests for individual machines for special uses and for the extension or replacement of present equipment. This demand is general, being confined to no one section of the St. Louis trade territory nor to any one branch of business. There is an increasing number of inquiries and from these the dealers augur a good fall business as soon as that season fairly sets in.

The Electric Motor Car Company has been incorporated in St. Louis to manufacture electric motor-car parts and supplies and will establish a plant therefor. The preliminary capital stock is $10,000. The incorporators are Noble H. Davis, A. J. Davis and Arthur E. Keller.

The city of Kirkwood, which voted on a bond issue for the acquisition and extension of the municipal electric-light plant, passed the proposition and will at once proceed with the work.

The Jack Possum Mining Company, Joplin, Mo., has been incorporated with $60,000 capital stock by J. N. Doty, James Roller and W. J. Owens. They will install mining equipment on the property controlled by the company.

The Bangor Zinc Mining & Smelting Company has been incorporated with $30,000 capital stock in St. Louis by C. W. Dice, Gustave A. Robyn, John Ferris, William H. Beach and Frank T. McDonagh. The company will put in mining equipment on its Joplin district property.

The Lasswell Land & Lumber Company, Hollywood, Dunklin County, Mo., has increased its capital stock from $20,000 to $50,000 for the purpose of installing new sawmill equipment.

The Elgin Silver Plate Company, with $100,000 capital stock has been incorporated at Elgin, Ill. The incorporators are J. M. Blackburn, G. W. Blackburn and R. W. Crocker.

The Hamilton Clay Mfg. Company, Carthage, Ill., has been reincorporated with $100,000 capital stock, and is to install additional equipment for clay manufacture.

The Donk Bros. Coal & Coke Company, St. Louis, is preparing to open three new mines on its Illinois coal land south of Edwardsville and north of the territory now being worked.

Maryville, Mo., voted a bond issue of $100,000 to extend the present water system.

The Kirkwood Sash & Door Company, Kirkwood, Mo., has been incorporated with $12,000 capital stock by Charles R. Reid, Oscar Stager and C. H. Mueller, and will install a small but complete plant for woodworking.

The Commercial Envelope & Paper Box Company, Binghamton, N. Y., has optioned a site here for the construction of a branch factory.

Ness City, Kan., has voted a bond issue of $16,000 for the rebuilding of the electric-lighting plant recently destroyed by fire.

Eastern Canada

TORONTO, ONT., August 26, 1911.

Good reports continue to be the rule in all industries using and producing machinery or equipment of any description. Competition from the United States is undoubtedly keener than it was. This is supposed to be due in part to some degree of dullness in business activity there, and in part to the chance of our elections turning out favorably for the government on September 21 and bringing about the establishment of the reciprocity agreement. There is no perceptible slackening of operations on this side in anticipation of such an outcome. It is felt, however, that, should the agreement be approved at the polls, the time would not be distant when another installment of reciprocity would be agreed upon, and that it would include manufactures from the United States. The view of domestic manufacturers appears to be a combination of the reflection that sufficient unto the day is the evil thereof and of the expectation that the government will be defeated. As to this latter point neither side can claim to have a greater degree of prophetic inspiration than the other. The fact, at all events, is that the trade and industry of Canada are surprisingly active for the time of year, and the manufacturers who turn out machinery and plant, have the prospect of continued activity for months to come. A few weeks hence when threshing is over and the marketing of grain has begun the farmer will have the initial purchasing power to set a large business in motion along all the channels of industrial and commercial enterprise. While the banks are husbanding their resources so as to be able to give all the assistance required to move crops, so far manufacturers have not been subjected to any sharp contraction in accommodation.

The Aspinwall Mfg. Company, Jackson, Mich., has a Canadian branch of its works in Guelph, Ont. It is considering the purchase of a site upon which to build much larger works than it is now operating there.

The Gilson Mfg. Company, whose headquarters are at Port Washington, Wis., is about to erect an additional building at its works in Guelph, Ont., where it finds it necessary to increase its core-making capacity for the manufacture of gasoline engines.

The Pollock Mfg. Company, Berlin, Ont., which makes hornless phonographs, is increasing its capital to $100,000, and will add largely to the capacity of its works.

The Polson Iron Works, Toronto, has been advised from Ottawa that an order-in-council has been passed by the Dominion Government granting an annual bonus of three per cent on $900,000 for 20 years to assist the company in building a drydock. The work of construction is to be begun at once.

J. B. Tudhope, president of the Carriage Factories, Ltd., and of the Tudhope Motor & Carriage Company, Orillia, Ont., announces that he and some associates have just formed a company to manufacture farming implements in Orilla. He said that the foundation of a factory building to cost upward of $400,000 is about to be begun.

John Reid, representing Cammell, Laird & Company, the British ship builders, whose tender for constructing the Canadian naval vessels is said to be the lowest, has been in St. Johns, N. B., discussing the question of locating the plant there.

The Montreal Herald says that a United States company is preparing to apply $30,000,000 of capital in the construction of mills, water powers, etc., in Quebec province for the manufacture of news print, card board, chemical pulp, etc.

The N. B. Pulp & Paper Company, Milletron, N. B., has the foundations ready for the machinery of its new mill.

The Galt Car & Coach Company, Galt, Ont., is erecting an additional factory, 60 x 200 ft. and is planning for the addition of a saw mill outfit.

The Clare Bros. Company, Galt, Ont., is calling for tenders for a large addition to its moulding shop.

Canadian Jewellers, Ltd., have just received a charter of incorporation from the Dominion Government. Its capital stock is $5,000,000, and its principal place of business is to be in Montreal.

Ruth & Condon, proprietors of the Novel Foundry, Peterboro, Ont., are installing a molding department.

The Board of Control of Toronto has decided to spend $420,000 more on its water filtration plant.

The great power station which the Canadian Light & Power Company is erecting at St. Timothe is now ready for operating the first installation of 7500 hp. Another unit of the same magnitude is to be installed in the near future.

The exhibition of power plant specialties held in Stratford about a month ago is reported to be bearing fruit in the way of business. Besides Canadian manufacturers, several United States companies had articles at the exhibition.

The Cockshutt Plow Company, Brantford, Ont., and the Frost & Wood Company, Smith's Falls, Ont., have joined their sales departments, the former company taking all the Canadian territory west of Peterboro, and the latter taking the remainder of Canada.

The Frost & Wood Company is about to increase its plant at Smith's Falls, Ont., by its addition of warehouses, the enlargement of its foundry and construction of new cleaning and tumbling mill rooms.

The Jenckes Machine Company, Sherbrooke, Que., has recently placed a large rubber conveyor belt con-

THE MACHINERY MARKETS

tract with the Goodyear Tire & Rubber Company of Canada.

The Doty Engine Works Company, Goodrich, Ont., is about to build a new factory.

The Steel Company of Canada, Hamilton, Ont., is having plans prepared for putting in a 2000 hp. motor to operate its main steel works.

Cluett, Peabody & Co., Troy, N. Y., and St. John, Que., is about to install a steam power electric plant and machinery in its factory in the latter place.

D. J. Albertson, Kalamazoo, Mich., is preparing plans for a tissue paper factory in St. Catherines, Ont.

Up to September 17, tenders for the purchase of all the assets of the Standard Fitting & Valve Company, Guelph, Ont., will be received by John M. Taylor, liquidator, Guelph, Ont., pursuant to an order for the judicial sale of the property.

The municipalities of St. John and Iberville, Que., are about to build a bridge across the Richelieu River at St. Johns, Que., to cost $154,000. The contractors are Lemoine & Co., 262 Park Lafontaine, Montreal.

The County Council of Wellington, Ont. has decided to buy a set of road machinery. Information can be had from James Beattie, Fergus, Ont.

Plans have been prepared for a sewer system and sewage disposal plant at St. Mary's, Ont., to cost $201,500.

A by-law will be submitted shortly to the electors of Galt, Ont., for the raising of $10,000 to improve the municipal water works.

A branch plant is being established at Hamilton by the Schacht Motor Car Company, Cincinnati, Ohio. The factory building at Sanford and Cumberland avenues, Hamilton, formerly occupied by the Tilden-Jackson Company, has been purchased and is being equipped with a full line of up-to-date machinery. A large addition to the factory is being planned, to be erected next spring, doubling its capacity. Thomas T. Rolph, Toronto, is president of the Canadian branch company; T. H. Schacht, Cincinnati, vice-president.

The Preston Woodworking Machinery Company, Ltd., Preston, Ont., of which W. S. Hudson is president, is making preparations to add largely to its machinery equipment.

Western Canada

WINNIPEG, MAN., August 26, 1911.

Reports of western Canada business conditions point to the existence of a demand for local factories and for more distributing warehouses. Parties who have connections with the East and are thus interested in pushing lines made in Canada, find themselves often more or less handicapped by the difficulty of making prompt delivery to customers. This is largely a consequence of the great activity in the factories of eastern Canada, and it begins to be felt that, very much as American manufacturers have in many cases found it necessary to establish branches in Canada, so eastern Canadian manufacturers may find it to their advantage to establish branches in western Canada.

The city of Calgary, Alberta, has a programme of waterworks extensions, calling for about 30 miles of new mains, which is expected to be fully carried out before the end of next year.

The Moran Company, Seattle, Wash., has received the contract for a 6,000,000-gal. steam-driven centrifugal pump for Edmonton water works, the cost to be $18,000.

A by-law has been submitted to the rate payers of Saskatoon, Sask., for a raising of $73,000 to be expended on water works extension.

Mueller & Taylor, 407 Hastings street, west, Vancouver, B. C., have received the contract for 13 bridges of concrete, and are in the market for reinforcing steel, timber, etc.

The Coulther-Waugh Fur Company, Montreal, have called for tenders for the erection in Calgary, Alberta, of a warehouse to cost about $40,000.

The Alberta Pacific Elevator Company has begun the erection of a large elevator at Brooks, Alberta.

A. M. Rockwell & Co. are about to erect a large storage warehouse in Chilliwack, B. C.

Russell Bros., machinists, Fort Frances, Ont., are about to build a new foundry, in the outfit of which will be some new devices of the company's own invention.

The Western Canada Flour Mills Company, whose head office is at St. Boniface, Man., is almost doubling the capacity of its plant at Rainy River, Ont.

The Rat Portage Lumber Company, whose head office is in Winnipeg, is considering the matter of rebuilding the saw mill recently destroyed at Rainy River, Ont.

Foundations are being laid for a building in Winnipeg for the recenty incorporated Hardstone Brick Mfg. Company. Its capital stock is $500,000.

Machinery has been ordered for the Sapperton Cement Tile Works Company, whose plant is being built at Sapperton, B. C.

Car works for the Grand Trunk Pacific Railway Company are to be constructed at Edson, Alberta. They are to be of standard capacity for a principal division point.

A shipment of 10 tons of saws, circular and band, forwarded from Hamilton, Ont., along with a quantity of electric machinery, has just been received by the Ocean Falls Pulp Company, at Ocean Falls, B. C.

The Alberta Pressed Brick Company, with headquarters in Calgary, is considering the erection of a large plant in Edmonton, Alberta.

Lacy Bros., Ltd., London, England, have begun the construction of branch works at Transcora, near Winnipeg. Several factories for the manufacture of ammunition and small arms will be put up on the large site the company has obtained. The factory, now under way, will, it is estimated, cost about $50,000.

C. C. Godding, representing the Tarcoma Match Company, is negotiating for the starting of a company to manufacture matches at New Westminster, B. C.

Government Purchases

WASHINGTON, D. C., August 28, 1911.

The Paymaster General, Navy Department, Washington, will open bids September 5, schedule 3833, for twenty sets steam turbine driven blowers for delivery to Brooklyn and on September 19, under schedule 3837, one motor driven winch for delivery to Mare Island.

The Quartermaster, United States Army, Portland, Me., opened bids August 15 for pumps and pumping machinery for the new storage plant at Fort Levett, Me., as follows: Bidder 1, Simpson Brothers' Corporation, Boston, Mass., $5000; 2, M. L. Baird & Co., Philadelphia, Pa., $5,000; 6, John W. Danforth Company, Washington, D. C., $5214; 8, F. & C. B. Nash Company, Portland, Me., $5333, alternate, $3815; 9, Mahoney Construction Company, Portland, Me., $4585.

The Constructing Quartermaster, Madison Barracks, N. Y., opened bids August 16 for new pumping plant as follows: Campbell & Lewis, Watertown, N. Y., $2200; Engineering Construction Company, New York, $2250; Edward Joy Company, Syracuse, N. Y., $2269; Fairbanks, Morse & Co., Chicago, Ill., $2138.

The Bureau of Supplies and Accounts, Navy Department, Washington, opened bids August 12 for a 12-in. electrically driven suction dredge as follows: Norbom Engineering Company, Philadelphia, Pa., $37,750; Alexander Miller & Brother, Jersey City, N. J., $34,900; Ellicott Machine Company, Baltimore, Md., $34,600.

The Commissioners of the District of Columbia opened bids August 15, for furnishing under item 1, one 18-hp. double cylinder locomotive traction engine and item 2, one 18-hp. return flue traction engine as follows: Geiser Mfg. Company, Waynesboro, Pa., item 2, $1834; W. B. Moore, Washington, D. C., item 1, $1,775, item 2, $1425; Frick Company, Waynesboro, Pa., item 1, $1,250 and item 2, $1,325.

The Bureau of Supplies and Accounts, Navy Department, Washington, opened bids August 15 for 14 electrically driven forced draft blowers, schedule 3800, class 11, as follows: Bidder 2, General Electric Company, Schenectady, N. Y., $34,000; bidder 3, Newport News Shipbuilding & Dry Dock Company, Newport News, Va., $31,738.

The Bureau of Supplies and Accounts, Navy Department, Washington, opened bids August 22 for material and supplies for the navy yards as follows:

Schedule 3805, class 91, one automatic railway cut-off saw—Bidder 88, J. A. Fay & Egan Company, Cincinnati, Ohio, $540 and $648; 98, Greenlee Bros. Company, Rockford, Ill., $498, $579 and $554; 127, E. F. Kirwan Company, Baltimore, Md., informal; 142, Manning, Maxwell & Moore, New York, $682.50; 210, Bentel & Margedant Company, Hamilton, Ohio, $825.

Schedule 3806, class 101, one combination cold saw cutting off machine—Bidder 127, E. F. Kirwan Company, Baltimore, Md., $1,950; 163, Newton Machine Tool Works, Cincinnati, Ohio, $1,000; 167, Niles-Bement-Pond Company, New York, $1,055 and $2,056.

Schedule 3807, class 111, one twelve hp. gasoline engine—Bidder 127, E. F. Kirwan Company, Baltimore, Md., $1,160; 238, De La Vergne Machinery Company, New York, $1,682; 261, Charles J. Taeger, Boston, Mass., $2,100.

Current Metal Prices.

The following quotations are for small lots, New York. Wholesale prices, at which large lots only can be sold, are given elsewhere in our weekly market report.

IRON AND STEEL—

Bar Iron from Store—

Refined iron.

1 to 1¾ in. round and square	₣ lb 1.70c
1½ to 4 in. x ⅜ to 1 in.	₣ lb 1.70c
1½ to 4 in. x ¼ to 3/8 in.	₣ lb 1.80c
Rods, ⅝ and 11-16 round and square	₣ lb 1.80c

Angles:

Cts. ₣ lb.	
3 in. x ¼ in. and larger	1.90c
3 in. x 3/16 in. and ⅝ in.	2.00c
1½ to 2½ in. x ⅛ in.	2.05c
1½ to 2¼ in. x 5/16 in. and thicker	1.95c
4 to 6 in. x 5/16 in.	2.05c
1 to 1¼ x ⅛ in.	2.10c
⅝ x ⅛ in.	2.20c
¾ x ⅛ in.	2.25c
⅞ in. x ⅛ in.	2.45c
½ x 3/32 in.	3.90c

Tees:

1 in.	2.35c
1¼ in.	2.20c
1½ to 2½ x ¼ in.	2.00c
1½ to 2½ x 5/16 in.	2.10c
3 in. and larger	2.05c
Beams	1.90c
Channels, 3 in. and larger	1.90c
Bands, 1¼ to 6 x 9/16 to No. 8	2.10c
Burden's "H, B & S" iron, base price	2.95c
"Burden's Best" iron, base price	3.15c
Norway bars	3.60c

Merchant Steel from Store—

	per lb
Bessemer machinery	1.90c
Toe calk, fire and sleigh shoe	2.50@3.00c
Best cast steel, base price in small lots	7c

Sheets from Store—

Black

	One pass, C R soft steel	R. G. cleaned.
No. 16	₣ lb 2.45c	2.75c
Nos. 18 to 20	₣ lb 2.50c	2.85c
Nos. 22 and 24	₣ lb 2.55c	2.95c
No. 26	₣ lb 2.60c	3.05c
No. 28	₣ lb 2.95c	3.30c

Russia, Planished &c.

Genuine Russia, according to assortment ₣ lb 12 @14½

Patent planished, W. Dewees Wood ₣ lb A, 10c; B, 9c net

Galvanized

Nos. 12 and 14	₣ lb 2.75c
No. 24	₣ lb 3.10c
No. 26	₣ lb 3.30c
No. 28	₣ lb 3.60c

No 20 and lighter 36 inches wide, 25c higher

Genuine Iron Sheets—

Galvanized

Nos. 22 and 24	₣ lb 5.50c
No. 26	₣ lb 6.00c
No. 28	₣ lb 7.00c

Corrugated Roofing—

2½ in. corrugated.	Painted.	Galvd
No. 24	₣ 100 sq. ft... 8.75	$4.70
No. 26	₣ 100 sq. ft... 2.85	3.90
No. 28	₣ 100 sq. ft... 2.50	3.65

Tin Plates—

American Charcoal Plates (per box)

"A.A.A." charcoal:

IC, 14 x 20	$6.65
IX, 14 x 20	7.50

A. charcoal:

IC, 14 x 20	$5.60
IX, 14 x 20	5.50

American Coke Plates—Bessemer—

IC, 14 x 20, 107 lb.	$4.50
IX, 14 x 20	5.50

American Terne Plates—

IC, 20 x 28 with an 8 lb coating	$8.70
IX, 20 x 28 with an 8 lb. coating	10.70

Seamless Brass Tubes—

List November 13, 1908. Base price, 18c

Brass Tubes, Iron Pipe Sizes—

List November 13, 1908. Base price, 18c

Copper Tubes—

List November 13, 1908. Base price, 21c

Brazed Brass Tubes—

List February 1, 1911 19½c ₣ lb

High Brass Rods—

List February 1, 1911. 14⅜c ₣ lb

Roll and Sheet Brass—

List February 1, 1911 14⅜c ₣ lb

Brass Wire—

List February 1, 1911. 14⅜¢ ₣ lb

Copper Wire—

Base price, Carload lots mill 13¾c

Copper Sheets—

Sheet copper hot rolled, 16 oz. quantity lots ₣ lb 17c

Sheet copper cold rolled, 1c ₣ lb advance over hot rolled

Sheet copper polished 20 in. wide and under, 1c ₣ square foot

Sheet copper polished over 20 in. wide, 2c ₣ square foot.

Planished copper, 1c ₣ square foot more than polished

METALS—

Tin—

Straits pig ₣ lb 50 @51 c

Copper—

Lake ingot ₣ lb 14 @14¼c

Electrolytic ₣ lb 13⅝@14 c

Casting ₣ lb 13⅝@14 c

Spelter—

Western ₣ lb 6⅞@7⅛c

Zinc—

No. 9, base, casks ₣ lb 8½c Open ₣ lb 9c

Lead—

American pig ₣ lb 5½@5¾c

Bar ₣ lb 6⅝@6¾c

Solder—

½ & ½, guaranteed ₣ lb 28½@28¾c

No. 1 ₣ lb 26½@26¾c

Refined ₣ lb 24½@25½c

Prices of solder indicated by private brand vary according to composition

Antimony—

Cookson ₣ lb. @10½c

Cuallets @10 c

Other brands 9@9½c

Bismuth—

Per lb $2.00@$2.25

Aluminum—

No. 1 aluminum (guaranteed over 99% pure) in ingots for remelting 21c and 22c

Rods and Wire Base price 31c

Sheets Base price 32c

Old Metals—

Dealers' Purchasing Prices Paid in New York

	Cents
Copper, heavy and crucible	10.75 to 11.00
Copper, heavy and wire	10.50 to 10.75
Copper, light and bottoms	9.50 to 9.75
Brass, heavy	7.25 to 7.50
Brass, light	5.75 to 6.00
Heavy machine composition	9.25 to 9.50
Clean brass turnings	7.00 to 7.25
Composition turnings	8.00 to 8.25
Lead, heavy	3.75
Lead, tea	3.50
Zinc, scrap	4.00

NICHOLSON U.S.A.

SUCCESS

NICHOLSON U.S.A.

Send for Catalog

IN YOUR SHOP-WORK

Ask for File Filosophy

depends on good mechanics. A good mechanic's success depends a great deal on the tools he uses. Give him a

NICHOLSON FILE

and you have a combination that cannot be equaled.

Nicholson File Company

PROVIDENCE, R. I.

THE IRON AGE

Established 1855

New York, September 7, 1911

VOL. 88: No. 10

Published Every Thursday by the
DAVID WILLIAMS COMPANY
239 West 39th Street, New York

Entered at the New York Post Office as Second-Class Mail Matter.

Subscription Price, United States and Mexico, $5.00 per Annum; to Canada, $7.50 per Annum; to Other Foreign Countries, $10.00 per Annum. Unless receipt is requested, none will be sent. Credit for payment will be shown by extending the date on the wrapper of your paper.

W. H. Taylor, - - - - - - President and Treasurer
I. A. Mekeel, - - - - - - - First Vice-President
Harold S. Buttenheim, - - - - Second Vice-President and Secretary

Geo. W. Cope, - - - - }
A. I. Findley, - - - - } Editors
W. W. Macon, - - - - }

M. C. Robbins, - - - - Manager
Charles S. Baur, - - - Assistant Manager

Branch Offices

Philadelphia, Real Estate Trust Building
Pittsburgh, Park Building
Boston, Compton Building
Chicago, Fisher Building
Cleveland, American Trust Building
Cincinnati, 807 Andrews Building

CONTENTS.

Steel Works Activity 505
Labor and Lower Prices for Commodities 504
Chicago Business Men's Pluck 505
Congressman Underwood's Boast of Cheap Iron 505
July Iron and Steel Exports and Imports 506
Pittsburgh and Vicinity Business Notes 506
Recent Experience with Titanium Rails 507
A South Bend Iron Combination 507
Coming Meeting of Accident Prevention 507
The World's Production of Aluminum 507
August Pig Iron Output 508
New Publications 509
Southern Special Charcoal Pig Iron 510
The Iron and Metal Markets 511
Trade Publications 514
The Panama Sewer Sale 514
Personal 515
Obituary 515
Standard Boiler Rules 516
Conservation Congress 521
Nelson Valve Company's Annual Dinner 522
Tags for Factory Operating Systems 522
Proposed Panama Steamship Line 522
Imports of Ferrosilicon and Other Ferroalloys 522
The Swedish Iron and Steel Corporation 523
Coal Production in 1910 524
Standard versus Heavy Duty Shapers 525
The Steel Process for Steel Castings 526
Ohio's State Licensing Code 527
The Bland Spring Making Machines 527
The Pig Iron Output: By Fuels Used 528
The Acme Automatic Engine 529
Mixer Used for Dry Stamps 529
The World Tradeways Tractor 530
Notable Air Compressor Installation 530
The American Locomotive Company 531
Transformers from Scrap 531
Coke Oven Gas as an Open Hearth Fuel 532
A New Brazing Lamp 533
Annealing Steel Castings 533
Repairing Tool Holders 534
Small Universal Engines 534
The Use of Pneumatic Machine Pig Iron 535
Acme No. 3 Drill Press 536
The Simplex Typing Printer 536
Six Foundry Equipment 537
Straub Packing Tool 537
New Sterling Power Hack Saw Machine 538
Pulsometer Air Power Plant Pump 538
The Improved Lorain Type B Coal Buckets 539
Corrugated Galvanized Iron Tin Plate 539
The Beaver Drill Rod 539
A New Jumping Jack 540
The Machine Tool Markets 541

Steel Works Activity

Reflected in Statistics for August

New Business Only Moderate—Pig Iron Stocks Reduced

The expansion of steel works operations in August, particularly in those of the United States Steel Corporation, is shown in our blast furnace statistics for that month. The production of coke and anthracite pig iron amounted to 1,020,637 gross tons, or 62,150 tons a day, against 1,703,068 tons, or 57,841 tons a day in July, a gain of 133,567 tons, or 4309 tons a day. The production by steel companies last month was 47,120 tons a day, an increase of 1,4048 tons a day over July, whereas the merchant furnaces produced 15,030 tons a day, or 339 tons a day less than in July.

The capacity of the 203 furnaces active September 1 was 62,914 tons a day, against 59,600 tons a day for 196 furnaces on July 1. It is significant that the gain of 7 active furnaces in the month was entirely contributed by the Steel Corporation, which is also to be credited with more than 75 per cent of last month's increase in pig iron output over that of July.

Steel ingot production of the Steel Corporation in August was 1,228,000 tons, which compares with 1,014,000 tons in July, and is the high record for the year. In pig iron a record for 1911 was made also, with an output of 976,000 tons.

Concerning bookings and shipments, it is stated that those of the leading interest were greater in August than for any month of the year. The same statement might be made for other steel companies as to shipments; indications are that they have not made a record for the year in new business. The past week has been a quiet one in finished material and the larger fall buying, of which there have been some predictions, is not in evidence as yet.

While no new points of weakness have developed in mill prices, the drift of the market is in the buyer's favor, and the concessions repeatedly referred to in recent weeks have become more general. In the wire trade buying has fallen off, as is natural after a campaign like that of August, in which the business was first closed up and the open announcement of cut prices made later.

The widespread rumors of new prices in wrought iron pipe have not encouraged buying and the market is on the same competitive basis that has existed for some weeks, though with only fractional variations in the prices of various producers.

Operations of steel car works are slackening. One plant in the Pittsburgh district is running at 30 per cent. and another at 50 per cent. of capacity.

Steel billets are still sold below the $21, Pittsburgh, basis that for some time has been considered the market. Extras are less rigidly adhered to.

In the foundry pig iron market the controlling conditions are the fact that nearly all melters have a suppiy for this year and the knowledge that a large idle blast furnace capacity is waiting for the first sign of better prices to blow in. Buyers are skeptical of the attempt to establish a higher price for the first quarter of 1912. It is significant that the production of merchant pig iron in August, 15,030 tons a day, was only 50 tons a day more than the average for the entire bad year 1908, when consumption was considerably less than the rate to-day, though pig iron stocks in 1908 were less.

Stocks of pig iron in the central West at merchant and steel works furnaces, apart from those of the Steel Corporation, were reduced 45,000 tons in the second half of August. The Corporation has now only 150,000 tons on hand, or less than a four days' supply.

An inquiry for 3500 tons of basic pig iron for this year's delivery has come from a northern Ohio steel company.

Lake Superior ore shipments in August were 5,548,311 tons and for the season to September 1 they were 19,301,846 tons, or 9,525,183 tons less than to September 1 last year. The movement will slacken off from this time on and little ore will be brought down in November.

Labor and Lower Prices for Commodities

We have the following letter from George Q. Thornton, president of the Carondelet Foundry Company, St. Louis:

"St. Louis, Mo., August 30, 1911.

"To the Editor of *The Iron Age*.

"Dear Sir: Referring to your articles in the issue of August 24 under heading 'Any Readjustment Will Include Labor,' I should like to ask the following questions:

"1. Would a reduction in general prices of commodities, by tariff change or otherwise, tend to increase or reduce the consumption and sale of such commodities?

"2. If sales of commodities are increased by such reduction in price, would more or fewer workmen be required in their production?

"3. If the result of such increased sales should be a greater demand for workmen, would the tendency be to reduce or increase wages?

"I am assured that we need at this time especially some clearer thinking on these and kindred subjects. As a reader of your journal of many years' standing, I should like to see your detailed comments on the above in as conspicuous a place as that occupied by the article in question, which I fear may have a rather misleading tendency.

"Yours truly,

GEO. Q. THORNTON."

Our correspondent has framed his questions so as to leave no room for doubt as to the answers he would make. The syllogism he would construct is a familiar one; it has frequently been used in theoretical discussions of the tariff. We have never considered theoretical discussions of this question to be profitable, especially when certain assumed economic conditions rather than actual experience are made the basis of argument. As an illustration, we might follow our correspondent's third question with two running like this:

> If the demand for commodities is increased, would the tendency be to reduce or raise the prices of such commodities?
>
> And if prices of such commodities were advanced, would their consumption and the demand for workmen engaged in their production increase or decrease?

Generalization is easy and if we are allowed to select a set of economic facts to the exclusion of all others, the process of reaching a conclusion is much simplified. It is not difficult, moreover, by traveling in a circle to arrive at a given starting point.

Our correspondent suggests that reductions in prices of commodities, from whatever cause, result in greater consumption, with larger employment of labor and hence a tendency to higher wages. The lowest prices of iron and steel this country has ever known were reached in the years 1893 to 1898, the years in which labor in the iron industry received the lowest wages in a generation. In 1899 in the same industry prices were the highest in ten years, labor the best paid and consumption at high mark. If low prices are a necessary cause of increased demand it would be hard to explain the record consumption of pig iron in the United States in 1907, for example, when the average price of No. 2 Southern iron was nearly $20 at the furnace, as compared with $10 for 1911. The theory that low prices are the route to enlarged consumption, larger employment of labor and hence to maintained, if not increased, wages, is not supported by the history of the iron trade in the past 20 years of its most notable expansion. Low prices have been generally accompanied by low demand and low wages.

Other things remaining the same—and here "other things" refers chiefly to purchasing power—a reduction in the price of a commodity tends to a larger use of it. But a distinction is to be made between a reduction in price due to a smaller expenditure of human labor, as for example a reduction resulting from invention, and on the other hand a reduction due to aggressive competition and inroads upon the returns to capital. A proposal for a general reduction in commodity prices as a means to higher wages might well rank with a general movement among manufacturers to raise wages as a means of increasing the public's purchasing power and thus eventually securing higher prices for products. The theory may be good enough but it does not agree with practice.

It was said in our editorial of August 24 that the moves now being made by legislative proposals and by proceedings against large corporations aimed at reducing prices. This scaling down of values, it was added, is ostensibly to be brought about without any reduction in the price of labor. Further, it was said that if there came a general downward revision of values of manufactured atricles, American labor engaged in the affected lines would have just one choice—either to bear a reduction in wages or give an increased output for the existing wages. The point emphasized was simply that under the conditions existing in this country the attempt to cut down the returns on capital invested in manufacturing industries without hurting labor employed in such industries will prove disappointing.

What has happened in the reduction of railroad

forces in the effort to pay dividends while operating expenses steadily increased is a fact which no theory can abate. High labor cost has been the complaint of manufacturers for the past five years. Further increasing competition and further cutting down profits, which, as is well known, have already been seriously curtailed in many lines since 1907, will only postpone the larger investment of capital which must precede any great increase in the demand for labor.

We are not concerned at the moment with the question of the efficacy of the measures proposed, as remedies for the high cost of living. That they will do all that has been claimed for them in this direction there is serious doubt. But we find nothing in our industrial record to warrant the conclusion that a policy which will hurt industrial capital can be enforced with no accompanying hardship to labor.

Chicago Business Men's Pluck

The courage and persistence of the average business man in the face of exasperating and disheartening conditions are well exemplified in Chicago at the present time. During the entire year building operations have been held up, at times almost to the point of complete suspension, because of a local plumbers' and steam fitters' strike. This labor trouble is particularly vexatious because it is occasioned by a purely jurisdictional dispute between two organizations and not by any matter regarding which contractors and men are at variance. The local organization of steam fitters has refused to permit, in the past, any work being done in Chicago by outside steam fitters. The organization of local plumbers, to which the outside steam fitters also belong, is now insisting that its steam fitters be allowed to work in Chicago and that the local steam fitters as individuals affiliate with the plumbers' union. The local steam fitters are supported by the building trades organization in Chicago, with the result that on those buildings where the plumbers are engaged all the other artisans strike, and vice versa, where the local steam fitters have contracts no plumbing can be put in. In connection with that work which is permitted to progress, there is little concealment of the fact that "peace money" from the builders has been influential with those in control of the labor situation. At the present time the situation continues in a state of deadlock, with no immediate solution in view.

In spite of this deplorable and inexcusable tie-up, there are now in process of construction in the loop district of Chicago 11 buildings in which 67,000 tons of structural steel is being erected, at an approximate cost of $25,000,000, and permits have just been issued for eight additional buildings requiring 40,000 tons of steel, to be built at a cost of nearly $17,000,000. The buildings included in this remarkable aggregate investment of $42,000,000, and an estimate of the quantity of steel each will require, are as follows: Hearst, 3000 tons; Rand-McNally, 6800; Insurance Exchange, 14,000; New Otis, 7500; McCormick addition, 3000; Monroe, 2500; Mallers, 4500; Rothschilds, 11,000; Mandel, 10,000; City Hall square, 3000; Hamilton Club, 1500; Kesner, 4000; Continental and Commercial National, 14,000; Chicago, Burlington & Quincy, 5000; Lytton, 3500; Marshall Field estate, one 3500 and another 4000; Boston Store, 2000; Morrison Hotel, 4000. These figures do not include 7000 tons for the new Field Museum to be located in Jackson Park.

This great building movement in Chicago is significant in at least two respects: 1. That the banks are in a position to take care of propositions of this aggregate magnitude very pointedly demonstrates the existence of large balances on deposit and the low rates of interest prevailing; it was stated a short time ago, regarding one of the Chicago banks, closely associated with the estate for which two new buildings are to be erected, that it had on deposit the largest amount in its history. 2. The buying of over 100,000 tons of fabricated steel at this time cannot be considered as significant of anything but extremely low prices for fabricating contracts. Following the three years of strenuous competition since 1907, the taking of this tonnage cannot have greatly strengthened the financial position of the fabricators who have made the successful bids.

It must be conceded that the city ordinance limiting to 200 feet the hight of buildings started in the loop district of Chicago after September 1 hastened the decision to erect some of these structures, but many of them had been under consideration before that date was fixed. Moreover, this is not the first time that Chicago has attempted to limit the hight of buildings by an ordinance, but each one was soon after repealed.

It would seem that the time had long since arrived for some concerted and drastic action by means of which the strife between the Chicago plumbers and steam fitters would be summarily ended. Such a costly business disturbance, for which there is so little excuse and from which benefit cannot possibly accrue to any but the few instigators, should have been terminated long ago. If it had been due to anything else than a labor fight, it would not have been permitted to continue for any length of time.

Congressman Underwood's Boast of Cheap Iron

When Representative Underwood of the Birmingham, Ala., district, made his famous reply August 2 on the floor of the House of Representatives to William J. Bryan's criticism of his position on the wool tariff, no part of his speech was applauded more vigorously than his frank admission of his ownership of stock in the Woodward Iron Company. The purpose of that speech was to make clear to all his hearers and to the country generally that, although interested in the manufacture of pig iron, Mr. Underwood had unselfishly favored a reduction in the iron and steel schedule. But, in the course of his remarks he made this declaration: "I say without expectation of contradiction that the furnace company in which I am interested can make pig iron cheaper than it can be made anywhere else in the world."

If Mr. Underwood had announced that the furnaces in which he is interested are among the most expensive to run in this country, and yet he favored a reduction in iron duties, his attitude would have been clearly altruistic. Boasting, however, that his company can make pig iron cheaper than any other maker of iron in the world, he is placed in the position of being absolutely without fear of any injury to his investment from the competition of other iron manufacturers. In point of fact, this declaration would naturally subject him to the charge that he is complacently willing to have his less fortunate domestic competitors crippled or run out of business. It would not take much of a reduction from the present low level of pig iron prices to put quite a number of active furnaces out of the running.

July Iron and Steel Exports and Imports

Both exports and imports of iron and steel showed a sharp reduction in July as compared with June, according to the report of the Bureau of Statistics of the Department of Commerce and Labor. The total value of the exports of iron and steel and manufactures thereof, not including iron ore, was $18,052,337 in July against $20,310,053 in June while the value of similar imports in July was $2,015,692 against $2,777,718 in June.

The exports of commodities for which quantities are given totaled 102,282 gross tons in July, against 173,818 tons in June, and 173,920 tons in May. The details of the exports of such commodities for July and for the seven months ended with July, compared with the corresponding periods of the previous year, are as follows:

Exports of Iron and Steel.

	July		Seven months ended July	
	1911.	1910.	1911.	1910
Commodities	Gross tons.	Gross tons.	Gross tons.	Gross tons.
Pig iron	9,446	17,504	76,577	53,213
Scrap	5,910	1,110	51,438	12,949
Bar iron	1,479	1,826	11,007	11,340
Wire rods	1,074	1,028	9,564	14,616
Steel bars	7,360	10,657	71,178	58,388
Billets, ingots and blooms	13,378	126	149,419	7,657
Steel rails	60,973	27,886	269,853	218,518
Iron sheets and plates	8,862	7,105	64,415	61,374
Steel sheets and plates	17,190	11,020	126,414	11,648
Tin and terne plates	4,713	372	30,291	7,056
Structural iron and steel	1,187	14,028	125,005	89,042
Rails, steel	1,474	5,500	16,795	42,380
All other wire	7,316	8,723	74,294	54,654
Wire nails	560	583	5,827	3,826
Cut nails	1,816	4,723	29,834	35,568
Other nails, including tacks	905	891	7,348	5,835
Pipe and fittings	12,780	14,406	111,784	88,560
Totals	102,282	127,574	1,261,663	766,624

The imports of commodities for which quantities are given totaled 15,252 gross tons in July, as compared with 20,304 tons in June and 23,375 tons in May. The details of such imports for July and for the seven months ended with July, as compared with the corresponding periods of the previous year, are as follows:

Imports of Iron and Steel.

	July		Seven months ended July	
	1911.	1910.	1911.	1910.
Commodities	Gross tons.	Gross tons.	Gross tons.	Gross tons.
Pig iron	8,548	19,865	97,552	139,918
Scrap	1,479	3,133	12,537	60,389
Bar iron	1,801	1,922	16,496	24,934
Billets, bars and steel forms	1,594	2,283	17,396	27,594
Sheets and plates	108	302	1,410	4,073
Tin and terne plates	235	10,790	12,369	47,010
Wire rods	1,198	1,737	10,001	12,152
Totals	15,252	41,932	167,795	316,070

The imports of iron ore in July were 200,845 gross tons, against 118,296 tons in June and 248,810 tons in the month of July, 1910. The total importations of iron ore for the seven months ended with July were 1,002,713 tons, against 1,508,076 tons in the corresponding period of 1910. Of the July imports of iron ore 90,205 tons came from Cuba, 49,201 tons from Spain, 32,870 tons from Newfoundland, 23,492 tons from Sweden, 518 tons from Canada and 4,559 tons from other countries.

The total value of the exports of iron and steel and manufactures thereof, not including iron ore, for the seven months ended with July, was $143,917,270, against $112,519,587 in the corresponding period of 1910.

The total value of the imports of iron and steel and manufactures thereof, not including iron ore, for the seven months ended with July, was $17,044,044, against $24,285,-968 in the corresponding period of 1910.

Pittsburgh and Vicinity Business Notes

The Dravo-Doyle Company, Pittsburgh, has established a steam specialty department, with J. C. McAllister, Jr., in charge, and is now prepared to offer steam specialities such as steam traps, back pressure valves, pump governors, boiler feed water regulators, etc.

The Standard Steel Tank & Mfg. Company, Pittsburgh, has been granted a Delaware charter with a capital of $100,000, and it is understood will build a plant in Pittsburgh to manufacture steel tanks, boilers and heavy plate work. The incorporators are Joseph L. Kontz, F. M. Strecker and M. L. Daina, all of Pittsburgh.

Stockholders of the Hazel-Atlas Glass Company will hold a meeting in Wheeling, W. Va., on September 7 to act on a proposition to increase the capital stock to $3,000,000. The company proposes to make some large improvements to its plant, using the proceeds of the increase in its capital for this purpose.

The City & Elm Grove Railroad Company, Wheeling, W. Va., has employed Chester & Fleming, consulting engineers of Pittsburgh, to make a complete examination and report of the water-works system for Pleasant Valley, a suburb of Wheeling, with reference to extensive improvements in the water supply.

The Westinghouse Electric & Mfg. Company, East Pittsburgh, has received a very large order from the Boston Elevated Railroad for car apparatus, it being the third large order received from the same buyer the past three months. This order brings the aggregate business of the company for the first four months of its current fiscal year up to a level that compares favorably with the corresponding period a year ago.

The Petroleum Iron Works Company, Sharon, Pa., builder of heavy plate work of all kinds, has elected directors as follows: C. H. Todd, J. L. Considine, C. J. McDowell, R. T. McCormick, J. P. Sweeney of Sharon; J. S. Cullinan, Houston, Tex., and John Slater, Washington. The directors elected the following officers: C. H. Todd, president; J. L. Considine, vice-president; J. P. Sweeney, secretary and treasurer; H. C. Knowles, assistant secretary and treasurer. The company reports its business of the past year as satisfactory.

The Osceola Silica & Fire Brick Company, Oliver Building, Pittsburgh, Pa., whose plant is at Osceola Mills, Clearfield Company, Pa., has closed with the Pittsburgh Crucible Steel Company, for furnishing about half of the No. 1 fire brick required in the construction of the latter's new plant at Midland, Pa. A facsimile of the order from the Pittsburgh Crucible Steel Company has been printed and is being issued as an advertisement. It calls for 1,500,000 to 2,000,000, quantity at buyer's option, first quality Osceola fire brick. The Osceola Company has recently spent $30,000 in improving its plant in various ways.

The new foundry of Spang, Chalfant & Co., Inc., at Etna, Pa., is mainly built of reinforced concrete. It is to be a two-story building, 100 x 467 ft. at one end, with an ell 100 x 250 ft., and a three-story office 60 x 100 ft. The larger building will contain a socket shop, a machine shop and a pattern shop. The roof is entirely concrete, covered with a composition weather proof roofing. The machine shop contains a 20-ton 50-ft. span crane and the socket shop a 10-ton 98-ft. span crane. The building is entirely fireproof, no materials other than concrete and steel being used.

The Universal Sanitary Mfg. Company, New Castle, Pa., has started to rebuild its plant, which was recently destroyed by fire. It will be about one-fourth larger than the former plant. The company had inducements offered to locate in some other city, but all were turned down. The new plant will include five buildings, each 40 x 187 ft., of brick.

The Alliance Brass & Bronze Company, Alliance, Ohio, has contracted for a new building, to be of brick, 40 x 100 ft. The product will be brass, bronze and all other kinds of non-ferrous castings.

The Positive Clutch & Pulley Works, 30-32 Lansing street, Buffalo, N. Y., states that its Canadian company is building a new factory consisting of a foundry, machine shop, woodworking shop, power plant, etc., at Aurora, Canada, which is about 16 miles from Toronto. Ground has been broken, some of the buildings are now under construction and it is hoped to have the plant or certain portions of it ready for use in November. Such machinery as is now in use in Toronto will be moved to Aurora, and while some additional machinery will be purchased for the new plant the greater part of it has already been acquired. The general offices and warerooms for carrying stock will be continued in Toronto. The Canadian works are conducted under the name of the Positive Clutch & Pulley Works, Ltd.

Morrison & Smith, Rio Hondo, Tex., intend to build a water and electric light system and are in the market for the necessary equipment and material.

Recent Experience with Titanium Rails

The Titanium Alloy Mfg. Company, Charles B. Slocum, general sales agent, Pittsburgh, has added to its publications relating to the effect of titanium on iron and steel, a 40-page pamphlet giving data bearing on the company's claim that titanium has solved the steel rail problem. It is stated that while three years ago the titanium rail was being tried on a few roads it is now in service on more than fifty steam railroads and on the more important traction lines, a total of 400,000 tons of such rails being now in use. The experience of the New York Central Railroad, concerning which publication has already been made, is cited; also that of the Lehigh Valley, the Lackawanna, the St. Paul, the B. & O., the Burlington and other lines. The Lehigh Valley Railroad has bought 23,000 tons of open-hearth steel rails for 1911, all of high carbon and high titanium content. A section is shown of the Bethlehem Steel Company's 110-lb. open-hearth titanium rail rolled for the Lehigh Valley. The analysis of the steel shows carbon 0.92, phosphorus 0.024, sulphur 0.021, manganese 0.887, and silicon 0.04 per cent. The steel is treated with a 10 per cent. titanium alloy, the amount used being equal to 1 per cent. of the weight of the steel.

Up to June, 1911, the Chicago, Milwaukee & St. Paul had bought 40,000 tons of titanium rails for this year, the use of 0.10 metallic titanium being called for. The Burlington ordered 10,000 tons of rails in 1911 for which titanium alloy was specified, and these rails will be used on every curve on the Burlington system. The results of 569 days' service of titanium rails on Erie Railroad curves showed in one case an average durability of 40 per cent. more for the titanium rails than for others, and in another case 46 per cent. greater durability.

A Scotch Bar Iron Combination

The London Economist publishes the statement that negotiations which have been in progress for the amalgamation of the Lanarkshire manufacturers of bar iron appear to have a fair prospect of success. The task of finding an equitable basis for amalgamation proved to be beyond the powers of the makers themselves, and a London syndicate—said to be the same that brought the tube trade negotiations to a successful conclusion—has taken the matter up, and prepared a scheme which has secured a degree of acquiescence sufficient to encourage the hope that it may ultimately be accepted with some modification.

According to a draft prospectus, which has been submitted to the principal makers, it is proposed to float a company with a capital of $3,000,000, equally divided into ordinary and preference shares, the former to be issued to the present proprietors of the works as part of the purchase consideration and the latter to be offered for public subscription, while, in addition, debentures to the amount of $1,500,000 will be subscribed by the promoters.

There are still obstacles sufficiently formidable to leave an element of doubt as to the final outcome of the negotiations. The most serious is the attitude of those steelmaking works which have within recent years added bar rolling mills to their equipment. The responsibility for the recent excessively keen competition in the home trade has been laid at the door of those concerns who, having a market to find for their new department, and not relying solely upon the making of bars for their profits like the bar iron producers pure and simple, cut prices. Not only did they persistently decline to become parties to the schedule of minimum prices drawn up by the association, but they are now affecting indifference with regard to the overtures being made for the purchase of their bar mills. It is believed, or at least hoped, that this indifference is more assumed than real, and is not entirely unconnected with the fixing of the price to be paid.

It is stated that the most important of those mixed works, while not willing meantime to sell out on the terms proposed, are prepared to facilitate the amalgamation by undertaking to work in harmony with the new company by falling in with the arrangement for the regulation of the output so as to maintain prices. Even among the 14 old-established bar iron makers there is very far from complete unanimity as to the acceptance of the scheme in all its details, one of the most formidable difficulties being the differences as to the valuations at which the works are to be taken over. The capacity of the works is equal to approximately 350,000 tons.

Coming Meeting on Accident Prevention

Accident prevention and exhibition by commissions are two of the topics to be discussed at length at the Chicago conference of the American Association for Labor Legislation, September 15 and 16, at the Audi torium Hotel. The programme is as follows:

Friday, 2 P. M. Standards for Accident Prevention.

Presiding officer, Henry R. Seager, president, American Association for Labor Legislation.

Standards, Accident Prevention: John Calder, general manager Remington Typewriter Works, Ilion, N. Y., formerly inspector of factories in Scotland.

Safety Standards through State Inspection: Edgar L. Heaves, chief inspector of factories for the State of Illinois, formerly secretary of the Illinois State Industrial Commission.

Public Safety Devices: Christopher Jennett, Rome, N. Y., safety inspector Illinois Steel Company.

Meeting to be also specially invited to lead the informal discussion on this topic: Louis Union, chief factory inspector of Missouri; W. Wyatt, International Harvester Company, Chicago; Joseph Swendman, Natural Association of Manufacturers, Hon. H. Walker, president Moline Works; Illinois; James D. Beck, Wisconsin Industrial Commission, and Dana Van Schaick, Workmen's Insurance Company, Hartford, Conn.

Friday, 8:15 P. M. Prevention of Industrial Diseases.

Presiding officer, Charles P. Neill, commissioner United States Bureau of Labor.

The Massachusetts Board of Boiler Rules: Joseph H. McNeill, chief boiler inspector of Massachusetts and chairman State Board of Boiler Rules.

The Wisconsin Industrial Commission: John R. Commons, member Wisconsin Industrial Commission, formerly professor of Economics, University of Wisconsin.

The Constitutionality of Commission Orders: Louis D. Brandeis, Boston, who will be expected to lead the informal discussion; Gilbert E. Roe, attorney, New York City; Bernard Flexner, attorney, Louisville, Ky., Charles McCarthy, Wisconsin Legislative Reference Library, and John Williams, commissioner New York State Department of Labor.

Saturday, 9:30 A. M. Uniform Reporting of Industrial Injuries.

Presiding officer, John R. Commons, member Wisconsin Industrial Commission.

The Reporting of Occupational Disease Reports: John B. Andrews, secretary American Association for Labor Legislation.

Accident Records in Minnesota: Dean D. Lyceshier, expert Minnesota Bureau of Labor.

The Advantages of Uniform Accident Schedules: Edson S. Lott, president United States Casualty Company.

A Plan for Uniform Accident Reports: Leonard W. Hatch, chief statistician New York State Department of Labor.

Among those who are specially invited to lead the discussion are: L. L. Rockey, chief Pennsylvania Bureau of Industrial Statistics; W. A. Allport, Illinois Commission on Occupational Diseases; David Ross, Illinois Bureau of Labor; Charles E. Getteby, Massachusetts Bureau of Statistics; Charles P. Kearns, Ohio Department of Factory Inspection; and Stanley L. Cox, Bureau of Liability Insurance Statistics, New York City.

Saturday, 2:15 P. M. Round Table Conferences.

Uniform Accident Reports.—A continuation of the session of Saturday forenoon, for the purpose of drafting the schedule for uniform accident reports.

Conference of Commissioners on the Administration of Workmen's Compensation Acts.—Presiding officer, C. H. Crownhart, chairman Wisconsin Industrial Commission. Discussion led by Amos L. Saunders, of Massachusetts.

Business Meeting, General Administrative Council, American Association for Labor Legislation. Discussion of Immediate Programme.—(1) Prohibition of poisonous phosphorus in the manufacture of matches; (2) Investigation of occupational diseases; (3) Reporting of industrial accidents and diseases; (4) Workmen's compensation for industrial injuries; and (5) Enforcement of labor laws.

The World's Production of Aluminum

The Frankfurter Zeitung recently published the following interesting statement regarding the aluminum industry: "The development of the aluminum production has been unusually rapid, the world's production having risen from 11,500 metric tons in 1905 to 24,200 metric tons in 1909 and 34,000 metric tons in 1910. The distinctive feature about the aluminum trade is that it is in the hands of only twelve companies of which five, namely, the Aluminum Industrie Akt. Ges. of Neuhausen, the Société Electro-Metallurgique Française of Froges, the Compagnie des Products Chimiques d'Alais et de la Camargue of Salindres, the British Aluminum Company, Ltd., and the Aluminum Company of America, account for nine-tenths of the total output. The price of aluminum per kilogram was 27s. in 1890, 2- in 1900, 3s. 3d. to 3s. 9d. in 1905, 1s. to 1s. 6d. in 1909 and 1s. 3d. to 1s. 7d. in 1910." The equivalent of the 1911 prices in United States money is 11.9 cents to 13.5 cents per lb.

The Vilter Mfg. Company, whose general offices are at 1008 Clinton street, Milwaukee, Wis., has found it necessary by reason of increased demands to provide better facilities on the Pacific coast and announces the removal of its branch in Los Angeles, Cal., to 2612 South Main street, where larger quarters have been secured, comprising not only an office but also a storehouse. A complete line of ammonia fittings and sundries, as also small ice and refrigerating machines, as well as ice tanks, will be carried in stock. C. M. Gay, who has been connected with the company for many years, continues in charge.

August Pig Iron Output

Large Increase Over That for July

Steel Works Furnaces Show More than the Entire Gain—Merchant Output Slightly Less

Our blast furnace statistics for August reflect the expansion in steel works operations which has been the chief market development of the past month. The output of coke and anthracite pig iron was 1,926,637 gross tons, or 62,150 tons a day, as against 1,793,068 tons, or 57,841 tons a day in July. The increase in the production of steel works furnaces was more than the increase in all kinds of pig iron, such furnaces producing 47,120 tons a day last month, an increase of 4648 tons a day, while the merchant furnaces produced 15,030 tons a day last month, a falling off of 339 tons a day from July. The number of active furnaces September 1 was 203, a gain of 7 in August, while the active capacity at the opening of this month was 62,914 tons a day, a gain of 3224 tons over August 1.

Daily Rate of Production

The daily rate of production of coke and anthracite pig iron by months, beginning with August, 1910, is as follows:

Daily Rate of Pig Iron Production by Months—Gross Tons

	Steel works.	Merchant.	Total.
August, 1910	46,534	21,429	67,963
September	47,007	21,536	68,542
October	45,794	21,726	67,520
November	41,427	22,232	63,659
December	35,909	21,440	57,349
January, 1911	36,501	20,351	56,852
February	42,349	21,741	64,090
March	48,970	21,066	70,036
April	47,805	21,031	68,836
May	42,270	18,809	61,079
June	42,708	16,877	59,585
July	42,472	15,369	57,841
August	47,120	15,030	62,150

Output by Districts

The table below gives the production of all coke and anthracite furnaces in August and the four months preceding:

Monthly Pig Iron Production—Gross Tons.

	April. (30 days)	May. (31 days)	June. (30 days)	July. (31 days)	August. (31 days)
New York	139,674	130,927	130,395	124,347	118,145
New Jersey	5,510	9,788	3,600	1,386	.....
Lehigh Valley	78,182	79,731	72,787	66,404	77,021
Schuylkill Valley	55,305	46,827	44,039	45,859	53,397
Lower Susquehanna and Lebanon Val.	44,537	44,179	41,751	40,084	38,741
Pittsburgh district	488,447	422,000	415,519	419,248	469,012
Shenango Valley	109,239	88,170	78,196	79,571	84,884
West. Penn.	100,593	61,892	60,047	73,177	96,366
Maryland, Virginia and Kentucky	60,978	53,271	48,969	52,583	46,262
Wheeling district	119,489	115,213	93,617	93,973	94,476
Mahoning Valley	189,822	187,748	188,187	184,402	189,200
Central and North. Ohio	161,742	152,909	141,973	116,953	131,850
Hocking Valley, Hanging Rock and S. W. Ohio	27,084	27,185	20,245	11,321	7,262
Mich., Minn., Wis., Col., Wash.	76,379	71,938	54,391	57,661	63,114
Chicago district	236,580	238,424	249,666	272,817	287,875
Alabama	149,737	134,386	117,915	126,200	140,879
Tenn., Georgia and Texas	22,178	28,868	27,169	27,082	28,153
Total	2,065,086	1,893,456	1,787,566	1,793,068	1,926,637

Production of Steel Companies

Returns from all plants of the United States Steel Corporation and the various independent steel companies show the following totals of product month by month. Only steel making iron is included in these figures, together with ferromanganese spiegeleisen and ferrosilicon. These last, while stated separately, are also included in the columns of "total production":

Production of Steel Companies—Gross Tons.

	Pig.—Total production.—			Spiegeleisen and ferromanganese.	
	1909	1910	1911	1910	1911
January	1,117,823	1,773,201	1,128,448	19,538	8,360
February	1,073,863	1,620,536	1,185,782	21,396	12,821
March	1,140,553	1,739,212	1,518,063	25,591	11,784
April	1,093,092	1,669,898	1,434,142	22,304	10,657
May	1,356,448	1,619,283	1,310,378	26,529	13,641
June	1,365,527	1,549,112	1,281,241	27,680	22,611
July	1,508,762	1,462,689	1,316,646	22,924	17,067
August	1,591,991	1,442,572	1,460,610	25,756	14,579
September	1,660,889	1,410,231	.....	15,151	.....
October	1,760,094	1,419,624	.....	8,500	.....
November	1,689,994	1,242,804	.....	9,032	.....
December	1,768,799	1,113,174	.....	12,178	.....



Diagram of Daily Average Production by Months of Coke and Anthracite Pig Iron in the United States from January 1, 1907, to September 1, 1911; Also of Monthly Average Prices of Southern No. 2 Foundry Iron at Cincinnati and Local No. 2 Foundry Iron at Chicago District Furnace.

Capacity in Blast September 1 and August 1

The following table shows the daily capacity of furnaces in blast September 1 and August 1:

Coke and Anthracite Furnaces in Blast

Location of Furnaces.	Total number of stacks	Sept. 1 — Number in blast.	Sept. 1 — Capacity per day.	August 1 — Number in blast.	August 1 — Capacity per day.
New York:					
Buffalo	17	9	3005	10	3297
Other New York	7	3	621	3	585
New Jersey	7	0	0	0	0
Pennsylvania:					
Lehigh Valley	24	12	2317	12	2381
Spiegel	3	2	167	2	160
Schuylkill Valley	16	6	1722	6	1584
Lower Susquehanna	7	2	583	3	637
Lebanon Valley	10	4	635	4	616
Pittsburgh District	50	38	15,308	33	13,407
Spiegel	3	2	330	2	332
Shenango Valley	20	9	2773	9	2752
Western Pennsylvania	27	11	3108	11	3025
Maryland	4	3	750	3	752
Wheeling District	14	9	3051	9	3135
Ohio:					
Mahoning Valley	24	17	6450	16	6360
Central and Northern	23	11	4285	10	3842
Hocking Val., Hanging Rock & S. W. Ohio	18	2	235	2	230
Illinois and Indiana	32	21	9235	21	9274
Spiegel	2	1	52	1	60
Mich., Wis., and Minn.	10	5	970	4	744
Colorado, Mo. and Wash.	7	3	1080	3	1050
The South:					
Virginia	23	3	617	6	665
Kentucky	5	1	145	1	156
Alabama	46	19	4565	17	4175
Tenn. and Georgia	20	8	910	8	873
Total	416	203	62,914	196	59,690

Among furnaces blown out in August was one Wickwire at Buffalo, one Paxton in the lower Susquehanna Valley, and Princess in Virginia. Furnaces blown in in the month include three Edgar Thomson, one Clairton and one Isabella in the Pittsburgh district. Struthers in the Mahoning Valley, Upson in northern Ohio, one Mayville in Wisconsin, Alice and one Ensley in Alabama.

Chart of Pig Iron Production and Prices

The fluctuations in pig iron production from January, 1907, to the present time are shown in the accompanying chart. The figures represented by the heavy line are those of daily average production, by months, of coke and anthracite iron. The two other curves on the chart represent monthly average prices of Southern No. 2 foundry pig iron at Cincinnati and of local No. 2 foundry iron at furnace at Chicago. They are based on the weekly market quotations of *The Iron Age*. The two sets of figures are as follows:

Daily Average Production of Coke and Anthracite Pig Iron in the United States by Months Since January 1, 1907—Gross Tons.

	1907.	1908.	1909.	1910.	1911.
January	71,149	33,918	57,975	84,148	56,752
February	73,038	37,163	60,976	85,616	64,090
March	71,821	39,619	59,232	84,459	70,086
April	73,885	38,289	57,962	82,792	68,836
May	74,048	37,603	60,753	77,102	61,079
June	74,486	36,444	64,656	75,516	59,585
July	72,763	39,287	67,793	69,305	57,841
August	72,594	43,851	72,546	67,963	62,150
September	72,783	47,300	79,507	68,476	.....
October	75,386	50,554	83,856	67,520	.....
November	60,937	51,595	84,917	63,859	.....
December	39,815	56,158	85,022	57,349	.....

Monthly Average Prices in Dollars of Southern No. 2 Foundry Iron at Cincinnati and Local No. 2 Foundry at Chicago District Furnace Since January, 1907.

	1907.		1908.		1909.		1910		1911.	
	Sou. Cin.	Loc. No.2, Chi.	Sou. Cin.	Loc. No.2, Chi.	Sou. Cin.	Loc. No.2, Chi.	Sou. Cin.	Loc. No.2, Chi.	Sou. Cin.	Loc. No.2, Chi.
Jan.	26.00	25.00	16.15	18.10	16.26	17.00	17.25	18.50	14.25	15.00
Feb.	26.00	25.50	15.75	17.81	16.13	16.40	17.06	18.50	14.25	15.00
Mar.	26.00	25.75	15.50	17.50	15.05	16.15	16.30	17.80	14.25	15.00
Apr.	25.06	26.00	15.20	17.38	14.25	16.15	15.37	17.00	14.25	15.00
May	24.25	26.50	14.75	17.28	14.50	16.15	15.00	16.56	14.00	15.00
June	24.10	26.25	15.25	17.38	14.70	16.13	14.85	16.25	13.50	15.00
July	23.85	25.20	15.00	17.20	15.75	16.65	14.75	16.06	13.25	14.87
Aug.	23.00	24.50	15.25	17.00	16.38	16.78	14.31	16.00	13.45	14.50
Sept	21.50	23.75	15.65	16.70	17.35	18.35	14.25	15.90	.....	.....
Oct	20.95	22.10	15.75	16.50	17.88	18.50	14.25	15.56	.....	.....
Nov.	19.50	20.31	16.00	16.75	17.75	18.50	14.25	15.50	.....	.....
Dec.	17.00	18.55	16.25	17.00	17.45	18.50	14.25	15.50	.....	.....

The Record of Production

Production of Coke and Anthracite Pig Iron in the United States by Months Since January 1, 1907—Gross Tons.

	1907	1908	1909	1910	1911
Jan.	2,205,607	1,045,250	1,797,560	2,608,605	1,759,326
Feb.	2,045,068	1,077,740	1,707,340	2,397,255	1,794,509
Mar.	2,226,457	1,228,204	1,833,194	2,617,949	2,171,111
Apr.	2,216,558	1,149,602	1,738,877	2,483,763	2,064,086
May	2,295,505	1,165,688	1,883,330	2,390,180	1,893,456
June	2,234,575	1,092,131	1,930,866	2,265,478	1,787,566
July	2,255,660	1,218,129	2,103,431	2,148,442	1,793,068
Aug.	2,250,410	1,359,831	2,248,930	2,106,847	1,926,637
Sept.	2,183,487	1,418,998	2,385,206	2,056,275	.....
Oct.	2,336,972	1,567,198	2,599,541	2,093,121	.....
Nov.	1,828,125	1,577,854	2,547,508	1,909,780	.....
Dec.	1,234,279	1,740,912	2,635,680	1,777,817	.....

New Publications

Hendricks's Commercial Register of the United States. Size, 7¼ x 10¼ in.; pages, 1419. Cloth bound. Price, $10 net. Published by S. E. Hendricks Company, 74 Lafayette street, New York City.

The present or twentieth annual edition of this book is by far the most complete ever published. The index which last year required 99 pages, now contains nine more pages, and this extra matter represents manufacturers of over 3000 articles that have not appeared in previous issues. The total number of classifications is over 45,000, each representing manufacturers of or dealers in machines, tools, specialties and materials required in the architectural engineering, mechanical, electrical, railroad and kindred fields. This edition contains 77 pages more than the previous one and 47 pages of matter appearing in the last edition were omitted, which makes the total number of pages of new matter 124 and represents over 350,000 names and addresses.

While the simplicity of its classification has always been a feature of the Commercial Register, the classifications this year have been arranged in numerical order and the index refers directly to the numbers of the various classifications instead of to the page. The different classifications are all arranged so that the book may be used for either purchasing or mailing purposes. The general heading for mailing purposes is first given, under which all manufacturers of a particular trade are first classified and each of the firms or corporations appears again under as many classifications as every variety of its product calls for. An effort has been made to give after the names of the different firms information which would be of assistance to the buyer and save the expense of writing to a number of firms for a particular article desired. Trade names of all the articles classified are included as far as possible and appear in parenthesis between the names and addresses of the different firms appearing under the classifications.

Superior Special Charcoal Pig Iron.—The Superior Charcoal Iron Company, Grand Rapids, Mich., states that all its blast furnaces are now making the Superior Special brand of charcoal pig iron. These furnaces are the Pioneer, Elk Rapids, Antrim, Excelsior, Champion, Marquette, Michigan and Pine Lake. Not long ago the Lake Superior & Ishpeming Railroad ordered a lot of car wheels made entirely from this iron. The wheels were made without the use of ferromanganese, ferrosilicon or alloys of any kind in either cupola or ladle, the fuel used being standard Connellsville coke. The wheels were of the 33-in. M.C.B. 725-lb. type, No. 2 tape. They broke at the 115th blow under the regular M.C.B. drop test of 220 lb., falling 12 ft., the M.C.B. requirements for this test being 12 blows. These wheels are to be placed under engine tanks, where they will be subjected to the heaviest service. From the high strength shown and the intense hardness of the chill, they will undoubtedly give a high mileage.

The Sowers Mfg. Company, operating the H. W. Dopp Company, Buffalo, N. Y., has recently finished and has in complete running order a new machine shop and erecting building. The company is steadily broadening its lines of foundry and machine shop work and engineering and finds its business this year ahead of that of 1910 at the same date. The excellent business is ascribed to the fact that the company's apparatus is becoming better known and used by those who are seeking the utilization of certain by-products.

The Wickwire Steel Company, Buffalo, N. Y., blew out its Harriet X furnace last week for relining. It will be blown in as early as possible in October.

The blast furnace of the Ironton Iron Company, Ironton, Ohio, was blown in this week.

The Jackson Iron & Steel Company, Jackson, Ohio, is this week blowing in its furnace which has been idle since December, 1910.

The Iron and Metal Markets

A Comparison of Prices

Advances Over the Previous Week in Heavy Type. Declines in Italics.

At date, one week, one month and one year previous.

	Sept. 7, 1911.	Aug. 30, 1911.	Aug. 2, 1911.	Sept. 7, 1910
PIG IRON, Per Gross Ton:				
Foundry No. 2 standard, Philadelphia	$15.00	$15.00	$15.00	$16.00
Foundry No. 2 Valley furnace	13.50	13.50	13.50	13.75
Foundry No. 2 Southern, Cincinnati	13.50	13.50	13.25	14.25
Foundry No. 2, Birmingham, Ala.	10.25	10.25	10.00	11.00
Foundry No. 2, at furnace, Chicago*	14.50	14.50	14.50	16.50
Basic, delivered, eastern Pa.	14.75	14.75	14.50	15.00
Basic, Valley furnace	13.00	13.00	13.00	13.75
Bessemer, Pittsburgh	15.90	15.90	15.90	15.90
Gray Forge, Pittsburgh	13.90	13.90	13.90	14.15
Lake Superior charcoal, Chicago	16.50	16.50	16.50	18.50
COKE, CONNELLSVILLE, Per Net Ton, at Oven:				
Furnace coke, prompt shipment	1.50	1.50	1.75	1.60
Furnace coke, future delivery	1.60	1.60	1.60	1.75
Foundry coke, prompt shipment	1.85	1.85	1.85	2.15
Foundry coke, future delivery	2.10	2.10	2.00	2.25
BILLETS, &c., Per Gross Ton:				
Bessemer billets, Pittsburgh	21.00	21.00	21.00	24.50
Forging billets, Pittsburgh	26.00	26.00	26.00	29.00
Open hearth billets, Philadelphia	23.40	23.40	23.40	27.00
Wire rods, Pittsburgh	27.00	27.00	27.00	28.00
OLD MATERIAL, Per Gross Ton:				
Iron rails, Chicago	14.00	14.00	14.00	16.00
Iron rails, Philadelphia	17.00	17.00	17.50	18.00
Car wheels, Chicago	13.00	13.00	12.75	14.00
Car wheels, Philadelphia	13.00	13.00	13.00	13.75
Heavy steel scrap, Pittsburgh	13.00	13.00	13.25	14.25
Heavy steel scrap, Chicago	10.50	11.00	10.75	12.25
Heavy steel scrap, Philadelphia	13.25	13.25	13.50	13.75
FINISHED IRON AND STEEL, Per Pound:	Cents.	Cents.	Cents.	Cents.
Bessemer rails, heavy, at mill	1.25	1.25	1.25	1.25
Refined iron bars, Philadelphia	1.27½	1.27½	1.27½	1.40
Common iron bars, Pittsburgh	1.25	1.25	1.25	1.45
Common iron bars, Chicago	1.20	1.20	1.20	1.35
Steel bars, Pittsburgh	1.20	1.20	1.20	1.40
Steel bars, tidewater, New York	1.36	1.36	1.36	1.56
Tank plates, Pittsburgh	1.30	1.30	1.35	1.40
Tank plates, tidewater, New York	1.46	1.46	1.51	1.56
Beams, Pittsburgh	1.35	1.35	1.35	1.40
Beams, tidewater, New York	1.51	1.51	1.51	1.56
Angles, Pittsburgh	1.35	1.35	1.35	1.40
Angles, tidewater, New York	1.51	1.51	1.51	1.56
Skelp, grooved steel, Pittsburgh	1.20	1.20	1.20	1.45
Skelp, sheared steel, Pittsburgh	1.30	1.30	1.30	1.55
SHEETS, NAILS AND WIRE, Per Pound:	Cents.	Cents.	Cents.	Cents.
Sheets, black, No. 28, Pittsburgh	1.95	1.95	2.00	2.15
Wire nails, Pittsburgh†	1.65	1.65	1.70	1.70
Cut nails, Pittsburgh†	1.60	1.60	1.60	1.65
Barb wire, galv., Pittsburgh†	2.00	2.00	2.00	2.00
METALS, Per Pound:	Cents.	Cents.	Cents.	Cents.
Lake copper, New York	12.75	12.75	12.75	12.87½
Electrolytic copper, New York	12.50	12.50	12.62½	12.62½
Spelter, St. Louis	*5.80*	5.90	5.70	5.25
Spelter, New York	*6.00*	6.05	5.90	5.40
Lead, St. Louis	4.42½	4.42½	4.45	4.30
Lead, New York	4.50	4.50	4.50	4.40
Tin, New York	41.25	42.87½	42.00	36.20
Antimony, Hallett, New York	7.75	7.75	8.00	7.87½
Tin plate, 100-lb. box, New York	$3.94	$3.94	$3.94	$3.84

* The average switching charge for delivery to foundries in the Chicago district is 50c. per ton.

† These prices are for largest lots to jobbers.

Prices of Finished Iron and Steel f.o.b. Pittsburgh

Freight rates from Pittsburgh in carloads, per 100 lb.: New York, 16c.; Philadelphia, 15c.; Boston, 18c.; Buffalo, 11c.; Cleveland, 10c.; Cincinnati, 15c.; Indianapolis, 17c.; Chicago, 18c.; St. Paul, 32c.; St. Louis, 22½c.; New Orleans, 30c.; Birmingham, Ala., 45c. Rates to the Pacific coast are 80c. on plates, structural shapes and sheets, No. 11 and heavier; 85c. on sheets, Nos. 12 to 16; 95c. on sheets, No. 16 and lighter; 65c. on wrought boiler tubes.

Plates.—Tank plates, ¼ in. thick, 6¼ in. up to 100 in. wide, 1.30c. to 1.35c., base. Following are stipulations prescribed by manufacturers, with extras to be added to base price (per pound) of plates:

Rectangular plates, tank steel or conforming to manufacturers' standard specifications for structural steel dated February 6, 1903, or equivalent, ¼ in. thick and over on thinnest edge, 100 in. wide and under, down to but not including 6 in. wide, are base.

Plates up to 72 in. wide, inclusive, ordered 10.2 lb. per square foot, are considered ¼ in. plates. Plates over 72 in. wide must be ordered ¼ in. thick, or else, or not less than 11 lb. per square foot, to take base price. Plates over 72 in. wide ordered less than 11 lb. per square foot down to the weight of 3/16 in. take the price of 3/16 in.

Allowable overweight, whether plates are ordered to gauge or weight, to be governed by the standard specifications of the Association of American Steel Manufacturers.

	Cents per lb.
Gauges under ¼ in. to and including 3/16 in. on thinnest edge, extra	.10
Gauges under 3/16 in. to and including No. 8	.15
Gauges under No. 8 to and including No. 9	.25
Gauges under No. 9 to and including No. 10	.30
Gauges under No. 10 to and including No. 12	.40
Sketches (including all straight taper plates) 3 ft. and over in length	10
Complete circles, 3 ft. in diameter and over	.20
Boiler and flange steel	.10
"A. B. M. A." and ordinary firebox steel	.20
Still bottom steel	.30
Marine steel	.40
Locomotive firebox steel	.50
Widths over 100 in. up to 110 in., inclusive	.05
Widths over 100 in. up to 115 in., inclusive	.10
Widths over 115 in. up to 120 in., inclusive	.15
Widths over 120 in. up to 125 in., inclusive	.25
Widths over 125 in. up to 130 in., inclusive	.50
Widths over 130 in.	1.00
Cutting to lengths or diameters under 3 ft. to 2 ft., inclusive	.25
Cutting to lengths or diameters under 2 ft. to 1 ft., inclusive	.50
Cuttings to lengths or diameters under 1 ft.	1.55

No charge for cutting rectangular plates to lengths 3 ft. and over.

TERMS—Net cash 30 days.

Structural Material.—I-beams and channels, 3 to 15 in., inclusive, 1.35c. to 1.40c., net. Other shapes and sizes are quoted as follows:

	Cents per lb.
I-beams over 15 in.	1.45 to 1.50
H-beams over 15 in.	1.50 to 1.55
Angles, 3 to 6 in., inclusive, ¼ in. and up	1.35 to 1.40
Angles, over 6 in.	1.45 to 1.50
Angles, 3 in. on one or both legs, less than ¼ in. thick, plus full extras as per steel bar card Sept. 1, 1909	1.40 to 1.45
Tees, 3 in. and up	1.40 to 1.45
Zees, 3 in. and up	1.35 to 1.40
Angles, channels and tees, under 3 in., plus full extras as per steel bar card Sept. 1, 1909	1.40 to 1.45
Deck beams and built angles	1.65 to 1.70
Hand rail tees	2.45
Checkered and corrugated plates	2.45

Sheets.—Makers' prices for mill shipments on sheets of U. S. standard gauge, in carload and larger lots, on which jobbers charge the usual discounts for small lots from store, are as follows:

Blue Annealed Sheets.

	Cents per lb.
Nos. 3 to 8	1.35 to 1.40
Nos. 9 and 10	1.45 to 1.50
Nos. 11 and 12	1.50 to 1.55
Nos. 13 and 14	1.55 to 1.60
Nos. 15 and 16	1.65 to 1.70

One Pass, Cold Rolled Box Annealed Sheets.

Nos. 10 to 12	1.60 to 1.65
Nos. 13 and 14	1.65 to 1.70
Nos. 15 and 16	1.70 to 1.75
Nos. 17 to 21	1.75 to 1.80
Nos. 22, 23 and 24	1.80 to 1.85
Nos. 25 and 26	1.85 to 1.90
No. 27	1.90 to 1.95
No. 28	1.95 to 2.00
No. 29	2.00 to 2.05
No. 30	2.10 to 2.15

Three Pass Cold Rolled Box Annealed Sheets.

Nos. 15 and 16	1.80 to 1.85
Nos. 17 to 21	1.85 to 1.90
Nos. 22 to 24	1.90 to 1.95
Nos. 25 and 26	1.95 to 2.00
No. 27	2.00 to 2.05
No. 28	2.05 to 2.10
No. 29	2.10 to 2.15
No. 30	2.20 to 2.25

Galvanized Sheets of Black Sheet Gauge.

Nos. 10 and 11	1.95 to 2.00
Nos. 12, 13 and 14	2.05 to 2.10
Nos. 15, 16 and 17	2.20 to 2.25
Nos. 18 to 20	2.35 to 2.40
Nos. 21 and 24	2.45 to 2.50
Nos. 25 and 26	2.65 to 2.70
No. 27	2.80 to 2.85
No. 28	2.95 to 3.00
No. 29	3.05 to 3.10
No. 30	3.25 to 3.30

All above rates are f.o.b. Pittsburgh, terms 30 days net, or 2 per cent cash discount 10 days from date of invoice, as also are the following base prices per square for painted and galvanized roofing sheets, with 2½-in. corrugations:

Gauge.	Painted.	Galvanized	Gauge.	Painted.	Galvanized
29		$2.40	23	$2.40	$3.50
28	$1.40	2.55	22	2.60	3.70
27	1.55	2.60	21	2.80	4.05
26	1.65	2.65	20	3.05	4.35
25	1.85	3.05	18	4.05	5.70
24	2.10	3.15	16	4.90	6.50

THE IRON AND METAL MARKETS

Wrought Pipe.—The following are the jobbers' carload discounts on the Pittsburgh basing card on wrought pipe, in effect from October 1, 1910:

	Steel		Iron	
	Black	Galv.	Black	Galv.
Butt Weld				
½ to ¾ in.			67	55
1 in.	75	63	71	59
1¼ to 1½ in.	78	69	75	65
2 to 3 in.	80	70	76	66
Lap Weld				
½ in.	76	66	72	60
¾ to 1 in.	78	67	74	62
1¼ to 1½ in.	78	67	73	63
2 to 2½ in.	78	59	71	55
3 to 6 in.	81½			
Butt Weld, extra strong, plain ends, card weight.				
¼ to ⅜ in.	60	50	56	44
½ in.	64	54	59	49
¾ in.	70	58	65	54
1 in.	74	63	70	58
1¼ to 2 in.	78	67	74	62
2½ to 3 in.	79	73	75	67
Lap Weld, extra strong, plain ends, card weight				
½ in.	75	69	71	65
¾ to 1 in.	77	71	73	67
1¼ to 2 in.	76	70	72	66
2½ to 3 in.	66	56	65	55
3½ to 12 in.	64	54	60	50
Butt Weld, double extra strong, plain ends, card weight.				
¼ in.	64	58	60	54
½ to 1½ in.	67	61	63	57
2 to 3 in.	66	63	65	54
Lap Weld, double extra strong, plain ends, card weight				
¾ in.	65	59	61	55
1 to 2 in.	67	61	63	57
2½ to 4 in.	66	60	62	56
4½ to 6 in.	59	49	62	56
7 to 8 in.				

Plugged and Reamed will be sold at two (2) points lower basing (higher price) than merchants' or card weight pipe. Butt or lap weld, as specified.

1 to 1½, 2 to 3 in. Butt Weld
2, 2½ to 4 in. Lap Weld

The above discounts are for "card weight," subject to the usual variation for "specification." Prices for less than carloads are three (3) points lower basing (higher price) than the above discounts.

Boiler Tubes.—Discounts on lap welded steel boiler tubes to jobbers in carloads are as follows:

	Steel
1 to 2 in.	65
2½ in.	67½
3 to 3½ in.	70
3½ to 4½ in.	72½
5 to 6 in.	65
7 to 13 in.	62½

Less than carloads to destination east of the Mississippi River will be sold at delivered discounts to carload lowered by two points for lengths 9 ft. and under, longer lengths to Pittsburgh. Usual extras to jobbers and dealer manufacturers.

Wire Rods and Wire.—Bessemer, open hearth and chain rods, $27. Fence wire, Nos. 0 to 9 per 100 lb., terms 60 days, or 2 per cent discount in 10 days, carload lots, to jobbers, annealed, $1.50; galvanized, $1.80. Carload lots, to retailers, annealed, $1.55; galvanized, $1.85. Galvanized bar wire to jobbers, $2; painted, $1.70. Wire nails, to jobbers, $1.65.

The following table gives the price to retail merchants on wire in less than carloads, including the extras on Nos. 10 to 16, which are added to the base price:

Fence Wire, Per 100 lb.

No.	0 to 6	7	8	9	10	11	12	13	14	15	16
Annealed	$1.65	$1.70	$1.75	$1.80	$1.90	$2.00	$2.10	$2.20	$2.30	$2.40	$2.50
Galvanized	1.95	2.00	2.05	2.10	2.20	2.30	2.40	2.50	2.60	2.70	2.80

Mixed and Stone Wire in Bundles, Discount from Standard List.

Bright and Annealed:
- ½ and coarser: 80
- 14 to 18: 80 and 5
- 19 to 26: 80 and 5 and 10
- 27 to 36: 80 and 5

Galvanized:
- ½ and coarser: 75 and 10
- 14 to 16: 75 and 10
- 17 to 26: 72½ and 10
- 27 to 36: 72½

Painted or Liquor Finished:
- ½ and coarser: 75 and 10
- 14 to 26: 75 and 10
- 27 to 36: 70 and 10

Tinned:
- 6 to 18: 75 and 10 and 10

Pittsburgh

PITTSBURGH, PA., September 6, 1911.—*(By Telephone.)*

Pig Iron.—The largest new inquiry in this district or nearby territory is that of a Canton consumer for 3500 tons of basic for delivery this year. We also note an inquiry from a local consumer for 1000 tons of foundry iron for the last quarter and the same tonnage for the first quarter of next year. Local consumers of pig iron are pretty well covered for the remainder of this year and have not yet sent out inquiries for the first quarter or the first half of next year. The average price of Bessemer iron in August was $15 at Valley basis, $15 at Valley furnace. We quote as follows: Bessemer, $15; basic, $13 for early delivery and $13.25 for extended delivery. No. 2 foundry, $13.50 to $13.75, malleable, $13.25 to $13.50; gray forge, $13, all at Valley furnace, the freight rate to Pittsburgh being 90c.

Steel.—Specifications against contracts for billets and sheet and tin bars are reported as coming in very freely, but there is no new inquiry, as consumers are covered by contract. Some of the smaller open hearth steel concerns are shading regular prices on billets and bars about $1 a ton on small lots for prompt delivery. We quote Bessemer and open hearth billets, 4 x 4 in. and up to but not including 10 x 10 in., $21 base, and sheet and tin bars in 30-ft. lengths, $22; 1½-in. billets, $22; forging billets, $26, base, usual extras for sizes and carbons, all prices being f.o.b. Pittsburgh or Youngstown district, with freight to destination added.

Rails.—The Carnegie Steel Company has sold to a local railroad 7000 tons of standard sections for prompt shipment and has also received other orders for about 4000 tons for early delivery. This concern also reports a fairly heavy inquiry for track supplies of all kinds, with large sales of splice bars.

(By Mail.)

The month of August made a better showing in the iron trade than July. While it has been dull so far this month, there is strong hope that it will show up equally well, and possibly be a little better. The rail and billet sales department of the Carnegie Steel Company reports that its orders and specifications sent to the mills for rolling in August exceeded those of July by a good many thousand tons; although a good part of this business is for export, yet the domestic business last month showed an increase over July. New orders for finished iron and steel are only for actual needs of consumers, and jobbers are carrying as light stocks as possible. The mills are naming such prices as they think are necessary to get what business is being offered, and the present market is altogether in favor of the buyer. There have been no drastic cuts in prices as yet, but there is more disposition to shade figures, and this is causing buyers to place orders very cautiously. The recent cut of $1 a ton in wire products has not resulted in any marked increase in business, and this would probably be the result if open cuts were made on other products. It looks as though it would be a waiting game for some little time, but no serious price disturbances are expected. The scrap trade is stagnant and so is coke, with prices only fairly steady.

Ferromanganese.—No sales are reported. Prices are only fairly strong, the metal having been sold recently at less than $37, Baltimore, for the first half of next year. We quote foreign 80 per cent. at $36.50 for the remainder of the year and about $37 for first half of 1912, the freight rate to Pittsburgh district being $1.95 a ton.

Ferrosilicon.—Consumers who had inquiries out are not closing, on account of the higher prices asked by sellers. We continue to quote 50 per cent. ferrosilicon at $53 to $54 and blast furnace silicon as follows: 10 per cent., $23; 11 per cent., $24; 12 per cent., $25, f.o.b. cars Ashland and Jisco furnaces.

Muck Bar.—A sale of 500 tons of high-grade muck bar is reported at a price equal to about $29, Pittsburgh. We quote best grades made from all pig iron at $28.50 to $29, Pittsburgh. Some makes of bar from outside makers are offered at slightly lower prices.

Skelp.—No sales are reported and there is no new inquiry. Prices are only fairly strong. We quote: Grooved steel skelp, 1.20c.; sheared steel skelp, 1.30c.; grooved iron skelp, 1.45c. to 1.55c., and sheared iron skelp, 1.65c. to 1.70c., all for delivery at consumers mills in the Pittsburgh district.

Wire Rods.—The market is very dull and prices are weak. We quote Bessemer, open hearth and chain rods at $27, Pittsburgh, but on a firm offer this price would no doubt be shaded.

Steel Rails.—Some new business in standard sections is about ready to be placed, and may be given out this week. The Carnegie Steel Company is having quite a good business in light rails, especially from the coal companies, and last week received new orders and specifications for about 3500 tons. Prices on light rails are as follows: 12-lb., 1.25c.; 16, 20 and 25-lb., 1.21c. to 1.25c.; 30 and 35-lb., 1.20c., and 40 and 45-lb., 1.16c. These prices are f.o.b. at mill, plus freight, and are the minimum of the market in carload lots, small

THE IRON AND METAL MARKETS

lots being sold at a little higher price. Standard sections are held at 1.25c. per lb. for Bessemer.

Plates.—The situation in the plate trade is quiet, with no large business pending. The Monon Railroad is asking prices on 1000 steel gondola cars, the Erie on 200 refrigerator cars, the Baltimore & Ohio on 10 steel postal cars, 10 steel baggage cars and the Vandalia Lines on 47 steel underframe box cars. The McKees Rocks Works of the Pressed Steel Car Company is running to only about 30 per cent. of capacity, while the Standard Steel Car Company is running its Butler plant to about 50 per cent. of capacity. Prices on plates continue somewhat weak and 1.30c. is being named, on desirable orders. We quote ¼-in. and heavier plates at 1.30c. to 1.35c., f.o.b. Pittsburgh.

Structural Material.—The actual bookings of the American Bridge Company in August were much the heaviest in any one month this year, and it is said to be filled up with work for the next six months. As a result of this, prices are a little stronger, the other fabricating concerns asking higher figures on work to be erected in the next two or three months, and on which they are able to guarantee deliveries. We quote beams and channels up to 15-in. at 1.35c., Pittsburgh.

Sheets.—General conditions are fairly satisfactory, as far as new demand and specifications against contracts go, but there is still considerable unevenness in prices. The mills have been going after new business more aggressively. In most cases concessions are not more than $1 a ton, but where desirable sizes are involved, and prompt specifications are furnished by the buyer, prices are being shaded $2 per ton. As a rule the leading sheet mills are operating to about 70 to 75 per cent. of capacity. Shipments of sheets by the mills in August showed an increase over July. We give on a previous page a table of prices f.o.b. mill on the various grades of sheets.

Tin Plate.—There is practically no new buying of tin plate, as the season is over. Specifications from the can makers are coming in quite freely, but not as heavy as some time ago. At present the American Sheet & Tin Plate Company is operating to about 80 per cent. of capacity and the independent mills as a rule are operating at about the same rate. The Jones & Laughlin Steel Company will soon complete its second unit of tin plate mills at Aliquippa, which will make a total of 24 mills. There are now about 150 hot tin mills operated by the independent plants. On desirable new business for delivery late this year or early in 1912 the tin plate mills are making a price of $3.60 per base box. We quote 100-lb. cokes for early shipment at $3.70 per base box f.o.b. Pittsburgh, but on new orders for late delivery $3.60 per base box is being named.

Bars.—The heavy buying in steel bars is pretty well over, most consumers having covered by contracts for their supply for some months ahead. The implement makers are specifying fairly well against contracts, but the wagon builders are not taking out their bars as promptly as desired. Prices continue somewhat weak and 1.20c. is being named by most of the steel bar makers on desirable orders. The new demand for iron bars is very dull and specifications against contracts are unsatisfactory. We quote steel bars at 1.20c. to 1.25c. and iron bars at 1.25c. to 1.30c., Pittsburgh.

Merchant Steel.—New orders and specifications in August were somewhat heavier than in July, but fell off to some extent in the latter part of the month. Prices are being more or less shaded. Regular quotations are as follows: Iron finished tire, ¼ x ½ in. and heavier, 1.40c., base; under these sizes, 1.55c.; planished tire, 1.60c.; channel tire, 1.80c., base; toe calk, 1.90c.; flat sleigh shoe, 1.55c.; concave or convex, 1.75c.; cutter shoes, tapered or bent, 2.25c.; spring steel, 2c.; machinery steel, smooth finish, 1.90c.

Hoops and Bands.—The makers report that actual orders and specifications against contracts in August were a little better than in July. It is said that in some cases bands have sold below the 1.25c. price and that 1.40c. on steel hoops has also been shaded. We quote steel hoops at 1.40c. and bands at 1.25c., extras on the latter as per the steel bar card.

Rivets.—There is only a fair new demand, consumers placing only such orders for rivets as are wanted to meet current needs. Specifications against contracts are not very good and prices in some cases are being shaded. We quote structural rivets at 1.70c. to 1.75c. and boiler rivets at 1.80c. to 1.85c., but these prices are not always obtained.

Wire Products.—The recent cut of $1 per ton on wire products has not brought out any large increase in new business, jobbers and consumers still buying only such quantities of nails and wire as are absolutely needed to meet current wants. Stocks held by jobbers are light and a more active buying is expected as fall approaches. Regular prices, which are openly shaded $1 per ton, are as follows: Galvanized barb wire, $2 per 100 lb.; painted, $1.70; annealed fence wire, $1.50; galvanized, $1.80; wire nails, $1.70 and cut nails, $1.60, all f.o.b. Pittsburgh, with full freight added to point of delivery.

Spelter.—Prices have shown a heavy decline in the past week, and we quote prime grades of Western at 5.70c., East St. Louis, equal to 5.82½c., Pittsburgh. New demand is reported to be light.

Shafting.—New demand and specifications are only for small lots to cover actual needs. The recent cutting in prices has not stimulated demand, and the present situation in this product is very unsatisfactory. We quote shafting in carload and larger lots at 60 and 7½ to 60 and 10 per cent. off regular list, delivered in base territory.

Railroad Spikes.—The demand is only for small lots for repair work. Some time ago some fairly large contracts for spikes were placed, but the railroads are not specifying very freely against these contracts. We quote railroad spikes at $1.50 per 100 lb., base sizes, f.o.b. Pittsburgh.

Merchant Pipe.—Three or four of the leading pipe mills report shipments in August as having been heavier than in July, and also larger than in the same month last year. No large contracts for gas or oil lines have been placed since our last report, but several of these projects are under way and may develop in the very near future. Mills report that the demand for merchant pipe is fairly heavy and the leading pipe mills are operating to about 70 per cent. of capacity. There is some shading in prices of iron and steel pipe, but not more than usual when the demand is only fairly active. We give on a previous page regular discounts on pipe and boiler tubes.

Boiler Tubes.—While there is a little better new demand for railroad tubes, the general condition of the tube trade is very unsatisfactory, and has been for some months.

Coke.—Trade is very quiet. While there is some inquiry for furnace coke for delivery over the next month or two, intending buyers are very slow in closing. We note a sale of about 5000 tons of standard furnace coke for September shipment at $1.50 per net ton at oven. The output in the upper and lower Connellsville regions last week was 332,157 tons, an increase over the previous week of 18,435 tons. We quote standard makes of furnace coke for prompt shipment at $1.50, and for remainder of the year at $1.60 to $1.65 per net ton at oven. We quote standard 72-hr. foundry coke for prompt shipment at $1.85 to $1.90, and for future delivery at $2.10 up to $2.25 per net ton, at oven.

Iron and Steel Scrap.—Dealers now report that it is easier to get scrap than it is to sell it. An embargo is on scrap routed to one of the largest consumers in this district, while another is expected to declare an embargo any day. The steel mills are operating to larger capacity than they were a month ago, and yet they are not taking in scrap as freely as they did some time ago. Prices are weak. Dealers now quote as follows, per gross ton, f.o.b. Pittsburgh, unless otherwise noted:

Heavy steel scrap, Steubenville, Follansbee, Sharon, Monessen and Pittsburgh delivery	$13.00
No. 1 foundry cast	$13.25 to 13.50
No. 2 foundry cast	12.75 to 13.00
Bundled sheet scrap, f.o.b. consumers' mill, Pittsburgh district	11.25 to 11.50
Rerolling rails, Newark and Cambridge, Ohio, Cumberland, Md., and Franklin, Pa.	13.50 to 13.75
No. 1 railroad malleable stock	12.75 to 13.00
Grate bars	10.75 to 11.00
Low phosphorus melting stock	15.75 to 16.00
Iron car axles	23.00 to 23.50
Steel car axles	17.50 to 18.00
Locomotive axles	23.00
No. 1 busheling scrap	12.00 to 12.25
No. 2 busheling scrap	8.50 to 8.75
Old car wheels	13.00 to 13.25
Sheet bar crop ends	15.25 to 15.50
*Cast iron borings	9.25
*Machine shop turnings	9.50
Old iron rails	15.50 to 15.75
No. 1 wrought scrap	13.50 to 14.00
Heavy steel axle turnings	10.00 to 10.25
Stove plate	10.50 to 10.75

*These prices are f.o.b. cars at consumers' mills in the Pittsburgh district.

THE IRON AND METAL MARKETS

Chicago

CHICAGO, ILL., September 6, 1911.—*(By Telegraph.)*

In this district the month of August failed to justify the hopes of larger tonnages as compared with June and July. While the bookings of last month did not fall off greatly, the aggregate of orders for rails, plates and bars, as compared with those of the preceding months, showed a decrease too large to be overcome by the well-maintained volume of structural business. Pig iron sales were likewise very light. As contrasted with an optimistic tone at the beginning of the month, the market now represents the aspect of making the best of an unsatisfactory situation. Shading of prices on sheets and steel bars continues especially pronounced, while the firmness of iron bars, plates and wire products is maintained with difficulty. The market for old material has weakened somewhat. The continuance of adverse rate rulings and the recent demands made upon the railroads by labor organizations, against which a firm stand is apparently to be made, have been coincident with a perceptible falling off in railroad expenditures. This seems to apply particularly to rolling stock, aside from locomotives, for which limited orders have been placed by several Western roads.

Pig Iron.—The past week brought out comparatively few sales, and nearly all of the business consisted of spot shipments in carload lots. For such business a price of $10, Birmingham, for No. 2 Southern has been obtainable without great difficulty. For forward shipment the price continues to be $10.50. Furnaces are quoting $11 for first quarter delivery, but this price has not proved interesting to consumers. Local iron can be moved only within narrow limits, and then only at prices very unattractive to the furnace. We quote for Chicago delivery, except for local irons, which are f.o.b. furnace, the following prices:

Lake Superior charcoal	$16.50 to $17.00
Northern coke foundry, No. 1	15.00 to 15.50
Northern coke foundry, No. 2	14.50 to 15.00
Northern coke foundry, No. 3	14.25 to 14.50
Northern Scotch, No. 1	16.00
Southern coke, No. 1 foundry and No. 1 soft	15.10
Southern coke, No. 2 foundry and No. 2 soft	14.60
Southern coke, No. 3	14.35
Southern coke No. 4	14.10
Southern gray forge	13.85
Southern mottled	13.85
Malleable Bessemer	14.50 to 15.00
Standard Bessemer	17.40
Basic	15.50
Jackson Co. and Kentucky Silvery, 6 per cent.	17.90
Jackson Co. and Kentucky Silvery, 8 per cent.	18.90
Jackson Co. and Kentucky Silvery, 10 per cent.	19.90

Structural Material.—The lettings for fabricated structural steel reported as placed in the past week totaled only 1500 tons and were scattered over a wide area. A building for Hegeler Brothers, Danville, Ill., will require 312 tons; the Masonic Temple at Des Moines, Iowa, 614 tons; a bank building at Jacksonville, Ill., 255 tons, and three jobs in California, two bridges and a courthouse, about 100 tons each. Competition among fabricators is not quite so keen, and there is correspondingly less pressure on the price of plain material. We quote plain material, mill shipment, for Chicago delivery, at 1.53c., and from store, 1.75c

(By Mail.)

Rails and Track Supplies.—In the matter of rails and new car equipment the railroads seem to have entered upon another period of strict retrenchment. Rail sales in this market in the past week covered an exceedingly meagre tonnage. From South and Southwestern territory the Ensley plant of the leading interest has drawn a more satisfactory volume, and on the basis of 50,000 tons monthly this mill has on its books about three months' rolling. A number of the inquiries for new cars upon which expectations of considerable business were based have been withdrawn. The unsettled labor situation in the West is held to be responsible in large measure for the present attitude. We quote standard railroad spikes at 1.65c. to 1.75c., base; track bolts with square nuts, 2.10c. to 2.20c., base, all in carload lots, Chicago; standard section Bessemer rails, 1.28c.; open hearth, 1.34c.; light rails, 40 to 45 lb., 1.16c. to 1.20½c.; 30 to 35 lb., 1.19½c. to 1.24c.; 16, 20 and 25 lb., 1.20½c. to 1.25c.; 12 lb., 1.25c. to 1.30½c.; angle bars, 1.50c. to 1.60c., Chicago.

Plates.—Specifications for bridge material for railroad work have not been subject to curtailment in as marked degree as other supplies, and the plate tonnage carried in this business has prevented any very large decrease in the tonnage placed in August as compared with June and July. However, a slight falling off is noted. Contract tonnage has supported the price situation as to plates, but for miscellaneous business moderate concessions are not entirely lacking. We quote for Chicago delivery from mill, 1.53c.; from store, 1.75c.

Sheets.—While the larger sheet mills continue to receive orders sufficient to keep in operation a large part of their total capacity, enough tonnage is not available to admit of their forfeiting business rather than meet concessions. The shading of $1 to $2 per ton for which the smaller mills are for the most part primarily responsible becomes, as a result, quite general. At the same time there is not so much a shading of the base price as a relinquishing of freight advantages. We quote for Chicago delivery, carload lots, from mill: No. 28 black sheets, 2.18c.; No. 28 galvanized, 3.18c.; No. 10 blue annealed, 1.68c. Prices from store, Chicago, are: No. 10, 1.95c. to 2.05c.; No. 12, 2c. to 2.10c.; No. 28 black, 2.45c. to 2.55c.; No. 28 galvanized, 3.45c.

Bars.—The manufacturers of bar iron have undoubtedly assumed a firmer stand with references to prices and upon the exceedingly reasonable basis that the low prices recently prevailing meant a direct loss. At the same time the order which will just fill out a rolling is pretty likely to bring out the price necessary to take it, particularly if it calls for extras. Steel car business is slightly decreased in volume, and as a result no change in the direction of firmer prices is manifested. We quote as follows, f.o.b. Chicago: Soft steel bars, 1.43c.; bar iron, 1.20c. to 1.25c.; hard steel bars, rolled from old rails, 1.20c. From store, soft steel bars, 1.70c. to 1.80c., Chicago

Old Material.—With the largest consumer of heavy melting steel in the market asking for delays in shipments, and other melters confining their purchases within narrow limits, the local scrap market is dull, with slightly lower prices. The accumulation of railroad and country scrap, the quick unloading of which on this market is possible though not considered imminent, is exerting an adverse influence. Railroad offerings in the current week were small, including 100 tons from the Chicago & Alton and 750 tons from the Wabash. We have modified our prices and quote for delivery at buyers' works, Chicago and vicinity, all freight and transfer charges paid, per gross ton, as follows

Old iron rails	$14.00 to $14.50
Old steel rails, rerolling	12.75 to 13.25
Old steel rails, less than 3 ft.	11.50 to 12.00
Relaying rails, standard sections, subject to inspection	24.00
Old car wheels	13.00 to 13.50
Heavy melting steel scrap	10.50 to 11.00
Frogs, switches and guards, cut apart	10.50 to 11.00
Shoveling steel	10.25 to 10.75
Steel axle turnings	8.50 to 9.00

The following quotations are per net ton:

Iron angles and splice bars	$12.50 to $13.00
Iron arch bars and transoms	13.75 to 14.25
Steel angle bars	10.25 to 10.75
Iron car axles	18.00 to 18.50
Steel car axles	16.00 to 16.50
No. 1 railroad wrought	10.75 to 11.25
No. 2 railroad wrought	9.75 to 10.25
Steel knuckles and couplers	10.25 to 9.75
Locomotive tires, smooth	15.00 to 15.50
Machine shop turnings	6.25 to 6.75
Cast and mixed borings	6.00 to 6.50
No. 1 busheling	8.75 to 9.25
No. 2 busheling	6.75 to 7.25
No. 1 boilers, cut to sheets and rings	7.50 to 8.00
Boiler punchings	12.00 to 12.50
No. 1 cast scrap	10.50 to 11.00
Stove plate and light cast scrap	9.00 to 9.50
Railroad malleable	10.25 to 10.75
Agricultural malleable	9.25 to 9.75
Pipes and flues	8.00 to 8.50

Wire Products.—Reports of shading of prices from sources more or less vague have had a disturbing influence on a situation which gave promise of developing satisfactorily with the beginning of fall trade. While the buying of stocks may be somewhat retarded thereby, the opinion prevails, based upon the relatively good tonnage being booked, that an active season in wire nails and fence wire, at least, may be expected. Jobbers' carload prices, which are quoted to manufacturing buyers, are as follows. Plain wire, No. 9 and coarser, base, 1.68c.; wire nails, 1.88c.; painted barb wire, 1.88c.; galvanized, 2.18c.; polished staples, 1.88c.; galvanized, 2.18c., all Chicago.

Cast Iron Pipe.—The volume of country orders for pipe has been the mainstay of the past week, including small town lettings of from 100 to 200 tons. The Santa Fe and Oregon Short Line railroads were purchasers of small tonnages. At Muskegon, Mich., the

THE IRON AND METAL MARKETS

letting of 7000 tons of pipe from 6 to 48 in. is appointed for this week. Pipe plants are well filled up on some sizes, particularly 4-in., the price of which is decidedly firmer. We quote as follows, per net ton, Chicago: Water pipe, 4-in., $26.50; 6 to 12-in., $24.50; 16-in. and up, $24, with $1 extra for gas pipe.

Philadelphia

PHILADELPHIA, PA., September 5, 1911.

The local market has been without special feature. Most of the business transacted has been in small lots for near future delivery, although some buyers would contract for extended shipment if sellers were agreeable. The pig iron movement has been confined to the foundry grades, which are being sold at unchanged prices. Structural material continues the most active of the finished material lines, although good business is ahead in heavy plates. Steel bars, while nominally quoted at 1.40c., are being sold at 1.35c., delivered, and refined iron bars, nominally quoted at 1.20c., mill, have been shaded. The old material market presents a waiting appearance, with prices still weak.

Iron Ore.—Negotiations for a considerable quantity of Swedish ore are still under way. Efforts to introduce a new Norwegian ore in this country are also noted. Very little business is reported in domestic ores, and the market generally is quiet.

Pig Iron.—Sales aggregate a fair total, but are confined almost exclusively to the foundry grades and made up principally of small orders, few being above 300 tons, and are mostly for early shipment. While the general range of prices for standard brands of Eastern foundry grades remains unchanged reports are current that the recent inside figure has been shaded on some brands. This, however, is not applicable to deliveries in this immediate vicinity, but rather at points where favorable freight rates are available and the buyer is given the benefit of a few cents difference in freight charges. An inquiry from a stove foundry for 2000 tons for this year's delivery is in the market. Deliveries on all grades of foundry iron continue to be taken freely and in instances are being urged, which is taken as indicating that consumers are not very well supplied beyond their immediate wants. The movement in Virginia foundry irons has been light; for delivery during the current month $12.25, furnace, can be done, although some producers continue to sell at $12.50. For shipment over the remainder of the year the majority of the sellers still hold at $12.50, furnace. Cast iron pipe makers continue in the market for low grade iron; one Delaware River interest has purchased practically 1000 tons of special analysis iron for early delivery, while negotiations are pending for several round lots. No movement in forge iron is reported, although good inquiries, based on possible business in rolled products, are reported. Steel making grades are quiet. No further inquiry has developed for basic iron and transactions in low phosphorus grades have been small. The following range of quotations is named for standard brands, delivered in buyers' yards in this vicinity, shipment ranging from prompt to the remainder of the year:

Eastern Pennsylvania No. X furnace	$13.00 to $13.50
Eastern Pennsylvania No. 2 plain	14.75 to 15.00
Virginia foundry	12.00 to 12.50
Gray forge	14.25 to 14.50
Basic	14.25 to 15.00
Standard low phosphorus	20.00 to 20.50

Ferroalloys.—Some little movement in ferromanganese for early delivery is reported, one lot of 350 tons to a consumer in this district going at $37, Baltimore. Heavy inquiry from the West is in hand, and it is said that one round lot for next year's delivery has been closed. A sale of 125 tons of 50 per cent. ferrosilicon is reported at $57, with some sellers now asking $58. Furnace ferrosilicon is quiet at unchanged prices.

Billets.—The demand has been extremely light. No interest is reported in large quantities for extended shipment. Ordinary business still commands full prices, $23.40, delivered, for open-hearth rolling billets, and $28.40 for ordinary forging billets, but the market has not been tested recently by any sizable inquiries.

Plates.—A fair volume of specifications against current orders is noted, but there has been little new business of importance placed. Plate makers are encouraged by heavy inquiries for ship plates, previously noted, and look forward to a more active general buying movement in the near future. With several makers orders taken during August are reported to have been larger in the aggregate than those taken the previous month. For ordinary plates 1.50c., delivered here, continues to be named.

Structural Material.—The principal item of interest in this vicinity is the new municipal convention hall for which the early estimates as to structural material requirements have been found to be low. Bids for the steel work, which went in a few days ago, show requirements to have been between 11,000 and 13,000 tons. Few contracts were closed by fabricators last week; only small building work was contracted for and a moderate amount of bridge work. While fabricated prices continue very low, mills still maintain the 1.50c., delivered, basis for plain shapes.

Bars.—The uncertainty as to prices of both steel and iron bars continues. A nominal quotation of 1.40c., delivered, for steel bars is still heard of, but 1.35c., delivered, is readily being done for carload lots. Makers of refined iron bars are endeavoring to hold the recent 1.20c., Eastern mill, price, but lower quotations have been made, although but few producers are willing to shade that figure. Much, however, depends on the desirability of the specification, and for ordinary business 1.27½c. to 1.32½c., delivered, continues to be named.

Sheets.—New business comes out slowly and is confined to small prompt lots. Eastern mills are not operating at much better than 75 per cent. of capacity, and orders ahead are light. Eastern makers maintain recent quotations, which are materially higher than those named for Western sheets.

Coke.—A moderate amount of business has been contracted for in both foundry and furnace grades. A few contracts for foundry coke have been made for deliveries running from four to six months, at prices recently current. In furnace coke transactions have been largely confined to prompt and near future requirements. Spot coke is a trifle less plentiful and, while prices have not advanced, there is a narrower range of quotations on some brands. The following prices, per net ton, are quoted for deliveries in this vicinity:

Connellsville furnace coke	$3.75 to $3.90
Foundry coke	4.25 to 4.40
Mountain furnace coke	3.35 to 3.55
Foundry coke	3.85 to 4.20

Old Material.—The market drags and prices continue to show weakness. Consumers are pretty well supplied with material and take on only bargain lots, making but few offers. Not many sellers will dispose of their holdings at the prices named, awaiting developments. Railroad lists now out represent about an average quantity of old material, for which bids will no doubt be materially lower than last month. Bids for the scrap on the Panama Canal will be opened today, and the announcement of prices named is being awaited with interest. It is said that the government's estimate as to tonnage on the ground has been too high. The following range of prices, while largely nominal, about represents the basis at which business could be done for delivery in buyers' yards, eastern Pennsylvania and nearby points, taking a freight rate from Philadelphia varying from 35c. to $1.35 per gross ton, for shipment ranging from prompt to the remainder of the year:

No. 1 railroad heavy melting steel scrap	$13.25 to $13.50
Yard heavy melting steel scrap	12.75 to 13.00
Old steel rails, rerolling (nominal)	14.00 to 14.50
Low phosphorus heavy melting steel scrap	16.75 to 17.25
Old steel axles (nominal)	19.50 to 20.00
Old iron axles (nominal)	24.50 to 25.00
Old iron rails	17.00 to 17.50
Old car wheels (nominal)	13.00 to 13.50
No. 1 railroad wrought	15.50 to 16.00
Wrought iron pipe	12.50 to 13.00
No. 1 forge fire	11.00 to 11.50
No. 2 light iron (nominal)	6.75 to 7.25
Wrought turnings	8.50 to 9.00
Cast borings	8.00 to 8.50
Machinery cast	13.00 to 13.50
Railroad malleable (nominal)	11.50 to 12.00
Grate bars, railroad	10.00 to 10.50
Stove plate	10.00 to 10.50

Cincinnati

CINCINNATI, OHIO, September 6, 1911.—(*By Telegraph.*)

Pig Iron.—The market is devoid of any snap. Inquiries dwindled to almost the zero mark, as compared with normal conditions, but in spite of this Southern producers especially seem to realize that any concessions would not bring out business and are said to be firm in maintaining prices. A few small lots of South-

THE IRON AND METAL MARKETS

ern No. 2 foundry have been taken by central Western consumers for delivery this year at $10.25, Birmingham, and there are also other sales recorded, covering carload lots, at $10.50. A northern Ohio melter contracted for 300 tons of Northern No. 2 foundry for last quarter delivery at $13, Ironton, and a few smaller orders were booked around the same figure for prompt shipment. About 100 tons of 8 per cent. silicon iron for fourth quarter movement was taken by a central Ohio consumer at $16 at furnace. Only a perfunctory interest is taken in next year's business, and it is rather problematical as to when the furnaces will open their books for that delivery. Prices made so far have been prohibitive, and if the present apathetic feeling prevails much longer it will develop probably an unprecedented situation in the inability of both buyer and seller to get together at this season for the coming year's requirement. Malleable continues dull and is quoted around $13.25, Ironton. Based on freight rates of $3.25 from Birmingham and $1.20 from Ironton we quote, f.o.b. Cincinnati, as follows:

Southern coke, No. 1 foundry and 1 soft	$14.00 to $14.25
Southern coke, No. 2 foundry and 2 soft	13.50 to 13.75
Southern coke, No. 3 foundry	13.00 to 13.25
Southern coke, No. 4 foundry	12.50 to 13.00
Southern stair foundry	12.75 to 13.00
Ohio Silvery, 8 per cent. silicon	16.50 to 17.20
Lake Superior coke, No. 1	14.70 to 14.95
Lake Superior coke, No. 2	14.20 to 14.45
Lake Superior coke, No. 3	13.70 to 13.95
Basic, Northern	14.20 to 14.45
Standard Southern charcoal	15.00 to 15.75
Lake Superior charcoal	19.00

(By Mail.)

Coke.—It is reported that a furnace interest in the Hanging Rock district has contracted for about 7000 tons of 48-hr. coke, for shipment during the remainder of this year. There is practically no inquiry for foundry grades, and sales are confined to very small lots. Prices are unchanged in all three fileds, with Wise County and Pocahontas furnace grades being held around $1.60 to $1.65 per net ton at oven for prompt shipment, with 10c. to 20c. per ton added for future delivery. Connellsville 48-hr. coke is obtainable as low as $1.50 for immediate shipment, but contract figures are higher. Foundry coke is quoted all the way from $2 to $2.35 per net ton, at oven, in all three districts.

Finished Material.—Structural material is holding up fairly well, but other lines are simply drifting along, and while orders are probably as numerous as ever they mostly call for small tonnages. Warehouse prices are firm at 1.70c. for steel bars and around 1.80c. per lb. for structural material. Railroad track material is in poorer demand.

Old Material.—Prices continue to show weakness, and the indifferent attitude of both buyer and seller does not help out the situation. Not much scrap is moving now, though an improvement is looked for before the month is up. The approximate prices paid by buyers delivered in their yards, southern Ohio and Cincinnati, are as follows:

No. 1 railroad wrought, net ton	$10.25 to $10.75
Loose borings, net ton	4.50 to 5.00
Steel turnings, net ton	5.00 to 5.00
No. 1 cast scrap, net ton	9.25 to 9.75
Burnt scrap, net ton	6.50 to 6.75
Old iron axles, net ton	16.25 to 16.75
Bundled sheet scrap, gross ton	7.25 to 8.25
Old iron rails, gross ton	13.25 to 13.75
Relaying rails, 50 lb. and up, gross ton	20.75 to 21.50
Old car wheels, gross ton	14.50 to 15.50
Heavy melting steel scrap, gross ton	16.75 to 20.25

Cleveland

CLEVELAND, Ohio, September 5, 1911.

Iron Ore.—Ore shipments for the season up to September 1 were 19,301,846 tons. That is a falling off of 3,525,183 tons as compared with the same period last year. The August movement was 5,548,311 tons. This is an increase of 326,738 tons over July. A falling off is expected in September and the movement after October will be very light. Last year shipments from September 1 till the end of the season aggregated 13,793,161 tons. With a similar movement the remainder of this season the total shipments for the year would aggregate 33,000,000 tons. While there are some predictions that the movement will reach 32,000,000, the opinion is more general that it will scarcely exceed [illegible] tons. The market remains inactive, the only sales reported being two small lots. No sales of importance are expected for the remainder of the season. We quote prices as follows: Old range Bessemer, $4.50; Mesaba Bessemer, $4.25; old range non-Bessemer $3.70; Mesaba non-Bessemer, $3.50.

Pig Iron.—The United Steel Company, Canton, Ohio, has an inquiry out for 3500 tons of basic iron, 500 tons for September delivery and 1000 tons per month during the last three months. Two local foundries are in the market for 1000 tons of foundry iron each, one wanting it for the last quarter and the other for the first half. While the market is not active, a number of sales of small lots of foundry iron for delivery during the last quarter are reported. Some of the furnace interests are declining to quote prices for delivery after January 1, but feel that for that delivery they should have an advance of 25 cents a ton over current prices. It is doubtful, however, if consumers at the present time would be willing to make contracts for delivery after the first of the year at an advance over current prices. Foundries are buying only for their minimum requirements and for this reason are not expected to have much if any unconsumed tonnage under contract at the end of the year. Prices on foundry grades are firm at $13.50, Valley furnace, for No. 2. A local producer is adhering to a price of $13.50 for basic. For Cleveland delivery we quote as follows, delivered, for prompt shipment and the last quarter:

Bessemer	$15.00
Basic	$13.75 to 14.00
Northern foundry No. 2	13.75 to 14.00
Gray forge	13.50
Southern foundry No. 2	14.00 to 14.50
Jackson Co. silvery, 8 per cent. silicon	17.00

Coke.—The market is dull. There is no inquiry for furnace grades. Some foundry coke is being sold in small lots for prompt shipment. We quote standard Connellsville furnace coke at $1.50 to $1.55 per net ton, at oven, for prompt shipment, and $1.60 to $1.65 for the remainder of the year. Connellsville 72-hr. foundry coke is held at $1.85 to $1.95 for prompt shipment and $2 to $2.40 for contract.

Old Material.—The market is very dull and weaker. Prices on several grades have declined from 25c. to 50c. a ton during the week. A large amount of steel scrap is being offered by both dealers and producers, but the demand from consumers is very light. One local consumer is out of the market, and another is buying only at very attractive prices. Iron rolling mills are buying but little material, and there is practically no demand from the malleable and gray iron foundries. The embargoes at Canton and Monessen are still in force. The Wheeling & Lake Erie Railroad closed September 1 on a small list. Dealers' prices, per gross ton, f.o.b. Cleveland, are as follows:

Old steel rails, rerolling	$12.75 to $13.00
Old iron rails	14.50 to 15.00
Steel car axles	17.00 to 17.50
Heavy melting steel	11.00 to 11.50
Old car wheels	12.00 to 12.50
Relaying rails, 50 lb. and over	20.00 to 21.00
Agricultural malleable	10.75 to 11.00
Railroad malleable	12.75 to 13.00
Light bundled sheet scrap	7.75 to 8.00

The following prices are per net ton, f.o.b. Cleveland:

Iron car axles	$21.00 to $22.00
Cast borings	6.00 to 6.50
Iron and steel turnings and billings	5.00 to 5.50
Steel axle turnings	5.00 to 5.50
No. 1 busheling	7.00 to 7.50
No. 1 railroad wrought	11.75 to 12.00
No. 1 cast	11.25 to 11.75
Stove plate	8.00 to 10.00
Bundled tin scrap	11.00 to 11.50

Finished Iron and Steel.—The most important change in the condition of the local market is an improved demand for structural material. Inquiries are now pending for from 2000 to 3000 tons of structural steel in small lots for work under contract, and a fair volume of other structural work is in prospect. The general price situation is somewhat clearer and prices on some lines are firmer. While it appears that the 1.20c., Pittsburgh, price for steel bars has been shaded in a few cases, the market seems firm at the present time at 1.20c. for round lots. Some consumers have made attempts during the past few days to secure 1.15c by offering to take a round tonnage, but have been unable to secure a concession from 1.20c. There is evidence that the price of structural material has been shaded $1 a ton, but the market now appears firm at 1.35c. The price of plates in this market has become quite generally established at 1.30c., Pittsburgh, but mills are still making sales in small lots at 1.35c. Prices on black and galvanized sheets have become fairly well established at $2 a ton below regular quotations. Mills are getting a fair volume of small orders for steel bars, plates and structural material, the aggregate of business placed being about the same as during the few previous

THE IRON AND METAL MARKETS

weeks. The demand for hard steel bars for reinforcing work is quite good, being more actvie than earlier in the season. Hard steel bars are firm at 1.10c., Pittsburgh. Rivet prices continue weak. We quote structural rivets at 1.60c., Pittsburgh, and boiler rivets at 1.70c., but these prices are being shaded $1 a ton in some cases. The demand for iron bars is limited to small lots. Both local mills are running, but have few orders ahead. We quote iron bars at 1.25c. to 1.30c., at mill.

Birmingham

BIRMINGHAM, ALA., September 4, 1911.

Pig Iron.—The furnace interests are resting on their oars, so to speak, waiting patiently for the upward movement in prices which has been expected for the past 30 days. They all believe they are now on bottom so far as prices are concerned, and any change must be for the better. The foundries seem content with the situation, ready to buy as far ahead as possible at $10 base for No. 2, but only taking their immediate requirements at the No. 2 basis of $10.50, this being the general price asked here now for nearby shipments. The furnaces seem to be relying on good crops and the delayed buying by the railroads to improve the market, while foundrymen regard the accumulated stocks on furnace yards as a guarantee of continued low prices. The position of these two interests promotes a deadlock which can only be affected by some general change in business conditions. A fair amount of inquiries for small tonnages for prompt shipment and liberal shipments against old contracts is in evidence. Prices are being generally held here at the following prices for nearby deliveries, all per gross ton f. o. b. furnace:

No. 1 soft	$11.00
No. 1 foundry	11.00
No. 2 soft	10.50
No. 2 foundry	10.50
No. 3 foundry	10.00
No. 4 foundry	9.75
Gray forge	9.50
Mottled	9.25

Cast Iron Pipe.—Texas and Oklahoma cities, together with Pacific coast points, seem to be the principal inquiries in this market for pipe, although there is the usual amount of buying for maintenance work coming from all sections. Stocks are not heavy on the yards, and shipments against old contracts are going forward in good volume, while none of the plants are running to full capacity. At the same time they report prospects of good business in the West this fall and their agents are active in that field now. Prices remain firm at the following schedule per net ton of 2000 lb., f. o. b. cars here: 4 to 6 in., $23; 8 to 12 in., $22; 12 in. and over, $21 average, with $1 per ton additional asked for gas pipe.

Old Material.—The dealers are taking advantage of all bargains offered, feeling that they can afford to buy at the present very low prices. The market is fairly active on some special grades, but the dealers do not expect to dispose of the bulk of their stocks until winter, when other districts are hampered by weather conditions, at which time they confidently expect to clean up their yards at a profit. Quotations are nominally as follows, per net ton, f. o. b. cars here:

Old iron axles (light)	$13.50 to $14.00
Old steel axles (light)	12.50 to 13.50
Old iron rails	12.50 to 13.00
No. 1 railroad wrought	11.00 to 11.50
No. 2 railroad wrought	9.50 to 10.00
No. 1 country wrought	7.50 to 8.00
No. 2 country wrought	7.00 to 7.50
No. 1 machinery	9.50 to 10.50
No. 1 steel	8.50 to 9.00
Tram car wheels	8.00 to 8.50
Standard car wheels	9.50 to 10.50
Light cast and stove plate	7.00 to 7.50

St. Louis

ST. LOUIS, MO., September 4, 1911.

September is starting out very quietly in the iron and steel business at this point, though reviews of August show that, although that month started out similarly, its aggregate was far ahead of July and in many cases ahead of August a year ago. Shipments have shown the same state of affairs as the new business booked. The situation here is regarded generally as of hand-to-mouth character for the present and immediate future, buyers taking only for immediate needs and insisting on prompt shipment.

Pig Iron.—Carload lot orders continue to be the rule in the pig iron market, but these are sufficient in the aggregate to make up a good business. Prices are well held, with no indication of softening. They are $10.50 to $11, Southern, Birmingham, for No. 2, and $13.50, Ironton, for No. 2 Northern, the latter figure being quoted for basic, malleable and foundry. There is no disposition here to open books for 1912 delivery at present quotations. No. 3 is growing scarcer and No. 4 seems to be still entirely out of the market.

Coke.—Sales are much of the same character as those of pig iron—small lots and quick shipment. The 5000-ton inquiry recently reported is still unplaced. An inquiry for 1300 tons is also in the market this week. Sales reported include one of 2000 tons of Virginia. The price range, all grades, is from $1.90 to $2.40 per net ton at oven, with best 72-hr. selected Connellsville or Stonega at $2 to $2.25, according to delivery period.

Finished Iron and Steel.—There has been a fair run of orders for structural steel, with marked insistence on immediate shipment. Little is being taken on forward requirements or for stock, and the fabricators are now taking only for immediate use. In bars the specifications have been fair, but the inquiries on new business have been rather light. In standard rails the only contract of moment was for 1700 tons from the East St. Louis, Columbia & Waterloo line for delivery over the remainder of this year. Another inquiry for about the same amount is in the market. In plates there has been practically no business. Track fastenings have been normal in movement. In light rails the inactivity of the coal mines has reduced the number of inquiries, while nothing is being heard from the lumber companies.

Old Materials.—The market for scrap has dropped back into a somnolent state after its recent flurry. While no falling off of consequence in the prices is reported, there has been no business, for buyers are almost completely out of the market. The 'Frisco list, which came out late last week, carried only 400 tons and that of the Missouri Pacific 700 tons. Dealers' prices, per gross ton, f.o.b. St. Louis, are as follows:

Old iron rails	$13.00 to $13.50
Old steel rails rerolling	13.00 to 13.50
Old steel rails, less than three ft	11.50 to 12.00
Relaying rails, standard section, subject to inspection	23.00 to 23.50
Old car wheels	13.00 to 13.50
Heavy melting steel scrap	11.50 to 12.00
Frogs, switches and guards cut apart	11.50 to 12.00

The following prices are per net ton:

Iron fish plates	$11.00 to $11.50
Iron car axles	19.50 to 20.00
Steel car axles	18.50 to 19.00
No. 1 railroad wrought	11.25 to 11.75
No. 2 railroad wrought	10.25 to 10.75
Railway springs	9.75 to 10.25
Locomotive tires, smooth	14.50 to 15.00
No. 1 dealers' forge	8.50 to 9.00
Mixed borings	6.50 to 7.00
No. 1 busheling	9.50 to 10.00
No. 1 boilers, cut to sheets and rings	8.00 to 8.50
No. 1 cast scrap	10.00 to 10.50
Stove plate and light cast scrap	8.00 to 8.50
Railroad malleable	8.50 to 9.00
Agricultural malleable	7.50 to 8.00
Pipes and flues	8.50 to 9.00
Railroad sheet and tank scrap	8.50 to 9.00
Railroad grate bars	8.00 to 8.50
Machine shop turnings	7.50 to 8.00

Preparatory to a general clean-up on the Gould lines in Texas, Judge T. J. Freeman, president of the International & Great Northern, and first vice-president of the Texas & Pacific, has just sold to the highest bidder, the National Iron & Steel Company, Houston, Texas, through its vice-president and general manager, I. H. Cohn, their entire accumulation of scrap iron, approximating some 500 cars. Most of this tonnage consists of rerolling rails, and a great part of it may move for export through Gulf ports.

Buffalo

BUFFALO, N. Y., September 5, 1911.

Pig Iron.—Orders booked the past week have not been large, as the majority of melters have covered the bulk of their requirements for the remainder of the year and furnaces are not yet inclined to quote for 1912 deliveries except in very special cases. There is still some good inquiry for 1911 delivery, one New Jersey company being in the market for 3000 tons, one-third each of three foundry grades. Orders received include one of 600 tons of No. 2 plain for last quarter delivery, taken at $13.50, and several ranging from 100 to 300 tons of foundry grades for the re-

THE IRON AND METAL MARKETS

mainder of the year. One order of fairly good tonnage at current prices permitted of delivery of a portion distributed through January but required complete payment by January 1. The demand for shipment on contracts is pressing, and iron is going forward from furnaces in exceptionally heavy volume. Shipments of basic by lake to a South Chicago company on contract are also going forward at a good rate. Prices are stronger, $13.50 being the minimum for No. 2 X foundry for delivery over the remainder of the year, and most furnaces are asking $13.75 for small lots, while $14 is asked in some instances. For prompt and fourth quarter delivery we quote as follows f.o.b. Buffalo:

No. 1 X foundry	$13.75 to $14.25
No. 2 X foundry	13.50 to 14.00
No. 2 plain	13.50 to 13.75
No. 3 foundry	13.50
Gray forge	13.50
Malleable	13.75 to 14.25
Basic	13.75 to 14.25
Charcoal	16.50 to 17.50

Finished Iron and Steel.—Orders amounting to a fairly good tonnage have been placed in the week embracing most lines of finished products, and selling agencies for this district state that these orders were taken at prices generally maintaining quoted schedules. A number of small short period contracts for steel bars have been placed at ruling prices. Canadian business shows continued activity and prices are firm for quick delivery. There has been some cutting on cold-rolled steel in the export trade and large tonnages in steel bars for extended deliveries command slight concessions. A number of good-sized orders for structural shapes from Canadian sources are noted and specifications on contracts are liberal. In fabricated structural lines the demand continues active, and a good deal of small and miscellaneous work has been contracted for during the week. The Buffalo Structural Steel Company was low bidder for fabricating and erecting the 235 tons required for the Flint & Kent department store building, Buffalo, for which bids were opened to-day. The Lackawanna Bridge Company has recently taken contract for the 1000 tons required for the American Radiator Company's warehouse at Bayonne, N. J.

Old Material.—The demand for all kinds of scrap has fallen off decidedly and the market is extremely dull as compared with the past few weeks. The only material that is being moved is on old contracts. Prices are nominal and unchanged as follows, per gross ton, f.o.b. Buffalo:

Heavy melting steel	$13.00 to $13.50
Low phosphorus steel	16.00 to 16.50
No. 1 railroad wrought	14.00 to 14.50
No. 1 railroad cast machinery cast scrap	13.75 to 14.25
Old steel axles	18.50 to 19.00
Old iron axles	22.00 to 22.50
Old car wheels	13.00 to 13.50
Railroad malleable	13.00 to 13.25
Boiler plate	12.50 to 13.00
Locomotive grate bars	11.00 to 11.50
Pipe	9.25 to 9.50
Wrought iron and soft steel turnings	7.25 to 7.50
Clean cast borings	7.00 to 7.25

San Francisco

SAN FRANCISCO, August 29, 1911.

The tonnage taken for this territory during the last month has in several departments been larger than for the month preceding, though the movement is still somewhat below the average of the last few years. Some increase of activity in the general trade is expected in September and October, but the anticipations of local merchants regarding the remainder of the year are moderate at best. The impending municipal election is assigned as a cause of dullness in this city, and the labor situation in the Harriman railroads is causing some anxiety all over the State. Merchants and manufacturers express a very conservative feeling regarding the outlook for the coming year. The improvement so far observed has consisted of increased small sales rather than large individual orders.

Bars.—The building trades continue to take a considerable tonnage of reinforcing bars, but most individual transactions in this line are small, the requirements of large development projects through the country being so far below expectations. Improvements connected with the Panama Exposition will doubtless cause an increased demand for reinforcement, but no business from this source can be expected before next spring. The jobbing trade in soft steel bars shows very slight improvement, while buying on the part of the larger manufacturing industries is limited to immediate needs. Merchants, also, are buying on a small scale. A large lot of foreign bars has just arrived in very bad condition. A rather firmer feeling is noted in the distributive trade, though resale prices in San Francisco are still quoted at 2c. for steel and 1.90c. for iron.

Structural Material.—No fabricating contracts of any importance have been signed in the past month, though two local jobs may be let at any time, and a few new plans are being figured. There is little of encouragement in the outlook for the next few months, local plans consisting mostly of small buildings requiring little steel. Only one large job is in prospect at Los Angeles, and there is practically nothing at Portland, Ore. The Ralston Iron Works has submitted the lowest bid on the new high school, but the figures are in excess of the appropriation and the job may have to be refigured. The Central Iron Works is low on the Knights of Columbus building and will probably get the contract, about 325 tons. No award has been made on the prospective jobs at Sacramento. Figures are being taken on the Mendel apartment building, which will require nearly 300 tons. It is estimated that the Standard Oil building will take about 1000 tons, but the plans may not be completed for some time. Plans for the new St. Luke's Hospital are about complete and may come up before long. The Pacific Rolling Mill has a small job for the Great Western Smelting Company, and a small steel shop building is to be erected for the American Forge Company. Plans are under way for a steel frame residence on Broadway near Webster street. The San Francisco Labor Council is planning to erect a building at a cost of about $200,000. Bids will be taken September 12 for steel work on the San Diego County jail.

Rails.—The recent tonnage has been materially increased by purchases on the part of the larger interests operating in California and the Pacific Northwest, while the movement of small lots is rather better than for some time past. Many inquiries are coming up to which little importance is attached, but the outlook for business from the smaller roads is improving Considerable work is projected by the California Milland in the vicinity of Marysville, Cal., and there is some talk of a road from Big Meadows to the line of the Western Pacific. The San Diego, El Cajon & Escondido Railway Company has been organized at San Diego, Cal., for the purpose of building a 60-mile road.

Sheets.—Buying by merchants is less in evidence than a few weeks ago. The jobbing movement is increasing, but is below normal for this time of year, when considerable activity is the usual rule. A fair demand for corrugated sheets, however, is expected for the coming month. Resale prices on black, galvanized and blue annealed sheets continue easy.

Plates.—The movement of marine plates has been increased by the construction of a collier at the Mare Island navy yard, material for which is now arriving. Inquiry for tank plates is again increasing, though the current tonnage is not especially large. The Standard Oil Company is starting work on improvements to its Richmond plant, which will include three batteries of stills and increased boiler capacity. This company is preparing to erect distributing tanks at Riverside and Salinas, Cal. The Associated Oil Company is starting work on two large tanks in the Coalinga district.

Merchant Pipe.—Continued dullness is reported by most local merchants, and there is a rather easy feeling in prices in the distributive trade. Some of the jobbers, however, are buying a little more freely, and bookings by the local agents of manufacturers have increased materially. One agent reports bookings for August amounting to almost double the small tonnage taken in July, though no large orders have been received. Aside from sales to dealers, many small purchases have been made by water, gas and oil interests. There is no certainty of any further improvement, though more jobbing business is expected next month, and merchants are now carrying rather light supplies. The city of Los Angeles has taken figures on about 65,000 ft. of ½ to 1-in. pipe, and the city of Aberdeen, Wash., will receive bids August 30 for about 45,000 ft. of ¾ to 2-in. pipe. The Sacramento Pipe Works has taken an order for 45,000 ft. of 4 to 12-in. pipe for the town of Oakdale, Cal.

Cast Iron Pipe.—The coast market is a little more

THE IRON AND METAL MARKETS

active than at the beginning of the month, with indications of further improvement. The most important orders are still coming from southern California, though a number of small transactions have been closed in this part of the State. The Coronado Water Company and the city of San Diego have placed fair orders with the United States Pipe Company, and the city of Los Angeles has divided an order for 955 tons among several interests. The town of Porterville, Cal., will open bids on a lot of pipe September 4, and the city of Santa Cruz, Cal., has just received figures on a small lot of 4-in. pipe. The city of Portland, Ore., will open bids September 1 on 735 gate valves, of 6, 8, 12 and 16-in. diameter.

Pig Iron.—Local requirements are of a limited nature and orders from the foundry trade are coming out slowly, though a little more movement is reported in other parts of the coast. No. 2 Southern foundry iron is valued at about $20.50, but is little more than nominal. Foreign foundry iron is quotable at the former wide range, $20 to $24, the actual price varying considerably according to terms of sale, etc.

Old Material.—A limited movement of old rails and melting scrap is under way, but supplies of the latter continue to accumulate in the yards, and further shipments to the East coast are likely. Requirements of melting scrap on this coast of late have been considerably below expectations. Cast scrap is also moving rather slowly, and wrought iron scrap is extremely dull. Prices are as follows: Cast iron scrap, per net ton, $16; steel melting scrap, per gross ton, $10.50 to $11; wrought scrap, per net ton, $11 to $15; rerolling rails, per net ton, $11.

Boston

BOSTON, MASS., September 6, 1911.

Old Material.—The market for scrap is dull. Dealers had entertained the hope that the closing weeks of summer would see a marked improvement, but have been disappointed. More material has come out in the past month than in the three preceding months, and metal is still being offered freely by producers. Boston does a large export business with Montreal, St. John and other Canadian ports, and this trade is moderately good. Prices to the mills are made attractive in some cases, especially by the smaller dealers, whose opinion seems to be that no marked improvement is in sight. Dealers' prices, carload lots, f.o.b. Boston and other New England points taking Boston rates (comprising practically all the important centers in their relations with eastern Pennsylvania), are as follows:

Heavy melting steel	$10.00 to $10.50
Low phosphorus steel	13.75 to 14.25
Old steel axles	16.50 to 17.00
Old iron axles	20.00 to 21.00
Mixed shafting	12.75 to 13.25
No. 1 wrought and soft steel	11.00 to 11.25
Wrought iron pipe	9.25 to 9.50
Skeleton (bundled)	7.75 to 8.00
Cotton ties	8.00 to 8.25
No. 2 light	4.50 to 5.00
Wrought turnings	5.75 to 6.00
Cast borings	5.00 to 5.50
Machinery cast	12.50 to 13.00
Malleable	11.00 to 11.50
Grate bars	6.00 to 6.50
Stove plate	8.50 to 9.00

The German Iron Market

BERLIN, August 25, 1911.—A moderate increase of activity appears to be the characteristic feature of the iron trade the past fortnight. At the fortnightly trading on the Düsseldorf Exchange a week ago the situation was summarized as follows: "Calls for delivery of goods are brisk in all lines." On the same day the quotations for most grades of Siegerland pig iron, as well as some of the Luxemburg-Lorraine qualities, were advanced about one mark per ton. In other directions prices are apparently firmly held. In bar steel for home delivery prices are quoted at 100 to 102 marks by all the leading mills; export prices range between 94 and 96 marks, f.o.b. In nearly all products the mills are well supplied with orders, and in some kinds work is carried on under pressure. The foreign market continues to show an active demand for rails, beams, heavy plates, bars and semi-manufactured material.

The Steel Works Union will fix the prices next week for the last quarter of the year. It is already regarded as practically certain that the reduction in steel material, applied for last month by mills running exclusively upon finished products, will not be voted; neither is any change in structural shapes looked for. The union continues in a position of giving the mills larger orders for half-rolled material than their allotments call for, and the demand for structural forms also continues brisk. The export demand for rails has lost nothing of its previous activity, but the home railroad authorities are still disappointing the expectations of producers.

In heavy plates business continues very brisk, and not a few of the mills are running to their utmost capacity. German shipyards continue to receive orders for steamers, and they are calling for unusually large quantities of plates. English yards are also taking large quantities of German plates. In thin plates the amount of work in hand has increased this month. Mills running on wire rods are well employed, but the position of the wire-nail mills is not satisfactory. This is especially the case with mills that do not produce their own material; and mills of this class are quite unable to fill export orders at existing prices without losing money. Tube mills have plenty of work to do, but the sharp competition that has prevailed since the organization broke down some months ago continues unabated, and there is no prospect that a change at this point will occur soon. An attempt is being made to induce those producers of bar steel who are members of the union to agree to take no orders for delivery beyond March 31, 1912. It is hoped, in the forthcoming renewal of the union, to include bars in the list of fully syndicated goods. The prospect for doing this, however, is not at all encouraging, after the former price convention broke down in March.

The pig-iron trade is quiet. Little business is doing in view of the fact that sales for 1912 delivery have not yet been declared open, and the supplementary amounts required for the current year are not large. The arrangement between the Luxemburg-Lorraine furnaces and the Essen Syndicate has not yet been perfected, but the prospects for a favorable result are said to have improved to a marked degree. The meeting at which an agreement was expected to be signed, however, was postponed till next week, when it is believed that the furnaces in question will either join the syndicate outright or will enter into contract relations with it for maintaining prices and controlling production. An advance of 2 or 3 marks per ton on the grades of iron produced in the Rhenish-Westphalian region is looked for upon the completion of the syndicate's organization; Siegerland grades have already been advanced. The interesting question as to whether the syndicate will decide to keep production at its present level will have to be determined at an early day, probably next week. Meanwhile the preparations of the big companies to increase still further their means of production are proceeding without abatement. It is now announced that the Gelsenkirchen Company, which, as previously reported in this correspondence, is building a great steel and iron plant at Esch in the southern part of Luxemburg, will blow in two of its new furnaces there in October, and four more will be completed by the end of the year. The steel mills are expected to begin operations in April.

Germany's exports of iron and steel in July reached 530,411 tons, being the greatest amount in the history of the trade. The excess of exports over imports gained 126,000 tons over July, 1910.

New York

NEW YORK, September 6, 1911.

Pig Iron.—The volume of business is still limited by two conditions, namely, that no great amount of iron will need to be bought to carry the foundries through the year and that furnacemen have no inducements to offer to start buying for next year. The very considerable amount of idle blast furnace capacity, some of which is only waiting for the first signs of improvement to blow in, encourages buyers to hold off, awaiting the outcome of the effort to establish for deliveries next year some advance on the current price. Some inquiry for malleable pig iron has come from New England and one Connecticut melter is in the market for 2500 tons of foundry iron, the major part for October and November delivery. Some Southern iron will probably be included in this purchase. Some buying is reported by New York State foundries, the transactions including irons for malleable and stove plate work. One sale of 4000 tons was made in New York State and another of

THE IRON AND METAL MARKETS

several thousand tons. In a few cases deliveries on current business stretch over into 1912. Foundries in this district are melting iron at about the same rate as in the past three months and are taking their iron at the contract rate of shipment in most cases. Meantime there has been a further slight reduction in stocks of iron at furnaces. We quote Northern iron for tidewater delivery as follows: No. 1 foundry, $15.50 to $15.75; No. 2 X, $15 to $15.25; No. 2 plain, $14.75 to $15. Southern iron is quoted at $15.25 to $15.50 for No. 1 foundry and at $14.75 to $15 for No. 2.

Finished Iron and Steel.—A continued absence of new inquiry and inability of the trade to gauge the promise of the immediate future, unless it is a lack of promise, describes present conditions. Uncertainty in prices is more pronounced than last week and it applies to plates as well as to steel bars and fabricated material. Bar iron seems still to maintain the strength it developed a few weeks ago, and is moving in fairly good volume. In steel bars, which are quite dull, the Pittsburgh base of 1.20c. is admitted, but some mills assert they are holding at 1.25c., Pittsburgh. In structural material a 1500-ton 12-story building, for the Seaman's Church Institute, Coenties slip, Jno. Downey, general contractor, is being figured; bids were due on September 6 for the viaduct work of the New York Central terminal area, 1000 tons; bids were due the same day for three bridges involving about 450 tons for the Boston & Maine, and bids are wanted by September 12 for two small bridges for the New Haven road. A 200-ton school building is to be erected at Hackensack, N. J., John T. Brady & Co., builders. Original plans for the Filene building, Boston, have been called in, and the action is taken to indicate a revision of design. A similar course has been taken with the 1700-ton garage for the Locomobile Company. The award for 14,000-ton structure for the Kansas City terminal is still pending at this writing. The Eastern Steel Company is low bidder for 300 tons of bridge work for the Pennsylvania Railroad. The Alfred E. Norton Company has a 600-ton contract for a mercantile building for Mrs. L. C. H. Dyckman, Edward Corning Company, builder. Quotations are: Plain structural materials and plates, 1.51c. to 1.56c.; steel bars, 1.36c. to 1.41c.; bar iron, 1.30c. to 1.35c., all New York. Plain material and plates from store, New York, 1.80c. to 1.90c.

Cast Iron Pipe.—The Department of Water Supply, Gas and Electricity of the city of New York will open bids September 13 from contractors for furnishing and laying 570 tons of 12-in. pipe and fittings. This appears to be the only letting of any importance at present in sight in this section. Several large private purchases have either recently been closed or are now rapidly approaching the closing point. Quite a considerable tonnage is involved in these transactions. Manufacturers of pipe feel considerably encouraged with the recent increase in business and with the indications of more interest shown by consumers. While prices have not materially changed, some important companies are asking more money for certain sizes on which their books are well filled for the next few weeks. Carload lots of 6-in. may still be quoted at $21 to $22 per net ton, tidewater.

Old Material.—Some movement has occurred in heavy melting steel scrap, but it has consisted mainly of purchases by dealers to apply against contracts. The eastern Pennsylvania consumers are either well covered or are not disposed to purchase except at lower than recently prevailing prices. Some important steel companies are only offering $12.50 delivered for the remainder of the year. Cast scrap has been in some demand, but only in small lots. Borings and turnings are neglected. Rolling mills are doing comparatively nothing in the market. Quotations are as follows, per gross ton, New York and vicinity:

Old girder and T rails for melting	$10.25 to $10.50
Heavy melting steel scrap	10.25 to 10.50
Relaying rails	0.00 to 0.00
Rerolling rails (nominal)	12.00 to 13.00
Standard bundled iron car axles	21.00 to 21.50
Old steel car axles	14.00 to 14.50
No. 1 railroad wrought	12.50 to 13.00
Wrought iron track scrap	11.00 to 11.50
No. 1 yard wrought, long	11.00 to 11.50
No. 1 yard wrought, short	10.00 to 10.50
Light iron	5.00 to 5.50
Cast borings	7.00 to 7.50
Wrought turnings	7.00 to 7.50
Wrought pipe	10.00 to 10.50
Old car wheels	14.00 to 14.50
No. 1 heavy cast, broken up	10.50 to 11.00
Stove plate	8.50 to 9.00
Locomotive grate bars	9.00 to 9.50
Malleable cast	9.00 to 9.50

Ferroalloys.—A Central Western purchaser has closed for a large quantity of ferromanganese at around $37, Baltimore. The inquiry was for 5000 tons, but the consumer did not purchase that amount. The market in ferrosilicon is very quiet, and it can be bought at $57, Pittsburgh.

Metal Market

NEW YORK, September 6, 1911.

The Week's Prices

Cents Per Pound for Early Delivery.

	Copper, New York.			Lead.		Spelter.	
	Lake.	Electrolytic.	Tin. New York.	New York.	St Louis.	New York.	St. Louis.
Aug. 31	13.75	12.50	42.00	4.50	4.42½	6.05	5.90
Sept. 1	13.75	12.50	42.00	4.50	4.42½	6.00	5.80
2	12.75	12.50		4.50	4.42½	6.00	5.80
5	12.75	12.50	41.25	4.50	4.42½	6.00	5.80
6	12.75	12.50	41.25	4.50	4.42½	6.00	5.80

The premiums on spot tin have been discontinued and the market is getting back to normal conditions. Copper is unchanged and very dull. Spelter has declined five points. Lead is very quiet.

Copper.—A few good sales of electrolytic copper are reported at 12.50c. for spot delivery in New York. Some dealers refuse to accept that price, holding out for 12.55c. and 12.60c. The impression is abroad among the dealers that many important consumers are very short of stock and the market shows signs of advancing. Exports of copper have been quite heavy so far this month, amounting in all to 4149 tons. The London market was reported steady this morning with spot copper offered at £56 and futures at £56 13s. 9d.

Copper Averages.—The Waterbury average for August was 12.75c. The average price of Lake copper in New York was 12.75c. and the average price of electrolytic was 12.57½c.

Pig Tin.—The pig tin market is slowly getting back to a normal basis, and premiums have been practically abolished. There have been some good arrivals of pig tin, and the steamer Minnehaha is expected in within a few days with 1000 tons, so that supplies are fairly plentiful. Some heavy trading was done in this market during the week, and there was considerable excitement yesterday when it was found that the London market had gone off £4 during the holiday of Monday. This resulted in lower prices here, with something of a scramble to buy. Pig tin to-day was offered at 41.25.

Tin Plates.—A better volume of inquiries is coming out and there are signs that the can manufacturers will shortly make good purchases. The price is unchanged at $3.94 for 100-lb. coke plates. Foreign tin plates are quoted at 13s. 9d. at Swansea, Wales

Lead.—Lead is very quiet and uninteresting. The American Smelting & Refining Company continues to maintain the New York price at 4.50c. The St. Louis market is reported quiet and lead to-day was bringing 4.42½c. in that market.

Spelter.—Spelter prices dropped five points during the week, and while the metal is being subjected to considerable manipulation on the part of dealers, consumers decline to show any great amount of interest in it. This morning the New York price was 6c. and the price in St. Louis was 5.80c. The Waterbury average for spelter for August was 6.29c.

Antimony.—The London dock strike prevented some shipments of antimony to this country, but stocks were so plentiful that the market was not affected upward, continuing very weak. Hallett's is offered at 7.75c., Cookson's around 8.37½c. and Chinese and Hungarian brands are being offered at about 7.37½c.

Old Metals.—The market is weak, but dealers' selling prices, New York, are nominally unchanged, as follows:

Copper, heavy and crucible	12.00 to 12.25
Copper, heavy and wire	11.50 to 11.75
Copper, light and bottoms	10.75 to 11.00
Brass, heavy	8.00 to 8.25
Brass, light	6.75 to 7.00
Heavy machine composition	10.50 to 10.75
Composition turnings	8.75 to 9.00
Clean brass turnings	8.00 to 8.25
Lead, heavy	4.00 to 4.25
Lead, tea	3.75 to 4.00
Zinc, cast	4.25 to 4.50

Chicago

SEPTEMBER 5.—Trading in metals during the past week was very dull. With the exception of slight fluctuations in the price of tin the market quotations have

remained unchanged for Chicago delivery as follows: Casting copper, 12.65c.; Lake, 12⅞c., in carloads, for prompt shipment; small lots, ¼c. to ⅜c. higher; pig tin, carloads, 44c.; small lots, 46c.; lead, desilverized, 4.45c. to 4.50c. for 50-ton lots; corroding, 4.72½c. to 4.75c. for 50-ton lots; in carloads, 2½c. per 100 lb. higher; spelter, 5.90c. to 5.95c.; Cookson's antimony, 9¼c., and other grades, 8¼c. to 8¾c., in small lots; sheet zinc is $8 f.o.b. La Salle, in carloads of 600-lb. casks. On old metals we quote for less than carload lots: Copper wire, crucible shapes, 10¾c.; copper bottoms, 9¾c.; copper clips, 10¼c.; red brass, 9½c.; yellow brass, 7½c.; lead pipe, 4c.; zinc, 5c.; pewter, No. 1, 26c.; tinfoil, 33c.; block tin pipe, 37c.

St. Louis

SEPTEMBER 4.—The metal market is rather quiet, with little to affect prices. Tin stands at 42.85c.; Lake copper, 13.05c.; electrolytic copper, 12.90c.; Cookson's antimony, 8.72½c.; lead, nominal, at 4.37½c., and spelter, also nominal, at 5.80c. In the Joplin district the past week 60 per cent. blende brought $48 for the top price. The surplus blende is now down to about 3000 tons for the district, but is expected to increase, as the mines are nearly all reopened, having been pumped out. Calamine is bringing $32 per ton for the best lots, though the basis price on 40 per cent. metallic contents is $23 to $25. Lead ore is bringing $60 to $63 per ton and the bins are all cleaned out. The prices of old metals are as follows: Light brass, 4c.; heavy brass and light copper, 8c.; heavy copper and copper wire, 9c.; zinc, 3c.; lead, 3¼c.; pewter, 20c.; tinfoil, 29c.; tea lead, 3c.

Iron and Industrial Stocks

NEW YORK, September 6, 1911.

The stock exchanges were closed on Saturday and Monday, and therefore the current review applies to only four days of activity. Marked fluctuations occurred in this time, however, some days displaying considerable strength while others showed decided weakness. The general feeling prevails that the liquidation so strongly in evidence for two or three weeks has about run its course and that until some unfavorable conditions develop the market can be expected to maintain about present values. The range of prices on active iron and industrial stocks from Wednesday of last week to Tuesday of this week was as follows:

Allis-Chalm., pref...	17½- 18	Pressed Steel, com..	30 - 30½
Beth Steel, com....	28¾- 30	Pressed Steel, pref.....	100
Beth. Steel, pref....	59¾- 60⅝	Railway Spring, com.	30 - 30¼
Can. com.....	98⅜- 103⅜	Republic, com.....	24⅞- 26
Can. pref.....	82½- 85¼	Republic, pref.....	88⅝
Car & Fdry., com..	48 - 49	Sloss, com.....	37
Car & Fdry., pref.....	115	Pipe, com.....	13
Steel Foundries.....	31 - 32½	Pipe, pref.....	45 - 46
Colorado Fuel.....	37⅜- 38	U. S. Steel, com...	69⅜-71¼
General Electric....	150¼-153	U. S. Steel, pref...	114¼-115¾
Gt. N. Ore Cert....	47½- 49	Weste. Elec.....	64 - 65½
Int. Harvester, com.	103¾-107	Am. Ship, com.....	56 - 57½
Int. Harvester, pref.	119½-121	Chic. Pneu. Tool....	46 - 46½
Int. Pump, com....	32½- 33	Cambria Steel.....	44 - 44¼
Locomotive, com....	34⅛- 35⅜	Lake Sup. Corp....	22⅞- 23
Locomotive, pref....	104⅛-105¾	Crucible Steel, com..	11⅛- 11⅝
Nat. En. & St., pref.....	95	Crucible Steel, pref.	80 - 80½

* Ex. dividend.

Dividends Declared

The Pittsburgh Valve, Foundry & Construction Company, regular quarterly, 1½ per cent., on the preferred stock.

The American Car & Foundry Company, regular quarterly, 1¾ per cent., on the preferred stock and ½ of 1 per cent. on the common, payable October 2.

Trade Publications

Induction Motors and Buffing Lathes.—Emerson Electric Mfg. Company, St. Louis, Mo. Three bulletins. The first two, Nos. 3143 and 3143, replacing Nos. 3139 and 3140 respectively, deal with single-phase induction motors of the full load start clutch types. The first bulletin describes and illustrates a back geared motor with countershaft which is made in ⅓ and ½-hp. sizes, while the other treats of a complete line varying from 1 20 to ½ hp. No. 3709, replacing No. 3707, illustrates an electric buffing lathe for use on both alternating and direct current circuits. These machines will operate on alternating current of from 25 to 133 cycles or on direct current at a potential of 110 and 220 volts.

Emery Wheels.—Pittsburgh Emery Wheel Company, Park Building, Pittsburgh, Pa., works Rochester, Pa. Illustrated catalogue. Describes the company's line of emery wheels and swing-frame grinding machines. Illustrations are given of emery, carborundum and adamite wheels, of emery wheels mounted on spindles with safety collars applied, and of swing-frame grinding machines, which are a specialty of this company. Tables are presented of grinding wheel speeds and price lists are given on straight and safety shape wheels, cup wheels and grinding machines.

Refuse Destructor.—The Griscom-Spencer Company, 90 West street, New York, N. Y. Bulletin No. 701. Pertains to the Morse destructor furnace which is built in many sizes and various constructions to meet the demand for the combustion of every class of refuse matter. These destructors possess the special advantages of convenient charging of material, introduction and regulation of air supply, maintenance of a uniform temperature and the removal of the residue.

Recording Instruments.—The Bristol Company, Waterbury, Conn. Bulletin and catalogue. The first, No. 142, shows a line of recording water level gauges for automatically recording the depth of water and other liquids, the rate of flow of water over weirs and the volumes of liquids in tanks. Condensed catalogue No. 160 is a general catalogue of recording instruments for pressure, temperature, electricity, speed, time, etc. Some of the instruments covered in the latter are the Bristol-Durand radii averaging instrument and the Bristol class III. compensated recording thermometer which were illustrated in *The Iron Age*, June 30, 1910, and January 19, 1911, respectively.

Insulated Wires and Cables.—Hazard Mfg. Company, Wilkes-Barre, Pa. Pamphlet. Size, 3½ x 6 in.; pages, 44. Describes and illustrates the various types of bar, and insulated copper wire and cables which this company is prepared to furnish. These include bare copper wire, copper cable for lightning rods, annunciator and magnet wire, rubber covered wires and cables, telephone and telegraph wires and cables and a number of special cords and cables. One of the installations where this company's railroad signal wires and cables were used was at the new Washington Union Station and a half tone engraving gives some idea of the magnitude of this work. A list of branch offices and agencies handling the company's wire rope and insulated wires and a list of the various Hazard products complete the pamphlet.

Feed Water Heater.—Benjamin F. Kelley & Son, 25 Church street, New York, N. Y. Booklet, entitled "The Utilization of Waste Steam." Describes the Standard water-tube feed water heater with numerous half tones and line engravings. Mention is made of the Kelley grease extractor and oil separator and a description of it together with a table of dimensions completes the booklet.

Flexible Casing.—T. R. Almond Mfg. Company, Ashburnham, Mass. Booklet. Describes a flexible casing for speedometer shafts which is claimed to be jar, strain and rust-proof and will not set under any condition. A high degree of flexibility has been secured in manufacturing this casing, so that it cannot be forced into any shape that will restrict the operation of the shaft or form a short kink. This casing consists of two coiled wires, one firmly and snugly encased within the other. The inner wire is a tempered steel spring, which forms a small bore tube that supports the flexable shaft, while the outer coil, which makes the casing oil-tight is a solid brass wire of special design.

Face Protector.—F. S. Lozuaway, 4206 Seventy-sixth street, S. E., Portland, Ore. Circular. Concerned with the champion face protector, which is a device for protecting the eyes and face when working in shops, chipping rooms, open hearths, sand blast and intense heat, automobile driving and wherever injury from dust or flying objects might occur. The protector consists of a frame suspended in front of the face and carrying a number of removable plates through which the wearer can see.

Tanks.—New York Central Iron Works Company, Geneva, N. Y. Catalogue and price list No. 55. Covers the Dunning line of tanks, which are made for hot-water storage, for air and gasoline and for pneumatic water systems. All of these different types are illustrated and described, and there are a number of tables giving the different sizes, capacities and weights. Space is also devoted to accessories such as manholes, saddles, hangers, nozzles, stuffing boxes and heads. Tables giving the capacity in U. S. gallons for round and rectangular tanks of various sizes for 1 ft. depth complete the catalogue.

Blast Furnace Views.—William B. Pollock Company, Youngstown, Ohio. Supplement No. 22 of the company's general book of views of modern blast furnaces which it has built. Pages 2 to 8 show No. 4 and pages 9 to 12 Nos. 2 and 3 Haselton furnaces of the Republic Iron & Steel Company, Haselton, Ohio.

The Panama Scrap Sale.—At Washington, D. C., September 5, proposals were opened from 11 bidders for the scrap metal relics of the machinery used by the French in their attempt to dig a canal across the Isthmus, and which the United States Government wishes to clear away before the waterway is completed. The highest bids came from the Chicago House Wrecking Company, ranging from $215,000 to $700,000, and the Phoenix Iron & Steel Company, Galveston, Texas, $66,250 to $246,250. The scrap scattered along the canal line consists of locomotives, dump cars, tanks, barges, and miscellaneous junk, weighing from 45,000 to 120,000 tons. The successful bidder must remove it within three years.

Personal

W. H. Oliver, Jr., purchasing agent of the Phillips Sheet & Tin Plate Company, Weirton, W. Va., has resigned and is now organizing a supply company, to be located in the city of Pittsburgh, to deal in mill, mine, factory, glass house, paper mill, brick yard, etc., supplies.

H. H. Duley has resigned his position of chief sprinkler inspector of the Cincinnati Fire Prevention Bureau, Cincinnati, Ohio, to become president of the new Cincinnati Fire Extinguisher Company.

R. G. McClure, secretary of the Indianapolis Commercial Association, has been selected as manager of the Cincinnati Commercial Association, vice J. M. Manley, who declined to accept the position. Carl P. Dehoney, formerly acting secretary of the association, has been elected secretary to assist Mr. McClure in his duties.

J. A. Campbell, president, and W. E. Manning, assistant manager of sales, of the Youngstown Sheet & Tube Company, Youngstown, Ohio, returned from Europe last week.

The election of Peter J. McArdle as one of the nine Councilmen in Pittsburgh will probably mean his retirement as president of the Amalgamated Association, a position he has held for several years.

C. H. Booth, of Youngstown, Ohio, vice-president of the United Engineering & Foundry Company, Pittsburgh, has returned from a trip to Europe.

Henry L. Barton, vice-president of the Metals Product Company, Detroit, Mich., has accepted a position with the General Motors Company of the same city.

Andrew C. Campbell has severed his connection with the E. J. Manville Machine Company, Waterville, Conn., with which company he was identified for the past 16 years, in the capacities of chief engineer, mechanical executive, secretary and superintendent. He is at present maintaining an office in Waterbury, as consulting engineer.

George T. Frankenburg has been appointed superintendent of the Columbus Brass Company, Columbus, Ohio. He was formerly outside foreman of the Cambria Steel Company, Johnstown, Pa.

Leo Loeb has recently been made assistant steam engineer in the steam engineering department of the Cambria Steel Company, Johnstown, Pa. He was formerly assistant professor of mechanical engineering at the Renssalaer Polytechnic Institute, Troy, N. Y.

Everett S. Swartwout has been appointed manager of the Chicago office of the Nordberg Mfg. Company, Milwaukee, Wis.

Lewis Wehner has severed his connection with the Bucyrus Company, South Milwaukee, Wis., to become chief engineer of the Vulcan Steam Shovel Company, Toledo, Ohio.

President James A. Farrell, of the United States Steel Corporation, is in Chicago this week and will visit the Gary and South Chicago works. From Chicago he and other officers of the corporation and subsidiaries go to Duluth, where a meeting of presidents of the subsidiary companies will be held Friday and Saturday.

Dr. F. Schniewind, of the United Coke & Gas Company, New York, is in Europe.

George G. Blackwell, Sons & Co., Ltd., Liverpool, England, state that they are and have been for some considerable time engaged on practical experiments to determine the relative value and effects to be obtained in the manufacture of various grades of steel by the introduction of the rarer metals such as molybdenum, vanadium, titanium, chromium, tungsten, etc. They state that the outcome of their experiments is as highly satisfactory as they are astonishing, and results of the greatest utility to the steel manufacturer have been amply demonstrated. They are not yet in position to make an announcement for publication, but are willing to correspond with any one interested in the subject of the various ferroalloys which are now coming so much to the front in the manufacture of high grade steel.

Obituary

DANIEL E. GARRISON, JR., of St. Louis, Mo. died September 2 at the Waldorf-Astoria, New York, from a self-inflicted wound. He was 44 years old and had been suffering from despondency over his health. He was vice-president of the Corrugated Bar Company, of which his father, Daniel E. Garrison, Sr., is president. The Garrison family has long been prominent in manufacturing and general business undertakings in St. Louis and the Southwest. The deceased was a widower and leaves a son.

S. O. GREENING, head of the B. Greening Wire Company, Hamilton, Ont., Canada, died last week, aged 64 years. He succeeded to the chief direction of the company on the death of his father in 1877. He was born in Manchester, England, and went to Hamilton with his father in 1856.

FRANK R. LONG, president and manager of the Frank R. Long Construction Company, Hackensack, N. J., died at his home in that town August 30 from stomach trouble.

Standard Boiler Rules

Standard rules for the care and construction of boilers are to be made the subject of a study by a special committee appointed by the Executive Committee of the American Society of Mechanical Engineers. The personnel of the committee is as follows: John A. Stevens, consulting engineer, Lowell, Mass., chairman; Edward F. Miller, professor of steam engineering, Massachusetts Institute of Technology, Boston, Mass.; Charles L. Huston, vice-president, Lukens Iron & Steel Company, Coatesville, Pa.; Herman C. Meinholtz, vice-president and superintendent, Heine Safety Boiler Company, St. Louis, Mo.; R. C. Carpenter, professor of experimental engineering, Sibley College, Cornell University, Ithaca, N. Y.; William H. Boehm, superintendent of steam boiler and flywheel insurance departments, Fidelity & Casualty Company, New York, N.Y., and Richard Hammond, president, Lake Erie Engineering Works, Buffalo, N.Y. There is reason to believe that a set of carefully prepared specifications formulated and recommended by such a committee will be recognized as a standard by legislatures and officials and that uniformity in legal provisions will be obtained.

Conservation Congress

The Third National Conservation Congress will be held in Kansas City, Mo., September 25, 26 and 27. Special attention is to be given to the maintenance and improvement of the fertility of the soil and also to the "influence of farm and rural life in promoting that strength and independence of character required for the highest class of citizenship." The delegates include 15 appointed by the Governor of each State; five appointed by the mayor of each city with a population of 25,000 or more; three delegates from smaller cities; three delegates appointed by county commissioners; five delegates from each national organization concerned in the work of conservation; three delegates from each chamber of commerce or similar organization concerned in the work of conservation; two delegates each to represent universities and experiment stations, and others. Henry Wallace, Des Moines, Ia., is president of the congress, and the executive secretary to whom names of delegates should be sent is Thomas R. Shipp, Washington, D. C., whose convention address is, National Conservation Congress, Kansas City, Mo.

The Pioneer furnaces of the Republic Iron & Steel Company made a new record in August with an output of 24,663 gross tons for the three stacks. The No. 3 furnace produced 9248 tons, or 298 tons a day ,against 8987 tons as its best previous month's output. The Republic Company's new No. 4 Haselton furnace made an output of 13,752 tons, or an average of 438 tons a day. Its largest single day's output was 501 tons.

The Princess Furnace Company, Glen Wilton, Va., blew out its furnace early last week. It will be idle until conditions in the iron market show an improvement.

Nelson Valve Company's Annual Dinner

The annual dinner of the Nelson Valve Company, Philadelphia, Pa. tendered to its officers and heads of departments, together with a few invited guests, was held at Nelson Hall, on the company's property, Tuesday evening, September 5.

Gathered around the banquet table were the members of the complete organization, including the sales representatives from all parts of the world. The occasion was memorable in that it was held upon the twentieth anniversary of the company.

Carlisle Mason, vice-president and general manager, presided as toastmaster and at his right sat Major George Mason, his father, one of the pioneers of the steel business in this country, and under whose direction what is stated to be the first boiler made of steel west of the Allegheny mountains was constructed at the plant of the Union Boiler Works at Chicago. His talk was reminiscent, and in conclusion he said it was one of the proudest moments of his life to be at the dinner and see his son the head of an institution such as the Nelson Valve Company.

General Manager Mason in talking to his guests said that the success of this company had been phenomenal; that each year it had doubled in size; that each month for the past two years had been greater than the one preceding, and that this had been accomplished by bearing in mind and practising honesty, fair-mindedness and good business policy with its customers, and giving in value a dollar's worth for every dollar.

Other speakers at the dinner were: George R. Van Dusen, corporation counsel; James Morton, representative in India, Australia, Strait Settlements, China, Japan and the Philippine Islands; Stockton Bates, auditor; Russell Bonnell, secretary; T. K. P. Haines, purchasing agent and advertising manager; Thomas Oakes, New York representative; W. J. Spencer, sales manager, and C. C. Peck, superintendent.

The trend of the remarks was toward continued cooperation, improvement in output and the upbuilding of the company, maintenance of quality, right principles and push.

The souvenirs of the dinner were replicas of the Franklin Institute medal given the company for excellence of output at the National Export Exposition, and on the reverse side the N-flying-V trademark of the company on its steel castings. Another souvenir was a cigar case.

Tags for Factory Operating Systems

Most business men, when tags are mentioned, think of the ordinary patched and eyeleted piece of stock that is used on bundles and packages. With the perfection of factory systems and the growth of the economical idea of a greater division of labor, manifold other uses are constantly being found for the tag. Special machines have been constructed for making, printing, couponing and numbering tags of extraordinary lengths and widths.

The reasons for the adoption by the superintendent or manager of a tag rather than a card in a factory system are two: 1. The hole of the tag, surrounded by a tough paper patch and reinforced with a metal eyelet if necessary, is convenient for hanging the tag on a machine or nail, or for tying it to a part going through the plant. The fact that the hole is there encourages the workman to hang the tag up instead of letting it lie on the work bench, where it is more apt to be mislaid, damaged or destroyed. 2. The tough, well-calendered stock of which the better grades of tags are manufactured makes the work easier for the office help who write out the tags and for the shop men who read and follow the directions upon them. A clean, smooth stock takes pencil, ink or carbon impression equally well, and time is saved both in the writing and the reading of the tag. As a natural consequence mistakes are less likely to happen when the tags are made out clearly.

Probably the most widely used and best known of system tags is the pay coupon tag which is adapted to factories and shops where the piece work system is in operation. This tag, in a high state of development, is seen in shoe factories where the division of labor is very great. It is also used by manufacturers of metal and electrical appliances, automobiles and carriages, mattresses, brass beds and furniture. On each tag are as many coupons as there are operations in manufacture. Each coupon is numbered and the workman, on completing his portion of the job, reports to the inspector or foreman, who O.K.'s the coupon and returns it to the operative. At the end of the week the coupons are returned to the office, checked off, and the pay slips made out. After payment has been made the coupons are canceled, kept about a month and then destroyed. Various methods of cancellation are in use. One suggested by the Dennison Mfg. Company is to dip one end of the coupon into a pot of yellow ochre dye. The coupons in this way can be canceled in bunches of 100 or more in one operation.

Shop order tags are regarded as a second grade division. These are issued by the office and contain instructions to the operative, who usually is paid by time and not by the piece. On account of durability and smooth surfaced stock they are intended to replace ordinary order-cards or slips. In some factories order tags contain numbered coupons, each one of which is a call for material to be delivered to the assembling department. When using such a tag the stub or upper end goes direct to the assembling room and carries upon its face the necessary directions. Each order coupon goes to the proper shop or store room and the parts called for are sent with it to the assembling room. Here the parts are grouped according to the numbers on the coupons and the articles are put together.

There is commonly a need of different kinds of record or special order tags which may be roughly grouped as follows. Stock bin tags, supply tags, "hold" tags, "hurry" tags, defective material tags, "rejected" tags, and machine record tags of various sorts. It is often found convenient when necessary to distinguish between operatives or periods of time to adopt tags of different colors. System tags are mentioned and illustrated in books written by specialists in factory organization and administration, including "Factory Organization and Administration," by Prof. Hugo Diemer; "Business Management," Part I, by Jas. B. Griffith; "Factory Manager and Accountant," by Horace L. Arnold; "Business Administration," by Carl C. Parsons; "Cost Keeping and Management Engineering," by H. P. Gillette and R. T. Dana; "Factory Accounts," by C. E. Hathaway and J. B. Griffith.

Proposed Panama Steamship Line

A fleet of 15 steamships to ply between New York and Seattle and San Francisco by way of the Panama Canal is promised by the incorporation September 5, at Trenton, N. J., of the Atlantic & Pacific Transport Company. It is possible the actual inauguration of the line is contingent on securing the ocean mail service between New York and Colon, New Orleans and Colon, San Francisco and Panama and Seattle and Panama. The capitalization is placed at $15,000,000 and those chiefly interested are understood to include Bernard N. Baker, Baltimore, former president of the Atlantic Transport Line; James S. Whiteley, former vice-president of that line; C. G. Heim, former treasurer, and T. B. Harrison, former secretary, all of Baltimore, and Adrian H. Boole, Washington, at one time identified with the Wilson Line. The mail contracts, it is stated, require stops by the ships at Savannah, Ga., or Charleston, S. C., and at San Pedro, Cal., or San Diego, Cal.

S. L. Bassett and H. E. Vogel, former secretary of the Machinists' Supply Company, Pittsburgh, have formed the Bassett-Vogel Company, 9 Market street, Pittsburgh, to act as manufacturers' representatives for the sale of leather and canvas belting, mechanical rubber goods, twist drills, reamers, taps, etc. A stock will be carried to fill orders promptly.

A patent on a grinding machine granted August 15 has been assigned by Bengt M. W. Hanson and Carl L. Grohmann, Hartford, Conn., to the Pratt & Whitney Company. Mr. Hanson has also assigned to the company a patent awarded August 15 covering a metal working machine and involving a head stock with means for supporting a tool as well as the spindle.

Imports of Ferrosilicon and Other Ferroalloys

Quarterly publication is made by the Bureau of Statistics, Department of Commerce and Labor, of the details of merchandise imports to the United States. From these statistics the following figures are taken, showing imports of ferrosilicon by quarters in the past two fiscal years. No imports of ferrosilicon containing 15 per cent. silicon or less are reported for the first half of this year:

Imports of Ferrosilicon to the United States—Gross Tons.

Quarter Ending—	15 Per Cent. Silicon or Less. Duty $5 Per Ton.	More Than 15 Per Cent. Silicon. Duty 20 Per Cent.
September 30, 1909*	610	880
December 31, 1909	2,050	1,373
March 31, 1910	400	1,752
June 30, 1910	730	2,273
September 30, 1910	425	2,120
December 31, 1910	665	3,005
March 31, 1911	...	2,264
June 30, 1911	....	1,609

*From August 5, when the Payne-Aldrich duty went into effect. Between July 1 and August 5, 3,717 tons was imported under the $4 duty.

The imports of ferromanganese and spiegeleisen in the first quarter of the past fiscal year were 35,890 tons; in the second quarter 34,937 tons, and in the third quarter 29,018 tons. The ferrophosphorus imports were 25 tons in the first quarter, 90 tons in the second and 50 tons in the third. Of tungsten or wolfram metal and ferrotungsten the imports were 124 tons, 108 tons and 288.65 tons for the three quarters respectively. The imports of molybdenum and ferromolybdenum for the three quarters were 8.04 tons valued at $11,373. Chrome and ferrochrome imports valued at $200 a ton or less were 234 tons, 207 tons and 76 tons respectively in the three quarters; valued at more than $200 a ton—27 tons, 10.02 tons and 5 tons respectively.

The Swedish Iron and Steel Corporation

Based upon reports from the trade, which constitute an almost unanimous expression of approval of Sisco Acorn Swedish steel, says the Swedish Iron and Steel Corporation, 12 Platt street, New York, it is arranging to bring in a complete stock of the following steels: Hot and cold forging die steel, up to 12 in. square, and 11 x 13 in. flats; sheet steel, Nos. 9 to 28 gauge; coils, 3/16 to 5/8 in. round and square, and a large assortment of other special material to meet special demands, suggested by numerous favorably disposed manufacturing concerns.

This company is at the present time carrying somewhat in excess of 4000 tons of Swedish die, tool and drill steels, and reports that the month of August was a record breaking month, for both the New York and New Orleans houses. This does not mean so much that general business conditions have improved, but indicates that the trade, having conducted long and complete tests covering a period of two years or more, under the present regime, has decided that Swedish steel, of the grades offered by this company, is suitable for the purposes for which it has recommended their use, the business of the month of August constituting an expression of the trade's confidence in the Swedish Iron and Steel Corporation.

Machinery arrangement, artificial shop lighting and the advantages and disadvantages of concrete floors, composition floors and wood floors for manufacturing plants are to be made the special subject for a meeting Tuesday evening, October 10, of the American Society of Mechanical Engineers, at the Engineering Societies Building, 29 West Thirty-ninth street, New York City.

The nomination of officers for the next year of the American Society of Mechanical Engineers has been announced as follows: President, Dr. Alexander C. Humphreys, president Stevens Institute, Hoboken, N. J.; vice-presidents, for two years, Prof. William F. Durand, Leland Stanford University, Stanford, Cal.; Ira N. Hollis, Harvard University, Cambridge, Mass.; Thomas B. Stearns, Denver, Col.; managers for three years, Charles J. Davidson, Milwaukee Electric Railway & Light Company, Milwaukee, Wis.; Henry Hess, president Hess-Bright Mfg. Company, Philadelphia, Pa.; George A. Orrok, mechanical engineer New York Edison Company, New York, N. Y.; treasurer, William H. Wiley.

Coal Production in 1910

For the first time in the history of the United States the coal mines of the country in 1910 were credited with an output exceeding half a billion net tons (2000 lb.), the combined production of anthracite, bituminous coal and lignite having amounted to 501,576,895 tons, with a spot value of $629,529,745. This great output, according to Edward W. Parker, coal statistician of the United States Geological Survey, was attained in spite of the fact that most of the mines in Illinois, Missouri, Kansas, Arkansas, and Oklahoma were closed for nearly six months by one of the most bitterly contested strikes in the history of the industry. The heaviest tonnage mined in any year previous to 1910 was in 1907, when a total of 480,363,424 net tons was produced.

Compared with 1909 the output in 1910 showed an increase of 40,762,279 net tons, or 8.85 per cent. Except for the States affected by the strike order the increase in production was general among the more important coal-producing States. The output of anthracite in Pennsylvania increased from 81,070,359 tons, valued at $149,181,587, to 84,485,236 tons, valued at $160,275,302, a gain of 4.21 per cent. in quantity and 7.44 per cent. in value. The bituminous production, including semi-anthracite, semi-bituminous, canal, splint, and sub-bituminous coals, lignite, and a small quantity of anthracite from Colorado and New Mexico, increased from 379,744,257 tons, valued at $405,486,777, to 417,091,659 tons, valued at $469,254,443, a gain of 9.83 per cent. in quantity and of 15.73 per cent. in value.

The total increase of 40,762,279 tons in 1910 over 1909 was equal to 20 per cent. more than the entire output of the United States in 1870 and more than half of the total output in 1880. The largest increases in production in 1910 were in the States that benefited from the idleness in the Mississippi Valley. The bituminous coal mines of Pennsylvania showed the largest increase, 12,554,735 tons. West Virginia was second, with an increase of 9,821,799 tons; Ohio third, 6,270,027 tons; Kentucky, fourth, 3,925,935 tons; Indiana fifth, 3,555,556 tons, and Alabama sixth, 2,388,529 tons.

Standard versus Heavy Duty Shapers

Only about one machine shop in a hundred requires a heavy duty shaper if the castings and forgings are made as they should be. Such is the opinion of the Ohio Machine Tool Company, maker of planers and shapers, Kenton, Ohio. It is emphasized that if patterns are correct the metal brought to the shaper ought not have a large excess of metal to be removed, and heavy duty shapers, representing a large investment and therefore a large overhead expense, as well as involving considerable friction load, are not necessary. A letter from C. C. Swift, secretary and treasurer of the company, remarks that there is too great a tendency on the part of managers of machine shops to purchase heavy machine tools where the work required could be done on lighter machines just as easily, more handily and even with greater output—all tending to cut down the overhead expenses. The company has been manufacturing a line of planers and shapers for some 20 years. The Ohio standard pattern shapers are built single or back geared, with 16 in., 18 in. or 22-in. stroke, but the company also manufactures a heavy duty 24-in. back-geared shaper. The company is contemplating an addition of a 60 x 100 ft. building for increasing its facilities.

Data prepared by the Bureau of Railway Economics in Washington indicate that while the railroads found their labor bills in total substantially heavier in the fiscal year 1911 than in 1910, at the same time the effort to retrench operating expenses by reducing forces has been conducted on a considerable scale for many months past, instead of having resulted from the demand of shopmen on Western railroads for increased pay and the closed shop, as has been generally supposed. Information received from a number of important systems shows a reduction of 9 per cent. in the number of employees April 30, 1911, as compared with those on payrolls April 30, 1911. The same rate of reduction for all the railroads of the country would mean that about 145,000 men had been thrown out of employment.

The Stock Process for Steel Castings

A Small Bessemer Converter Equipped with an "Economizer" and Using Fuel Oil for Melting

Interesting results have been secured at the works of the Darlington Forge Company, Ltd., Darlington, England, by the use of a new type of small Bessemer converter on which patents covering the construction and the process have been secured by Guy J. Stock, of Darlington. The practice at the Darlington plant has been developed in the past 21 months, the converter in use there being of three tons capacity. At seven other steel foundries in Great Britain the Stock converter is either in use or is being installed. Thos. Firth & Sons, Ltd., Sheffield, England, have ordered a second plant, which will give that firm a 3-ton and a ½-ton converter.

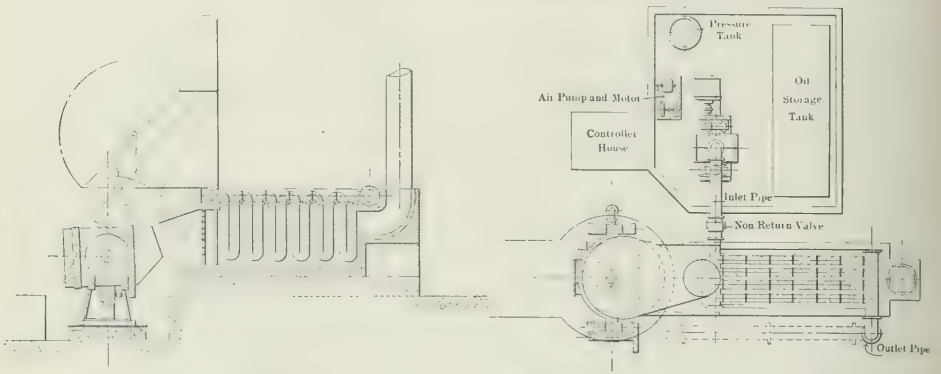


Fig. 1—Elevation and Plan of a Stock Converter Installation.

One of the features of the Stock process is that the cupola is dispensed with; the melting of the metal previous to blowing is accomplished in the converter itself, crude oil being used as fuel. Another feature is that there is an "economizer", as the inventor terms it, consisting of a series of U-shaped pipes and between these the hot waste gases resulting from the melting operation are led,

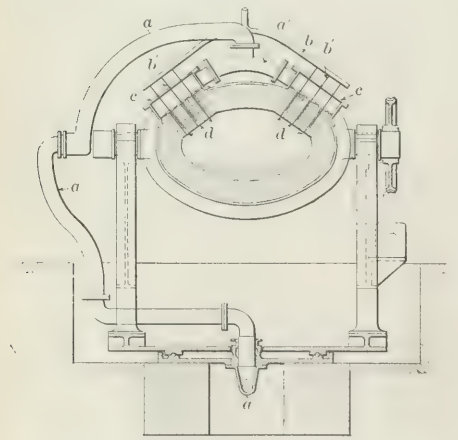


Fig. 2.—Section of Stock Converter, Showing Blast and Oil Pipes and Oil Jets for Melting

the blast in turn passing through these heated pipes to the converter.

Fig. 1 gives an elevation and plan of a Stock converter installation, and in Fig. 2 is a section showing the arrangement of the tuyeres and of the oil and blast pipes.

The vessel is made of oval section so as to expose the largest possible surface of the metal to the action of the oil burners, and the tuyere box was designed for the most effective action of the blast and of the oil jets. The converter is lined with silica brick running up to a thickness of 13 in. around the tuyeres. For convenience of working, in addition to the mounting on trunnions working in roller bearings a turntable is provided for the revolution of the vessel. The purpose of this arrangement is illustrated in Figs. 3 to 5. In Fig. 3 the vessel is in the position for charging, which is effected by the use of a peel. By this method it is stated three tons of pig iron and scrap can be charged by three men in about ten minutes. After charging, the vessel is moved through an angle of 90 deg. into the position for melting, as shown in Fig. 4. Here the nose of the converter is pointed toward the air heater or economizer. The hot gases from the burning oil are drawn through the heater by means of the chimney stack, as shown in Fig 1. Blast is supplied in the case of the 3-ton converter by a Roots pressure blower with a capacity of 3000 cu. ft. per minute, the blowing pressure varying from ¾ lb. per sq. in. for melting to 3½ lb. per sq. in. as the maximum for converting.

Air from the blower is delivered into the heater through the inlet pipe shown in the plan in Fig 1, and after passing through the system of pipes goes to the converter through the pipe *a*, Fig. 2, which terminates in a two-way branch pipe *a'*, leading into the blast boxes *cc* and through the tuyeres *d* into the vessel. The oil supply pipe is shown at *b*, and *b'b'* are small oil jets extending from it into the tuyeres. In melting, the air which passes through the tuyere enters the vessel at a temperature of about 800 deg. Fahrenheit, and in the burning of the oil a very close approach to perfect combustion has been secured. With a 3-ton converter the metal is melted in about 1½ hours. The blow which follows takes from 15 to 25 minutes. Thus a blow every 2 hours can ordinarily be made. The converter is shown in the position for blowing in Fig. 5, the necessary hood and chimney for carrying away the products of combustion being fixed directly above the air heater. The vessel is brought into position for pouring by turning it through 180 deg. in a horizontal plane from the position occupied during the blow.

The oil used for melting is forced by the blower or by an air compressor into a smaller tank which contains a sufficient quantity for five to six meltings. This service tank is fitted with a coil through which hot air or steam can circulate so as to decrease the viscosity of the oil. The tank is connected to a small independently driven compressor, maintaining a constant pressure of 30 to 35 lb. per

sq. in., forcing the necessary amount of oil through a flexible tube to the oil tubes in the tuyere box. These latter are steel tubes with an internal diameter of about 1/16 in. and point through the center of the tuyeres. When the melting operation is completed these oil pipes are withdrawn, the tuyere box being so arranged that this can be done in a few seconds.

In addition to dispensing with a cupola and providing the economizer for preheating the air, the advantages of the Stock converter are stated as follows: With liquid fuel for melting there is no taking up of impurities in this process. The high temperature of the melted charge permits of using pig iron low in silicon as well as high percentages of scrap. A very fluid steel is secured, making it possible to use this process for the manufacture of difficult and intricate castings. The products manufactured from Stock converter steel include wheel centers, high carbon steel wire, low carbon seamless drawn tubes, chip-

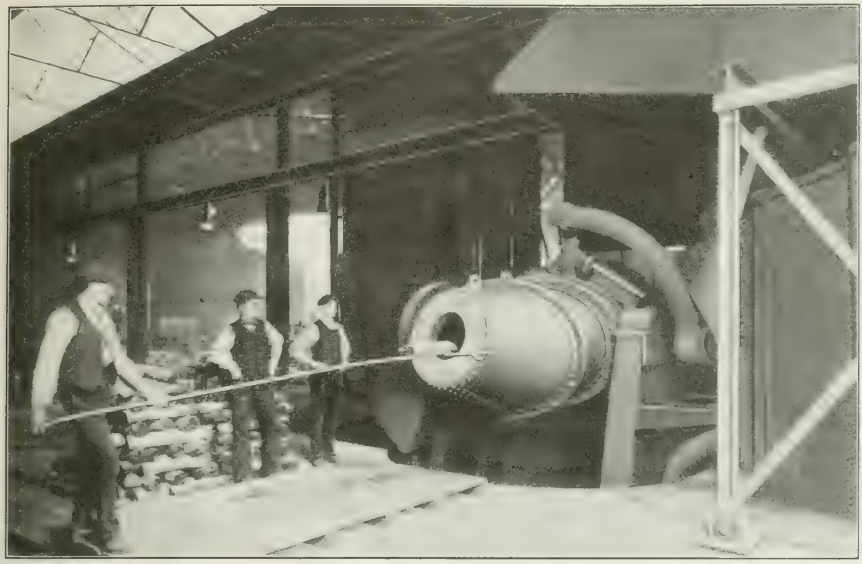


Fig. 3 Charging the Converter.

ping and calking chisels and pneumatic tools; also high-speed tools for steel containing tungsten, chromium and vanadium.

With an operation of 52 tons a week in a 3-ton Stock converter, working single shift, the cost per ton has been worked out as shown below. The cost of the charge in this table is based on a price of 60 shillings or $14.58 per ton for Bessemer, or hematite, iron, and an ascertained loss of 13 per cent. in conversion, with a further loss of 3¼ per cent. in ladle spillings and floor scrap:

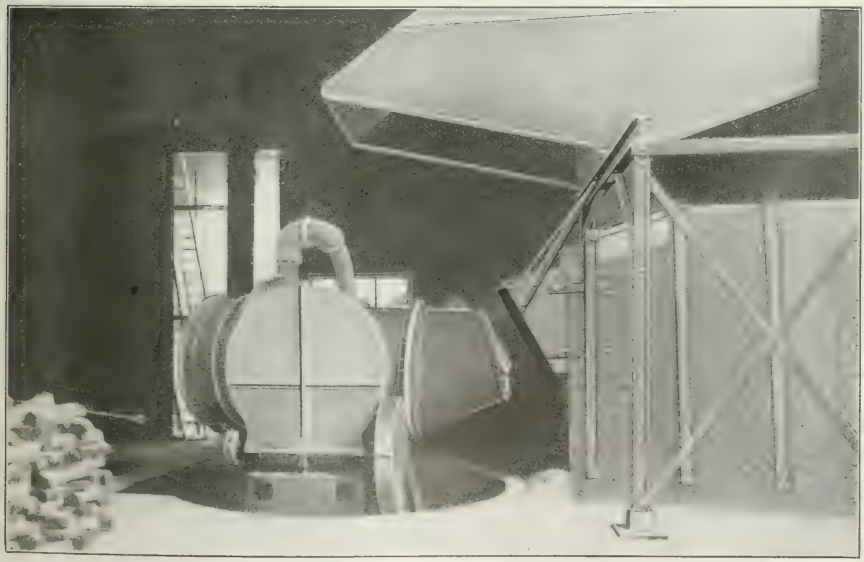


Fig. 4 Position for Melting. Water Cooled Brick Dome. Tuyere. Economizer.

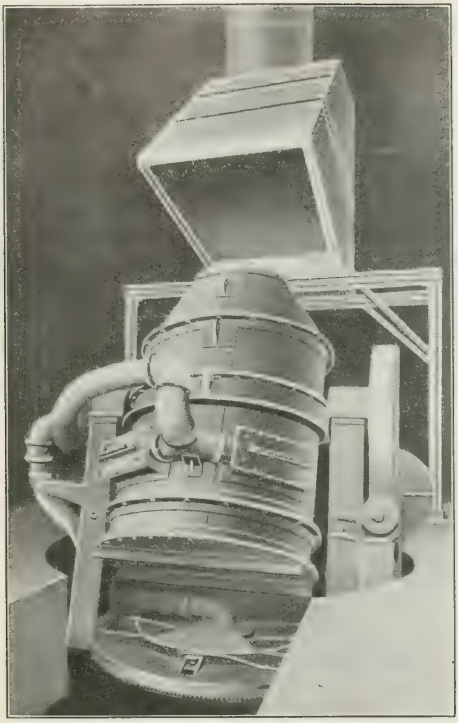


Fig. 5.—Converter in Position for Blowing.

Cost of Stock [illegible] Stock Converter.

Metal and mixings 123 cwt. 3 qr. 10 lb.	$17 02
Fuel oil 6401/2 gal. at 5 cents per gal.	2 03
Electric power 142 units at 1 cent per unit	.42
Direct wages	.25
General repairs and upkeep, including linings	1.70
Cost of converted metal	$21.90
Add allowance for ladle linings and repairs	.50
Cost of metal in molds	$22 40
Add allowance for depreciation and interest	$0.53
Add allowance to cover royalty charges	.83 1.36
Total cost of steel	$23 76

Analyses. Carbon, 0.12 per cent. Manganese, 0.508 per cent. Silicon, 0.130 per cent. Sulphur, 0.014 per cent. Phosphorus, 0.041 per cent.

[illegible] Stock Converter Steel. Borrow Test. Stock Co. Steel.

No.	Description	Original area In.	T. S. 1,000 lb. per sq. in. orig. area	Contraction Per Cent	Elongation. In.	Elongation. Per cent	Bent
1	42 Rear bars	0.50	27.4	54.3	3	30.0	180 No Fracture
4	Radial wheels	0.50	28.0	50.8	3	34.0	" " "
1	Ford. bearing keep	0.50	28.8	52.3	3	33.0	" " "
1	" "	0.50	29.6	47.2	3	33.0	" " "
1	Aft. " "	0.5	30.0	52.8	3	33.0	" " "
4	Side frames	0.50	29.0	50.8	3	28.0	" " "
10	Platform supports	0.50	29.4	51.6	3	30.6	" " "

Analyses.

	No. 1. Per cent	No. 2. Per cent	No. 3. Per cent.	No. 4. Per cent.	No. 5. Per cent.	No. 6. Per cent.	No. 7 Per cent
Carbon	0.22	0.22	0.20	0.23	0.23	0.22	0.21
Manganese	0.607	0.540	0.600	0.567	0.540	0.607	0.540
Silicon	0.273	0.178	0.237	0.285	0.273	0.273	0.296
Sulphur	0.012	0.019	0.013	0.016	0.010	0.012	0.018
Phosphorus	0.020	0.024	0.018	0.029	0.020	0.020	0.028

Charles S. Powell, 165 Broadway, New York, is the agent in the United States for the Stock process. Mr. Powell recently returned from an extended stay in England devoted to a study of the practice at the Darlington steel foundry.

Ohio's State Building Code

Ohio has a remarkable building code which has been in operation since July 31. What is now law is only a part of an ambitious programme being drawn up by the Ohio State Building Code Commission. The code in its entirety is to cover in part the construction, heating and ventilation, sanitation, lighting and electric work of theaters and assembly halls, churches, school buildings, asylums and hospitals, hotels and tenement houses, club and lodge buildings, workshops, warehouses, office buildings and railroad stations.

The law as passed covers theaters, assembly halls, school houses, colleges, seminaries and the like. The third part of the code, which part has also been passed, defines fireproof construction, mill construction, etc., and stipulates the requirements regarding fire walls and fire stops, fire doors, shaft and belt openings, rolling steel doors and shutters, fireproof windows, ladders and fire escapes, standpipes and fire extinguishers. Part 4, which has also been passed, covers sanitation in general, being in fact an extended State plumbing code. The remainder, covering the general subjects of heating and ventilation, gas fitting, electric work, elevators, general building construction, strength of materials and the maintenance of business establishments for the selling and handling of oil, varnishes and the like, for the storage of rubbish, for handling garbage, etc., has not yet been formulated or adopted by the Ohio Legislature. The Ohio State Building Code Commission is located in Columbus, with Thomas E. Kearns, chief inspector of workshops, factories and public buildings, as president; John W. Zeuber, State fire marshall, as secretary, and Fred W. Elliott, Chamber of Commerce Building, Columbus, consulting architect.



Fig. 6.—Test Specimens of Steels Represented in Table [illegible]

The accompanying tables give the analyses and results of physical tests of Stock converter steel. In Table 1 tests are given of two pieces cut out of a 10-in. stop valve which had been subjected to a hydraulic test of 500 lb. per sq. in. Table 2 gives the result of tensile and bending tests of the test pieces shown in Fig. 6. The seven numbers given in the table correspond with those marked on the test pieces in the illustration

[illegible]

Test No.	Description.	Orig. area. In.	T. S. 1,000 lb. Per sq. in. orig. area	Contraction. Per cent.	Elongation. In.	Elongation. Per cent.
1	10-in. stop valve	0.496	27.8	[illegible]	3	31.3
					[illegible]	37.0
2	"	0.250	28.4	53.6	[illegible]	36

The Baird Spring Making Machines

An increasing demand from spring manufacturers for standard machines for the making of springs has led the Baird Machine Company, Oakville, Conn., to develop a line containing three types, namely: Spring coiling and cutting machine, Fig. 1; spring winding and cutting machines, Figs. 3 and 4, and continuous spring coiling machine, Fig. 2. Some examples of the product are seen in Fig. 5.

The spring coiling and cutting machine is furnished with either die or roll tools, to suit the circumstances of their proposed use. Die tools are more easily changed from one size to another, but their initial cost is greater, as a separate set of tools is necessary for each size of spring. If a company is using the same spring at intervals the method is cheaper in the end.

For jobbing manufacture roll tools are more desirable, as with the same rolls on one diameter of wire any spring within the capacity of the machine can be made by adjusting the mechanism. But gauges may have to be used or tests made in other ways. This type of machine automatically takes the wire from the coil, feeds a predetermined length and coils either right or left hand, open or close coiled springs, and cuts them off. It is capable of receiving attachments for varying the pitch in the spring, such combination. A setting attachment can also be applied to set the spring or take out the initial tension. The machine is made in sizes taking wire up to about 3/16 in. diameter, and will make springs up to about 2 in. diameter,

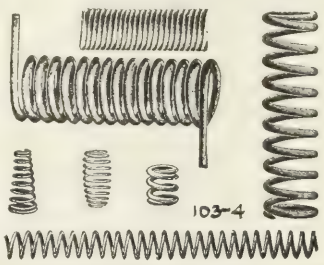


Fig. 5.—Types of Springs Made with Baird Spring Machines.

with quite a wide range of adjustment. It will not make springs with straight ends.

The Baird spring winding and cutting machine uses

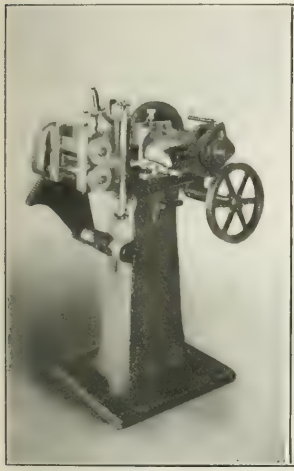


Fig. 1.—Spring Coiling and Cutting Machine.

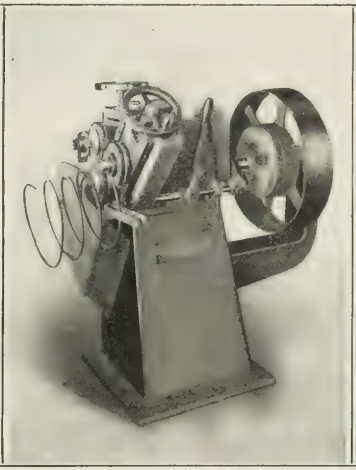


Fig. 2.—Continuous Spring Coiling Machine.

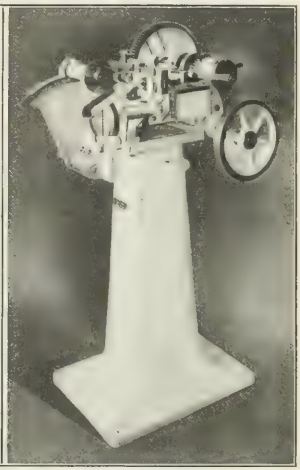


Fig. 3.—Spring Winding and Cutting Machine.

MACHINES MADE BY THE BAIRD MACHINE COMPANY, OAKVILLE, CONN.

so that a spring can be made with both open and closed coils, a very common type having squared ends, as shown in the illustration. A diameter changing attachment can also be applied, which will make cone or barrel shaped springs, and the two attachments together would make cone or barrel shaped springs with squared ends, or other

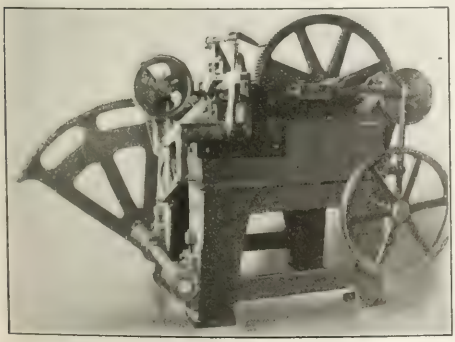


Fig. 4.—Baird No. 2 Spring Winding and Cutting Machine.

an entirely different principle from the coiling machines. They manufacture open or close springs, right or left hand, and some types of cone springs. All have straight ends, but the lengths of the ends may be varied within limits to suit ordinary conditions.

The continuous spring coiling machines are about the same construction as the spring coiling and cutting machines except that the springs are not cut off, this type being used for making the long springs which consume so much wire that it is impracticable to feed such a length. It is also capable of receiving the same attachments for varying the pitch and diameter, or both, as the coiling and cutting machines, with the exception of the setting attachment, so that a long length of spring varying in pitch and diameter for the making of such things as poker handles, etc., can be made and then cut apart into shorter springs by subsequent operations. A type of this coiling machine is shown making a spring of large diameter, the rolls being adjustable.

The Thomas Steel Company, Niles, Ohio, is adding two additional hot mills, one 30-in. and one 36-in., which will make the plant comprise 12 mills. It is also extending the present sheet-bar building about 100 ft. and is putting up a large steel water tank.

The Preparation of Brown Iron Ores*

The Approved Methods of Mining, Transporting and Washing and Concentrating

BY H. S. GEISMER, CHATTANOOGA, TENN.†

There are three general methods available for obtaining commercial brown iron ore: hand-screening, washing, and washing and concentrating.

Hand screening has produced a large tonnage of ore in the past, but is rapidly falling into disuse, except as a preliminary step, largely because modern furnace practice requires all foreign material to be separated from ores before they are delivered to the furnace, and hand-screened ores can rarely be made to fulfill that requirement. Another argument against hand-screening is that the waste pile often contains as much ore as the screen recovers. The operation known as hand screening consists of throwing the ore-bearing material against a stationary inclined screen of 0.5 in. to 0.75 in. mesh, similar in construction to the screens employed in sand pits. The recently prospected brown ore deposits of Cuba seem to offer possibilities for hand screening not possessed by the average American deposit, since these ores are not associated with worthless clays.

Washing and washing and concentrating may be discussed together, since concentrating is never practical on brown iron ore, except to treat ores that have already been washed. (Strictly speaking, washing might be classed as concentrating, but it is never so designated by brown ore men).

The various steps of removing ore-bearing material and converting it into ore suitable for blast furnace use may be grouped under five heads: loading for transportation, transporting, feeding into the washer, washing, and concentrating. These five subjects will be considered in consecutive order. Each of these successive steps may be accomplished in a number of different ways, the choice depending entirely upon the character of the ore-bearing material to be treated.

Brown-ore deposits vary in character:

a. As to size of the ore-fragments—they may vary anywhere from gravel to boulders weighing tons.

b. As to material with which the ore is associated—clay, sand, loam, gravel and chert are all to be classed as ore-bearing material.

c. As to richness of deposits—1 yd. of ore-bearing material may yield 1 ton of ore, while another yard may yield but a thimbleful.

d. As to thickness of deposit—anywhere from blanket deposits a few feet in thickness to concentrate deposits several hundred thick.

e. As to quality of ore—anything from pure limonite to ferruginous sandstone.

f. As to origin—you may choose between "residual," "replacement," and "concentrate;" no matter which of these terms seems to fit your particular deposit, there will be plenty of geologists ready to convince you that your conclusions are erroneous—and perhaps they are. But this question need not be considered in the present inquiry.

I.—Loading

All the methods for loading and transporting earth and rock are applicable at times to the different classes of brown ore deposits. Those most used are: loading with pick and shovel into wheelbarrows, dump carts and wagons drawn by mules, horses or oxen, or tram cars drawn by animals or dinkeys; loading with steam shovels into drop-bottom wagons, tram cars, or side-dump cars of various styles and capacities, from 1 to 12 cu. yd.

The greatest difference between the loading of brown ore dirt and that of earth for railroad building or similar purposes is that the brown ore material cannot always be loaded blindly, but requires careful handling to prevent mixing the ore-bearing materials and the worthless rock with which it is often found intimately associated, and which cannot always be separated from the ore by washing. This consideration often eliminates the steam shovel as a loading device in ore banks that would be otherwise well adapted to that style of loading; and instances are not rare in which washers fed by steam shovels have been abandoned on account of the low quality of ore produced, and at a later date have been successfully operated under management that substituted hand loading for shovel work.

Brown ore deposits are often buried under blankets of worthless clay and sand that require to be stripped off before the ore can be recovered. For this class of stripping the steam shovel is admirably adapted; and the foregoing remarks concerning the care needed to separate ore from foreign material when loading with shovel do not here apply, since the line of separation between the ore-bearing material and the over-burden is well defined. It is generally advisable to carry on such stripping in advance of the mining. The various types of drag line excavators now manufactured present great possibilities in connection with stripping operations, especially where large lean and barren areas have been left surrounded by deep cuts, and subsequent operations require the wasting of these abandoned areas, to permit of mining ore lying at deeper elevations.

The steam shovel is usually a losing proposition, if used in mining shallow deposits. Cuts under 5 ft. in depth can be handled more economically by hand, unless the deposit consists of ore masses too large for hand loading. This mention of large masses suggests another manner in which the steam shovel may interfere with the output of a washer. I refer to the tendency to load with the shovel dipper masses larger than the crusher at the washer will handle, necessitating extra labor and costly delays. The economical place to break down large lumps is in the ore bank, where dynamite can be used freely; but the irresistible tendency in steam shovel work is to load anything that can be handled by the dipper. It would, of course, be possible to install crushers capable of receiving any boulder that could be loaded into a shovel dipper; but, except in rare instances, the cost of such crushers would be prohibitive for brown ore plants.

In districts where steam shovels are used to advantage great variations are noticeable in the type of shovels employed. This generally indicates that at various times the financial standing of the different operators has varied; and the date on the name plate of the largest shovel will probably coincide with the date of the best-filled treasury. The tendency in brown ore mining is toward larger shovels with standard-gage railroad trucks. The old argument that widely separated deposits at varying elevations require light-traction shovels that can be more easily moved about is now answered with, "Small, widely separated deposits do not require steam shovels at all."

The light revolving type of steam shovel was for a time very popular in brown ore work; but, except for following narrow leads of ore, it cannot compete with the large standard type of equipment. The operating costs are nearly the same with the large and small shovels, while the outputs are almost as two to one.

II.—Transporting

The system of transportation to be adopted is regulated largely by the method employed for loading the ore, but each system may permit of variations that may involve startling results. For example, a deposit made up of small scattered pockets, lying at widely different elevations, can only be loaded by hand labor. This would suggest transportation by wagons or mule carts; but, owing to the depth of some of the pockets, the grades become too steep for mule or horse travel; oxen are substituted, and no further trouble is experienced. Again, a change in car design, where self-dumping cars are employed, may greatly affect the economy of transportation.

*From the Bulletin of the American Institute of Mining Engineers, August, 1911. Articles on "The Brown Iron Ores of Alabama" appeared in *The Iron Age* for 1908 as follows: June 4, p. 1788; June 11, p. 1856; June 25, p. 2008; July 9, p. 108. August 6, p. 381; September 3, p. 632.

†Chattanooga district manager, Southern Iron & Steel Company.

The richness of a deposit needs small consideration in planning the method for loading, but it has a marked effect on the cost of transportation. The cost of transportation per ton of ore produced will depend upon two conditions: the richness of ore-bearing material (number of cubic yards of material required to produce one ton of ore) and the length of haul from ore-bank to washer. The first is dependent on natural conditions. If the deposit is so lean that transportation by any known system is economically impracticable, there is nothing left to do but abandon the property. The second is largely dependent upon individual judgment in choosing the location for the washer. Present practice seems to favor a large central washing plant, fed by a number of scattered ore banks, in contrast to a small washer located at each deposit. This practice lowers the actual cost of washing the material, but introduces an excessive transportation charge that very often more than offsets such saving.

The thickness of a deposit may limit the choice of systems of transportation that can be adopted. For example, a thick deposit of small area can only be followed down by means of a hoisting engine in connection with an incline or shaft. The method adopted for loading the ore-bearing material may determine the system of transportation required. Mechanical loading, for example, requires mechanical haulage. When dinkeys and side-dump cars are used for transportation in connection with shovel-loading it is generally advisable to have this equipment and the shovel of standard-gauge design; this allows great flexibility in the shifting of the equipment, besides making it possible to handle railroad equipment, such as car loads of coal, to any point of the operation.

In connection with shovel-loading, the transportation requires careful watching. Unless the shovel can be kept at work continually it will not show a satisfactory cost; and the only way to accomplish this is so to arrange the system of transportation that the shovel-loading track is always supplied with empty cars.

III.—Feeding the Material into the Washer

When the ore-bearing material arrives at the washer it is dumped on to a grizzly, made up of parallel iron bars or rails with 3-in. openings between them. The fine material which falls through the openings passes directly into the log box or falls into a mud box and is carried to the log box by a flume. The coarse material rejected by the grizzly may be handled in several different ways: broken down with hammers, as it rests on the grizzly bars, until it will pass through the openings; or carried down the grizzly bars (this requires that the bars be set at an inclination of about 30 deg.), and delivered into a crusher, from which it passes into the log box; or delivered from the end of the grizzly bars directly into an overhead screen, the fines passing through the screen into the log box while the coarse goes directly into the loading bin.

The output that can be obtained from a washer is often limited directly by the amount of material that can be handled through the grizzly; and yet, in most instances, little attention is paid to the grizzly design, either as to the area required for it or the manner of delivering material to and from it.

To design a grizzly properly, two determinations are required: (*a*) the size of the ore fragments as delivered to the grizzly; and (*b*) the character of ore-bearing material (mud, clay, sand, gravel, etc.) delivered upon the grizzly with the ore.

When the ore occurs principally as large "dornicks" the grizzly area must be large. If the grizzly bars are horizontal, a large number of men will be required to hammer the lumps through; and if they are inclined, the material must be spread over a large area, to prevent the lumps from blocking the openings. A nozzle, delivering water at about 100-lb. pressure, is of great service in separating the fine material from the coarse and forcing the fines through the bars.

If the ore occurs in small pieces, varying in size from gravel to cobblestones, imbedded in stiff clay, the grizzly must be designed to effect a partial breaking-down of the clay mass, or the resulting product at the washer will consist largely of clay balls. This can best be accomplished by the use of giant nozzles. However, it is not always possible to separate the ore sufficiently from the clay; and a good many rich ore deposits are not workable because of this fact.

If the ore-bearing material as delivered to the grizzly contains a considerable quantity of soft, nearly decomposed sand boulders, opportunity must be afforded to separate them from the material being delivered into the logs; for, when once in contact with the logs, they are quickly broken up and can then only be separated from the ore product by jigging.

In connection with the delivery of ore-bearing material from grizzly to the washer, the possibilities of a flume are often overlooked. A flume not only offers a cheap and convenient method for transporting the material between these two points, but is also of considerable advantage to the washer. In fact, some ores require no further treatment than to be made to travel several hundred feet down a gravity flume. A metal-lined flume requires a minimum inclination of 11 deg.

IV.—Washing

The ordinary log washer of the "ground-hog" variety is probably not a curiosity in any State of the Union; nor should we marvel at this, when we consider its wide usefulness, coupled with its history, which dates back to ancient Greece. The so-called modern washing plant differs little from the earlier variety as regards log design, the difference being mainly noticeable in the accessories that have been added. Nor are the results obtained in these modern plants always entirely different from the results obtained in the less pretentious old ones. In too many instances the modern plant is simply a copy of a neighboring successful one, and, while the original design may have required all the extra trimmings, the latter plant did not; and it is quite possible that the trimmings effect a waste rather than a saving. The flow-sheet for a complete plant would show the following:

All material is delivered into a revolving conical overhead screen. The oversize passes out at the end of the screen on a picking belt, from which it is delivered to a crusher, thence on to another picking belt, and then directly into the railroad cars or storage bins. Very often the crusher is omitted and the material passes from the overhead screen to a picking belt and is delivered to the loading bins. The undersize from the overhead screen passes directly into the lower end of the log washer. During the passage along the logs most of the loose dirt is separated from the rock material and flows out at the lower end of the logs with the water overflow. The rock material passes out at the upper end of the log and is delivered into a sand screen. The oversize from the sand screen passes on a picking belt for delivery into bins or railroad cars. The undersize is either sluiced to jigs for treatment or is carried away with the waste water.

As a rule the proper functions of the various accessories do not receive proper study; and when once installed they are operated continuously, even though they may be responsible for useles waste. The work that each part of the washer equipment may be expected to accomplish is not necessarily shrouded in mystery, and the limitations of each are easily determined.

OVERHEAD SCREEN

The principal object of this screen should be to eliminate from the washer feed all material that is too large to be handled by the logs. It is true that in passing through this screen much dirt may be separated from the large boulders by means of numerous nozzles delivering water under pressure, but it is also true that this dirt would be more effectively removed could the dornicks be handled in the washer.

If the ore material carries a large proportion of sand boulders, the screen is of great advantage, since it cleanses these boulders and permits them to be easily detected by the picker boys before they reach the crusher.

In some deposits the large lumps of ore are comparatively close-grained (in contrast to the honeycomb structure generally characteristic of ore boulders), and a thorough rinsing is all that is required to make them marketable; with such deposits the overhead screen will increase the capacity of the washer considerably, as it can be arranged to handle all of the lump ore, leaving only the fines for the logs.

If the ore-bearing material consists largely of loam and sand, the overhead screen will be very effective. On the other hand, if the material consists of small ore particles imbedded in clay which tends to concentrate

into clay balls, the screen cannot be depended upon to effect a separation and may produce great waste of ore. The explanation is that the clay, in "balling up," carries with it most of the ore particles; and, since the balls produced are too large to pass through the screen, they are delivered from the end of the screen on the picking belt and are then thrown away by the picker boys. Or, if they are not thrown away, their clay content will materially affect the resulting ore analysis. The best way to overcome this difficulty is to abandon the overhead screen temporarily at least, and pass all of the material through the logs.

LOG WASHERS

The function of the log is usually overestimated. Logs, if properly designed and erected, will eliminate from all classes of rock material clay, loam and sand. They will not separate pyrites, quartz and limestone from ore. Yet logs are continually being erected to handle material that consists of one-fourth ore and three-fourths useless rock.

Almost the only change effected in the design of logs during the past 1000 years is the substitution, to a limited extent, of steel for wood. Each type has its advantages. The steel log is higher in first cost, but in permanent plants its longer life will offset this difference. Its principal disadvantage is that it does not permit the variations in lug-spacing so effectively employed with wooden logs when the character of the material handled changes suddenly. The principal disadvantage of the wooden log is, that it is liable to break if overloaded with large dornicks, and, at best, is short-lived. In some localities it is impossible to obtain timber suitable for logs. In the manner of driving log washers recent practice has substituted intermediate friction drivers to eleminate "breaking pins" or, worse still, breaking gears. To obtain satisfactory results from any type of log washer an adequate supply of water is an absolute necessity.

CRUSHERS

Crushers may be installed to accomplish any one of three things:

1. Reducing dornick ore to a size considered satisfactory by the furnace manager who buys the ore. This may be anything from 1-in. ring to 6-in. ring.

2. Reducing dornicks of the honeycomb type to permit their being effectively handled in a log washer. The cavities in ore of this type are filled with clay, and unless they are broken down into small sizes the clay cannot be eliminated by the washer. The following figures show the effect of installing a crusher between grizzly and washer at a plant operated by me several years ago:

Average of Ore Loaded in Railroad Cars.

Before Installing Crusher.

	Metallic Iron. Per Cent.	Silica. Per Cent.	Alumina. Per Cent.
August 4	44.33	16.32	4.02
August 11	48.37	11.44	3.09
August 19	44.48	16.80	4.28
August 26	46.74	13.90	4.30

After Installing Crusher.

	Metallic Iron. Per Cent.	Silica. Per Cent.	Alumina. Per Cent.
September 4	48.21	12.04	3.61
September 11	49.11	10.76	3.60
September 18	47.77	12.50	3.80
September 25	49.80	11.52	3.78

3. Crushing breccia dornicks consisting of loosely cemented fragments of rock and ore to a size that will allow them to be fed into jigs. Deposits that would be materially benefited by such treatment are rare and very careful experiments should be made before installing a crusher for such duty.

SAND SCREENS

Most of the sand contained in the material delivered to the log washer passes along the logs and is delivered with the ore product. This has led to the practice of passing all material from the washer-discharge into a revolving screen made of wire cloth about ⅜-in. mesh. A stream of water playing on the inside of this screen forces most of the sand out. It also forces all the ore fines out; and, in many plants, investigation reveals the fact that the material passing through the sand screen is superior to that recovered. Constant sampling of the tailings from any washer is always to be recommended. If the tailings contain a large percentage of ore, and yet are too siliceous to be marketable, the feasibility of recovering the ore by means of concentrators should be investigated. When jigging is employed all of the material passing through the sand screen should be delivered to the jigs for treatment. This permits variations in the size of openings in the sand screen; and careful experiments are required to determine just what size of material should be allowed to pass through the screen into the jigs. In most deposits material that will be rejected by screens having 1.5-in. perforations is not materially benefited by jigging.

PICKING BELTS

Picking belts, as the name implies, are slow-moving conveyors of any description that afford opportunity to pick out clay balls and worthless rock from the ore product as delivered by the washer. If the ore is crushed before being delivered to the washer, picking belts are generally installed to feed the crusher. To be effective all of the material on the belt must be thoroughly rinsed by numerous sprays before passing the picker boys; otherwise the material is liable to be so covered with mud that it is impossible to distinguish between the ore and refuse. Picking belts are worthless unless manned by a sufficient number of competent pickers to separate the waste material during its passage between washer and bin; yet such belts are often turned over to one or two boys without further thought or supervision.

The greatest opportunity afforded for improvement in the methods now practised at brown ore washers would seem to be in connection with these picking belts. Attachments making it possible to replace with mechanical separation the present unreliable hand picking will undoubtedly be perfected in the near future.

V.—Concentration

For concentrating brown ore (beyond the results that may be obtained in a washer) three means are available, although only one (jigs) has been adopted to any great extent. I refer to jigs, reciprocating tables and magnetic and electrostatic separators. The effectiveness of concentrators is dependent on three things: the size of the ore, the material with which the ore is associated and the quality of the ore.

If the crude ore, as delivered on board cars, contains a large amount of fines, say from 1 in. down, and it appears that these fines contain a considerable amount of siliceous material, the substitution of a 1-in. mesh screen in place of the fine mesh standard sand screen and the subsequent concentration of the fines from the screen will probably be advisable. If the ore product consists largely of breccia, made up of sand, rock and ore, crushing and subsequent concentrating may eliminate the siliceous contents. If the ore product contains a large amount of "galvanized" sand rock, which cannot be eliminated by picking belts on account of its resemblance to the ore mass, crushing and subsequent concentrating may be required.

The waste from the ordinary sand screen may carry enough ore to justify the erection of a concentrator, even though none of the rest of the product requires it. Before installing a concentrator in connection with any plant complete tests should be required. Such tests in connection with jigs may reveal the fact that the specific gravity of the ore and rock is so similar that jigs are not effective; again, tests in connection with electrostatic separators may prove them worthless for the purpose intended, because of the large silica content of the ore to be treated. Magnetic and electrostatic separation has received very little attention from brown ore operators up to the present time. The advantages of the reciprocating table have been also quite generally overlooked.

The New Departure Mfg. Company, Bristol, Conn., is sending out a neatly printed set of twelve data sheets ready for insertion in the S. A. E. Hand Book. These sheets cover descriptions of all New Departure ball bearings, in the double row, single row, magneto and new cup and cone types, also accurately compiled tables showing standard press fit and push fit on shaft and in casing, and diagrammatic tables compiled by Frederick Hughes, the company's chief engineer, by which the maximum thrust and radial load capacity of any bearing running at any speed can be easily determined.

The Acme Automatic Engine

Several interesting features have recently been added to the Acme automatic steam engine, which is now manufactured by the Sterling Machine Company, Norwich, Conn., instead of the Rochester Machine Tool Works, Rochester, N. Y., as formerly. The special points of the engine are a marked simplicity of construction and the incorporation of many features found in automobile engines. Fig. 1 is an exterior view of the engine and Fig. 2 shows the constructional details.

The engines are of the vertical two-cylinder single-acting inclosed type with a balanced rocking valve. Three different series of engines are built having strokes ranging from 3½ to 7 in., the length of the stroke in the middle series being 5 in. The series are divided into different sizes of cylinder diameter, the engines of each series being practically identical as regards external appearance and size. This range of sizes covers all the applications to which these engines are adapted, such as the driving of mechanical stokers, rock drills, small friction hoists, belt or direct driven pumping machinery for contractors or irrigation purposes, for direct connection to small gear-driven pumps and for operating small plants, such as laundries and creameries, etc. In addition there are at the present time a number of engines in service on shipboard for driving lighting generators, ammonia compressors and ventilating fans.

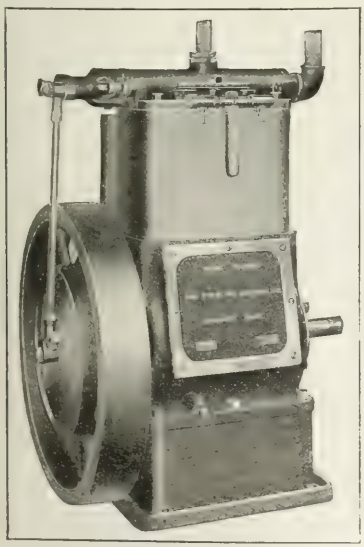


Fig. 1.—The Acme Automatic Engine Built by the Sterling Machine Company, Norwich, Conn.

The influence of automobile engine practice on the design of many of the details is clearly shown in Fig. 2. Drop-forged crankshafts which are ground to size are employed and the connecting rods are of I-beam section bushed with bronze at both ends. The bearing cap at the crank end is held in place by castellated nuts and cotter pins as is commonly the case in automobile work. The piston rings, which are placed two above and one below the wrist pin, are of the diagonal cut type and are ground to size after the cutting operation has been performed. The balanced valve is a single one-piece casting which has been ground on the outside to fit a bored chamber and is fastened to the extended valve stem with a cross key in a similar way to that in which the ordinary Corliss valves are fastened. This valve adjusts itself for wear. Automatic cylinder relief valves are built into the head to relieve any water that would otherwise cause damage.

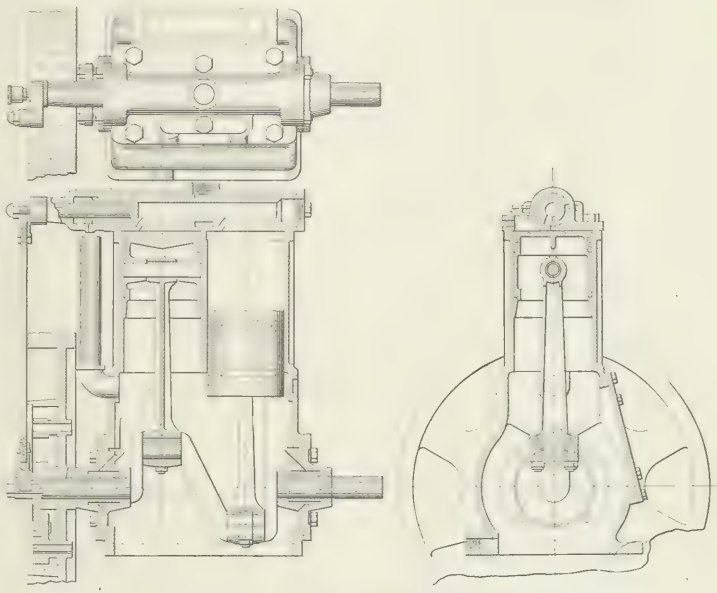


Fig. 2.—Sectional View Showing Constructional Details.

A simple type of governor consisting of four main pieces is employed and the action of the weight is modified by a hardened roller traveling in a milled arc. The entire mechanism is contained in an oil pocket and only the pin to which the lower end of the valve rod is connected extends through. This feature, coupled with the fact that the mechanism is located on the outside of the fly wheel insures easy access. Practically all parts of the engine are lubricated by the internal splash system and there are only two grease cups used. Any water of condensation which may collect and the leakage from the valve stem stuffing box pass down into the base through a vent-pipe at the end of the engine.

As far as possible all parts of the different engines have been made interchangeable. The cylinder diameters of the smallest series, which has a stroke of 3½ in., are 2½, 3 and 3-5/16 in. Four different cylinder bores are furnished in the middle or 5-in. stroke series, the dimensions being 3-5/16, 4, 4-9/16 and 5 in. The largest series of engines, which has a 7-in. stroke, is built with cylinders having diameters of 5, 6 and 7 in.

The blast furnace of the Struthers Furnace Company at Struthers, Ohio, having been relined and repaired, was blown in August 26.

The American Diamond Blast Company, engineer for waterproofing and sand-blast contractors, has moved its offices to 209 West Thirty-third street, New York City.

Alloys Used for Die-Castings

BY E. F. LAKE.

In the manufacture of die-castings the metals that can be compounded into alloys are of the utmost importance. In making such castings a commercial success it was necessary to give them a surface as smooth as could be furnished by machining processes and methods. It was also necessary to have them as accurate to size as machined parts. This meant that for the majority of cases an allowance of one-half a thousandth of an inch was all that could be made.

Die-castings are made in steel moulds into which the molten metal is squirted under pressure. The machines, alloys and methods with which such castings are made have been a gradual development through a period of more than 60 years, notwithstanding the fact that some would have us believe that the process is a secret of their own accomplishment. During this period many alterations and improvements have, of course, been made, and castings are now turned out that are as strong as cast iron and as tough as yellow brass, while the immediate future promises to give us castings on a commercial scale that will equal the strength, toughness and wearing qualities of the high-grade bronzes. This development has been brought about by the combined efforts and applied energies of many individuals, but by far the larger part of the progress has been due to the great advancement in metallurgy and the many discoveries that have been made in that field in the past few years. These have given us numerous alloys and mixtures that have much better properties for mechanical application than anything known in the past.

Originated with Lead Bullet Mold

As we may trace the origin of the die-casting principle back to the lead bullet mold that was a household utensil in the American revolution, so we may also trace back to this period the metals or alloys that were used. Starting with the lead used in the manufacture of these bullets other metals were added to harden and strengthen it and give it better wearing qualities.

The printing press required a type of metal that would cast a sharp figure, withstand the necessary compression and be hard enough to wear well, but at the same time be cheap. To pure lead, therefore, tin and antimony were added, and this alloy was cast in metal molds many decades ago. This made the first alloy that was cast in steel molds for machine parts on a commercial scale. An ordinary type metal is made from 80 per cent. lead, 15 per cent. antimony and 5 per cent. tin. This also makes a good bearing metal, and Magnolia anti-friction alloy is of this composition.

The First Machine for Casting Machine Parts

After many years of casting type in metal molds and with automatic machines that squirted the metal into them under pressure, C. and B. H. Dusenbury, in 1877, patented a hand-operated machine with which machine bearings were cast in metal molds. This was doubtless the first machine invented for manufacturing die-castings for machine parts. The main principles on which these earlier casting machines operated are the same as those used in the best die-molded casting machines of the present day. The improvements that have been devised are only in details of construction that make the machine easier to operate and give it a wider range of application.

There has, however, been a vast improvement in the alloys that are made into die-castings. In ordinary practice we frequently meet with die-castings made from alloys whose ingredients may be any of the following metals: Zinc, tin, lead, copper, antimony, bismuth, aluminum, nickel, silver and iron. Iron, however, is nearly always an impurity, while nickel and silver are not used very often.

In these castings the zinc may vary anywhere from 03 to about 30 per cent.; the tin from 05 per cent. to zero; the lead from 03 per cent. down, and the antimony in percentages up to 26. In one instance a copper content of 20 per cent. was used, but in most cases with a copper content of more than 10 per cent. it is difficult to cast the alloy, owing to its action on the molds. In these alloys aluminum has been used in percentages as high as 6. The regular aluminum mixtures, however, have been successfully cast; that is, those that contain a high percentage of aluminum and a low percentage of zinc or copper, or both.

The accompanying table gives the composition of the alloys that are the most frequently met with in die-castings. The harder, tougher and stronger alloys and those having the best wearing properties are shown by those with a zinc base. Where no special strength is required the lead-antimony-tin alloys, such as are used for various kinds of type and anti-friction metals, are often used for die-castings, as they are much cheaper.

Some of the Alloys Used in Die Molded Castings.

Kind of Alloy	Zinc	Tin	Lead	Copper	Antimony	Aluminum
	92 6	3 5		2	1 5	0 4 a
	92			7	1	4 a
Leddell's	90			5		5
	89	1		6	1	3
	88 5			4 5		2 5 b
	88	5 5		5	1 5	
Leddell's	87 5			6 5		6
Shonberg's	87	10		3		
Lumen bronze	86			10		4
	85	5		5		5
Ledebur's	85			5	10	
Salge's	84	9 9	1 1	4	1	
	83	5		10		2
Stratton's	82	6	10	1 5	0 5	
Anti-friction	82	6 5	6 5	5		c
Fenton's	79	14		6	1	
Ledebur's	76	17 5		5	1 5	
	74	15		5		6
	74	12		11		3
	73	19		5	2	1
High copper	47	31		20		2
Parson's white bronze	38 5	56 5	0 5	2 5	1 5	0 5 d
Bearing bronze	29	65		4 5	1 5	
Electrotype		3	93		4	
Russian railroad car		2	90		8	
Ordinary bearing		6	87		7	e
Jacoby metal		5	85		10	
Linotype		5	83		12	
Magnolia		5	80		15	
		10	80		10	
Railroad bearing		10	75		15	
Monotype		8	74		18	
Standard white metal		5	71		24	
Graphite metal		15	68		17	
		10	65		25	
Railroad bearing		20	60		20	
Standard type		15	58	1	26	
Heyle's metal		46	42		12	
Italian railroad car		37	38		25	

a High tensile and low ductility.
b Phosphor-copper 4.5.
c Heavy duty.
d Analysis.
e Heavy load.

While many good die-castings are being made, there are altogether too many produced that have a smooth outer surface while the metal is porous and spongy in the interior and the casting is thus greatly weakened. Many others are made of metal mixtures that disintegrate and thus lose most of their strength in a short time. This is largely due to the fact that many persons engaged in the die-casting business who had a good mechanical knowledge and could design and manufacture machines but who had very little practical information regarding metals and their actions when compounded into the alloys suitable for die-molded castings. Some of these thought it only necessary to throw the metals into a melting pot, melt them down and stir them. Under such methods many poor compositions were made into die-castings that had a smooth outer surface, and as they looked good they were accepted, but soon failed in service. This gave the die-casting business a "black eye" in some places.

How the Best Alloys Are Made

The best alloys for die-castings are made by combining the metals in such a manner that they will enter into solution with one another with no part of them segregating. An easy illustration of this can be made by taking a glass of water and adding salt. A certain amount of salt will dissolve so that the two elements cannot be dis-

tinguished from each other. Thus they have entered into solution. If the water were frozen and the two elements remained undistinguishable, even though examined under a microscope, it would be a solid solution, the same as the metal alloys. If the salt and water were only mixed together in a finely divided state each element could be distinguished from the other by a microscopical examination. With metals this would be called a mixture, while the former would be an alloy. When more salt is added than the water will dissolve it forms around the edge of the glass or settles to the bottom. It thus illustrates the segregation of metals in an alloy or mixture when they are not properly melted and mixed or combined in the correct percentages.

Segregation more often occurs, however, in the center or interior of metals by one element remaining in suspension in the other while it is becoming solid or freezing. Then again, two metals may enter into solution with one another when they are in the molten state, but when the temperature is lowered and they begin to solidify segregation or a separation takes place. Salt and water also act in this way. When freezing, a certain amount of the salt is precipitated, or segregated. By taking the top of the ice off, melting it and again freezing it from 3 to 5 times, salt water can be made fresh enough to drink. While the salt and water illustration is not strictly scientific from a chemical viewpoint it gives a clear idea of the meaning of solid solution. The molecules of metal that form the various mixtures are not bound together by a cohesive force that is strong enough to make them nearly approach the physical properties of the alloys. Thus castings made from them are not as successful for commercial uses.

Lead and copper are two elements that act in a similar manner to salt and water. As high as 20 per cent. of lead can be made to enter into solution with copper and form a homogeneous alloy, but when more lead than this is used it begins to segregate, and 30 or 40 per cent. of lead added to 70 or 60 per cent. of copper will only make a mixture. Of zinc and aluminum 50 per cent. of each can be made into a mixture that will give fairly good results when first cast, but they disintegrate to such an extent that the castings crumble into small particles inside of a year. This alone should emphasize the necessity of having a metallurgist, or some one who thoroughly understands metals, working in conjunction with others when manufacturing die castings.

The Mechanical Work Requires Care

The mechanical work of manufacturing die-castings also needs careful attention, as good alloys can be spoiled in these operations. All metals have a great affinity for oxygen, and to a slightly less degree for hydrogen and nitrogen, when their temperature is raised above normal; the higher the temperature the stronger will be this affinity. It is thus necessary to have the alloys well protected from the air while making them into castings. If this is not done the metals are liable to absorb some of these gases, which may become occluded or segregate enough to form microscopical bubbles or even in large enough quantities to form blow-holes. This, of course, destroys the cohesive force between the molecules separated by these gases and weakens the metal.

With some styles of die-casting machines air pressure has been used over the surface of the bath to force the metal into the molds. This forces air into the molten metal and never results in good castings. In others mechanical means have been used to force the metal into the molds, but nearly always in such a way as would continually keep the bath churned. This draws the gases from the air into the molten metal. Under such conditions the longer the casting machine is operated the poorer will be the castings, as it does not allow the bath to remain quiet for a long enough time for the gas bubbles to rise to the surface, as they would do if not occluded. If castings made under these conditions are broken the holes formed by the gases can often be seen with the naked eye. If not, a small magnifying glass will bring them out clearly. A pronounced segregation of any of the various metals can often be seen also.

In the mechanical operation of making die-castings, therefore, it is of considerable importance to have the retort that holds the molten metal tightly covered and thus protected from the outside atmosphere. The bath should also be kept covered with a flux, to prevent any air that may be in the retort from coming in contact with the metal. Common salt is one of the best fluxes for this purpose. In addition to this the machine should be so designed as to prevent the bath of molten metal from being put in motion when forcing a portion of it into the die mold. Too many die-casting machines have been made without having these details perfected, and thus poor castings have resulted, even when the best of alloys were used.

Zinc

Of the metals used in manufacturing alloys for high tensile die-castings zinc has been by far the largest ingredient, varying from 73 to 93 per cent. In some bearing metals that have been termed white bronzes a zinc content of from 30 to 40 per cent. is used with a high percentage of tin. One alloy that carried 20 per cent. of copper had a zinc content of 47 per cent., with the tin 31 per cent. and aluminum 2 per cent.

Zinc belongs to the same chemical group as cadium and mercury, and has a strong resemblance to magnesium. It occurs in nature in combination with carbon and oxygen or with sulphur or with silicon and oxygen. Zinc ores are first converted into an oxide by roasting and the oxides then reduced by heating them with charcoal. This product is called spelter, and is not pure. The impurities present are lead and iron, and sometimes arsenic and cadmium. Zinc has a brilliant luster of a bluish-white color, and at the ordinary temperatures it is very brittle, with a highly crystalline structure. At from 200 to 300 deg. F. it is easily rolled into sheets, but above 400 deg. it again becomes brittle. It melts at 786 deg. and casts very crystalline if the temperature is raised much above this.

Zinc gives die-castings the proper degree of hardness, but, as it is very low in ductility, other metals have to be added to correct this quality. Alloys with the higher percentages of zinc are quite brittle, but have a greater hardness than when the zinc is low. The toughness can be increased by lowering the zinc content, but it will sacrifice some of the hardness. The required toughness is usually obtained by adding copper to the zinc, but much over 10 per cent. of copper cannot be added, as it raises the melting point of alloys to temperatures at which they will not cast successfully in metal molds.

Copper and Silver

Copper is nearly always found in nature in combination with oxygen or sulphur, or both, and the difficulty of separating it from these is what makes it more expensive than zinc. Large deposits of copper are found, however, that are nearly pure. It is very malleable, ductile, tough and tenacious, and imparts these properties to the metals with which it is alloyed. When from 3 to 5 per cent. of copper is added to zinc it gives the alloy a whiter color than that of pure zinc. The color of the copper does not show in the metal until from 20 to 25 per cent. has been used. After this the higher the percentage of copper the more pronounced will be the copper color.

Copper melts at 1980 deg. F. Thus, if die-casting alloys are very high in copper the metal from which the die-molds are made oxidizes. This formation of oxide occurs at a temperature considerably below the melting point of copper and causes the surface of the dies to wear away when but few castings have been made. Unless a large number can be made to the correct size before the die-molds give out the die castings are not a commercial success. The higher the copper content the sooner will the die-mold be destroyed. In the zinc-base alloys used for die-molded castings copper is used to back up the zinc crystals and thus overcome the crystalline nature of zinc. It therefore adds toughness but does not confer any great strength. Other metals are depended on for this.

As silver belongs to the same chemical group as copper it has been used as an alloying material with more or less success. Its high cost, however, prohibits its use for ordinary purposes. It melts at 1762 deg. F., is softer than copper and is extremely ductile and malleable, with a good tenacity. It is one of the best conductors of heat and electricity.

Tin

Tin belongs to the same chemical group as lead, and nearly always occurs in nature in combination with oxygen, in which case there are two parts of oxygen to one of tin. It melts at 450 deg. F. One peculiar feature of tin is that when a temperature of 50 deg. below zero F.

is reached it slowly assumes a gray color, is very brittle and the specific gravity is lowered. It then begins to crumble and this is known as the tin pest. Hence tin cannot be used in very cold countries.

Tin ranges between nothing and 20 per cent. in die-casting alloys that require strength and toughness. It is then nearly always used in combination with copper and zinc, with a little antimony added. In a high copper alloy, however, the tin content was made 31 per cent., and as high as 65 per cent. has been used in anti-friction alloys.

The strongest, toughest and best die-casting alloys contain from 5 to 10 per cent. of tin. With a high tin percentage die-castings have a very smooth surface, as the alloys seem to spread or flow over the surface of the steel mold better than when but little or no tin is used. Scraper marks put on the surface of the die-mold are plainly reproduced in the castings and all projections and corners are sharply defined. This also makes the highest priced alloy, for which reason there is a tendency to use cheaper metals. The majority of die-castings are of such small size, however, that the price of the metal is not as much of a factor as the physical properties.

With a tin content ranging between 55 and 65 per cent., a zinc content of 30 to 40 per cent. and the copper from 2 to 5 per cent., with about 1.5 per cent. of antimony, a very good bearing metal can be made and this can be cast accurately to size in the die-casting machines. Parson's white bronze is similar to this in composition. It is much harder and wears longer than the lead-base bearing metals that contain a high percentage of antimony and a low percentage of tin. The latter is about one-third of the price of the former, but the former better withstands the hard usage given to bearings that are designed for parts similar to the crankshaft of an internal combustion engine.

Lead

In the strong, tough alloys lead is never used, but many die-castings are made from alloys having a lead base and containing high percentages of antimony. The tin in these ordinarily varies from 2 to 20 per cent., but in some of the bearing alloys as high as 46 per cent. has been used, with 42 per cent. of lead and 12 per cent. of antimony. The lead ordinarily varies from 58 to 93 per cent. and the antimony from 4 to 26 per cent. These alloys were first perfected for use in anti-frictional bearings and later for casting into type in metal molds. Here the die-casting of machine parts started. Bearings were cast accurately to size in die-molds and small, instrument and machine parts that required no particular strength, toughness, etc., were die-cast from these alloys. After this the alloys were much improved in their physical properties and machine parts were die-cast from better metals.

Lead has a bluish-gray color and a high lustre. It is very malleable and ductile, with a very low tenacity. It is also very dense, but all of the base metals lower its density when alloyed therewith. Its melting point is 620 deg. F. When in a finely divided state it can be pressed into a solid compact mass, or two clean surfaces can easily be welded together by pressure, even when quite cold. Being soft and malleable it can be whittled with a knife or squirted into the form of tubes, rods or more intricate shapes.

These properties make lead especially applicable for die-castings, but its shrinkage is so great, its tensile and compressive strength so very low and its softness such that it has to be alloyed with other metals that overcome these faults. Lead only enters into solution with zinc to a very limited degree and hence they are seldom used in the same composition. No matter how well they may be mixed in the liquid state they separate into layers before the temperature is lowered to the freezing point. The zinc layer carries a very small percentage of lead in solution and the lead layer has a very small percentage of zinc in solution.

When heated to between 1650 and 1800 deg. F. lead and zinc enter into complete solution, but as this temperature is lowered they continue to separate until the freezing temperature is reached. If it were possible to cool them suddenly from 1650 to 1800 deg., the total solubility could be retained. The longer the elapsed period of time during which the temperature is lowering from 1650 deg. to the freezing point the more complete will be the separation of the metals. The oftener these metals are melted and cooled the more complete also will be the separation. This, again, is very similar in action to the salt and water solution, previously mentioned, which is made fresh enough for drinking purposes by continued freezing and melting; some salt being condensed each time the water is frozen.

Antimony and Bismuth

Antimony belongs to the same chemical group as phosphorus, arsenic and bismuth. It occurs in nature in the free state and also in combination with sulphur. It is hard and brittle, with a silvery-white color and a high metallic lustre. It imparts hardness to lead, and hence the degree of hardness that is desired in type or bearing metals can be obtained by varying the percentage of antimony. It also imparts hardness to die-casting alloys. It has one peculiar property, which is that when freezing from the liquid state it expands like water, instead of contracting like most metals. This is a valuable property for alloys used in the manufacture of die-castings and hence it can be found in nearly all of them. From 1 to 2 per cent. seems to be sufficient, when acting in conjunction with the pressure under which the alloy is injected into the mold, to overcome the shrinkage imparted by the other metals.

Experiments have shown that pure antimony increases the expansion of pure lead in proportion to the percentage used until the maximum expansion is attained, when the antimony content reaches 13 per cent. This is the eutectic alloy and it melts at 443 deg. F. When more than 13 per cent. of antimony is used the expansion is lowered until it reaches a minimum at about 35 per cent. antimony. It then rises again to a second maximum with about 50 per cent. antimony, after which it again lowers and then rises until pure antimony is reached. It may seem queer that, while pure lead melts at 621 deg. F. and pure antimony at 1166 deg. F., a combination of the two will cause the melting temperature to lower to 443 deg. F. Many of the die-casting alloys given in the table, however, exhibit the same phenomena in melting temperatures; they being lower than the average melting temperature of the various ingredients.

Antimony gradually increases the hardness of lead until a content of 13 per cent. has been reached. From there to 17.3 per cent. of antimony a more gradual rise in hardness is made, and at this latter point the maximum hardness is attained. After 80 per cent. antimony has been passed the hardness again falls very rapidly down to that of the pure antimony. An alloy containing 32.5 per cent. of antimony and 76.5 per cent. of lead is four times as hard as pure lead.

Good sharp castings, in which the details are brought out plainly, are obtained when the alloys contain from 15 to 25 per cent. of antimony, as the expansion then produced causes the metal to completely fill the mold. With an alloy containing about 20 per cent. of antimony very good casting properties are obtained with a high degree of hardness.

While bismuth has this same property, it costs nearly 25 times as much as antimony and it is thus seldom used in die-castings. Bismuth, however, melts at 520 deg. F. and this gives it an advantage over antimony in some places. Bismuth expands to a greater degree than antimony on passing from the liquid to the solid state, and this also gives it an advantage where cost is not a factor. The desired results, however, can nearly always be obtained with antimony.

Aluminum

Small percentages of aluminum are used in nearly all of the high grade die-casting alloys. This usually ranges from 0.5 per cent. to 6 per cent. In this range it is used for its strength-giving as well as its purifying qualities. While copper is used in the alloys with a zinc base to overcome their crystalline nature by backing up the zinc crystals, aluminum or tin or both are used to confer strength. Aluminum has proved to be the better of the two elements for this purpose. Tin adds a certain amount of ductility to the zinc-copper alloys, but they lack the stiffness and fluidity that is imparted by aluminum. By adding 3 per cent. of aluminum to an alloy containing about 10 per cent. copper and the remainder zinc, the strength of the metal will be increased five-fold. Antimony has proved to be of little benefit in this regard,

and manganese has proved to be detrimental, as it makes the metal run more sluggishly, without adding any beneficial properties. Phosphorus, on the other hand, has proved to increase the strength of the zinc alloys containing copper and aluminum, and the one in the table showing a phosphor-copper content of 4.5 per cent proved to be stronger than cast iron.

Some of the aluminum alloys, that is, those that have aluminum for the base, are being cast in die-casting machines, but it is necessary to use ingredients that will lower the melting point of aluminum, which is 1215 deg. F. The oxide of aluminum forms so quickly on its surface that this also creates difficulties that have to be overcome when die-casting it. A composition that is fairly high in zinc and contains enough copper to give it the required toughness can be successfully cast.

Silicon, Sodium, Calcium, Etc.

Owing to the fact that silicon affects brass in nearly the same manner as aluminum, and aluminum greatly improves the brass mixtures, some experiments were carried out to see if it would have a similar influence on the zinc-base alloys that contained small percentages of copper. It seemed to work differently on these alloys, however, as when as high as 11 per cent. of silico-copper was used, in place of the ordinary copper, the silicon seemed to have no effect, as it neither increased nor decreased the strength of the alloy. This was also the case even when aluminum was added to the mixture.

Sodium, like other alkaline impurities, offers no resistance to the destructive influences of the dampness of air. It has a bad effect on alloys with a low copper percentage, and together with all other alkaline impurities should be kept out of die-casting alloys. Its properties are very similar to those of potassium. At ordinary temperatures it is soft like wax and it is light enough to float on water, its melting point being 207 deg. F.

Calcium, however, produces such a feeble alkaline solution that it might act as a good deoxidizer, and, if more uses were found for it, its price could be made cheap enough for practical purposes. Unless it should show superiority to the many other deoxidizers on the market, however, it would find little use. It melts at 1480 deg. F.

Thallium is a very soft white metal that oxidizes quickly in moist air and melts at 575 deg. F. It is quite similar to lead, but is softer and heavier. It is seldom met with outside of the laboratory, but exists in nature in quantities sufficient to make it available should it prove useful. It seems to possess properties that would add some good qualities to the white metal alloys.

Tellurium belongs to the same chemical group as sulphur. It is silvery white, crystalizes easily and melts at 845 deg. F. It exhibits some properties that would warrant experiment with it as a substitute for zinc. It is quite a rare element, however, and unless it should prove better than zinc it could not be made practically successful.

Nickel, Titanium and Cadmium

Nickel has added such good properties to steel that it is continually being experimented with in the non-ferrous alloys. It alloys readily with aluminum and increases its elasticity. It has been used in small percentages in some of the die-casting alloys and has proved beneficial. Enough is known to warrant the assumption that when the proper combination with other metals is discovered nickel will prove to be a useful metal for an alloying material. Its melting temperature, however, of 2640 deg. F. is too high for it to be used in any but homeopathic doses.

Titanium is fast coming into use as a purifier and an alloying element, and this will doubtless add good properties to the die-casting alloys. It has a great affinity for oxygen and nitrogen and should be of especial benefit in removing these gases, when the best manner of using it is known. These gases have proved to be very injurious in die-casting alloys. When not more than 3 per cent. is used titanium has a good influence on aluminum, and with a 2 per cent. titanium content aluminum alloys show greatly improved resistances to tensile stresses. It has also been proved of special benefit to copper and brass and bronze mixtures and thus should be of special benefit to the zinc-copper-aluminum die-casting alloys.

Cadmium belongs to the same chemical group as zinc and is very similar to magnesium, but is not as common as either of these. It is harder than tin and has a very similar color. It is whiter and less crystalline than zinc. It melts at 610 deg. F. It should thus be of especial benefit to die-casting alloys, if it were obtainable and the proper combinations were discovered. Its price is around $1 per pound, but it should be produced as cheaply as aluminum if there was a sufficient demand for it. Zinc and cadmium enter into solution in all proportions and remain so at all temperatures. These show the extreme of metal's solubility and compare with the liquids alcohol and water.

The various elements used to increase the physical properties of die-casting alloys since the industry started with type or bearing metals have given good results. The hardness, tensile strength, toughness, wearing qualities, resistance to shocks and strains and frictional wear have been greatly increased. The alloys as yet, however, are altogether too weak for many purposes. Their increase in physical properties has been a gradual growth and has taken many years. More progress is an assured fact, as many more individuals are now interested in this field of activity than formerly and the growth is bound to be much more rapid. The elements being brought into use in metallurgy and the many new compositions that it is possible to form give the assurance that die-casting alloys will be greatly improved. When these have attained the strength of bronze castings there will be an immense field opened for their exploitation. This might revolutionize a part of the foundry industry; but when the strength of steel shall have been attained there will be a much more complete revolution. The improvements in the past few years would seem to warrant the writer in prophesying this for the future.

The World Trademark Treaties

The first published report of the results of the fourth conference of the International Union for the Protection of Industrial Property appears in the Daily Consular and Trade Reports for September 2, issued by the Bureau of Manufactures of the Department of Commerce and Labor, Washington, D. C. The original documents were in French, and translations were made in the United States Patent Office.

The conventions resulting from these international conferences are of vital interest to all firms and individuals concerned with patents, trademarks, designs, etc., and the proceedings of the fourth conference, held in Washington from May 15 to June 2, 1911, are specially important in view of the fact that more than 75 delegates, representing 40 nations, were in attendance. The three conventions, or arrangements, revised at Washington relate to the protection of industrial property, the international registration of trademarks, and the repression of false indications of production on merchandise. The Daily Consular and Trade Reports publishes the full text of these conventions, together with a complete list of the delegates of the adhering nations.

Illustrations of Mesta machines and views of the plant of the Mesta Machine Company, West Homestead, Pa., have been compiled in a 32-page booklet presented as a souvenir to participants in the Pittsburgh meeting of the American Society of Mechanical Engineers. Conspicuous among the pictures are a four-stage air compressor for 1000 lb. pressure, a 100,000-lb. steel gear wheel 24 ft. in diameter, a 24-ft. rope wheel with 20 grooves, finishing a 20-ft. steel gear molded on a Mesta molding machine, a motor-driven lever shear capable of cold-cutting steel bars 7 in. square and mill and blowing engines and steel plants installed by the company.

The Lorain Metal Products Company, Lorain, Ohio, was recently incorporated to take over the business conducted under the same name. Its chief product is iron castings, but in a short time brass molding will be added. The new company will continue to occupy the building heretofore used by the Lorain Metal Products Company, erecting additions thereto as needed. Martin S. Kelly is president; E. J. Maple, vice-president and superintendent; F. J. Stack, secretary and treasurer.

Notable Air Compressor Installation

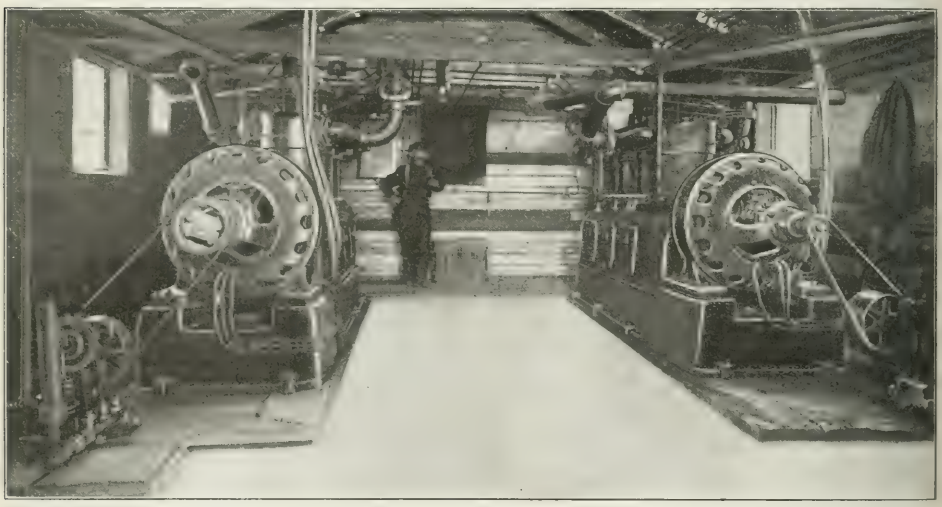
Details of the National Motor-Driven Compressors Used at the Iroquois Steel Plant

An air compressor installation of more than usual interest was that employed by Hibben & Co., Chicago, Ill., in the construction of the new plant of the Iroquois Iron Company at South Chicago, Ill., which was illustrated in *The Iron Age*, July 6, 1911. Two of the special features of the installation are the controlling device which automatically maintains the pressure of the air supply within the maximum and the minimum limits and the particularly crude foundation upon which the compressors are mounted.

The two compressors are of the single-stage motor-driven 3VS type built by the National Brake & Electric Company, Milwaukee, Wis., the capacity of each unit being 300 cu. ft. of free air per minute. These compressors have been in service since January of this year, and furnished all the power required to operate the pneumatic tools and hoisting apparatus employed. In supplying compressed air for this kind of work an air compressor is subjected to very hard service, as the load changes constantly and the controlling device is of necessity required to operate with unusual frequency. In this case the controlling device was mounted on each compressor and permanently wired to the motor. Its function is to maintain the pressure of the air supply within predetermined limits by starting the compressor when the low-pressure limit is reached and stopping it when the pressure reaches the high point. Both of these operations are performed electrically, and as the compressor is started without load no undue strain is placed on any part of the apparatus. Its design is such as to limit the amount of current applied in starting to that required when running under normal full load conditions. If the supply voltage should chance to fail, the motor is not subjected to danger of the armature burning out, since the controlling device automatically inserts resistance in the circuit and simultaneously unloads the compressor. When current again flows through the line the controlling device starts the compressor in the normal way without manual assistance.

Each unit was equipped with an individual direct-connected alternating current, three-phase, 60-cycle, 440-volt slip ring motor mounted on an extension of the lower half of the compressor frame. The arrangement of the apparatus is clearly shown in the accompanying engraving as well as the unstable foundations upon which the compressors were mounted. These consisted of 10 x 10 in. timbers with a few planks laid crossways and served to show the sturdy construction of the entire air compressor plant. The motor shaft is extended and a pulley from which the triplex water pump shown in the foreground is operated, is mounted thereon. This pump lifts the water direct from a well and circulates it through the system employed for cooling the compressor.

The main frame of the compressor is split in the horizontal plane and the two pieces are accurately machined and fitted. The lower half supports the crank shaft bearings and acts as an oil storage chamber as well while the upper portion is heavily ribbed, so as to give a maximum of strength to support the cylinders. Access to the crank chamber, crank shaft, connecting rods and other parts is readily provided by doors on the side. An outboard bearing is mounted within this upper half in which an extension of the pinion end of the armature shaft works. The gear and the pinion are of the herringbone type, the former being of open hearth steel and the latter of tool steel. The compressor cylinders are arranged vertically, thus affording a very compact form of installation and eliminating all uneven wear on the piston and the cylinder surfaces. The valves are made of nickel steel which reduces the wear and also the possibility of breaking to a minimum. All the working parts are entirely inclose to protect them from possible injury while they are at the same time readily accessible for inspection.



The Two Motor-Driven Air Compressors which Were Used in Constructing the New Plant of the Iroquois Iron Company. The Apparatus Was Made by the National Brake & Electric Company, Milwaukee, Wis.

An automatic lubricating system serves the bearings and the other working parts and requires no attention other than an occasional replenishing of the oil supply. While the compressor is operating the oil which is stored in the lower half of the crank chamber is splashed over the crank shaft and the bearings. The gear is partly submerged in the oil in this chamber and during operation automatically lubricates itself and the pinion together with the outboard bearing. The wrist pin is lubricated automatically by a device consisting of a long slender tube with a steel ball valve at its lower end which is fastened to the connecting rod. In this way the oil is forced through the tube and on the wrist pin by the action of the connecting rod.

In addition to supplying compressed air for the work of Hibben & Co., these compressors also supplied compressed air to the American Bridge Company and the Brown Hoist Company for operating the pneumatic tools employed by these firms in erecting their part of the work. The service rendered throughout was uniformly reliable, entirely satisfactory and very economical, and at no time was it necessary to resort to steam-driven appliances. In this way it was possible for the contractors to dispense with the services of a licensed steam engineer which resulted in conducting the operations not only expeditiously but also advantageously and economically. The saving to

the firm due to the use of motor-driven compressors instead of steam and belt-driven compressors and steam-driven hoisting engines was estimated at approximately $18 per day.

The American Locomotive Company

Tenth Annual Report

The American Locomotive Company has issued its report for the year ended June 30, 1911. Following is a summary of its operations, including the Montreal Locomotive Works, Ltd., as compared with the preceding fiscal year:

	1910-11.	1909-10.	Increase.
Gross earnings	$40,649,385.08	$32,203,392.10	$8,445,992.98
Manufacturing, maintenance and administrative expenses and depreciation	36,526,514.79	29,605,443.09	6,921,071.70
Net earnings	$4,122,870.29	$2,597,949.01	$1,524,921.28
Interest, etc., on bonds of constituent companies, coupon notes, etc.	557,308.53	513,190.69	44,117.84
Profit	$3,565,561.76	$2,084,758.32	$1,480,803.44
Dividends on preferred stock at 7 per cent.	1,750,000.00	1,750,000.00	.....
Surplus	$1,815,561.76	$334,758.32	$1,480,803.44
Extraordinary additions and betterment fund	300,000.00	.....	300,000.00
Net credit to profit and loss	$1,515,561.76	$334,758.32	$1,180,803.44

The condensed general balance sheet, of the same companies, as of June 30, 1911, is as follows:

Assets.	
Cost of property	$52,982,737.50
Securities owned	781,757.12
Cash	2,865,850.97
Accounts collectible	6,860,437.23
Bills receivable	993,342.95
Accrued interest	4,744.14
Material and supplies	5,282,728.50
Contract work in course of construction	740,549.91
Steam shovels, contractors' locomotives and automobiles manufactured for stock	925,360.20
Notes discounted (per contra)	2,143,554.46
Total	$73,581,062.98

Liabilities.	
Preferred stock	$25,000,000.00
Common stock	25,000,000.00
Bonded debt of constituent companies:	
Richmond Locomotive Works	$550,000.00
Dickson Mfg. Company	562,500.00
Rogers Locomotive Works	280,000.00
Montreal Locomotive Works	1,500,000.00
Gold coupon notes	$6,000,000.00
Accounts payable	1,852,068.65
Accrued interest	110,270.82
Unclaimed interest	1,025.00
Dividends on preferred stock payable July 21, 1911	437,500.00
Indorsements (per contra)	2,143,554.46
Extraordinary additions and betterment fund	587,472.88
Profit and loss:	
Balance June 30, 1910	$8,041,109.41
Add profit for 1910-11	1,515,561.76
Total	$73,581,062.98

The following extracts are taken from the accompanying statement by President W. H. Marshall:

The gross earnings for the year, $40,649,385, were $8,445,993 greater than the preceding year and over twice as large as the year 1908-9.

Production varied during the year from a maximum of 80 per cent. of the capacity of the plants to a minimum of 38 per cent.

At the beginning of the year there were unfilled orders on the books of $17,550,000, nearly one-half of the gross earnings for the year, and on July 1, 1911, the amount was $6,015,000. In only one month during the year did the receipt of orders represent work for more than one-half of the company's capacity, and it was evident early in the winter that retrenchment was necessary to meet the falling off in business which overtook the plants during the last half of the year. Several of the smaller plants were therefore closed and the orders confined to the larger plants, with the resultant economy in the cost of plant operations as a whole.

Reference was made in a preceding report to extensive improvements at the larger plants which are located at Schenectady, Dunkirk, Pittsburgh and Richmond. These improvements have been practically completed, the capacity of the company being now twice as great as it was at the time of its formation in 1901, and capable of producing about $60,000,000 of business.

In addition to expenditures above referred to, the company has spent on its plants during the year for miscellaneous betterments $402,315.59 of the "extraordinary additions and betterment fund." From the surplus earnings of the year, there has been set aside a sum of $300,000 for "extraordinary additions and betterments," making the total amount of this fund available for further expenditures $587,472.88.

During the last 10 years the company has persistently adhered to the policy of maintaining its plants in the highest state of efficiency and has expended for maintenance and upkeep, including minor betterments involved in the re-designing of machinery, equipment, etc., $11,256,787, all of which has been charged against income as a part of current expenses.

On October 1, 1911, there will be paid the fifth and last installment of $1,000,000 of short term gold coupon notes which were issued October 1, 1906, leaving a balance of outstanding notes of $5,000,000 which were issued October 1, 1909.

The balance sheet includes a charge of $2,143,554.46 representing equipment trust notes discounted by this company in advance of maturity, and, as there is a possible obligation, in the event of any default in payment, a like amount is also shown as a contingent liability. The notes are secured by a lien upon the locomotives and the security is ample. There has been a decrease in this account since last year of $290,029.79.

The name of the Dickson Works at Scranton, Pa., is omitted from the list of plants operated by the company. During the year this plant was closed and dismantled, a contract entered into for the sale of the real estate, and arrangements made to retire during the ensuing year the bonds outstanding against that property, amounting to $562,500.

Titaniferous Iron Sands.—A pamphlet is being distributed in this country bearing the name of an exploiting company at The Hague, Holland, and entitled "Titaniferous Iron Sand in the Island of Java." It purports to give, amid a jumble of comment on ore reduction and other metallurgical phenomena, some data on the electric smelting of titaniferous iron sands and the subsequent treatment of the product in making steel in the electric furnace. The author has interluded his scientific observations with weak attempts at wit, making it much of a question how far his rambling paragraphs will be taken seriously. A quotation is made, purporting to be from an opinion of "the editor of *The Iron Age*" on "a new process for producing pure iron direct from iron ores," but no such statement was ever made by any one connected with this paper, editorially or otherwise. A similar statement, credited to the same source, was circulated some time ago in support of a so-called "direct process" whose promoters have been driven from the field of their stock-selling operations. So far as the electric furnace is concerned it has well earned its place in modern steel making, but it is a doubtful policy to attempt to create interest in it by such rubbish as this Hague pamphlet.

Representative A. O. Stanley, chairman of the Congressional committee which is investigating the United States Steel Corporation, visited Gary, Ind., last week in company with R. A. Woolley, who is known as the field investigator of the committee. The homes of workmen, the public schools, the recreation facilities and other institutions were inspected and the mills were visited. Chairman Stanley also visited Duluth and made inquiry concerning the operations of the ore railroads of the Steel Corporation.

The Standard Welding Company will open a branch office in the Ford Building, Detroit, September 11, in charge of C. E. Miller.

The Goulds Mfg. Company, Seneca Falls, N. Y., is among the large employers of labor who realize the value of cementing their organization more closely by getting all the employees together socially at certain periods. On August 23 the employees of this company had an outing at Cayuga Lake Park, near Seneca Falls, which proved highly successful. An account of the athletic events on this occasion was given large space on the sporting pages of the daily papers of Rochester, Auburn and Syracuse.

Coke Oven Gas as an Open Hearth Fuel

Its Use a Logical Development of the Extension of the By-Product System—Features of the Practice at Sydney, Nova Scotia, and in Europe

BY ARTHUR P. SCOTT[1]

Characteristic of more or less recent metallurgical literature has been an increasing interest in the disposition of by-product coke-oven gas, more especially with reference to its possibilities as a fuel in the open-hearth furnace. In this connection four articles, which seem to be of special importance, will be briefly abstracted by way of introduction to a short discussion of the subject. The first of these, "On the Present-Day Status of Basic Open-Hearth Practice," which is to be found in Nos. 1 and 2 of Stahl und Eisen for 1910, was read by Dr. Otto Petersen before the Verein Deutscher Eisenhüttenleute on December 5, 1909, in Düsseldorf. In describing the Hubertushütte open-hearth plant in Kattowitz, O. S., Dr. Petersen says in substance:

Results at Hubertushütte

The steel works consist of two 20-ton and one 25-ton basic open-hearth furnaces, the capacity of whose regenerators amounts to about 1.4 cu. m. per ton in the gas chambers and 1.6 cu. m. in the air chambers. The gas producer plant consists partly of old Siemens producers and partly of modern water-sealed producers. This open-hearth plant has been using coke-oven gas as fuel since June, 1907. The quantity of oven gas used was small at first, but was gradually increased until, taking the coal consumption at Hubertushütte for 1906 as normal under producer practice at 31.8 per cent. in September, 1909, with an ingot production of 6200 tons, the coal consumption amounted to only 14.9 per cent., so that 53.15 per cent. of the total coal requirements was replaced by oven gas. The above fuel consumption includes, besides the open-hearth furnaces, provisions for such allied requirements as test and hardening forges, ladle warming and a 6-ton acid open hearth in the steel foundry with its annealing and core ovens. Oven gas is in regular use at Hubertushütte, and the full complement of producers is only requisitioned to make good an occasional shortage. The life of the open hearth ends and roof has been reduced by about 8 to 10 per cent. (being now 550 to 600 heats), while the life of the checkers has been increased 40 to 60 per cent. (now 1050 heats). For this reason, along with the saving in coal, unloading wages, producer labor and maintenance, this departure in open-hearth practice appears to be of considerable economic importance.

Experience at Sydney, Nova Scotia

In the discussion following Dr. Petersen's address, E. von Maltitz, of Barmen, said in part: "Some years ago I had to run three of the open-hearth furnaces on coke-oven gas exclusively at the works of the Dominion Iron & Steel Company, at Sydney, C. B., Canada. It was not possible to preheat the oven gas in the regenerators without considerable loss of CO and a corresponding increase of CO_2. We were compelled, therefore, to use the gas without regeneration and we followed the method employed in the Pittsburgh district for natural gas; that is, the gas was fed into the furnace through 6-in. pipes inserted close to the hearth on both sides of the ports. The heat obtained from this gas was so small that we were compelled to supplement it with tar from the coke-oven plant. As a result of the use of tar the life of the roof was reduced to 90 heats. We were obliged after three years of fruitless effort to give up the use of coke-oven gas with tar. For this reason it would interest me very much if Director Amende, of Hubertushütte, gave a few details concerning his methods, whereby not only is the time of heat cut down, but the life of the roof, considering the fuel employed, is so unusually high."'

Director Amende in replying gave no information as to the method of introduction of the gas, merely adding the following facts: The coke-oven plant at Hubertushütte consists of 90 Otto-Hoffman ovens, 10 m. long, 1.5 m. high and 0.55 m. wide. This plant handles 320 tons of coal in 24 hours, and the oven gas has the following composition:

	Per cent.
CO_2	0.5
C_2H_2	2.0
O	1.2
CH_4	16.4
H	38.7
N	24.8
CO	10.4

The coal employed is of poor quality and 50 to 60 per cent. or even 70 per cent. of the gas is used for heating the ovens themselves. In general the excess gas amounts to 45 per cent.—in all about 50,000 to 70,000 cu. m. in 24 hours. There has been no deleterious effect upon the open-hearth product, which consists of shapes and bars, also sheets and band iron of the finest grade. In every respect the use of coke-oven gas has proved satisfactory and he would gladly use more of it if he had it to use.

The Fields for Blast Furnace and Coke Oven Gas

The second article in question is a paper[2] read before the Fifth International Congress for Mining, Metallurgy, Applied Mechanics and Practical Geology at Düsseldorf in June, 1910, by Chief Engineer Terpitz, who describes the use of oven gas as an open-hearth fuel at Hubertushütte, but adds nothing to the data given by Dr. Petersen and Director Amende. He calls attention, however, to the large additional surplus of tunnelhead gas that has become available by reason of the development of the gas engine, and emphasizes the increasing importance of studying the peculiar adaptability of blast-furnace gas and coke-oven gas, respectively, that each may be employed to the best economic advantage. He describes certain attempts to utilize blast-furnace gas as an open-hearth fuel, and, though results to date have not been definitely encouraging, he believes that in a few years blast-furnace gas will be successfully used in that capacity, although it will probably have to be regenerated by passing it through hot coke or coal. He adds, however, that in view of the ease with which low-grade dust coal may be used under boilers and of the fact that blast-furnace gas is distinctly more suitable for gas engine consumption than is oven gas, the logical outlet for the latter is through the open-hearth furnace, for use in which, as has been fully demonstrated at Hubertushütte, it is pre-eminently well adapted.

Oven Gas at the Cockerill Steel Foundry

The third article, which is a communication made to the alumni of the Liege Engineering School on May 1, 1910, by Charles Wigny, chief engineer of the Cockerill Company, and published in the Revue Universelle des Mines for August, 1910, describes the use of oven gas in a 4-ton, open-hearth furnace in the Cockerill foundry. This article was reviewed from the German in *The Iron Age* of February 2, 1911, p. 318, but has lost so much in the double translation that it will be well worth the reader's while to refer to the original. A few of the main facts are here recapitulated. The furnace in question manufactures soft steel for the foundry, making with producer gas 3½ heats in 24 hours from a charge of 30 per cent. pig iron, 35 per cent. steel scrap and 35 per cent. steel turnings, with a yield of 95 per cent. It is of special design, the hearth, gas producers and regenerative chambers for the air constituting one solid block of masonry. The gas is not preheated, but arrives from the producer with practically all of its sensible heat and without losing any tar or carbon. The fuel consumption under producer practice is 40 per cent., which, in view of the small capacity of the furnace, seems excellent. The use of oven gas as a fuel was begun without any change in the charge or in the furnace design, the oven gas was led directly into the

[1] Metallurgist, Allegheny Steel Company, Brackenridge, Pa.

[2] Reviewed in *The Iron Age*, July 14, 1910, page 103.

main of the two producers, it having been the original intention to mix oven and producer gases. This was found unnecessary, however, and for almost a year previous to the date of writing not a single kilogram of coal had been charged. The oven-gas consumption per ton of steel was 435 cu. m., the daily production being raised from 14 to 16 tons in 24 hours. The oven gas had the composition:

H	57 per cent.
CO_2	1.5 per cent.
CO	6.0 per cent.
CH_4	22.5 per cent.
Nitrogen	13.0 per cent.
Calorific power (Net)	3600 calories per M³

Mr. Wigny then proceeds to show by calculation that oven gas is actually a more efficient fuel in the open hearth than is producer gas; that it is better economy to employ oven gas in the open hearth than to use it for the production of power with either a steam engine or turbine or a gas motor; and that with even a relatively poor oven gas the flame temperature amply suffices for steel melting. On the other hand he points out that blast-furnace gas at the best produces a flame temperature that is very near the low line as far as open-hearth requirements are concerned, and that a poor blast-furnace gas, even with air and gas both preheated to 900 deg., is quite inadequate.

The Higher Efficiency of Coke Oven Gas

The fourth and last paper referred to is by M. Trasenster in the Revue Universelle des Mines, November, 1910. This article has been reviewed from the German in *The Iron Age* for May 18, 1911, p. 1232; but, as C. C. Tufts very justly observes (*The Iron Age* for June 22, 1911, p. 1501), this article also has suffered in the double translation.

Trasenster's contribution is best read as a sequel to Wigny. He states that the very favorable results described by Wigny for the 4-ton furnace in the Cockerill steel foundry have been confirmed by a like experience with the 7-ton open-hearth furnace in the same foundry, and on the basis of some very interesting calculations explains why coke-oven gas shows higher thermal efficiency in the steel furnace than producer gas and that although under some conditions the efficiency of oven gas in the gas engine may be greater than its efficiency as an open-hearth fuel, nevertheless the greater cost of producer coal as compared with the poorer grades that may be employed for steam raising may probably even then swing the actual balance of economy in favor of burning coke-oven gas in the open-hearth furnace.

The Results Summarized

The gist of the evidence to date appears, therefore, to be:

1. That as regards steel works consumption, the most economical disposition of the surplus gas of the by-product coke oven is as an open-hearth fuel—a disposition which has been shown to be perfectly practical for the gas, either alone or mixed with producer gas.

2. That the furnace tonnage is thereby not diminished, but rather increased and the furnace life is not materially impaired. Recorded experience in this direction seems to be confined to Kattowitz and Seraing. It is unfortunate that the method employed at Hubertushütte for introducing the oven gas into the furnace has not been described, but the writer is informed[3] that mixture of the two gases is regarded as essential from the point of view of safety, the producer gas being lighted first and the oven gas introduced subsequently into the current of producer gas. At what point the introduction is effected is not stated.

Against these two successes must be scored the failure recorded by Herr von Maltitz at the works of the Dominion Iron & Steel Company, at Sydney, and as the writer has some knowledge of the manner in which the experiments at the latter place were carried on, a few notes regarding them may be of interest. The facts are as recorded by Herr von Maltitz, but other facts which seem to the writer to have a very important bearing on the case have been omitted.

Further Data on Sydney Practice

In the first place, while it is true that natural gas is ordinarily introduced at both sides of the ports, it is also true that the Pittsburgh furnace in vogue with this gas is characterized by its use of the open port with both chambers on air, which is distinctly different from the type of end employed in other districts for use with producer gas; and more especially does it differ from the type of end necessitated by the usual form of the Campbell type of tilting open-hearth furnace. It is a perfectly safe assumption that the furnace end in which it was attempted at Sydney to burn oven gas would not have proved successful with even natural gas, which is well known to be an almost ideal open-hearth fuel. The complaint was made by the Sydney melters that the oven gas "flew high to the roof"—which was true; but this manifestation was wrongly blamed upon the relatively high hydrogen content of oven gas. As will be shown later herein, the Sydney gas is of excellent quality. As a matter of fact, whenever we find the flame in an open-hearth furnace curling about the roof brick instead of sweeping rapidly over the bath, we may conclude with certainty, not that aught is amiss with the fuel, but that there is a pinch in the draft somewhere. Natural gas in a poorly drawing furnace will hug the roof just as closely as the oven gas ever did at Sydney. The same principle holds *a fortiori* when the congestion is aggravated by the introduction of a bountiful supply of steam-blown tar. The premature destruction of the roof recorded by Herr von Maltitz is simply an indication that a good fuel was misapplied. The writer firmly believes that under the same conditions fuel oil would have made an equally poor showing. Finally, the employment of coke-oven gas as a fuel at Sydney was only one of several very formidable metallurgical problems that confronted the management there at the outset and it was considered inexpedient at that juncture unnecessarily to complicate the situation by experimenting further with oven gas, but the ingenuity of Herr von Maltitz and of his associates had by no means been taxed to the utmost in this regard when the use of coke-oven gas was abandoned.[4]

A Comparison of Gases at Belgian and German Works

The following tables of analyses and of calorific values based thereon are for the Cockerill and Hubertushütte fuels:

Analyses.

	Cockerill prod. gas.	Cockerill oven gas.	Typical Oberschlesien prod. gas.[5]	Hubertushütte oven gas.
CO_2	7.5	1.5	2.8	6.5
O_2	..	..	..	1.2
CH_4	..	..	..	2.0
CO	19.3	6.0	30.2	10.4
H_2	12.3	57.0	14.1	38.7
CH_4	1.3	22.5	..	16.4
N_2	59.6	13.0	52.9	24.8

Calorific Values.

	Net cal. per M³.	Air req'd per M³.	Products of comb. per M³.	Equiv. vol.	Air Reqd.	Total gas and air.	Total waste gases.
Cockerill producer gas	1034	.885	1.727	3.523	3.118	6.641	6.084
Cockerill oven gas	[6] 3608	3.678	4.363	1.000	3.678	4.678	4.363
An Oberschl. prod. gas	1268	1.067	1.845	2.843	2.500	4.843	4.323
Hubertushütte oven gas	[7] 3029	2.986	3.741	1.000	2.986	3.986	3.741

The tables clearly show that while the products of combustion of oven gas are less voluminous than those of

[3] Private communication.

[4] It is safe to say that if the management of the Dominion Iron & Steel Company had considered itself warranted by general economic considerations in resuming the attempt to utilize oven gas in this manner it would have done so without hesitation, because there is not, to the writer's knowledge, on this side of the Atlantic a single steel works where the utilization of the by-product is more carefully and effectually studied than is done at Sydney. For instance, the high phosphorus content of Dominion iron, which at first seemed a serious menace to production, has been turned to very profitable account by pouring the hot metal from the mixer into a basic vessel to low phosphorus and then to transfer to a basic open-hearth furnace where, by means of one or two pots of basic-blown metal with perhaps one pot of molten pig, a 50-ton heat is finished in a very short space of time after the last pot has been blown, the "reboil" with molten pig counteracting entirely any superoxidation that may result from the after blow. In this manner during a recent month Dominion made nearly 12,000 tons of ingots from one 50-ton furnace, which must be conceded to be a remarkable performance. Under such circumstances, of course, fuel cost almost vanishes. The economy of the process has more recently been added to by [illegible] the basic slag as a fertilizer. The only other plant where this basic duplex process has been operated, so far as the writer is aware, is that of the Phoenix Company, at Ilsede, Westphalia.

[5] Private communication.

[6] Wigny's value is 3640 calories.

[7] Amende's value, presumably allowing for benzol, etc., 3300 calories.

producer gas, they are, nevertheless, considerably more bulky than either an equivalent of producer gas or the air required to burn it. Wigny's furnace does not preheat the gas; therefore the air downtakes must be ample to accommodate freely all the products of combustion and insure proper draft. The Hubertushütte furnace, on the other hand, being of the usual producer-gas type, must needs keep both air and gas downtakes in commission, in order to insure good working draft. This has been effected in one of the two practical ways; viz, by keeping gas and air distinct and throwing the rich gas into a carrying medium of lean gas. The other way is to merge gas and air ports and utilize the whole regenerative system for air, introducing the rich gas cold at the neck of the furnace, as is done in the Pittsburgh district with natural gas and which is in principle the method followed in the 4-ton furnace at Seraing.

How Far Coke Oven Gas Can Be Depended on for Steel Works Supply

There is no reasonable doubt that scrubbed by-product, coke-oven gas of average quality can be substituted for natural gas and successfully burned unmixed with any other gas in the present Homestead type of open-hearth furnace without detriment either to furnace or to production, though there would be anticipated, other things being equal, a certain increase in the sulphur content of the product, dependent upon the character of the coking coal used. Nor can we doubt that with the same general type of furnace, successfully burning fuel oil, a tar tank could be coupled to the oil pumps, due regard being had to the fluidity of the tar, without prejudice either to the furnace or to production. Admitting this to be so, let us see to what extent in a self-contained steel plant, the by-product coke oven installation may be depended upon for open-hearth fuel.

Let our blast-furnace plant, with a fuel ratio of 2000 lb., deliver 1000 tons of molten basic iron per day to our mixers. Let us use exclusively our own scrap which we shall suppose amounts to 20 per cent. Let our open hearth yield (ore not reckoned) be 98 per cent and let our fuel consumption be 8000[8] cu. ft. of natural gas per ton of steel. Let our natural gas have the following composition and calorific value:

Carbon dioxide	0.0	
Ogygen	0.2	
Ethylene	2.2	
Carbon monoxide	0.3	
Hydrogen	3.0	
Methane	91.8	
Nitrogen	2.5	
Net calorific value calculated	8298	calories per cu. m.
Volumes of air required to burn one volume of gas	9.13	

Let our coke-oven gas have the following composition and calorific value:[9]

Carbon dioxide	3.2	
Oxygen	0.4	
Ethylene	2.8	
Carbon monoxide	6.3	
Hydrogen	41.6	
Methane	29.6	
Nitrogen	16.1	
Net calorific value (calculated)	4240	calories per cu. m.
Volumes of air required to burn one volume of gas	4.43	

We can, therefore, figure roughly on an oven-gas consumption of 16,000 cu. ft. per ton of steel.[10]

The following is fairly typical of the charge and yield of a well-known type of by-product oven with a good average gas coal:

Charge:
5.65 gross tons of coal

Yield
Coke ..... 4.43 net tons
Tar ..... 57 U. S. gallons
Surplus gas ..... 22,600 cu ft.[11]

[8] This is a most liberal allowance. Under standard conditions this figure should be well under 7000 cu. ft per ton for basic furnaces.

[9] The figures here given represent a typical analysis of the Sydney gas, and are taken from trustworthy notes in the writer's possession. This gas has at times been poorer, but was practically always at least of the excellence recorded for the Hubertushutte gas.

[10] This estimate is somewhat higher than the consumption given above for Wigny's 4-ton furnace. He reports the equivalent of 15,355 cu. ft. for a gas with a net calorific power of only 3640 calories, which, in view of the coal consumption of 40 per cent. reported by him for the same furnace under producer practice, shows our forecast to be conservative in the extreme. Our estimate also takes no account of suspended tar and benzol, which quite appreciably enhance the actual heating value of oven gas.

On this basis we figure from our 1000 net tons daily of coke a surplus of 5,100,000 cu. ft., or enough, none being diverted to other uses, to take care of 320 tons of steel daily; that is, about 25 per cent. of our ingot production, which we may calculate as 1219 tons. With a higher fuel ratio at the blast furnaces we should, of course, have a correspondingly larger surplus of gas.

In addition to this gas surplus we have also $\frac{1000 \times 57}{4.43}$ = 12,867 gal. of tar as a by-product from our daily quantum of coke. Figures on the calorific value of coal tar are by no means plentiful, but from an abstract of an address by President Godinet, of the Société Technique du Gaz en France, and which appears in the Journal of Gas Lighting, Water Suppy, etc., July 13, 1909, p. 99, we select a heating value of 8000 calories, that being the lowest of the several values there given. The highest value quoted by M. Godinet is 11,000 calories and some authors give 10,500 as a representative value. Using 8000 calories and a specific gravity of 1.18, we calculate calories per gallons of tar as 35,736, virtually the same value as 35,961 per gallon of fuel oil of the usual 10,555 calories and specific gravity 0.900. Assuming like thermal efficiency in the furnace for both tar and oil, we find ourselves enabled with 12,867 gal. daily of tar to provide for the production of a further 250 tons of steel, on the basis of 50 gal. of fuel oil per ton of basic open-hearth steel—a reasonably liberal allowance.

We have thus substituted gas and tar for 47 per cent. of our fuel consumption. In other words, figuring the coal consumption under producer practice as 700 lb. per ton, we effect a daily saving of about 180 tons of coal, which represents an absolute return of 14 per cent. of the coal required to produce our daily coke supply, besides a certain small reduction in producer maintenance and wages; also, the life of the furnace should not be appreciably affected. When a melter states that fuel A is harder on the furnace than fuel B, he is simply unconsciously stating that he and his bricklayer have been accustomed to fuel B and favor furnace lines that suffer under fuel A. A melter accustomed to fuel A will aver contrariwise, and so on. If the Hubertushütte regenerators are situated immediately beneath the furnace and lack slag pockets; if the producer coal is relatively high in ash and the producers are fairly close to the furnace—all of which things are probable—the increase of checker life with oven gas, as recorded by Director Amende, is readily understood. Under normal conditions, however, the character, both physical and chemical, of the stock employed, has more to do with furnace life than has the fuel.

Objections to By-Product Gas

There are two objections that may be urged against the use of by-product gas:

1. A shop that depends upon tonnage for its livelihood must standardize in every possible way, and in the long run, other things being equal, an open-hearth mill burning the same fuel all along the line, has the advantage of the mill which burns three fuels.

2. Not least among the advantages of a producer fired furnace is its absolute independence of every other part of the world, as far as fuel is concerned, except the coal yard. The furnace fired with oven gas or tar introduces an additional peradventure. If the normal fuel for the mill be natural gas or oil, this objection is negligible, since in the light of the above ventured opinions natural gas, fuel oil, oven gas and coal tar can be burned interchangeably in the open-port type of furnace. If the normal fuel, however, be producer gas, two types of furnace are necessary; and in case of absolute failure of oven-gas supply, the open-port type will require at the very least one week's time to change it over to the producer-gas pattern. On the other hand, of course, such failure of oven gas can be met by the use of stored tar for a time, or by fuel oil. A comparison of the reigning prices for tar and fuel oil, respectively, will be found to be very instructive in this connection, more especially in view of the probability that the former price will not rise and that the latter will not drop, at least in the near future.

[11] The figures given by Director Amende of Hubertushütte are equivalent to approximately 37,400 cu. ft. of surplus gas for the same oven charge. His figures seem to indicate a 36-hour coke.

Let it be said, in conclusion, that by-product recovery as applied to the manufacture of blast-furnace coke is logical and attractive; but it should be realized at the outset that the by-product coke oven must be strictly immune from "tonnage fever", which is another way of stating that its operating costs, other things being equal, cannot be materially depressed below a certain normal for any one set of conditions. Its high first cost must, therefore, be compensated for solely by increased percentage of coke yield, and by scrupulous economy of the by-products. Of the latter, ammonia is usually well taken care of; but not so, for the most part, the gas and tar, the all too frequent tendency being to seize every possible pretext for burning or otherwise disposing of them with some faint show of economy rather than to systematically husband them. Ladle warming, for instance, is a convenient scape goat.[32] These things should not be. It is only one degree less reprehensible to install a recovery system and fritter away a substantial portion of the by-product, than it is to build the older type of oven and frankly waste the whole of it. How, then, may by-product tar and gas be disposed of? Heat, light and power production and the chemical industries furnish only a partial answer. Do not the signs seem to point significantly in the direction of the open-hearth furnace?

[32]Ladle warming, it may be added, is one of the most gratuitously wasteful and poorly performed operations in steel works practice today. The quantity of fuel of one kind or another that is employed in very many works to produce a miserable apology for a hot ladle is nothing short of scandalous. One of the few creditable practices in this direction was observed by the writer in a certain European works, where the ladle, of approximately fifteen tons capacity, was simply inverted over a small steam-blown fire of refuse coke, acquiring thereby a good and even heat with negligible fuel cost. Larger ladles, perhaps, scarcely lend themselves to this method.

A New Browning Crane

Details of the Electric Locomotive Type for Handling Coal

Handling coal for electric railway power houses is the special field covered by a new crane recently brought out by the Browning Engineering Company, Cleveland, Ohio. It is of the locomotive type with motor drive. In addition to handling fuel for power houses it can also be used on docks, as is clearly shown in the accompanying engravings, which are reproduced from photographs taken



Fig. 1.—The New Electric Locomotive Crane Built by the Browning Engineering Company, Cleveland, Ohio.

at the plant of the Wisconsin Coal & Dock Company, Milwaukee, Wis. A general view of the crane is given in Fig. 1, while Fig. 2 shows the machine loading cars from a stock pile.

In general the construction of the crane is practically the same as that of the builder's steam locomotive crane, the only change being that a 50-hp. motor and the necessary controlling devices are substituted for the boiler, the engine and the water tank which form a part of the equipment of the steam-operated machine. Power is ordinarily taken from an overhead wire through a trolley pole, the wire being fed from a direct-current generator or an adjacent distributing transformer. In the crane in use at Milwaukee the current is brought to the machine by a jumper feed wire terminating in a plug, which is inserted in a socket just below the deck of the crane. The current, regardless of its source of supply, is led to a shoe on the lower base which makes a rubbing contact with a collector ring on the upper or swiveling base. The wiring is entirely inclosed in metal and fiber conduits which protect it from moisture and mechanical injury. A 50-hp. 500-volt Westinghouse direct-current motor of the No. 306 Inter-pole railway type is used, which is capable of developing a high torque. The motor is re-

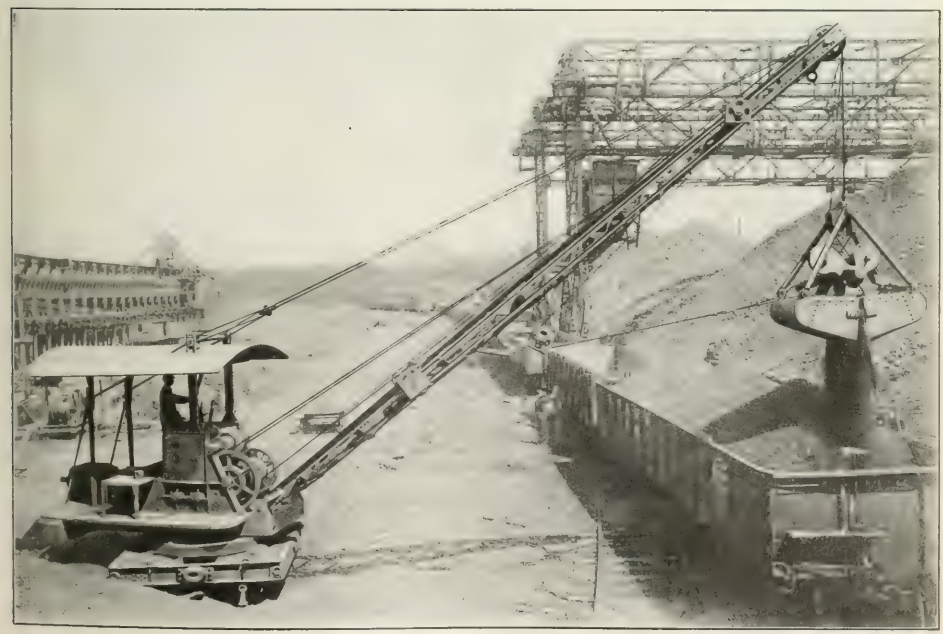


Fig. 2—The Crane Loading Cars From a Stock Pile.

versible and is under direct control of the operator, the controller being conveniently located in front of his regular position. The one motor can be used for hoisting, rotating, slewing and traveling, and any three of these four operations can be performed simultaneously.

The crane is fitted with a 38-ft. steel beam of the builder's standard design and double drums for operating a two-line automatic grab bucket. The capacity of the bucket is 1 cu. yd. or 4000 lb. and the maximum radius of the boom is 35 ft. The capacity of the crane is 500 tons per 10-hr. day. The crane is mounted on a four-wheel truck and travels at a speed of 600 ft. per minute. All of the gears used are made from open-hearth steel forgings and have cut teeth, no cast gears or pinions being used.

Annealing Steel Castings*

Suggestions on Proper Procedure in the Foundry

BY BRADLEY STOUGHTON

The annealing of steel castings is not always a necessary operation in their manufacture, and especially in the manufacture of small steel castings, which have not great length to produce severe strains by shrinkage. While it cannot be denied that proper annealing must benefit all steel castings in greater or less degree, on the other hand, annealing, as too frequently practiced, is often more a detriment to some castings in the heat than it is a benefit to the remainder.

Annealing has the two-fold purpose of relieving any strains produced in the metal during cooling in the mold, and of improving the strength and ductility of the metal by breaking up the coarse structure inevitably developed to some extent during cooling from solidification and, in some cases, amounting to that extreme degree of coarse crystallization which causes the appearance known as ingotism. Annealing to relieve strains is a comparatively simple operation, but annealing to produce the best grain obtainable, which shall in turn give the highest possible combination of strength and ductility to the casting, is an operation so often imperfectly understood and crudely practiced in foundries, that I hope an interchange of ideas may be of benefit, even though I cannot offer anything new or revolutionary for consideration.

Microscope and Pyrometer in Annealing Work

The microscope and some form of pyrometer, however crude, are invaluable adjuncts to annealing practice. The time has passed when steel foundries can obtain the best results in competition by means of the unaided eye. The pyrometer will tell us when the steel has reached that temperature which will give to it the best grain, and, therefore, the best physical properties, while the microscope will tell us whether or not this heat treatment has performed its work as thoroughly as it should. If the structure of the casting, after its first solidification is not excessively coarse, heating it slightly above its critical temperature, maintaining it there until the heat has penetrated to the most remote point, and then for about one-half hour thereafter will produce the desired result. But, if the steel has been cast at an excessively high temperature, or if it cooled with unusual slowness through the first 200 or 300 deg. after solidification, or if, in any other way, an unusual coarse and open crystalline structure has been produced, the process of annealing described above, even if protracted beyond the time limits mentioned there, will not completely obliterate the coarse crystals. The large crystals will be broken up into smaller ones, it is true; nevertheless, a sort of skeleton work, showing indistinctly the boundaries of the previous large size crystals will persist, and the steel will be somewhat below normal in strength and ductility, or both.

This point will be well seen by reference to Figs. 1, 2 and 3. Fig. 1 shows fine-grained steel as produced by forging or rolling; Fig. 2 shows the same steel in a very coarse crystalline state; while Fig. 3 shows the same steel after again reheating above its critical temperature. It will be seen that the large crystals are broken up into small ones, but there still persists a skeleton work showing the outline of some of the coarse grains.

Figs. 4, 5 and 6, on the other hand, show steel in a finely grained condition; the same steel with a coarse structure, and, finally, this coarse structure refined almost to its original condition.

Double Process in Annealing

In order that the steel shown in Fig. 3 might be refined as completely as that shown in Fig. 6, two steps in the annealing would be necessary. The coarse-grained steel would first have to be heated for an hour or more, after complete soaking, at a temperature far above its critical temperature. This would produce a structure intermediate between that of Fig. 1 and Fig. 2, and would obliterate the skeleton work showing the outlines of the previous coarse crystals. Such a casting must then be cooled to a black heat and subsequently reheated slightly above its critical temperature in order to give it the best possible physical qualities. This double process, of course, involves a waste of time, heat and labor, and the bad quality of the coarse structured steel may not always be bad enough to justify this expenditure, but it should be remembered that this double process—and this alone—can redeem steel castings of extraordinarily coarse crystalline structure.

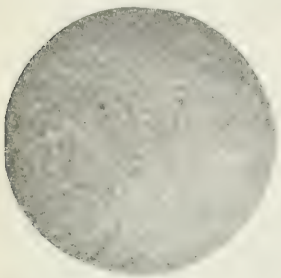


Fig. 1.—Grain of rolled steel of 0.50 per cent. carbon, magnified 40 diameters.

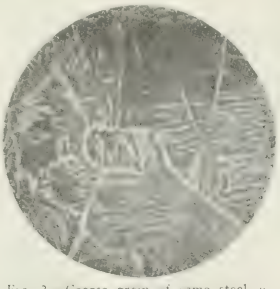


Fig. 2.—Coarse grain of same steel as Fig. 1, due to heating to high temperature; magnified 40 diameters.

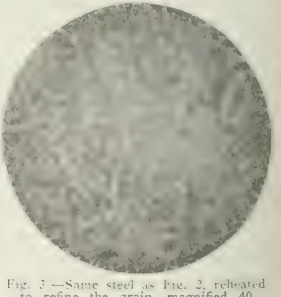


Fig. 3.—Same steel as Fig. 2, reheated to refine the grain, magnified 40 diameters. Note skeleton structure showing outlines of former large crystals.

Another point about the annealing of steel castings, which is not often emphasized, is that slow cooling through that limited interval of temperature known as the "critical range" is detrimental to both strength and ductility. Slow cooling below 1200 deg. F. will improve the ductility of the metal, but slow cooling from 1700 deg. down to 1200 deg. F. develops thicker grains of ferrite and cementite and reduces both strength and ductility. Fig. 7 shows the structure of steel which has been cooled very slowly through this interval, and illustrates the fact to which I have alluded. Fig. 8 shows the critical range of steel and iron. Most of our steel castings contain less than 0.50 per cent. carbon and, therefore, the critical temperatures above which they are to be reheated are located in the line GO. To cool the steel slowly from above the GO to below the line PSK, will develop thick crystals of ferrite and cementite.

Because of this circumstance there has arisen a process of annealing which consists in maintaining the steel castings above their critical temperatures about half an hour

*Paper read before the American Foundrymen's Association.

after they are completely soaked, then pulling them out so the air will blow upon them until they are black heat; after which they may or may not be returned to the furnace and allowed to cool as slowly as they will. Of course, it must be remembered that this method of annealing may set up strains in castings of very complicated shape, and the castings must also be so piled that they will not strain each other during the expansions and contractions which they undergo whilst cooling through the critical interval.

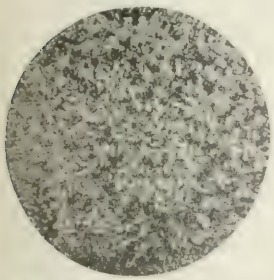


Fig. 4.—Grain of rolled steel of 0.08 per cent. carbon, magnified 40 diameters.



Fig. 5. Coarse grain of same steel as Fig. 4, due to heating to high temperature; magnified 40 diameters.

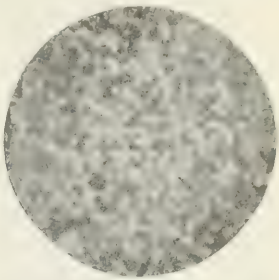


Fig. 6. Same steel as Fig. 5, reheated to refine the grain, magnified 40 diameters.

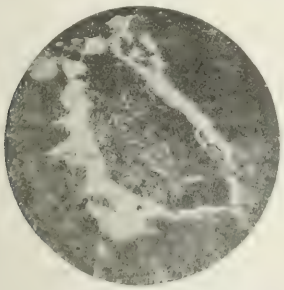


Fig. 7.—Steel cooled very slowly from 1650 to 1200 deg. F., magnified 250 diameters.

Seger Cones for Temperature Indication

It may be of interest to the management of foundries to know that Seger cones may be purchased from the chemical supply houses and elsewhere and serve a valuable purpose in annealing work. These Seger cones are little forms of clay, melting at a great variety of temperatures. If these cones be placed in a furnace along with the castings, their melting will show when any particular temperature is attained. It is also possible to put cones in different parts of the furnace to determine the uniformity of the heat.

An ordinary horseshoe magnet is a valuable adjunct in annealing steel castings because castings of 0.50 per cent. carbon and less, lose the power of attracting a magnet when they reach a temperature of 1550 deg. F., so that in this way we can check up the eye in estimating the temperature of the annealing furnace, and this is especially valuable, because this particular temperature (i. e., 1550 deg. F.) is only a short distance below the correct one for annealing.

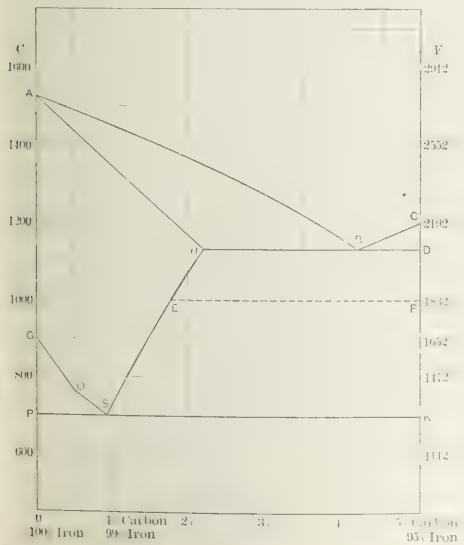


Fig. 8.—Diagram showing the critical range of steel and iron.

Kentucky Iron History

Through the courtesy of William R. Belknap, chairman of the Belknap Hardware & Mfg. Company, Louisville, Ky., we have received a copy of the Louisville Courier-Journal of August 20, giving a most interesting account by John L. Smith of the preparations now under way for the removal to that city of the last of the machinery, fixtures and scrap from the place where the Tennessee Rolling Works once operated, on the north bank of the Cumberland River in Lyon County, Kentucky. Reference was made to the dismantling of this plant in *The Iron Age* of July 27. The article in the Courier-Journal, however, is a much more extensive description of the old plant, and is accompanied by interesting illustrations. It also enters into the history of the works and gives reminiscences in connection with early iron manufacturing in the locality.

In the immediate vicinity of the Tennessee Rolling Works was the old Suwanee furnace, erected in 1847, which was the plant where William Kelly developed his pneumatic process of refining iron at about the same time that Sir Henry Bessemer invented his pneumatic process in England for the manufacture of steel. In that vicinity also was the blast furnace that was built in 1827 by Morris B. Belknap, progenitor of the Belknap family at Louisville. In *The Iron Age* of March 21, 1889, in an obituary of W. B. Belknap, a son of Morris B. Belknap, incidents in connection with the building of this furnace are narrated. In that sketch, and in the article in the Courier-Journal, the trials and triumphs of the Kentucky pioneers in the iron industry are graphically set forth.

Eastern manufacturers who desire to secure warehouse facilities for distributing their products on the Pacific coast can effect such arrangements with M. P. Stein & Co., Stockton, Cal., who are prepared to lease the necessary accommodations either by floor area, tonnage or piece. They are also in position to receive such merchandise, advance freight charges and attend to its reshipment. Stockton has no industrial switching charges, possesses tidewater navigation to San Francisco and is a terminal point for the Southern Pacific, Santa Fe, Western Pacific and Interurban railroads.

Small Open-Hearth Furnaces*

Design of Furnaces for Small Castings Using Oil as Fuel

BY WALTER MACGREGOR†

The design of a furnace, to get the best efficiency from the fuel, depends entirely upon the nature of the fuel to be burned. To get the highest temperature our furnace body should be of such proportions that we could burn the necessary amount of fuel in the smallest possible space, and in order to burn a large amount of combustible in a small space a short flame is necessary. The factors governing the short flame, according to the fuel experts of the United States Navy, are: (1) a pure carbon fuel; (2) Initial heating of the air which furnishes the oxygen for combustion; (3) intimate mixture of the oxygen with the fuel or diffusion; (4) large surface of the fuel presented for impact of this oxygen.

The first factor, the nature of the fuel, is settled for us, as we have decided upon fuel oil, with a probable analysis as follows: Carbon, 83.26 per cent.; hydrogen, 12.41 per cent.; sulphur, 0.50 per cent.; oxygen, 3.83 per cent., and with a specific gravity at 60 deg. F. of 0.926. The heat value of this fuel, according to Du Long's formulæ, would be 19481 B.t. u. per pound. From this analysis we can easily compute the quantity of air required for combustion and the products of combustion for any amount of fuel burned.

Determining the Air Requirements

As a representative size of the small open-hearth furnace we will choose a 5-ton furnace as an example. We are to melt and reduce 5 tons of metal, and from the time of charging the heat till the time of charging the following heat we will assume 4 hr., and as the oil consumed varies so much in different furnaces, we will assume as an average fuel consumption 48 gal. of oil per ton of steel melted in this time, or 1 gal. per minute.

Considering 12 lb. of air required for burning 1 lb. of carbon, and 34.78 lb. of air required for burning 1 lb. of hydrogen, we have from the analysis of the fuel:

9.9912 lb. of air required to burn the total carbon in fuel.
4.2161 lb. of air required to burn the total hydrogen in fuel.

14.2073
.16 correction of amount for oxygen in fuel.

14.0473 lb. air required for complete combustion of 1 lb. of liquid fuel.

With fuel oil of 7.72 lb. per gallon we have $14.047 \times 7.72 = 108.37$ lb. air required per gallon of oil.

With air at 13.14 cu. ft. per lb. we have $108.37 \times 13.14 = 1424.11$ cu. ft. air required to burn one gallon of fuel oil.

Hence, to burn 1 gal. we must admit theoretically 1424 cu. ft. of air per minute into the furnace. To this we must add the amount of air required in reducing the carbon and silicon in the metal:—10,000-lb. charge, of which 12½ per cent. is pig iron of about 2½ per cent. carbon and the rest steel scrap and billets of about 0.30 per cent. carbon, all to be reduced to about 0.18 carbon at the time of tapping. From this we get the total carbon contents of the bath as 56.5 lb., to be reduced to 18 lb. of carbon, or $56.5 - 18 = 38.5$ lb. of carbon to be burned out in about 2 hr. of reducing the charge, and, as before, 157.6 cu. ft. of air are required to burn 1 lb. of carbon, we have $157.6 \times 38.5 = 6070$ cu. ft. of air required in 2 hr., or 50 cu. ft. per minute. All of this passes off with the products of combustion. In the same way we can determine the amount of air required in eliminating the silicon, which will run about 42 cu. ft. per minute. A certain amount of oxygen is also taken up by the manganese, but this is so small as to be neglected.

With the total theoretical amount of air required, $1424 + 50 + 42 = 1516$ cu. ft. per minute, we are in a position to determine the proper furnace proportions with due regard to the second circumstance in producing the short flame: "initial heating of the air." The volume of air is figured at a temperature of 72 deg. F., which will be about the temperature of air entering our valve. The increase in volume of air at different points along its travel due to its increase in temperature must be the governing factor in designing the ports, flue openings, etc. As the volume of this air increases in a direct ratio to the absolute temperature, it follows that the volume occupied at any point may be computed when the temperature at that point is known.

Sizes of Air Valve and Chimney

In case of the air valve, due to the reversing feature of the furnace, this should be figured rather to accommodate the products of combustion than the entering air, as these are at a higher temperature, and will, therefore, require a greater area of flue. The temperature of the valve is a vital point in the problem of design, for any heat beyond this point toward the stack is lost as far as the furnace is directly concerned, and can only be used in the field of economizers. In determining the size of the valve we will first have to determine the velocity of the products of combustion through the valve due to the draft of the stack, and this in consequence gives as our starting point the design of the stack, which we would naturally consider as our finishing point.

A number of eminent authorities on chimney design have chosen 600 deg. F. as the most economical stack temperature, and Rankine has spent considerable time in trying to prove it in his work on "steam engines." I have never seen an open-hearth stack with that low temperature, and will, therefore, base my calculation on a temperature of 1000 deg. F. as being more nearly uniform with current practice. In my experience with small furnaces I find that the most satisfactory stack draft to be maintained is about 1 in. of water. This is a function of the hight of the stack and the difference in temperature inside and outside the stack. With this difference in temperature and a draft of 1 in. of water, we would get a stack 110 ft. high, and hence we will assume this as the minimum hight to be desired. The velocity of gas due to the pressure head corresponding to this hight of stack and temperature, allowing a .25 per cent. friction factor, is a little less than 15 ft. per second, which is recommended by a number of authorities as good practice.

We have based our calculation, so far, on the theoretical amount of air required for combustion, but will design our stack and flues, as in the case of power-plant design, for an excess capacity of 100 per cent., which would be 3000 cu. ft. of gas per minute, or 50 cu. ft. per second. This divided by the velocity of 15 ft. per second would give a sectional area of stack of 3 1/3 sq. ft., or a trifle over 2 ft. diameter, and we will assume 27-in. diameter of stack as best suited to this furnace, and plenty large enough to permit of any crowding of the furnace. This then will also be the size of the valve and flues leading to the valve from the checker chambers.

Size of the Checker Chamber

The second factor governing the short flames, "the initial heating of the air," spoken of before, is introduced by means of the reversing feature of the furnace through the checker chambers, and these chambers should be so designed as to slow up the travel of the products of combustion, in order that they may give up the major part of their heat to the checker brick, or that part of the heat which is not required to produce the stack draft. The cubical contents of these chambers should not be less than 75 cu. ft. per ton of steel melted per heat, and preferably in the neighborhood of 100 cu. ft. per ton. These chambers should be located behind the furnace and not immediately under the furnace. This point is quite as important in small furnaces as in large ones, as they operate at a higher temperature and we should get the benefit of a good circulation of outside air under the hearth of the furnace. These chambers should be long and narrow or deep, in oil-burning furnaces, giving a very long travel to the products of combustion, before they reach the valve, as on account of the highly volatile nature of the fuel and the slowness with which many of the hydrocarbons mix with oxygen a great deal of the fuel will be out in the stack before it has undergone complete combustion.

The methods of gas analysis, as applied to steam boiler practice, will show some very interesting relations in this regard. In a 5-ton furnace which I have been operating a flue gas analysis will show the following:

	Carbon Dioxide. Per cent.	Carbon Monoxide. Per cent.	Oxygen. Per cent.
At the rear of the checker chambers 24 ft. back of the center line of furnace.....	6.4	3.1	0.2
In the air valve 9 ft. further back.....	8.8	0.3	8.0
In the stack 16 ft. further back.....	9.4	0.3	9.

With a decrease in temperature between the first and last point from 1,750° F. in the rear of the chambers to 930° F. in the stack.

*Paper, substantially in full, read before the American Foundrymen's Association

†American Steel Foundries, Indiana Harbor, Ind.

In case all the fuel were burned before it reached the stack the sum of the oxygen components of the flue gas would be 21 per cent., as there is 21 per cent. by volume of oxygen in all the air admitted to the furnace, the volume of the carbon element being so small as to be considered zero, but as a matter of fact the sum of the oxygen components at the valve is only 17.1 per cent., and even out of the stack it is only 18.7 per cent., which shows that there is some form of hydrocarbon gas occupying the other 4 per cent. which is getting past the valve unburned and being wasted out in the stack. This, I think, shows very conclusively the necessity of having long chambers and flues in oil-burning furnaces to insure complete combustion of the gaseous fuel before reaching the reversing valve.

These figures are based on atomizing the fuel with compressed air instead of with steam, as with steam the hydrocarbons are slower in taking up oxygen, and a gas analysis at the valve will show a higher percentage of hydrocarbon gas unburned at the valve and a corresponding increase in stack temperature. A sample of gas at the base of the stack when steam was used for atomizing purposes showed the following analysis: CO_2, 7.5 per cent.; CO, 0.4 per cent., and oxygen, 9.5 per cent., or a total of 17.4 per cent. of oxygen components out in the stack which is 5½ per cent. less than shown at the base of the same stack with air, and therefore, a less perfect combustion.

Size of Air Ports and Furnace Body

The third condition governing the short flame, "intimate mixture of oxygen with the fuel or diffusion," bears directly on the size and arrangements of the air ports and the furnace body. The size of the ports depends upon the size of the reversing valve, or vice versa, and the relation between the two is in a direct ratio to the absolute temperature at the two points, these temperatures being 1490 deg. F. at the valve, and 2800 deg. F. at the ports, or in a ratio of 1 to 2. The ports, therefore, should have an area of twice the area of the reversing valve. We will, therefore, have a total port area at one end of the furnace of about 7 ft. These ports should be carried out the full width of the furnace to prevent any short circuit of air through the furnace body, as the travel of gas through the furnace body should have the same velocity at all points to get the proper diffusion. These air ports should come well up above the hole in the monkey wall through which the oil burner enters the furnace, so that the air must come down on top of the flame rather than underneath it. This is a very important factor in designing a hot-working furnace.

The space to be allowed for hearth in small furnaces should not be under 10 sq. ft. per ton of charge and then, too, the shape should approach more nearly a square than the oblong shapes in general use, as this tends to give a better effect of the radiation of the walls and roof, and by widening the furnace we lessen the cutting action of the flame on the side walls and keep down the repair bills.

As to the length of the furnace body, this should be governed by the length of the oil flame, for the hottest part of the flame should be about the center of the furnace. It has been my experience that I have not been able to get a flame that was intense enough to melt down a charge of metal any less than about 8 ft. from the tip of the burner to the hottest part of the flame, and as the tip of the burner should stick clear through the monkey wall, which will extend 9 in. beyond the ports of the furnace at least, we will get as a minimum furnace length twice the length of the flame as mentioned above, plus twice the width of the ports, plus twice the thickness of the end walls, plus twice the 9-in. extension of the monkey wall beyond the ports, or a total of about 22 ft., as the minimum length of the outside of the furnace body.

Compressed Air for Atomizing Oil

The fourth circumstance governing the short flame, "large surface of fuel presented for impact of oxygen," as a matter of oil burners and atomizing agents, and has furnished inspiration to thousands of inventors—all to very little purpose. The matter of atomizing this fuel oil is one of overcoming the surface tension of the oil and breaking it up into very fine particles, so that it will present greater surface for contact with the oxygen, and the two methods in use, superheated steam and compressed air, give a mechanical efficiency so small that you can barely find it at all.

There is a great deal of discussion at the present time on the needless waste of using compressed air for atomizing purposes when superheated steam will answer, but in the small casting business one of the main difficulties is getting the metal hot enough to run the thin sections in the molds, and since, by its very nature compressed air, while atomizing the oil, furnishes at the same time oxygen for combustion, and that, too, very intimately mixed with the oil, it is quite evident that by using air we would get quicker combustion, a shorter flame and a somewhat hotter furnace.

In conclusion, I will say that in operating a furnace designed along these lines it will not be a difficult matter to get out six 5-ton heats in 24 hr., and still have the metal hot enough to pour many castings weighing a fraction of a pound each. With a 5-ton heat it is not uncommon to pour as high as 175 molds, consuming about 50 min. in pouring. The metal must, therefore, be extremely hot at the time of tapping the heat.

The Cost of Producing Alabama Pig Iron

The market letter of Matthew Addy & Co. for September 2 has the following concerning the ability of Southern blast furnaces to make money on the $10 basis for No. 2 foundry iron at Birmingham: "As a matter of fact, $10 f.o.b. Birmingham for No. 2 is not an attractive price, even to the furnaces that can most cheaply make iron. All of the iron produced is not No. 2. A good deal of low-grade iron is made, even by the best iron makers, and this brings from 50 cents to $1 less money than No. 2. There has been a lot of nonsense written about $6 iron. Some of this nonsense has even been repeated in Congress. The people of Birmingham who boasted of $6 iron never did a more foolish thing. Some iron, years ago, undoubtedly was made in Alabama at that cost. But then they paid labor not to exceed $1 a day, and they had rich ores on the surface—not mines half a mile in the ground as today. And at a producing cost of $6 there was no margin for depreciation or repairs, no accounting for wear and tear and no charge for capital invested, let alone a reasonable profit. In no sane scheme of bookkeeping were the furnaces then getting back a new dollar for an old one. In these days labor is getting fair wages, raw materials are vastly more expensive than ten years ago and bondholders demand their interest regularly, while shareholders modestly expect now and then some little return. Ten dollars, Birmingham, means that raw materials—the potential wealth of the country—are being consumed simply for the sake of consuming them. At that price, if a blast furnace were like a steamboat, so to speak, it would be tied up to the wharf and allowed to wait until there was more water in the river. The South, if its iron industry is to thrive, simply must get more money. This is being realized and the policy of selling just to sell at any old price is not so much in vogue as once was the case. Consumers themselves prefer to pay higher prices for iron, for the history of the trade is that the consumer is more prosperous and finds more profit in his business when iron is nearer the top than the bottom level."

The annual report of the National Enameling & Stamping Company for the year ended June 30, 1911, shows gross profits of $1,718,671. Income from investments, etc., brought the total income up to $1,740,005, an increase of $44,838 over the previous year. Renewals, repairs, interest charges, etc., amounted to $611,919, and net profit for the year was $1,074,085. After appropriations for sinking fund, interest, and charges there remained a surplus for the year of $171,156, which was $92,476 less than the previous year's showing. The total surplus and reserve at the close of the year was $3,278,301.

With the railroads discriminating against every other town on the map (see Interstate Commerce Commission's complaint files for verification) it is wonderful how few waste places there are, says the Wall Street Journal.

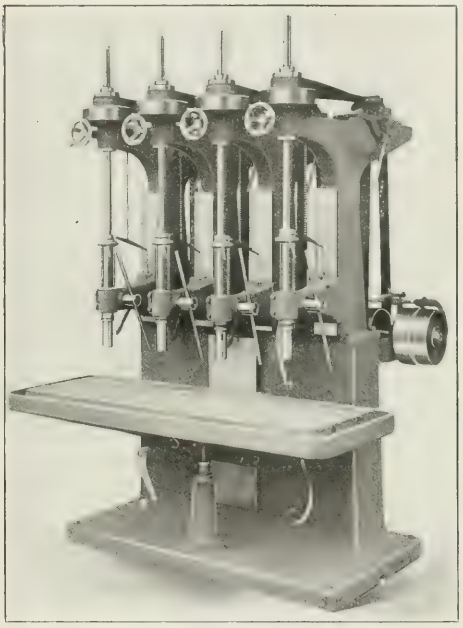
The new bar mill of the Lackawanna Steel Company, Buffalo, N. Y., was completed and placed in operation last week, largely increasing the mill capacity of the company's plant.

Avey No. 3. Drill Press

In addition to its No. 1 ball-bearing drill press which was illustrated in *The Iron Age*, October 27, 1910, the Cincinnati Pulley Machinery Company, Cincinnati, Ohio, has recently placed on the market a new type, which is known as the No 3 tool. Four different sizes, having one, two, three and four spindles respectively are built, the last being the one illustrated.

The drill is designed to handle work up to the limit of capacity of drills having a No. 3 taper shank. Ball bearings are used throughout and all the cones and the ball races are of hardened and accurately ground steel, the bearings being of the four-point contact type. The design of the tool enables it to be run at the maximum speed which high-speed twist drills are capable of and at the same time requires the minimum of oiling and power.

The spindle of the machine is of crucible steel 1 13/16 in. in diameter and is bored to conform with the No. 3 Morse standard taper. The sleeve is graduated and the



The Avey No. 3 High-Speed Ball-Bearing Press Built by the Cincinnati Pulley Machinery Company, Cincinnati, Ohio.

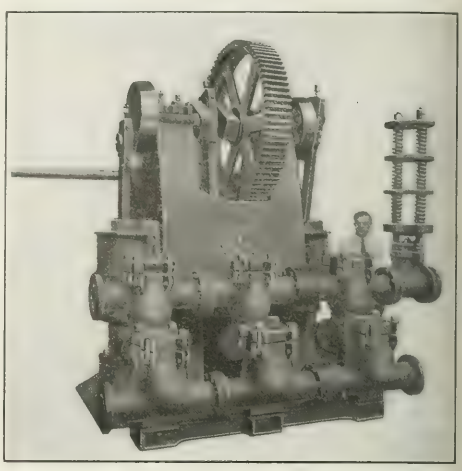
stop collar is mounted thereon, that may be set to drill holes at any predetermined depth, not exceeding the feed of the spindle which is 8 in. without using a scale. This column is held in place by a fixed clamp screw and no wrench or screw driver is consequently required.

Four spindle speeds are obtained for each spindle, the drive being by 2-in. belt. Each spindle has a belt tightener carrier controlled from the front of the machine by hand wheel and screw feed, which gives positive and precise belt tension. The distance from the center to the column face is 12 in. and the weight of the four-spindle machine is approximately 4000 lb. If desired a lubricating outfit can be supplied, the inside of the lower portion of the column forming the reservoir. The tables can be furnished either with or without T slots and both types are supplied with a heavy groove around the edge to take care of the lubricant.

The Goulds Triplex Pump

For operating at high pressures, from 215 to 1500 lb., the Goulds Mfg. Company, Seneca Falls, N. Y., has placed on the market a new single-acting triplex-plunger power pump. The general construction of the pump greatly resembles an older type which has been extensively used for water works, fire protection systems, hydraulic elevators, oil pipe lines and in mines. It differs markedly in the gearing, as the older pump had two sets of gears and pinions, one on each side of the standards, while the new type has but one gear and one pinion which are located between the standards as shown.

Locating the gearing in this position has of necessity lengthened the right side of the pump slightly and correspondingly increased the distance between the two valve



The New Single-Acting Triplex-Plunger High-Pressure Pump Built by the Goulds Mfg. Company, Seneca Falls, N. Y.

boxes on that side. Instead, however, of lengthening the pipe connecting the valve boxes and making each set a different shape distance pieces are put in between the right and the middle set as shown. In this way the three sets of valve boxes are identical in form and are interchangeable, a feature which not only saves time when repairs are needed, but also reduces the number of parts that must be kept in stock by the large user who may be located at a great distance from the factory.

Sly Foundry Equipment

The W. W. Sly Mfg. Company, Cleveland, Ohio, states that increasing business in its dust arrester and sand blast department has compelled the erection of a new two-story building, 60 x 115 ft., which is constructed of steel and cement. From the present outlook it appears as though by next spring the building will have to be enlarged. Orders for tumbling mills are coming in well, and the company is now working its plant 12 hours per day.

A small sand-blast apparatus has just been set up in one part of the factory, showing three different ways of sand blasting. One is the Sly sand-blast tumbling barrel, another is the gravity-feed sand blast and the third is the tank pressure sand blast. All of these machines handle the sand automatically, take care of the dust, clean and elevate the sand and return it to the hoppers where the clean sand returns to the sand-blast machine. Workmen have nothing to do in handling the sand, except now and then to dump a fresh wheelbarrow load of it on the floor. These machines have been erected in the factory expressly for demonstrating purposes, and the company is always pleased to receive its out-of-town friends and demonstrate what it can do for them in regard to sand blasting.

C. R. Rogers & Co., Corry, Pa., engineers and contractors, recently prepared plans for a new manufacturing plant for the Kurtz Brass Bed Company, of the same place, to be 100 x 250 ft., having concrete floor, brick walls and timber roof. The plant will be located along the Erie Railroad, and will have a larger capacity than the present one. A new 100-hp. Ajax gas engine will be installed, while the manufacturing equipment in the old plant will be used.

Strode Packing Tool

Patents have been recently granted to Edward P. Strode of the New York Edison Company, New York City, covering a new type of packing tool intended to be used for packing condenser tubes in power plants. The tool is operated by compressed air or steam and its use is said to result in a large increase in a number of tubes which can be packed per hour, as compared with the results secured with a hand packing tool and a hammer. An exterior view of the new tool is given in Fig. 1, while Fig. 2 is a section showing details of its construction.

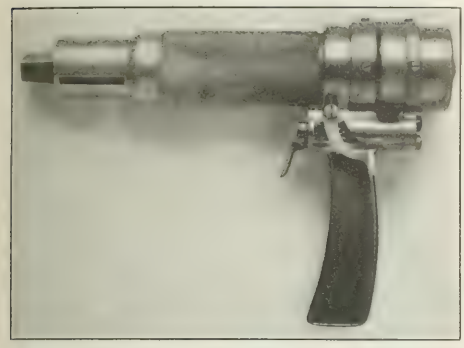


Fig. 1.—A New Tool for Packing the Ends of Condenser Tubes Patented by Edward P. Strode, New York City.

As will be noticed the tool resembles a pistol in appearance. Referring to Fig. 2, which is a sectional view showing constructional details, the breech or body part of the tool *a* is integral with the handle. The barrel *b* has vent holes and a diminished end. All three parts are held together by screw threads. A tubular reciprocating plunger, *c*, has a piston, *d*, which fits closely within the barrel. The guide tube *e* is enlarged at its outer end to form a guideway for the reciprocating plunger and is screwed into the breech. Within the inner surface of the guide tube there is a rotary shaft, *f*, with an enlarged journal bearing at its outer end. This tube is enlarged still more at *g* so as to leave space between it and the small end of the barrel for a guideway for the plunger. The end of this enlarged part is turned down into the form of a frustum of a cone at *h*, and has a shoulder which fits accurately against the end of the tube where the packing is to be inserted. This enlarged part also

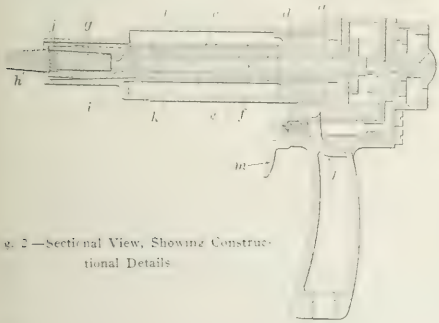


Fig. 2.—Sectional View, Showing Constructional Details

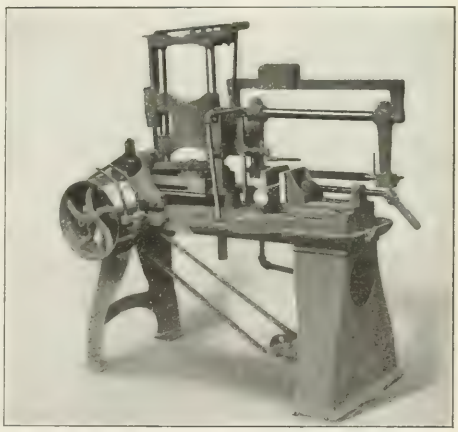
constitutes a cylinder around which the packing cord is wound before the tool is used. A longitudinal groove in the body part in which a longitudinal finger is pivoted upon the pin *i* is provided for securing this cord. The finger is grooved at its outer end and a spiral spring, *j*, is inserted in a boring in the enlarged portion of the tube *g*, the arrangement being such that normally this finger is held at its outer end against the inner surface of the diminished end of the barrel.

In operation the packing cord is inserted at the outer end of a slot through the diminished end of the barrel and is forced in sufficiently so that the friction between it and the inner surface of the small end of the barrel is enough to wind it firmly around the tube *g* when the shaft *f* is rotated. Compressed air is led to the tool through a hose and is admitted through an opening on the bottom of the handle to the body of the barrel. This opening is divided into two parts, one for conveying the air to the piston *d* and the other to the rotating motor. When the operator presses the valve lever *l* after the packing cord has been inserted, air is admitted to the motor. The motor imparts motion through gearing to the enlarged portion of the shaft *f* thus drawing the cord through the opening and winding it around the enlarged portion until it has been completely drawn in and is in a position to be operated upon by the reciprocating plunger *c*. The operator then releases the valve lever and inserts the coned end *h* of the tool into the end of the condenser tube. The trigger *m* is then operated successively a number of times until the cord has been driven, the number of blows depending upon the density which it is desired to give to the packing. The tool is then removed and the set-nut secured in position in the regular way.

As compared with the hand method of packing, as high as 28 tubes have been packed per minute instead of 40 per hour. The average, however, for a day is from 10 to 15 tubes per minute.

New Sterling Power Hack Saw Machine

A new high-speed power hack-saw machine, known as the No. 2½, has been placed on the market by Diamond Saw & Stamping Works, 357 Chestnut street, Buffalo, N. Y. The general type of machine was illustrated and described at length in *The Iron Age* of January 21, 1909; but the present machine has a cutting capacity up to 7 in. of either round or square bars, takes blades 10 to 15 in. in length and weighs 380 lb. net. It is equipped, as indicated, with the automatic lift, raising the saw blade on the return stroke and thereby saving wear on the blade. The device is adjustable so that the full length of the blade may be used and the vise swivels so that cutting may be done at a 45-deg. angle. While there is an automatic shut-off and the blade is lifted automatically, as stated, it is emphasized that the automatic arrangements are accomplished without intricate devices likely to get out of order.



New Hack Saw Machine Made by Diamond Saw & Stamping Works, Buffalo, N. Y.

The General Contractors' Association, room 2508, 13-21 Park Row, New York City, of which C. A. Crane is secretary, has undertaken an important piece of work in endeavoring to secure the prevailing rate of wages in various localities throughout the State of New York for the purpose of establishing an authentic bureau of information on the subject of wages. The occupations covered comprise not only the building trades but all classes of labor in connection with contract work.

Pulsometer as Power Plant Pump

A Recent Application of This Device

In power plants a new type of pump is coming into use in addition to the ordinary reciprocating and the centrifugal styles. The special advantages of the pump, as described by the builder, the Pulsometer Steam Pump Company, 17 Battery place, New York City, for this particular class of service, are simplicity, lightness and cheapness. Figs. 1 and 2 show the external appearance and the internal construction of the pump respectively.

Simplicity of construction is secured as there are no mechanically operated parts and the filling and emptying of the pumping chambers is automatic. Since there are no rubbing contacts no lubrication is required, a feature that possesses a special value when the Pulsometer is used as a sump pump or where it handles the boiler feed water. It is emphasized that the Pulsometer is light for its capacity, which is an important factor in emergencies or doing reconstruction work since it can be hung from beams or timbers or suspended by a rope it necessary.

Referring to Fig. 2, it will be seen that the Pulsometer consists of a hollow one-piece casting having two bottle-shaped chambers *a a*, with their necks communicating at the top and each opening into a common outlet chamber, *b*, through a check valve. An air chamber, *c*, connects with the suction inlet and serves to cushion the incoming pulsations. In operation the steam from the boiler is admitted to the top of the pump and enters either the right or the left pumping chamber, depending upon the position of the steam ball valve at the top. Assuming that the left chamber is filled with water, the pressure of the steam depresses the surface of the water without agitation and forces the water through the two check-valves into the discharge pipe *d*.

When the water has fallen to the level leading to the discharge chamber its even surface is broken up, and the water and the steam are thoroughly churned up and brought into intimate contact on account of the peculiar design of the pumping chambers with the result that the steam is instantly condensed. This condensation forms a vacuum in the left chamber which is assisted by a slight upward pressure in the other chamber and pulls the steam valve over to the other seat and shuts off the supply of steam to the left chamber. The vacuum thus produced draws in a charge of water through the suction pipe, and while the left chamber is filling up, the right one is emptying. It will be seen in this way that the action of the pump consists in alternately emptying and filling the pumping chambers. These operations will continue as long as the pump is supplied with steam and water and they follow each other rapidly and with such regularity that practically a continuous stream of water leaves the discharge pipe. Each pumping chamber has an inwardly opening air valve which draws in a supply of air every time a vacuum is formed in either chamber. This air forms a layer on the top of the water which acts as a sort of piston and keeps the water and the steam from coming in contact too early and at the same time also serves as a cushion to deaden the shock of the water as it rushes in.

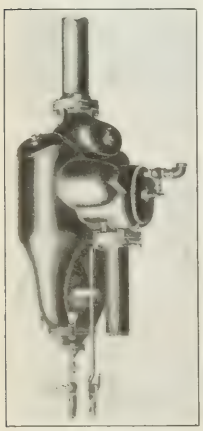


Fig. 1.—Exterior View.

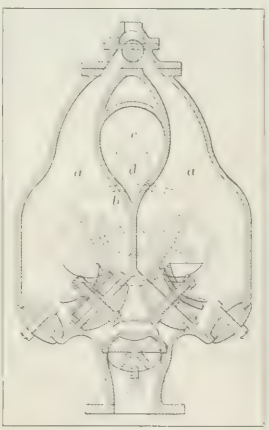


Fig. 2.—Sectional View.

Two Views of the Pulsometer Made by the Pulsometer Steam Pump Company, New York City.

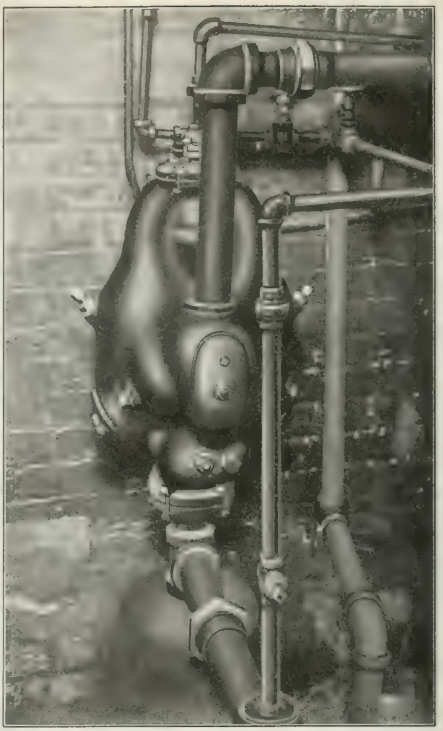


Fig. 3.—The Pulsometer Employed as a Sump Pump in a Large Office Building.

In Fig. 3 a Pulsometer is shown permanently installed in the power plant of a large New York office building where it is doing duty every day as a sump pump. When employed for this class of work or for returning drips and other water to open heaters the pump may be said to have a high thermal efficiency, for all the steam that is condensed in the pump is mixed with the water and returned to the boiler feeding system, the only heat loss being due to radiation.

These pumps are built in a number of sizes, ranging in delivery from 20 to 2000 gal. per minute. Tests made on the Pulsometer have, it is stated, resulted in securing a maximum duty of over 23,000,000 ft.-lb. per 100 lb. of coal, the average figure being 15,000,000 ft.-lb.

The Fuller & Johnson Mfg. Company, Madison, Wis., has sold its implement business to the Madison Plow Company, which will continue to manufacture the Fuller & Johnson line of implements. Its present customers can secure repair parts, etc., from the Madison Plow Company. The Fuller & Johnson Company will hereafter devote its entire attention to the manufacture of gasoline engines, including its complete line of double efficiency farm pump and multi-motor engines. The implement factory is now being dismantled, and is to be remodeled for the manufacture of engines. This change has been brought about by the rapid growth of the company's engine business and the need for additional room for this purpose.

The Sweet & Doyle Foundry & Machine Company, Green Island, Albany County, N. Y., is installing new machinery in its machine shop to take care of larger work.

The Andresen-Evans Type B Grab Buckets

A New Style for Three-Line Operation

Operating grab buckets by three or more lines has resulted in the development by the Andresen-Evans Company, Monadnock Building, Chicago, Ill., of a new style known as the type B bucket. In a great many respects this bucket does not differ very materially from the company's type A bucket which was illustrated in *The Iron Age*, September 1, 1910. The new style is, however, operated by three or more lines instead of two and in designing it the overall hight, both opened and closed, has been reduced. This change, which is a very material advantage in unloading from vessel holds, has been secured by substituting an opening device that consists of two bar connections in compression operating from the vertical sliding pivot blocks to which the opening cables on each side are fastened for the lever brackets and the tension chains of the other type. Fig. 1 illustrates the bucket closed while a view of it when opened and showing its extensive reach is given in Fig. 2.

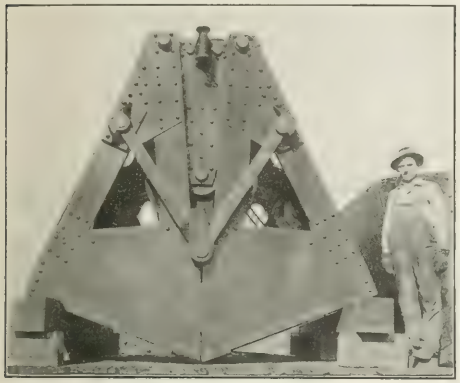


Fig. 1.—The New Type B Grab Bucket Built by the Andresen-Evans Company, Chicago, Ill.

The actual reduction in the minimum vertical clearance in which one of these buckets can be operated is clearly brought out by a comparison with the type A bucket. The overall hight for a 2-yd. bucket is 8 ft. 10½ in. for the type A grab and 7 ft. 6 in. for the type B. In the opened position, Fig. 2, the difference is even more pronounced. Formerly the overall hight increased from 8 ft. 10½ in. to 9 ft. 7½ in., while in the new bucket this dimension actually decreases 3 ft., making the hight when opened 4 ft. 6 in., a difference of more than 5 ft. between the two.

With the exception of the decrease in the hight, the design of the grab remains the same and the advantages peculiar to the type A bucket of digging action and direct closing pull parallel with the line of the lip travel have been retained. It is pointed out that the design of this bucket and the arrangement of the hoisting and the closing lines results in securing more service from the cables. The opening lines are directly connected to the bucket and do not pass over sheaves, with the result that excessive wear is eliminated. Where cables are employed inside the bucket for closing it instead of chains they are short and are not a part of the hoisting line. In this way it is not necessary to take out the hoisting cable and renew it when the closing cables wear out. Records of this bucket in service show that cables previously discarded for service in other buckets have given satisfactory service on buckets of this company for 6 months and as closing cables for a period one-third as long.

Another advantage of the reduced clearance aside from enabling the bucket to be employed efficiently in unloading the holds of vessel is an increase in the hight to which material can be placed on stock piles under ore bridges.

Carnahan Genuine Charcoal Iron Tin Plate

The Carnahan Tin Plate & Sheet Company, Canton, Ohio, has issued an interesting booklet entitled "The True Story of Genuine Charcoal Iron Tin Plate," which gives a description of the process employed by the company in manufacturing this product.

The process starts with "the best and most refined material that it is possible to obtain, regardless of cost." This is melted in a double cold-blast knobbling fire, using nothing but charcoal as a fuel. After this iron is worked in the knobbling fire, the ball developed is taken to a steam hammer and hammered into a bloom weighing about 350 lb. This is subjected to a white or welding heat, when the bloom is again placed under the hammer and given a second hammering to insure absolute solidity. After another heating the bloom is taken to a mill and rolled into a bar; this is cut into convenient lengths, piled four high, and these piles are heated until the several bars are welded into a comparatively solid mass. The piles are again put through the bar mill and rolled into sheet bars, which are cut up into suitable lengths for rolling into sheets. The following chemical analysis of the company's black plate was made by the Bureau of Standards, Washington, D. C.: Carbon, 0.03; manganese, 0.03; silicon, 0.024; sulphur, 0.012; phosphorus, 0.041.

The company contemplates the installation of a new and larger steam hammer in its forge department.

The M. Mitshkun Company, specializing in railroad equipment and making switches, frogs, crossings, rails and fastenings, has moved its offices, shops and yards to larger premises at Dix avenue and the Michigan Central Railroad, Detroit, Mich.

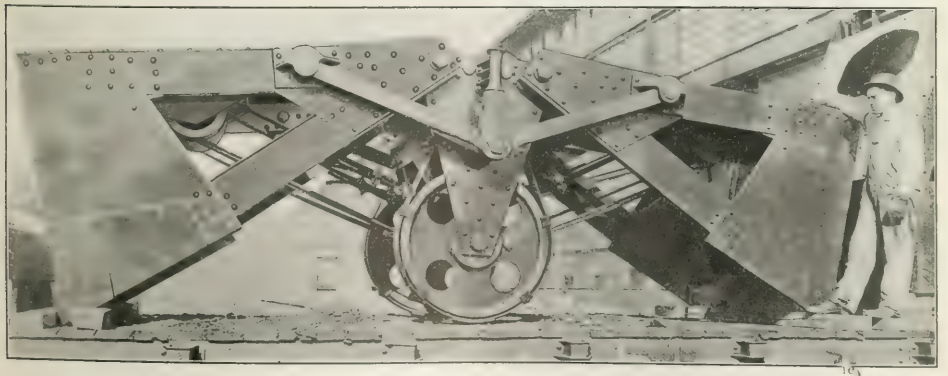


Fig. 2.—The Bucket Opened Showing its Extensive Reach.

The Driver Drill Rack

Causing the various tools used in a shop to be put away in their proper places is the principal value claimed for a new tool rack made by C. H. Driver, 1423 Sixteenth

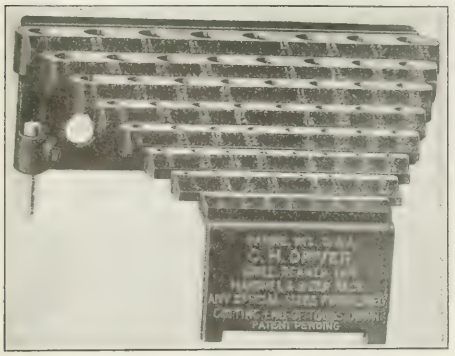


Fig. 1.—The New Drill Reamer, Tap, Mandrel and Sizer Rack Made by C. H. Driver, Racine, Wis.

street, Racine, Wis. The rack will accommodate the sizes of drills, taps, reamers, mandrels and sizers ordinarily employed in machine shop operations and the tools will be put away in their right places without having to stop to measure the sizes. At the same time the rack also acts as a safeguard or check since when a tool is removed, its size is indicated, which fact insures the proper one being used for a particular job. Fig. 1 is a view of the

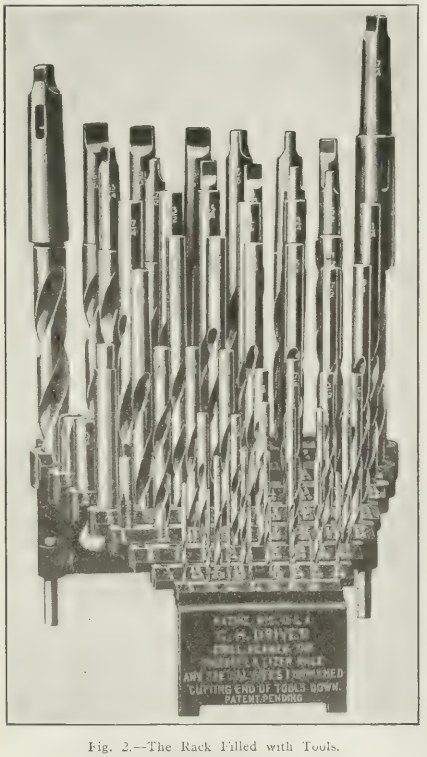


Fig. 2.—The Rack Filled with Tools.

rack when empty showing its construction, while Fig. 2 illustrates it filled with an assortment of tools.

The rack consists of a series of steps, holes being bored in $\frac{5}{8}$ treads to accommodate the tools, the diameters of which are indicated on the beveled face of the risers. The tools are put away simply by inserting them in the holes which correspond to their diameters without referring to the size marked on the tools or the rack. If the size of the tool has been rubbed off when slipped in a chuck it is simply necessary to find the hole in the rack in which it will stay. This does away with the necessity of calipering or locking up a drill gauge or micrometer. In this way tools can be put only in the proper place, as it is impossible to put drills in a larger hole than they will fit or to force them into ones that are too small.

While the rack illustrated shows one size, it is possible to have it accommodate additional tools, as it is built on the sectional plan. The parts are interchangeable and the extension can take place either in front or at one side. The sections can be supplied for either fractional, numerical or letter arrangements. The variation in the size of the holes in the fractional rack can be had in 64ths, 32nds, 16ths and 8ths, as may be desired. Different sections can be furnished to meet any special arrangement, such as, for example, where two or more tools of the same size are desired.

A New Foundry Flux

A metallic reducing agent or flux, which it is claimed will not temper the alloys in which it is used, has been placed on the market by the New Era Mfg. Company, Kalamazoo, Mich. This flux is known as the Meta-loyed-flux and is used for deoxidizing purposes in molten brass or bronze and aluminum casting alloys as well as in the manufacture of copper castings and in melting mixtures containing scrap material. The special advantages claimed for this flux, aside from its non-tempering property, are preventing excessive shrinkage, porous formations, blowholes and cold-shuts and increasing the fluidity, density and ductility of the material being cast.

The prevention of the formation of pores and the defects in the castings is effected by the neutralizing action of the flux upon the nascent oxides of the molten alloys. The increase in the fluidity of the metal is an advantage where castings having small or thin portions are to be poured. The amount of flux used per 100 lb. of metal varies from 2 to 3 oz., according to the nature of the material, and if mixtures containing scrap are being melted from 25 to 50 per cent. more flux must be employed. When used with aluminum the flux is added before removing the crucible from the fire, while with brass, bronze and copper the crucible is first removed. The mixture is stirred and skimmed in the usual way before pouring. As compared with phosphor tin the cost per pound of Meta-loyed-flux is 25 per cent. less, while one pound, it is said, will go further than three times that amount of tin and will give more satisfactory results.

The Titusville Iron Company, Titusville, Pa., builder of gas and steam engines, tubular boilers, etc., advises through Louis C. McKinney, its president, that it is operating its boiler shop and foundry machine departments full time and is employing a complete force of men. The volume of business booked will enable it to continue full operations for some time ahead. August was the largest month from a sales standpoint this year, and if current business holds up well the present year will be the best in the company's history. W. J. Harman, formerly superintendent of the boiler shop of the Erie City Iron Works, Erie, Pa., is now general superintendent of the Titusville Iron Company.

The influence of a name is shown in the recent decision of the Gibbs Gas Engine Company to change its name to the Standard Gas Power Company, owing to the fact that the former name tended to indicate that the company was engaged in the manufacture of gas engines only. It is stated that the former name resulted in considerable confusion, and the present name has been selected as defining the wider scope of the business; namely, the manufacture of gas producers, for both fuel and power, as well as of gas engines. The general offices of the company are in the Walton Building, Atlanta, Ga., and the company has also an office and salesroom on Main street, Jacksonville, Fla.

The Machinery Markets

Business in the machinery trade is decidedly irregular. In Cleveland some dealers report their August sales to be 20 per cent. over the preceding month and there is an excellent demand in that market for foundry equipment. Business is below normal in Cincinnati and in Detroit. Trade is quiet in New York, although there is an excellent export demand. The export business holds good in other markets. In Philadelphia the demand is quiet. Metal working machinery is not selling well in Baltimore, but there is a good call for contracting equipment. Irrigation projects continue to hold the attention of the trade in Texas, and some heavy business is looked for from that source shortly. A good demand for machine tools continues elsewhere in the South and there is a good volume of inquiries. Irrigation machinery is selling well on the Pacific coast, but the call for metal working machinery is not very heavy.

New York

NEW YORK, September 6, 1911.

Export business continues to support the machinery market. Some large sales of mining machinery have been made for delivery in Mexico and the Japanese engineering firms in this city have been buying for railroads in that country. Some good business has come from German car and locomotive manufacturing companies and English and French machinery makers are good customers for American machine tools just now. The railroads are buying a tool here and there but they show no disposition to close any business of real importance. The New York Central Railroad continues to defer purchasing against the extensive list it has had before the trade for several months, although there are rumors current among machinery men that buying will be begun within a few days. Machinery men who handle contracting machinery, such as hoisting engines, dredges, steam shovels, etc., are doing a good business and there is an improved call for heavy engines. Houses that handle metal working machinery do not find business so good. Orders are coming in for single tools in good volume, but there is no large buying from any one source.

The Bradley Contracting Company, 1 Madison avenue, New York, has purchased a site in Long Island City, near the Queensboro Bridge, on which will be erected a machine shop in which the company proposes to make repairs on its contracting equipment. The property is on the river front and is 400 x 500 ft. The company will operate its own line of boats to transport material from the shops to the scene of its subway construction operations.

Charles D. Durkee & Co., 2 South street, New York, has acquired a large site at Grasmere station, Staten Island, fronting 700 ft. on the Staten Island Rapid Transit Railroad. The company is having plans prepared for the erection of a brick factory building for the manufacture of marine hardware. The erection of dwellings for employees is also included in the plans of the company.

The Union Tool & Supply Company, 103 Chambers street, New York, has been incorporated under the laws of the State of New Jersey with $10,000 capital stock. Ivan Spangenberg, Thomas J. Wasser and Theodore Rurode are the incorporators. No manufacturing plans are yet announced.

The Old Forge Company, Moodna, N. Y., has been incorporated to manufacture paper with a capital stock of $100,000. J. B. Waykins, R. C. Kastner and V. E. Smith, of New York City, are the incorporators.

The North Tonawanda Musical Instrument Company, North Tonawanda, N. Y., has awarded the contract for the erection of a four-story addition 50 x 150 ft. to its plant at Payne and Sommers avenues and the Erie Railroad; also a building 40 x 90 ft. to be used as a boiler house, dry kiln and buffing room.

The Victor Motor Truck Company, now located at 1455 Niagara street, Buffalo, N. Y., has awarded the contract for the main building of its new plant on a four-acre site at Beaver road and the New York Central Railroad just north of the city. The building will be 60 x 270 ft. and one story, of brick and concrete construction.

The Wilson Aero Company, Buffalo, has been incorporated with a capital stock of $100,000 to manufacture aeroplanes under the patents of John A. Wilson, Jr., constructed with two motors and a device to prevent the machine from falling should either or both motors fail. The present offices of the company are at 705 D. S. Morgan Building.

The National Carbonic Gas Company, Buffalo, is building a fireproof factory at 871 Seneca street.

The West Haven Mfg. Company, manufacturer of saws and hack saws, New Haven, Conn., is having plans prepared for an addition and will make other extensive alterations to its works.

The Rhode Island Tool Company, Providence, R. I., has let contract for an addition to one of its buildings which will add a floor space of about 14,000 sq. ft.

The Abbott Ball Company, manufacturer of steel balls for burnishing metal goods by tumbling, Hartford, Conn., has purchased a site in the Elmwood district and is contemplating the erection of a new factory. Plans are now being drawn for a building 40 x 100 ft., two stories, of modern mill construction. The company is interested in literature relative to fuel oil engines and will appreciate any information that can be given on this subject.

Catalogues Wanted.

H. K. Kouyoumjian, 701 Commercial Building, Cleveland, Ohio, desires catalogues from American manufacturers of machinery.

Philadelphia

PHILADELPHIA, PA., September 4, 1911.

The volume of business transacted by local merchants and manufacturers of machinery and tools in this district in August can scarcely be called satisfactory. Considerable irregularity in the placing of orders was noted and in but few instances have gains been made over the previous month. Buying was spasmodic; a period of activity, which would have a tendency to make the trade feel that better conditions were at hand, was almost invariably followed by a period of extremely light buying. As a rule business during the first half was better than that of the last half. Builders of machinery have, in a few instances, been a little bit better off as far as work ahead is concerned, but few have made any increase in the productive rate. Several builders of special machinery doing an established export trade report that demand to have been easier in August. Little new business develops in the export of tools of the usual standard types. Business in the closing week of the month showed no improvement, orders being usually confined to single tool propositions. The railroads continue light buyers of machinery or tools, although some further locomotive and rolling stock orders have been placed. The second hand machinery market is quiet. Boilers and engines are in fair demand, but pending business closes slowly. Little change is reported in the foundry situation, in instances steel casting plants as well as gray iron foundries have a little better volume of orders on hand.

The Ferracute Machine Company, Bridgeton, N. J., reports the demand for its varied line of presses and sheet metal tools as having been somewhat lighter, as is customary at this season of the year. Several good domestic contracts have been taken, but foreign orders have declined. A material improvement in business is, however, anticipated during the next few months.

J. G. Speidel, Reading, Pa., notes a material increase in the demand for cranes of various types. That for elevators has been well sustained since early in the year and the various departments of the plant are actively engaged.

Proposals will be received by A. F. Hammond, superintendent of supplies Board of Education, City Hall, Philadelphia, for laboratory scales and balances, calipers, micrometers and other instruments and materials required for use in the annex of the Central High School, located in Germantown and Frankford. Bids will be received until September 12 and the expenditure for the equipment is limited to $20,000. A full description of the articles required may be obtained at the office of the superintendent, room 302, City Hall.

The Hilles & Jones Company, Wilmington, Del., has been booking sufficient orders, largely in the nature of single tools, to enable it to maintain an average output

THE MACHINERY MARKETS

of about 75 per cent. The demand, however, has been irregular, a comparatively good week or two being frequently followed by several weeks of comparative dullness.

The Pennsylvania Equipment Company, West End Trust Building, is in the market for a 30 to 36-in. vertical boring mill, a 5-ft. radial drill, acetylene gas cutting-off apparatus, two or three motor trucks, a 6000-gal. and an 8000-gal. steel storage tank and a second hand generator set of 300 to 400 k.w., 250-volt, direct-current, direct connected to engine. As the floor space for the latter is limited the equipment must be as compact as possible.

The Reading Crane & Hoist Company, Reading, Pa., has booked considerable business recently. Inquiries have, however, been somewhat lighter and scattered over a wide territory. Quite a good volume of business has been under negotiation for export to Mexico and South America, but orders develop rather slowly. A good volume of general orders is on hand and the company's plant is operating close to full capacity. Recent shipments include a double I-beam traveling crane to the Omaha Electric Light & Power Company, Omaha, Neb., a single I-beam traveling bridge for the United States Bureau of Standards, Washington, D. C., and two cranes each to the Brompton Pulp & Paper Company, East Angus, Quebec, and the Piermont Paper Company, Piermont, N. Y.

The Newton Machine Works, Inc., has been securing a fair amount of business in special equipment, purchased largely for replacement or for special requirements. Purchases recently have been largely of a spasmodic nature. The bulk have been principally for cold saw cutting-off machines, rotary planers and milling machines. A recent order was for a slab milling machine to take in work 8 ft. long and to swing cutters 32 in. in diameter. This is believed to be the largest sized slab milling machine ever built.

The Frick Company, Waynesboro, Pa., reports the volume of business transacted so far this year to have exceeded that for the same period last year by 10 per cent. A number of orders have recently been taken and indications point to considerable further business in the near future. Among contracts just closed is one for a 125-ton plate ice plant for the American Ice Company, Baltimore, Md., for which a double acting horizontal refrigerating machine will be furnished, a new type of machine which has been but recently placed on the market. This company is now erecting an addition to its machine shop. The building will be two stories with basement 55 x 75 ft. and of brick and steel. A number of machine tools have already been purchased for the new shop and further purchases of equipment will be made in the near future.

Baltimore

BALTIMORE, MD., September 5, 1911.

Business conditions in the iron, steel and machinery trades has been irregular, characteristic of the midsummer season. In a few instances an improvement over the previous month has been reported, but generally the demand has practically been on about an even basis. In the machine tool and machinery trade the volume of business transacted has been fair. Machinery sales have, for the most part, been small individually, although a few moderate lists, covering such tools as are used by automobile repair shops and small machine plants have been closed. Builders of special machine tools and machinery report August business as having been fair. In the power equipment lines little business of importance is reported. Boiler and tank makers find new work scarce in this immediate vicinity. Several good contracts have been closed by heating and ventilating engineers and negotiations are pending for considerable business, to be completed before cold weather sets in. A good demand continues for contractors' equipment. Municipal work of direct interest to the trade has been quiet, although proposals are being taken for a large amount of sewerage work. Irregular conditions are reported by structural material fabricators. Considerable small work with an occasional large project has developed in the South. Quite a fair amount of structural work for export has been taken by some of the local fabricators. Railroad buying is still on a very conservative basis, although there is a tendency on the part of some of the local roads to broaden out. Most of this, however, is in the way of terminal betterments. The trade generally anticipates more active conditions during the next few months. Several projects in which sellers of machinery and tools are interested are in sight and a better market is anticipated in practically all lines.

The Wilford Mfg. Company, Baltimore, has been incorporated and will engage in the sale of wood and metal working machinery, with headquarters at 202 Marine Bank Building. The incorporators are Albert Wilford, J. Spencer Clark and Frank E. Walsh, Jr.

The Baltimore & Ohio Railroad has awarded contracts for new shop buildings and other improvements at Hardman, W. Va., and Rowlesburg, W. Va., to the Roydhouse, Arey Company, Philadelphia, who will also install the heating systems in the new buildings. The new equipment required will be purchased through E. H. Bankard, purchasing agent, B. & O. Building, this city.

Bartlett, Hayward & Co. deny the report which is again being circulated that they will erect a new machine shop at Scott and McHenry streets. They report business in their general industrial department as being quiet, although the stove and furnace department is very busy preparing for the fall trade.

Wallace Stebbins & Sons report general business in August as having been quite satisfactory, an improvement over that of the previous month being noted. A large share of the orders taken have been for the smaller engines and general power equipment. A fair business is reported in general shop supplies and heating and ventilating specialties.

The Skinner Ship Building & Drydock Company will build a 40 x 45 x 10 ft. pontoon for the Baltimore & Ohio Railroad Company for use at Philadelphia. The pontoon will be equipped with electric pumping machinery, including both pump and motor, to be furnished by the railroad company.

The Atlantic Mill & Lumber Company is building a wood working factory building, storage shed and lumber yard on Dock street, East Baltimore. The main building will be 30 x 57 ft. All the buildings will be fireproof, on concrete foundations and have slag roofs. A moderate quantity of wood working machinery is to be installed, including combination, band and cross cut saws, jointers, moulders, etc., all to be electrically driven.

The Aumen Machinery & Supply Company reports business during August to have been about even with that of the previous month. Inquiries have been comparatively good although confined to small and medium, wood and metal working equipment. The bulk of the sales have been in single tools, although an occasional larger order comes out. The most extensive list closed recently was for a line of tools for a moderate size automobile repair shop. Small tools and supplies were fairly active during August and the outlook for a moderate increase in general business is considered favorable.

The Page Engineering Company, 113-121 East York street, has acquired a tract of land on Claggett street, South Baltimore, 98 x 1385 ft., extending to the water front, on which is being erected a modern machine shop. The plant will include a main building 40 x 100 ft. and a wing 32 x 38 ft. Electric lighting and steam heating will be included. In addition to the buildings, a yacht basin and marine railway will be constructed. Some new machinery will be required for installaton in the new plant, but particulars are not available at this time.

John D. Adt continues to operate all departments of the plant at full capacity. While the demand for elevators and elevating machinery has been rather quiet, that for special equipment has been more active. Several good export orders for tobacco-making machinery, one from Chile, South America, and one from England, have recently been booked and further business of that character is in sight. The demand for machine shop supplies and machine work continues active and the general business situation is quite satisfactory with this concern.

The T. C. Bashor Company has taken a number of good contracts for heating and ventilating work, including one for the heating and ventilating in connection with the high pressure plant, for the new Coco Cola Building. The heating installation in the new chapel building of the Mt. Hope Retreat, Mt. Hope, Md., will also be installed and contracts for a high pressure piping system for the new plant of the Canton Box Company and for special work for the Baltimore & Ohio Railroad at Grafton, W. Va., have also been booked. A number of special stacks, spouts, etc., will be furnished the Republican Finance Company for use

THE MACHINERY MARKETS

at the Tidewater Portland Cement Company plant at Union Bridge, Md. The demand for boilers, engines and tank work is reported as being rather light. General inquiry is reported good and a number of bids are out on work of both a general and special nature, which will be closed in the near future.

It is reported that the board of directors of the York Water Company, York, Pa., have awarded a contract for the construction of a 1,000,000,000 gal. basin, along the east branch of Codories Creek, in York and Springfield Townships, to Stamper, Royland & Co., of Richmond, Va. The cost of the work will, it is said, exceed $200,000.

Furst Concrete Scow Construction Company has been incorporated and will engage in the manufacture of plain reinforced concrete construction, also the construction of scows, barges and other vessels of concrete and concrete railroad ties. Telegraph poles and other articles will also be manufactured. The capital stock of the company is $100,000. Frank A. Furst is president; Michael T. Homer, vice-president, Joseph J. Hock, secretary, treasurer and manager.

Bids have recently been received by Swift & Co. for the erection of a three-story warehouse building at Eutaw & Camden streets. Plans, it is understood, call for the demolishing of the present building and for the installation of a moden refrigeration plant. Particulars are not yet available.

The Crown Cork & Seal Company denies the report that it will build a branch plant at Sparrow's Point. It had been currently reported that this company would build and equip a plant at that point to take care of certain branches of its business.

It is stated that Glidden & Fritz, architects, have been commissioned to prepare plans for a larger garage and warehouse to be erected for John W. Browers, on Cathedral street, near Biddle street. The proposed structure is to be three stories in height and it is reported that it is to be occupied by the Brown Taxi Company.

Chicago

CHICAGO, ILL., September 5, 1911.

The Hymen-Michaels Company, Chicago, has been incorporated with a capital stock of $2,500, to engage in manufacturing metal goods and machinery. The organizers are Henry L. Stern, Sol Salins, Jesse H. Williamson.

The Chicago Bearing Metal Company, Chicago, is investigating sites with a view to erecting branch plants at points east of Buffalo and at Kansas City or Denver.

The Illinois Smelting & Refining Company, Chicago, advises that it will add to its line the manufacture of blue vitriol and is having plans prepared for an addition to its works for this purpose.

The Illionis Valley Sand Company, Ottawa, Ill., is contemplating the rearrangement of its works to about double its present capacity.

The Weaver Mfg. Company, Springfield, Ill., manufacturer of the Weaver rolled jaw chuck, has moved into its new plant at Ninth & Cornell avenues. This company is in the market for a tool and cutter grinder, 1¼-in. turret lathe, and an 18-in. engine lathe.

The Double Blast Mfg. Company, North Chicago, Ill., has been incorporated with a capital stock of $6,000 to engage in the manufacture of soldering furnaces. The incorporators are Nathan W. Lundy, Anna C. Lundy and P. C. Regan.

The Barnard & Leas Mfg. Company, Moline, Ill., is considering the building of a new machine shop, foundry and power plant, but as yet has not decided when it will begin work. It is quite likely, however, that the machine shop will be the first new building constructed, and of course its equipment will be modern in every respect. The company manufactures special mill and elevator machinery and wood split pulleys.

The Buchanan-Lawrence Company, Joliet, Ill., has been incorporated with $200,000 capital stock by W. M. Buchanan, Edward R. Daley and Erik Dillberg, and will equip a plant for the manufacture of boots and shoes.

Lawrence Bros., Sterling, Ill., are pushing rapidly the work of erection on their new plant. New equipment for the manufacture of hardware specialties will be installed.

At Kankakee, Ill., an addition is to be built augmenting the electric light and power station. The new building will be 60 x 130 ft., and will provide room for a new capacity.

The Eclipse Gas Stove Company, Rockford, Ill., is preparing plans for a four-story addition, 70 x 80 ft.

The Illinois Welding Company, Springfield, Ill., which has been in operation for two or three months, was recently incorporated with a nominal capital stock of $2,500.

The Alton, Jacksonville & Peoria electric line, with offices at Alton, Ill., is about to erect a new power house in that city.

The Star Bit & Tool Company, Rockford, Ill., will manufacture wood-boring tools. The company will have a capital stock of $30,000 and was incorporated by August Weyburg, Henry Lind and Robt. C. Lind.

The machine shops at the Hawkins Mine of the International Harvester Company, Nashwauk, Minn., were severely damaged by fire last week. The loss is estimated at $50,000.

The Minneapolis Sash & Door Company is to erect a $90,000 six-story factory in Minneapolis, Minn. The company owns property 113 x 363 ft. and the new plant is to be the largest for the manufacture of sash and doors in Minneapolis.

The Oostburg Steel Foundry Company, Oostburg, Wis., recently decided to close down its plant indefinitely. This action has been followed by the filing of a notice of dissolution.

The R. V. Mfg. Company, Milwaukee, Wis., has been incorporated to manufacture hot water and steam radiator valves. The company was organized by George E. Page, C. A. Stone and Geo. Davelaar, with a capital stock of $10,000.

At Boone, Iowa, ground is being broken for a new electric lighting plant, the construction of which is to be completed at the earliest possible time.

The Lytle Construction Company is preparing plans for the construction of a water works system at Pierson, Iowa. This company's office is at Sioux City, Iowa.

The Central Foundry Company, Oklahoma City, Okla., is planning to spend $25,000 in completing larger quarters into which it expects to move shortly. Max K. Weigel is president of the company.

Cincinnati

CINCINNATI, OHIO, September 5, 1911.

September is ushered in with some improvement to be noted in the machine tool trade. While business is yet below normal, indications are that the fall season will not be so disappointing a period as was predicted by numbers of manufacturers some time ago. Just at the moment it appears that Southern business is leading that from other sections of the country. Buying is confined principally to the general trade, with the railroads and automobile manufacturers contributing only a comparatively small number of orders.

Power plant equipment continues on the active list and electrical machinery is also in good demand.

An educational school for printers' apprentices is a new departure for the Cincinnati Continuation School, which will be under the supervision of Dean J. H. Renshaw. It will be conducted along the same lines as the school for machinists' apprentices, the students receiving full pay for the time they are in school.

George E. Whitney, secretary Lima State Hospital, Lima, Ohio, will open bids September 15 for the following power plant equipment: Eight 200-h.p. water tube boilers, six engines ranging from 135 to 265 h.p., six generators ranging from 75 to 150 k.w., and the usual equipment of heaters, pumps and piping. Specifications may be seen at the offices of J. G. Lorimer, superintendent of construction, Lima, Ohio, and of F. L. Packard, the designing engineer, Columbus, Ohio.

The Stacey Mfg. Company, Elmwood place, Cincinnati, has made up plans for an addition to its plant that will be approximately 50 x 250 ft., of regular mill construction. Harry Hake, Cincinnati, is the designing architect. The company makes a specialty of gas tank work.

The Armor Steel Castings Company, Cincinnati, drew off its first heat in its new steel castings plant at Winton place September 1. The company will manufacture steel castings under the Gebhard patents for hardening steel which it controls.

The Kern Machine Tool Company announces that it will move its Cincinnati factory, located at Winton place, to East Hamilton, Ohio, where it has acquired

THE MACHINERY MARKETS

the building formerly occupied by the Fireproof Metal Furniture Mfg. Company. It expects to have the plant at the new location in full operation by October 1.

It is reported that the International Chemical Corporation, of New York City, has acquired a controlling interest in the Central Mfg. Company, Cincinnati, and that it will soon commence the construction of a large fertilizer plant at Lockland, a Cincinnati suburb.

On September 12 F. A. Geier, president of the National Society for the Promotion of Education; J. H. Cone, commissioner of that association; J. M. Manley, local secretary of the National Metal Trades Association, and J. H. Renshaw, dean Cincinnati Continuation School, will leave Cincinnati on invitations from Detroit, Kalamazoo and other cities to explain industrial educational ideas as carried out by several Cincinnati schools.

A report just made public by the Triumph Electric Company, Oakley-Cincinnati, shows that August of this year was the best month in the history of the company. Sales for the past six months were 15 per cent. greater than during the corresponding period of 1910, although the year 1910 showed an increase of 33 1-3 per cent. over the annual average for the previous 10 years.

The Piqua Motor Company, Piqua, Ohio, has been incorporated with $50,000 capital stock. L. H. Wessel and Edward K. Keifer are named among the incorporators. It is probable that some small machine tool equipment will be required later.

The McMaul Boiler Mfg. Company, Toledo, Ohio, contemplates erecting a boiler shop in East Toledo.

W. H. Mertens, receiver for the Eureka Foundry Company, Cincinnati, presented a very encouraging report to the creditors of that company at a meeting held September 2. Operations in August showed a good profit and September bids fair to be even better.

The Alvey-Ferguson Company is now installing machinery in its new factory at Oakley, Ohio, and expects to have the plant in operation within 30 days. Most of the equipment was brought from the company's Louisville plant, which will be abandoned.

The Lowe Brothers Company, Dayton, Ohio, manufacturer of paints and varnishes, is building a large addition to its main factory. The building is 46 x 175 ft., five stories and basement, of reinforced concrete and fireproof throughout. It will be equipped with all the latest appliances for the manufacture of paints. Part of the building will be used for testing room and laboratory.

Cleveland

CLEVELAND, OHIO, September 5, 1911.

There has been a little more activity in the local machine tool market during the week due to the placing of some small lot orders. During the previous few weeks business was almost wholly in small tools, but now there is a little more demand for medium sized tools. While dealers look on the buying as a temporary spurt, there is a feeling that with the vacation season now over, September will show some improvement in the volume of sales. Business in August was somewhat better than during July. Some of the dealers report that their sales during the past month increased about 20 per cent. over the previous month. Among the local machine tool builders conditions show little change. Makers of automatic screw machines and turret lathes report some improvement in orders. In general machinery there is a good demand for coal tipples. Some orders for good sized installations are about to be placed. The demand for light traveling cranes is quite active. Some orders are coming out for foundry equipment, the market for which has been very dull for some time. The rubber tire making industry in Akron is reported to be in a very satisfactory condition.

A new plant for the manufacture of cranes, hoists and chain is being built by D. Round & Son, Cleveland. The plant will be located at stop No. 3 on the Northern Ohio Traction line and the Pennsylvania Railroad just out of Cleveland. The building will be 50 x 250 ft., two stories, of brick and steel construction and equipped with Detroit-Fenestra steel window sash. The machinery will be electrically driven, power being furnished from the adjoining plant of the Cleveland Chain & Mfg. Company, of which Mr. Round is president. A new generator of 50 to 100 hp. will be purchased. A little later the concern will be in the market for two 200-lb. power belt hammers. Little if any other machinery equipment will be required, as the machinery in the present plant at 7625 Broadway will be moved to the new site.

The Lake Erie Nail & Supply Company, 412 Frankfort avenue, Cleveland, has taken the agency in this territory for the complete machinery line of the Hamilton Machine Tool Company, Hamilton, Ohio, and for the wood working machinery of the Advance Machine Company, Toledo, Ohio.

The Chubb Cement Mfg. Company, Huron, Ohio, has been organized with a capital stock of $10,000 to manufacture cement building blocks and drain tile. The company has secured the building formerly occupied by the electric light plant. It will purchase a 8-hp. engine, a 15-hp. boiler and cement block and tile making machinery. Benjamin J. Chubb is the manager.

The manufacturing business that has been conducted in Bucyrus, Ohio, by the Crooks-Uhle Machine Company has been incorporated and the name changed to the Crooks-Uhle Mfg. Company. The capital stock is $10,000. Officers have been elected as follows: President, F. A. Wise; vice-president, F. E. Uhle; secretary-treasurer, J. W. Miller; general manager, Earl G. Crooks. The company manufactures light steel novelties and will add additional products along the same line. Some new machinery will be installed.

The Star Drilling Machine Company, Akron, Ohio, is enlarging its plant by the erection of a new blacksmith shop and an addition to its boiler shop. The company expects to buy several steam hammers for its blacksmith shop. The boiler shop will be equipped with a 12-ton crane, which has been arranged for.

The Trumbull Public Service Company will enlarge its steam power plant at Warren, Ohio, by the erection of a boiler room, 40 x 40-ft., in which a 500-hp. boiler will be placed. It is also announced that the company will make another similar addition to its plant next spring.

The Youngstown Sash Weight & Foundry Company, Youngstown, Ohio, has been incorporated with a capital stock of $15,000 by R. A. Potts and others. The company will make sash weights and other products. A site has been secured on which a plant will be erected.

The McNaul Boiler Mfg. Company, Toledo, Ohio, will build a new plant in East Toledo, near the plant of the Republic Iron & Steel Company. The building will be 70 x 240-ft. of brick and steel construction.

It is announced that the Ohio Valley Enamel Company will build a new enameling plant at Shadyside, Ohio, near Bellaire. Business men have raised $10,000 to purchase a site.

The Burt Mfg. Company, Akron, Ohio, makers of ventilators, oil filters, etc., reports that the volume of its business so far this year is up to that for the corresponding period of last year, which was the best year in the company's history.

The Wise Furnace Company, Akron, Ohio, has decided to postpone until next spring the building of a new foundry, for which a site was secured some time ago.

F. L. PRENTISS.

Detroit

DETROIT, MICH., September 5, 1911.

Little that is new has developed in the local machinery market, the dullness noted last week being still in evidence. Dealers report that the volume of business is about 40 per cent. less than normal at the present time and current orders for machine tools of standard lines are small and scattered and are, in the main, for necessary replacements. Some activity is being noted in grinding machinery for mills and grain elevator equipment is also somewhat in demand following the recent organization of quite a number of small elevator companies throughout the State. Business for the automobile trade is scarce and no new developments are looked for in this direction in the immediate future. Building operations are beginning to show a decline, which is natural considering the volume of work which has been completed this summer.

The Motor Foundry Company has been incorporated with a capital stock of $35,000 by John H. James, Joseph A. Geyman and Arthur Webster. The new company is equipping a large building in the east end factory district for the production of iron and steel castings.

THE MACHINERY MARKETS

The Vanadium Saw Mfg. Company has been organized by Eugene W. Wilson, John G. Kramer and Thomas S. Sprague with a capital stock of $1,000,000. No manufacturing plans have been announced.

Frank J. Gorman has purchased the buildings formerly occupied by the Ford Motor Company at Brush street and Piquette avenue. It is understood that Mr. Gorman will equip a portion of the plant for the manufacture of motor cycles.

The Pabst Brewing Company, Milwaukee, Wis., is erecting a large brick mill and warehouse at its Detroit branch.

The Phoenix Engineering Company has filed notice of an increase of capital stock from $10,000 to $100,000.

The Columbus Castings Company has filed articles of incorporation giving the capital stock at $30,000. Frank Illensberger, Thomas H. Sedley and Edward L. Nelson are the principal stockholders.

The Machinery Sales Company has been organized by Fred D. Cooley, John A. Skelton and Ray C. Silver with a capital stock of $3,000 and will deal in machinery.

The Manistee Iron Works, Manistee, Mich., has decided to buy the American rights to manufacture a rotary pump recently patented in England. The capital stock of the company will be increased to $800,000 and it is understood that a goodly portion of the increase will be expended in modernizing the company's plant in preparation for the manufacture of the new pumps.

The Kellogg Corn Flakes Company, Battle Creek, Mich., has a new building under way which will double the capacity of the company's plant and will be of fireproof construction 66 x 120 ft. and five stories.

The Reo Motor Truck Company, Lansing, Mich., is making preparations for extensive improvements at its plant. The company will enlarge the present buildings and will install new and improved machinery so that all parts of the cars can be made at the local factory.

Negotiations are under way for the removal of the plant of the Kelley Chair Company, Kent City, Mich., to Hancock, Mich. W. C. Kelley is president of the company.

The large cooperage shop of the Cadillac Mfg. Company, Cadillac, Mich., was destroyed by fire this week, entailing a loss of $6,000. The shop will be rebuilt in the spring.

The city of Coldwater, Mich., has awarded the contract for the new machinery at the municipal power house to the Westinghouse Electric Mfg. Company.

The Grand River Butter Company has been organized at Ionia, Mich., by C. Romander, R. A. Hawley and others with the idea of operating a chain of creameries in that section of the State.

W. K. Kellogg, proprietor of the Corn Flakes Company, of Battle Creek, Mich., has purchased the plant of the defunct Corl Piano Company in that city and will utilize the building for the manufacture of shipping cases.

It is reported that the Manistee River Power Company will soon begin work on a large water power project on the Manistee River. Leon F. Titus and Stephen Lantner, of Traverse City, Mich., are among those interested in the company.

Farmington, Mich., has voted in favor of bonding for a water works system. An electric lighting system is now in process of installation.

The East Shore Woodenware Company, Frankfort, Mich., suffered an almost total loss of its plant by fire August 26 with a resultant damage amount to about $80,000.

The National Auto Truck Company, Bay City, Mich., will soon begin the construction of its new buildings which will include a manufacturing building, carbonizing building and testing house. Considerable equipment will be required.

The Commonwealth Power Company, of Jackson, Mich., is planning the construction of a large power house in Battle Creek, Mich., in connection with the company's Au Sable River power project, recently noted in the *Iron Age*.

The new chemical plant of the Lake Superior Iron & Chemical Company, at Manistique, Mich., is nearing completion. A considerable part of the machinery is being imported from Germany.

The Wolverine Mfg. Company, Zeeland, Mich., will increase its capital stock from $150,000 to $350,000 and greatly increase the capacity of its plant, including the equipment of a new department for the manufacture of phonographs.

It is reported that the Minneapolis, St. Paul & Sault Ste. Marie Railway will locate car shops at Gladstone, Mich.

Baraga, Mich., has bonded for $30,000 for the construction of an electric light and water works plant. Address the village clerk.

C. Y. Bennett, of St. Ignace, Mich., has purchased a large tract of timber near that city and it is understood that he will erect a saw mill in connection therewith.

Indianapolis

INDIANAPOLIS, IND., September 5, 1911.

W. J. Holliday & Co., Indianapolis, manufacturers of shafting and structural shapes, has acquired a tract of seven acres on which it proposes to erect a steel frame building to accommodate its structural steel and plate making department. The building will be equipped with electric cranes, shears, punches, etc.

The New Process Lighting & Heating Company, Laporte, Ind., has been organized with a capital stock of $50,000 and expects to build a new factory at once.

The Kelly Foundry & Machine Company, Goshen, Ind., is about to place a contract for the erection of a one-story building 75 x 155 ft.

The Lebanon Heating Company's plant at Lebanon, Ind., will be sold at receiver's sale at a date to be fixed by the court.

The Socker-Bettner Company has been incorporated at New Castle, Ind., with $10,000 capital stock by Homer H. Socker, C. F. Bettner and C. E. Socker. The company will deal in hardware.

The Granger Electrical & Mfg. Company, Warren, Ind., has been incorporated with $50,000 capital stock to manufacture electrical novelties. The directors are Francis Granger, R. L. Tobin and F. Canady.

The Auto Lighting & Electrical Company, Indianapolis, has been incorporated to manufacture vehicle lights. The directors are G. S. Montfort, C. R. Brown and F. C. Parker.

The J. B. Arpin Coal Co., Brazil, Ind., has been incorporated with $50,000 capital stock. The company has leased several acres of land a few miles west of the city and will proceed to sink a shaft for the first mine. The members of the company are Chicago and Grand Rapids capitalists and are represented by McNutt, Shattuck & Robinson, attorneys, of Brazil.

The South

LOUISVILLE, KY., September 5, 1911.

Business is opening up with the beginning of the first month of fall, and a steady flow of inquiries is reported. Hesitation on the part of buyers in closing for machinery for which they are known to be in the market is a somewhat discouraging feature of the situation, but this merely delays business and does not eliminate it. The improvement noted recently in the demand for machine tools continues to be felt, and a number of comfortable orders in this line have been booked. Louisville has just completed its municipal fiscal year and reports building during the past 12 months amounting to over $5,500,000, the largest recorded. Heavy building operations during the succeeding period are also in prospect and dealers in contractors' outfits are expecting big business from this source.

Van Vredenburgh & Co., 518 West Chestnut street, Louisville, are equipping a general machine shop and will refit pipe tools, make dies and do other machine work. Richard Van Vredenburgh is the proprietor of the shop. The equipment he has bought thus far includes a Universal tool and cutter grinder.

The Louisville Cement Company has purchased for installation at its Speed's, Ind., cement mill a complete Robbins belt conveyor having a capacity of 450 tons per hour. The conveyor will carry cement from the crushers to several large concrete storage bins which have been recently erected.

The United States Cast Iron Pipe & Foundry Company has purchased a six-ton Howe scale of special design for use in weighing pipe at its Louisville plant.

The Hillen Mfg. Company, Louisville, which recently began operations, has purchased three brass turret lathes of Warner & Swasey manufacture from E. D. Morton & Co., Louisville. The Hillen company is operating a brass foundry and manufacturing plumbers' supplies.

E. D. Morton & Co., Louisville, dealers in power

THE MACHINERY MARKETS

transmission, machine tools, etc., have taken the local agency for the Otto gas engine.

G. O. Tuck & Co., Louisville, manufacturers of tobacco, will close a deal shortly for the purchase of an automatic machine for drying leaf tobacco.

The Pioneer Coal Company, recently organized by Louisville capitalists, has begun to make purchases of machinery and supplies in connection with its coal mining operations near Barbourville, Ky., in the southeastern part of the State.

The Eagle Casting Company, Winchester, Ky., supplied a large number of ornamental iron standards used in some boulevard lighting which has recently been done in Louisville through the co-operation of merchants, lighting companies and advertising concerns.

Neville Kellner & Co., Louisville, will be awarded the contract for installing a heating plant in the addition to the Parkland school in Louisville by the Board of Education. A Hart & Krauss boiler will be used.

The city of Owensboro, Ky., has closed a contract with the Westinghouse Electric & Mfg. Company, Pittsburgh, for the installation of a steam turbine and generator in the municipal lighting plant. The cost of the equipment will be $14,500. The George F. Stocker Company, St. Louis, secured the contract for the installation of a switchboard and cooling tower.

A co-operative company is being organized at Franklin, Ky., by the farmers of Simpson county for the erection of a $40,000 elevator and flour milling plant.

The Nicholasville Water Company, Nicholasville, Ky., has filed amended articles of incorporation increasing its capital stock from $8,000 to $20,000. It is understood that considerable improvements are to be made.

The Hazard Light & Water Company, Hazard, Ky., has filed articles of incorporation, its capital stock being $25,000. The incorporators include Jesse Morgan, J. B. Hoge and T. S. Ward.

The Harris Coal Company has been incorporated at Providence, Ky., for the purpose of operating a coal mine. F. B. Harris, B. C. Harris and Thomas E. Finley are stockholders.

The Consumers' Lumber & Coal Company, Lawrenceburg, Ky., has been organized for the purpose of operating a planing mill. The mill is now being equipped.

The Paducah Water Company, Paducah, Ky., is erecting a boiler house adjoining its pumping station. Water tube boilers will be installed and a coal elevating and conveying outfit will also be required. A steel smoke stack will be erected.

Dayton, Tenn., has voted in favor of issuing $225,000 of bonds for the purpose of installing a system of water works. Euclid Waterhouse, John A. Denton and W. A. Ault are commissioners in charge of the issue.

The Great Falls Power Company is planning a hydroelectric plant on the Caney Fork River near McMinnville, Tenn. It is expected that the plant will develop 55,000 hp. The work of constructing a dam will be begun shortly, the company having completed the purchase of the necessary riparian rights.

Prices on an engine are being asked by the Riceville Gin & Warehouse Company, Riceville, Tenn.

A larger site for the water works pumping station of Clarksville, Tenn., has been purchased by the municipality and the station will be moved. It is expected that some changes in the equipment will be made in making the removal.

Ransom & Frierson, Shelbyville, Tenn., are planning the erection of a cotton gin. A power press will be among the items of equipment purchased.

It is reported by a Nashville, Tenn., industrial bureau that the Cherokee Globe Company, Gainesville, Tex., will remove its plant to Nashville and that it will be considerably enlarged.

Maryville, Tenn., will vote on a $75,000 bond issue for water works purposes on Wednesday, September 20. The issue was authorized at the last session of the State Legislature.

The Jackson Ornamental Iron & Bronze Works has been incorporated at Jackson, Tenn., for the purpose of erecting a plant costing $25,000. Steel, bronze and brass grill work for use in bank and office fixtures will be the chief output of the plant. J. C. Felsenthal has been chosen president; W. R. Sparkman, vice-president; J. J. Losier, secretary and general manager; L. J. Weis, treasurer, and W. M. Burns, superintendent. Equipment for the plant is now being purchased.

The South Pittsburg Light Company has been incorporated at South Pittsburg, Tenn., with $10,000 capital stock by W. C. Houston, A. L. Kelly and Charles Houston.

The Florence Wagon Company, Florence, Ala., has under consideration plans for removing its plant to Chattanooga, Tenn. It has a capital stock of $250,000.

The Alabama-Georgia Syrup Company, Montgomery, Ala., has decided upon the erection of a refrigerating plant for use in storing syrup. This apparently offers a new field for refrigerating machinery, as cold storage has not heretofore been regarded as essential to the handling of syrup. The company intends to expend about $25,000.

Tracy W. Pratt, Huntsville, Ala., who is endeavoring to organize a company for the establishment of a paper mill, states that the concern will build a plant costing $400,000. In view of the large amount of low-grade lumber in the form of waste from sawmills which would be available it is believed that the plant could produce paper very cheaply.

R. A. White, R. T. Dallas, A. W. Bingham and others, of Ardmore, Okla., are organizing a company with $10,000 capital stock for the manufacture of a galvanized iron egg crate.

Wm. L. Bassalo, Ensley, Ala., plans the erection of a plant for the manufacture of a patented wrench.

The Piedmont Foundry & Machine Company, Hickory, N. C., is in the market for a belt-driven stake riveter. The company specifies that it have 72-in. throat capacity for ⅝-in. hot rivets.

Ira Mowery is contemplating the erection of a plant for the manufacture of acetylene generators at Paragould, Ark. The Paragould Commercial Club has the matter in hand.

The American Net & Twine Company, Anniston, Ala., has decided upon the enlargement of its plant. The concern plans the expenditure of $150,000 in the improvements. A contract for the new building has already been let.

A peanut hulling plant will be erected at Jonesboro, Ark., by the Arkansas Peanut Growers' Association. J. M. Jones is president and R. H. Hancock secretary and treasurer of the subsidiary organization formed for the purpose of erecting the plant.

St. Louis

ST. LOUIS, MO., September 2, 1911.

Business in the machine tool line has been rather quiet with respect to actual orders placed, but the dealers report considerable in sight. In consequence they look for September to show up fairly well in comparison with the months that have preceded it. The transactions of the week have been for the most part in individual machines.

The announcement is made that the capacity of the Standard Oil Company's large refineries at Wood River, Ill., about 15 miles from St. Louis, will be practically doubled.

The Fulton Iron Works, which is building a new plant on the western edge of the city to which it will remove as soon as completed, has placed its order for the crane equipment. This will include nearly a dozen electric cranes, several of which will be of 30 tons capacity.

The new Municipal Courts building of St. Louis, which is practically completed, awaits the order of the Board of Public Improvements for the boilers and heating and lighting equipment. It is expected to be of sufficient capacity to heat, light and provide power for the building itself, the City Hall adjoining and the police headquarters and courts buildings across the street.

The St. Louis Board of Public Improvements has decided to install in the municipal testing plant a new machine capable of crushing the hardest of rock and brick for use in testing street materials.

The Huttig Sash & Door Company, which was recently burned out, has commenced the construction of a new unit plant, the first unit to cost $200,000, aside from the mechanical equipment.

The Ralston Purina Company has begun the construction of a $40,000 addition to its factory and will equip it with machinery for the increase of its product.

The Mississippi Valley Glass Company has begun the construction of a $35,000 addition to its glass manufacturing plant, and will increase its equipment.

The Byrnes Belting Company has begun the erection of its new $40,000 building to increase its production capacity.

THE MACHINERY MARKETS

G. L. Fraser, general manager of the Coalamont mine of the Columbia Coal & Coke Co., Winnipeg, Man., with mining properties in British Columbia, has been in the southern Illinois mining district inspecting the mines there previous to equipping the Coalamont plant with about $500,000 worth of machinery.

The Central Electric Light, Heat & Power Company, Gibson, Ill., has been incorporated with $100,000 capital stock by Archibald Hood, James Hood and H. L. Clarke.

The Quincy & Western Railway Company has been incorporated to build a railroad from Niota to Quincy, Ill. The incorporators are W. T. Duke, H. F. Dayton, J. P. W. Wall, W. H. Govert and S. B. Montgomery. The line will be electric.

The E. W. Ray & Son Lumber Company, St. Joseph, Mo., with a capital stock of $50,000, to manufacture lumber, has been incorporated by E. W. Ray, E. W. Ray, Jr., and Louis F. Schilling.

The Carthage Electric Company, Carthage, Ill., has been incorporated by William Matthiesen, Victor W. Olff and H. C. Hall and will equip a plant for the manufacture of electrical apparatus.

The Dorris Motor Car Company, St. Louis, has completed plans for the erection of a new plant for the manufacture of automobiles. It will be 187 x 300 ft., three stories, and will immediately adjoin the present large plant. The capacity of the company will be trebled by the addition.

Through the offices of the Business Men's League of St. Louis a plant for the finishing of cotton goods will be established here immediately, large enough to employ a force of 300 hands. A building of 45,000 sq. ft. floor area has been leased and $100,000 will be spent in equipping it. The new plant will do bleaching, dyeing, printing and finishing of all kinds of cotton goods.

The Goodenough Mining Company, with $50,000 capital stock, has been incorporated at Joplin, Mo., by C. B. Rhodes, Frank E. Weeks and Frank Nicholson. It will equip its mining property with machinery at once.

The architects are announced to be at work on the plans for the large buildings to be erected on two blocks of ground bought here for the Western branch of the Lowell Bleacheries, Lowell, Mass. The plant is expected to approximate the capacity of the home plant and will handle all the trade which can be reached economically from St. Louis.

The Automatic Register Company, East St. Louis, Ill., has had its machine tested on the Illinois Traction System. The device not only records the number of passengers who enter the car or train but the mileage traveled by each. It is stated that no attention from the passenger or conductor is required in working the device. The company has an authorized capital stock of $1,000,000. A. D. Branhan, the inventor, is president of the company; Judge William P. Launtz, first vice president and general counsel; Adolph R. Korreck, second vice president; Paul W. Abt, secretary and treasurer; Ernest Lane, general manager; Gebhard A. Buettner, superintendent.

The Western Wheel Barrow & Mfg. Company, Kansas City, Mo., will erect a new factory at Portsmith, Ark., at a cost of $25,000. Plant will be used for the manufacture of wheelbarrows and swings and for foundry purposes. New machinery will be required. J. P. Ellison is secretary and treasurer of the company.

Texas

AUSTIN, TEX., September 2, 1911.

If present plans are carried out several hundred thousand acres of raw land in the Gulf coast region of Texas will be reclaimed by means of irrigation within the next year or two. Some of these irrigation projects involve the construction of large canal systems and the installation of pumping plants which will give an enormous flow of water. The new law authorizing the creation of irrigation districts and the issuing of bonds upon the land involved is stimulating the inauguration of several projects of this character. In the lower Rio Grande valley alone one district to embrace 125,000 acres of land upon which bonds to the amount of $3,000,000 are to be issued is now proposed. The commissioners court of Chambers county sitting at Anahuac has been petitioned to order an election to vote on the proposition of creating an irrigation district to embrace about 75,000 acres of land bordering the Trinity River. The proposition is said to be generally favored by the tax payers of the proposed district.

The Southwestern Portland Cement Company will make improvements to its plant at El Paso at a cost of $12,000 in addition to the large water purification plant that it is installing.

The Chanute Window Glass Company is reported to have completed arrangements for the erection of a large glass factory at Wichita Falls.

The Rio Hondo Gin Company has been formed for the purpose of installing a cotton gin at Rio Hondo. Its capital stock is $6,000. The incorporators are F. M. Paul, Ed. H. Smith and Alba Heywood, all of San Antonio.

J. G. Warfield has promoted the organization of a company which will erect a factory at Waco for the manufacture of a stalk-cutting machine. About $100,000 will be invested in the enterprise, it is stated.

The Brice Gin Company has been formed at Clarendon, with a capital stock of $6,000. The incorporators are R. S. Kimberlain, John Grady and C. L. Benson.

The Lutcher & Moore Lumber Company will install a new 200-hp. engine and new matching machine in its planing mill at Orange. New filing and engine rooms will also be erected.

The City Council has under consideration the construction of a complete sewer system for Bay City.

The lumber mill of the Aldridge Lumber Company at Aldridge, which was recently destroyed by fire, entailing a loss of about $60,000 will be immediately rebuilt. The new mill will have a much larger capacity than the one destroyed.

The city of Terrell is erecting a new concrete power house for its water works plant.

Collier & Love are installing two large irrigation pumping plants near Hoban. They are also putting in a large plant near Barstow.

Stump Robbins, Saragosa, will install a water works plant and distributing system for that town.

The Troup Gin, Mill & Light Company has taken over the electric light plant at Troupe, and has just finished the installation of a cotton gin here. It is also operating a sawmill, box factory and novelty woodworking plant.

The window glass factory of the Texas Glass Company at Texarkana is to be nearly doubled in capacity. When the proposed enlargement is finished it will be one of the largest window glass factories in the United States, it is stated. R. M. Patterson is manager.

The Brownwood Ice & Fuel Company is rebuilding its ice plant at Brownwood, which was destroyed by fire a few weeks ago. The new plant will have a daily capacity of 70 tons.

The Business Men's Club of Waco is promoting the establishment of a large factory for the manufacture of overalls and working clothes. The factory will start with 100 machines.

H. E. Luck and associates are making good progress with their plans for the establishment of an automobile factory at Cleburne.

J. A. Huston is installing new machinery and making other improvements to his cotton gin at Malaga, N. M.

The Meerschaum Company of America contemplates establishing a factory at Deming, N. M., for the manufacture of pipes and other articles out of meerschaum. It owns a large deposit of meerschaum, situated 28 miles from Silver City, N. M. Theodore W. Osterheld is chief engineer of the company.

The copper smelter addition to the plant of the American Smelting & Refining Company at El Paso will be finished about October 1. It will cost about $400,000.

At the election held in Austin August 30 for the purpose of ratifying the contract that was entered into recently by the City Commission and William B. Johnson, of Hartford, Conn., representing the Hydraulic Properties Company, of New York, for the reconstruction of the dam across the Colorado River at this place and the installation of a hydroelectric plant comparatively few votes were cast against the proposition. The cost of the proposed works is $1,720,000. The hydroelectric plant will develop a minimum power of 7500-hp. The dam will be of reinforced concrete construction.

THE MACHINERY MARKETS

The Wilkins Trunk Mfg. Company, Dallas, is about to erect a new factory of reinforced concrete construction three stories 50 x 150 ft. The new plant will cost approximately $40,000. John F. Wilkins is vice-president.

The Texas Rolling Mill Company, Fort Worth, is about to add to its plant a fabricating department in which a car repairing equipment will be installed. To provide for these additions the capital stock of the company has been increased from $175,000 to $300,000.

The Pacific Coast

PORTLAND, ORE., August 29, 1911.

The machine tool business is rather quiet. The only transactions in the heavier class of tools consist of a few orders for single tools from widely separated points, and aside from prospects of the establishment of a few new shops there is little encouragement in the outlook. The demand for small shop equipment is keeping about on a level with the record of the last month or two, but is hardly sufficient to offset the dullness in heavier equipment.

The general market, aside from metal working tools, is in very satisfactory shape, with a fair number of large orders and a heavy volume of small business in all departments. Conditions in the interior are favorable, as the grain crop is above expectations and is expected to move rather early at fair prices. More attention is being turned to the fruit industry and the demand for pumps and irrigating machinery is steadily increasing. Wood working and logging equipment, however, continues to occupy a leading position in this market as a whole. The demand for marine gas engines, which has for years been a feature of the Columbia River and Puget Sound districts, is especially strong this summer.

A lot of new equipment, including a No. 3 and a No. 6 Austin crusher, will shortly be installed in the Moskill rock quarry near Chehalis, Wash.

The Moran Company, Seattle, Wash., has taken a contract amounting to about $50,000 for alterations to the steamer Hyades.

It is announced that the Wendling-Johnson Lumber Company, which recently acquired a mill at Acme, Ore., will rebuild the plant on a large scale.

The Security Vault & Metal Company has purchased a site in this city on which it expects to erect a factory shortly.

The Pacific Coast Dry Milk Machinery Company has been incorporated in this city with the object of manufacturing milk condensing and dairy machinery.

J. G. Lidgerwood, of the Lidgerwood Mfg. Company, New York, has been making a tour of the coast. M. H. Dickinson, coast manager, has been supervising the establishment of a branch office in San Francisco.

The Bellingham Brass Mfg. Company has been incorporated at Bellingham, Wash., with a capital stock of $50,000 by C. J. Christopher, F. B. Carrion and E. M. Wilson.

The Seattle, Wash., branch of the S. A. Woods Machine Company has moved from the White Building to 576 First avenue South, where a large store has been occupied.

The Woodcock Mfg. Company has been incorporated at Spokane, Wash., with a capital stock of $40,000 by L. H. Woodcock, Charles Borne and S. Mann for the purpose of starting a saw works.

The Alaska Marble Company is opening a quarry on Chickamin Creek, near Leavenworth, Wash., and plans to install a gang of saws in addition to the quarry outfit.

The hoisting outfit being built by the Willamette Iron & Steel Works, this city, for the Yosemite Lumber Company's plant near Merced Falls, Cal., is said to be the largest of the kind ever used in logging on the coast. It is designed to lower logging cars down a 7600-ft. incline with a maximum grade of 70 per cent.

The Loggers' & Contractors' Machinery Company, this city, has established a branch at Seattle, Wash., under the management of G. L. Davis.

The Multnomah Iron Works, this city, has issued a new catalogue of logging machinery.

The Index-Galena Lumber Company, Index, Wash., has added several Berlin machines to its plant, including an 8-in. band resaw.

The Niagara Falls Ladder Company is installing a plant for the manufacture of ladders at Hoquiam, Wash.

H. N. Woods, of Napa, Cal., is preparing to start a tub and pail factory at Klamath Falls, Ore.

Eastern Canada

TORONTO, ONT., September 2, 1911.

A comment heard on all hands is that both industrial and commercial activity are surprisingly well maintained in a time of considerable political excitement. In many quarters it is believed that if the government is sustained the present reciprocity agreement with the United States will be followed by one including manufactured articles. Canadian manufacturers are not taking any open part in the campaign, but there is no doubt that their good wishes are with the opponents of reciprocity. So far business is as good as it probably ever was at this season in Canada. It is perhaps safe to say that never before was it so good at this time of year. Yet farmers are not selling very freely of their new crop. A reason given is that some of them are looking for higher prices in the event of reciprocity being established. When the farmers do become free sellers trade will increase in volume, and unless more skilled labor comes in among the shiploads of immigrants arriving the problem of getting hands enough to man the factories and workshops will be a serious one.

Oscar Hilip and Adolph Mueller, of the H. Mueller Mfg. Company, Decatur, Ill., have been looking into the advantages of several Canadian cities and towns with the purpose of establishing branch works in this country.

Orders have been placed with the Allis-Chalmers-Bullock Company, Montreal, for six 4000-hp. steam turbines, governors and accessories for the new pulp and paper plant which the Price Bros. Company is building at Jouncaire, Que.

The Price Brothers Company, Quebec, Que., has ordered a steel penstock 29,000 ft. long and weighing more than 2000 tons from the Petroleum Iron Works Company, Sharon, Pa. All the electrical apparatus for the Price Brothers Company new pulp and paper plant at Jouncaire, Que., including two 3000-hp. generators, raising and lowering transformers, two large switchboards and accessories, will be installed by the Canadian Westinghouse Company, Hamilton.

A briquetting plant is being installed at the Mackay mine, Cape Breton, N. S.

The Electric Power Company, whose system ramifies over a large extent of eastern Ontario thickly dotted with towns, has completed important improvements at Brighton, Colborne, Cobourg, Port Hope, Oshawa, Deseronto, Bowanville, Sidney, Napanee, and is proceeding with further improvements in some of the towns mentioned and at Healy Falls, Campbellford, Peterboro and elsewhere.

The Flexible Conduit Company, Guelph, Ont., has been incorporated with a capital stock of $50,000.

An appropriation of $20,000 has been voted by the ratepayers of Middleton, N. S., for the equipment of the town's electric lighting system.

The Hahn Brass Company, New Hambourg, Ont., has installed a 50-hp. motor in its works and will hereafter run these by power from the Hydro-Electric Commission's system.

The town of Orillia, Ont., has awarded contracts for electrical equipment to the Canadian Westinghouse Company, Hamilton, Ont., the cost to be $12,250.

A by-law will be submitted to the ratepayers of Ottawa this month to authorize the purchase of electric pumping equipment.

The Sherbrooke Railway & Power Company, Sherbrooke, Que., has authorized the issue of $300,000 additional bonds in connection with the recent purchase of the Eastern Townships Electric Company, the Lennoxville Light & Power Company and the Stanstead Electric Company. It is proposed to extend the distributing systems of those concerns.

An order has been placed by the Canadian Pacific Railway Company with the Fairfield Shipbuilding Company, of Glasgow, for two steamships 570 ft. long and 68 ft. beam, 18 knots per hour, to supplement the fleet now engaged in the Pacific trade between Vancouver, Yokohama and Hong Kong. They are to be delivered early in 1913.

The Preston Car & Coach Company, Preston, Ont., has under construction a new erecting shop which is 60 x 200 ft.

The Robb Engineering Company, Amherst, N. S., and South Framingham, Mass., has received an order from the Sturgeon Lake Development Company, Toronto, for two Robb-Mumford boilers, 54 in. by 18 ft.

THE MACHINERY MARKETS

and one stack 48 in. in diameter and 80 ft. high, with smoke connection.

The Nova Scotia Car Company, Halifax, N. S., has completed the improvement of its forge department. It has 17 oil furnaces now in operation, having found crude oil to be a more economical fuel than coal. Its gray iron foundry is also in operation. Machinery for the new steel car plant has arrived and is being installed. In October the building of steel cars will be begun at the plant.

The Goodyear Tire & Rubber Company of Canada, Toronto, has received an order for 12,000 ft. of elevator belting for the equipment of 27 elevators in Saskatchewan.

The Dominion Bridge Company, Walkerville, Ont., has obtained the contract to construct a steel bridge for the Canadian Pacific Railway across the Thames at London, Ont.

The Canadian Pacific Railway Company is about to erect at Montreal a 24-stall engine house, a machine shop and a mechanical coaling plant.

The Norton Company, Chippewa, Ont., has given a contract for the extending of its factory, in which is to be installed a considerable amount of new machinery.

The Hamilton Bridge Works Company, Hamilton, Ont., is preparing plans for large new buildings to cost between $150,000 and $200,000.

W. V. Dawson & Co., Montreal, are putting up a large new factory.

Commercial Cars Ltd., Luton, Bedfordshire, England, manufacturer of auto trucks, etc., is arranging for a site in Montreal upon which to establish a large branch plant.

The MacDonald Thresher Company, Stratford, Ont., is about to enlarge its factory.

The Truro Foundry Company, Truro, N. S., is planning to build a new machine shop.

The Campbell Lumber Company, Weymouth, N. S., is arranging to build a large sawmill this autumn or next spring.

The Hamilton Bridge Company, Hamilton, Ont., has obtained the contract for constructing the new power house on the Canadian Niagara Power Company at Niagara Falls, Ont. The cost of the new building and equipment is estimated at $125,000.

The Bishop Construction Company, Toronto, has received the contract for building the plant of the Swift Canadian Company, Toronto, and also for building the Union Stock Yards Company's new structures there.

The Canadian Sunbeam Company, Toronto, has been incorporated with a capital of $200,000 to manufacture electrical machinery, generators, motors, etc.

The International Harvester Company will add to its Hamilton plant a building 100 x 400 ft., of reinforced concrete, to cost about $250,000. David Dick & Sons, Welland, Ont., have the contract for its erection.

Western Canada

WINNIPEG, MAN., September 2, 1911.

The Canadian west will be a very large absorber of equipment and machinery during the next twelvemonth. The good crop has given to many business concerns and the promoters of many undertakings warrant for proceeding with their plans. It will make the obtaining of capital much easier for these projects. In some cases the supplying of funds was made conditional upon the West having a large crop this year. A fact of which mention is called for, because it is generally too little appreciated, is the growing importance of the manufacturing industries of this section. The number of new works employing skilled labor has been very greatly increased in the part of Canada west of the Lakes in the last five years. All the principal cities in the prairie country, as well as the two at the head of the Lakes, have industrial commissioners whose chief duty it is to secure manufacturing enterprises for their cities. These are all having considerable success. Manufacturers are fully occupied at the present time.

The Vancouver Island Power Company, which is a subsidiary company of the B. C. Electric Railway Company, Vancouver, B. C., has ordered from the John McDongall Caledonian Iron Works Company, Montreal, a 6000-hp. Doble Impulse wheel and a 4000-kw. Allis-Chalmers Bullock generator. The power company is thus doubling its capacity, having put in an equipment of the same description about six months ago.

The Edmonton Portland Cement Company, Edmonton, Alberta, has awarded the contract for a 1250-kw., 3-phase, 60-cycle turbo generator set to the Allis-Chalmers-Bullock Company, Montreal; the Goldy & McCullough Company, Galt, Ont., will supply the boilers.

Frank P. Jones, manager of the Canada Cement Merger, Montreal, has been in Winnipeg in connection with the proposed construction of a $500,000 plant here. It is understood that the site has already been purchased. Quotations on from 8000 to 15,000 hp. of electrical energy have been sought from the city.

The Dominion Government has consented to assist the city of Prince Albert, Sask., in the construction of the power plant at McCaul Falls.

The Canada Foundry Company, Toronto, expects to begin on the construction of the railway bridge across the Saskatchewan River at the Pas very shortly. This bridge is for the Hudson Bay Railway the Dominion Government is building. The supply of water mains and the laying of them, to cost altogether $515,000, are undertaken by the Municipal Construction Company, Vancouver, B. C., for that city.

The Independent Harvester Company, Plano, Ill., is about to open up a factory in Brandon, Man., for the manufacture of its machines.

George White & Sons, London, Ont., are building a large warehouse at Brandon, Man., which it has fixed upon as its distribution point for the west.

The Canadian Sumner Iron Works, Vancouver, B. C., will erect a small foundry and iron plant at Burnaby, B. C.

The Prince Rupert Hydro Electric Company, Prince Rupert, B. C., has been incorporated with a capital stock of $5,000,000.

The Northoll Engineering & Construction Company, Vancouver, B. C., has been incorporated with a capital stock of $100,000.

The National Timber Company, Vancouver, B. C., has been incorporated with a capital stock of $250,000.

The Macleod Iron Works, Macleod, Alberta, have dissolved partnership, George E. Guerin withdrawing, and Floyd T. Richfield continuing the business.

A report from Fort Frances, in the Rainy River district, says that the Seine River Lumber Company, is contemplating the building of a large lumber mill near there.

The Edmonton Iron Works Company, Edmonton, Alberta, will enlarge its plant and go into the manufacture of breaking plows.

The Tacoma Match Company, Tacoma, Wash., is negotiating to erect a factory at New Westminster, British Columbia.

The Grand Trunk Pacific Railway is preparing plans for the erection of machine shops at Edson, Alberta, the first divisional point west of Edmonton.

The Alberta Pacific Elevator Company will erect a large grain elevator at Brooks, Alberta.

The rate payers of Edmonton, Alberta, have disapproved the arrangement for the granting of a municipal franchise to the International Heating & Lighting Company.

The Canadian Puget Sound Lumber Company, Victoria, B. C., will shortly start to institute several improvements which will make the plant one of the most modern on the coast. Since the recent amalgamation of the Michigan Puget Sound Lumber Company and the Michigan Pacific Lumber Company into the Canadian Puget Sound Lumber Company, with a capital stock of $5,000,000, many important improvements have been decided upon and will be carried out as the need for them arises. It was recently announced that the new company would erect a large saw mill, either at Victoria or on the mainland, but so far plans to that end have not been completed.

On September 5 the rate-payers of High River, Alberta, will vote on a by-law to raise $125,000, for the purpose of installing water works and a sewerage system.

The Savona Townsite Company, Savona, B. C., intend to immediately install a water system in the town with a daily capacity of 400,000 gal., which will provide for fire protection as well as domestic service.

Construction work has started on the new packing plant which is being erected at Moose Jaw by Gordon, Ironsides & Fares, Winnipeg. The plans call for practically eight large buildings which will cost approximately $2,000,000.

A structural iron works has been established at Barnet, B. C. The promoters are MacDonald & Godson, the latter of the firm of Robertson & Godson, Vancouver.

Current Metal Prices.

The following quotations are for small lots, New York. Wholesale prices, at which large lots only can be bought, are given elsewhere in our weekly market report

IRON AND STEEL—

Bar Iron from Store—

Refined iron:

1 to 1⅞ in. round and square	₤ lb 1.70¢
1½ to 4 in. x ⅝ to 1 in.	₤ lb 1.80¢
1½ to 4 in. x ¼ to 5 i	₤ lb 1.80¢
Rods—⅝ and 11-16 round and square	₤ lb 1.80¢
Angles:	Cts. ₤ lb.
3 in. x ¼ in. and larger	1.90¢
3 in. x 3-16 in. and ⅛ in.	2.50¢
1½ to 2½ in. x ⅜ in.	2.05¢
1½ to 2½ in. x 5-16 in. and thicker	1.95¢
1 to 1¼ in. x 3-16 in.	2.05¢
1 to 1¼ x ⅛ in.	2.10¢
⅞ x ⅛ in.	2.20¢
⅝ x ⅛ in.	2.25¢
⅝ in. x ⅛ in.	3.45¢
½ x 3-32 in.	3.90¢
Tees:	
1 in.	2.35¢
1¼ in.	2.20¢
1½ to 2½ x ¼ in.	2.00¢
1½ to 2½ x 3-16 in.	2.10¢
3 in. and larger	2.95¢
Beams	1.90¢
Channels, 3 in. and larger	1.90¢
Bands—1¼ to 6 x 6-16 to No. 8	2.10¢
Burden's "H. B. & S." iron, base price	2.95¢
"Burden's Best" iron, base price	3.15¢
Norway bars	3.60¢

Merchant Steel from Store—

	per lb
Bessemer machinery	1.90¢
Toe calk, tire and sleigh shoe	2.50@3.00¢
Best cast steel, base price in small lots	7¢

Sheets from Store—

Black	One pass C.R. soft steel	R. G. cleaned
No. 16	₤ lb 2.45¢	2.75¢
Nos. 18 to 20	₤ lb 2.50¢	2.85¢
Nos. 22 and 24	₤ lb 2.55¢	2.95¢
No. 26	₤ lb 2.60¢	3.05¢
No. 28	₤ lb 2.95¢	3.30¢

Russia, Planished &c.

Genuine Russia, according to assortment ₤ lb 12 @14½

Patent planished, W. Dewees Wood ₤ lb A. 10¢; B. 9¢ net

Galvanized

Nos. 12 and 14	₤ lb 2.75¢
No. 24	₤ lb 3.10¢
No. 26	₤ lb 3.30¢
No. 28	₤ lb 3.60¢

No 20 and lighter 36 inches wide, 25¢ higher

Genuine Iron Sheets—

Galvanized

Nos. 22 and 24	₤ lb 5.50¢
No. 26	₤ lb 6.00¢
No. 28	₤ lb 7.00¢

Corrugated Roofing—

2½ in. corrugated	Painted.	Galvd.
No. 24	₤ 100 sq. ft. $3.75	$4.70
No. 26	₤ 100 sq. ft. 2.85	3.90
No. 28	₤ 100 sq. ft. 2.50	3.65

Tin Plates—

American Charcoal Plates (per box)

"A.A.A." charcoal:

IC. 14 x 20	$6.65
IX. 14 x 20	7.90

A charcoal:

IC. 14 x 20	$5.60
IX. 14 x 20	5.70

American Coke Plates—Bessemer—

IC. 14 x 20 107 lb.	$4.50
IX. 14 x 20	5.50

American Terne Plates—

IC. 20 x 28 with an 8 lb coating	$8.70
IX. 20 x 28 with an 8 lb. coating	10.70

Seamless Brass Tubes—

List November 13, 1908. Base price, 18¢

Brass Tubes, Iron Pipe Sizes—

List November 13, 1908. Base price, 18¢

Copper Tubes—

List November 13, 1908. Base price, 21¢

Brazed Brass Tubes—

List February 1, 1911. 19½¢ ₤ lb

High Brass Rods—

List February 1, 1911. 14⅜¢ ₤ lb

Roll and Sheet Brass—

List February 1, 1911. 14⅜¢ ₤ lb

Brass Wire—

List February 1, 1911. 14⅜¢ ₤ lb

Copper Wire—

Base price, Carload lots mill 13¾¢

Copper Sheets—

Sheet copper hot rolled, 16 oz. (quantity lots) ₤ lb 17¢

Sheet copper cold rolled, 1¢ ₤ lb advance over hot rolled

Sheet copper polished 20 in. wide and under, 1¢ ₤ square foot.

Sheet copper polished over 20 in. wide, 2¢ ₤ square foot.

Planished copper, 1¢ ₤ square foot more than polished.

METALS—

Tin—

Straits pig ₤ lb 50 @51 ¢

Copper—

Lake ingot	₤ lb 14 @14¼¢
Electrolytic	₤ lb 13¾@14 ¢
Casting	₤ lb 13¾@14 ¢

Spelter—

Western ₤ lb 6¾@ 7¼¢

Zinc—

No. 9, base, casks ₤ lb 8½¢ Open ₤ lb 9¢

Lead—

American pig ₤ lb 5½@5½¢

Bar ₤ lb 6⅝@6¾¢

Solder—

½ & ½, guaranteed ₤ lb 28¼@28¾¢

No. 1 ₤ lb 26¼@26¾¢

Refined ₤ lb 24⅜@25¼¢

Prices of solder indicated by private brand vary according to composition.

Antimony—

Cookson ₤ lb. @10½¢

Hallets @10 ¢

Other brands 9@ 9½¢

Bismuth—

Per lb $2.00@$2.25

Aluminum—

No. 1 aluminum (guaranteed over 99% pure), in ingots for remelting 21¢ and 22¢

Rods and Wire Base price 31¢

Sheets Base price 33¢

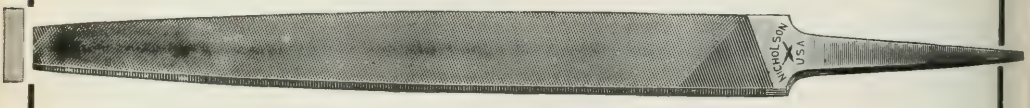
Old Metals—

Dealers' Purchasing Prices Paid in New York

	Cents.
Copper, heavy and crucible	10.75 to 11.00
Copper, heavy and wire	10.50 to 10.75
Copper, light and bottoms	9.50 to 9.75
Brass, heavy	7.25 to 7.50
Brass, light	5.75 to 6.00
Heavy machine composition	9.25 to 9.50
Clean brass turnings	7.00 to 7.25
Composition turnings	8.00 to 8.25
Lead, heavy	3.75
Lead, tea	3.50
Zinc, scrap	4.00

NICHOLSON U.S.A.

Honesty Is The Best Policy Even In a FILE



YOU WILL ALWAYS FIND THE ***NICHOLSON*** *HONEST ALL THROUGH. IT HAS WON ITS FAMOUS REPUTATION BECAUSE OF ITS KEEN, SHARP BITE AND LASTING QUALITIES*

ASK FOR CATALOG ASK FOR FILE FILOSOPHY

Nicholson File Company, Providence, R. I.

THE IRON AGE

Established 1855 | New York, September 14, 1911 | Vol. 88: No. 11

Published Every Thursday by the
DAVID WILLIAMS COMPANY
239 West 39th Street, New York

Entered at the New York Post Office as Second-Class Mail Matter.

Subscription Price, United States and Mexico, $5.00 per Annum; to Canada, $7.50 per Annum; to Other Foreign Countries, $10.00 per Annum. Unless receipt is requested, none will be sent. Credit for payment will be shown by extending the date on the wrapper of your paper.

W. H. Taylor, - - - - - President and Treasurer
I. A. Mekeel, - - - - - - First Vice-President
Harold S. Buttenheim, - - - Second Vice-President and Secretary

Geo. W. Cope, - - - - } Editors
A. I. Findley, - - - - }
W. W. Macon, - - - - }

M. C. Robbins, - - - - Manager
Charles S. Baur, - - - Assistant Manager

Branch Offices

Philadelphia, Real Estate Trust Building
Pittsburgh, Park Building
Boston, Compton Building
Chicago, Fisher Building
Cleveland, American Trust Building
Cincinnati, 807 Andrews Building

CONTENTS.

New Demand Not So Large ... 561
After Effects of Co-operation in the Steel Trade ... 562
Electrification at Lake Superior Mines ... 562
Piece-Rate Cutting ... 563
Correspondence ... 564
What Is the Matter with Business? ... 565
Trench & Co.'s Hopeful Forecast ... 565
The Iron and Metal Markets ... 566
Personal ... 577
Labor Notes ... 577
Obituary ... 577
The Steel Corporation's Unfilled Orders ... 578
A Steel Company Charges Discrimination ... 578
Further Decrease in Idle Cars ... 578
Lake Superior Iron Ore Shipments in August ... 578
American Rolling Mill Company Sheet and Pair Furnaces ... 578
Illinois Steel Screw Spikes ... 578
The Milwaukee Industrial Exposition ... 579
The Philadelphia Foundrymen's Association ... 579
The Progress of Metallurgy ... 580
The New Comptometer ... 583
The Fire Trade ... 583
Atlas Crude-Oil Engine ... 584
One Steel Corporation Investigation Ended ... 585
The Sintering of Mayari Iron Ores in Cuba ... 586
Copper Production and Stock in August ... 589
New Atlas Ore Car ... 590
Air Drill for Close Quarters ... 590
Westinghouse Air Brake Business ... 591
Text Book and Blue Print Holder ... 591
Baltimore Industrial Notes ... 592
Large Lagonda Strainers ... 592
Mechanical Equipment of the New York Central Terminal ... 593
Correction ... 593
A Toledo Metal Stamping Plant ... 594
Pittsburgh and Vicinity Business Notes ... 595
The Vilter Ammonia Compressor ... 596
The Heald Machine Company's Good Business ... 596
Motor-Driven House Pump ... 597
The Electric Lamp Trade ... 597
Duff Ball-Bearing Journal Jack ... 597
The Machinery Markets ... 598

New Demand Not So Large

Mills Still Under August Momentum

Pig Iron Stocks Less—Eastern Market Shows Most Activity

September has not yet brought such a scale of buying in iron and steel products as that of late July and early August, which made last month the banner month of the year in steel works and rolling mill operations. The August performance may have been due to one of the moderate waves in demand which, throughout 1911, have alternated with the troughs—the short periods in which the market has halted.

It is hard for the trade to be satisfied with conditions under which the most certain thing about rolling schedules is that for a given week they can only be made up when the week arrives. The uncertainty about prices is one reason for this; there is also the fact that many consumers of steel have no assurance of continuing their own present rate of operations.

As for some weeks, structural steel work is of good volume. This week the principal contracts reported are 4000 tons for the Boston & Albany bridge at Worcester, Mass.; 3500 tons for the Aeolian Building, New York; 3800 tons for the city hall at Cleveland, Ohio; 3000 tons for spillway gates and valves for Panama, and 2000 tons for the New York Central Railroad, in addition to a large number of jobs running from 200 to 1000 tons, the East leading in the activity. There is not enough business pending, however, to encourage high hopes for the winter—a fact that may explain the eagerness of large fabricating interests in going after recent contracts.

Railroad buying shows further shrinkage, with little promise of any change for the better. Rail sales are insignificant, including 2100 tons to the Pittsburgh & Lake Erie and 1800 tons to the Pennsylvania Lines West. The Canadian Government has inquired for 10,000 tons for the Hudson Bay Railway.

Continued weakness is shown in tin plates, sheets, wire products and merchant pipe; in none of the last three lines has the buying this month been up to that of August. For tin plates both months have been of the off-season period, but new business has been done at $3.60, Pittsburgh, or 10 cents below the basis of existing contracts.

In the Pittsburgh district sheet bars have been quoted recently at $2 a ton below the $22 basis at which the majority of mills have aimed. At the same time the "spread" between the prices of sheet bars and sheets is probably less than has ever been known. In Eastern Pennsylvania a tentative inquiry has appeared for a three years' billet supply of an interest using a minimum of 20,000 tons a year.

The Eastern pig iron market is more active and has a better tone than is indicated by reports from

Chicago and the Central West. Buffalo has made a number of sales for Eastern shipment and in New England, New York and New Jersey 25,000 tons of pig iron, chiefly foundry grades, is under inquiry. Buffalo and Eastern Pennsylvania producers are apparently firmer than sellers in Central territory.

Alabama pig iron stocks were reduced 10 per cent, or by 26,000 tons, in August. Eastern Pig Iron Association figures, as well as those of the Buffalo district, show slight reductions also. While the statistical position is thus tending in the seller's favor, the market for Southern iron is not so strong, and in some quarters the past week has shown more effort to get business, the $10 basis for No. 2 prompt iron at Birmingham still persisting.

The United States Steel Corporation's steel works operations this week are scheduled at 75 per cent. of capacity, which is slightly below the recent rate. The pig iron stocks of the corporation only increased 18,000 tons last week with the steel plants shut down for Labor Day. As these stocks have been for some time at a minimum, two additional blast furnaces are being blown in—one Shoenberger and one Donora, both operated by the American Steel & Wire Company. Their resumption confirms reports of large August bookings in wire products. The corporation's statement of unfilled orders on August 31, showing a gain of 112,000 tons over the total on July 31, is to be taken in connection with the heavy shipments of August and the fact that June and July made a total gain of 471,000 in the tonnage on the books. Exports have much to do with this showing, foreign business for some time having been but little short of 20 per cent. of the total.

After Effects of Co-operation in the Steel Trade

The steel trade has been so long accustomed to so-called official prices for rolled material that it finds difficulty in adjusting itself to the conditions attending an open market. Frequently the prices actually made in the past few weeks have been referred to as departures from a level which sellers are assumed to be maintaining. While any control of the market through co-operation among manufacturers has disappeared, as is well known, this continued recognition of standards from which it is to be inferred the market has at times slipped away is proof of the influence still exerted by the good understanding among manufacturers arrived at after the panic of 1907. While profits have been reduced, it is not claimed that the manufacturers of finished material have gone to the limit of their ability to sell at a profit, as has plainly been the case in the pig iron market; yet, in the midst of conditions which might be expected to bring out sharp competition, actual market transactions as reported week by week show only fractional reductions from the basis announced by the leading interest early in June.

It may be that the American Iron and Steel Institute's Committee on Improvement in Methods, which was the court of resort when one steel company felt that a competitor was not living up to the understanding, did its work so well that its influence is still strongly felt in the trade. There is no doubt, moreover, that the lines of operation of the respective companies, which have become pretty well defined in recent years, are receiving more or less recognition. One of the things claimed for the policy of co-operation was that it kept the various steel companies "within their own particular bailiwicks." This expression no doubt meant in part that there was a certain regard for territorial lines and that one steel company would not go far afield in order to take business naturally tributary to the plants of another. It may have meant also that one manufacturer would not cut prices in order to get the trade of a buyer most of whose requirements had been regularly supplied by another manufacturer. It is evident that this latter feature of the steel trade—the fact that a buyer is apt to place his orders with the company he has been in the habit of dealing with—gives continued momentum to a quasi-co-operation in this present period of open competition.

Another factor which cannot be exactly measured, but which without doubt has an influence, is that the buyers of steel are not ignoring the effect upon their own products of drastic cuts in the products of the rolling mills. The agricultural machinery trade, for example, would find an insistent demand for an important reduction in prices of implements and harvesting machinery if it were able to buy bars at a material reduction from the prices prevailing last year. Similar considerations may have prevented buyers in other lines from aggressive attempts to break the market for iron and steel products.

There should be no omission, in accounting for the absence of demoralization in the steel market, to give full weight to the amount of business flowing in upon the mills. With all that is said about the absence of railroad buying and the failure of demand to occupy our increased mill capacity, the continuous exhibition of buying power that has marked the past few months of open competition should by no means be underestimated. It may be well that the steel companies learned, under the regime of live and let live, to be content with less than full rations. It is plain, at all events, that none of them, in spite of occasional evidence of special aggressiveness, has determined on a policy likely to bring on any serious unsettling of values. Something might be said, in this connection, of the sustaining influence of the Lake Superior ore situation, but that is apart from the present purpose. What is evident, aside from all other considerations, is that the steel trade has acquired a new habit in the past four years, and is not hurrying to break away from it.

Electrification at Lake Superior Mines

Compared with the advance made elsewhere in the electrification of mining properties, there has been until lately relatively little progress among the operations on the iron and copper ranges of upper Michigan. Recent tendencies are, therefore, of considerable interest, from the fact that they indicate important developments in this direction within the next few years.

The entering wedge has usually been electric haulage underground, followed by the use of electric motors in the shaft and crusher houses, for surface tramming and on the stock piles. In this the Cleveland-Cliffs Iron Company, Ishpeming; Corrigan, McKinney & Co., Crystal Falls, and the Oliver Iron Mining Company, Iron Mountain, have been among the pioneers. Electric hoists, both for cages and skips, have naturally followed, the leaders in this respect being the Penn Iron Mining Company and the Cleveland-Cliffs Iron Company. In working out their systems, however, the methods of the two show a radical

difference; for, while the former manifests a preference for rebuilt hoists of early standard design working with heavy fly-wheels and clutches, the latter is introducing the German Ilgner system of control, in which current from the generating plant is led to the hoist motors through a fly-wheel motor generator set that balances the load. The latter plan was first tried out in the upper Peninsula, with marked success, by the Winona Copper Company, Winona, Mich., and has recently been investigated by the Cleveland-Cliffs Iron Company, whose engineer made a tour of European plants in which the system had been installed. A third distinct line of demarcation is to be found in the plans of the Calumet & Hecla Mining Company for operating the hoist motors in groups directly from steam turbine generating sets, the latter being regarded as sufficient balancers in themselves.

The companies named above have also been prominent in the trying out of motor-driven pumps for mine drainage. A notable installation is that of the Penn Iron Mining Company, at Vulcan, Mich., which consists of a concrete station at the 1,200-ft level enclosing two 8-stage turbine pumps, electrically operated, for raising water to the surface. The Cleveland-Cliffs Iron Company, on the other hand, is trying the experiment of using a piston pump, motor-driven, to operate against the unusually high head of 1,000 ft., the idea being to secure greater efficiency than is obtainable from a rotary pump.

For operating compressors of standard piston types motors are beginning to come into use, and on long lines the use of small electrically driven compressors as boosters will be quite general in future. Turbo-compressors do not seem to be as well adapted to the requirements of mining work as those of the reciprocating pattern, but if their efficiency for this service can be demonstrated there ought to be a considerable field for them here.

In the surface plants, particularly of the copper country, motors are finding wide application, being used to operate the valve gear of steam stamps, trommels, jigs, classifiers, concentrating tables, buddles, crushers, rolls, regrinding mills, water and sand pumps, elevators, conveyors, tailings wheels, repair shop machinery, etc. The Calumet & Hecla Mining Company has gone into this more extensively than any other. It is also working out very thoroughly the matter of electric control.

Electricity naturally is used very largely for lighting, also for firing blasts and for signal systems. The possibilities of electric drilling are being given considerable attention, but there appears to be a decided lack of definite information on this subject.

A start has been made toward the utilization of water power for generating electric current to be employed in mining operations. The first important plant of this kind was that constructed by the Penn Iron Mining Company in the vicinity of Republic, Mich., followed recently by another of larger capacity at Loretto which has attracted a great deal of attention. Last year the Cleveland-Cliffs Iron Company put in operation a small hydro-electric plant on the Au Train River and is constructing one of considerable size on the Carp River between Negaunee and Marquette. The greatest interest, however, is generally taken at present in the development being carried out at Twin Falls on the Menominee River by the Peninsula Power & Development Company, Iron Mountain, Mich., which will supply current as needed to the mines in that vicinity. There are at numerous points on the iron ranges opportunities for similar plants; and it is probable that in the not far distant future they will almost entirely displace steam units for regular service.

Steam engines or turbines will find a place, however, as auxiliaries to the water power plants; and some of those at present operated will be held in reserve for that purpose. Two new steam turbine units were purchased by the Cleveland-Cliffs Iron Company specifically with this end in view and are now running parallel 17 miles apart, serving the part of the company's transmission system already completed.

Piece-Rate Cutting

Few subjects are of more general interest to manufacturers than systems of wage payment, and few parts of this subject are more vitally interesting than the justice or injustice of the widely prevalent custom of piece-rate cutting as carried out in every factory in the land. There are times when the workman knows there is some justice in the cut, but there are far more times when the apparent injustice of it all strikes a bitterness into his heart which rankles there for a long time. From the ordinary workman's standpoint, cutting rates is usually considered unnecessary and is done only to increase the profits for a grasping employer. Yet it is quite possible, and, in fact, it can be shown that with the world and its people as they are to-day, that readjustment of piece prices is often necessary and is not always unjust.

In the first place, all will admit that no one can do exactly as he should wish to do because we are all subject to certain natural laws—because we are human and deal with other human beings. We daily make sacrifices for our children; we have clear days and stormy, we have sickness and health. We ought not to complain when it rains, because rain, disagreeable as it is, is necessary to our lives. We have to accept compromises in practically everything we do. Let us keep that in mind.

Admitting the unfortunate custom of piece-rate cutting to look blameworthy from the standpoint of the producer, let us imagine a case in which the management of a factory decided to try out the success of a system in which everything was on piece-work and a promise was made not to cut a single price, no matter how much money a workman made. It can be conceded that that is the way most producers would wish to have the system arranged.

The first visible effect of such a change would be to increase the total factory daily output. The increase might be as much as 25 per cent., or more, with the same working force, equipment and floor-space. This increase in productive capacity would undoubtedly be very acceptable to any manufacturer. With the workmen, however, it would not be so pleasant as would at first appear, for a condition of which little is known would immediately show up glaringly, and on the first payday following about 50 per cent. of the hands would be exceedingly unhappy. The cause of this unhappiness with one-half of the workers would be that they had been able to earn only a little more than before, whereas the other half had most of them earned half as much again, for no one will attempt to deny that some piece-prices have been

set more accurately than others; also that some workmen can do twice the number of pieces than their fellow workmen. The moment, then, that the new system takes effect all these things will show up; some will earn big wages, others will earn very little more than under the old conditions. And there is nothing to do about it, because the company has agreed to stick by the prevalent rates, which is just what it was asked to do.

The only thing left for a workman to do, then, is to seek employment in some department where he is told one can make higher wages than he can at his present work. This he tries to do, with more or less success. Now it will be seen that trouble will begin for the manufacturer. Everyone, of course, wants the best paying jobs; no one wants the hard jobs and feels imposed upon if he is asked to take one. That there always will be both hard and easy jobs will not be denied. It may be that one department in the factory has its piece-prices more correctly adjusted than the others, and after the change this department will find great trouble in getting men, as the latter will all flock to the other departments where it has been rumored that the prices are high, and where therefore a larger day's pay may be earned. What a disorganizing influence a condition like this brings about, only those who have employed help can fully understand.

Let us suppose, however, that a man is having his house painted at so much a day, and that when it was only half finished the painters all quit and went to painting his neighbor's house, because he agreed to pay them 25 cents more a day. It can be seen in this example the good effect which stability of prices has and just why a manufacturer dislikes to start anything which will upset the wage scale in his own shop. In self defense he cannot afford to do it, at any rate just at present.

But there is still another obstacle. On certain articles which he makes, of which perhaps he manufactures great quantities and on which the margin of profit is quite small, there is a great deal of competition. Each year he has to quote a lower price in order to get the business, and it is quite clear that a time will come when he must quote a price which will bring him no profit unless he reduces his cost of manufacturing. One way of doing this is to substitute automatic machinery for hand work; another is to cut the price paid for work. Evidently, if he has promised not to cut prices, he must either discontinue manufacturing, or put in automatic machinery, either of which actions will be felt by the help.

Any manufacturer must look a long way ahead and lay his plans with great caution and only after considerable study. With such obstacles opposing the straight "no cut" piece-work system he is bound to go slowly. He realizes full well the benefits, but he likewise appreciates the dangers. For example, it is clear to him that he cannot be the only one to install the system; his competitors must immediately do likewise, or he will lose to them the greater part of his business, because of his promise not to cut piece-rates. His competitors have the advantage because they have made no such agreement with the help. It is acknowledged that we can have no world's disarmament of nations until all the nations agree to it.

Realizing the evils of rate-cutting, the manufacturer has devised the "premium" system, which is really a distinct advance in the direction of better conditions for the workingman. With piece-work in which a cut follows the earning of more than a certain day's pay, the workmen saw to it that he was not punished in this way for his efficiency. With the uncertainty which exists as to the accuracy of piece prices, no factory owner dares to allow straight unlimited piecework. What he has done, however, is this: He has invented the half and half premium system, which is the same as saying, "You are capable of doing more than you do, and it has been my custom to cut you when you did it. If I was sure my prices were all right, I'd say go ahead and earn all you can. Since you can do more and want to earn more, and since I am not sure of my prices, I'll tell you what I'll do. I'll share half and half with you what you can make over your old day rate."

The world is full of apparently unjust conditions, but general conditions are far better than they once were. Yet it is found that a great many things cannot be changed all at once. This life is full of compromises.

Correspondence

Labor and Lower Prices for Commodities

To the Editor: Referring to page 504 of *The Iron Age* of September 7, I have read with interest your answer to Mr. Thornton on "Labor and Lower Prices for Commodities," and the facts you state ought certainly to be convincing. But it seems that you have omitted one argument which could be used with telling effect to explode the untenable theory that lower price widens the market and thus benefits the laborers, and I suggest this argument as follows:

If prices have to be lowered on account of reduction in the duties, the consumption of home-made products will not be increased because the importation of foreign material will keep it limited. In connection with this I beg to suggest that the following self-evident truth should not be lost sight of by the framers of the tariff. The free traders constantly repeat that lowering the duties will break up trusts. Now the largest factories of combinations of capital as, for instance, the United States Steel Corporation, are located so far inland that they are protected from competition with foreign goods by the freight from the coast. The independent companies are mostly located further east. The last named would therefore be most hurt by increased importation, and the combinations of capital would then have the field more to themselves.

The free traders keep on telling that lower prices caused by lowering of duties will make living cheaper and thus benefit the consumer. They either will not or cannot see that the vast majority of people have to work in some way or other and are thus producers as well. Each one of them generally produces one class of articles and consumes a variety of others. If now the price has to be lowered on the article he produces, his buying capacity will be restricted—in many cases so much so that he cannot buy any commodities at all, no matter how much the prices may be lowered.

The only class of people who will not get hurt by such price reductions are the fortunate ones who live off the interest on their capital and thus do not produce. That class alone gets the full benefit of lower prices on commodities. It thus seems that the free traders are working for the interests of the rich who do not need to work.

The stagnation in business caused by the fear of unpractical and experimental legislation has cost and is at present costing the country enormous amounts, and it is marvelous that none of the agitators in Congress has any feeling in that respect. The only explanation I can see is that the agitators are personally interested in the prolongation of this uncertainty. N. LILIENBERG.

PHILADELPHIA, SEPTEMBER 7, 1911.

What Is the Matter with Business?

An editorial answer to the above question was recently printed in the Sunday Call of Easton, Pa. The position taken by the editor of that paper is so refreshingly different from the attitude assumed by many of his newspaper colleagues that we feel sure that our readers will take pleasure in perusing his remarks as reproduced below:

There has grown up within the past decade a demand for an interference by the government with what is termed "big business." There are United States commissions, composed almost all of lawyers and "experts" just out of colleges, whose official duty is to tell those who have their money in an enterprise or in a big business how the same must be conducted or carried on. These learned commissioners—who pretend to be acting for the people—find it necessary, if they would hold their positions and draw their salaries, to keep themselves in the limelight. To do this they must, forsooth, keep nagging those who are doing the country's "big business" until the men who are in these "big business" enterprises have little time to attend to anything except court trials. There was a time when men who did a "big business" were considered invaluable and most desirable citizens. To-day they are not only being fined for crimes that are new in the calendar, but they are threatened with imprisonment.

Nor is the United States government alone in these prosecutions (or persecutions, have it either way), but nearly every State is making laws against the way that men have found it best to do their business, and there is another lot of commissioners drawing fine salaries for creating business disturbances.

What would you do if you kept a store and were trying to do business if an inspector came in every day to tell you what to buy and what you must pay for your goods and what to charge for what you sold? You'd be more than human if you did not tell your daily caller to get out p. d. q. or wish he were in a place that rhymes with "well." Now "big business" is not unlike "small business." There is no difference in doing business. It is all done with a view to profit or gain. Of course, sometimes—too often—it is with a loss, but that can't be helped.

The unthinking person may see a difference between the men doing a big business and those who do a smaller business. We don't. The old Knights of Labor motto was "The injury of one is the concern of all." And so it is with business. If the "big business" man is hurt—it doesn't matter in what way—it won't be long before the smaller fellow will feel it. And when there is any interference with the small dealer the first to find it out—and to his sorrow—is the bigger chap. And go along the line to the consumer—who buys of the small dealer, who buys of the big dealer. Curtail his working time or cut down his wages and you'll not need to wait long to hear some one crying "ouch" at the other end.

The people of the country are like the spokes of the wheel. Every spoke that is broken weakens the wheel. Interference with the manufacturer by any combination of men has an ill effect on the whole. Put the transportation companies to unexpected expense and they'll start out to economize—certain to start with the discharge of employees, the shortening of working days, or a failure to keep their road beds and locomotives and cars in the best condition. Thousands of railroad shop men are idle half the time. We know how it is in Easton. The companies can't spare the money to keep their workmen employed. They need the money to pay big fees to lawyers to defend them in court. No man can spend more than a hundred cents for a dollar, and no railroad company or industrial enterprise or "big business" undertaking can with the same money pay big fees for legal services and its men in its shops.

We read a great deal these days about the "conservation" of the coal fields and the forests and the water powers. But whoever thinks of the "conservation" of the business interests? The country has gone mad in its assaults on business enterprises, and now having done all that could be done to bring about the prevailing condition we wonder, in our stupidity, what's hurting us. The way the country has been led by demagogues into the financial bog verifies the statement made many years ago by an English writer that there was a larger proportion of fools in America than in any other land.

Trench & Co.'s Hopeful Forecast

The market report of C. S. Trench & Co., 81 Fulton street, New York, is always interesting, but the one issued September 5 is especially so. Following are some extracts from it:

"We see no reason, in spite of the heavy declines in Wall Street since our last report, to change our opinion regarding an improvement in business operations during the next few months. Such statistics as are available bear witness to an increase in the business operations of the country. We spoke in our last two reports of an improvement having commenced, and cited the iron, steel and metal trade as bearing witness to this fact. This week a statement has been issued by the United States Steel Corporation which must be rather surprising reading to those who, influenced by the decline in securities, may have formed the impression that the business of the country was very poor and going backward. [Extracts are then given from President Farrell's statement which was printed in *The Iron Age* of August 31.] That prices are slightly lower does not spell dullness and bad business. The iron and steel market is virtually an open market now; there are no pools, and therefore it is quite natural that in some cases prices are lower. With an unmanipulated market it is not unnatural that with increased demand, after a dull spell, the competition for the business should make in some cases lower prices. That the manufacturers of the country should feel more confident over the immediate future is easily explained from the fact that the tariff question, as far as any actual duty changes, has been put off for easily 18 months, if not two years. . . The trust question of course remains, but even on that subject we have a rest for at least three months. In other words, the developments in business have been favorable, even including the reaction in Wall Street. That reaction should have taken place two or three months ago. Perhaps it is just as well that it did not, otherwise it might have caused a mild panic, as business was then very much unsettled over tariff, trusts and crop failures. As it is now, the present decline in Wall Street prices has made no impression whatever in depressing commercial circles. This we think a very interesting feature and well worthy of being noted.

"There has, however, been one unfavorable feature interjected into the situation, and that is the labor question. It would have been extraordinary if our labor interests were not excited over the remarkable happenings of the past few weeks in England. How serious our labor question may become remains to be seen, but we are inclined to think the present fears are exaggerated, and that it will be felt more seriously next spring than this autumn. We think the outlook good for business in America over the next three months, but believe the English strike has perhaps ended the late wonderful European trade movement abroad of the past two years, and that nothing very encouraging may be expected from now on from that quarter. They have, however, had a good long innings. . . From our standpoint the September improvement is as much to be expected now as we thought a fortnight ago, because the intervening dullness was also expected."

The Pittsburgh Gage & Supply Company, Pittsburgh, states that orders during July and August were not good, but that a very satisfactory increase has been noticed this month, especially in the oil filter and oiling system departments. It has received another order from the Jones & Laughlin Steel Company for a large White Star oil filter to be installed in its Aliquippa Works. Orders for large duplex and multiplex White Star filters have also been placed by the William Tod Company, Youngstown, Ohio; Allis-Chalmers Company, Milwaukee, Wis.; Wisconsin Engine Company, Corliss, Wis.; Pocahontas Coal Company, Ware, W. Va.; Philadelphia Company, Sistersville, W. Va.; Standard Plate Glass Company, Butler, Pa., and Trinidad Electric Transmission, Railway & Gas Company, Trinidad, Colorado.

The Iron and Metal Markets

A Comparison of Prices

Advances Over the Previous Week in Heavy Type, Declines in Italics.

At date, one week, one month and one year previous.

	Sept. 13, 1911.	Sept. 6, 1911.	Aug. 9, 1911.	Sept. 14, 1910.
PIG IRON, Per Gross Ton:				
Foundry No. 2 standard, Philadelphia	$15.00	$15.00	$15.00	$16.00
Foundry No. 2, Valley furnace	13.50	13.50	13.50	13.75
Foundry No. 2 Southern, Cincinnati	*13.25*	13.50	13.50	14.25
Foundry No. 2, Birmingham, Ala.	*10.00*	10.25	10.25	11.00
Foundry No. 2, at furnace, Chicago*	14.50	14.50	14.50	16.50
Basic, delivered, east in Pa.	14.75	14.75	14.50	15.00
Basic, Valley furnace	13.00	13.00	13.00	15.75
Bessemer, Pittsburgh	15.90	15.90	15.90	15.90
Gray forge, Pittsburgh	13.90	13.90	13.90	14.15
Lake Superior charcoal, Chicago	16.50	16.50	16.50	18.50
COKE, CONNELLSVILLE, Per Net Ton, at Oven:				
Furnace coke, prompt shipment	1.50	1.50	1.40	1.60
Furnace coke, future delivery	1.60	1.60	1.65	1.75
Foundry coke, prompt shipment	1.85	1.85	1.85	2.10
Foundry coke, future delivery	2.10	2.10	2.10	2.25
BILLETS, &c., Per Gross Ton:				
Bessemer billets, Pittsburgh	21.00	21.00	21.00	24.50
Forging billets, Pittsburgh	26.00	26.00	26.00	29.00
Open hearth billets, Philadelphia	23.40	23.40	23.40	27.00
Wire rods, Pittsburgh	27.00	27.00	27.00	28.00
OLD MATERIALS, Per Gross Ton:				
Iron rails, Chicago	**14.50**	14.00	14.00	16.00
Iron rails, Philadelphia	17.00	17.00	17.50	18.00
Car wheels, Chicago	*12.75*	13.00	12.75	14.00
Car wheels, Philadelphia	*12.75*	13.00	13.00	13.75
Heavy steel scrap, Pittsburgh	*12.75*	13.00	13.25	14.50
Heavy steel scrap, Chicago	10.50	10.50	10.75	12.25
Heavy steel scrap, Philadelphia	*13.00*	13.25	13.50	13.75
FINISHED IRON AND STEEL, Per Pound:	Cents.	Cents.	Cents.	Cents.
Bessemer rails, heavy, at mill	1.25	1.25	1.25	1.25
Rerolled iron bars, Philadelphia	1.27½	1.27½	1.27½	1.40
Common iron bars, Pittsburgh	1.25	1.25	1.25	1.45
Common iron bars, Chicago	**1.22½**	1.20	1.20	1.37½
Steel bars, Pittsburgh	1.20	1.20	1.20	1.40
Steel bars, tidewater, New York	1.36	1.36	1.36	1.56
Tank plates, Pittsburgh	1.30	1.30	1.35	1.40
Tank plates, tidewater, New York	1.46	1.46	1.51	1.56
Beams, Pittsburgh	1.35	1.35	1.35	1.40
Beams, tidewater, New York	1.51	1.51	1.51	1.56
Angles, Pittsburgh	1.35	1.35	1.35	1.40
Angles, tidewater, New York	1.51	1.51	1.51	1.56
Skelp, grooved steel, Pittsburgh	1.20	1.20	1.20	1.40
Skelp, sheared steel, Pittsburgh	1.30	1.30	1.30	1.50
SHEETS, NAILS AND WIRE, Per Pound:	Cents.	Cents.	Cents.	Cents.
Sheets, black, No. 28, Pittsburgh	*1.90*	1.95	2.00	2.15
Wire nails, Pittsburgh	1.65	1.65	1.70	1.70
Cut nails, Pittsburgh†	1.60	1.60	1.60	1.65
Barb wire, galv., Pittsburgh†	*1.95*	2.00	2.00	2.00
METALS, Per Pound:	Cents.	Cents.	Cents.	Cents.
Lake copper, New York	12.75	12.75	12.75	12.87½
Electrolytic copper, New York	*12.37½*	12.50	12.62½	12.62½
Spelter, St. Louis	**5.90**	5.80	5.80	5.35
Spelter, New York	**6.05**	6.00	6.00	5.50
Lead, St. Louis	*4.40*	4.42½	4.45	4.30
Lead, New York	4.50	4.50	4.50	4.40
Tin New York	*39.75*	41.25	43.00	34.80
Antimony, Hallett, New York	7.75	7.75	7.75	7.87½
Tin plate, 100-lb. box, New York	*$3.84*	$3.94	$3.94	$3.84

* The average switching charge for delivery to foundries in the Chicago district is 50c. per ton.
† These prices are for largest lots to jobbers.

Prices of Finished Iron and Steel f.o.b. Pittsburgh

Freight rates from Pittsburgh in carloads, per 100 lb.: New York, 16c.; Philadelphia, 15c.; Boston, 18c.; Buffalo, 11c.; Cleveland, 10c.; Cincinnati, 15c.; Indianapolis, 17c.; Chicago, 18c.; St. Paul, 32c.; St. Louis, 22½c.; New Orleans, 30c.; Birmingham, Ala., 45c. Pacific coast, 80c. on plates, structural shapes and sheets, No. 11 and heavier; 85c. on sheets, Nos. 12 to 16; 95c. on sheets, No. 16 and lighter; 65c. on wrought boiler tubes.

Plates.—Tank plates, ¼ in. thick, 6¼ in. up to 100 in. wide, 1.30c. to 1.35c., base, net cash, 30 days. Following are stipulations prescribed by manufacturers, with extras:

Rectangular plates, tank steel or conforming to manufacturers' standard specifications for structural steel dated February 6, 1903, or equivalent, ¼ in. thick and over on thinnest edge, 100 in. wide and under, down to but not including 6 in. wide, are base.

Plates up to 72 in. wide, inclusive, ordered 10.2 lb. per square foot, are considered ¼-in. plates. Plates over 72 in. wide must be ordered ¼ in. thick on edge, or not less than 11 lb. per square foot, to take base price. Plates over 72 in. wide ordered less than 11 lb. per square foot down to the weight of 3-16 in take the price of 3-16-in.

Allowable overweight, whether plates are ordered to gauge or weight, to be governed by the standard specifications of the Association of American Steel Manufacturers.

Extras.	Cents per lb.
Gauges under ¼ in. to and including 3-16 in. on thinnest edge	.10
Gauges under 3-16 in. to and including No. 8	.15
Gauges under No. 8 to and including No. 9	.25
Gauges under No. 9 to and including No. 10	.30
Gauges under No. 10 to and including No. 12	.40
Sketches (including all straight taper plates) 3 ft. and over in length	.10
Complete circles, 3 ft. in diameter and over	.20
Boiler and flange steel	.10
"A. B. M. A." and ordinary firebox steel	.20
Still bottom steel	.30
Marine steel	.40
Locomotive firebox steel	.50
Widths over 100 in. up to 110 in., inclusive	.05
Widths over 100 in. up to 115 in., inclusive	.10
Widths over 115 in. up to 120 in., inclusive	.15
Widths over 120 in. up to 125 in., inclusive	.25
Widths over 125 in. up to 130 in., inclusive	.50
Widths over 130 in.	1.00
Cutting to lengths or diameters under 3 ft. to 2 ft., inclusive	.25
Cutting to lengths or diameters under 2 ft. to 1 ft., inclusive	.50
Cutting to lengths or diameters under 1 ft.	1.55

No charge for cutting rectangular plates to lengths 3 ft. and over.

Structural Material.—I-beams and channels, 3 to 15 in., inclusive, 1.35c. to 1.40c., net. Other shapes and sizes are quoted as follows:

I-beams over 15 in.	1.45 to 1.50
H-beams over 18 in.	1.50 to 1.55
Angles, 3 to 6 in., inclusive, ¼ in. and up	1.35 to 1.40
Angles over 6 in.	1.45 to 1.50
Angles, 3 in. on one or both legs, less than ¼ in. thick, plus full extras as per steel bar card Sept. 1, 1909	1.40 to 1.45
Tees, 3 in. and up	1.40 to 1.45
Zees, 3 in. and up	1.35 to 1.40
Angles, channels and tees, under 3 in., plus full extras as per steel bar card Sept. 1, 1909.	1.40 to 1.45
Deck beams and bulb angles	1.65 to 1.70
Hand rail tees	2.45
Checkered and corrugated plates	2.45

Sheets.—Makers' prices for mill shipments on sheets of U. S. standard gauge, in carload and larger lots, on which jobbers charge the usual discounts for small lots from store, are as follows:

Blue Annealed Sheets.

	Cents per lb.
Nos. 3 to 8	1.35 to 1.40
Nos. 9 and 10	1.40 to 1.50
Nos. 11 and 12	1.50 to 1.55
Nos. 13 and 14	1.55 to 1.60
Nos. 15 and 16	1.65 to 1.70

Box Annealed Sheets, Cold Rolled.

	One Pass.	Three Pass.
Nos. 10 to 12	1.60 to 1.65	.....
Nos. 13 and 14	1.65 to 1.70	.....
Nos. 15 and 16	1.70 to 1.75	1.80 to 1.85
Nos. 17 to 21	1.75 to 1.80	1.85 to 1.90
Nos. 22, 23 and 24	1.80 to 1.85	1.90 to 1.95
Nos. 25 and 26	1.85 to 1.90	1.95 to 2.00
No. 27	1.90 to 1.95	2.00 to 2.05
No. 28	1.95 to 2.00	2.05 to 2.10
No. 29	2.00 to 2.05	2.10 to 2.15
No. 30	2.10 to 2.15	2.20 to 2.25

Galvanized Sheets, of Black Sheet Gauge.

Nos. 10 and 11	1.95 to 2.00
Nos. 12, 13 and 14	2.05 to 2.10
Nos. 15, 16 and 17	2.20 to 2.25
Nos. 18 to 22	2.35 to 2.40
Nos. 23 and 24	2.45 to 2.50
Nos. 25 and 26	2.65 to 2.70
No. 27	2.80 to 2.85
No. 28	2.95 to 3.00
No. 29	3.05 to 3.10
No. 30	3.25 to 3.30

All above rates on sheets are f.o.b. Pittsburgh, terms 30 days net, or 2 per cent. cash discount in 10 days from date of invoice, as also are the following base prices per square for painted and galvanized roofing sheets, with 2½-in. corrugations:

Gauge.	Painted.	Galvanized.	Gauge.	Painted.	Galvanized.
29	....	$2.40	23	$2.40	$3.50
28	$1.40	2.25	22	2.60	3.70
27	1.55	2.60	21	2.80	4.05
26	1.65	2.65	20	3.05	4.35
25	1.85	3.05	18	4.05	5.70
24	2.10	3.15	16	4.90	6.50

Wire Rods and Wire.—Bessemer, open hearth and chain rods, $27. Fence wire, Nos. 0 to 9 per 100 lb., terms 60 days, or 2 per cent. discount in 10 days, carload lots, to jobbers, annealed, $1.50; galvanized, $1.80. Carload lots, to retailers, annealed, $1.55; galvanized, $1.80. Galvanized barb wire to jobbers, $1.95; painted, $1.65. Wire nails, to jobbers, $1.65.

THE IRON AND METAL MARKETS

The following table gives the price to retail merchants on wire in less than carloads, including the extras on Nos. 10 to 16, which are added to the base price:

Fence Wire, Per 100 lb.

No.	0 to 9	10	11	12 & 12½	13	14	15	16
Annealed	$1.65	$1.70	$1.75	$1.80	$1.90	$2.00	$2.10	$2.20
Galvanized	1.95	2.00	2.05	2.10	2.20	2.30	2.70	2.80

Market and Stone Wire in Bundles, Discount from Standing List.

Bright and Annealed:
- 9 and coarser....80
- 10 to 18....80 and 10
- 19 to 26....80 and 10 and 2½
- 27 to 36....80 and 5

Galvanized:
- 9 and coarser....75 and 10
- 10 to 16....75 and 10
- 17 to 26....72½ and 10
- 27 to 36....72½

Coppered or Liquor Finished:
- 9 and coarser....75 and 10
- 10 to 26....75 and 10
- 27 to 36....70 and 10 and 5

Tinned:
- 6 to 18....75 and 10 and 10

Wrought Pipe.—The following are the jobbers' carload discounts on the Pittsburgh basing card on wrought pipe, in effect from October 1, 1910:

	Butt Weld, Steel Black.	Butt Weld, Steel Galv.	Butt Weld, Iron Black.	Butt Weld, Iron Galv.
1 to 1½ in.	..	..	49	43
½ in.	75	63	71	59
¾ to 1½ in.	79	69	75	65
2 to 3 in.	80	70	76	66
	Lap Weld			
2 in.	76	66	72	62
2½ to 4 in.	78	67	74	64
4½ to 6 in.	77	67	73	63
7 to 12 in.	75	59	71	55
13 to 15 in.	51½	..	..	..
Butt Weld, extra strong, plain ends, card weight.				
½, ¾, 1 in.	69	59	65	55
1¼ in.	74	68	70	64
¾ to 1½ in.	78	72	74	68
2 to 3 in.	79	73	75	69
Lap Weld, extra strong, plain ends, card weight.				
2 in.	75	69	71	65
2½ to 4 in.	77	71	73	67
4½ to 6 in.	76	70	72	66
7 to 8 in.	69	59	65	55
9 to 12 in.	64	54	60	50
Butt Weld, double extra strong, plain ends, card weight.				
¼ in.	64	58	60	54
¾ to 1½ in.	67	61	63	57
2 to 3 in.	69	63	65	59
Lap Weld, double extra strong, plain ends, card weight.				
2 in.	65	59	61	55
2½ to 4 in.	67	61	63	57
4½ to 6 in.	66	60	62	56
7 to 8 in.	59	49	62	56

Plugged and Reamed.

1 to 1½, 2 to 3 in. Butt Weld
2, 2½ to 4 in. Lap Weld

} will be sold at two (2) points lower basing (higher price) than merchants' or card weight pipe. Butt or lap weld, as specified.

The above discounts are for "card weight," subject to the usual variation of 5 per cent. Prices for less than carloads are three (3) points lower basing (higher price) than the above discounts.

Boiler Tubes.—Discounts on lap welded steel boiler tubes to jobbers in carloads are as follows:

	Steel.
1¾ to 2¼ in.	65
2½ in.	67½
2¾ to 3½ in.	70
3½ to 4½ in.	72½
5 to 6 in.	65
7 to 13 in.	62½

Less than carloads to destination east of the Mississippi River will be sold at delivered discounts for carload lowered by two points for lengths 22 ft. and under; longer lengths f.o.b. Pittsburgh. Usual extras to jobbers and boiler manufacturers.

Pittsburgh

PITTSBURGH, PA., September 13, 1911.

Actual business taken by the mills so far this month has been somewhat of a disappointment and if the present light rate of new orders continues through the rest of the month it will not show up as well as August. The fact is pretty generally recognized that the iron trade at present is going through a crucial period and the outcome depends much on the action taken by manufacturers to meet conditions as they develop. On practically everything but rails the market is as wide open as it was in February two years ago, but there has not been the scramble on the part of the mills to get orders at the sacrifice of prices that was seen in February, 1909. One reason for this is that prices to-day on all iron and steel commodities are low. The whole trade is moving along cautiously, placing orders for only such material as it needs, and prices, while holding fairly well, are somewhat weak. Pig iron is very dull and so is steel. Reports are that sheet bars have been offered at about $2 a ton below what is considered the regular price, and by a mill. There have been no marked changes in prices of finished iron and steel, but there is continued weakness in sheets, tin plates, wire products and pipe. The coke market is fairly strong, but prices on iron and steel scrap are weak and lower. General conditions are far from being satisfactory, but at the same time there is a moderate amount of new business being placed, which two or three years ago would have kept the mills going to practically full capacity. It is expected that conditions will improve within the next month or two, but the immediate outlook is not any too bright.

Pig Iron.—The United Steel Company at Canton, Ohio, has closed for the purchase of 3500 tons of basic iron, 500 tons for September and 1000 tons a month for October, November and December. The iron is understood to have been sold by the Canal Dover furnace, which has a rate of 50c. a ton from Canal Dover to Canton, Ohio. The price is understood to have been about $13 at furnace. Sales are also reported of about 750 tons of malleable iron at $13.25, Valley, and 300 to 500 tons of gray forge at $13, Valley. Some inquiry is out for small lots of foundry iron for delivery over the remainder of this year, on which furnaces are quoting $13.50 at furnace. We quote as follows: Bessemer, $15; basic, $13; No. 2 foundry, $13.50; malleable Bessemer, $13.25; gray forge, $13, all at Valley furnace, the freight rate to the Pittsburgh district being 90c. a ton.

Steel.—There is little or no new inquiry for steel, but specifications against contracts for billets and sheet and tin bars are reported as coming in very nicely. More aggressiveness is being shown on the part of some steel mills to get orders and reports are that sheet bars have been offered as low as $20, delivered, which is a cut of $2 a ton from what are regarded as regular prices. We quote Bessemer and open hearth billets, 4 x 4 in. and up to but not including 10 x 10 in., $21, base; sheet and tin bars in 30-ft. lengths, $22; 1½-in. billets, $22; forging billets, $26, base, usual extras for sizes and carbons, all prices being f.o.b. Pittsburgh or Youngstown district, with freight to destination added.

Ferromanganese.—An Ohio steel interest has closed for about 4000 tons of foreign 80 per cent. ferromanganese for delivery through all of 1912 at either $36.50 or $36.75, Baltimore. This is the largest inquiry that has come in the market for some time and it brought out some low prices. We also note sales of about 400 tons of foreign 80 per cent. for delivery through the first half of 1912 at $36.90, Baltimore, the freight rate for delivery in the Pittsburgh district being $1.95 a ton. It is evident that the efforts of importers to hold to $37 have not been successful. We quote foreign 80 per cent. at $36.50 for remainder of this year and $36.75 to $37 for first half of next year.

Ferrosilicon.—There has been a very sharp advance in prices of ferrosilicon, one local dealer reporting a small sale at $58, Pittsburgh. A local interest is in the market for 300 tons of 50 per cent. for delivery in 1912, but owing to the high prices asked the business has not been closed. We quote 50 per cent. at $57 to $58, and blast furnace as follows: 10 per cent., $23; 11 per cent., $24, and 12 per cent., $25, f.o.b. cars, Ashland, Ky., and Jackson, Ohio, furnaces.

Muck Bar.—There have been no recent sales in this market and we quote best grades made from all pig iron at $28.50 to $29, Pittsburgh.

Skelp.—The market is very quiet and no new sales are reported. We quote: Grooved steel skelp, 1.20c.; sheared steel skelp, 1.30c.; grooved iron skelp, 1.45c. to 1.55c., and sheared iron skelp, 1.65c. to 1.70c., all for delivery at consumers' mills in the Pittsburgh district.

Wire Rods.—New demand for rods is dull and specifications against contracts are unsatisfactory. We continue to quote Bessemer, open hearth and chain rods at $27, Pittsburgh, but this price could no doubt be shaded if any attractive business was being offered.

Steel Rails.—The Carnegie Steel Company has sold 2100 tons of standard sections to the Pittsburgh & Lake Erie Railroad and has also taken some good sized orders for standard sections for export. This company received last week specifications and new orders for about 4000 tons of light rails. Prices on light rails are as follows: 12-lb., 1.25c.; 16, 20 and 25-lb., 1.21c. to 1.25c.; 30 and 35-lb., 1.20c., and 40 and 45-lb., 1.16c. These prices are f.o.b. at mill, plus freight, and are the minimum of the market in carload lots, small lots being sold at a little higher price. Standard sections are held at 1.25c. per lb. for Bessemer.

THE IRON AND METAL MARKETS

Plates.—No new orders for steel cars are being placed, and the whole plate market is dull. The Northern Power Company, Akron, Ohio, is in the market for 700 tons of plates for a pipe line. None of the plate mills has any great amount of work ahead, and unless some orders for steel cars or other work come up soon they will have to run at a lower gait. We quote ¼-in. and heavier plates at 1.30c. to 1.35c., Pittsburgh.

Structural Material.—New inquiries are active and a good deal of work is being given out, but most of it is in the New York and Chicago districts. The McClintic-Marshall Construction Company has taken 3000 tons of steel for the spillway gates and valves for the Isthmian Canal and 1200 tons for paper mills for the Lake Superior Paper Company, Sault Ste. Marie, Ontario. We quote beams and channels up to 15-in. at 1.35c., Pittsburgh.

Sheets.—New demand and specifications against contracts are fairly heavy, the demand having been stimulated to some extent by the concessions in prices being made by makers, which have resulted in practically an open market on sheets. These concessions, as a rule, amount to $1 to $2 a ton, and the latter seems to be bottom of the market. So far as known none of the mills will shade prices more than $2 per ton, and this is done only on very attractive orders and to the large trade. The leading sheet mills are operating to about 70 per cent. of capacity. The full schedule of prices now in effect on the different grades of sheets is printed on a previous page.

Tin Plate.—The buying season in tin plate is over and very few new orders are being placed, but a number of the leading mills, including the American Sheet & Tin Plate Company, state that specifications against contracts are coming in very freely. The leading tin plate mills report that shipments of tin plate in August were the heaviest in any one month for some time, and in the case of two or three of the largest tin plate mills were the heaviest in any one month in their history. The American Sheet & Tin Plate Company has put on five hot tin mills at its Sharon, Pa., works, but has taken off others, so that its rate of operation is about the same as heretofore. The Jones & Laughlin Steel Company is ready to start up its second unit of 12 hot tin mills at its Aliquippa works, but these will not likely be started for some little time, owing to the light demand. On new orders for tin plate the leading mills are quoting $3.60 per base box, but shipments are still going forward on contracts, based on $3.70 per box of 100 lb. We quote cokes at $3.60 to $3.70 per base box, f.o.b. Pittsburgh

Spelter.—The spelter market has recovered considerable of its lost ground in the past week, prime Western grades being quoted to-day at 5.85c., East St. Louis, equal to 5.97½c., Pittsburgh. A sale of 100 tons for September and October shipment was made about the middle of last week at 5.80c., East St. Louis. Stocks in the consumers' hands are reported light and new demand is more active at present than for some time.

Shafting.—Several local makers report that some nice specifications from the implement makers have been received in the past week, and this trade is specifying more liberally than for some time. New orders being placed are fair, but mostly for small lots. Prices on shafting continue irregular, and while the official discount on carload and larger lots is 60 per cent. off list, actual prices on carload and larger orders range from 60 and 5 per cent. to 60 and 10 per cent. off list, the latter discount being named only to the very largest trade.

Railroad Spikes.—Some fairly liberal specifications have been received by local makers in the past week from the Baltimore & Ohio and the Pittsburgh & Lake Erie railroads. The regular price of railroad spikes is $1.50 per 100 lb., base sizes, f.o.b. Pittsburgh, but on some orders recently placed $1.45 has been done.

Merchant Pipe.—A local gas interest placed an order last week for about 5 miles of 6-in. iron line pipe and another local gas interest placed 6 miles of 12-in. steel pipe and is in the market for 10 to 12 miles more of the same size. New demand for merchant pipe is fairly active, actual orders and specifications received in August being reported heavier than in the previous month. All the leading pipe mills have guaranteed prices to jobbers against decline until October 1. It is stated that discounts on both iron and steel pipe are slightly shaded in some cases, but only to the large trade. Regular discounts on iron and steel pipe are printed on a previous page.

Boiler Tubes.—Several mills report that specifications on locomotive tubes have latterly been coming in a little more freely, but the new demand for merchant tubes is very dull and only for small lots to cover actual needs. Regular discounts continue to be more or less shaded.

Bars.—Both iron and steel bars are dull and owing to the falling off in placing contracts for steel cars there has been a noticeable decrease in orders for steel bars from the car building concerns. Some mills rolling iron bars are slightly firmer in their ideas as to prices and are not willing to make concessions any longer, such as have been prevalent for some time. The steel bar mills are reported to be operating to about 75 per cent. with the exception of one leading interest which is pretty well filled up and is reported to be running its mills to nearly full capacity. We continue to quote steel bars at 1.20c. to 1.25c. and iron bars at 1.25c. to 1.30c., Pittsburgh.

Merchant Steel.—New orders are still confined to small lots to cover actual needs, and specifications against contracts so far this month have not been as active as in August. Indications are that shipments by the mills this month will show a falling off as compared with last month. Regular quotations are as follows: Iron finished tire, ¼ x ½ in. and heavier, 1.40c., base; under these sizes, 1.55c.; planished tire, 1.60c.; channel tire, 1.80c., base; toe calk, 1.90c.; flat sleigh shoe, 1.55c.; concave or convex, 1.75c.; cutter shoes, tapered or bent, 2.25c.; spring steel, 2c.; machinery steel, smooth finished, 1.90c.

Hoops and Bands.—Several makers report that specifications in the past two weeks on hoops have been coming in more freely, but bands are rather quiet. We quote steel hoops at 1.40c. and bands at 1.20c. to 1.25c. extras on the latter as per the steel bar card.

Rivets.—A fair amount of new business is being placed, but mostly in small lots to cover actual needs of consumers. Orders for structural rivets are said to be more active than for boiler rivets. We quote structural rivets at 1.70c. to 1.75c. and boiler rivets at 1.80c. to 1.85c., but these prices are shaded on desirable orders.

Wire Products.—A fair amount of new tonnage in wire nails and wire is being placed. Stocks all over the country are reported as very light and a material improvement in demand is expected as soon as fall trade opens up. We quote galvanized barb wire at $1.95 to $2, painted $1.65 to $1.70, annealed fence wire $1.45 to $1.50, galvanized $1.75 to $1.80, wire nails $1.65 and cut nails $1.60, all f.o.b. Pittsburgh, full freight added to point of delivery.

Coke.—Most blast furnaces have covered their coke requirements for the remainder of the year and are out of the market. Two Valley blast furnaces have been buying their coke from month to month for some time, and one of these interests has recently bought 18,000 tons of standard grade blast furnace coke for September shipment at $1.50 to $1.55 per net ton at oven. We also note a sale of 60 cars of high grade furnace coke for September delivery at $1.60 per net ton at oven. Several coke makers report that specifications against contracts for foundry coke have been coming in quite freely. Prices on furnace coke seem to be a little firmer for the best grades. Output of coke in the Upper and Lower Connellsville regions last week was 347,284 tons, an increase over the previous week of about 15,000 tons. We quote standard makes of furnace coke for prompt shipment at $1.50 to $1.55 and on contracts for remainder of this year at $1.65 to $1.70 per net ton at oven. We quote 72-hr. foundry coke for prompt shipment at $1.85 and up to $2, and on contracts from $2.10 and as high as $2.40, the latter price being paid for some brands of coke that have a very high reputation in the trade.

Iron and Steel Scrap.—Only a small amount of scrap is moving from dealers to consumers and the market is weak. The embargo on scrap routed to the Pittsburgh Steel Company at Monessen, Pa., has been removed and shipments are now going forward to this company, which is the largest individual user of heavy steel scrap and other grades in the Pittsburgh district. The Pennsylvania Railroad list on scrap closed last week and bids made by dealers were somewhat lower than on the previous list, the heavy steel scrap being reported as having sold at $12.75, delivered. The Baltimore & Ohio list is closing this week, and it is understood bids

THE IRON AND METAL MARKETS

of dealers on this list were lower than on the August list. We note sales of 1800 to 2000 tons of heavy steel scrap at $13, delivered to consuming point in the Pittsburgh district; also 500 tons of turnings at about $9.25, delivered; also a sale of 200 tons of low phosphorus melting scrap at $15.50, delivered. Dealers are now quoting lower prices on heavy steel scrap, cast scrap, low phosphorus melting stock and borings and turnings. Prices are as follows per gross ton f.o.b. Pittsburgh, unless otherwise noted:

Heavy steel scrap, Steubenville, Follansbee, Sharon, Monessen and Pittsburgh delivery	$12.75 to $13.00
No. 1 foundry cast	12.75 to 13.00
No. 2 foundry cast	12.25 to 13.00
Bundled sheet scrap, f.o.b. consumers' mill, Pittsburgh district	11.00 to 11.25
Rerolling rails, Newark and Cambridge, Ohio, Cumberland, Md., and Franklin, Pa.	13.50 to 13.75
No. 1 railroad malleable stock	12.75 to 13.00
Grate bars	10.75 to 11.00
Low phosphorus melting stock	15.50 to 15.75
Iron car axles	23.00 to 23.50
Steel car axles	17.50 to 18.00
Locomotive axles	23.00
No. 1 busheling scrap	12.00 to 12.25
No. 2 busheling scrap	8.50 to 8.75
Old car wheels	13.00 to 13.25
Sheet bar crop ends	15.25 to 15.50
*Cast iron borings	9.00
*Machine shop turnings	9.25
Old iron rails	15.50 to 15.75
No. 1 wrought scrap	13.50 to 14.00
Heavy steel axle turnings	10.00 to 10.25
Stove plate	10.50 to 10.75

*These prices are f.o.b. cars at consumers' mills in the Pittsburgh district.

Chicago

CHICAGO, September 12, 1911.

What was true of this market a week ago continues to prevail at this writing. Specifications are being received at a rate that shows no great falling off, but new business is noticeably lacking. The mill tonnages are being maintained only with considerable effort. Rail sales are reported as insignificant and new competition in track fastenings in this market is not expected to add strength to the situation. Contracts for fabricated steel placed during the week were in scattered tonnages and aggregated about 2700 tons. With reference to sheets, plates and steel bars conditions are much alike and concessions are the rule. Bar iron tonnage is light, but manufacturers are making a strong effort to preserve prices on a basis affording some profit. There seems to be little doubt that in wire products the buyer has been satisfied with regard to prices in connection with the placing of fall contracts. The Southern pig iron makers are showing an increasing desire for business and quotations are being made more attractive. The local market for old materials is weaker and declines in prices are noted.

Pig Iron.—The past week developed a disposition on the part of some of the Southern furnaces to encourage by slight concessions an interest on the part of melters. Immediate shipment iron is obtainable on a $10, Birmingham, basis; for delivery during the remainder of the year at $10.25 and for delivery running over into the first quarter at $10.50. While no quotations are reported as having been made thus far on first quarter iron only, indications point to $10.50 as the price for this business. A number of sales in small tonnages are reported, but the business taken was of a scattering variety and insufficient to relieve the general quiet of the market. Local conditions remain unchanged and Chicago and Milwaukee furnaces continue to quote $14.50 at the furnace. The revision of the rate from Ohio to Mississippi River points, making it $3.75 instead of $3.10 as at present, is to become effective October 1. We quote for Chicago delivery, except for local irons, which are f.o.b. furnace, the following prices on prompt shipments:

Lake Superior charcoal	$16.50 to $17.00
Northern coke foundry, No. 1	15.00 to 15.50
Northern coke foundry, No. 2	14.50 to 15.00
Northern coke foundry, No. 3	14.25 to 14.50
Northern Scotch, No. 1	16.00
Southern coke, No. 1 foundry and No. 1 soft	14.85 to 15.10
Southern coke, No. 2 foundry and No. 2 soft	14.35 to 14.60
Southern coke, No. 3	14.10 to 14.35
Southern coke, No. 4	13.85 to 14.10
Southern gray forge	13.60 to 13.85
Southern mottled	13.60 to 13.85
Malleable Bessemer	14.50 to 15.00
Standard Bessemer	17.40
Basic	15.50
Jackson Co. and Kentucky Silvery, 6 per cent	17.90
Jackson Co. and Kentucky Silvery, 8 per cent	18.90
Jackson Co. and Kentucky Silvery, 10 per cent	19.90

Rails and Track Supplies.—It is suggested that should the threatened railroad strikes in the West materialize they would throw into the general market a considerable quantity of work which otherwise the shops of the railroad would handle. At the present time a general strike seems unlikely and the railroads show no disposition to increase the volume of their purchases. Rail sales during the week are reported as too unimportant to be recorded, although it is understood a small amount of export business was obtained. The market for track bolts and spikes shows moderate specifying. It is expected that the entrance of the new factor into the local market may bring out additional weakness in track fastenings. We quote standard railroad spikes at 1.65c. to 1.75c., base; track bolts with square nuts, 2.10c. to 2.20c., base, all in carload lots, Chicago; standard section Bessemer rails, 1.28c.; open hearth, 1.34c.; light rails, 40 to 45 lb., 1.16c. to 1.20½c.; 30 to 35 lb., 1.19½c. to 1.24c.; 16, 20 and 25 lb., 1.20½c. to 1.25c.; 12 lb., 1.25c. to 1.30½c.; angle bars, 1.50c. to 1.60c., Chicago.

Structural Material.—Contracts covering fabricated steel reported during the past week included 663 tons for a conservatory and college building at St. Mary's, Ind., the general contract for which was let to the Bedford Stone & Construction Company; 406 tons for alterations in the Poole Building, let to A. Bolter's Sons, Chicago; 457 tons of structural steel for an Ohio River dam at Woodland, W. Va., awarded to the American Bridge Company; 630 tons for steel transmission towers for the Southern California Edison Company, Los Angeles, placed with the Riter-Conley Mfg. Company; 194 tons of bridge spans at Payette, Idaho, to the Minneapolis Steel & Machinery Company; 102 tons for the El Dorado County Court House, Placerville, Cal., to the Judson Mfg. Company, and 236 tons for Hegeler Bros. at Danville, Ill. The Lally Company, San Francisco, will build its warehouse building of reinforced concrete construction. Plain material continues to be the strongest of the finished lines and we quote for mill shipment, Chicago delivery, 1.53c. and from store 1.75c.

Plates.—The failure of Western steel car business to materialize in quantity has cut down the possible plate tonnage in this market to a marked extent and concessions have been offered quite generally. Prices on the basis of 1.30c., Pittsburgh, are reported. We continue to name full prices, which are for mill shipment, Chicago delivery, 1.53c., and from store, 1.75c.

Sheets.—The situation as regards sheets is not materially changed from the condition reported last week. Shading of prices is quite as common and the effort necessary to obtain sufficient orders to maintain the present rate of production quite as urgent. We continue to quote Chicago prices as follows: Carload lots, from mill: No. 28 black sheets, 2.18c.; No. 28 galvanized, 3.18c.; No. 10 blue annealed, 1.68c. Prices from store, Chicago, are: No. 10, 1.95c. to 2.05c.; No. 12, 2c. to 2.10c.; No. 28 black, 2.45c. to 2.55c.; No. 28 galvanized, 3.45c.

Bars.—New business in steel bars is very slow and specifications show a slight decrease in volume. The base price of 1.25c. is distinctly above the market, which is quite generally $1 a ton less, with some quotations reported at even lower levels. Bar iron mills have met with considerable success in maintaining their demands for better prices, and while the asking price of 1.25c., Chicago, is not always obtained, sales at less than 1.22½c. are the exception. We quote as follows, f.o.b. Chicago: Soft steel bars, 1.38c. to 1.43c.; bar iron, 1.22½c. to 1.25c.; hard steel bars, rolled from old rails, 1.20c. From store, soft steel bars, 1.70c. to 1.80c., Chicago.

Wire Products.—The fact that a considerable amount of contracting has taken place in wire products, while the leading interest reports a general satisfaction with prices, seems to indicate that purchasers are being taken care of in keeping with the general situation. Indications point to an average fall business with steady prices. Jobbers' carload prices, which are quoted to manufacturing buyers, are as follows: Plain wire, No. 9 and coarser, base, 1.68c.; wire nails, 1.88c.; painted barb wire, 1.88c.; galvanized, 2.18c.; polished staples, 1.88c.; galvanized, 2.18c., all Chicago.

Cast Iron Pipe.—The letting of 7000 tons of pipe scheduled for last week at Muskegon, Mich., was delayed and it is now expected that the award will be made during the current week. The only other municipal contract awarded was at Belle Plain, Iowa,

THE IRON AND METAL MARKETS

amounting to 400 tons. Miscellaneous business has held up well and the demand for 4-in. pipe in particular is crowding the plants. We quote as follows, per net ton, Chicago: Water pipe, 4-in., $26.50; 6 to 12-in., $24.50; 16-in. and up, $24, with $1 extra for gas pipe.

Old Material.—Prices for steel scrap are generally inclined to be soft as a result of an extremely indifferent buying sentiment. The larger melters, already in possession of large stocks, seem desirous of reducing their holdings rather than increasing them even at attractive prices. The long-continued period of low prices has taken the edge from the speculative possibilities offered by current quotations and opportunities once attractive now seem only to contribute to the general weakness. The Baltimore & Ohio Railroad is offering a list of about 8000 tons. We quote for delivery at buyers' works, Chicago and vicinity, all freight and transfer charges paid, per gross ton, as follows:

Old iron rails	$14.50 to $15.00
Old steel rails, rerolling	12.50 to 13.00
Old steel rails, less than 3 ft.	11.50 to 12.00
Relaying rails, standard sections, subject to inspection	24.00
Old car wheels	12.75 to 13.00
Heavy melting steel scrap	10.50 to 11.00
Frogs, switches and guards, cut apart	10.50 to 11.00
Shoveling steel	10.25 to 10.75
Steel axle turnings	8.50 to 9.00

The following quotations are per net ton:

Iron angles and splice bars	$12.50 to $13.00
Iron arch bars and transoms	13.50 to 14.00
Steel angle bars	10.25 to 10.75
Iron car axles	18.00 to 18.50
Steel car axles	16.00 to 16.50
No. 1 railroad wrought	10.75 to 11.25
No. 2 railroad wrought	9.75 to 10.25
Steel knuckles and couplers	10.25 to 10.75
Steel springs	10.25 to 10.75
Locomotive tires, smooth	15.00 to 15.50
Machine shop turnings	6.25 to 6.75
Cast and mixed borings	6.00 to 6.50
No. 1 busheling	8.75 to 9.25
No. 2 busheling	6.75 to 7.25
No. 1 boilers, cut to sheets and rings	7.50 to 8.00
Boiler punchings	12.00 to 12.50
No. 1 cast scrap	10.50 to 11.00
Stove plate and light cast scrap	9.00 to 9.50
Railroad malleable	10.00 to 10.50
Agricultural malleable	9.25 to 9.75
Pipes and flues	8.00 to 8.50

Philadelphia

PHILADELPHIA, PA., September 12, 1911.

A firmer tone is observed in the pig iron market. The statistical position in this territory, as noted by returns to the Eastern Pennsylvania and Virginia Pig Iron Association, show the situation to be more favorable to producers than for any previous month this year. The volume of orders taken in August shows a material increase over the previous month, while stocks on furnace banks have again declined. As far as current buying of pig iron is concerned, there has been little change. The finished material situation continues quiet. Coke shows a firmer tendency. A further softness has developed in the old material market and prices for the leading grades have been forced to a lower level.

Iron Ore.—An air of expectancy regarding some large business in Swedish ore is still noted, but nothing definite has been reported. Importations for the week ended September 9 were confined to Cuban ore, of which 4550 tons was brought in.

Pig Iron.—A somewhat better feeling prevails. Consumers in many cases are urging deliveries on contracts and the current make in this district is believed to be slightly under the consumptive rate. Several producers are falling behind somewhat in deliveries, which reason is given for the blowing in of the Topton furnace of the Empire Steel & Iron Company in the immediate future. Occasional sales of larger lots of foundry iron are reported. One New Jersey sanitary ware manufacturer has closed for 2000 tons of mixed grades, and several 500-ton lots of No. 2 X and No. 2 plain have been taken by local and nearby melters. The larger proportion of the sales have, of course, been confined to small lots for early shipments. Standard brands of No. 2 X are comparatively firm at $15 to $15.25, delivered in this immediate vicinity, and in isolated cases even $15.50, delivered, has been done. While inquiries for foundry grades have not been quite so numerous as recently, it is evident that many consumers have not covered fully for their fourth quarter needs. They are buying in small lots from time to time, however, rather than contract for large quantities. Some little inquiry for first quarter of 1912 is noted, but sellers in this district still refuse to open order books for such delivery. Cast iron pipe makers are feeling the market for low grade iron, but no definite tonnage appears to be involved. The majority of Virginia producers maintain the price of $12.50, at furnace, for deliveries up to the end of the year, although one seller is reported to be willing to accept such business at $12.25. Little movement is reported in Southern iron. The steel making grades remain quiet. There has been no inquiry reported for basic, while small lot transactions in low phosphorus iron are made at unchanged prices. The recent inquiry for forge iron for rolling mill purposes has developed into business. One lot of between 3000 and 4000 tons, for delivery over the next three months, has been sold, the reported price being $14.50, delivered, while small sales at about the same price have also been made. The following range of prices is named for standard brands, delivered in buyers' yards in this vicinity, shipment ranging from prompt to the remainder of the year:

Eastern Pennsylvania No. 2 X foundry	$15.00 to $15.25
Eastern Pennsylvania No. 2 plain	14.75 to 15.00
Virginia foundry	15.00 to 15.50
Gray forge	14.50
Basic	14.75 to 15.00
Standard low phosphorus	20.00 to 20.50

Ferroalloys.—A tentative inquiry for 900 tons of ferromanganese is reported, but sales have been confined to a few small lots. Prices are gradually working higher, $37, Baltimore, being generally named for this year's delivery. Some sellers quote $37.50 for first half and $38 for the entire year of 1912, although reports are heard that $37, Baltimore, has been shaded for Western business for the latter delivery. No transactions in 50 per cent. ferrosilicon are reported, but prices have been advanced, ranging from $58 to $59, delivered. A small lot of furnace ferrosilicon has been sold at unchanged prices, $23 to $25 per ton at furnace, with specifications within Bessemer limits as to phosphorus and sulphur, plus $3.30 freight to points in this vicinity.

Billets.—Current sales are light. Few inquiries of any size come out, although one Eastern consumer is understood to be feeling the market for a round quantity, covering requirements extending over several years. Billet makers are not particularly encouraged with the situation, and prices covering any quantity of material are uncertain. For current business, however, open-hearth rolling billets are held at $23.40, and forging billets at $28.40, delivered in this vicinity.

Plates.—A pretty fair volume of miscellaneous small orders continues to be received by Eastern makers. Specifications are comparatively well maintained, but the aggregate is scarcely sufficient to enable mills to maintain their recent productive rate. Plates for structural work appear the most active, although marine boiler and ship plates have been in fair demand. Considerable business in ship plates is in sight, but develops slowly. For the ordinary run of business quotations are firmly maintained at 1.50c., delivered here.

Structural Material.—Business in this line has been quiet. A few small buildings have been contracted for and some small bridge work for local railroads is being figured on. Contracts for the local Municipal Convention Hall, for which the McCaull Construction Company was the low bidder, have not been awarded, and a feeling exists that the scheme will not be pushed as rapidly as expected. An architect has been selected for the new Stock Exchange Building, and plans for financing this project are now under way. Prices of fabricated material appear somewhat firmer, while for plain shapes 1.50c., delivered, is maintained.

Bars.—Reports are current that the recent quotation of 1.20c. at mill for refined iron bars is being shaded, but no definite information is available. The leading mills continue to name this price, equal to 1.27½c. to 1.32½c., delivered here, in carload lots. The demand, however, is extremely quiet and the market can hardly be said to have been seriously tested. Steel bars continue rather quiet, with quotations ranging from 1.35c. to 1.40c., delivered.

Sheets.—The demand shows no improvement. Current orders are small and principally for prompt shipment, and Eastern mills are operating on an unsatisfactory basis. Eastern makers, while not fully meeting concessions of Western mills, frequently make price adjustments under sharp competition.

THE IRON AND METAL MARKETS

Coke.—The market has a slightly firmer appearance. Recent low prices for spot furnace coke are no longer available, the range now being from $1.55 to $1.65 at oven, with forward furnace coke quoted at $1.65 to $1.75. Moderate sales of foundry coke for shipments extending over the next three to six months are reported at practically unchanged prices—$2 to $2.25 at oven, according to grade. The following range of prices, per net ton, is named for deliveries in this territory:

Connellsville furnace coke	$3.80 to $4 00
Foundry coke	4.25 to 4.60
Mountain furnace coke	3.40 to 3 60
Foundry coke	3.85 to 4.20

Old Material.—The volume of business moving is extremely small. Consumers are pretty well supplied and show no interest in the market. Sales when made are of the bargain character. There has been no movement in heavy melting steel, and offers for No. 1 railroad steel are lower. Bids against railroad lists are in, but no awards have yet been announced. There is practically an entire absence of speculative buying in any grade. The following range of prices, while largely nominal, about represents the basis at which business could be done for delivery in buyers' yards, eastern Pennsylvania and nearby points, taking a freight rate from Philadelphia varying from 35c. to $1.35 per gross ton, for shipment ranging from prompt to the remainder of the year:

No. 1 railroad heavy melting steel scrap	$13.00 to $13 25
Yard heavy melting steel scrap	12 75 to 13.00
Old steel rails, rerolling (nominal)	14.00 to 14.50
Low phosphorus heavy melting steel scrap	16.75 to 17.25
Old steel axles (nominal)	19 50 to 20 00
Old iron axles (nominal)	24.50 to 25.00
Old iron rails	17.00 to 17 50
Old car wheels (nominal)	12.75 to 13.25
No. 1 railroad wrought	15 00 to 15.50
Wrought iron pipe	12 00 to 12.50
No. 1 forge fire	10.75 to 11.25
No. 2 light iron (nominal)	6.75 to 7.25
Wrought turnings	8.25 to 8.75
Cast borings	7.75 to 8.25
Machinery cast	12.75 to 13.25
Railroad malleable (nominal)	11 00 to 11 50
Grate bars, railroad	9 75 to 10 25
Stove plate	9.75 to 10.25

Cincinnati

CINCINNATI, OHIO, September 12, 1911.—*(By Telegraph.)*

Pig Iron.—The largest inquiry before the trade is one from a Michigan melter for 2000 tons of malleable, shipments to commence next month. A southern Ohio firm is asking for 500 tons of charcoal iron for movement this year. Foundry iron inquiries are limited to a few very small lots to fill immediate requirements. Sales are correspondingly light and the total business closed last week would scarcely be considered a decent sized order during a normal period. Southern prices appear to be firm around a minimum figure of $10.25, Birmingham, for delivery through the remainder of this year, but it is probable that a bona fide offer would bring out concessions from several producers. Northern iron is unchanged at $13, Ironton, with a number of furnaces asking $13.50, and one sale of 250 tons of No. 2 foundry was made on a basis of $13.25 for last quarter delivery. Malleable is quoted at $13.25 at furnace and a few medium-sized lots have changed hands in the past few days. Consumers are practically taking no interest in any delivery beyond December, apparently believing that present low prices will prevail for first quarter business. No additional dormant furnaces in the Ironton district are preparing to blow in, and nothing but a healthy, firm advance in prices would induce their owners to consider resuming operations. Based on freight rates of $3.25 from Birmingham and $1.20 from Ironton, we quote, f.o.b. Cincinnati, as follows, for prompt shipment:

Southern coke, No. 1 foundry and 1 soft	$14 00 to $14 25
Southern coke, No. 2 foundry and 2 soft	13.25 to 13.75
Southern coke, No. 3 foundry	12 75 to 13 25
Southern coke, No. 4 foundry	12 50 to 13 00
Southern gray forge	12.50 to 13 00
Ohio Silvery, 8 per cent. silicon	16.95 to 17.20
Lake Superior coke, No. 1	14.70 to 14.95
Lake Superior coke, No. 2	14.20 to 14.45
Lake Superior coke, No. 3	13.70 to 13.95
Basic, Northern	14.20 to 14.45
Standard Southern car wheel	25.50 to 25.75
Lake Superior car wheel	19.00

(By Mail.)

Coke.—The foundries have generally contracted for enough coke to run them through the remainder of the year, and quite a number have enough bought to cover their requirements until July, 1912. There are no indications of any awakening in the furnace trade, and it is almost a certainty that the coke business will be extremely dull until at least January 1. For domestic use small lots are being sold, but even this particular demand is not up to normal. Prices are unchanged, with 48-hr. coke obtainable in the Connellsville field around $1.50 to $1.65 per net ton at oven, with a premium of about 10c. to 20c. asked for Wise County and Pocahontas standard grades. The regular quotations on foundry coke range from $2 to $2.30 at oven, but it is quite possible that the lower figure could be shaded on prompt shipment business.

Finished Material.—Steel bars show considerable improvement, and in this territory no lower price than 1.20c., Pittsburgh, is being done, with local warehouse prices ranging from 1.65c. to 1.70c. Structural material is moving fairly well and is quotable around 1.75c. to 1.80c. in local warehouses.

Old Material.—There has been no change for the better, and, with the possible exception of No. 1 cast scrap, all grades are in very poor demand. While dealers are hopeful for better conditions, there is nothing in the present situation to warrant any immediate change. The approximate prices paid by buyers delivered in their yards, southern Ohio and Cincinnati, are as follows:

No. 1 railroad wrought, net ton	$10.25 to $10.75
Casting borings, net ton	4 50 to 5.00
Steel turnings, net ton	5 50 to 6.00
No. 1 cast scrap, net ton	9.25 to 9.75
Burnt scrap, net ton	6.25 to 6.75
Old iron axles, net ton	16.25 to 16.75
Bundled sheet scrap, gross ton	7.25 to 8.25
Old iron rails, gross ton	13.25 to 13.75
Relaying rails, 50 lb. and up, gross ton	20.75 to 21.50
Old car wheels, gross ton	10.00 to 10 50
Heavy melting sheet scrap, gross ton	9.75 to 10.25

Cleveland

CLEVELAND, OHIO, September 12, 1911.

Iron Ore.—Sellers regard the prospects for a fair volume of business during the early part of next year as much more favorable than they were for sales in the corresponding period of this year. The heavy buying in the early part of last year, which was followed later by a falling off in the demand for iron and steel and the heavy reduction in the expected consumption of ore, resulted in the carrying over of large stocks of ore. Because of having overbought, some furnace interests have this year purchased no ore or a very limited tonnage. Ore men believe that surplus stocks will be light by the opening of navigation next year, and that the demand will then be considerably better than it was early this season, even if conditions in the iron and steel trade show no further improvement by that time. The only sale reported for the week is a small lot of non-Bessemer ore. We quote prices as follows: Old range Bessemer, $4.50; Mesaba Bessemer, $4.25; old range non-Bessemer, $3.70; Mesaba non-Bessemer, $3.50.

Pig Iron.—The United States Steel Company, Canton, Ohio, has purchased 3500 tons of basic iron from a nearby furnace having a freight rate of 50c. The price is said to have been above $13.50, delivered. Another furnace that recently made sales at $12.65, Valley furnace, and having a 90c. freight rate, is understood to have bid $13, at furnace. The foundry iron market in this territory is exceedingly dull. Sales are confined to a few small lots. Two local inquiries for 1000 tons each, noted last week, failed to result in much business. One for the first half was withdrawn, the consumer declining to pay 50c. a ton advance over current prices that was asked by the furnaces. The foundry that had an inquiry out for 1000 tons for the last quarter decided to defer buying any large tonnage and placed an order for only a very limited amount. Foundries that are not covered by contracts are generally buying small lots as needed. One merchant furnace in the Valley, the stock pile of which is becoming quite low, may be blown in before the end of the month. There is no change in prices. For Cleveland delivery we quote as follows for prompt shipment and for the last quarter:

Bessemer	$15.90
Basic	$13.75 to 14.00
Northern foundry No. 2	13.75 to 14.00
Gray forge	13 00 to 13.25
Southern foundry No. 2	14.60 to 14.85
Jackson Co. silvery, 8 per cent. silicon	17.55

THE IRON AND METAL MARKETS

Coke.—The market is dull. There is no demand for furnace grades. There is one inquiry for foundry coke for a year's requirements. The only sales reported are in small lots. We quote standard Connellsville furnace coke at $1.50 to $1.55, per net ton, at oven, for spot shipment, and $1.60 to $1.65 for contract. Connellsville 72-hr. foundry coke is held at $1.85 to $1.95 for prompt shipment and $2 to $2.40 for contract.

Finished Iron and Steel.—Mills are getting a fair volume of business, the improvement noted during August being maintained. Orders are quite plentiful but they are nearly all for small tonnages. The structural market continues the most active. Local fabricators are figuring on more small work than for some time. The contract for the steel for the new city hall building, Cleveland, 3300 tons, has been awarded to the Republic Structural Iron Works, Cleveland, the low bid of that company amounting to about $38.50 per ton, delivered. About 700 additional tons will be required later. For the work let Bethlehem sections are specified for about 65 per cent. of the tonnage. The remainder has been divided between other mills. Bids are being received for 400 tons of steel for the Cleveland Press Building. Considerable tonnage will be required for a new building to be erected by the News-Bee, Toledo, Ohio, for which plans are expected out shortly. The outlook in the lake shipbuilding industry shows some improvement. The Great Lakes Engineering Works, Detroit, has closed a contract for a package freight steamer for the Eastern trade and the Standard Oil Company has received bids for a steamer for the oil trade. Other boats are being figured on to go to the coast for special trades. There is practically no change in the price situation. Steel bars are firm at 1.20c., Pittsburgh. Tank plates are well established at 1.30c., but this price is not so general on boiler steel. Structural material is firm at 1.35c., Pittsburgh. Sheets are generally quoted at 1.90c., Pittsburgh, for No. 28 black, 2.90c. for No. 28 galvanized and 1.45c. to 1.50c. for No. 10 blue annealed. The demand is rather light. There is a fair demand for billets in carload lots. The demand for iron bars has improved slightly, but prices are weaker, being shaded to meet the competition of Western mills. We quote iron bars at 1.20c. to 1.25c., Cleveland.

Old Material.—The market is very dull and prices are weak, although most quotations are unchanged. Mills are not taking scrap freely and are buying very little. One local steel plant is out of the market and another is buying only such material as is offered at very attractive prices. Yard dealers are awaiting a firmer market and are declining to offer stocks at current prices. Turnings are particularly weak, there being no demand for this grade. The Pennsylvania Railroad received bids September 12 on a large tonnage. Dealers' prices per gross ton, f.o.b. Cleveland, are as follows:

Old steel rails, rerolling	$12.50 to $12.75
Old iron rails	14.50 to 15.00
Steel car axles	17.50 to 18.00
Heavy melting steel	11.50 to 11.75
Old car wheels	11.50 to 12.00
Relaying rails, 50 lb. and over	22.50 to 23.50
Agricultural malleable	10.75 to 11.25
Railroad malleable	12.00 to 12.50
Light bundled sheet scrap	9.50 to 10.00

The following prices are per net ton, f.o.b. Cleveland:

Iron car axles	$18.75 to $19.25
Cast borings	6.50 to 6.75
Iron and steel turnings and drillings	7.00 to 7.25
Steel axle turnings	8.00 to 8.50
No. 1 busheling	9.50 to 10.00
No. 1 railroad wrought	11.75 to 12.00
No. 1 cast	11.25 to 11.75
Stove plate	9.50 to 10.00
Bundled tin scrap	11.00 to 11.50

St. Louis

ST. LOUIS, MO., September 11, 1911.

The iron, steel and coke markets here all seem to show the same characteristics—a hand to mouth business with an aggregate which is quite satisfactory, all things considered, as compared with any part of the present year at least. No large new business is reported in any direction, but all the orders, whether on specifications or in new business, are for immediate delivery, showing that the materials are wanted for current use. There is no future buying.

Pig Iron.—The sales of the week, in new business, include a number of single carload lots, and one or two orders for 100 tons each. Inquiries are received for 350 tons and 100 tons which will be closed in a few days. A good taking on contracts is reported. The price remains steady on the basis of $10.50 to $11, Birmingham, for No. 2 Southern, and $13 to $13.50, Ironton, for No. 2 Northern. Basic, malleable, etc., are absolutely lifeless.

Coke.—A contract for 5000 tons of Stonega best 72-hr. selected coke, at the market, for delivery over the next six months, was the only evidence of activity in this market developed during the week. Takings on contracts continue up to the mark, and there are no reports of consequence of consumers falling behind in their requisitions. All orders are for the quickest possible shipment, indicating that everybody is pretty well up with supplies and buying for current needs in small lots while awaiting the developments of the fall season.

Finished Iron and Steel.—The aggregate of business continues to show gains, but it is still being made up of small orders for immediate shipment. In fact, that seems to be about the only point on which there is competition, the prices being held undisturbed by buyers' attempts to gain concessions. In standard rails the only sale of the week was of 500 tons for an Arkansas road, which was in addition to a previous contract. Track fastenings have been in good demand and prices remain firm. In structural steel the orders of the week were for specific business only, and immediate shipment was the consideration in practically every instance. A very good quantity was taken in comparison with previous weeks. In bars there was liberal specification against contracts, with immediate delivery conditions, showing that the consumers were in need of the material for use at once. Fabricators are showing no very strong desire to order for stock, but are good purchasers nevertheless. In light rails there has been practically no demand from the coal trade, but there has been a little sign of life among the lumber roads. In plates there has been practically nothing doing. The award for the material for the Ft. Worth dam, which was expected the past week, has been held up for a short time, but is expected to come through during the month.

Old Material.—While there has been no specific softening of prices in the scrap market, there has been nothing doing. No lists have come out and the dealers are engaged chiefly in trying to round up lots at low prices to ship on orders taken after the recent flurry in figures approached its climax. Consumers seem to have taken up to their requirements for some little time to come and are keeping out of the market, apparently in the hope of a reduction of prices, which, however, are very well held. Dealers' prices, per gross ton, f.o.b. St. Louis, are as follows:

Old iron rails	$13.00 to $13.50
Old steel rails, rerolling	13.00 to 13.50
Old steel rails, less than 3 ft.	11.50 to 12.00
Relaying rails, standard section, subject to inspection	23.00 to 23.50
Old car wheels	13.00 to 13.50
Heavy melting steel scrap	11.50 to 12.00
Frogs, switches and guards cut apart	11.50 to 12.00

The following prices are per net ton:

Iron fish plates	$11.00 to $11.50
Iron car axles	19.50 to 20.00
Steel car axles	18.50 to 19.00
No. 1 railroad wrought	11.25 to 11.75
No. 2 railroad wrought	10.25 to 10.75
Railway springs	9.75 to 10.25
Locomotive tires, smooth	14.50 to 15.00
No. 1 dealers' forge	8.50 to 9.00
Mixed borings	6.50 to 7.00
No. 1 busheling	9.50 to 10.00
No. 1 boilers, cut to sheets and rings	8.00 to 8.50
No. 1 cast scrap	10.00 to 10.50
Stove plate and light cast scrap	8.00 to 8.50
Railroad malleable	8.50 to 9.00
Agricultural malleable	7.50 to 8.00
Pipes and flues	8.50 to 9.00
Railroad sheet and tank scrap	8.50 to 9.00
Railroad grate bars	8.00 to 8.50
Machine shop turnings	7.50 to 8.00

Birmingham

BIRMINGHAM, ALA., September 11, 1911.

Pig Iron.—A sale of 2000 tons of gray forge iron is reported at $9.25, Birmingham, for delivery through the remainder of the year. Otherwise transactions in the majority of cases have involved carloads and lots of 100 to 200 tons each for comparatively early delivery. At this time there are no good reasons to expect a heavier buying movement during the coming week. The inquiries pending are very much on the same order as those received for some weeks past, with the lack of interest on the part of buyers for first quarter and first half deliveries probably more pronounced. For

THE IRON AND METAL MARKETS

such deliveries the producing interests are apparently content to await further developments before fixing prices, and accordingly are not solicitous for orders. It is believed in certain quarters that $10.50 per ton, Birmingham, can now be made applicable to first quarter shipments strictly, but producers' records do not show any such transactions. As a matter of fact, the tonnage so far sold for first quarter delivery is very small comparatively, and even in one or more cases a significant portion of the output through the last quarter is yet to be disposed of. The most interesting development in the local situation is the statement that stocks were further reduced in August. Figures just compiled show that the aggregate on Alabama furnace yards September 1 was approximately 240,000 tons, representing a reduction of 26,000 tons in August. Of the total, approximately 60,000 tons is covered by warrants and 16,000 tons is free basic iron, leaving some 160,000 tons of free foundry iron, with the output represented by 13 active stacks. We quote as follows per gross ton, f.o.b. cars here for shipments to Southern points during the remainder of the year:

No. 1 soft	$11.00
No. 1 foundry	11.00
No. 2 soft	10.50
No. 2 foundry	10.50
No. 3 foundry	10.00
No. 4 foundry	9.75
Gray forge	9.50
Mottled	9.25

Cast Iron Pipe.—A lot of 4000 tons of water pipe for Charlotte, N. C., has just been bought, and a material addition has been made to the order placed some weeks ago from Portland, Ore. The movement of the past week from local plants was very heavy, particular mention being made of the forwarding in one shipment of 1100 tons to San Diego, Cal., by the United States Cast Iron Pipe & Foundry Company. The percentage of active capacity has not yet increased, but repairs to the plant formerly operated by the Dimmick Pipe Company are well under way. Aside from several small lots for requirement in the Middle West and the usual offerings for maintenance work no new business is now being advertised, but prices are being fully maintained and we continue to quote the market at the following prices per net ton, f.o.b. cars here: 4-in. to 6-in., $23; 8-in. to 12in., $22; over 12-in., average $21, with $1 per ton extra for gas pipe.

Old Material.—Dealers have added materially to their stocks in the past fortnight and report a fair volume of new business pending. The actual consumption has improved slightly, and it is understood that the mills now in operation will continue to receive shipments at a fairly steady rate for some months. We continue to quote the market nominally at the figures below per gross ton, f.o.b. cars here:

Old iron axles (light)	$13.50 to $14.00
Old steel axles (light)	12.50 to 13.50
Old iron rails	12.50 to 13.00
No. 1 railroad wrought	11.00 to 11.50
No. 2 railroad wrought	9.50 to 10.00
No. 1 country wrought	7.50 to 8.00
No. 2 country wrought	7.00 to 7.50
No. 1 machinery	9.50 to 10.50
No. 1 steel	8.50 to 9.00
Tram car wheels	8.00 to 8.50
Standard car wheels	9.50 to 10.50
Light cast and stove plate	7.00 to 7.50

Waddill Catchings, New York, is now in the Birmingham district looking over the properties of the Central Foundry Company and the Central Iron & Coal Company, of which companies he is president.

Ward W. Jacobs, Hartford, Conn., president of the Shelby Iron Company, has been inspecting the properties of his company in the Birmingham district.

Hammond-Byrd Iron Company has been incorporated to succeed the Hammond-Byrd Company. H. Hammond is president; William H. Byrd, Jr., vice-president, and H. L. Morrow, secretary and treasurer.

The German Iron Market

Luxemburg-Lorraine Furnaces Stay Out of the Pig Iron Syndicate

BERLIN, August 31, 1911.

The long-drawn-out negotiations between the Pig Iron Syndicate and the independent producers in the Luxemburg-Lorraine district came to an end at last yesterday and with a negative result. The outlook for an understanding had been declared to be so bright within the past week or two that the meeting yesterday had been looked forward to as merely a formal procedure for giving validity to an arrangement already practically agreed upon. It turned out otherwise, however, and the rupture between the two interests is pronounced to be final. The split came over the question of allotments for the outsiders. The Syndicate interests proposed to take the actual shipments of the various furnaces during the year 1910 and the first half of 1911 as the basis for the new allotments; but the Luxemburg-Lorraine furnace owners objected to this as unfair to them, inasmuch as the furnaces in the Rhenish-Westphalian district, which are the leading interests in the Syndicate, made unusually heavy shipments in 1910, including considerable export business, whereas they themselves, they said, were holding back with their shipments. They therefore came forward with a counter proposition to take the shipments of the first half of 1911 as the basis for allotments. This would have amounted to giving the Luxemburg-Lorraine group about 53 per cent. of the allotments; but the Syndicate was not willing to concede more than 50 per cent. The previous price arrangement with these outsiders was not renewed yesterday, but an attempt to do this was made today; a positive result, however, was hardly looked for. Failing this, the Luxemburgers will be free to begin taking contracts tomorrow at their own terms.

Steel Trade Satisfactory

The Steel Works Union held its regular monthly meeting yesterday and gave out its usual report on the business situation in semi-finished material, structural shapes and rails. It says that the home trade in steel material for further manufacture continues satisfactory. Consumers are well employed and are calling for shipments on order at a satisfactory rate. Business for the fourth quarter of the year was declared open at unchanged prices. The recently announced improvement in the foreign market has been maintained, and prices have further risen. Sales continue good, notwithstanding the interference caused by the great strikes in England. In heavy rails foreign business remains good, and some further large orders have been taken. The Württemberg state railroads have given their contracts for rails, the amounts called for being somewhat greater than for the current year. Calls for grooved rails and light ones for mines are satisfactory, but a quieter tone in new business is noted. Home business in structural forms remains good. Books were declared open for the fourth quarter at unchanged terms. Foreign business in this line is good with most countries, and specifications are coming in briskly, except from England during the strikes. The prospects for a good autumn trade are regarded good.

The bar manufacturers held a meeting today at Düsseldorf to take preparatory steps for another effort to get together. A commission to take the matter in hand was appointed, and another meeting will be held about October 1. The aim appears to be merely to reach an agreement as to bottom prices. It is seriously doubted, however, whether anything will come of this movement.

As for the rest, there seems to have been hardly any change in the market situation since a week ago. Trade continues fairly satisfactory. Nevertheless, the stock market has been excited for a week over the Morocco affair, as well as over its own excesses in speculative buying of iron shares during the past few months; and these had a sharp backset last week. They lost more heavily in August than for many months. The latest news from Belgium indicates that the recent improvement in the trade there has been maintained, but no further advances in prices are reported.

Boston

BOSTON, MASS., September 12, 1911.

Old Material.—The scrap market continues dull. While prices have not declined, neither have they stiffened in any particular. Material continues to come out in large quantities, but from the dealers rather than from the producers. Export business with Canada, confined as always to No. 1 wrought and soft steel, remains active, conditions there being apparently better than in this country. In other classes of scrap Canada is doing a considerable export business, chiefly with Europe. The prices quoted below are those offered by the large dealers to the producers and to the smaller dealers and collectors, per gross ton, carload lots, f.o.b. Boston and other New England points, taking Boston rates from eastern Pennsylvania points. In compari-

THE IRON AND METAL MARKETS

son with Philadelphia prices the differential for freight of $2.30 a ton is included. Mill prices are approximately 50 cents a ton more than dealers' prices. The quotations follow:

Heavy melting steel	$10.00 to $10.50
Low phosphorus steel	11.45 to 11.95
Old steel axles	14.20 to 14.70
Old iron axles	17.70 to 18.70
Mixed shafting	12.75 to 13.25
No. 1 wrought and soft steel	11.00 to 11.25
Wrought iron pipe	9.25 to 9.50
Skeleton (bundled)	7.75 to 8.00
Cotton ties	8.00 to 8.25
No. 2 light	4.50 to 5.00
Wrought turnings	5.75 to 6.00
Cast borings	5.00 to 5.50
Machinery cast	12.50 to 13.00
Malleable	11.00 to 11.50
Grate bars	6.00 to 6.50
Stove plate	8.50 to 9.00

Buffalo

BUFFALO, N. Y., September 12, 1911.

Pig Iron.—While the volume of inquiry for the past week has not been so large as in either of the two weeks preceding, it represents a fair total, including about 4000 tons of foundry grades for early delivery and 1500 tons for deliveries beyond the last quarter of the year. Sales for the week have aggregated about 10,000 tons, principally foundry grades. Furnaces are well filled with shipping specifications on contracts, and there remain only small gaps to sell them to capacity for the remainder of the year. A careful canvass of the situation shows that there will be very small stocks, if any, on furnace banks in this vicinity on January 1, the policy of the furnacemen evidently being shaped to that end. The Wickwire Steel Company has one furnace out for relining, which will bake until October. Prices show a stiffening tendency and furnacemen are absolutely firm at the minimum shown below. Not much inclination is as yet indicated on the part of producers to negotiate for 1912 deliveries. We quote as follows, f.o.b. Buffalo, for fourth quarter delivery:

No. 1 X foundry	$14.00 to $14.25
No. 2 X foundry	13.75 to 14.00
No. 2 plain	13.75 to 14.00
No. 3 foundry	13.50 to 13.75
Gray forge	13.50
Malleable	13.75 to 14.25
Basic	13.75 to 14.25
Charcoal	16.50 to 17.50

Old Material.—The market is stagnant in every line, as far as new business is concerned. Consumers' wants are apparently well covered for present needs, causing a very restricted demand. Prices have sagged slightly in some grades and producers are holding fast to their stocks on account of the low prices. We quote as follows, per gross ton, f.o.b. Buffalo:

Heavy melting steel	$12.75 to $13.25
Low phosphorus steel	16.00 to 16.50
No. 1 railroad wrought	14.00 to 14.50
No. 1 railroad and machinery cast scrap	13.50 to 14.00
Old steel axles	18.50 to 19.00
Old iron axles	22.00 to 22.50
Old car wheels	13.00 to 13.50
Railroad malleable	12.75 to 13.00
Boiler plate	12.50 to 13.00
Locomotive grate bars	11.00 to 11.50
Pipe	9.25 to 9.50
Wrought iron and soft steel turnings	7.15 to 7.40
Clean cast borings	7.00 to 7.25

Finished Iron and Steel.—The demand continues fairly active for most lines of finished products, with structural steel leading in demand and in stability in prices. Inquiries and orders are being received in about the same volume as for the past month. One noticeable improvement is that mills which have for some time been able to make shipments on bars within three or four days are now compelled to extend deliveries in many instances to three or four weeks. There is no cessation in the activity which has prevailed in fabricated structural lines during the latter part of the summer, and local contractors are experiencing some trouble in placing orders for prompt delivery. The Charles F. Ernst Sons Iron Works has received contract for the International Railway Company's substation on Fillmore avenue, 250 tons, and the George Kellogg Structural Company, for the Magnus Beck hotel and café, 100 tons. The 400 tons of standard shapes for the Main Street Realty Company's store and office building will be furnished by the Lackawanna Steel Company and fabricated by the Charles F. Ernst Sons Iron Works, the remaining 200 tons for this building to be Bethlehem shapes. The steel for the Buffalo General Electric Company's 17-story office building, 1200 tons, for which the Riverside Bridge Company, Martin's Ferry, Ohio, holds contract for fabricating, is being rolled by the Carnegie Steel Company.

New York

NEW YORK, September 13, 1911.

Pig Iron.—An encouraging amount of inquiry from New England, New Jersey and New York State has come to the producers of foundry and basic iron in the past week. One inquiry is for 5000 tons, another for 3000 tons; others for 2000 tons, 1500 tons and 1000 tons, there being several for the last-named tonnage. Several of these buyers will probably close this week, the deliveries called for in all cases being for the last quarter of the year. A Brooklyn foundry has bought upward of 1000 tons in the week, and a stove foundry in New Jersey is asking for 1500 tons. There are no new developments as to prices, except that Buffalo furnaces are now more generally quoting $13.75 for No. 2 X for delivery late in the year, though the $13.50 iron has not disappeared. A slight reduction in stocks at the furnaces represented in the Eastern Pig Iron Association is reported for August, these stocks being now around 100,000 tons. Foundries as a rule are taking in all the iron coming to them under their contracts. In some cases considerable stocks have been carried by melters and it is possible that consumption is more than is indicated by blast-furnace operations. We quote Northern iron for tidewater delivery as follows: No. 1 foundry, $15.50 to $15.75; No. 2 X, $15 to $15.25; No. 2 plain, $14.75 to $15. Southern iron is quoted at $15.25 to $15.50 for No. 1 foundry and at $14.75 to $15 for No. 2.

Finished Iron and Steel.—The structural trade in this and nearby districts has been giving a good account of itself in the past week, a number of awards being reported on work that has been pending for some time. The two largest contracts taken are the Boston & Albany bridge at Worcester, Mass., 4000 tons, by the Pennsylvania Steel Company, and the Aeolian building, New York, 3500 tons, by the American Bridge Company. The New York Central has let a total of 2000 tons of steel work—800 tons and 500 tons on two sections of the terminal work in this city, 200 tons for a bridge at Watertown, N. Y., and 500 tons for signal bridges. Other railroad awards include 200 tons for the Green street station of the Boston Elevated, taken by L. F. Shoemaker & Co.; three bridges for the Boston & Maine, 280 tons, taken by the Boston Bridge Works; three bridges for the Central New England Railroad, 180 tons; signal bridge for the B. & O., 100 tons. In New York recent lettings include a hospital building at Forty-second street and First avenue, 1200 tons, taken by the Hinkle Iron Works; Pavilions L and M for Bellevue Hospital, 1200 tons; the Meyrowitz building on Fifth avenue, 300 tons, by A. E. Norton & Co., and a stable for the Empire State Dairy Company, Brooklyn, 500 tons, by Levering & Garrigues. The last-named company was also awarded an addition to the Edison Company power house at South Boston, 250 tons, and the First National Bank at New Haven, Conn., 400 tons. The Ward-Corby Company bakery building at Cambridge, Mass., 900 tons, went to the McClintic-Marshall Construction Company; the high school at Schenectady, N. Y., 400 tons, to the Jones & Laughlin Steel Company; the Philadelphia Rubber Works warehouse at Philadelphia, 300 tons, to the Belmont Iron Works; a building at Lancaster, Pa., 500 tons, to the Phoenix Bridge Works; the Masonic Homes hall at Elizabethtown, Pa., to the same company. Bids go in October 10 on the postoffice at Washington, D. C., 4000 tons, and the Filene building, Boston, 5000 tons, will be bid on again next week. The steel for the Albany Capitol Building, 300 to 400 tons, will be furnished by the American Bridge Company. The plate trade shows little change from recent conditions, the volume of business from week to week being about the same, but the movement is irregular; few transactions call for large quantities, the demand in this locality being mainly for repair work. Some of the plate mills report an exceptionally good business in flanging work, keeping that department of their works in excellent shape. Steel bars are quiet, the demand calling for small lots only. The Eastern bar iron trade has become restricted to a limited number of mills, which

THE IRON AND METAL MARKETS

are reported as actively engaged. Most of these mills make finished products into which bar iron enters and thus they work up a considerable part of their bar output. The leading makers, however, report a sufficient volume of business in bar iron, in addition to their own consumptive requirements, to keep their mills fairly busy. It is interesting to note that most of the business of these mills is now coming from railroads. Quotations are continued as follows: Plain structural materials and plates, 1.51c. to 1.56c.; steel bars, 1.36c. to 1.41c.; bar iron, 1.30c. to 1.35c., all New York. Plain material and plates from store, New York, 1.80c. to 1.90c.

Cast Iron Pipe.—Although specifications have not yet been issued, it is understood that the Department of Water Supply, Gas and Electricity of the city of New York will open bids September 26 from contractors, for laying over 8000 tons of 48-in. and perhaps some other sizes of pipe. This department opens bids to-day for furnishing and laying 560 tons of 12-in. pipe and fittings. A few public lettings are coming out in New England, but they are for unimportant quantities. The situation has again changed, as many of the inquiries recently in the market have failed to result in sales, and the aspect of affairs is therefore less encouraging. This change in the attitude of buyers may perhaps be due to the recurrence of liquidation in Wall street. Carload lots of 6-in. continue to be quoted at $21 to $22 per net ton, tidewater.

Old Material.—The market is exceedingly quiet. Consumers of steel scrap are making offers which are considerably under the views of holders, and business in this line is therefore practically at a standstill. The rolling mills are purchasing sparingly and are pursuing the same policy as the steel companies in offering low prices. The foundries are not taking much cast scrap, apparently having sufficient stocks on hand to supply their limited requirements, the foundry jobbing trade being decidedly slack. Quotations are as follows, per gross ton, New York and vicinity:

Old girder and T-rails for melting	$10.25 to $10.50
Heavy melting steel scrap	10.25 to 10.50
Relaying rails	20.50 to 21.50
Rerolling rails (nominal)	12.00 to 12.50
Standard hammered iron car axles	21.50 to 22.00
Old steel car axles	16.00 to 16.50
No. 1 railroad wrought	12.50 to 13.00
Wrought iron track scrap	11.00 to 11.50
No. 1 yard wrought, long	11.00 to 11.50
No. 1 yard wrought, short	10.00 to 10.50
Light iron	4.25 to 4.75
Cast borings	6.00 to 6.50
Wrought turnings	6.50 to 7.00
Wrought pipe	10.00 to 10.50
Old car wheels	10.50 to 11.00
No. 1 heavy cast, broken up	10.50 to 11.00
Stove plate	8.50 to 9.00
Locomotive grate bars	8.50 to 9.00
Malleable cast	10.50 to 11.00

Ferroalloys.—Several sales of 200-ton lots of ferromanganese have been made at around $37, Baltimore, for delivery this year. Dealers here are quoting $37.25 for delivery over the first half of next year. Ferrosilicon is advancing and sellers of the European product are out of the market as they are demanding more than $60. Several New York sellers refused a consumer's offer to buy at $57, and they are quoting from $58 to $59 over the first half of next year.

Metal Market

NEW YORK, September 13, 1911.

The Week's Prices

Cents Per Pound for Early Delivery.

	Copper, New York.		Tin.	Lead—		Spelter—	
	Electro-			New	St.	New	St.
Sept.	Lake.	lytic.	New York.	York.	Louis.	York.	Louis.
7	12.75	12.50	43.00	4.50	4.42½	6.00	5.85
8	12.75	12.50	42.55	4.50	4.42½	6.05	5.87½
9	12.75	12.37½	....	4.50	4.40	6.05	5.90
11	12.75	12.37½	40.75	4.50	4.40	6.05	5.90
12	12.75	12.37½	40.25	4.50	4.40	6.05	5.90
13	12.75	12.37½	39.75	4.50	4.40	6.05	5.90

Arrivals of pig iron so far this month have been very heavy, but most of the stocks have been taken up and prices are not much lower. Quotations on electrolytic copper have been reduced. Lead is easier in St. Louis. Spelter is more scarce.

Copper.—Some good business has been done in electrolytic copper as the result of a reduction made last Saturday when quotations were lowered ⅛c. Buyers who came into the market yesterday and to-day found that there was not much for sale at that price for early September and October delivery, and a few of the large sellers raised their quotations to 12.50c., which was the market before the reduction. Other people were offering electrolytic copper, however, at 12.37½c., but if there is any great amount of buying the market will soon return to 12.50c. There is scarcely any demand for Lake copper and the price is largely nominal at 12.75c. L. Vogelstein & Co. give the following figures of German consumption of foreign copper for the months January-July, 1911: Imports, 106,077 tons; exports, 4928 tons; consumption, 101,149 tons, as compared with consumption during the same period in 1910 of 95,092 tons. Of the above quantity 91,771 tons was imported from the United States. In London this morning spot copper was sold for £55 8s. 9d. and futures for £56 2s. 6d.

Pig Tin.—So far this month 3130 tons of pig tin has arrived in this country. Considering the fact that 3000 tons is considered a normal month's arrival, these heavy shipments are almost unprecedented. Nevertheless, spot tin is not over plentiful as most of this material has been shipped into the interior. The market is somewhat shaky because of unsettled conditions abroad and quotations have not been reduced as much as might be expected. There is only a fair amount of tin on hand for September and some for October delivery. A considerable quantity of pig tin that came in during the week was owned by the leading consumer. The price this morning was 39.75c. for September delivery. In London this morning spot tin was sold for £180 5s. and futures for £178 10s.

Tin Plates.—The mills are doing a good business and some fair sized sales were made during the week to a big packing company that manufactures its own tin boxes. A reduction of 10c. has been made in some quarters on 100-lb. coke plates. The price now is $3.84 to $3.94. The foreign market has been unusually steady for several weeks and the price remains unchanged at 13s. 9d. at Swansea, Wales.

Lead.—Lead is weaker in the West and outside dealers who have been in control of the market there have reduced their quotations to 4.40c. They continue to quote higher than the American Smelting & Refining Company in this market and the New York price is unchanged at 4.50c., which is the quotation made by the leading interest.

Spelter.—Stocks of spot spelter are very short in New York and they have been greatly curtailed in St. Louis. A good amount of steady buying has been done during the week but it has been hard to define just what prices were paid as dealers were continually changing front and each day saw fluctuations. This morning the price in New York was 6.05c. and in St. Louis 5.95c.

Antimony.—Antimony is plentiful and so little is being taken that prices are uncertain, as some dealers are very anxious to sell and there are reports of cutting. Hallett's is fairly firm at 7.75c., but Cookson's might now be had as low as 8.25c. Chinese and Hungarian brands are quoted at 7.20c.

Old Metals.—Although profound dullness prevails, dealers' selling prices, New York, are nominally unchanged, as follows:

Copper, heavy cut and crucible	$12.00 to $12.25
Copper, heavy and wire	11.50 to 11.75
Copper, light and bottoms	10.75 to 11.00
Brass, heavy	8.00 to 8.25
Brass, light	6.75 to 7.00
Heavy machine composition	10.50 to 10.75
Composition turnings	8.75 to 9.00
Clean brass turnings	8.00 to 8.25
Lead, heavy	4.20 to 4.25
Lead, tea	3.95 to 4.00
Zinc, scrap	4.25 to 4.30

Chicago

SEPTEMBER 11.—Metal sales the past week were at about an average rate for this market. Although a slight weakness was observed in prices values were without material change. We quote at Chicago: Casting copper 12.65c.: Lake, 12¾c., in carloads, for prompt shipment; small lots, ¼c. to ⅜c. higher; pig tin, carloads, 42½c.; small lots, 44½c.; lead, desilverized, 4.45c. to 4.50c. for 50-ton lots; corroding, 4.72½c. to 4.75c. for 50-ton lots; in carloads, 2½c. per 100 lb. higher; spelter, 5.95c. to 6.00c.; Cookson's antimony, 9¼c., and other grades, 8¼c. to 8¾c., in small lots; sheet zinc is $8 f.o.b. La Salle, in carloads of 600-lb. casks. On old metals we quote for less than carload lots: Copper wire, crucible shapes, 10¾c.; copper bottoms, 9½c.; copper clips, 10¼c.; red brass, 9½c.; yellow brass, 7½c.; lead pipe, 4c.; zinc, 4¼c.; pewter, No. 1, 26c.; tinfoil, 32c.; block tin pipe, 36c.

St. Louis

SEPTEMBER 11.—The metal market for the week has been rather quiet. Tin is quoted here at 42.87½c.; Lake copper is a little off at 12.97½c. and electrolytic likewise at 12.80c.; antimony, unchanged at 8.72½c., and lead a little better at 4.37½c. to 4.40c. Spelter has shown more firmness, being quotable at 5.85c., with a fairly good demand. In the Joplin district quotations are well held in all the ores. The mines are producing a little more than they have been and the surplus has increased slightly. The prices for old metals are as follows: Light brass, 4c.; heavy brass and light copper, 8c.; heavy copper and copper wire, 9c.; zinc, 3c.; lead, 3¼c.; pewter, 20c.; tinfoil, 29c.; tea lead, 3c.

Iron and Industrial Stocks

NEW YORK, September 13, 1911.

The stock market has experienced another period of liquidation. Quite a number of stocks made new low records for the year. The lowest prices were made on Thursday, Friday and Saturday. On Monday some improvement occurred, but even then the stock market did not exhibit decided strength. The most disturbing influence of the past week was the fear of war between France and Germany over Morocco, which almost caused a panic in Berlin, during which American securities dealt in on the international exchanges suffered quite severely, our own market sympathizing considerably. The range of prices on active iron and industrial stocks from Wednesday of last week to Tuesday of this week was as follows:

Allis-Chalm., com.	6⅝	Pressed Steel, pref.	98
Beth. Steel, com.	28 - 30¾	Railway Spring, com.	30
Beth. Steel, pref.	60¼	Railway Spring, pref.	100
Can, com.	9½ - 10¾	Republic, com.	34 - 36¾
Can, pref.	84 - 86¾	Republic, pref.	89⅛ - 92
Car & Fdry., com.	47 - 49⅞	Sloss, com.	37 - 39½
Steel Foundries	27¾ - 30½	Pipe, com.	13 - 13¾
Colorado Fuel	28 - 28¾	Pipe, pref.	45 - 46
General Electric	150 -153	U. S. Steel, com.	66⅞ - 72
Gr. N. Ore Cert.	45½ - 49	U. S. Steel, pref.	114⅛-116¼
Int. Harv., com.	103⅛-108⅝	Weste. Elec.	68 - 69½
Int. Harv., pref.	118 -120	Va. I, C. & C.	75
Int. Pump, com.	31 - 33½	Am. Ship, com.	55 - 57
Locomotive, com.	34 - 36	Am. Ship, pref.	106½
Locomotive, pref.	105¾-105⅞	Chic. Pneu. Tool	46 - 46¾
Nat. En. & St., com.	16 - 17	Cambria Steel	53 - 53⅝
Nat. En. & St., pref.	95 - 96	Lake Sup. Corp.	22 - 24
Pittsburgh Steel, pref.	101	Crucible Steel, com.	11 - 11½
Pressed Steel, com.	29½ - 31	Crucible Steel, pref.	80 - 80¾

Directors of the Plymouth Cordage Company, Boston, Mass., have voted to recommend to the stockholders that the stock be increased by 5000 shares, to be offered at par, $100, to stock of record October 2. The new financing is to capitalize expenditures in increasing the plant. The directors also voted to omit the usual extra cash dividend of $3 this year. The present stock outstanding is $2,500,000, receiving 8 per cent. regular dividends.

Dividends Declared

The American Pipe & Construction Company, Philadelphia, regular quarterly, 2 per cent., payable October 1.

The American Smelting & Refining Company, regular quarterly, 1 per cent. on the common stock, payable October 16, and 1¾ per cent. on the preferred, payable October 2.

The Cambria Iron Company, regular semi-annual of 2 per cent., payable October 2. This company leases its property to the Cambria Steel Company.

The Crucible Steel Company of America, quarterly, 1¾ per cent. on the preferred, payable September 30.

The Youngstown Sheet & Tube Company, quarterly, 2 per cent.

The Sloss-Sheffield Steel & Iron Company, regular quarterly, 1¾ per cent. on the preferred stock, payable October 1.

The Gorham Engineering Company has just completed a modern engine building works and boat shop at East Oakland, Cal. This establishment builds the entire craft, including engines, hull and all fittings. It also builds a full line of stationary, hoisting and marine engines from 5 to 250 hp, together with the Gorham air compressor and Gorham motor-driven fire apparatus.

The Oven Equipment & Mfg. Company has removed its offices and works from Stamford, Conn., to its new factory at Dixwell and Putnam avenues, New Haven, Conn. The increased demand for sectional ovens, inclosed flame gas burners and economizer gas appliances made the move neecssary.

Patriarche & Bell, steel merchants, 215 Pearl street, New York, have issued a new steel stock list which they are sending to the trade. This publication gives the sizes of high-grade steel which they regularly carry in stock for immediate shipment. They state that their stock of fine spring steel is probably the best assorted and largest of any in this country and that it is all of the best quality made. Of the steels thus held ready for immediate shipment they aim to have a very wide range of sizes and good quantities of each size. They have enlarged their stock of mining drill and quarry steels on account of the increase in their customers for such steels and the uncommonly good and uniform quality of the stock handled. The firm states that recent business has been good in the number of orders received, but disappointing as to their size.

The Goulds Mfg. Company, Seneca Falls, N. Y., has opened a new branch house at Ohio and Franklin streets, Chicago, Ill., to handle its business in the Middle West, including the States of Indiana, Illinois, Michigan, Wisconsin, Minnesota and Iowa. This house will take over the entire business of the present Gould Company with the exception of its line of centrifugal pumps. It will exploit the new line of volute centrifugal pumps which are made at the Seneca Falls factory along with the rest of the company's complete line, which includes hand lift pumps, force pumps, windmill pumps of all types, hand and power spray pumps, triplex power pumps, rotary pumps, centrifugal pumps, air compressors, vacuum pumps, working heads, etc., comprising in fact all types of pumping equipment for every service.

Isolated plant interests—consulting engineer, manufacturers, supply houses and business establishments interested in the progress of isolated plants who formed the National Isolated Power Plant Association, are issuing booklets aiming to give facts about isolated plants. It appears to be the feeling that a great many isolated plants fail to materialize owing to a misunderstanding of the relative cost of central station service and of service obtained from the building's own equipment. Copies of these booklets, which discuss the various features of cost of operation, depreciation and the like, may undoubtedly be obtained by writing to the secretary of the Association, F. C. Farnsworth, Bush Terminal, Brooklyn, N. Y.

The new No. 9 continuous bar mill of the Lackawanna Steel Company, Buffalo, N. Y., has been placed in operation. The company now has two bar mills, its No. 9 and No. 6, in addition to its No. 2 mill, which is used mostly for rolling angle bars. The No. 9 mill will have an estimated capacity of 100,000 tons per year. It will roll rounds from ¼ to 5 in.; coiled rounds ¼ to ¾ in.; nut flats for bolt and nut makers; squares, ¼ to 3 in.; flats, ⅝ x ⅛ to 6 x 2 in.; hexagons, ovals, half ovals, half rounds, small angles, etc.

The Fanner Mfg. Company, Cleveland, Ohio, has been making extensive improvements in its plant. It has just doubled the capacity of its malleable casting department by rebuilding the No. 2 furnace and installing modern molding machines as well as other improved equipment. J. L. Hopper has succeeded Mr. Swallow as superintendent of the malleable foundry. The company manufactures chaplets, stove trimmings, malleable and gray iron castings, brass beds and general stampings.

The Rosedale Foundry & Machine Company, North Side, Pittsburgh, has received a contract for iron and steel fittings for the Government dry dock at Puget Sound, which calls for about 150 tons. This company also manufactures the Playford mechanical stoker, for which it has received a contract for sixteen from a large steel manufacturr in Pittsburgh, while an Ohio user has placed a second order for four additional stokers.

The Knox Pressed & Welded Steel Company invites those interested to attend the formal opening of its plant at Niles, Ohio, Thursday, September 21. Different designs of water-cooled devices for open-hearth furnaces will be exhibited.

Personal

L. S. Schmidt, formerly chief engineer of the Alan Wood Iron & Steel Company, and for the past two years with the Upson Nut Company, has made a new connection, having accepted the vice-presidency of the Knox Pressed & Welded Steel Company. He will look after the open-hearth department and will give his personal attention to the manufacturing and installation of the Knox welded steel water-cooled ports, doors and door frames. He will make his headquarters at the works at Niles, Ohio.

Benjamin T. Delafield, who formerly represented the Lunkenheimer Company for a number of years in St. Louis and Kansas City territory, has become connected with the Best Mfg. Company, Pittsburgh, Pa., to handle its line of valves, fittings, flanges, pipe bends, fabricated pipe and other power plant material in the same territory. He will make his headquarters in Kansas City.

C. W. Tallcott, secretary and treasurer of the Ernst Wiener Company, 50 Church street, New York, manufacturer of contractors' and industrial railway equipment, returned last week from Europe, after a six weeks' absence.

Alfred E. Croft, sales manager in the Chicago district for the Colles feed-waterheater, has been appointed agent in the same territory for John Brennan & Co., Detroit, Mich., manufacturers of marine and fire-box boilers, tanks, etc.; also for the Brown Engine Company, Fitchburg, Mass., and the Franklin Oil Filter Company, St. Louis, His office is at 117 North Canal street, Chicago.

Ernst Mueller, manager of the American office of the German machinery selling firm of Schuchardt & Schutte, 90 West street, New York, is in Europe on a business trip.

At a meeting of the board of directors of Manning, Maxwell & Moore, Inc., September 11, George D. Branston was elected secretary and treasurer to succeed Jocelyn H. Evans, who resigned because of ill health. Mr. Branston was formerly connected with Joseph T. Ryerson & Son, Chicago, Ill.

Chairman E. H. Gary of the United States Steel Corporation, who has been abroad for nearly three months, sailed from Liverpool on the Lusitania on Monday.

Charles M. Schwab sailed for Europe September 9 on the Olympic for an absence of two months, his trip having to do in part with the ore arrangements of the Bethlehem Steel Company with Swedish producers.

Cecil A. Grenfell, who has represented English interests in the negotiations of the past few months for the merger of the Southern Iron & Steel Company and the Alabama Consolidated Coal & Iron Company, returns to New York this week from a trip to England.

Henry R. Cornelius, for many years sales manager of the Southwark Foundry & Machine Company, Philadelphia, and who has been district manager of the Wisconsin Engine Company at Pittsburgh since its incorporation, has severed the latter connection to enter a more diversified field in the sales department of the Mesta Machine Company, Pittsburgh, builder of heavy rolling mill machinery and power equipment.

Frank M. Eaton, resident partner of Hickman, Williams & Co., Cincinnati, Ohio, has returned from a summer vacation spent at his country home in Colorado.

Labor Notes

The Inside Ironworkers' Union, which called a strike in New York against two of the firms in the Employers' Association of Architectural Iron Workers, met with retaliation on the part of the employers who discharged 20 per cent. of the union men in the shops not affected and informed them that they could get jobs in the shops where the strikes had been called. This upset the union's plan to call strikes on a few shops at a time and no further action will be taken by the employees until a mass meeting can be held to discuss the subject.

The executive board of the International Association of Machinists, in session at Chicago September 10, refused to sanction the strike of the machinists in the Illinois Central Railroad shops.

Obituary

C. O. Brunner

Christian Otto Brunner, Bethlehem, Pa., died September 7, aged 80 years. He was born in the house in which he died. Educated in local schools, he spent some years in the mercantile business in Bethlehem, Philadelphia, Luzerne County and again in Bethlehem. On July 12, 1860, he was engaged by the then infant Bethlehem Iron Company as its first employee, taking charge of the hands, keeping time, making payments and acting as bookkeeper. Soon after he was appointed acting treasurer, and so remained until July, 1870, when he was elected treasurer of the company. In this position he remained, being continued in it by the Bethlehem Steel Company, until September 1, 1911, when, after a service of 41 years, he tendered his resignation. In connection with this long term of office he had the gratification, July 12, 1900, of being the guest of honor at a reception tendered him by the officers of the company in commemoration of his 40 years' service. Amid much reminiscent speechmaking he was presented with a silver service and a cane by the office force and as a mark of their personal esteem. He was actively engaged in relief work during the Civil War. Throughout his life he was associated with the work of the Moravian Church, taking an active part in various church organizations. He was a member also of the Pennsylvania, the Moravian and the Northampton County historical societies. His wife, to whom he was married in 1859, died in 1895. He leaves a son and a daughter. His son is Franklin H. Brunner, secretary of the Guerber Engineering Company.

Edward G. T. Colles, president of the E. G. T. Colles Mfg. Company, Chicago, died in that city September 8 after a long illness, aged 52 years. He had been a resident of Chicago for 33 years, and was prominent in engineering circles, being known as an authority on water heaters, purifiers and separators, in connection with which apparatus he was the inventor of many devices.

Edwin F. Simonds, vice-president of the Simonds Mfg. Company, died September 10 at Fitchburg, Mass., aged 62 years. Although latterly a resident of Pasadena, Cal., he had lived for 20 years in Chicago. He was born at Fitchburg and removed to Chicago to operate the steel plant of his company.

Edward W. Harden, director and general superintendent of the American Frog & Switch Company, Hamilton, Ohio, died at his home in that city September 6, aged 46 years. He leaves a widow and one daughter.

Sherman W. Ladd, long prominently identified with the United Shoe Machinery Company, Beverly, Mass., died September 7. For a number of years he represented the company abroad, and for the past year had been superintending the construction and equipment of the new Canadian plant at Montreal. He was active in the organization of the company and was one of the oldest officials in point of service. He leaves a widow.

Olin A. Stranahan, a well-known mechanical engineer, died September 8 in a dentist's office in New York while undergoing an operation for an abscess at the root of a tooth. For a long time Mr. Stranahan was in the service of Westinghouse, Church, Kerr & Co., and he spent spent five years with the British Westinghouse Company. For a while he was general sales agent of the Allis-Chalmers Company. He was a member of the Engineers' Club and of the American Society of Mechanical Engineers. He was born in 1866, and leaves a widow and a daughter.

Francis L. Robbins, formerly president of the Pittsburgh Coal Company, and one of the largest operators in steam and coking coal properties in the United States, died at Mercy Hospital, Chicago, September 8, from an operation, aged 56 years. He was a director in several banks in Pittsburgh.

George T. Johnson & Co., iron and steel merchants, Philadelphia, Pa., formerly located in the Pennsylvania Building, announce their removal to 505 Chestnut street. The offices of the Johnson Engineering Company, associated with the firm, have also been moved to the new address.

The Steel Corporation's Unfilled Orders

The United States Steel Corporation reports that the unfilled tonnage on its books August 31 was 3,695,985 tons, or an increase of 111,900 tons over the amount reported July 31. For four consecutive months increases have been reported. Unfilled orders at the end of a given month are arrived at by deducting shipments in that month from the sum of the unfilled tonnage at the end of the previous month and the contracts and current orders entered in the month ("current orders" being new business coming in from day to day not applying against contracts). Specifications on contracts are, of course, not considered, as they would be a duplication of contracts previously entered. The table below gives the unfilled tonnage of the Steel Corporation by months since June 30, 1910, together with the amount at the close of each quarter from December 31, 1902, to June 30, 1910.

Aug. 31, 1911	3,695,985	Mar. 31, 1908	3,765,343
July 31, 1911	3,584,085	Dec. 31, 1907	4,624,552
June 30, 1911	3,561,056	Sept. 30, 1907	6,425,008
May 31, 1911	3,113,187	June 30, 1907	7,603,878
April 30, 1911	3,218,704	Mar. 31, 1907	8,043,858
Mar. 31, 1911	3,447,301	Dec. 31, 1906	8,489,719
Feb. 28, 1911	3,406,543	Sept. 30, 1906	7,936,884
Jan. 31, 1911	3,110,919	June 30, 1906	6,809,850
Dec. 31, 1910	2,674,757	Mar. 31, 1906	7,018,712
Nov. 30, 1910	2,760,413	Dec. 31, 1905	7,603,086
Oct. 31, 1910	2,871,949	Sept. 30, 1905	5,865,377
Sept. 30, 1910	3,158,106	June 30, 1905	4,829,655
Aug. 31, 1910	3,537,128	Mar. 31, 1905	5,579,560
July 31, 1910	3,970,931	Dec. 31, 1904	4,696,203
June 30, 1910	4,257,794	Sept. 30, 1904	3,027,436
Mar. 31, 1910	5,402,514	June 30, 1904	3,192,277
Dec. 31, 1909	5,927,031	Mar. 31, 1904	4,136,961
Sept. 30, 1909	4,796,833	Dec. 31, 1903	3,215,123
June 30, 1909	4,057,939	Sept. 30, 1903	3,278,742
Mar. 31, 1909	3,542,595	June 30, 1903	4,666,578
Dec. 31, 1908	3,603,527	Mar. 31, 1903	5,410,719
Sept. 30 1908	3,421,977	Dec. 31, 1902	5,347,523
June 30, 1908	3,313,876		

A Steel Company Charges Discrimination.—Press dispatches report a suit brought against the Philadelphia & Reading Railway Company by the Alan Wood Iron & Steel Company, of Ivy Rock, Pa., in which the plaintiff seeks to recover $87,886 for damages, and asks that the defendant corporation pay a penalty of treble that amount for alleged illegal discrimination. It is charged that since April, 1905, the railroad company has refused to furnish motive power for the transfer of cars to and from the works in Ivy Rock, the company handling at its own expense 43,943 cars at an average cost of $2 per car. The complaint further says that the railroad company does the switching at Pencoyd Iron Works and the Phoenix Works at Phoenixville as well as at the Lukens and Worth plants at Coatesville, Pa.

Further Decrease in Idle Cars.—The number of idle freight cars in the United States and Canada was reduced by 19,629 in the two weeks ending August 30, as shown by the report of the American Railway Association, the net surplus on that date being 84,541 as compared with 104,170 on August 16. At the end of August last year the total number of idle cars was about 60,000 and the decrease in the two weeks preceding had been 31 per cent. More cars are in service now than twelve months ago, but the decrease of 19 per cent. in the last two weeks of August shows that the demand for cars in that fortnight did not grow this year in the same ratio as in the corresponding period of 1910.

Horace J. Stevens, Houghton, Mich., announces that the tenth annual edition of his Copper Handbook will be published September 15. Eighteen months have been spent in an absolutely complete revision of the mine descriptions and statistical section of the book. The new edition, Vol. X, will contain 1902 octavo pages of text, and will list and describe 8130 mining companies, mines and attempts at mines, this being much the largest number of titles given in any work of reference on mines. As in preceding years there will be several hundred pages of preliminary chapters devoted to the history, technology and uses of copper.

A new record for the loading of an ore boat was made at the Great Northern dock at Superior September 8, when the steamer W. E. Corey, of the Pittsburgh Steamship Company, took on 9325 tons of ore in 25 minutes, or at the rate of 373 tons a minute.

Lake Superior Iron Ore Shipments in August

Shipments of iron ore from upper lake docks in August were 5,548,311 gross tons as compared with 5,221,373 tons in the preceding month and 6,964,381 tons in August, 1910. Only about 16,000 tons was shipped last month from the new Cuyuna range, its total to September 1 being 111,265 tons. The shipments by ports in August, 1910 and 1911, and the totals to September 1 in the two years are as follows:

	Aug., 1911.	Aug., 1910.	To Sept. 1, 1911.	To Sept. 1, 1910.
Escanaba	706,445	697,412	2,418,251	3,162,271
Marquette	357,571	525,898	1,200,748	2,249,774
Ashland	407,578	645,107	1,509,841	2,878,971
Superior	1,689,952	1,332,284	6,382,273	5,227,687
Duluth	1,211,667	2,382,156	4,370,117	9,823,644
Two Harbors	1,175,098	1,381,524	3,724,838	5,484,682
	5,548,311	6,964,381	19,606,068	28,827,029

The shipments to September 1 this year were thus 9,220,961 tons, or 31.99 per cent. less than to the same date last year. Superior leads all ports this year, and has sent out 32.5 per cent. of all the ore shipped. To September 1 it had shipped 1,154,586 tons more than to September 1, 1910, whereas all the other ports show a marked falling off. Duluth's falling off was not only actual but relative. From having 34.08 per cent. of the total to September 1 last year it had only 22.29 per cent. this year.

American Rolling Mill Company Sheet and Pair Furnaces.—The sheet and pair furnaces at the plant of the American Rolling Mill Company, Middletown, Ohio (described in an illustrated article in *The Iron Age* of August 31), as well as the annealing furnaces and the furnaces for the jobbing mill are designed so that uniformity of heat throughout the hearth area is given, a soaking, slow, penetrating heat being secured by making the furnaces extra large. All are equipped with American underfeed stokers. Two of the larger sheet mills are provided with double continuous pair heating furnaces for special high-grade sheets. All the sheet furnaces, as well as the annealing furnaces, are of the double type. The slab heating furnaces in the sheet heating department are of the reversing type. Georg J. Hagan of Pittsburgh, furnace engineer and contractor, erected all of the above furnaces.

Illinois Steel Screw Spikes.—The Illinois Steel Company, Chicago, Ill., which has for a long time been manufacturing railroad spikes, has found it necessary, on account of the rapidly increasing demand for screw spikes, to equip its Joliet Works with screw-spike machinery. It is now prepared to furnish screw spikes of superior finish in either Bessemer or open-hearth steel. The company has just issued a most artistic booklet, which gives much detailed information with regard to spikes of this design. In it will be found the standard specifications for screw spikes adopted January 1, 1911, and sectional views showing dimensions, sizes of threads, etc. The company states that it is in position to manufacture many special sizes and shapes not shown in the publication.

At a meeting of directors of the Youngstown Sheet & Tube Company held last week former officers of the company were re-elected as follows: John A. Campbell, president; H. G. Dalton, of Cleveland, and O. S. Robinson, of Youngstown, vice-presidents; R. S. Garrick, treasurer; George E. Day, secretary, and W. B. Jones, auditor. The directors approved the revised plans for the building of six 60-ton open-hearth furnaces and a blooming mill. The plans for new finishing mills have not yet been fully decided upon.

The Reading Iron Company, Reading, Pa., in carrying out its plans for the modernization of all its plants, has awarded to the Pennsylvania Steel Company the contract for the structural steel for the renewal of its No. 5 pipe mill, on South Seventh street. The new brick and steel structure will be a great improvement in every way over the old frame building which for many years inclosed this mill, and the reconstructed building will fully harmonize in style and equipment with the adjoining and recently completed No. 6 pipe mill at the corner of Seventh and Laurel streets. It is expected that the foundations will be in shape before cold weather sets in.

The Milwaukee Industrial Exposition

In connection with its fiftieth anniversary, the Merchants' and Manufacturers' Association of Milwaukee, Wis., conducted during the ten days from September 2 to 12 an exposition of Milwaukee manufactured products. While not completely representative of the iron and steel industry that has grown so rapidly in that city, the exhibits presented a number of interesting displays.

The Pawling & Harnischfeger Company, crane builder, obtained a large measure of attention for its new single line grab bucket designed for the handling of sand in the foundry. A steel framework was erected in the booth with a runway for carrying a standard trolley. From this a 1½-yard bucket was hung, and its operation was demonstrated as under actual working conditions. A description of this device was published in a recent issue of *The Iron Age*. This exhibit also included I-beam trolley hoists up to 1½-ton capacity.

The Falk Company had in operation a new type 10-hp. kerosene engine, which it has designed and built under the Secor-Higgins patents controlled by the M. Rumely Company, LaPorte, Ind. At present this engine is being developed in 5, 10 and 15-hp. sizes, but larger models are to be brought out as soon as possible. The engine was directly connected to a generator under an intermittent lamp load. Under an instantaneous no-load to full-load jump, the engine regulation showed a variation of only three volts—an imperceptible drop, so far as affecting operating conditions. The unit was being run continuously during the exposition, and its apparent freedom from the ordinary oil engine troubles attracted very favorable interest. This company also had in operation a set of double helical gears which it manufactures under the Wuest patents. Gears of this style are made in sizes up to 12 ft. in diameter and 42-in. face from one-piece steel castings, the teeth being cut on a hobbing machine in one setting.

The Allis-Chalmers Company presented several types of portable electrically driven air compressors and air-brake systems and also a motor-driven 500,000-gal. centrifugal pump. A somewhat similar exhibit was displayed by the National Brake & Electric Company, a pioneer in the development of portable high pressure rotary air compressors for both industrial and railroad service.

Kearney & Trecker, whose milling machines have become established among the standard machine tools with a growth that in many respects is almost unique, exhibited in operation a vertical spindle miller on which a job of continuous milling was being machined. The pieces were connecting rod journal caps requiring the machining of six faces, and the total average time for finishing each was about two minutes.

The American Oxhydric Company conducted demonstrations, at hourly intervals, of both the welding and cutting of metals with the oxy-hydrogen flame. Description of what can be accomplished with these cutting and welding torches has appeared previously. In the present instance, apart from the popular interest excited by the spectacular character of the operations, significance attached particularly to the advantages of this method of cutting where the work is of irregular character or difficult of access with ordinary mechanical cutting tools. On such work as would require either involved machine work or slow hand clapping or cutting the oxhydric process operates at full speed and maximum efficiency.

The Pressed Steel Tank Company showed a number of pressed-steel regulation size barrels and the Vilter Mfg. Company had a refrigerating plant in operation.

The remarkable growth of Milwaukee and its present position as a manufacturing center are scarcely realized generally. Its manufacturing industries number 4126, and the value of its output of iron and steel machinery products in 1910 was $34,112,555.

The Philadelphia Foundrymen's Association

The Philadelphia Foundrymen's Association held its first meeting following the summer recess at the Manufacturers' Club, on the evening of September 6. President Thomas Devlin occupied the chair. The meeting was well attended by local and out of the city foundrymen. Following the usual reports of the secretary and treasurer, the name of J. Jacob Shannon & Co., 1744 Market street, Philadelphia, representing the Whiting Foundry Equipment Company, Harvey, Ill., was presented for membership and favorably acted upon.

The appointment of two delegates to represent the association at the convention of the Atlantic Deeper Waterways Association, Richmond, Va., October 17 to 20th, was considered. President Thomas Devlin was named as one and the other will be appointed later.

W. A. Pollock Davis, Philadelphia, read a paper on "The Use of Titanium in Iron and Steel Practice." After speaking briefly of the production of titanium, he described the beneficial results obtained in the addition of the titanium to molten iron and steel, resulting in the elimination of blow holes and other imperfactions. While excellent results have been obtained by such additions in the ladle, he advocated more particularly that they be made directly in the cupola, open-hearth or electric furnace, which would preclude the effect of irregular atmospheric conditions that are frequently met with while treating the metal in the ladle. The longer treatment in the original receptacle, he believed, was decidedly more efficacious than the short treatment necessarily following the method of ladle treatment.

Charles V. Slocum, general sales agent of the Titanium Alloy Mfg. Company, Pittsburgh, followed with an interesting address on the development and manufacture of titanium alloy. He referred to the supply of titanium ores and the early difficulties in manufacturing an alloy suitable for the purpose intended. The early alloys were a combination of titanium and aluminum, the manufacture of which was discontinued and the present commercial allow of titanium and carbon substituted. This material, when added in proper proportions to either iron and steel in the ladle, preferably placed in the warm ladle and the metal tapped or poured into it and stirred with a rod, in order to bring about an intimate mixture, makes the slag more fusible and eliminates the blow holes in the metal by permitting the occluded gas in the metal to escape, increases the temperature of the metal and minimizes shrinkage. In making additions of the alloy directly to the cupola more care is necessary. If the cupola is regularly slagged, not so much trouble is experienced, but as the alloy has a strong affinity for slag its fusion with that material is more likely when the slag remains in the cupola. Excellent results have, however, been obtained by direct additions, if necessary precautions are taken.

In general foundry practice 0.1 to 0.3 per cent of the alloy is used in the ladle, dependent on the grade of iron, representing a cost of 25 to 75 cents per ton of iron, the quantity increasing with the silicon content in the iron. In steel practice from 0.3 per cent upward is used, according to the softness or hardness of the metal. The use of the alloy prevents brittleness, and the carbon content of the steel may be materially increased, while at the same time the ducility and tensile strength of the metal are greater. This has been demonstrated in manufacture as well as in actual service, notably in steel rails. In isolated cases unsatisfactory reports on the benefits obtained from titanium alloy were reported, but these have been due apparently to defects in manufacture and in the use of the alloy in treating the metal. When used in the ladle in iron foundry practice, a small percentage of the alloy will overcome any variation in atmospheric conditions.

Following Mr. Slocum's address a brief discussion followed in which results obtained by various users of the alloy were cited and authorities named who strongly recommended its use in both iron and steel foundry practice. A vote of thanks was extended both Mr. Davis and Mr. Slocum. Adjournment was followed by a luncheon in the club dining room.

Chairman DuPuy of the Crucible Steel Company of America, Pittsburgh, states that the company's fiscal year ended with August 31, 1911, and the chartered accountants, Price, Waterhouse & Co., are now auditing the accounts for that period. No quarterly statement will therefore be issued at this time, as the annual report will be published later in the present month showing the full year's results. He added that it was only necessary to say that the earnings for the fiscal year have been very satisfactory and will probably show in the neighborhood of 10 per cent. on the company's preferred shares, after deducting $500,000 for depreciation of plants, etc.

The Progress of Metallurgy

Address by Sir Robert A. Hadfield at Sheffield, England, July 1, 1911

Below we reproduce the address delivered by Sir Robert A. Hadfield on the occasion of the conferment upon him of the honorary degree of doctor of metallurgy by the University of Sheffield. In presenting Sir Robert for this honor Professor Appleton, the public orator of the university, made the following complimentary personal allusion:

"The Hadfield family has long been associated with the history of this city, and the name of Robert Hadfield, Sr., takes rank with those of Huntsman and Bessemer, of John Brown and J. D. Ellis, of the Firths and the Jessups, as that of one of the original founders of Sheffield's steel industry. That tradition has been most worthily upheld in this generation by Sir Robert A. Hadfield, the distinguished son of a distinguished father. His discovery of manganese steel not only revolutionized the whole trend of metallurgical thought, but proved to be of extraordinary and world-wide utility. By the extent and variety of his research work in other directions he has added enormously to the scientific knowledge of iron and steel and their alloys, and his contributions to the proceedings of various learned societies have conspicuously enriched the literature of ferrous metallurgy.

"As an investigator his work has received universal recognition. The Iron and Steel Institute has awarded him the Bessemer gold medal, its most coveted honor; from the Institution of Civil Engineers he has received the Howard, the George Stevenson and the Telford medals and premiums; and numerous societies on the Continent and in America have delighted to do him honor. As the crowning point in his career he was installed, at the age of forty-five, president of the Iron and Steel Institute, and for two years he occupied that proud and enviable position as head of the most powerful and the most famous association of steel masters in the world. In Sheffield he is known not only as the head of a most successful business, not only as a scientist of the highest distinction, but also as an employer who has interested himself profoundly in everything that tended to improve the conditions of labor, and as one who has shown in many practical ways his genuine sympathy with those who work for and under him."

In accepting the degree Sir Robert said:

Sir Robert's Address

Among the many recognitions it has been my good fortune to receive, none will be more highly prized than this honorable distinction. It has been said that a prophet has no honor in his own country, but in conferring this degree upon me Sheffield has proved otherwise, and I am indeed most grateful. To receive from my fellow-citizens the very kind approval of such work as I have been able to do in the past on behalf of metallurgy is a distinction to be proud of, and one which falls to the lot of few.

SHEFFIELD'S FAME FOR HIGH QUALITY

Sheffield's fame in the manufacture of steel of the highest quality has spread throughout the world, and I can conscientiously say that whenever opportunity has presented I have never forgotten its interests, and these, in a well-traveled life, have not been few.

My interesting trip round the world has taught me more than ever that honest, sterling work and high quality tell, and everywhere I have visited I found the name of my city stand very high in this respect. It was the high quality and nature of our handicraft which we know appealed so much to Ruskin, and was the reason we secured his wonderful treasures. Let us ever continue our policy, aided, too, as we are now, by our alma mater, the university, to guide us and perfect us in our work. Lord Allerton, in a recent admirable speech to the Iron and Steel Institute, spoke of quantity not being everything, and that the first British interest was quality, on which our commerce has been reared. We in Sheffield do not want to follow the lead of some other countries where quantity may be the first desire, and quality left as a secondary consideration.

FAMOUS NAMES IN SHEFFIELD'S HISTORY

It is not necessary for me to now go, except very briefly, into Sheffield's past history. I remember getting together some information on this point when presenting my address as Master Cutler in 1899. In the past such names as Huntsman in the eighteenth century, Sanderson, Jessop, Brown, Mappin, Stephenson, Earnshaw, Vickers, Howell, Firth, Doncaster, Seebohm, Rodgers, Ellis Sorby and many others, both on the scientific and practical side, are household words, not only among us, but they are known in all lands, one may truly say to the uttermost parts of the earth.

Four names—Mark Firth, Sir Frederick Mappin, Sir Henry Stephenson and Dr. Clifton Sorby—specially stand out on the educational side of Sheffield's modern history; their untiring devotion can never be forgotten. I well remember our small beginning on the applied science side, and the opening address of Sir Frederick Bramwell when Professor Greenwood was in charge.

Coming down to present times, the same devotion to the department of applied science has been shown by our chancellor, the Duke of Norfolk, Dr. Hicks, our present Lord Mayor, Sir Joseph Jonas, Colonel Hughes, Sir William Clegg, Alderman Franklin, Sir Charles Eliot, Earnshaw Howell, Wilson Mappin, the present Master Cutler, the late T. Andrews, of Wortley, Drs. Arnold and Ripper, Aldermen Stuart Uttlay and Wardley and many others, ably aided as they have been by our indefatigable registrar and secretary, Mr. Gibbons and Mr. Swift.

It was largely due to a relative of mine, Sir John Brown, that the Bessemer process took such strong root in Sheffield, assisted as he was by his partner, J. D. Ellis, and the original work of the late William Allen, of H. Bessemer & Co. Some of you may not know that America was largely indebted to Sheffield in aiding its remarkable development in the seventies of last century, the great American metallurgist, Holley, receiving his training in the Bessemer process here in Sheffield. Moreover, the science of metallography, now such an important adjunct in metallurgical research, was founded in 1888 by a Sheffield man, the revered Dr. Clifton Sorby. It will be seen, therefore, that Sheffield has played an important part in the development of the metallurgy on iron and steel.

THE FUSION PROCESS OF MAKING CAST STEEL

While speaking of Sheffield and its past work, I may mention one interesting circumstance attending my travels round the world, and relating to the fusion process of producing cast steel, in which we in Sheffield are so much interested. We have all believed that Huntsman could justify claim to be the first to reduce this process to practical application, and in one sense he certainly did this; yet I find that it is more than probable that out in the East they knew more about methods of producing cast steel quite 2000 years ago, and probably even much earlier than we have in the past given them credit for. Aristotle, too, has spoken of the Hindus knowing how to manufacture steel about 300 B. C. I recently sent Dr. Arnold a set of photographs representing iron and probably steel tools which I came across during my visit to Ceylon, representing a most valuable collection arranged there by Dr. Willey, F. R. S. These are of undoubted antiquity, dating back 1500 to 2000 years.

By the kindness of my friend, the Governor-General of Ceylon, Sir Henry MacCallum, I have been allowed to have from the Colombo Museum a number of these priceless specimens, which we are now examining in our research department, and, as I have told Dr. Arnold, I shall be glad to afterward present them to the University Museum Coming to modern times, and as an antithesis of this in point of date, it may be interesting to state, with regard to the present development of metallurgy in the Far East, that the steamer in which I crossed the Pacific last year

brought the first load of Chinese pig iron to the western shores of America. In view of the vast mineral wealth of China, what extraordinary possibilities this one fact opens out for the world's future in the metallurgy of iron and steel!

The particular branch of metallurgy, alloys of iron and steel, having been one which I have studied closely, it may be interesting to say a few words upon the topic; also to mention one of the reasons why I took this up. When visiting the Paris Exhibition in 1878, I was particularly struck with the wonderful exhibits of the Terre Noire Works, and young as I was at that time I determined to look into the subjects they were investigating, and the results of which they so freely placed before the world. All their data being in French, I had to translate this myself, some 60 pages or more, and to the younger members present I would point out the great advantage of making themselves thoroughly proficient in modern languages. If I had not known enough of the French language to do this work the priceless store of information in these Terre Noire researches would probably never have been appreciated by me, and my early alloy papers might not have been written at the time they were. It was this assistance, simple as it may be, which enabled me to be first in the field. It was also largely through the research and efforts of Terre Noire that it became possible to produce rich ferromanganese in the blast furnace, so that instead of costing £90 per ton, as it did, it can to-day be obtained for some £8 to £10 per ton. Their work has therefore proved of immense value to the world.

SIR ROBERT'S OWN WORK

Speaking of my own personal work, which I would fain avoid, but on an occasion like the present there seems no alternative, I may say that it required a considerable time, some 10 years or so later than the above-mentioned data, before my research bore fruit, manganese steel, as it is termed, being one of the first results. This, as you all know, is a world-wide product, and has found an important and useful place in the arts. I believe, too, that my work on this subject, which I presented to the Institution of Civil Engineers, also the Iron and Steel Institute in 1888 and 1889, was the first presentation of a systematic study with regard to the addition of a special element other than carbon added to and alloyed with iron. Faraday conceived the same idea of studying iron alloys about 1830, and had an interesting series of them made in Sheffield, but at that time the results were naturally imperfect in nature, and were not carried sufficiently far to be either of practical or scientific value. Since my first paper was read a wonderful race of alloy steels has been born, many of them now strong giants, interesting not only from a scientific point of view, but of great practical value. It was a great satisfaction to me when I found that my friend, Dr. Arnold, saw the great importance of this branch of research, and in his turn, with most valuable papers, many of them classics, has so vigorously helped on this important work.

Dr. Arnold, at an early age, grasped the point which many scientific men even now seem to fail to understand, namely, that to know and understand any particular or special kind of steel, also to be able to gauge its qualities, there must be thorough correlation in researches of this kind. Most scientific men in former days who were not metallurgists obtained specimens of steel upon which to experiment, and thought that it was quite sufficient to say that their examination had been carried out, for example, upon a bar of carbon steel; even if the carbon percentage was stated, there the data usually ended. We know now—as shown in my original papers in 1886 and onward, describing manganese iron or manganese steel, silicon steel, aluminum, nickel steel, chromium and tungsten, and many other iron alloys, and further followed up by the accurate work done by the head of our metallurgical department, Dr. Arnold—that we must have complete correlation, including not only composition but mechanical tests, microstructure, very complete chemical analysis—in many cases such data have now to be obtained with regard to twice the number of elements formerly determined—electrical and physical properties.

To fully understand the qualities of any particular type of iron or alloy steel is not an easy matter, and generally requires those having a particular and experienced turn of mind, combining not only scientific but practical knowledge. As mentioned in one of my papers 14 years ago—and it is as true to-day—"Never probably were the properties of any metal as much probed and examined as those of the metal iron and its alloys. It can be safely answered in the affirmative that the numerous physicians engaged in its diagnosis, guarding its welfare, curing its defects and improving its physique, will in the future as in the past obtain results rendering it of still greater use than ever before to mankind." Having until now been an unqualified practitioner, I can now claim, thanks to the honor you have paid me to-day, to be a fully qualified doctor. Just where the next improvement in the world of iron and steel is to take place I confess is very difficult to say. We want, and shall probably in due time get, another Bessemer, Siemens or Sorby; it may perhaps be some student now here, who knows? The marshal's baton may be in any knapsack; it is always there waiting to be grasped. The research work we metallurgists undertake represents the great truth of the Chinese proverb that he who holds the iron of the world will rule the world. It is not, however, merely holding the iron of the world—China herself does that, having, I believe, the largest known deposits—but understanding the properties of that metal which will make us masters of the metallurgical world.

HIS NUMEROUS PAPERS ON METALLURGY

After my first paper on manganese steel I followed this with a considerable number of other papers with regard to the effect of silicon, aluminum, chromium, nickel, cobalt, tungsten, copper and other elements upon iron. My labors have resulted in some 32 different papers, read before various scientific and technical societies. Among other discoveries, several of the steels I invented for electrical purposes have been found of great practical value. In a paper presented to one of the scientific societies, a well-known professor has stated that my inventions in these products alone have effected savings, in this country and abroad, amounting to figures which run not merely into thousands, but hundreds of thousands of pounds annually. To have given such assistance in the arts of peace is no little satisfaction to me.

My paper on "Experiments Relating to the Effect on Mechanical and Other Properties of Iron and Its Alloys Produced by Liquid Air Temperatures," in which I received such admirable assistance from Sir James Dewar, F. R. S., represented not fewer than 2000 individual observations, and contains data which I cannot help thinking will be found for many years to come of valuable practical assistance to the metallurgist.

It is indeed a great pleasure and satisfaction to find that the work I started in 1888 has borne such good fruit, and proved of benefit not only to my native city but more or less throughout the world. I would here acknowledge not only the cordial and valuable help I have received from those in my own research department, but also from many important scientific friends and metallurgists in this country, Europe and America. It has indeed been a great pleasure to me that my work has brought me into friendly personal and intimate touch with other fellow workers—alas! many of them gone from us—in the same and other fields, including not only those of my own city and nation, but in the great American republic and Europe.

CREDIT TO OTHERS

I will not weary you by reading the names of those to whom I refer, but give them in my printed notes, as they may be useful for reference by our younger men. The list is necessarily incomplete, and is one rather of a personal nature, representing chiefly those personally known to me; yet at the same time these names, I believe, represent most of those who have helped on metallurgy during the last 25 or 30 years. With nearly all of them I have been in touch regarding metallurgical research, either orally or by correspondence; in fact, I think the only one among this list whom I have not personally met was the late Sir William Siemens.

In Sheffield I refer to Sorby, Greenwood, Vickers, Reynolds, Hicks, Arnold, McWilliam, O'Shea, Williams, Ripper, Saniter and others. Elsewhere in England, Percy, Bessemer, Siemens, Snelus, Gilchrist, Richards, Martin, Abel, Bauermann, Kelvin, Baker, Bell, the Hopkinsons, Fleming, Ewing, Barrett, Lodge, Tutton, Mond, Crookes, Riley, Spencer, Roberts-Austen, Stead, Bottomley, Kennedy, Dewar, Turner, Rosenhain, Carpenter, Harbord and many others.

In Europe, Moissan, Osmond, H. le Chatelier, A. le Chatelier, Guillet, Pourcel, Frémont, Charpy, Grenet, Girod, Dumas, Guillaume, Ledebur, Wedding, Heyn, Ehrensberger, Martens, Borchers, Brinell, Akermann, Benedicks, Tschernoff.

In America, Fritz, Howe, Jones, Holley, Campbell, Raymond, Kirchhoff, Stoughton, Cushman, Sauveur, Knowlton, Burgess, Woodward, Dudley and many others.

As I have mentioned, the list does not pretend to be a complete one, and no doubt some names are omitted, but I have been personally in touch with nearly all those mentioned, and happily most of them are still with us.

To aid us in the continuance of this work, and to maintain our position in the world of metallurgy, we have now the valuable assistance of our university. I say most positively, and it is my firm conviction, Sheffield would not to-day hold the position it does—not merely on the scientific side but also the commercial—but for the work started in the applied science department of our university years ago by the foresight as well as the liberal financial assistance of those whose names I have previously referred to, including specially that by the late Mark Firth, Sir Frederick Mappin and Dr. Clifton Sorby, then wisely assisted by our City Council, both as regards financial and other assistance.

TRIBUTE TO SHEFFIELD UNIVERSITY

To my mind, if it had not been for the manner in which metallurgical training has been conducted by our university there is no doubt that more than one erroneous theory, with the attendant evils, which sooner or later have to be unlearned, would have arisen. Errors delay true advance, and one of them would have now held its sway, to the detriment (at least so it seems to me) of the true advancement of metallurgical science and knowledge. I refer to the allotropic theory of iron and the hardening of steel as being due to the presence of a so-called adamantine Beta form of iron. I say this with all respect to those who have fought against us. Thanks to our City Council's wise provisions, Dr. Arnold and his staff have been able by scientific research to show the error of this theory, and to-day Sheffield is to be congratulated upon having been the means by its correct research work of avoiding this pitfall. Here, therefore, we have a concrete example of the excellent work the Sheffield University has done. An error of this kind, powerfully supported as it has been, to be overcome has to be fought, and there are few who know the long, painful struggle and almost herculean efforts of those who have fought the battle.

In many respects I can truly and proudly claim that the work of our city represents the most sound and accurate metallurgical knowledge of the day. Long may we continue the good work of helping on and increasing this by scientific research. We have not selfishly kept such knowledge to ourselves, but freely disseminated it throughout the world. I do not think I am exaggerating when I state that we Sheffield men can claim to have unselfishly and freely contributed to the world more original research work in the metallurgy of iron and steel than any other section of our empire, or, in fact, of any other nation. This is a fact that Sheffield can well be proud of. Long may this healthy state of things continue, and let our past success be an incentive to the younger men coming up among us to continue the good work and to steadfastly run the race which is set before them.

It is no little satisfaction to be able to state these facts when there are still some in our midst who always seem to be thinking that old England is ever taking a back seat and has not kept up with the times. Nothing is farther from the truth, and again I say, let our successful efforts in the past be an encouragement for the younger men in our midst to continue to ever keep Hallamshire in the front rank.

OTHER NATIONS ENGAGED IN RESEARCH WORK

We must not forget that other nations are paying great attention to this question of research. The Reichsanstalt in Germany has done great work, and while I was in Washington I visited the Bureau of Standards, which I found to be admirably organized and equipped. The National Physical Laboratory, too, in this country is doing excellent work. Very large sums of money are freely granted, but money is not everything in research. At the back of it all are the brains which direct the research, and there is no reason why we should not in the future continue to lead in metallurgical research as we have done in the past.

I specially refer to this aspect of metallurgy because it enhances the value of the honorary degree of doctor of metallurgy, which has been wisely founded by our university and which you have only previously bestowed three times. Now it is my happy lot to receive this distinction, I want you to understand how much I value and appreciate it, coming as it does not only from my native city, but from a city which leads the science of metallurgy.

As I have said, do not let our past success cause us to rest on our oars. May I therefore here say a few words about the value of research, some of which I have referred to in a presidential address given some time ago, but which is quite as true to-day. In progressive manufacture, the complexity of which increases year by year, there are, in addition to the many ordinary difficulties met with, those of how to solve new problems which constantly present themselves. This can only be done by research, which should form an actual part of industrial operations and demands almost as much attention as is devoted to the manufacturing side.

I have recently received from Messrs. Krupp an interesting and most instructive booklet with regard to their new research laboratory, completed at enormous expense and thought. I congratulate them heartily upon their wise expenditure. Nothing is more calculated to keep their works in the prominent position it has occupied in the past. They, too, have given much research work freely to the world, and in no spirit of envy or ill-will should we begrudge advance by another nation. Science is cosmopolitan, free and open to all. The best will win the race. I, for one Englishman, am not afraid to face the future, and feel that if we are true to ourselves it contains an even brighter future than our glorious past, but do not let us rest upon our oars. As one who has carried out many researches in metallurgy, and has also benefited by the scientific investigation of others, not only in this country but elsewhere, I cannot too strongly insist upon the practical importance of research. It is more than ever necessary not to rest satisfied with the knowledge of to-day, or to think that this will satisfy the needs of to-morrow. Rapid and great changes are constantly occurring in metallurgy as in other branches of scientific knowledge. In the Royal Society, too, we have probably the most unselfish body of men in the world engaged in pure research.

Sir James Dewar has pointed out the comparatively small cost of research work, and that the whole cost of a century's research experiments at the Royal Institution, of which he is the able head, had been only about £120,000. What an insignificant sum to pay for the benefits mankind has received from the splendid investigations of Young, Davy, Faraday, Tyndall, Dewar himself and others! Yet most of these labors were carried out *honoris causa*, not for immediate material benefit.

Finally, may I say that the astronomer may investigate the worlds around us; the electrician, the physicist, the chemist and the mathematician may study phenomena of the greatest intricacy, but I venture to claim that the metallurgist, though his rank may appear somewhat humbler, yet has to solve problems not less difficult nor less important. Moreover, he must have a combination of knowledge not easy to acquire. He can therefore well claim that his profession entitles him to take a place round the council board of the international universities of science.

If we are inclined at times to think we have reached the height of human knowledge, let us remember the words of the late Lord Salisbury, no less a philosopher than a statesman: "We live in a small, bright oasis of knowledge, surrounded on all sides by a vast unexplored region of impenetrable mystery, and from age to age the strenuous labor of successive generations wins a small strip from the desert and pushes forward the boundary of knowledge."

Every year the Cleveland Engineering Society arranges an outing trip to inspect manufacturing plants of interest. This year it was decided to go to Lorain and visit the plants of the National Tube Company and the American Shipbuilding Company in that city. The trip was made September 12 in special cars on the Lake Shore Electric Railway. A large number of the members of the society attended and found much to interest them in looking over the two plants. Following its usual custom, the society has not been holding meetings during the summer. It will resume its regular sessions with a programme meeting September 26.

The New Comptometer

Designed for the Addition of Feet, Inches and Fractions

For use in drafting rooms and other lines of work involving the handling of plans a new model Comptometer has been brought out by the manufacturer, Felt & Tarrant Mfg. Company, 1713 North Paulina street, Chicago, Ill. This new type was especially designed for this class of work, and the distinguishing feature is the including of two columns of keys for the addition of inches and fractions of inches in eighths. This enables it to be used for the assembling of the detail measurements of overall dimensions in construction plans and eliminates the monotony of doing this work mentally. Fig. 1 shows the new machine, while one of the Comptometers in use in a drafting room is illustrated in Fig. 2.

Where a considerable number of measurements involving feet, inches and fractions of inches are to be collected and totaled by mental calculation it is first necessary to arrange them in a column and after reducing the fractions to a common denominator to add them up. With the Comptometer the same result is accomplished by merely pressing the keys corresponding to each whole number or fraction in feet and inches. In this way the adding and checking of detail measurements of a latticed column, a steel girder or a building plan becomes a purely mechanical operation, and one that is entirely automatic as far as the computation is concerned. Instead of assembling the measurements of rivet spacings indicated on a plan by first setting them down on paper and then footing them up, the draftsman sets the machine beside his work and collects the figures in succession by a single key stroke for each, whether it be a fraction, a whole number or an integer and a fraction. No error results if two or more keys are struck at once, and it is possible with a little practice to depress from four to eight keys simultaneously, the only restriction being that no two shall be in the same vertical column.

In addition to handling work of this nature the machine has a still wider range of usefulness, since it is equally well adapted to other forms of calculation common to engineering practice and general accounting. All computations involving addition, multiplication, division and subtraction can be readily performed. The method of operation is by no means intricate, since the machine is operated solely by keys like a typewriter. The touch system of operation can be employed just as well as with a typewriter, thus enabling the operator to concentrate his attention upon the work before him and so mininizing the danger of misreading figures, since the keys in a column are alternately concave and flat topped. Practically anyone who knows figures can learn how to add, multiply, divide or subtract in an hour, while speed and accuracy in every form of calculation are readily acquired by practice.

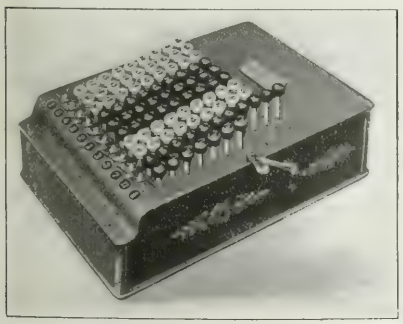


Fig. 1—A New Comptometer for Drafting Room Use Made by Felt & Tarrant Mfg. Company, Chicago, Ill.

One of the special fields for which the Comptometer is adapted is the making of estimates. In the office of a large structural steel contractor the engineering department makes up a bill of material for use in preparing estimates on the fabrication of structural steel for office buildings, bridges, etc., as soon as the drawings of the



Fig. 2—The Machine in Use.

structure are completed. This bill contains an itemized list of all the material of every description entering into the job, which for an ordinary office building of ten stories would include approximately 100 sheets of items to be figured and totaled. For making the calculations of the weight of steel and its value a 10-column machine is used. This work formerly required the services of three men working constantly, but with the Comptometer it is possible for one operator to do this work in about 60 per cent. of the time formerly required, the remainder being devoted to the figuring of material for the store keeping department, including material received from rolling mills and material issued on contract. All of these calculations are extensions involving multiplication. In addition to this ten-column machine the time-keeping department of this company employs an eight-column machine, which not only has taken the place of two clerks, but enables the work to be gone into much more in detail than was formerly the case. Other classes of work upon which one of these machines can be used include the figuring of stresses in a structure, with the accompanying large volume of calculations, compiling the data of tests with the result that a stenographer can be employed to do the figuring which formerly required the services of a high-priced member of the engineering staff, making up the pay roll, distributing the material, labor and other charges on a construction job and compiling operating records.

The File Trade.—A prominent file manufacturer describes conditions in that trade as exceedingly unsatisfactory. Business is not only very quiet but no indications yet appear of a revival of demand during the fall months. Buyers, for supply houses in particular, are making strong efforts to depress prices. Some of them, instead of asking for quotations, are making offers that are fully 25 per cent. below the market of the beginning of this year. The tendency of this attitude of the supply trade is to send the manufacturer directly to the consumer, even when the latter may desire to purchase only small quantities. It may be added, however, that hope has by no means been abandoned that a revival of some degree of activity may occur before the closing in of winter.

A natural gas well in Alberta, Canada, has tapped an enormous supply and is now running 29,000,000 cu. ft. a day. It eclipses in volume anything hitherto found on this continent.

Atlas Crude-Oil Engine

New Diesel-Type Engine with Noteworthy Performance

The impetus which the use of crude oil as engine fuel has been gathering and the contemporaneous development which the fuel oil engine has undergone are conspicuously shown in the new Diesel-type crude-oil engine which the Atlas Engine Works, Indianapolis, Ind., has brought out. The fact that the new engines are large in size—300, 450 and 600 hp., for example—and the prominent identification for years with the steam engine industry of the Atlas En-

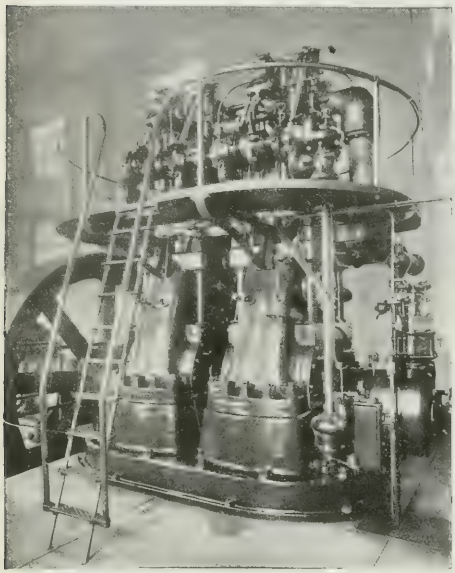


Fig. 1.—Atlas Crude-Oil Diesel-Type Engine Built by the Atlas Engine Works, Indianapolis.

gine Works speak much for that institution's belief in the future of the fuel oil engine. In fact the record of the Diesel engine, both here and abroad, in manufacturing plants and on war and merchant vessels has brought forth the expression from the company that it is the machine destined to replace steam power. It is to be recalled that the wide and large use of gasoline has, in its distillation from crude petroleum, produced supplies of fuel oil much in excess of the demand. The admitted high thermal efficiency of the internal combustion engine is the other factor of importance and the Diesel engine works under the four-stroke cycle without needing ignition devices or carburetors, a peculiarity regarded as highly favorable from an engineering and commercial standpoint.

The accompanying illustrations will assist in gaining an idea of the Atlas oil engine. Simplicity in operating parts and measures to maintain a maximum of the inherent high efficiency of the type of engine are emphasized. It is not felt necessary to refer to the general arguments in favor of the oil prime mover, such as small space requirements as compared with the steam-engine equipment. In the first stroke of a cycle air is drawn into the cylinder; then the air is compressed on the next or return stroke, developing a temperature of about 1000 deg. F.; then, on the working stroke, a fine spray of oil is gradually and steadily injected into the cylinder, and, the temperature of the compressed being high enough, gradual combustion ensues without explosion. The oil supply is dependent on the power requirements of the moment, controlled by the governing mechanism, and indicator cards show that the pressure and temperature in the cylinder do not rise appreciably above that due to the compression of the air, or 500 lb., and that the burning of the oil produces an impulse having a time element and relieved gradually with the expansion of the burned charge. The fourth stroke is the usual scavenging action, to rid the cylinder of the products of combustion. The temperature for ignition, as explained, is obtained solely by compression of the atmospheric air, without heater, hot plate, magneto or other device. The spray of oil, which is mixed with a jet of air at 900 lb. pressure, is introduced through a small nozzle during one-tenth of the working stroke, at a rate calculated to maintain temperature and pressure practically constant during the combustion period.

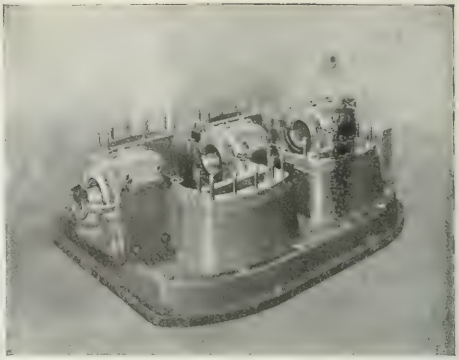


Fig. 2.—Base of the Atlas Crude-Oil Engine.

The engine is of the vertical single-acting inclosed type. The base, shown in Fig. 2, is a single deep casting containing housings for the main bearings and forming reservoirs for crank lubricating oil. The A-frame over each crank is cast in one piece with cylinder and water jacket. All valves, admission, exhaust, fuel, starting and relief, are attached to the cylinder heads, and are accessible from the outside, and need not be disturbed when the heads are taken off. They are driven by positive means and the lay shaft with eccentrics and cams is shown in Fig. 3. The pistons are of the long trunk type.

The general economy of the engine is indicated in some tests made by C. E. Sargent, mechanical engineer, Chicago, covering performance for different loads. A two-cylinder engine, with 20 x 30 in. cylinders, direct connected to a 250-volt, direct-current Fort Wayne generator of 175-kw.

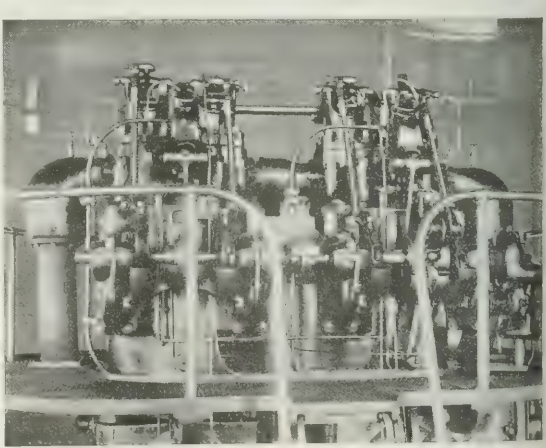


Fig. 3.—Valve Mechanism and Gallery from Which it is Accessible.

capacity, run at 175 r.p.m., and working in parallel with the remainder of a works' power plant, was tested. A shop load of lights and motors was used, maintained as near constant as possible by hand manipulation of a rheostat. The engine had run about 2800 hr. under load. The results, a table of which has been taken from Mr. Sargent's report, showed that the oil consumption per 100 kw.-hr. was less than 10 gal. through a wide range of load. The engine developed 1 b.h.p. on less than ½ lb. of fuel oil, which at the average calorific value of 19,000 to 19,500 B.t.u. per pound and a weight of 7.3 lb. per gallon, gives for oil costing 2 cents per gallon 100 kw. of power for a 10-hr. day for $2.

Copies of the Sargent test will, it is stated, be sent to those whom the company thinks are sufficiently interested, but an illustrated book has been prepared for

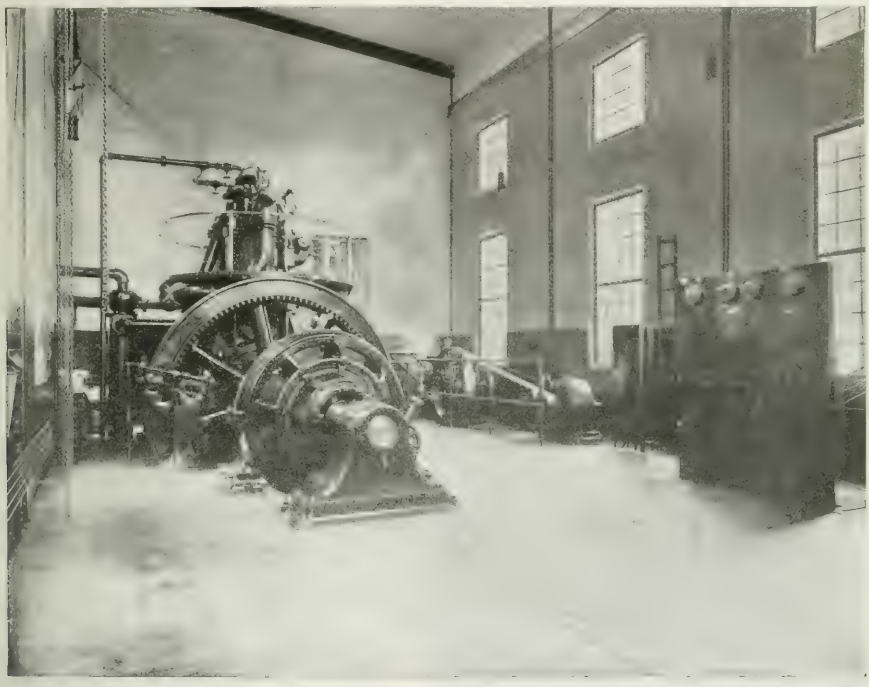


Fig. 4.—Complete Installation of a 300-b. h.p. Atlas Oil Engine Direct-connected to a 200-kw. Electric Generator.

general distribution, discussing the subject of the engine and comparative motors in an usually interesting and instructive style. For example, it is shown how the crude oil engines saves about 45 per cent. of the heat required to operate a producer gas plant, and about 80 per cent. over steam in continuous operation, not to mention that no fuel is consumed when the engine is not running. The Sargent report gives the logs of the different tests and sample indicator cards, which are highly elucidating, and besides commending the design speaks of the speed regulation as not surpassed by the best Corliss engines.

The American Institute of Chemical Engineers will hold its fourth annual meeting in Washington, D. C., December 20, 21 and 22. Papers will be presented on the general subject of patents and on the manufacture and testing of explosives as well as on a number of other important chemical engineering subjects. One day will probably be devoted to visits to the technical chemical engineering plants in Baltimore and vicinity. Visits to laboratories and other points of interest in Washington will also be arranged. John C. Olsen, Polytechnic Institute, Brooklyn, N. Y., is secretary.

The structural section of the Engineers' Society of Western Pennsylvania held its first fall meeting in the society rooms, Oliver Building, Pittsburgh, on September 5. The meeting was devoted to a general discussion of nonmetallic roofing materials. The principal paper was read by W. S. Babcock, waterproofing engineer of the Barrett Mfg. Company, New York, on "Built-up Roofs." A discussion on concrete roofs was led by W. M. Kinney, inspecting engineer Universal Portland Cement Company, Pittsburgh. A discussion on Carey roofing was led by C. R. Kirkpatrick, superintendent of construction Philip Carey Company, Chicago.

One Steel Corporation Investigation Ended

Concerning the inquiry into labor conditions, trade methods and other phases of the operations of the United States Steel Corporation, which the Department of Commerce and Labor has had under way for some time, Secretary Nagel is quoted as follows:

"We have about completed our investigation of the Steel trust, which will cover several volumes, containing as many words as a big family Bible. In investigating a corporation we start to know its purpose; to learn whether it carries on business in accordance with its charter; its methods, profits and losses, wages and prices, costs of materials; whether it has combinations with railroads whereby it gets unfair advantages, and whether it is in a conspiracy to control or make prices. The Steel trust gave us great aid, throwing open all its books. This has been so with most corporations. It was not so with the Tobacco trust, but the recent decision may make that organization more compliant. At the end of the last fiscal year work was still pending on the lumber, steel and tobacco industries, International Harvester, water transportation and concentration of water power. Some of this work has since been completed. We are now making a directory of business houses which handle imported merchandise in all foreign countries."

E. H. Titchener & Co., Binghamton, N. Y., are constructing an addition to their factory, 42 x 50 ft., which will provide necessary additional room. The firm manufactures staples, wire shapes, nails, double-pointed tacks, etc.

The Sintering of Mayari Iron Ores in Cuba*

Transportation, Handling and Nodulizing Equipment of the Spanish-American Iron Company—The Plants at Felton and Woodfred

BY JAMES E. LITTLE, STEELTON, PA.

Of the several extensive deposits of brown iron ore in Cuba, including those of Mayari and Moa, that of Maayri was the first to be systematically explored, and was selected as the scene of the first operations in the development of this class of ore. Construction work, begun in the spring of 1907, involved the building of 16 miles of standard gauge railroad and two large double-track inclines, the installation of mining machinery, a nodulizing plant, power plant, shops and shipping facilities, and the dredging of an extensive basin for deep draught vessels. Unusual weather conditions delayed the completion of



Fig. 1.—View from the Top of the Lower Incline Connecting Mayari Mountain with the Gravity Yard at Piedra Gorda.

portions of this work, so that the entire plant was not in operation until December, 1909.

The ore in its natural state contains a very large percentage of water, which increases to some extent with the depth below the surface. Near the surface it is red in color, with somewhat granular structure. The color gradually changes with depth, finally reaching a bright yellow. The consistency also changes towards the bottom to a clay-like, sticky mass. The relative proportion of red and yellow ore is quite variable; in some places the yellow reaches close to the surface, while in others the red extends almost to the underlying serpentine.

General Features of the Mining and Transportation Systems

The ore of the Mayari division of the Spanish-American Iron Company lies on an irregular plateau about 15 miles long and 5 miles wide at the widest point, entirely covered with pine trees and brush, which grow directly on the ore. The elevation at the northern extremity, which is approached by the railroad, is about 1700 ft. above sea level. At the southern end the general elevation is about 2000 ft. Ore is removed by means of scraper-bucket excavators and steam shovels, these machines loading into special standard gauge, side-dump steel cars of 100,000 lb. capacity. A short haul brings these cars to the head of an inclined plane, 6800 ft. long, and of varying grades from 6 to 25 per cent. From the foot of this upper incline there is a short railroad about a mile long to the head of a second incline, 1950 ft. long and of 25 per cent. inclination. This lower incline ends in a gravity yard at an elevation of 130 ft.

The ore is therefore lowered by the inclines and connecting railroad through 1491 ft. vertical height, from elevation 1621 to elevation 130, the track distance being 2.44 miles. Both inclines are double track, 14 ft. center to center. Empty cars coming up on one track partly counterbalance loaded cars descending on the other track.

The main cables, 3 in. in diameter, pass over heavy drums, 20 ft. in diameter, at the head of each incline. Each end of the cable is securely fastened to a "barney" car, against the spring buffer of which the ore car rests. The speed is controlled by a steam engine geared to the drums and by post brakes operated by steam.

From the gravity yard at Piedra Gorda, at the foot of the lower incline, ore is carried over a single track standard-gauge line, 13.45 miles long, to Felton on Nipe bay, where a nodulizing plant for drying and sintering the ore is situated. The name Felton was selected for the principal town in honor of Edgar C. Felton, the president of the Pennsylvania Steel Company, of which the Spanish-American Iron Company is a subsidiary corporation.

The nodules produced are stocked under a traveling bridge at the wharf in position for prompt loading with grab buckets into vessels for shipment to the United States.

The common labor employed comes principally from the northern provinces of Spain. Many Cuban mechanics and laborers and a few Jamaicans are also employed. There is, of course, quite a colony of American engineers, clerks, mechanics and others holding positions of responsibility.

The mining settlement, Woodfred, so named in honor of the president of the Maryland Steel Company, is magnificently situated on the ridge of Mayari mountain, overlooking the beautiful Mayari valley, studded with royal palm groves and tobacco fields, and in the distance the sugar cane fields of the Nipe Bay Company along the shores of Nipe Bay and Banes Bay.

The contour of the ground at the point where excavations were begun, though appearing to be quite regular, is not ideal for steam shovel operation. The depth of ore is not uniform, in many places the underlying rock projecting far up into the ore, even to the surface. The general slope of the ground, even in the most nearly level places, is quite irregular. Therefore, it is difficult to find many places where it is possible to operate a steam shovel for an extended period in a cut of economical depth, without including a considerable portion of the rock with the ore excavated. For this reason the scraper-bucket excavators are more satisfactory as well as more economical for excavation, although their capacity is considerably less

*From a paper prepared for the Wilkes-Barre, Pa., meeting of the American Institute of Mining Engineers and published in the Bulletin of the Institute for August, 1911. Articles on the Mayari iron mines appeared in *The Iron Age* of August 15, 1907, p. 421; April 9, 1908, p. 1149; August 26, 1909, p. 614; April 13, 1911, p. 914.

than that of the large size shovel used. Three of these excavators are now at work, together with one 90-ton Bucyrus steam shovel. The excavators operate 1.25 cu. yd.

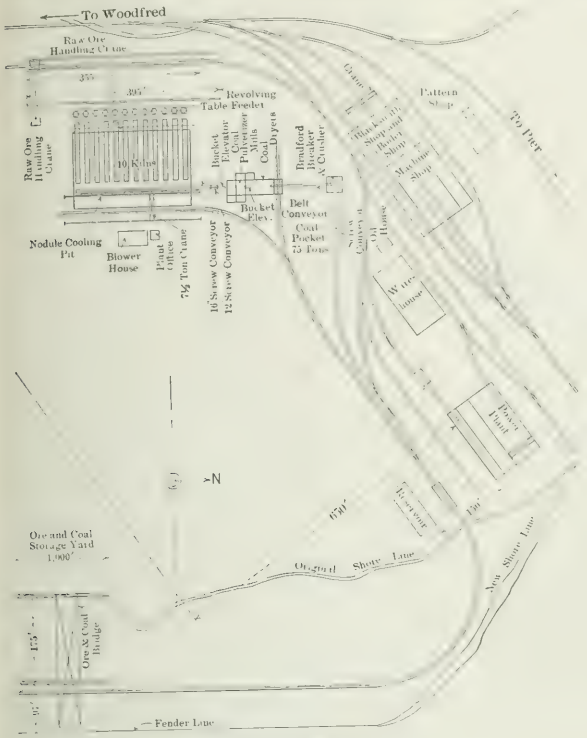


Fig. 2.—Plan of Works at Felton.

Page buckets, although a larger capacity of bucket is contemplated. The bucket swings through a radius of 60 ft. and without difficulty removes all the ore for a width of about 100 ft. down to the rock bottom, the projecting rock and stumps being discarded. Each machine crew consists of one operator, one fireman, and three pitmen.

Operation of the Ore Incline

As the machine works up hill or down hill continually, and the track alongside follows the same grade, cars can be dropped down by gravity to be loaded as needed, with a minimum amount of locomotive service. Three heavy shifter type locomotives serve the shovel and excavators, and deliver cars to the head of the upper incline. Here the tracks have grades arranged so that cars, when the brakes are released, will run to the incline and the empties coming up will run off on another track. At present two cars are lowered over the incline at once, although when desired three cars may be so handled. A brakeman travels up and down with each car to control the brakes at the beginning and end of the trip.

Both inclines are operated on the tail rope system, the main cable on the upper incline being 3 in. in diameter, of six strands of 19 wires each, of plow steel, with a 1⅛-in. independent wire-rope center, the latter also having six strands of 19 wires twisted around a hemp core. Its breaking strength is estimated at 377 tons. The total length of this cable, manufactured by the John A. Roebling's Sons Company, is 7810 ft., and its weight exceeded 123,000 lb. The successful manufacture, transportation and installation of this unusual cable in its present position is a feat of engineering well worthy of notice. Along the track at intervals are rollers, 10 in. in diameter, supporting the cable. These rollers, turned from well-seasoned native hard wood, are carried by a 1/5-in. axle which runs in simple hard wood bearings spiked to two ties.

At the upper end of the incline the cable passes over two drums, 20 ft. in diameter, set tandem, both carrying heavy gears which mesh with a common pinion, 58.5 in. in diameter, on a center line between the drums. There half turns are made over each drum by the cable. The pinion shaft is also the crank shaft of a pair of 30 x 30-in. vertical engines which are used in accelerating the moving parts and to carry the cars over certain parts of the incline where the descending loaded cars are on too low a grade to pull the empties up a steeper grade. On each drum are two pairs of post brakes operated by steam, the load being applied by a weighted lever acting through

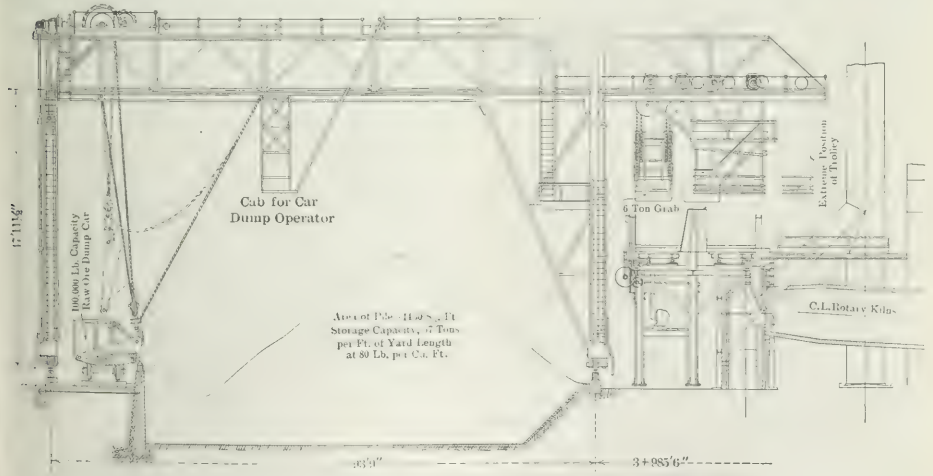


Fig. 3.—Section Through Raw Ore Yard and Feed End of Kilns (Looking South.)

an eccentric. The surface of the drum is lagged with hard wood for the brake shoes to act upon. Grooved wooden lagging is also used on these drums for the cable to pass over. The drums are carried on a shaft 24 in. in diameter in center, with bearings 21 in. in diameter. The construction of the drums and machinery is very massive.

steel castings being used for almost all parts. All of this material was furnished by the Nordberg Mfg. Company of Milwaukee, Wis.

The machinery house is 221 ft. back from the head of the incline in order to provide for the crossover tracks from either incline track to load and to empty track. Spring switches are used except one, which is free, being thrown by empty cars coming up to the correct position for the next loaded cars going down. Safety switches

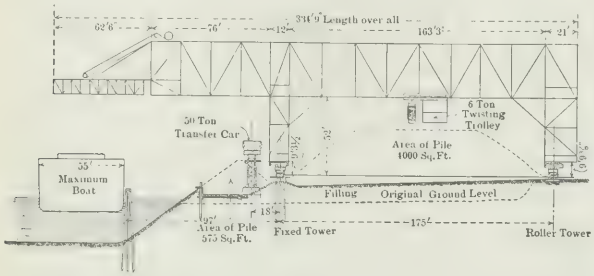


Fig. 4.—Section Through Ore and Coal Storage Yard (Looking South).

are located on the mine railroad and at the head of the incline to prevent damage by cars running away. The contour of the upper incline, starting from the top, is as follows:

582 lin. ft. on 25 per cent. grade.
2175 lin. ft. on 17 per cent. grade.
1917 lin. ft. on 6 per cent. grade.
1829 lin. ft. on 25 per cent. grade.

At the foot of the last slope the contour ends in a parabolic vertical curve 700 ft. long, connecting the 25 per cent. grade with the 1.4 per cent. grade. An indicator in front of the operator in the machinery room shows the position of the cars during the trip. In addition there is a complete electric bell signal system and an independent telephone line to provide for communication between the top and bottom of the inclines. The main rails on incline are 100 lb. per yard. Between these is a barney car track of 36-in. gauge, using 56 lb. per yard rails.

The connecting railroad from the foot of the upper incline to the top of the lower line is arranged with suitable crossover tracks so as to facilitate handling the cars up and down by one locomotive, which is of the same type as those used on the mine railroad. Gravity tracks at both ends provide for handling cars to and from the inclines.

The lower incline, arranged exactly the same as the one above, is 1950 ft. long, with a uniform 25 per cent. grade ending at the bottom in a long vertical curve. The cable used is of the same diameter as the upper incline cable in order to keep the machinery details uniform, but, as the length and weight of cable is much less, it is made of cast steel instead of crucible steel and has hemp center instead of an independent wire rope.

At the foot of the lower incline is the Piedra Gorda gravity yard, where loads are made up into a train by gravity, and empties, taken from train by a switch-back arrangement, are run to the foot of the incline. Fig. 1 is a view from the top of the lower incline, showing the Piedra Gorda gravity yard. The main line railroad leads off to the right towards Felton. The Mayari Valley and Nipe Bay are shown in the background.

The main line railroad from Piedra Gorda yard to Felton, first class in every respect, is single track, 90-lb. A. S. C. E. standard rails, laid on native hard wood ties, ballasted with rock. The locomotive which handles the trains on the main line is of the consolidation type, with leading truck and trailer wheels, cylinders 19 x 24 in., capable of hauling a 45-car train of ore, weighing about 3200 net tons, from Piedra Gorda to Felton. The maximum grade is 0.5 per cent. in favor of loads, and the maximum curve is 6 deg. All bridges are of steel.

The Nodulizing Kilns

At Felton, the terminal on Nipe Bay, the trains, after weighing the cars, are delivered to a track on the west side of the raw ore yard, where one side of a car rests on a sill wall. A plan of the works at Felton is given in Fig. 2, and Fig. 3 is a section through the raw ore yard and the feed end of kilns, looking north. The full length of the yard is 750 ft. Two electric gantries carrying trolleys with 6-ton grab buckets cover this distance and handle the ore from the yard to the kiln feeders.

The gantries also carry machinery for dumping the ore cars. A pair of hooks suspended from hoisting drums are guided by means of "tag lines" so as to engage with pins in the door on the front side of the car. In raising, the door turns about hinge pins situated on the back side of the car so that when the door is raised to its full hight, through about 90 deg., its frame is in position to serve as a link in lifting the back side of the car body off of the under frame through a sufficient angle to discharge its load over the sill wall on which the front of the car body rests. As a rule cars will dump when raised to 45 deg.; or perhaps a little higher, if the ore is particularly wet and sticky.

The nodulizing plant, located on the east side of the raw ore yard, consists of 12 rotary kilns, 10 ft. in diameter, and 125 ft. long, set at an inclination of 5/8 in. per foot, and 20 ft. apart. The kilns are of the type commonly used in the manufacture of cement. The diameter, however, is unusually large in order to overcome trouble from "ringing up" in the hot zone, which often causes serious delays in the operation of kilns of smaller diameter. Each kiln is carried by two steel tires rigidly fastened to the shell. The cut steel driving gear attached to the shell close to the tire near the cold end is 152.78 in. in diameter, and 4 in. in pitch. Each kiln is driven by a 35-hp. variable speed motor.

To protect the kiln drive motors from heat and dirt they are placed in a tunnel of reinforced concrete running from end to end of the kiln building. Belts from the motors pass through slots in the side wall of the tunnel to the pulley on the driving gear. A fan at each end of the tunnel supplies fresh air.

The kilns are lined for 85 ft. from the hot end with 9-in. firebrick; the remaining 40 ft. has a 6-in. lining. At the upper end each kiln opens into a brick hood connected to the stack, 78 in. in diameter and 90 ft. high above the center of the kiln.

The device for feeding the raw ore into kilns is very simple and effective. A table 19.5 ft. in diameter is revolved at a speed of about one revolution per hour. One side is kept filled with ore by a grab bucket on the raw ore yard gantry, the cantilever extension of which covers the feeder table. Under the edge of the kiln side of the feeder table is a wide hopper ending in a chute set at a steep angle. The ore is gradually and regularly plowed off the table by a fixed deflector, which makes an acute angle with the direction of motion of the ore on the table. The ore falling through the chute is delivered to the kiln several feet from the end.

The sintered ore in the form of nodules falls from the delivery end of the kiln to an open cast-iron chute set at an angle slightly steeper than 30 deg. This chute passes under the floor, delivering the nodules outside of the building into a trough 12 ft. wide and 9 ft. deep below the end of the chute. This trough extends the full length of the kiln building, 240 ft. A small stream of water runs down each trough with the nodules, facilitating the motion and furnishing the water for cooling. A pump is provided to remove any excess of water in order to maintain a depth of 8 or 9 ft. in the trough. A 7.5-ton overhead electric traveling crane, carrying a man trolley with 3 cu. yd. grab bucket, is provided for removing the nodules from the trough and loading them into 50-ton electric transfer cars on the track passing alongside of the trough.

Coal Pulverizing Plant

On the north side of the kiln building the coal pulverizing plant is located. Coal is brought from the wharf in the same transfer cars as are used for removing nodules. It first passes through a Bradford breaker and a roll crusher, which break it down to 0.75-in. size and less, at the same time removing the foreign materials. Crushed coal is taken from the crusher by an 18-in. belt conveyor to the 150-ton storage bin. From the bottom of this bin the coal runs into two rotary driers 48 in. in

diameter, 30 ft. long, in which it is dried to 0.5 per cent. or less of moisture, in order to be in condition for pulverizing. The dried coal is elevated by a bucket elevator to a small bin, which feeds to four 42-in. Fuller-Lehigh pulverizers placed in two pairs on either side of the screw conveyors into which the pulverized coal falls from the bottom of the pulverizers. Motors for driving the Fuller mills, driers, elevators and conveyors are placed in dust-proof brick buildings on either side of the main building; the shafting extending through the walls carries the driving pulleys.

The pulverized coal from the screw conveyors under the mills is taken by bucket elevators to a 16-in. screw conveyor about 300 ft. long, with an opening in the bottom for supplying the coal to small bins opposite each kiln. The bottom of each bin forms a hopper for a short screw which feeds the coal regularly to the low pressure burners.

The blast, 9 oz. pressure at the nozzle of the fan, is supplied by four Buffalo blowers, situated in a separate building to the east of the kiln building. All blowers deliver into a common pipe, which passes over the nodule crane runway, down into the kiln building, and to the various kiln burners.

Ore Storage and Loading

At the wharf is a stockyard 1000 ft. long, covered by two electrically operated ore bridges, one carrying a 15-ton trolley and grab for handling ore, the second a 6-ton grab to be used principally for unloading coal and also as an auxiliary ore bridge. Both bridges have a main span of 175 ft. and a cantilever extension on the water side 90 ft. long, to the end of which is hinged an additional 60 ft. to carry the trolley out over the hatches of vessels in loading ore or unloading coal. The latter extension or boom is arranged to be lifted to clear the ships' upper works in moving from hatch to hatch. Fig. 4 is a section of the ore and coal storage yard, looking south.

The construction at the water front is somewhat unusual. Close to the front leg of the bridge, and parallel to its runway, is a trestle extending over one side of a trough. A transfer car brings the nodules from the nodulizing plant and discharges from one side into this trough in position to be readily loaded into the vessel, or to be moved back to storage under the main span of the bridge by the grab buckets. The bottom of the trough is 1 ft. above high tide. Its outer wall is formed by planking spiked to a row of piles. All of this construction being above the water line, it is not subject to damage by the *teredo navalis*. From the outside of the trough wall the bottom drops off at an angle of 45 deg. to 8 ft. deep at the fender line, which is approximately under the hinge of the boom of the bridge.

Considerable dredging was necessary in order to provide a suitable harbor. A basin 1500 ft. long, 200 ft. wide at each end and 400 ft. wide at the widest point was dredged to a depth of 28 ft. The approach channel, 2500 ft. long and 200 ft. width, was dredged to the same depth. Felton on Cagimaya Bay, a well-protected branch on the south side of Nipe Bay close to its entrance, has proved a very safe and satisfactory harbor.

Shops, Power Plant, Etc.

As a part of the Felton plant a large repair shop has been installed, with ample machine tool equipment, foundry, blacksmith shop and car and boiler repair equipment. The main floor and the yard on the west end are covered by a 30-ton overhead electric traveling crane. All except the smallest machine tools are individually driven by electric motors. A well-arranged lavatory and toilet room is provided for the comfort of the employees. The building covers a space 120 by 260 ft. In a separate building is a carpenter and pattern shop, 40 x 90 ft., containing a sawmill. Near the machine shop is a general warehouse, of steel, 70 x 150 ft., included in which is a bonded warehouse for the use of officials of the Cuban Custom House.

Nearby is the electric power plant, in which are installed three 500-kw., 250-volt, direct-current Crocker-Wheeler generators. Steam is furnished by two batteries of Babcock & Wilcox boilers, each of 880 boiler hp. capacity, operating at 150 lb. pressure. The engines are cross-compound Wisconsin Corliss, with cylinders 20 x 40 x 42 in. Weiss barometric condensers with auxiliary pumps complete the equipment. Coal is delivered to a bin at the west end of the building by the electric transfer car; from this bin it is taken by conveyor to a crusher, and subsequently elevated and conveyed to an overhead suspended bunker, under which is a chute for feeding the hoppers of the stokers. Ashes are handled by an elevator and delivered to a car on a track alongside of building. All the plant buildings are of substantial steel construction covered with corrugated iron, and in most cases having a concrete floor.

To provide accommodation for employees, towns have been established at Felton and at Woodfred. The Felton establishment includes two hotels, three *fondas* or eating houses, a steam laundry, bakery, general store, butcher shop, ice plant, and many dwelling houses of different grades. The general water supply comes from the Mayari River, which is crossed by main line railroad, about 11.5 miles from Felton. At this point water is pumped to a tank on the top of a nearby hill, from which it flows by gravity through an 8-in. pipe line to Felton.

At Woodfred a well-equipped hospital has been established under the care of a competent physician and surgeon. Its situation on top of Mayari Mountain is ideal for the purpose. The branch hospital at Felton cares for accident cases and is used also as a dispensary. Sanitary conditions, both at Felton and at Woodfred, are carefully guarded, so that the percentage of sickness among employees is very low.

In addition to the wharf for the receipt of coal and the shipment of ore, there is a pier constructed of creosoted pine, 1700 ft. long, to a point where 25-ft. depth of water is reached. This pier is used for the receipt of general merchandise and machinery and for local passengers. Transportation of ore and coal is handled at present by chartered steamers, ore being delivered to the Maryland Steel Company at Sparrow's Point, Md.

Nipe Bay is a growing seaport, with weekly communication with New York by the Royal Mail Steam Packet Steamers. It is also served by the bi-weekly service of the Munson Line. It lies on the north coast of Cuba, almost directly north of Santiago de Cuba. The northeast trade winds, which blow perhaps from 60 to 80 per cent. of the time, moderate the temperature and make this part of Cuba quite a desirable location for an American colony.

Copper Production and Stock in August

The Copper Producers' Association has issued the following statement for August:

	Lb.
Stock of marketable copper of all kinds on hand at all points in the United States, August 1	137,738,858
Production of marketable copper in the United States from all domestic and foreign sources during August	125,493,667
Deliveries of marketable copper during August:	
For domestic consumption	59,935,364
For export	69,855,660
Total	129,791,024
Stock of marketable copper of all kinds on hand at all points in the United States, September 1	133,441,501

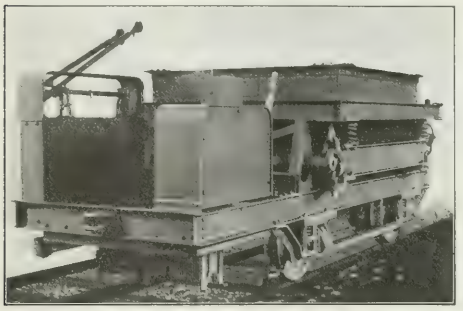
This shows a decrease in stock of 4,297,357 lb. The stock of copper held in the United States is now lower than at any other time since February 1 of the current year. While the reduction in the past month was not so great as in July, it nevertheless shows a continued movement in the right direction.

The Hope Engineering & Supply Company, Pittsburgh, has secured the services of Louis Bendit as manager of its Western office, in the New York Life Building, Kansas City, Mo. He will have associated with him a corps of experienced engineers and will be prepared to give careful attention to all inquiries in consulting and contracting engineering along the line of natural gas. He will also have charge of its sales agencies of Miller gas and oil engines, 25 to 400 hp.; C. & G. Cooper gas engines, 300 to 2000 hp.; Hammon gas pipe couplers, and Sprague gas meters.

The Rateau Steam Regenerator Company, 140 Cedar street, New York, is advised that the Court of Appeals, Hamm, Germany, has sustained the basic Rateau patents on steam regenerators, issuing a permanent injunction against all infringers.

New Atlas Ore Car

For handling ore in steel plants the Atlas Car & Mfg. Company, Cleveland, Ohio, has recently designed and built three scale cars for the Warwick Iron & Steel Company, Pottstown, Pa. The special features of the new design are simplicity of construction and operation, the speed with which the load can be dumped and a form of construction that is claimed to eliminate practically all



A New Scale Car for Handling Ore in Steel Plants Built by the Atlas Car & Mfg. Company, Cleveland, Ohio.

danger of injury to its motor equipment by improper operation.

Heavy steel construction is employed throughout. The car is dumped by hand by a lever conveniently located in front of the hopper and directly back of the motor controller. The dumping lever opens a two-part discharge door which swings out under the center of the trucks and the load is discharged almost instantaneously. The hopper is suspended from a steel frame by springs to protect the scales from jarring. The controller and the weighing mechanism are located at the forward end of the car. The lever connecting with the motor controller regulates the speed, and as this cannot exceed a certain predetermined maximum the motors, it is emphasized, cannot be injured by an inexperienced or careless operator.

The scales, which have a capacity of 20,000 lb., will weigh within 5 lb. of the actual weight, it is stated, and are designed to weigh separately various ore mixtures which may be placed in the hopper to form a load. The scale consists of five loose beams and one main or tare beam, arranged one above the other, and contained in a metal weigh box which can be locked if desired. The capacity of the main beam is the full capacity of the scale, 20,000 lb., while one of the other beams will weigh 15,000 lb., two of the remaining four will weigh 7500 lb., and the other two 5000 lb. each. At the top of the weigh box is a double plus and minus beam marked at 500 lb. on either side of the zero point, its purpose being to enable the operator to determine over or under weight on any beam. In weighing the load the weight is first placed on the minus side of the center at a point which will cause the beam to balance when the load is within a certain amount of that desired. The weight is then placed at the zero point in the center of the beam and additional material placed in the car. If an excess load is delivered the weight is moved to the plus side until it balances it, the excess is noted and the over-weight deducted from the load delivered to the car on its next trip.

The axles run in malleable iron boxes having malleable pedestals and high-grade bronze bearings. The wheels used are of heavy chilled cast iron with ground treads. Two 12½-hp. Westinghouse motors are used to propel the car and the device for controlling the current passing to the motors was made by Electric Controller & Mfg. Company, Cleveland, Ohio.

The following table gives the principal dimensions and specifications of the car:

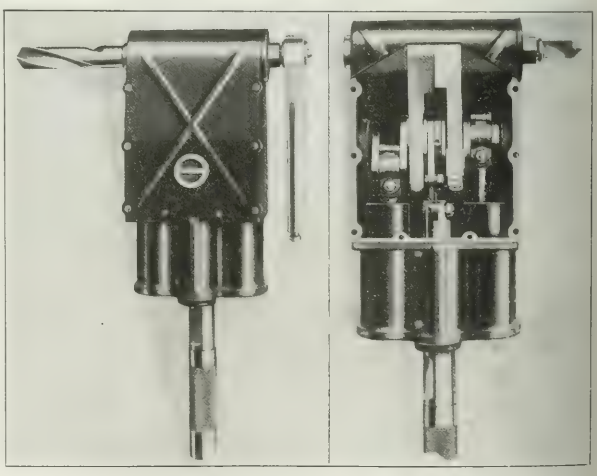
Overall length, ft	16 5 6
Width, ft	7½
Height of car above rail, ft	6
Size of discharge door opening, ft	2x4
Capacity, lb	6
Capacity, cu. ft	125
Diameter of wheels, in	28
Gauge of track, in	3½

Air Drill for Close Quarters

A new close quarter piston air drill, designed for drilling, reaming and tapping in narrow places where a center-spindle drill cannot be used, has been brought out by the Cleveland Pneumatic Tool Company, Cleveland, Ohio. This machine will drill within 1⅛ in. of a side wall or a corner. It is simple in construction, and its makers claim that it has fewer parts than any similar type of corner drill. The drill is made in two sizes, No. 38, with a capacity of a 1¼-in. hole, and No. 49, that will drive a 2-in. twist drill. The accompanying illustrations show an interior and an exterior view of the drill. In both machines the distance from the throttle connection to the outside of the spindle casing is 12 in.; the length of feed 2 in.; the distance from the center of the spindle to the outside of the casing, 1⅛ in.; the width of the casing at the spindle, 6 in. The distance from the point of the feed screw to the end of the socket is 8½ in. in the smaller machine and 9⅝ in. in the larger. Each weighs 26 lb. The spindle speed when running light with 80-lb. air pressure is 240 r.p.m. in the smaller drill and 120 r.p.m. in the larger.

The spindle is placed at the extreme forward end of the machine and the throttle handle at the rear end. The motor consists of two double-acting pistons connected to a crank shaft, which is mounted on annular ball bearings and is provided with eccentric disks. The disks are connected by eccentric straps to two piston valves which control the two cylinders, each valve contro'ling one cylinder. The air is taken in centrally between the cylinders. Power is transmitted from the driving crank to the spindle by ratchet levers which are connected to opposite wrists of the driving crank, their opposing ends alternately engaging ratchet teeth cut on the spindle.

The body of the machine is a single piece steel casting with the piston and valve cylinders cast integral. The advantage claimed for the single piece construction is that it insures perfect alignment for all working parts, doing away with screws, bolts or other attachments to fasten the cylinders to the casing. Owing to the position of the spindle in the extreme forward end and the throttle handle at the rear end considerable stress is thrown on the casing when the drill is running, and with the cylinders and casing in one piece danger of the cylinders



A New Close Quarter Piston Air Drill Made by the Cleveland Pneumatic Tool Company, Cleveland, Ohio.

coming loose from the casing is avoided. The casing is provided with large hand holes, through which access is easily had to the crank and connections. These permit the filling of the case with hard grease for lubricating the active parts and the cover plate seals the machine against oil leakage. The crank, connecting rod, ratchet levers, ratchet pawls, eccentric straps and caps are drop forged. The drill sockets are made to receive the entire length of standard Morse taper drill bits.

Westinghouse Air Brake Business

The Westinghouse Air Brake Company, Pittsburgh, whose works are at Wilmerding, Pa., has purchased a site at Emeryville, Cal., on which it will commence the erection of a large plant for the manufacture of its various products. The plant is not being established with a view of catering to the Oriental trade of the company, as reported, but simply for the purpose of taking care of its Pacific coast business. The company has experienced trouble in making shipments across the continent, as some times damage was done to machinery, and by locating a plant on the coast this trouble will be avoided.

So far in its current fiscal year the business of the Westinghouse Air Brake Company has held up remarkably well. It has received a very large amount of new business from the Interborough Rapid Transit Company, New York City, in connection with the alterations that have been made by the latter, so that it can run 10-car trains. These 10-car trains are being equipped with Westinghouse appliances throughout. Numerous other railroads are installing the new patented brake which the company has perfected, and it is also receiving a large number of inquiries from additional railroads regarding them. The company is operating its plant to a fair rate of capacity with considerable business on its books, and regards the outlook as fairly satisfactory.

Text Book and Blue Print Holder

Patents have been applied for by Robert H. Smith, Massachusetts Institute of Technology, Boston, Mass., on a combination text book and blue print holder. The use of this holder is shown in Fig. 1, while Fig. 2 illustrates the way in which it is attached to the back of a lathe and Fig. 3 gives details of its construction. Among the special advantages claimed for the holder are a saving of time with a corresponding increase in the efficiency of the workman by providing a device for holding a print or drawing, while eye strain is also eliminated as the line of vision is perpendicular. Prints or drawings when held by this holder are not likely to be soiled or damaged and in addition they are kept in the best position for rapid reading.

The print is held in position by gravity as there are no springs, clips or hooks connected with the holder. Referring to the upper portion of Fig. 3, which shows some of the constructional details of the holder, it will be noticed that it is composed of a vertical rod, *a*, on which are mounted two movable parts, *b* and *c*. The upper one of these is free to slide on the vertical rod and its weight holds the mounted print *d* in place. Unmounted prints are held near the upper edge of the inclined surfaces *e* and *f* of the two movable parts, which combine the weight of the weighted lift forming the lower portion of the upper movable member *b* with that of an inclined plane. The part *c* can be adjusted vertically on the rod to locate the print at the proper hight. The rod *a* is attached by a bracket to the machine, as shown in Fig. 2, or if the holder is intended for bench use, a round base is provided.



Fig. 1.—The Holder in Use.

Fig. 2.—Manner of Fastening Holder.

Two Views of a Combination Text Book and Blue Print Holder Patented by Robert H. Smith, Boston, Mass.

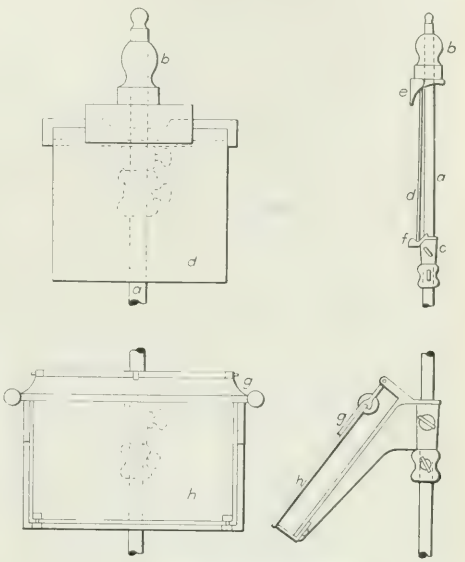


Fig. 3.—Details of the Two Holders.

The text book holder, shown in Fig. 1 in use on the same rod with the blue print holder, has a weighted hinge or flap, *g*, Fig. 3, with handles on both ends, which rest on the upper margin of the book. The weight of this part holds the book open, while a transparent celluloid cover, *h*, fastened to and operated by the hinge, keeps the book clean. If desired the blue print and the text book holders can be used separately on the rod instead of in combination as shown in Fig. 1.

An unusual public electric service is promised for New York if the plan goes through of the Longacre Electric Light & Power Company, which has been granted a franchise to operate in New York City. It is stated that while the company intends to erect one or more power houses within the city, it realizes that there are isolated electric plants in numerous buildings operating sometimes at considerably low rates of capacity, and that by using together such stations on common mains it would be possible to run the various plants at a more economical load and at the same time give to all these stations a break-down connection, in allowing the current to feed back into any particular building in the event of a failure of its own plant. It is stated that the company, which has offices at 165 Broadway, New York, has offered to purchase excess current from the smaller plants at 1½ cents per kw.-hr. during the daytime and at 1¼ cents during the night.

Baltimore Industrial Notes

Dietrich Brothers have been very busy with work in hand, but note some irregularity in new business, particularly during the closing weeks of the month. A fair amount of small and moderate contracts for structural work have been taken in the South, one for the structural work for Normal School Building No. 162, Washington, D. C., and one for a church building in this city being the most important. Two large contracts, one for the Baltimore Bargain House and one for the Casualty Building, keep the plant fully engaged.

The Consolidated Gas, Electric Light & Power Company is building at its Spring Garden Station, Heath and Leadenball streets, a steel power house to contain two 12-ft. sets of Lowe water gas apparatus, as designed by the United Gas Improvement Company of Philadelphia. The capacity of these two sets of apparatus will be 6,000,000 cu. ft. per day.

The Industrial Building Company, which was formed for the purpose of erecting manufacturing buildings of the beehive type, in order to provide first-class facilities for small manufacturers, was recently incorporated with a capital of $300,000, and the following officers have been elected: President, Alexander Harvey, secretary and treasurer of the Detrick & Harvey Machine Company; vice-president, William J. Champion, president and general manager of the William J. Chapman Coal Company; secretary and treasurer, Charles M. Cohn, vice-president of the Consolidated Gas & Electric Power Company. The first plant that this company will build in this city is now well under way, being located at Preston and Clifton streets.

The Chesapeake Iron Works has booked a number of small orders for both structural and ornamental iron work. The local demand has been rather inactive, although a promising amount of new work is developing, particularly in the South. Bids are going out on a fair amount of new projects, including an addition to the Valentine Warehouse, Richmond, Va., requiring about 150 tons of structural work. Orders recently taken by this company include one for the structural and ornamental work for 31 sets of stairways, for various school buildings in Allegheny County, Md.

Municipal contracts, in which the local iron, steel and machinery equipment trade have been interested, have not been very numerous. Considerable work in connection with sewerage propositions are, however, up for proposals.

The Baltimore Bridge Company has taken on quite a satisfactory volume of business the past month and now has the capacity of its plant pretty well engaged for several months ahead. Export trade has figured considerably in contracts recently closed by this concern, including one for 20 spans of bridge work, varying from 12 to 200 ft. long, for extensions on the San Miguel Railway, Guatemala, South America. Two hundred and forty plate girders, 45 ft. long and 6 ft. deep, aggregating about 1300 tons and the steel work for eight cargo cranes, are to be supplied to the Isthmian Canal Commission. A number of moderate contracts for local work have also been taken, including one for the steel work for a warehouse for the Baltimore and Ohio Railroad at Henderson's wharf, Canton.

The Western Maryland Railway Company is making plans for a large expenditure of money in the construction and equipment of terminals in this city and also at other points along its line. About $7,000,000 will be expended in this work, which, however, will no doubt be extended over a long period of time. Tentative plans include the providing of modern yards at Port Covington and Hillen Station, where suitable property has been purchased. At Port Covington plans include two new piers, and a new warehouse will probably be built at Hillen Station. The Western Maryland is extending its connections with other lines and is planning for a very much larger freight traffic through this city. At the present time no definite plans have been completed, although the clearing of sites for the proposed work in this city is now going on.

The Frederick Railway Company has petitioned the Public Service Commission for authority to purchase the minority interests in the Frederick Gas & Electric Company, Frederick, Md. These interests consist of common and preferred stock valued at about $50,000.

Plans are being considered by municipal and railroad engineers for the erection of a new bridge over the Baltimore & Ohio Railroad at Monroe street, near the Mount Clare shops, steel and concrete, spanning some 25 or more tracks.

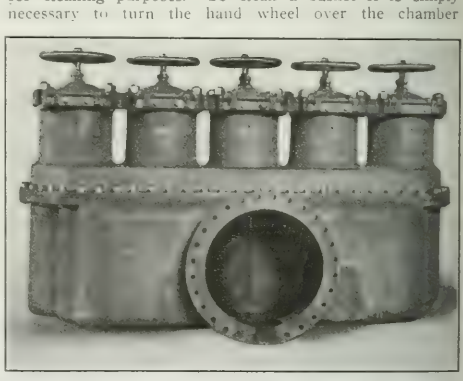
It is currently reported that the Pennsylvania Railroad contemplates the erection of a new viaduct on Lafayette street, from Pulaski to Smallwood streets.

Large Lagonda Strainers

What are claimed to be the two largest water strainers ever built were recently completed by the Lagonda Mfg. Company, Springfield, Ohio. They are intended to remove the solid matter held in suspension in circulating and feed water and were furnished to two large railway concerns, one being supplied to the Toledo Railways & Light Company, Toledo, Ohio, and the other to the Metropolitn Street Railway Company, Kansas City, Mo. The general construction of these strainers does not differ very materially from the multiple strainer illustrated in *The Iron Age*, October 6, 1910, but the interesting feature about them is their size. The width measured from one end to the other is 10 ft. 1½ in. and the hight from the bottom flange to the top of the hand wheel is 6 ft. 1 in. The total weight of each strainer is 11,000 lb.

The strainer consists of a cast-iron body lined with bronze having five strainer baskets which can be easily removed for cleaning without shutting down the pump. The water enters through the inlet pipe, passes up to the top of the valve chamber, where it divides, and finally goes down through all the baskets in multiple. With but three of the baskets in service an area greater than that of the 30-in. pipe in which the strainer is connected is provided, and with all five in service the total straining area is several times that of the supply pipe.

While these strainers are of massive dimensions little difficulty is said to be encountered in removing the basket for cleaning purposes. To clean a basket it is simply necessary to turn the hand wheel over the chamber



An Exceptionally Large Water Strainer Built by the Lagonda Mfg. Company, Springfield, Ohio.

corresponding to it. This operation raises the basket entirely out of the strainer and at the same time shuts off the water from that particular compartment. A small bypass relieves the pressure in this chamber, the bolts at the top are loosened and the top flange is raised. This exposes the basket, which can now be taken out and cleaned. When the basket is replaced the operations are precisely the reverse, and the motion of the hand wheel lowers the basket from the upper part of the chamber into the straining position, and at the same time lifts the valve disk on the bottom of the basket from its seat on the valve collar, which is also raised from the valve. If by any chance there should be an obstruction resting upon the upper valve collar, the basket as it is being raised to the cleaning position will tend to tilt the obstruction either into the basket or out of the way of the valve, since the basket travels almost as high as the full distance before the lower valve disk comes in contact with the lower seat of the valve collar.

In service it is recommended that at least one basket be kept in reserve in the upper portion of the strainer body, so when it is desired to clean the strainer this spare basket can be quickly dropped into the strainer body and the other baskets removed one at a time.

Mechanical Equipment of the New York Central Terminal

Details of the Various Apparatus Installed

BY CHARLES H. HUGHES, NEW YORK.

The improvements of the New York Central Railroad in New York City are interesting not only on account of their magnitude, but also of the engineering problems which had to be solved. Briefly, they included pulling down a station which for years was one of the finest in the country, an office building and a train shed; a general enlargement of the terminal yard necessitating the demolishing of some 200 houses and the removal of 2,500,000 cu. yd. of material, the erection of a new station, office buildings and power plant and the electrification of the road for 35 miles from the city. Work was started in 1902 and it is expected that the improvements will be completed in 1913 or 1914.

The enlarged yard is nearly 1700 ft. long by 1000 ft. wide, covering an area of 43 acres and having 17.5 miles of track. At the southern end is the Grand Central Station with a 600-ft. frontage on Forty-second street, on the east the Grand Central Palace and at the north is the boiler house.

The Boiler House

The boiler house is the central unit from which will be distributed all the supplies common to an up-to-date terminal, which include a heating system, electric lighting plant, compressed air system, hot and cold water for domestic and fire purposes, hydraulic elevator pumps for baggage elevators, turbo-generators and the necessary operating appliances.

The generating units are in a building about 88 ft. wide by 150 ft. long, at the northern corners of which are two large stacks and at the southern two towers. The structure is built over the train yard, the supporting columns being placed between the tracks. There are three floors; the first is for pumps, heaters, etc., the second for air compressors, generators and boilers, the third for boilers, and over the boilers on the third floor is the coal bunker.

At present only the boilers on the second floor are installed, and these comprise 10 Heine safety water tube boilers with superheaters, arranged in five batteries, a row of three being on one side and two on the other. Three of the batteries have a capacity of 1270 hp. each and the other two of 1100 hp. The arrangement of the boilers on the third floor will be the same as those on the second, the uptakes from both entering common flues exhausting into the stacks. The stacks are of steel, lined with firebrick, and are surrounded by diagonally steel braced towers.

The coal bunker has a capacity of 3000 tons, the coal being raised by a steam-driven balanced skip hoist and belt conveyors or by a crane, so that the bunker can be filled from cars or from wagons on the street. From the bunkers are chutes that deliver the coal to the furnaces which are hand fired.

The boilers are equipped for forced draft, air being supplied below the grates. Each row has its own duct connected to a double inlet steam-driven fan having a capacity of 40,000 cu. ft. per minute. The fan can be driven by either one of two vertical steam engines, only one of which is in use at a time, the other being for emergency.

Building Heating System

The heating system for the terminal area is the largest of its kind in the world. It is of the hot water forced circulation type with three separate pressures, each being a unit by itself and so maintained at the boiler house. All are designed on the loop principle which is followed in the buildings to be heated. For example, a molecule of water leaving the boiler house travels in one continuous direction, the same distance as any other molecule of water, so that there is a constant differential head between the supply and return mains and branches throughout the terminal area.

It is to be noted that three pressures, viz., low, intermediate and high, are employed, necessitating three separate lines of supply and return mains. The low pressure is for heating all buildings up to the sixth story, the intermediate up to the twelfth and the high above the twelfth.

Water for the system is heated by the exhaust steam from the turbines, compressors and pumps, which exhaust into a large cast-iron header that has branches to heaters through which the water is forced by centrifugal pumps. Each heater has a capacity of 6000 gal. per minute. There are now three heaters installed, but provision is made for the installation of future ones as may be required. The system is laid out so when additions are made they will be along the same general lines as at present followed, ultimately giving a total capacity sufficient to heat 170,000,000 cu. ft. of building space. This is equivalent to fully 17 office buildings equal in size to the 13-story Grand Central Palace occupying the block from Forty-sixth to Forty-seventh streets. A further idea of the size can be obtained from the fact that the terminal area around which the heating mains extend has a perimeter of over a mile. Each building is heated from a branch taken from the main loop. Van Stone joints with improved square shoulders are used and all the pipes are heavily covered with non-conducting material.

Lighting

To the west of the boiler house there is contemplated, and the boiler house is planned for it, the erection of a machinery house in which will be rotary converters for transforming the current from the Port Morris and Yonkers power stations, so as to be available for terminal purposes. Steam-driven generators will eventually be installed for furnishing electricity, for should an accident happen to the converters the steam units could at once be brought into use.

All the buildings are wired for standard 120-240-volt direct current, and they are supplied from the generating equipment at the boiler house, switchboards being installed in every building from which the light and power circuits are carried. The yards, where covered, have incandescent lights with switches easily available. The platforms have lights controlled by push buttons at the ends.

Pumps

The elevators in the office portion of the Grand Central Station are electrically operated and those in the baggage hydraulic. Both are run by power furnished by the boiler house. The pumps for the hydraulic elevators are situated over 1500 ft. away from the elevators themselves, and as the pumps are above the operating valves of the elevators a back pressure system was designed for the elevators to operate against, so they would force the water in their descent up into surge tanks, which are of sufficient hight to cause the water to flow back to the pumps in the boiler house. There are at present about 26 passenger and freight and 14 baggage elevators in operation.

Compressed air for terminal purposes is supplied by two Corliss valve air compressors having a combined capacity of 3000 cu. ft. per minute. The air is used for filling car brake tanks, baggage checking tubes, cleaning and the like.

For fire protection there are two steam and one electric pump with a combined capacity of 3500 gal. per minute. Tanks having a capacity of 60,000 gal. are provided for water storage purposes. The pumps for the plumbing service and the fire protection system can be operated interchangeably by using reducing valves.

Under the platforms and along all yard storage and cleaning tracks there are hundreds of service outlets so placed as to be reached quickly. These outlets consist of cold water for car cleaning, steam for car heating and compressed air for brake testing and car cleaning, thus providing for every service requirement.

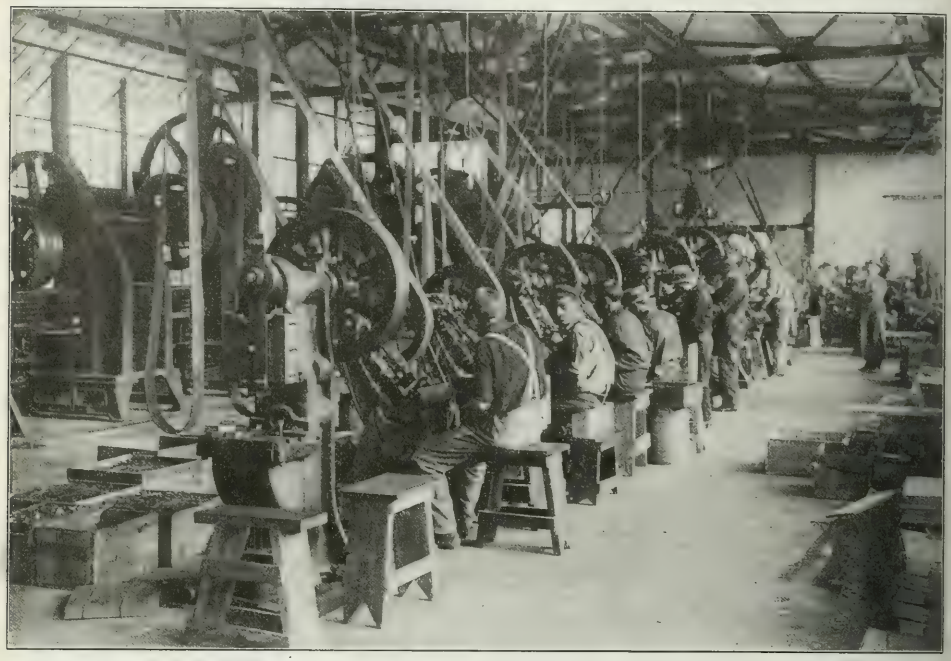
The design of the boiler house and service plant equipment with the mechanical and electrical arrangements for the Grand Central Terminal yards and buildings was made by the Grand Central Station architects, C. A. Reed, executive, and Clyde R. Place, mechanical engineer in consultation with W. G. Carlton, superintendent of power for the terminal company.

Correction.—In the announcement of the three-spindle vertical drilling machine built by Hanford & Barkley, German Insurance Building, Rochester, N. Y., which appeared in *The Iron Age* of August 24 on page 434, it was erroneously stated that the production of car journal boxes on a rotary side planer was 450 pieces per day. This figure should have been 100 pieces.

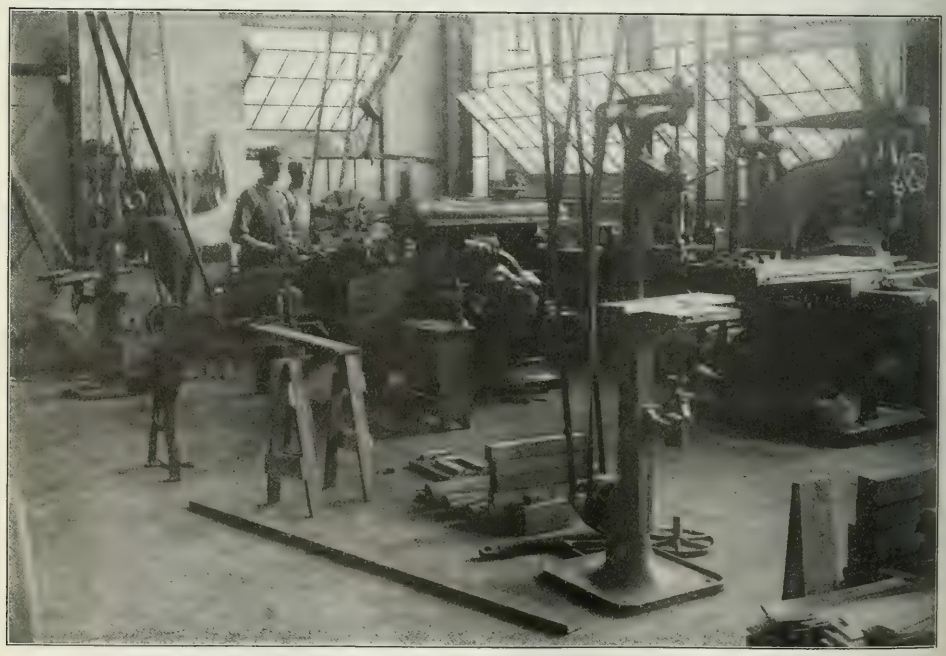
A Toledo Metal Stamping Plant

An insight into the housing, equipment and arrangement of a plant for producing stampings in steel, brass, aluminum and other metals may be gained from a new factory in Toledo, Ohio, designed for the purpose, for a business established by a number of individuals familiar with what the modern development in sheet metal machinery and manipulation offers. It is the works of the Acklin Stamping Company, at 1645 to 1653 Dorr street, Toledo, one of the recent additions to the manufacturing industries of that city, and the accompanying reproductions of photographs are given for the suggestions they may make to others contemplating plant extensions.

The Acklin Stamping Company was incorporated in



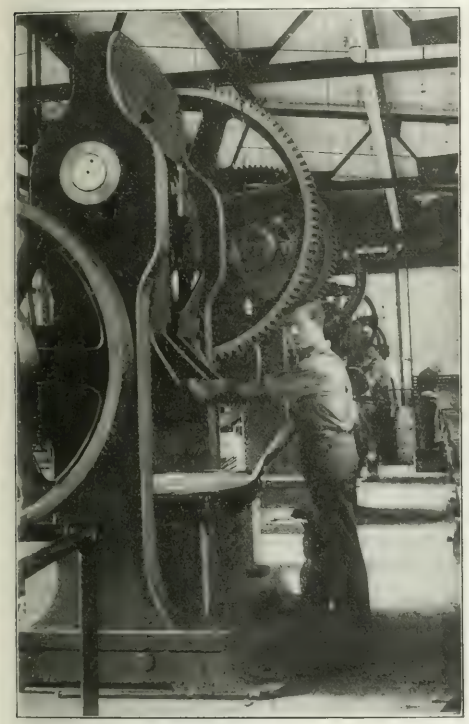
Interior View Showing Excellent Light in the Plant of the Acklin Stamping Company, Toledo, Ohio.



A Corner of the Tool Room

April of this year and purchased land in the new manufacturing district adjacent to the Lake Shore Railroad. Devore & McGormley, architects, prepared the plans for a fireproof, strictly modern building on the land, which is 150 x 110 ft. One of the illustrations shows that close attention was paid to the question of light. The building is heavy and rigid in its construction, the flooring being laid on a thick bed of concrete, bringing about an absence of vibration.

The business is to be confined exclusively to the production of sheet metal stampings. A full complement of presses has been installed, the largest ones weighing 50,000 lb. each, so that a wide range of work may be undertaken. The presses are of a special nature and massive in con-



A Corner of the Press Room Showing Massive Construction of Machinery

struction. This latter feature is to ensure close and accurate stampings not possible in the ordinary press. A corner of the large press room is shown, giving an idea of the massiveness of the machinery.

When equipping the plant special care was taken to provide safety devices which will eliminate the dangers to which press operators are liable. The dies used are fitted with chutes and the necessary fixtures for carrying the blanks and shells into the various positions in the dies so that the operator is not compelled to place himself in dangerous positions. The company is also a believer in the use of compound dies to do away with unnecessary handling of the work. While these are more expensive to construct and to keep up on work in large quantities, they are found to effect a saving through less time and labor required. A corner of the tool room is shown in one of the cuts.

Although the business was begun only in July the company has already secured a large number of desirable contracts, it is stated, and numbers among its customers some of the most substantial manufacturing concerns in the country. Jeremiah Bingham, who is recognized as one of the experts of the country in sheet metal work, is superintendent and mechanical engineer; James M. Acklin, a graduate of one of the Engineering Schools of Cornell University, is vice-president and general manager, and W. C. Acklin is treasurer and secretary.

Pittsburgh and Vicinity Business Notes

After an investigation extending over many months, the Portsmouth Steel Company, Portsmouth, Ohio, has placed with Tate, Jones & Co., Inc, Pittsburgh, an order for their swinging type of fuel-oil burners for six open-hearth furnaces, with reversing-valve stands for each furnace, No. 3 oil-pumping system, etc., complete. This makes a total of 82 open-hearth furnaces throughout the United States and Canada equipped with Tate, Jones & Co.'s fuel-oil burners and reversing-valve stands.

The Vulcan Crucible Steel Company, Aliquippa, Pa., reports the following officers elected for the coming year: Samuel G. Stafford, president and general manager; Joseph A. Kelly, vice-president; W. A. Campbell, secretary and treasurer. The board of directors consists of W. A. Shaw, Charles Bailey, Joseph A. Kelly, W. A. Campbell and S. G. Stafford. The volume of business it is receiving at the present time is reported to be very fair, with good prospects for business this winter. A new catalogue on vanadium steels is in preparation and will be issued shortly.

The Westinghouse Electric & Mfg. Company has received an order from the Warren Street Railway Company, Warren, Pa., for five double equipments of No. 307 motors with type K-36-F control, and from the Boston Elevated Railroad Company, Boston, Mass., for 50 additional quadruple equipments of No. 306 motors with type H L control.

The Sistersville Electric Light & Power Company, Sistersville, W. Va., has placed an order with the Mesta Machine Company, Pittsburgh, for one 20 x 24-in. twin tandem, horizontal, double-acting, four-cycle gas engine. The engine will operate with natural gas and is rated at 1000 b.h.p., being arranged for direct connection to a 650-kw., 60 cycle, 2300-volt railroad generator.

D. D. Lamond & Co., consulting and contracting engineers for blast furnace construction, Ferguson Building, Pittsburgh, Pa., state that of late they are receiving more inquiries than for a long time previously. Naturally, the inference is drawn that trade conditions are not only better than they have been but are still improving.

The Elkins Foundry & Machine Company, Elkins, W. Va., is erecting a new plant, which will include a machine shop, 32 x 60 ft., a foundry of the same size and a pattern storage room on the second floor. C. S. Robb is president of the company and J. P. Phillips is manager.

The Bessemer Gas Engine Company, Grove City, Pa., has received an order from the Honolulu Gas Company, Honolulu, for a 60-hp. gas-engine-driven compressor and has also received several orders for compressors to be used in the West Virginia gas district.

The Art Brass Fixture & Mfg. Company, Pittsburgh, has put in operation at McKees Rocks its new plant for the manufacture of steel and brass stampings, turnings and fixtures, a complete line of combination gas and electric fixtures, art brass specialities, steel, aluminum and enameled sheets, etc. Lawrence M. Fluhart is president; Scott Hayes, vice-president; Livingston R. Jeffords, treasurer; John A. Irwin, secretary; Carroll P. Davis, counsel, and Earl B. Hennecke, general sales manager.

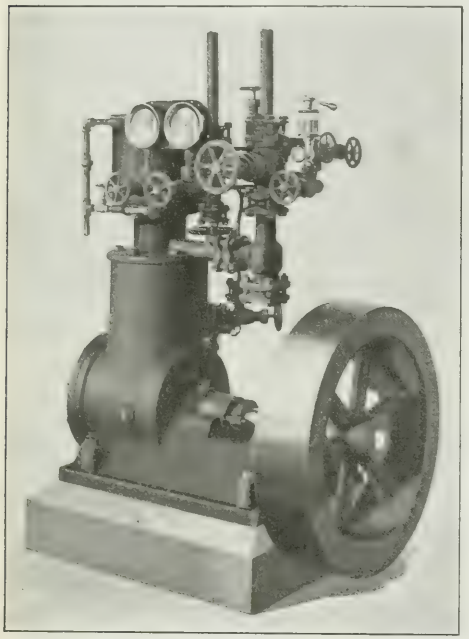
A cylinder with two pistons describes a feature of a steam engine built by Kühnle, Kopp & Kausch, Frankenthal, Bavaria. Its aim is to reduce to a minimum the variations in temperature of the metallic walls of the cylinder with which the steam comes in contact. The admission of steam to the cylinder takes place at a middle point, it being delivered behind one piston while the other is compressing so that the latter may be ready to receive the high pressure steam at the end of the stroke of the acting system, the two systems of course being fixed to a single rod and moving together. Each piston is single acting, alternately receiving the supply of live steam.

The Mumford Molding Machine Company, Plainfield, N. J., reports that among orders received in August for large jolt ramming machines were the machines for the new foundry of the Pennsylvania General Electric Company, at Erie, Pa.; a 24-in. machine with table 72 x 72 in. for the Burnside Works of the American Brake Shoe Company; a third machine for the Snow Steam Pump Works, Buffalo, N. Y., and a machine with table 72 x 108 in. for the Moore & White Company, Philadelphia.

The Vilter Ammonia Compressor

Regularity of operation, reliability and efficiency coupled with a low initial cost are the special features claimed by the Vilter Mfg. Company, 1008 Clinton street, Milwaukee, Wis., for its new vertical single-acting air compressor. In designing the machine an effort was made to secure one that would be nearly as automatic as possible in operation and free from a multiplicity of parts and many operations.

The entire base, two main crank shaft bearings, the cylindrical crank shaft and the compressor support are an integral and substantial casting. The cover for the crank case has the same diameter as the part upon which it rests, thus assuring ready accessibility to the crank pin and the connecting rod. The crank shaft journals, two in number, are of ample proportions and are located in perfect alignment. Removable white metal bushings are employed to insure smooth running and maximum service. The compressor, the water jacket and the members connecting the suction and the discharge pipes also form a single semi-steel casting. The suction enters the cylinder at a point near the center of the bore in the vicinity of the supporting flange and meets the long ports of the double trunk piston. At the top the cylinder is counterbored to receive



The New Improved Vertical Single-Acting Ammonia Compressor Built by the Vilter Mfg. Company, Milwaukee, Wis.

the discharge valve and cage. The cylinder head is a simple round casting held in position by heavy studs and nuts and can be removed without disturbing any pipe connections or mechanical parts. The base and the compressor are bolted together and when this is done the non-moving structure of the machine is complete.

A double trunk piston having long ports between the upper and lower fitted sections is used. These ports register with the suction gas inlet throughout the entire stroke, thus securing ample passage for gas to the compression end of the cylinder, but at the same time preventing liquid or gas from entering the crankcase. The upper part of the piston, which contains the large suction valve, has two right-angle cut concentric snap rings, while similar rings are fitted above and below the hollow piston pin in the lower part. Steel set screws keep the piston pins in the bosses and an even distribution of oil to the cylinder walls is secured by the use of oil grooves. High grade forged steel is used for the suction valve which is contained in the piston. This valve is carefully finished and ground to a perfect seat, all superfluous metal being removed from the disk and the stem drilled throughout the entire length to decrease the weight and render the valve responsive in operation. The discharge valve which is housed in a semi-steel cage fitted into the upper counterbore of the cylinder is a light-weight cup-shaped piece of pressed steel. In proportion to their size both valves are said to be very light in weight and of ample proportion with relation to the bore of the cylinder. These valves will give the full area opening at from ⅛ to ¼ in. extreme lift, thus insuring full cylinder charging and noiseless operation at all speeds.

The connecting rod, which is made in two parts, has a solid round head steel forging for the upper portion. The piston pin eye is bushed with white metal which is carefully finished to fit the pin while the crank pin end is a separate marine type journal, lined with high grade babbitt metal. The two parts of the rod are fitted to screw together to provide the necessary adjustment for the piston clearance and are rigidly locked by a steel jam nut. A simple straight round steel forging finished throughout its entire length is used for the crank shaft, a solid crank being pressed and keyed on one end and a band wheel applied to the other.

The lubricating system includes a hand oil pump to furnish oil to the upper part of the cylinder and an oil cup or grease box for the main bearing adjacent to the fly-wheel. Oil is splashed from the crank case to lubricate the inner main bearing, the crank and piston pins and the lower part of the trunk piston automatically and it is only necessary to introduce an additional supply of lubricant through the plugged opening at the upper part of the crank case cover occasionally. The hight of the oil in the crank case is indicated by a gauge glass.

The Heald Machine Company's Good Business

The Heald Machine Company, manufacturer of grinding machines, Worcester, Mass., is building an addition which will enable the doubling and probably trebling of its product, should this become necessary. In erecting the new shop, the endeavor has been to construct a model building which will be the most satisfactory possible for the work to be done in it. It is constructed of reinforced concrete, with brick panels under the windows and saw-tooth roof, and is arranged with concrete posts and concrete girders for five rows of cranes for use in assembling machines. The principal purpose is to use this building as an assembling shop, thus relieving the congested condition of the present works, in which for some time there has not been sufficient room for conducting this essential part of manufacturing operations.

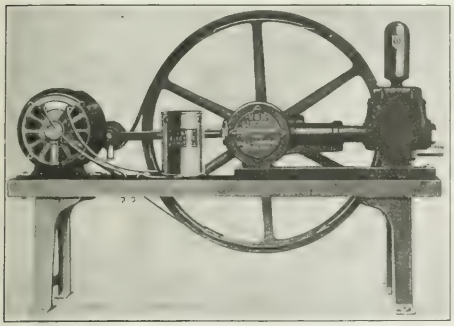
The company has several new machines under construction and in process of working up. One of these machines recently brought out, the No. 75 internal grinder, is a modification of the company's standard machine, the principal changes being to adapt it especially for grinding short holes such as will be found in ball bearings, transmission gears and various sleeves and bushings not over 2 to 3 in. long. The company has been favored with an excellent amount of business, its sales for the past twelve-month having amounted to 80 per cent. of those of the preceding twelve-month, which was the biggest year's business it has ever done.

A compendium on core-room practice is what E. A. Coleman's paper on the subject is, presented at the Pittsburgh meeting of the American Foundrymen's Association. The paper has now been printed, and its enumeration of the design and equipment of the core-making and core-baking departments of the foundry, illustrated with 38 large-size half-tone engravings of modern machinery and arrangement, makes it of great value. It is possible that copies may be had for a nominal sum by addressing Dr. Richard Moldenke, secretary of the association, Watchung, N. J.

The T-slots in small tables for machine tools are frequently milled out on vertical spindle milling machines. Difficulty is encountered in removing the cutting, and the speed of machining has been held down as a result. In this connection the use of a small jet of compressed air playing continuously on the work at the point of cutting has been found to increase the operating speed fully 50 per cent.

Motor-Driven House Pump

To provide an independent and reliable automatic water supply system for all purposes the Vaile-Kimes Company, Dayton, Ohio, is manufacturing an electric motor-driven pump designed for installation with a compression or pneumatic tank. Although the rural and suburban districts are regarded as the principal fields of usefulness for which the pump was intended, it can nevertheless be used in cities where the water rates are high and one's



A Pump with Westinghouse Motor Drive Built by the Vaile-Kimes Company, Dayton, Ohio.

own supply is available or where the pressure is low. A supply of electricity is, course, necessary.

The pump takes the water directly from the cistern, well, lake or stream and forces it under pressure into a tank from which it is distributed to the house. The power is obtained from a ⅛-hp. Westinghouse motor and one of the special features of the outfit is the use of a large flywheel and an idler. The first cost of the outfit is comparatively small, it is explained, when the capacity and efficient operation are taken into consideration and the operating expense is also very slight.

An automatic switch governed by the water pressure in the system controls the operation of the motor, starting it automatically when the pressure falls to a given point and stopping it when the maximum desired pressure is reached. No attention is therefore required to keep the water supply up to the desired point. A smooth and uniform discharge is secured by the air chamber.

The following table gives the principal dimensions and specifications of the pump.

Diameter of cylinder, in.	1¼
Length of stroke, in.	2
Diameter of suction pipe, in.	¾
Diameter of discharge pipe, in.	½
Diameter of pulley, in.	20
Speed of pulley, r. p. m.	140
Pressure developed, lb.	35
Capacity of pump per hour, gal.	180
Overall length, in.	33
Overall width, in.	10
Overall height, in.	20
Complete shipping weight, lb.	90

If desired the pump can be arranged to be mounted on the wall by substituting brackets for the legs.

The Electric Lamp Trade

The National Electric Lamp Association, Cleveland, Ohio, states that the various member companies of that organization are adding to their office space in the principal cities as rapidly as the growth of their business warrants. The past month one of the companies opened new offices in San Francisco and Los Angeles. Two other companies have erected new office buildings for their own use. The manufacturing and engineering facilities are increasing correspondingly.

The development laboratories of the association have for several months been working on a number of new types of lamps. These new types include the round bulb Mazda lamp for regular residence service in a smaller bulb than has up to a recent period been available, this bulb being only 2 5/16 in. in diameter; a tubular bulb Mazda lamp, which is the first of that kind ever placed on the market, and a line of Mazda lamps specially designed for electric vehicle service. The tubular lamp, which is supplied in the 25-watt size is a bulb 1¼ in. in diameter and 5¾ in. in length, will probably be of the most interest for industrial work, as a bulb of this shape adapts itself to many special uses in connection with the illumination of machine parts where a restricted space is available for the lamp.

From present indications, the total number of lamps sold by the member companies of the association this year wil be considerably in excess of the number sold last year, and this may be taken as an indication of a healthy condition of the industry.

Duff Ball-Bearing Journal Jack

For the rapid and convenient removal or replacement of journal brasses in freight cars, passenger and Pullman coaches and for general railroad service where short, light and powerful jacks are required, the Duff Mfg. Company, Pittsburgh, N. S., Pa., has recently placed on the market an improved ball-bearing pack. The special features of the jack are a positive stop to prevent the lifting bar from being run too far out of the jack, an adjustable wheel holding device and ease of operation.

The load is raised on an improved type of ball-bearing on the downward movement of the operating lever which is the more convenient stroke. The material and workmanship are high grade throughout. Refined malleable iron and steel are employed and all the gears are steel forgings with machine cut teeth. The weight of the jack is very light, being only about 35 lb., and a convenient carrying handle at the right enables the jack to be transported from place to place easily. An adjustable wheel



The No. 53 Improved Ball Bearing Journal Jack Built by the Duff Mfg. Company, N. S., Pittsburgh, Pa.

holding device of improved design shown at the left is provided to hold the wheel down when operating. This is a very essential feature under many conditions, but if not required it can be readily detached from the jack by loosening the top and the bottom holding bolts.

The jacks are made in two sizes of practically the same construction, the only difference being in the height and the length of the raise. Both jacks have the same capacity, namely, 15 tons. The closed hight of the No. 53 jack, which is the one illustrated, is 9¾ in., the length of raise, 4 in., and the weight 35 lb. The other jack which is designated as the No. 52 type measures 11 in. when closed, has a 1-in. longer raise and weighs 2 lb. more.

David Evans & Co., Rookery Building, Chicago, have acquired the exclusive Western representation for the Columbia Steel Company, Elyria, Ohio, in northern Indiana, western Michigan, Illinois, Wisconsin, Iowa and Minnesota. In this connection H. L. Hanson has become associated with David Evans & Co. and will give his entire attention to the development of the line of cold-rolled strips and sheets for stamping, drawing and forming.

The Machinery Markets

Orders are not very well distributed in the machinery trade. Some branches of manufacture are doing an excellent business, while in others a lamentable dullness prevails. Some good export trade has been placed in New York and inquiries from that source are heavy. The call for machinery for export is noticeably good in most markets. In Cincinnati, for instance, the importance of the export trade is shown by the books of one manufacturer, which indicate that 65 per cent of his recent orders have come from abroad. In Cleveland no improvement has been noticed in the recent demand. Business is slightly better in St. Louis, but is scarcely 65 per cent of normal there. In Chicago, as elsewhere, there is an absence of lists from the railroads, but a fairly good miscellaneous trade is coming out. Inquiries and orders show a slight increase in Detroit, the campaign for good roads causing the purchase of considerable road working machinery. The trade in New England is expecting some good business from the General Electric Company for its Lynn works; no list is out, but the company is believed to be preparing to buy about $100,000 worth of equipment. Mining and irrigating enterprises are developing some business in Texas where a general improvement is seen in the demand from manufacturing plants. Automobile repair shops and other small consumers of tools are placing good orders on the Pacific coast, where mining and saw mill requirements are also in active demand. A disappointing lull exists in the South in the demand for general machinery, but makers of machinery for breweries and distilleries report a heavy influx of orders.

New York

NEW YORK, September 13, 1911.

Considerable good business is coming to general machinery houses, but the orders are for small lots of tools, with the exception of those from export houses. The export trade continues to excellently support the market. The recent buying here on the part of Japanese engineering firms, it has been ascertained, was for the account of the Imperial Steel Works, which is adding to its metal-working equipment. A large list of machine tools has been sent to manufacturers by Fox Brothers & Co., 126 Lafayette street, New York. This equipment is intended for a South American customer whose name is not disclosed. Some South American inquiries that have appeared in this market of late were for machinery for a shipyard in Argentina. The railroads are buying a machine here and there. The New York Central has been closing for some small lots of equipment and it is believed to be buying very conservatively against a large list sent out several months ago. The Westinghouse Electric & Mfg. Company, Newark, N. J., is getting some machine tools to be installed in an addition now under way. Several orders were placed for machinery through New York representatives of Western machine tool builders for machines for delivery to Newark, but they were purchased through the Pittsburgh office of the company. On other occasions the Newark plant has filled its machinery wants direct. Recent dullness in the real estate markets in cities adjacent to New York has resulted in a decrease in the applications for building permits, and manufacturers of power units, such as are installed in office buildings and factory lofts are feeling the lack of business from that source. There is also a decided absence of new enterprises in the way of factory construction.

The United States Government has been purchasing considerable power equipment lately, and air compressor manufacturers have been getting some excellent business from that source. The Isthmian Canal Commission is now taking bids for the equipment for a hydroelectric station to be erected at Gatun on the Canal Zone. The plant is to have an original capacity of 6000 kw. divided into three units of 2000 kw. each. In addition there are to be installed two 100-kw. motor generator exciter sets for the regulation and control of the turbo alternators. The generating room is to be served by a 20-ton crane, and there will be compressed air regulators.

Inquiries for material for medium-sized power plants for lighting systems are coming out well just now. The municipal lighting plant of Freeport, L. I., is to be improved at an expenditure of $10,000. The municipality of Bismark, N. J., is getting bids on equipment for a small lighting plant, and a boulevard lighting system is to be installed at Binghamton, N. Y. The Keeseville Electric Company, with offices at Jay, N. Y., has been granted permission to build an electric light plant and a transmission line 15 miles from Ausable, N. Y., to furnish power to nearby towns.

The Hanson & Van Winkle Company, 329-331 Chestnut street, Newark, N. J., manufacturer of electroplating apparatus, etc., is making an addition 30 x 50 ft., and three stories to its plant.

The Royal Gem Knitting Mills Company, St. Johnsville, N. Y., is erecting a new plant, 48 x 224 ft., at an expenditure of $18,000.

The Farrar Iron & Steel Company, Buffalo, N. Y., has been incorporated to fabricate and erect structural steel buildings. Its initial capitalization is $10,000. The company has arranged to establish a fabricating plant and will install necessary cutting, punching and riveting machinery. Frank N. Farrar, formerly secretary of the East Buffalo Iron Works and president of the Builders' Association Exchange, is president and treasurer of the new company. James Thompson, a prominent structural steel erector, is vice-president, and Edward J. Henesey, formerly with the H. C. Harrower Iron & Steel Company, is secretary. Offices have been opened in the Builders' Exchange.

Work will soon be commenced on addition, 80 x 200 ft., one story, of steel and reinforced concrete, which is to be made to the boiler shops of the Utica Steam Engine & Boiler Works, Utica, N. Y.

The E. J. Bosworth Specialty Company, Rochester, N. Y., has been incorporated with a capital stock of $30,000 to manufacture metal and leather specialties. E. J. Bosworth, C. W. Ryan and G. P. Culp, 12 Beverly street, are the incorporators.

The Niagara Chocolate Company, Niagara Falls, N. Y., has completed arrangements for building a factory on Erie avenue, in that city.

The Camillus Cutlery Company, Camillus, N. Y., is taking bids for a drop-forge shop, 50 x 100 ft., one story, which it will erect this fall.

The Syracuse Unit Brick Company, Syracuse, N. Y., has been incorporated by W. P. Hart and J. D. Meehan, of Syracuse, and C. F. Lane, of Detroit, Mich., to manufacture brick, tile, etc. The capital stock of the company is $240,000.

Contract for construction of powerhouse and pumping station and foundation for engines for the water works at Silver Springs, N. Y., has been awarded to Wm. Summerhays & Sons, Rochester, N. Y.

The Eureka Seat Company, Buffalo, N. Y., has been incorporated to manufacture automobile seats and parts. The capital stock is $10,000. The incorporators are Joseph H. Morgan, 217 Laurel street; Maurice J. Cogan and Norbert C. Kropp.

The Pratt Chuck Company, Frankfort, N. Y., has let contract for the erection of a factory building 80 x 260 ft., one story.

The Trojan Shirt Marker Company, Troy, N. Y., has been incorporated by H. I. Gasson, 64 Maple avenue, Troy; Walter G. Lichtenstein, Rochester, and Victor E. Nathan, New York City, to manufacture shirt markers, etc. The company has a capital stock of $50,000.

The Fancher Furniture Company, of which J. Walrath is president, Salamanca, N. Y., has let contract for the erection of a four-story furniture factory, 60 x 150 ft., on Rochester street.

The Thorold Silver Smelter Company, Thorold, Ont., which is the largest silver smelter in Canada, and treats the concentrates of many cobalt mines, will move its plant from Thorold to Niagara Falls, N. Y., where it will build and equip a plant which will enable it to double its output. By this change in location the company will secure exemption from the duty of 25 cents per pound on cobalt going into the United States and also a better labor market. The company annually ships $500,000 worth of its product to the United States.

The Clark Harp Mfg. Company, Syracuse, N. Y., has been incorporated with a capital stock of $100,000

THE MACHINERY MARKETS

to manufacture harps and other musical instruments. M. A. and M. E. Clark and V. R. Clymer, Syracuse, are the incorporators.

The town of Hobart, N. Y., will build a sewage disposal plant, a water filter system and a water storage reservoir from plans of Morrell Vrooman, engineer, Gloversville, N. Y.

The Solvay Steel & Forging Company, recently incorporated at Solvay, N. Y., a suburb of Syracuse, has secured a site and commenced the construction of a small plant, with which it will do a general forging business. Charles M. Hammond is president, Henry W. Thomsen is vice-president, and Otto Schramm is secretary and treasurer.

Work is progressing rapidly on the extensive addition which the Swansdown Knitting Company is building to its plant at Hudson, N. Y.

New England

BOSTON, MASS., September 12, 1911.

The trade is chiefly interested in inquiries from the General Electric Company for a large amount of machine tools for the Lynn Works. From known items in the list it is believed that the total of purchases will run well above $100,000. No general list has been sent out, so far as can be learned by the trade, purchases being made with some degree of previous selection.

Business has not improved. The usual experience is that September is not beginning well. Some of the builders of machinery report conditions satisfactory. Among these is the Bullard Machine Tool Company, Bridgeport, Conn., which reports a satisfactory amount of orders for vertical lathes and boring mills received from widely diversified industries. The export trade plays an important part with most of the builders of lighter machinery who are at all busy. Experiences vary greatly in the various branches of the metal trades.

The Judson Tool Company, Auburn, Me., has established a shop on Washington street, where it will manufacture a lathe tool holder, a lathe taper attachment, a lathe center grinder and a steam and air regulator, as well as doing a general jobbing business. The company has $10,000 capital. Willard J. Stevens, South Poland, Me., is the president; Perley E. Fish, Auburn, treasurer, while the third director is Harry Mansur, Auburn. The shop has received its equipment and nothing more will be purchased at present.

The Howe Scale Company, Rutland, Vt., is erecting a foundry building, 64 x 64 ft., of wood and concrete, the capacity of the present being no longer adequate to the company's needs.

The American Steel & Wire Company is erecting a storage at its Worcester, Mass, works, 100 x 160 ft., one story, of brick, concrete and steel construction.

The Penobscot Machine Company, Bangor, Me., founder and machinist, is building a foundry and machine shop to replace the building destroyed by the conflagration of April 30. The foundry and blacksmith shop are nearly completed, and the work of the machine shop building, which will be 46 x 68 ft., four stories, will begin immediately. The company has purchased all the equipment that will be required at present.

The Wright Wire Company, Worcester, Mass., is adding two stories to a brick building, 42 x 176 ft., at its Palmer, Mass., plant. The entire building will be used for wire drawing, part of the machinery being taken from the Worcester mills, and part being under construction at the company's machine shop. The machinery in the present building will be removed to a new structure which was completed recently.

The F. E. Wells & Son Company, Greenfield, Mass., will erect a new building at Turners Falls, Mass., which will be devoted to a new forging department in which wrench forgings will be manufactured, largely for the company's own product.

The Bontempi Rust-Proofing Company, 111 Broadway, New York, has leased the building at Water and Thomas streets, Bridgeport, Conn., and will equip the premises for the treatment of iron and steel products for the prevention of rust.

The H. E. Chellis Company, 65 Harrison avenue, Springfield, Mass., manufacturer of screw machine products, has been incorporated with a Massachusetts charter, to take over the business started by H. E. Chellis last February. Mr. Chellis is the president, Thomas H. Baldwin, treasurer, and Robert A. Baldwin the third director. The business has grown so rapidly that it was necessary to secure new capital. The shop is now running four nights a week until 10 o'clock.

The McLagon Foundry Company's plant at New Haven, Conn., was burned September 8, with a loss of $5,000. The machinery and patterns were destroyed.

B. F. Perkins & Sons, Holyoke, Mass., will erect a one-story addition, 100 x 200 ft., one story.

The Shoe Hardware Company, Waterbury, Conn., will largely increase its plant by the addition of two buildings, one 86 x 96 ft., five stories, the other 33 x 43 ft.

The Connecticut Company will build an addition 60 x 60 ft., to its power plant on Grand avenue, New Haven, Conn.

Additions to general manufacturing plants in New England include the following: Hoosac Cotton Mills, North Adams, Mass., additions to cost $800,000, including, according to local report, weave shed 180 x 280 ft., three stories; spinning mill, 155 x 382 ft., and boiler house to contain 13 50-hp. boilers, seven of which will be installed immediately. Fellows & Co., Boston, addition, 40 x 80 ft., three stories, to novelty wood working plant, Skownegan, Me.

Philadelphia

PHILADELPHIA, September 12, 1911.

Business continues to drag. Purchases are deferred as long as possible, and, when finally made, immediate delivery is required. Transactions are almost entirely confined to single tools. Occasionally a sale of a few tools for small shop equipment is reported, but even business of this character is scarce. Merchants' sales for the week have been small, and tool builders report a scattered business, the bulk of the trade coming from points outside this territory. Locomotive builders are not so fully engaged and car builders report less active conditions. A fair amount of business has been done in special machinery equipment. The demand for boilers and engines continues moderate, the bulk of the business being confined to equipment of the smaller class. General inquiries for machinery are light and, under existing conditions in the industrial trade, there is little prospect for any immediate material increase. The foundry trade still continues irregular.

Ballinger & Perrot, engineers and contractors, are taking bids for a brick and concrete addition, 60 x 98 ft., five stories, to the manufacturing building of Laird, Shober & Co., Nineteenth and Buttonwood streets. Electric lighting and steam heating are included. The matter of increasing and rearranging the power plant of the company is being considered.

The Elwood Ivins Tube Works, Oak Lane, notes a steady improvement in the demand for its various lines of seamless tubing. The plant is running full time, as has been the case for several years. New machinery is being added to the equipment, the majority of which is of a special nature peculiar to the class of work.

The Royersford Foundry & Machine Company, Royersford, Pa., still reports an unsatisfactory demand for its lines of punches and shears. In its other specialities, such as power transmission, machinery, roller bearing, hangers, etc., a fair business has been done.

The R. S. Newbold & Son Company, Norristown, Pa., reports orders for last month as being fully up to those received in June and July. A number of good contracts have been closed, and orders on hand are sufficient to keep the plant fully occupied for the next three months.

The Department of Supplies, city of Philadelphia, will receive bids until September 15 for various supplies required for the year 1912. These include, among other articles, electric supplies and instruments, oils, greases and boiler compound, paints, varnishes and painters' supplies, bicycles and bicycle sundries. Samples may be seen and specifications obtained on application to the director, Joseph H. Klemmer, 312 City Hall.

It is reported that the John B. Stetson Company, hat manufacturer, has purchased the plant of Isaac A. Sheppard & Co., stove manufacturers, covering a city block at Third and Fourth streets, Montgomery avenue and Berks street, and will erect several large manufacturing buildings. The parties interested refuse either to confirm or deny the report, but the general belief is that the deal has been consummated and that Sheppard & Co. will move their plant to a new location.

The Philadelphia Roll & Machine Company is operating its plant on full time, but not quite up to full capacity, although closely approaching that mark in the roll department. Orders for its new type of chilled cast rolls have been quite numerous, while a good pro-

THE MACHINERY MARKETS

portion of business has been done in sand cast rolls. The demand for charcoal iron machinery castings has not been particularly active, although a number of orders for special machinery equipment have been taken.

The Energy Elevator Company continues exceedingly busy. Orders from out of the city have been particularly heavy, although local orders have also been satisfactory. A number of power freight elevators are being installed locally and in various sections of the country, including one in Paterson and another in Perth Amboy, N. J. Automobile lifts are also in good demand. It is contemplating the purchase of additional machine tool equipment.

The stockholders of the old Baldwin Locomotive Works will hold a special meeting September 21 for the purpose of formally transferring its real and personal property to the new corporation. This will conclude the various details in connection with the recent changes of title and corporate arrangements. Officials of the company state that business recently has been quiet, orders having been coming in in small number from railroads and industrial concerns, and there is little ahead in the way of large business. About 12,000 employees are now on the pay roll. The labor difficulties which this company has been experiencing are entirely a thing of the past.

Frank Toomey, Inc., dealer in machinery and supplies of every description, 127-131 North Third street, Philadelphia, has under way some additions to his warehouse which will not be completed until about the beginning of next year. He expects soon to put on the market about $100,000 worth of some of the most modern machine tools.

Chicago

CHICAGO, ILL., September 12, 1911.

The absence of any machinery lists from railroads or the large buyers has created an atmosphere of dullness in the local market, which has not been scattered by the fairly good miscellaneous business prevailing. A local machinery dealer furnished the complete equipment for a newly equipped drop forging plant and several sales of machines in lots of two or three are reported. Floor sales have made up the greater part of the local business in the past week and shipments have been to widely separated points.

Fritz A. Schultz, builder of metal spinning lathes and other sheet metal working tools, will move from his present location on North Jefferson street, Chicago, to 4824 West Lake street. At this latter location, two buildings, one 50 x 125 ft. and one 30 x 40 ft. will be occupied. Additional machinery and equipment will be required.

The Alamo Engine & Supply Company, Omaha, Neb., has obtained the contract for the installation of the new water works plant at Benedict, Neb.

The Kessler-DuMez Machinery Company, Milwaukee, incorporated by E. S. Kessler, A. Henry DuMez, and Wilhelmina DuMez, will have a capital stock of $25,000.

The Stahl-Slater Lubricating Company, St. Paul, Minn., is about to erect a $20,000 steel and concrete factory building on property recently purchased. It is expected that the building will be ready for occupancy this fall.

The Progress Machine Company, Chicago, has entered into a lease contract for a term of 20 years, covering the occupancy of a factory building to be erected at 512 La Salle avenue. Construction is to begin at once.

Elmer L. Jensen, engineer, Harvard, Neb., will receive bids until September 22 for the construction and installing of an electric light and water works plant for the town of Grafton, Neb.

The Manistee Iron Works, Manistee, Mich., expects to manufacture, under exclusive American and Canadian rights, a new type of rotary pump. It is planned to increase the capital stock of the company to provide for the development of this new line.

The Peoples Power Company, East Moline, Ill., will install in the course of the next six months a generator and transformer station at the location recently acquired on First avenue.

The Webster Mfg. Company, Tiffin, Ohio, manufacturer of transmission machinery, have opened a sales office in Chicago, at 816 Fisher Building.

The Mayo Mfg. Company, Chicago, has been incorporated with a capital stock of $6000 for the manufacture of wagons and vehicles. Incorporators are Franklin Mayo, Walter N. Jacobsen, and Edward D. Chaurette.

The Joliet Auto Truck Company, Joilet, Ill., to manufacture and deal in vehicles, supplies and accessories, has been incorporated with a capital stock of $10,000. Incorporators are Philip F. Carroll, Milo M. Case, and Wilbur O. Dayton.

The Buchanan-Daley Company, Joilet, Ill., has been incorporated with a capital stock of $40,000, and will deal in lumber, coal, and building materials. Incorporators are William M. Buchanan, Edward R. Daley, and Lester Patterson.

The Western Aeroplane Mfg. Company, Chicago, to manufacture aeroplanes, has been incorporated with a capital stock of $1200, by Adolph Katz, Jay J. Douglass, and Charles T. Bushong.

The Advance Water Heater Company, Chicago, which has recently been incorporated with a capital stock of $10,000, will manufacture and deal in heaters, iron and lead pipe. The incorporators are P. A. Thompson, C. T. Temple and W. H. Gilbert.

The Lowrie Safe & Lock Mfg. Company, Chicago, to manufacture safes and locks, has been incorporated by George L. Walker, William J. Walker, and J. Hubert Jann. Capital stock, $1000.

The Borden Condensed Milk Company will erect a $40,000 addition to its Elgin, Ill., plant, the structure to be 60 x 120 ft. Reinforced concrete construction will be used.

The Federal Engineering Company, Milwaukee, is having plans prepared for the erection of a factory building 60 x 100 ft., at Scott street and Thirty-sixth avenue.

The National Machine Company, Milwaukee, is erecting a new shop on National avenue.

The Oklahoma Engineering Company, Oklahoma City, Okla., has been incorporated with a capital stock of $25,000. Incorporators are Fred W. Kenney of Anadarko and George W. Frye and T. Myron Pyle of Oklahoma City.

The citizens of Grove, Okla., have voted for the construction of an electric light plant and water works.

Bonds amounting to $170,000 will be issued for municipal improvements at Hobart, Okla.

Cincinnati

CINCINNATI, OHIO, September 12, 1911

There is some complaint among machine tool builders regarding the slowness of collections, but this condition is expected to improve as the fall season advances. Inquiries continue very encouraging, as compared with two months ago, and, while the railroads are practically doing no buying at all, business from the general trade is coming up well. The importance of the export trade is emphasized in the statement of one large manufacturer, whose books show that 65 per cent. of his orders now come from that source.

Woodworking machinery is in excellent demand, with the South furnishing a full share of business in that line.

As was mentioned some time ago, the J. A. Fay & Eagan Company, Cincinnati, manufacturer of woodworking machinery, has acquired a large building site in Bond Hill suburb, to which its city plant will be moved as soon as the necessary buildings are constructed. As the Cincinnati Traction Company has agreed to construct a car line to this suburb, it is quite probable that building plans for the new factory will be rushed and construction started at an early date.

B. L. Baldwin & Co., Perin Building, Cincinnati, are working on plans for a four-story factory building to be constructed for the United States Paper Goods Company, on Pearl street.

To mine coal and manufacture coke, the Union Coal Land Company has been incorporated at Logan, W. Va., with a $75,000 capital stock. Among the incorporators named are: J. Carey Alderson, S. A. Draper and E. G. England, all of Logan.

It is rumored that the O. Armleder Company, Cincinnati, manufacturer of light auto trucks, is contemplating an addition to its plant, or the erection of a larger new factory on another site.

The Triumph Electric Company, Oakley, Cincinnati, has decided to enlarge its plant. No plans have as yet been made up, and definite information as to the size of the addition will hardly be available before next spring.

The Cincinnati Lithographing Company has had

THE MACHINERY MARKETS

E. Sloctemeyer, architect, draw up plans for a two-story building, 90 x 100 ft., and of steel construction, to be erected at Findlay and Province streets.

The Alma Cement Company, Jackson, Ohio, has increased its capital stock to $1,000,000. It has not been announced whether this increase means any additions to its present plant.

The Cincinnati Traction Company has let contract to the Roche-Bruner Company, Johnston Building, Cincinnati, for the construction of the large car barns in Hyde Park, recently mentioned.

It is reported that the Cincinnati Fly Screen Company will soon enlarge its plant in the West End district.

Considerable power plant and heating equipment will be required for the new Good Samaritan Hospital, to be erected in Cincinnati. Gustav W. Drach is the architect in charge.

The Fork Mountain Lumber Company, Springdale, W. Va., has been incorporated with $50,000 capital stock to operate a sawmill. Jacob S. Young, Springdale, is one of the incorporators.

Kirk & Blum, sheet metal workers, Cincinnati, have recently closed contract for the installation of a large dust and shavings collecting system for the Champion Works of the International Harvester Company, at Columbus, Ohio.

Fahnestock, Ferber & Robertson, Cincinnati architects, have drawn up plans for rebuilding the garbage reduction plant of Covington, Ky., recently destroyed by fire.

The William Powell Company, Cincinnati, will make an addition to its plant by the construction of a basement and remodeling the first floor of its factory.

The United States Electrical Tool Company, manufacturer of portable electric tools, Cincinnati, completed a new factory building this year, 68 x 200 ft., two stories, of brick construction. The company reports that business has picked up well in the past few weeks and promises to be considerably better than during the summer months. Some new tools are shortly to be brought out by the company.

The machine tool business is increasing with manufacturers at Hamilton, Ohio. The president of a large metal working machinery manufacturing company there recently stated that for the first time in three years the company has been receiving good inquiries from its agents in European countries, outside of Germany and Russia. All of the company's European representatives report that business in their territory is improving.

Cleveland

CLEVELAND, OHIO, September 12, 1911.

The local machine tool market continues dull, September having apparently brought out no improvement in the demand. The only business placed with the dealers the past week was scattering orders for single tools. No inquiries of any consequence came out. The only business of importance pending is the machinery equipment for the new West Technical High School, orders for which are expected to be placed this week. The demand for second-hand machinery is inactive. Builders of machine tools and general machinery report conditions about stationary. However, when any change is reported it is slightly for the better. The foreign demand is generally quiet, not being more active than the domestic demand. Orders for forging machinery are slightly more plentiful. The demand for automatic screw machinery is not active. Makers of industrial car and locomotive equipment report a moderate volume of orders. Makers of twist drills are getting a better volume of orders, and the demand for screw machine products has picked up. Automobile plants are quite busy, but they appear to have finished the placing of orders for their machinery requirements for the season, orders from that source being very light. The railroads are still keeping out of the market.

The Ajax Mfg. Company, Cleveland, has recently received orders for two large forging machines, one a 6-in. machine for the Milwaukee plant of the International Harvester Company, and the other a 5-in. machine for the shops of the Kansas City Railroad at Pittsburgh, Kansas.

Proposals will be received by F. A. Jones, consulting engineer, Youngstown, Ohio, September 28 for a gas engine, generator and motor for the new high school building in that city.

The Hobbs-McCarty Company, Cleveland, has been incorporated, with a capital stock of $25,000, by F. B. Hobbs, W. F. McCarty and others. The company will operate a plant at 10011 Quincy avenue, Cleveland, now run in the name of F. B. Hobbs, and another plant in Medina, Ohio. It will make tools, dies and special machinery.

Several Canton men, headed by L. E. Shull, formerly president of the Shull Steel Casting Company, have prepared a proposition for the establishment of a large foundry in Coshocton, Ohio, for the manufacture of radiators. The matter will be taken up by the Board of Trade in Coshocton.

Ground will be broken shortly for the new plant of the Ohio Steel & Wire Company, Warren, Ohio. It will be located near the plant of the General Foundry Company in that city.

The Buckeye Stereopticon Company, Cleveland, has increased its capital stock from $50,000 to $75,000.

The Novelty Stamping Company has accepted the offer of a new site at Shadyside, Ohio, near Bellaire, for the erection of a new plant. The company plans to start work shortly on the plant, which will be used for the manufacture of enamel ware.

The Toledo & Ohio Central Railroad has under consideration the extension of its shops at Bucyrus, Ohio.

Detroit

DETROIT, MICH., September 12, 1911.

A slight betterment is observed in conditions in the local machinery market, some orders of small lots being reported, together with a number of single tool propositions. Inquiries show an increase and dealers generally are rather inclined to be optimistic over the outlook. The campaign for good roads in the State has caused the purchase of quite an amount of roadmaking machinery, and a good deal of second-hand equipment is being used in this connection.

The Michigan State Fair will be held in Detroit, September 18 to 27, and Detroit manufacturers will have an exceptionally complete exhibit of machinery and implements.

Building circles have been rather quiet, the awards for the week being of a very ordinary nature.

A deal of considerable importance was consummated this week through the purchase by the Crane Company, Chicago, of a site for a branch plant in this city. The company, which is one of the largest manufacturers of valves, pipe and fittings in the country, has acquired the plant and business of the J. A. Roe Company, Detroit, and a piece of land 105 x 480 ft., adjoining on the river front, on which the new buildings will be erected.

Figures have been asked on a large new mill building for the Commercial Milling Company. Modern milling machinery will be installed.

The Public Lighting Commission is erecting an addition to the municipal electric light plant. Smith, Hinchman & Grylls are the architects.

The Wolverine Hotel Company has been incorporated with a capital stock of $416,000. The company has plans in the hands of Spier, Rohns & Gehrke, architects, for the construction of a 14-story hotel. A large amount of structural steel will be used and a heating plant and elevators installed.

Malcolmson & Higginbotham are preparing plans for the new Northwestern High School. The building will be 168 x 241 ft., with a separate boiler house.

The Herreshoff Motor Car Company has purchased a tract, comprising approximately 50,000 sq. ft., in the northern part of the city, with the intention, it is understood, of erecting a plant for the manufacture of automobiles.

The Newton Beef Company, packer, has filed notice of an increase of capital stock from $15,000 to $100,000.

The Breed Mfg. Company, manufacturer of motor cycles, has purchased a factory site in Bay City, Mich., and will remove its plant from Detroit in the near future. The move is made with the idea of augmenting the capacity of the plant. G. W. Breed is president of the company.

The United Brass & Foundry Company has been incorporated with a capital stock of $10,000 The principal stockholders are Thomas Walburn, M. B. Walburn and William Brabant.

The Suburban Motor Car Company has been incorporated with a capital stock of $400,000. William J. Brown, J. R. Nostrand and J. N. Newman are the principal stockholders.

The Morton Motor Car Company has increased its capital stock from $5.000 to $10,000.

THE MACHINERY MARKETS

The American Pattern Works has increased its capital stock from $2,000 to $10,000.

Muskegon, Mich., is to remodel its entire waterworks system at an expense of over $200,000. The new work will include a new intake pipe from Lake Michigan and a large number of new mains.

Fremont, Mich., is considering the establishment of a municipal water plant on the White River, 12 miles from Fremont. The estimated cost of the dam and machinery is $60,000.

The Peerless Wire Fence Company, Adrian, Mich., has a $20,000 addition to its plant in course of construction.

The Strable Mfg. Company, Saginaw, Mich., is planning the installation of a sprinkler system in its plant.

H. L. Hart will establish a pop-corn factory at Brooklyn, Mich. Machinery for husking, cleaning and packing corn will be required.

The Battle Creek, Coldwater & Southern Electric Railroad has found a market for its bonds and work will be started on the road in April. C. E. Wildey, of Burlington, is among those interested.

The Nichols & Shepard Company, Battle Creek, Mich,. manufacturer of farming machinery, will soon commence the erection of a large addition to its plant, which will more than double its capacity. A portion of the addition will be equipped for the manufacture of traction engines. The company reports an excellent volume of business.

Walter J. Woodman, of Portland, Me., has been appointed receiver of the National Boat & Engine Company. The company operates large plants at Muskegon and St. Joseph, Mich., which are known as the Racine Boat Company and the Truscott Boat Mfg. Company, respectively.

The American Fork & Hoe Company, Jackson, Mich., manufacturer of farming implements, has under construction an addition 60 x 96 ft., three stories, and has plans in hand for two other new buildings, one 100 x 230 ft., three stories, and the other 40 x 50 ft., two stories.

The Carpenter Spray Company has been organized at Grand Rapids, Mich., with a capital stock of $55,000, and will engage in the manufacture of spraying materials. E. C. Carpenter, St. Joseph, Mich., is at the head of the organization.

The Lansing Wheelbarrow Company, Lansing, Mich., has taken over the business of the Advance Concrete Mixer Company, Jackson, and will manufacture the product it formerly made.

The General Electric Company, Schenectady, N. Y., has been awarded the contract for the machinery to be installed in the municipal power plant at Marquette, Mich.

The taxpayers of Ubly, Mich., have voted in favor of bonding for the construction of a water works system.

It is reported that the United Woolen Mills Company, Chicago, will establish a woolen mill at Holland, Mich.

The Dielectrite Rubber Company, Muskegon, Mich., manufacturer of dielectrite insulation for high and low tension, is making extensions to its plant which will include the installation of tubing, shearing, grinding and buffing machines, punches, power saws, lathes, drill presses, transmission machinery and motors. The company, which is a new enterprise, reports an excellent volume of business and has been obliged to increase its capacity within the last six months.

The Grande Brick Company, Grand Rapids, Mich., is considering the doubling of its plant and the purchase of additional machinery.

Indianapolis

INDIANAPOLIS, IND., September 12, 1911.

The Magee Wiring Machine Company, Indianapolis, has been incorporated with $10,000 capital stock to manufacture sheet metal wiring machines. The directors are J. D. Williams, H. F. Hubbard and S. S. Broughton.

The Helfrich Pottery Company, Evansville, Ind., has been incorporated to manufacture pottery. The directors are A. Helfrich, M. D. Helfrich and H. F. Weaver.

The Ohio River Contract Company, Evansville, Ind., secured the contract for dam No. 48, on the Ohio River, six miles below Henderson, Ky. The bid was $1,400,000.

The M. Rumely Company, Laporte, Ind., last week shipped 5 cars of threshing machinery and tractors, in one train, to Regina, Canada.

The National Farm Device Company, Indianapolis, has been incorporated with $250,000 capital stock to manufacture graincleaning devices. The directors are J. M. White, George W. Benedict and A. J. Schoen.

The Stedman Foundry & Machine Company, Lawrenceburg, Ind., has sold its plant to the Baltimore & Southwestern Railroad Company, which will build on the site freight houses and warerooms. The Stedman Company will erect modern concrete buildings for a new foundry, to cost $25,000.

John Clark, formerly of the Clark Motor Car Company, Shelbyville, Ind., will become manager of a new automobile plant for a company now being organized.

The American Car Seal Company, South Bend, Ind., manufacturer of an automatic freight car seal, has begun operations.

Fire, September 4, destroyed the tipple and mine building at Diamond, Ind., belonging to J. H. McClelland, of Brazil, Ind., causing $5,000 loss.

The Maxwell-Briscoe Motor Company, Newcastle, Ind., after operating its plant on a 48-hour-a-week schedule during the hot weather, has resumed full time, full capacity, night and day shifts. The company will build 10,000 machines for the 1912 season.

The Home Electric Company, Wakarusa, Ind., has been incorporated with $15,000 capital stock, to supply heat, light and power. The directors are J. E. Gall, J. E. Bollenbacher and V. H. Schalliol.

The Ward Fence Company, formerly of Portland, Ind., has moved to Marion, Ind.

The Rushville Furniture Company, Rushville, Ind., is erecting a new factory. It will have its own electric power plant.

The Grocers' Chemical Works, Evansville, Ind., will erect a new plant, to cost $70,000.

The Dunkirk Cement, Tool & Machine Company, Dunkirk, Ind., has been incorporated with $10,000 capital stock, to manufacture tools and machinery. The directors are E. E. Gunkel, F. L. Hickman and J. R. Runner.

The South

LOUISVILLE, KY., September 12, 1911.

A disappointing lull has developed in the local machinery market, both in the number of inquiries and in the business actually being closed. Boiler manufacturers are doing less than they have been, but report that prospects for future business are still good. Manufacturers of ice machinery also state that there is a falling off in inquiries. Makers of special machines, such as dryers for brewery and distilling plants, report a heavy influx of business, and orders for this character of equipment are being received in sufficient volume to keep plants busy for a number of months.

The Louisville branch of the Standard Oil Company is rebuilding and enlarging its blacksmith shop at Fifth and Bloom streets.

Theodore H. Curtis, Louisville, former superintendent of machinery for the Louisville & Nashville Railroad, is patenting several devices for the perfection of which he resigned his position. Among them are an improved staybolt for locomotives and a staybolt for steam boilers.

The Brinly-Hardy Company, farm implement manufacturer, Louisville, has increased its capital stock from $160,000 to $210,000. The increase is for the purpose of taking care of the improvements which have been made recently in the plant.

The American Machine Company, Louisville, reports numerous orders for electrically operated freight and passenger elevators. It has been awarded a contract for nine elevators to be installed in the depot and office building of the Southern Railway at Atlanta.

The Columbia Steam Laundry, Louisville, will install new power equipment, including a 150 hp. boiler and a 50-75 hp. engine. E. X. Jackman is proprietor of the laundry.

The Henry Vogt Machine Company, Louisville, reports a falling off in inquiries for refrigerating and power machinery, but the plant is running full time on orders which have already been closed.

The Southern Brick & Tile Company, Louisville, has awarded a contract for a ditching machine to the Buckeye Traction Ditcher Company, Findlay, Ohio.

The Louisville Drying Machine Company reports enough orders ahead to keep the plant busy for several months. Brewing and distilling companies are the principal purchasers, although a good many machines are also being sold for the drying of alfalfa.

THE MACHINERY MARKETS

W. J. Loughbridge, Lexington, Ky., has under consideration plans for the erection of an ice factory. This is the third project of the kind now under consideration at Lexington.

The Phoenix Hotel, Lexington, Ky., has awarded a contract to the Hatfield Electric Company, Indianapolis, for the installation of its power plant. Skinner engines and General Electric dynamos are to be used. The Triumph Ice Machine Company, Cincinnati, is installing the refrigerating plant.

The development of the coal deposits of western Kentucky is expected to proceed much more rapidly than heretofore. The increasing difficulty of getting Pittsburgh coal into Southern markets, compared with the facility with which the Kentucky product may be marketed in that section, has encouraged those owning coal lands in the western part of the Bluegrass State, and many new openings are being made.

The Luton Coal Company, Providence, Ky., is erecting a new tipple at its plant. In addition a good deal of mining machinery will be installed. An air compressor will also be purchased.

The Princeton Handle Company, Princeton, Ky., is contemplating the addition of wood-working machinery for finishing material. At present only the rough stock is manufactured. B. C. Crane is superintendent of the plant.

Thomas J. Mitchell, Uniontown, Pa., and others are organizing the Mitchell Coke Company for the purpose of constructing coke ovens near Hellier, Ky.

The Genuine Open Hearth Iron Metal Products Company, Newport, Ky., which was recently organized, will sell shop rights for a patent culvert and other metal products, according to recent announcement. A. L. Andrews, of the Newport Rolling Mill Company, is one of those interested in the new company, which was recently incorporated.

Barney & Sides, Rector, Ark., are equipping a plant for the manufacture of elm hoops at Hickman, Ky. They took over the plant and equipment of the Hickman Lumber & Planing Mill Company.

The Home Warehouse Company, Owensboro, Ky., plans the erection of a grain elevator to cost $15,000. A separate company will be formed for the purpose.

The Owensboro & Rockport Bridge & Terminal Company has been granted an extension of six months within which which to begin the work of constructing a bridge over the Ohio River between the points named.

The Park Carriage Company, Henderson, Ky., has announced plans for the erection of a three-story addition to its plant. It will be 25 x 100 ft., and will enable the company to increase its capacity considerably.

The Roberts Fluorspar & Lead Company, Marjon, Ky., has filed articles of incorporation. Its capitalization is $30,000, and the incorporators include George P. Roberts, William S. Ranson and Richard M. Lambert.

R. B. Starkweather and others, of Knoxville, Tenn., have purchased the plant and quarries of the Tegart Stone Company, Bowling Green, Ky., and are organizing the Victoria Limestone Company for the purpose of carrying on the business. The plant will be considerably enlarged and a mill for cutting stone to dimension will be equipped. It is probable that another opening will be made on the property.

The Hazard Bridge Company, Hazard, Ky., has filed articles of incorporation. The company is capitalized at $15,000, and the incorporators include Jesse Morgan, T. S. Ward and J. B. Hoge.

Clay City, Ky., acting with the county, is planning the construction of two bridges. It is expected that contracts will be let early in the fall, as it is desired that they be completed before winter.

The city of Owensboro, Ky., will shortly create a franchise for a gas company. The company now operating is expected to purchase the franchise and in this event it will probably make enlargements and otherwise improve its plant.

D. N. Young, of the Electric Dry Cleaning Company, Mt. Sterling, Ky., is having a power-house erected. The plant will be operated by electricity and motors and other equipment will be required.

W. T. Windell, Pikeville, Ky., is planning the erection of a large stave mill near that city. He has secured a considerable acreage of white oak timber and this will be worked up.

Jonesboro, Tenn., has decided by popular vote to issue $25,000 of bonds for the purpose of assisting in the construction of an electric line to Johnson City, Tenn.

The Chattanooga Roofing & Foundry Company, Chattanooga, Tenn., has installed new equipment for the purpose of enlarging the department devoted to the manufacture of skylights and window sash bars, galvanized gutters, roofing, etc. It is specializing in the manufacture of a metal shingle.

The Pinnacle Wagon Mfg. Company, Cincinnati, Ohio, is reported to be negotiating with the Board of Trade of Cumberland Gap, Tenn., relative to the establishment of a wagon factory there.

The Farmers' Union, Etowah, Tenn., is planning the erection of a cotton gin and flour mill. It will be located near the plant of the Etowah Ice Company, which will probably furnish the power for the operation of the new projects.

The Lakeview Traction Company, Memphis, Tenn., announces that it has closed contracts for $65,000 worth of equipment, completing the requirements of its power house. R. H. Bruce is chief engineer. The company will operate a traction line from Memphis to Lakeview.

The Maryville Electric Light, Heat & Power Company, Maryville, Tenn., which was recently organized with $100,000 capital stock, is proceeding with the plans for the construction of a hydroelectric plant at Abrams' Falls, 25 miles from Maryville.

The Richmond Hosiery Mills has purchased a building at Chattanooga, Tenn., and will equip it for the exclusive manufacture of bunting.

F. H. Angell will be in charge of the exhibit of the Jeffrey Mfg. Company, Columbus, Ohio, at the Appalachian exposition at Knoxville, Tenn. The exhibit will consist of pulverizing machinery for manufacturing limestone into fertilizer.

The Cullman, Ala., Light & Water Company, of which B. Kiel is superintendent, is receiving bids on the installation of an air compressor.

The Ashland Oil Mill & Fertilizer Company, Ashland, Ala., is in the market for a 175-hp. boiler. Address A. A. Northern. Second-hand equipment is preferred.

The Hughes Grate Shaker Company, Birmingham, Ala., has been incorporated with $300,000 capital stock by C. R. Atkins, J. G. Hughes and H. E. McCormick.

The Georgia Green Slate Company, Candler Building, Atlanta, is purchasing equipment for a slate quarry, and is in the market at present for channeling machines.

Two important fires in Alabama will probably require the purchase of new equipment by the concerns affected. The plant of the Southern Mfg. Company, Gadsden, Ala., was completely destroyed with $100,000 loss. It manufactured sash, doors and blinds. H. L. Gwin is secretary. The Armour Packing Company's packing and cold storage plant at Birmingham was also burned, the estimated loss being $200,000. The plant was completed only in July.

The Bryson Mountain Coal & Iron Company, Hartcraft, Tenn., is completing the erection of a new power plant.

As soon as negotiations looking to the purchase of the privately owned water works system by the municipality at Shreveport, La., are completed, steps will be taken to double the capacity of the plant.

J. R. Gilcrest, Toronto, Ohio, has purchased the controlling interest in the Davis-Price Foundry & Machnie Company, New Cumberland, W. Va. Machinery for clay-working plants will be especially manufactured.

The United States Porcelain Company, New Cumberland, W. Va., has closed its plant for the purpose of making repairs and installing additional machinery. The company manufactures high potential insulation.

Hain Mate, Huntington, W. Va., is organizing a company for the manufacture of a steel-back step-ladder.

The citizens of Lexington, Tenn., have voted to issue bonds for the installation of an electric light plant and water works.

The John A. McKay Mfg. Company, Dunn., N. C., has completed an extension to its machine shop and is now enlarging its foundry department, 30 x 150 ft., with one wing for core room, 30 x 30 ft. Orders have been placed for new machinery.

St. Louis

ST. LOUIS, MO., September 11, 1911.

The machine tool market continues to show a fair average of orders without any large contracts or inquiry lists. Dealers report a little improvement in the total

THE MACHINERY MARKETS

as compared with recent weeks, and see signs of a better movement before the month is over. In general, however, the business is scarcely more than 65 per cent. of the normal condition previous to the dullness which has been continuing so long.

The Wrought Iron Range Company has let the contract for its new plant to be built on the northwestern edge of the city and to which it will remove as soon as the new buildings can be completed. The new structures will cost about $100,000, exclusive of the machinery plant, which will constitute by far the larger part of the total investment. All the buildings will be of fireproof construction, and are expected to be ready by March next.

The permit for the new building of the Matthews-Davis Tool Company, which has been issued, calls for a building to cost $18,000, exclusive of mechanical equipment. The plant will be utilized for the manufacture of an expansion boring tool.

The Bangor Zinc Mining & Smelting Company, St. Louis, has been incorporated with $30,000 capital stock, to operate in the Joplin field, by C. W. Dice, Gustave W. Robyn and John Ferris.

The Rudolph Mfg. Company, Roselle, Ill., has been incorporated, with $25,000 capital stock, by H. J. Mensching, R. H. Rudolph and L. A. Mensching.

The Missouri Belting Company has bought a new site for its plant, and will build and equip for much larger output than it has at present.

The Cronk & Foster Engraving Company, Little Rock, Ark., has been incorporated, with $35,000 capital stock, by Edward Cronk, Frank Foster and A. Foster, and will equip a plant for the engraving business.

The Beecher Light & Power Company, Beecher, Ill., has been incorporated to establish a public lighting system by Henry B. Ruge, William J. Hinds and Carl Ehrhardt.

The William J. Lemp Brewing Company has taken out a permit for the erection of an addition to its brewing plant to cost $78,000, exclusive of its mechanical equipment. The building will be seven stories and fireproof.

The city of Springfield, Mo., has voted to hold an election on the proposed issue of $600,000 of bonds for the purchase of machinery and the installation of a municipal water plant. It will also vote at the same time on the establishment of a $100,000 septic system for the handling of its sewage. The plan contemplated makes no provision for the acquisition of the present privately owned system.

The Monmouth Creamery Company, Monmouth, Ill., has been incorporated and will equip a plant for the handling of and manufacture of dairy products.

The Ross-Frazier Iron Company, St. Joseph, Mo., has been incorporated, with $100,000 capital stock, by John A. Ross, Jacob M. Ford, Charles A. Frazier and others.

The Wyco Car Company, St. Joseph, Mo., has been incorporated with $50,000 capital stock, for the manufacture of motor cars, by Huston Wyatt, G. N. Johnson and J. E. Eberly.

The Dorris Motor Car Company, St. Louis, Mo., has announced plans for the erection of a three-story reinforced concrete automobile factory to cost $100,000. It is intended that construction will begin within 30 days.

Texas

AUSTIN, TEXAS, September 9, 1911.

A general improvement is noted in the demand for machinery in Texas as well as in the Southwest and Mexico. Much attention is being given to the installation of mills and machinery for mines, particularly in Arizona and New Mexico. What is considered a remarkable demand for irrigation pumping machinery exists in the shallow water belts of western Texas and New Mexico, where many individual pumping plants have been installed during the last few months. This development movement has just been started, the discovery that a sufficient supply for irrigating considerable areas of land may be obtained by putting down shallow wells being comparatively new. It is expected that the good demand that already comes from those sections for pumping machinery will be wonderfully increased from now on.

The Laredo Water Works Company, Laredo, will install a large amount of new machinery in its plant, enlarging the capacity and making other improvements.

The Commercial Club of Kingsville, Texas, is promoting the establishment of a large creamery. It is proposed to organize a local company for the purpose.

The Temple Gas Company, Temple, is preparing to rehabilitate its plant. It will purchase considerable new machinery and relay the mains of its distributing system.

W. L. Swinney and associates are installing stone cutting and dressing machinery in their quarry near San Saba.

The Rio Grande Development Company has been formed at Houston for the purpose of constructing a system of irrigation in the lower Rio Grande valley. The capital stock is $10,000. Incorporators are L. M. Matthews, W. G. Buckner and T E. Cowart.

Bids for the construction of a drainage system to embrace 85,000 acres near Brownsville were opened August 30 by the drainage commission, but all were rejected owing to the failure of the bidders to comply with certain legal requirements. A new date, October 3, was set for receiving new bids. Bonds to the amount of $204,500 were recently issued by the district to pay for the proposed drainage work.

T. H. Zanderson of San Antonio, Walter Avant of Jordontown and associates will build a water works plant and distributing system at Jordontown, Texas, at a cost of about $15,000.

The Byrd Land & Cattle Company will construct a large system of irrigation on Turkey Creek near Uvalde. The plans involve the dredging of a canal from the Nueces River to Turkey Creek, a distance of nine miles. A reinforced concrete dam will be built across Turkey Creek and a reservoir formed that will cover about 5000 acres. It is estimated that the water supply will be sufficient to irrigate about 60,000 acres. The surveys for the project are now being made.

The Business League of Bay City is promoting the establishment of creamery. M. Thompson, O. J. Doubeck and B. E Norvell have charge of the matter

R. P. Smythe of Plainview and associates are promoting the establishment there of a beet sugar factory to cost about $600,000. Practical sugar manufacturers are interested in the proposition. Tests have been made of the land of that section for growing sugar beets and it is found that the industry can be made a success.

The Marley Gin Company, Reisel, has been formed with a capital stock of $6500. The incorporators are W. M. Marley, J. A. Smith and F. M. Miller.

The Munger Automobile Company, Dallas, has been formed with a capital stock of $25,000. The incorporators are S. I. Munger, L. R. Munger and S. I. Munger, Jr.

Wesley Merritt of Chicago has purchased several blocks of ground at Port Bolivar, including a good water frontage, as a preliminary step in what is asserted to be the establishment of blast furnaces for utilizing East Texas iron ore. The East Texas Iron Ore Mining & Development Company is also reported to have adopted plans for the establishment of furnaces at Port Bolivar.

The Pacific Coast

SAN FRANCISCO, September 5, 1911.

Scarcely an inquiry for large machine tools has been experienced for several weeks, and nothing is in prospect which offers much encouragement for the immediate future. Some of the local merchants look for more activity after the municipal election, but others feel that business is not likely to be resumed on any large scale for at least a year. The railroads are buying practically nothing, and while they have asked for prices on a few tools, they are not expected to enter the market actively before next year. Much will depend on the developments of the next few weeks in the relations of the railroads with their shop employees.

It is reported that the Westinghouse Air Brake Company and the Oliver Chilled Plow Company will establish plants at Emeryville and Richmond, Cal., in the near future, but the best that is expected in this connection is the sale of a few small machines. A good many orders for single tools of small size are coming from automobile repair shops and other small concerns through the country, keeping this class of trade about up to the recent average.

Mining machinery continues active in a small way, with a fair amount of inquiry for stamp mills, crushers, etc., of a fairly large nature. Nothing is being done in the line of heavy rock crushers, as many of the plants already established are idle. Small crushers, however, are wanted by many counties and towns, and all lines of

THE MACHINERY MARKETS

road-building machinery are moving well. The recent movement of sawmill machinery has been very satisfactory for this time of year, and many new projects are coming up which will require mill and logging equipment within a few months. Some large orders are coming out for electrical equipment. Numerous improvements are being made in brick plants, both around San Francisco and in southern California. The demand for power pumps is of about the same volume and nature as for some time past.

The Southern Sierras Power Company has placed orders for a lot of equipment to be installed at San Bernardino, Cal., C. C. Moore & Co. getting the contract for the installation of the steam generating plant, which will amount to about $200,000. The contract for steel transmission towers has been placed with Milliken Bros., Inc.

The Great Western Cutting & Welding Company, San Francisco, has been incorporated with a capital stock of $200,000, By O. L. Berry, M. J. Kuhl and E. B. Folsom.

The American Gas Engine Company has started work on its shop at Ventura, Cal. Gas engines of from 5 to 45 hp. will be made.

The C. L. Best Gas Traction Company, Oakland, Cal., is building an addition to its steel foundry. A 10-ton electric crane will be installed. In addition to traction engines the company is now manufacturing electric harvesters.

Preliminary plans are being made for the shops of the Geary Street Municipal Railroad, for which several machine tools will be required.

The Los Angeles Pressed Brick Company, whose large paving brick plant at Santa Monica, Cal., was destroyed by fire last month, will rebuild as soon as plans can be completed.

The Irrigators' Supply Company, controlled by the same interests as the Pacific Electric Heating Company, intends to start a factory at Ontario, Cal., for the manufacture of metal goods used in irrigation.

Specifications have been completed for the main power equipment of the San Francisquito No. 1 plant of the city of Los Angeles have been completed, and bids will be taken at an early date. The equipment will include generators, water wheels and transformers, the estimated cost being about $350,000.

The Crow Mfg. Company has taken an order for a pumping plant for the city of San Bernardino, Cal.

Samuel Livingston of Oakland and F. Deutsch of this city have formed a partnership under the name of the Western Machinery Company.

The Main Street Iron Works, this city, is building the engine for a new steamer, the hull of which has just been completed at Eureka, Cal.

The Gorham Engineering Company, Oakland, Cal., is building hulls and engines for two 100 hp. gasoline boats for Seattle parties.

The State Harbor Commissioners have awarded to the Moore & Scott Iron Works a contract for repairing steel dredge buckets by the electric welding process.

A meeting of the stockholders of Baker & Hamilton, hardware and steel merchants, San Francisco, has been called for October 26, for the purpose of considering an increase of the capital stock from $1,000,000 to $2,000,000.

The Clive Arms & Mfg. Company, A. A. Clive president, has been organized at Los Angeles, with the intention of building a plant for the manufacture of firearms.

The Trinity River Gold Mining & Reduction Company is arranging to add ten stamps to the ore mill at the Headlight mine, Trinity Center, Cal. The company is also considering the installation of a dredge on Trinity River.

The Fruit Growers' Supply Company will double the capacity of its sawmill at Hilt, Cal., during the winter. Additional logging equipment will also be required.

A meeting of the creditors of the A. T. Ames Mfg. Company, pump manufacturer, Niles, Cal., was held August 30.

An attachment has been filed on the property of the Goldy Machinery Company, Sunnyvale, Cal., in the interest of H. L. Atkinson of New Jersey.

The Western Machine & Foundry Company, Santa Barbara, Cal., will shortly erect two buildings, to house a cupola and automobile shop.

The Riverside Portland Cement Company, Riverside, Cal., has installed a 15-ton crane, purchased from the Brown Hoisting Machinery Company.

Bids will be opened by the Board of Public Works of this city, September 20 for machinery, etc., for the San Francisco Hospital, the estimated cost of which is about $100,000. Over half the expenditure will be for power house equipment, including steam turbines, and most of the remainder for laundry and refrigerating plants.

The Pacific Navigation Company is planning to install a large laundry plant at San Pedro, Cal.

The Feather River Mill Company, operating near Portola, Cal., has placed orders for a new band saw and several other machines.

The Seattle Frog & Switch Company, Seattle, Wash., will move its plant to Earlington, Wash., along the line of the Chicago, Milwaukee & Puget Sound Railroad. The company has purchased five acres of land at Earlington, on which is to be erected a general manufacturing building, 100 x 200 ft., which will enable the company to increase its present output about 50 per cent.

The Portland Railway Light & Power Company, Portland, Ore., has begun the erection of a car building plant, the building and equipment of which are expected to cost several hundred thousand dollars.

Government Purchases

WASHINGTON, D. C., September 11, 1911.

The Bureau of Yards and Docks, Navy Department, Washington, will open bids under schedule 3887 September 19 for five engine lathes and 19 motors for machine tools, schedule 3888, and on September 30 for two 15-ton locomotive jib cranes, one to be delivered to navy yard, Norfolk, Va., and one to Mare Island Navy Yard.

The United States Engineers' office, Wheeling, W. Va., will open bids September 22 for constructing and delivering steel hull dipper dredge Col. M. B. Adams, with machinery, fittings, etc.

The superintendent of prisons, Department of Justice, Washington, will open bids September 18 for one air compressor, air receiver, riveting hammers and a quantity of hose for use with the hammers.

The Navy Department, Washington, will open bids September 19 under schedule 3887, class 131, for five Hendy-Norton engine lathes for the Newport Navy Yard, and under schedule 3888, class 141, motor applications to belt-driven machine tools for the Brooklyn Navy Yard.

The Bureau of Yards and Docks, Navy Department, Washington, will receive bids until September 30 for a portable air compressor and accessories for the navy yard at Norfolk, Va.

The Bureau of Supplies and Accounts, Navy Department, Washington, opened the following bids September 5:

Schedule 3893, class 1, one motor-driven extension lathe—Bidder 75, Harron, Ricard & McCone, San Francisco, Cal., $941; 85, Kemp Machinery Company, Baltimore, Md., $978; 135, Rix Compressed Air & Drill Company, San Francisco, Cal., $718, $745 and $790; 226, Manning, Maxwell & Moore, New York, $735 and $929; 245, Springfield Machine Tool Company, Springfield, Ohio, $1,051.

Class 2, one motor-driven back-geared power feed drill press—Bidder 2, Atlantic Precooling & Wood Preserving Works, Norfolk, Va., $580; 85, Kemp Machinery Company, Baltimore, Md., $473.50, $422 and $489; 135, Rix Compressed Air & Drill Company, San Francisco, Cal., $574; 226, Manning, Maxwell & Moore, New York, $815 and $560; 271, Pacific Tool & Supply Company, San Francisco, $550.

Class 3, one motor-driven two-wheel emery grinder with two spare wheels—Bidder 85, Kemp Machinery Company, Baltimore, Md., $259; 199, James Clark, Jr., Electrical Company, Louisville, Ky., $240; 226, Manning, Maxwell & Moore, New York, $990 and $885; 241, Springfield Mfg. Company, Bridgeport, Conn., informal.

Class 4, one motor-driven sensitive drill—Bidder 199, James Clark, Jr., Electrical Company, Louisville, Ky., $160; 226, Manning, Maxwell & Moore, New York, $274.

Class 5, one screw-cutting back-geared motor-driven tool room lathe—Bidder 75, Harron, Ricard & McCone, San Francisco, Cal., $772 and $1,105; 135, Rix Compressed Air & Drill Company, San Francisco, Cal., $1,104 and $1,154; 204, Eccles & Smith Company, San Francisco, Cal., $1,338; 226, Manning, Maxwell & Moore, New York, $1,350; 228, Niles-Bement-Pond Company, New York, $1,241; 233, O. L. Packard Machinery Works, Milwaukee, Wis., $1,027; 271, Pacific Tool & Supply Company, San Francisco, Cal., $1,475.

Class 6, one back-geared motor-driven extension gap lathe—Bidder 75, Harron, Ricard & McCone, San Francisco, Cal., $2,302; 85, Kent Machinery Company, Baltimore, Md., $2,403, $2,257; 204, Eccles & Smith Company, San Francisco, Cal., $3,835; 226, Manning, Maxwell & Moore, New York, $1,725 and $2,365; 228, Niles-Rement-Pond Company, New York, $3,271; 233, O. L. Packard Machinery Works, Milwaukee, Wis., $2,330; 271, Pacific Tool & Supply Company, San Francisco, Cal., $2,850.

Schedule 3833, class 21, 20 sets steam turbine-driven blowers—Bidder 63, General Electric Company, Schenectady, N. Y., $1,000; 83, Kerr Turbine Company, Wellsville, N. Y., $967.50; 165, Terry Steam Turbine Company, New York, $1,075 and $912.50; 172, Westinghouse Machine Company, East Pittsburgh, Pa., $1,100; 246, B. F. Sturtevant Company, Hyde Park, Mass., $1,059 and $944; 249, Turbine Equipment Company, Philadelphia, Pa., $1,045 and $1,145.

Current Metal Prices.

The following quotations are for small lots, New York. Wholesale prices, at which large lots only can be bought, are given elsewhere in our weekly market report.

IRON AND STEEL—

Bar Iron from Store—

Refined Iron:
1 to 1½ in. round and square ₰ lb 1.70¢
1½ to 4 in. x ⅜ to 1 in. ₰ lb 1.80¢
1½ to 4 in. x ⅛ to 3/4 in. ₰ lb 1.80¢
Rods, ⅜ and 11-16 round and square ₰ lb 1.80¢

Angles: Cts. ₰ lb
3 in. x 3 in. and larger 1.90¢
2 in. x 2 in. and ⅛ in. 2.00¢
1½ to 2½ in. x ⅛ in. 2.05¢
1½ to 2½ in. x 3-16 in. and thicker 1.95¢
1 to 1½ in. x 3-16 in. 2.05¢
1 to 1¼ x ⅛ in. 2.10¢
⅞ x ⅞ in. 2.20¢
⅝ x ⅝ in. 2.25¢
⅝ in. x ⅛ in. 2.15¢
½ x 3/32 in. 3.00¢

Tees:
1 in. 2.35¢
1¼ in. 2.20¢
1½ to 2½ x 1¼ in. 2.00¢
1½ to 2½ x 3/16 in. 2.10¢
3 in. and larger 2.05¢
Beams 1.90¢
Channels, 3 in. and larger 1.90¢
Bands, 1¼ to 6 x 6/16 to No. 8 2.10¢
Burden's "H. B. & S." iron, base price 2.95¢
Burden's "Best" iron, base price 3.15¢
Norway bars 3.60¢

Merchant Steel from Store—

per lb
Bessemer machinery 1.90¢
Toe calk, fire and sleigh shoe 2.50@3.00¢
Best cast steel, base price in small lots 7¢

Sheets from Store—

Black	One pass, soft steel.	R. G. cleaned.
No. 16 ₰ lb	2.45¢	2.75¢
Nos. 18 to 20 ₰ lb	2.50¢	2.85¢
Nos. 22 and 24 ₰ lb	2.55¢	2.95¢
No. 26 ₰ lb	2.60¢	3.05¢
No. 28 ₰ lb	2.95¢	3.50¢

Russia, Planished, &c.

Genuine Russia, according to assortment ₰ lb 12 @14½
Patent planished W. Dewees Wood ₰ lb A. 10c; B. 9c net.

Galvanized

Nos. 12 and 14 ₰ lb 2.75¢
No. 24 ₰ lb 3.10¢
No. 26 ₰ lb 3.20¢
No. 28 ₰ lb 3.60¢
Nos. 20 and 22 after 36 inches wide, 25c higher.

Genuine Iron Sheets—Galvanized

Nos. 22 and 24 ₰ lb 5.50¢
No. 26 ₰ lb 6.00¢
No. 28 ₰ lb 7.00¢

Corrugated Roofing—

	Painted	Galvd
2½ in. corrugated		
No. 24 ₰ 100 sq. ft.	$3.75	$4.70
No. 26 ₰ 100 sq. ft.	2.85	3.90
No. 28 ₰ 100 sq. ft.	2.50	3.65

Tin Plates—

American Charcoal Plates (per box)

"A.A.A." charcoal:
IC. 14 x 20 $6.65
IX. 14 x 20 7.90
A. charcoal:
IC. 14 x 20 $5.60
IX. 14 x 20 6.70

American Coke Plates—Bessemer—
IC. 14 x 20 107 lb $4.50
IX. 14 x 20 5.50

American Terne Plates—
IC. 20 x 28 with an 8 lb coating $8.70
IX. 20 x 28 with an 8 lb coating 10.70

Seamless Brass Tubes—

List November 15, 1909. Base price, 18¢

Brass Tubes, Iron Pipe Sizes—

List November 15, 1909. Base price, 18¢

Copper Tubes—

List November 15, 1909. Base price, 21¢

Brazed Brass Tubes—

List February 1, 1911. 19½¢ ₰ lb

High Brass Rods—

List February 1, 1911. 14¾¢ ₰ lb

Roll and Sheet Brass—

List February 1, 1911. 14¾¢ ₰ lb

Brass Wire—

List February 1, 1911. 14¾¢ ₰ lb

Copper Wire—

Base price. Carload lots mill 13¾¢

Copper Sheets—

Sheet copper hot rolled, 16 oz. (quantity lots) ₰ lb 17¢
Sheet copper cold rolled, 1¢ ₰ lb advance over hot rolled.
Sheet copper polished 20 in. wide and under, 1¢ ₰ square foot.
Sheet copper polished over 20 in. wide, 2¢ ₰ square foot.
Planished copper, 1¢ ₰ square foot more than polished.

METALS—

Tin—

Straits pig ₰ lb 46 @47 ¢

Copper—

Lake ingot ₰ lb 14 @14¼¢
Electrolytic ₰ lb 13¾@14 ¢
Casting ₰ lb 13¾@14 ¢

Spelter—

Western ₰ lb 6⅞@ 7⅛¢

Zinc—

No. 9, base, casks ₰ lb 8½¢ Open ₰ lb 9 ¢

Lead—

American pig ₰ lb 5¼@5½¢
Bar ₰ lb 6⅜@6½¢

Solder—

½ & ½, guaranteed ₰ lb 28¼@28½¢
No. 1 ₰ lb 26¼@26¾¢
Refined ₰ lb 24¾@25 ¢
Prices of solder indicated by private brand vary according to composition.

Antimony—

Cookson ₰ lb @10¼¢
Hallett @10 ¢
Other brands 9@ 9½¢

Bismuth—

Per lb $2.00@$2.25

Aluminum—

No. 1 aluminum (guaranteed over 99% pure), in ingots for remelting 21¢ and 22¢
Rods and Wire Base price 31¢
Sheets Base price 33¢

Old Metals—

Dealers' Purchasing Prices Paid in New York.

	Cents.
Copper, heavy and crucible	10.75 to 11.00
Copper, heavy and wire	10.50 to 10.75
Copper, light and bottoms	9.50 to 9.75
Brass, heavy	7.25 to 7.50
Brass, light	5.75 to 6.00
Heavy machine composition	9.25 to 9.50
Clean brass turnings	7.00 to 7.25
Composition turnings	8.00 to 8.25
Lead, heavy	3.50
Lead, tea	2.50
Zinc, scrap	4.00



THE IRON AGE

Established 1855 — New York, September 21, 1911 — Vol. 88: No. 12

Published Every Thursday by the
DAVID WILLIAMS COMPANY
239 West 39th Street, New York

Entered at the New York Post Office as Second-Class Mail Matter.

Subscription Price, United States and Mexico, $5.00 per Annum; to Canada, $7.50 per Annum; to Other Foreign Countries, $10.00 per Annum. Unless receipt is requested, none will be sent. Credit for payment will be shown by extending the date on the wrapper of your paper.

W. H. Taylor, - - - - - President and Treasurer
I. A. Mekeel, - - - - - - First Vice-President
Harold S. Buttenheim, - - - Second Vice-President and Secretary

Geo. W. Cope, - - - - } Editors
A. I. Findley, - - - - }
W. W. Macon, - - - - }

M. C. Robbins, - - - - Manager
Charles S. Baur, - - - Assistant Manager

Branch Offices

Philadelphia, Real Estate Trust Building
Pittsburgh, Park Building
Boston, Compton Building
Chicago, Fisher Building
Cleveland, American Trust Building
Cincinnati, 807 Andrews Building

CONTENTS.

Wage Readjustments 607
Is Government Interference with Business Culminating? 608
Today's and Other Price Levels 608
The Coming Machinery Meeting 609
Safeguarding the Bankruptcy Act 609
Economic Changes and Better Business 610
Rate Discrimination Alleged on Eastern Iron Ores 611
The Philadelphia Foundry Foremen's Outing 611
The Thomas Iron Company's Meeting 611
The Iron and Metal Markets 612
Banquet of American Ingot Iron Salesmen 623
American Engineers for the New Steel Works In India 623
Connellsville Coke Producers Demand Lower Freight Rates 623
The British Iron Trade 624
More Factories Wanted in Pittsburgh 624
Personal 625
The Pittsburgh Foundrymen's Association 625
Obituary 625
Pittsburgh and Vicinity Business Notes 626
President Farrell on the Steel Corporation's Plans for Duluth 626
American Opportunity in Europe 627
The Need of Stronger Packing 627
New Portable Welding Machine 628
Railroad Equipment Orders 629
The Youngstown Sheet & Tube Company 630
Hanna Electric Riddle Oscillator 638
Job Handling System 638
The American Institute of Mining Engineers 639
The Lagonda Automatic Cut-Off Valve 640
The Twisting of Reinforcing Bars 641
Molybdenum Steel from the Electric Furnace 641
Root & Van Dervoort Factory Expansion 641
The Cost of Southern Pig Iron 642
Customs Decisions 642
The La Belle Iron Works 643
A Stocomb Tool Store in New York 643
The Brown-Ketcham Iron Works Failure 643
Cupola and Air Furnace Combined 644
Double-Crank Forging Press 644
Motor-Driven Bench Drill 645
Improved Westinghouse Transformer 645
Allen-Bradley Motor Starters 646
Important Westinghouse Electric Contracts 646
Judicial Decisions of Interest to Manufacturers 647
New Tools and Appliances 648
Trade Publications 649
The Machinery Markets 650

Wage Readjustments

A Factor in the Steel Situation

An Effort to Raise Wire Prices—Frequent Cutting on Other Products

Taking the steel industry as a whole, the past week has brought little change in volume of orders or in prices. Rumors of further cuts on this or that product have been sifted down to what the trade has known well for weeks—that there is actually an open market in iron and steel. The reports that some large producers had given a free hand to salesmen in their respective districts scarcely needed denying; yet in some lines their effect was evidently unsettling.

The possibility of lower wages at steel works and rolling mills is being very seriously discussed. In 1909 10 per cent. reductions were made by the independent producers a few weeks after the price cuts of February; but the market broadened so rapidly under the lower prices for finished material that prices rebounded and the old wages were soon restored. Conditions attending the present open market do not point to a repetition of the course of prices in 1909, and in the opinion of some manufacturers it is inevitable that labor will share in the hardships the trade is undergoing. Denial has been made, however, of a report that a large Western mill has already made a beginning by putting in force a reduction in tonnage rates.

It is still the case that the reports as to volume of business which emanate from the Steel Corporation are more favorable than those coming from independent steel companies. The average of capacity employed by the various steel companies on domestic business continues to be about 65 per cent.

The wire trade appears to stand alone in an effort to establish higher prices, after the recent lapse to $1.65 for wire nails and $1.45 for plain wire, and a number of manufacturers are now asking $1.70 for wire nails and $1.50 for wire.

In the Central West, while the 1.20c. Pittsburgh basis for steel bars is commonly maintained, some good transactions have been put through at 1.15c., while farther west the use of a Chicago basing price is more general, resulting in sales that with an 18-cent freight deducted would represent 1.10c. Pittsburgh.

A 10 per cent. wage reduction at two mills in the Philadelphia district emphasizes the effect of recent declines in sheets. At 1.90c for No. 28 the market is now at the low level reached in the distressful year, 1898, while independent producers are paying $5 a ton more for sheet bars than in 1898.

No indication is yet given that a new and lower card on merchant pipe will be issued October 1, when the present guarantee on prices expires. Naturally business is restricted meantime.

The B. & O. has given an order for 7000 tons of rails and the Buckhannon & Northern one of 4500 tons to be rolled at Pittsburgh. At Chicago the Davenport

& Muscatine Railroad has bought 3000 tons and the Birmingham, Bessemer & Ensley has placed 3200 tons with the Ensley mill. A 1500-ton order for the Stewart Sugar Company of Cuba will be rolled at Sparrows Point. The Grand Trunk contract for 10,000 tons is still pending, as are 10,000 tons for Peru and 30,000 tons for Argentina.

Pittsburgh reports some shading of the 1.35c price on plain structural material, 1.30c having been named on a large order for beams and channels up to 15 in. The contract has been let for the Kesner building, Chicago, 3400 tons, and bids have been taken there this week on 6000 tons for the C. B. & Q. office building. The American Bridge Company will fabricate 7500 tons for the new open hearth plant and finishing mills of the Youngstown Sheet & Tube Company.

The foundry pig iron market drifts on, without any promise of greater activity. In the East there are signs that more iron will have to be bought for this year than was counted on, while in the West a good many consumers are expecting to carry over in their yards into next year iron bought for 1911. In southern Ohio an inquiry has come up for 20,000 tons of basic. At Pittsburgh a sale of 1000 tons has been made at $12.60 at furnace, representing a decline of 40 cents.

Ferromanganese and ferrosilicon have advanced sharply. In the Central West a sale of 6000 tons of ferromanganese was made at $37 for first quarter and $38 for second quarter. Some producers have advanced their price to $38.50 for next year. On an inquiry for 200 tons of 50 per cent. ferrosilicon for the first half of next year as high as $60 Pittsburgh was named, as against a recent market of $58.

A slump in tin at London has brought the New York price down to 38.87½c, as against 39.75c last week. Lead is lower in the West and copper is weak at 12⅜c for electrolytic.

Is Government Interference with Business Culminating?

This country has had practically eight years of turmoil and harassing interference with business. Barring loss of lives and actual destruction of material, the expense to the country could hardly have been greater if it had been engaged in actual warfare with some other power. Business enterprises have been interfered with, young men with well-considered schemes for business advancement have been hampered in carrying such projects into successful operation, the natural growth of the business of the country has been seriously impeded, and capitalists have practically been ordered not to make further investments in manufacturing and transportation projects. So much interference with business matters has been experienced that the whole country has become weary of the constant agitation.

It is impossible to conceive that a condition of this kind should continue indefinitely. All physical or mental developments or phenomena have their period of growth, culmination and decline. The country has seen a continuous increase in the activity of government agencies in interfering with business matters, and the past year has had crowded into it more developments of this character than any previous twelve months. We have had final stages in the prosecution of great corporations and we have had investigations of several corporations proceeding simultaneously. In addition to all the ordinary investigations by the Executive branch of the Federal Government, we have had this year a siege of Congressional investigation. And now President Taft has declared in a public address at Detroit that he proposes to continue to enforce the Sherman anti-trust act against "all the industrial companies with respect to which there is any reasonable ground for suspicion that they have been organized for a purpose, and are conducting business on a plan which is in violation of the anti-trust law." It would seem as if this condition of affairs must mean the culmination of the long period of business turmoil. We may be unduly hopeful, but we are strongly inclined to the opinion that a decline in this class of agitation will be perceptible in the near future. Of course some of the political agitators, whose activity in this direction has brought them prominence, may continue until the end of their political careers to play the same tune, but we believe it will be increasingly difficult for them to attract a following.

To-day's and Other Price Levels

In a recent comment in these columns on the course of prices for rolled iron and steel it was stated that "while profits have been reduced, it is not claimed that the manufacturers of finished material have gone to the limit of their ability to sell at a profit, as has plainly been the case in the pig iron market." It need scarcely be said, however, that in several lines producers having to buy semi-finished product in the market find difficulty in getting a profit out of present prices for their final product. Intimation of the hardship in which one industry is already involved was given in our last issue in the statement that "the spread between the prices of sheet bars and sheets is probably less than has ever been known." Late in 1898, when the lowest prices ever known in this country were reached on nearly all iron and steel products, No. 28 sheets sold at 1.90 cents at Pittsburgh. The American Metal Market in referring to that low price (adding that on a few sales 1.85c. was touched) shows that it was done with sheet bars at $16 as against $21 and $22 today. Even with labor cost—surprising as it may seem—$2 less per ton of sheets now than in 1898, it is hard to see how independent sheet mills are living with $4 to $5 a ton handicap today as compared with the conditions under which this lowest sheet price in the history of the industry was last made in the United States.

Passing to bars, there need be no discussion of the small chance any mill has today on a cost of $20 to $21 at Pittsburgh for billets and a market for bars in which sales have been made as low as 1.28c. in the Chicago district, which would be equivalent to 1.10c. for a Pittsburgh mill. Nor is there any living profit for a wire mill buying its own rods at $26 at Pittsburgh and selling plain wire at 1.45 cents per pound. Indeed, even for the big companies recent wire prices have left nothing to boast of in their scale of profits. In the wrought pipe and tube trade, moreover, where the competition is largely among companies having their own blast furnaces and steel works, while some have ore and coke also, profits have been far from satisfactory, while prices have gone close to the lowest on record.

It will be of interest to compare, as is done in the following table, today's prices of the principal iron and steel products with the high level reached in 1907, the low point in the open market of 1909, and the midway prices at the opening of 1910 and 1911 under cooperation among steel manufacturers. Pittsburgh prices

are given, except in the case of Southern foundry iron, for which the Cincinnati price is quoted:

Fluctuations of Iron and Steel Prices in 1907, 1909, 1910 *and* 1911.
[Pig iron, billets and rails in dollars per gross tons; other products in cents per pound.]

	High, 1907.	Low, 1909.	Jan. 1, 1910.	Jan. 1, 1911.	Sept. 20, 1911.
Bessemer pig iron	$24.35	$15.65	$19.90	$15.90	$15.90
Basic pig iron	23.90	14.90	17.90	14.15	13.50
No. 2 foundry iron, Cinti.	26.00	14.25	17.25	14.25	13.25
Bessemer billets	30.00	22.00	27.50	23.00	21.00
Bessemer rails	28.00	28.00	28.00	28.00	28.00
	Cents.	Cents.	Cents.	Cents.	Cents.
Plates	1.70	1.10	1.55	1.40	1.30
Structural shapes	1.70	1.10	1.55	1.40	1.35
Steel bars	1.60	1.05	1.50	1.40	1.20
Sheets, No. 28	2.55	2.10	2.40	2.20	1.90
Tin plates	3.85	3.40	3.60	3.60	3.60
Fence wire	1.90	1.40	1.65	1.50	1.45

It will be seen that the heavier finished materials are $7 to $8 a ton less today than at the crest of the wave in 1907, while wire is $9 and sheets are $13 a ton lower. Billets and all pig irons on which there is a free market (Bessemer pig iron being scarcely a market factor today) are lower now than in 1909. While rails show a good profit and plates, shapes, bars, wire and tin plates have not yet fallen to the low levels of 1909, when independent steel manufacturers found it necessary to reduce wages, it is evident that further shrinkage in a number of lines would be a serious menace to the maintenance of steel works and rolling wages.

The Coming Machinery Meeting

The joint meeting of the National Machine Tool Builders' Association and the National Supply & Machinery Dealers' Association to be held in New York October 10 to 12 should prove an interesting occasion, as it will be the first time for these organizations to meet concurrently. The decision to do so reflects credit on the officers of the two associations, as such a meeting should smooth over numerous rough places in the machinery business world. The matter of adopting a uniform contract between manufacturers and dealers is scheduled to come up at the meeting, and if this question alone is amicably settled it will have been worth while.

The past year has been a trying one for machinery makers and sellers, and the question of selling terms has been quite troublesome. At the last meeting of the Machine Tool Builders' Association a uniform contract was ratified, but in many cases the terms agreed upon have not been fully carried out. On the dealers' part, the matter of maintaining the manufacturers' prices has apparently been misunderstood, as in many cases dealers have cut their commissions on some makes of machines in order to induce trade in other directions. The result has been that manufacturers' representatives elsewhere have obtained the impression that the dealers making such reductions have been given special terms by the manufacturers. Again, other dealers have not rigidly kept their operations within the territory allotted to them. The dealers, too, have their complaints, one of which relates to the practice of some manufacturers in underselling the dealer in the latter's territory by offering the buyer terms more advantageous than those awarded to the dealer in a selling contract.

The making of uniform prices for machine tools is out of the question, regardless of the legality of such a course, but a proper price understanding between the manufacturer and seller can be arranged and adhered to, as can the other selling problems that arise. The proposition to have the association adopt punitive measures toward a member who violates a contract would seem to be a correct solution of the matter.

Another matter to be taken up will be the requests of professional appraisers for information concerning prices of equipment in the works of their clients. Trouble and expense to manufacturers and dealers are involved in the furnishing of these details. The proposition is to establish a standard fee as compensation. In the routine of its work the appraisal company has its men go through a plant, placing valuations on everything in much detail. Equipment is often an unknown quantity to the experts, and it has come to be their custom to send lists of tools to the machinery people, with requests for the price at which each item was sold. The task imposed may be a formidable one. With new tools it is not difficult, but usually the inquiries pertain to older machinery, which necessitates the unearthing of records extending back over years. While the inclination is to decline to undertake the labor, a duty to a customer, the client of the appraisal company, usually prevails.

If the two associations would agree to establish a fee in payment for such information, the problem would be simplified. Buyers of machinery would understand the reason for a refusal. The purpose is not to make the charge an extortionate one. One suggestion is a dollar an item, which, it is said, would not cover the actual cost. The fee would be a deterrent with the appraisers. They would be more likely to depend upon their own judgment and upon records which might be maintained in their offices. Doubtless, also, they would use the books of their customers more freely in getting at the facts.

Whatever may result from the joint meeting, the decision of the two organizations to meet together and discuss the issues between them cannot but result in a better understanding on both sides.

Safeguarding the Bankruptcy Act

Periodically a bill is introduced in Congress providing for the repeal of the national bankruptcy act. Such a measure is now pending, and called forth a protest by the American Bar Association at its recent annual meeting. Probably the law is in little danger—its workings have been eminently satisfactory from the beginning and various amendments have added to its efficiency. Nevertheless, it is well to call attention from time to time to the benefits which have come to business since laws governing failures were organized into a federal statute.

The experience of many of the younger generation engaged in manufacturing industries does not go back to the chaotic conditions which prevailed when each State was a law unto itself in the handling of the affairs of bankrupts. In those days insolvency proceedings—receiverships, trusteeships, assignments—were often binding only in the individual commonwealth. The findings of a New York court, for example, as to an insolvent estate was final only in regard to property within that State. Similar proceedings might be necessary in other States, before a tangle was unsnarled. A complete relief from the obligations of a debtor could sometimes be prevented by unscrupulous practice. A creditor might have the power to squeeze more than his share from an estate. The result was a marked influence on the extending of credits, even to the point of giving preference to residents of some States as compared with those of others. The federal

bankruptcy act has put all creditors on an equal basis. It is a machine which automatically and equitably adjusts the affairs of an honest bankrupt. His obligations are wiped out once and for all, so that he is given a chance to start afresh as a factor in the commercial or industrial community.

Economic Changes and Better Business

Increased Power and Auxiliary Requirements in Various Industries

Early reports on the prospects for fall business made to a number of large machinery builders in the Middle West from their sales offices and agencies in all parts of the United States as well as Canada and Mexico have been of an encouraging nature. The most marked feature of the situation is the provision being made throughout the country for increased power. Manufacturers of steam engines and condensers, gas engines, steam turbines and water turbines are all busy figuring on future requirements, with a fair percentage of active negotiations; and those supplying boilers, stokers, heaters, feed pumps, gas producers, governors, electric generators, etc., appear to be benefiting in proportion. This activity is contrary to anticipations. It was the general belief in midsummer that most lines of industry were "over-powered," as compared with the rate of production that has been called for; it was thought that, even where improvements or greater capacity seemed to be required, mill, factory or mine owners would patch up existing plants rather than buy much new equipment. The lesson of the lean years has obviously been, however, that it is true economy to keep in advance of power requirements, rather than to lag behind them, and that it costs less to maintain power plants in a high state of efficiency than to save by curtailing investment.

Simultaneously there has arisen the need for the more complete electrification of various industries where this can be brought about to advantage. In spite of all that has been accomplished in substituting motor drive for shafting and belting it would seem as though this progress does little more than keep pace with the total increase of general productive capacity, leaving the field for future work in this line practically as extensive as in the beginning. Opportunities for the introduction of electric control and the automatic regulation of operating machinery are also greater than ever before.

Handling Equipment

As in the case of power equipment, the conviction is becoming deeply rooted that money expended in better facilities for handling material, whether by piece or in bulk, will earn dividends rather than dissipate them; also, that it is more profitable to get rid of worthless components of raw material at its place of origin, as far as possible, than to pay freight and handling costs on the intermingled refuse. Hence coal and ore crushing, screening and washing plants and separators for material of many different kinds are sharing in the attention given to elevators, conveyors, cranes, magnets, steam shovels, suction dredges, etc. Even gravel washing has become an important industry, and numerous additional plants for this purpose—nearly all motor driven—will be erected within the year.

In connection with the above has come the recognition, so long delayed, that water and other fluids used in large quantities for industrial purposes represent merely so much bulk material to be handled. Hence, instead of contenting themselves with a "hodge-podge" of pumping units unrelated to one another and of unknown efficiency, users are installing well planned water-handling systems. This frequently results in one central pumping plant of high economy, serving many different purposes, where not long ago the operating costs, depreciation, etc., from scattered units ran into absolutely unwarranted figures. The possibilities of this gain in economy, taking all of its varied applications, are only just beginning to be realized, but many more managers are figuring on them than even a year ago.

Air and Refrigerator Appliances

Air under pressure, whether at 2 lb. or 150 lb., has also come to be regarded not as an elusive, intangible quantity, but as a commercial commodity, the handling of which requires judgment. This is a subject to which a great deal of attention is being devoted at the present time, attention that has lately been reflected in the purchase or planning of equipment. Similarly, apparatus that is pneumatically operated finds increasing application, and is bought more than formerly on the basis of demonstrated efficiency. The same may be said of apparatus producing or utilizing hydraulic pressure.

Refrigeration, although confined until recently to the preservation of animal and vegetable matter, has suddenly become an advanced science, and the beneficial effects of using air freed from moisture by this means are being studied out in their bearing upon numerous industrial processes, of which drying the blast for the iron smelting furnace was one of the earliest to be tried. Plants for ice-making have, however, been extensively built this year, especially for operation as a day load for electric lighting stations; and numerous orders for the coming season are already being placed. This line is, in fact, one of the most active in the entire list, and it helps to relieve the condition in others.

The use of electric heat in the industries, including metal working, is also looming up as one of the most important facts now before the manufacturers of this country. Its applications to steel refining furnaces, to welding, cutting, softening armor plate, etc., which constitute some of the best known of present processes, are only a few of many for which equipment will be developed on a large scale within the next year or two. The advantages of a localized, closely regulated heat and the lowering in cost which improved methods have brought about will force growing recognition of this subject.

In the various auxiliary lines mentioned above prospects are brighter at the present time than for the purchase of operating machinery peculiar to each branch of the industry, as in ore reduction plants, iron and steel mills, cement-making plants, textile mills or factories for the production of numerous daily necessities. The field of each of these has its limits, while power, pumping and conveying apparatus finds its application everywhere; but the demand for these auxiliaries is very evenly distributed through the country; and this always means that within a short time there will be improvement in the related lines, the machinery for which is usually standard and can be secured and installed in considerably less time, as required.

Metal Working Tools

While the manufacturers above referred to build machinery for almost every conceivable line of industry none of them produces machine tools, and their reports concerning the probable requirements of metalworking plants did not include these tools. So far as their own requirements are concerned, it does not seem probable that these will be very heavy during the fall. Independent inquiries among representatives of machine tool agencies develop a hopeful attitude on their part, but in some instances the optimism seems rather forced, being based upon the feeling that after the summer dullness business "must pick up." Several of those interviewed had, however, a good run of inquiries in hand and were following them up sharply. Actual orders have had their origin of late in widely separated parts of the country, with buying mainly of a miscellaneous character, some being from quite unexpected sources. Repair plants auxiliary to large industrial enterprises are taking an occasional lot of tools.

Foreign trade has been cultivated to a greater extent this year than in other recent seasons, and the results are showing up well. There is a disposition now among leading houses to make this a regular feature of their business, catering to it when times are good as well as when they are dull; but how long that feeling will last remains to be seen.

Taken altogether, the situation is favorable to gradually bettering conditions during the next few months. There is no lack of money for the purchase of new machinery as needed, and all that most prospective users require is to be convinced that the time has come to prepare for an increase in their own business. This now seems in a fair way to be brought about.

C. A. T.

Rate Discrimination Alleged on Eastern Iron Ores

B. Nicoll & Co., 165 Broadway, New York, have filed a petition with the Interstate Commerce Commission at Washington, complaining of the rates on iron ore made by the Delaware, Lackawanna & Western, the Lehigh Valley, Philadelphia & Reading, Central Railroad of New Jersey, New York Central, Erie and other lines. The iron ore from Buffalo to Lehigh Valley and other Eastern points is $1.45 per gross ton. The petitioner admits that this rate is reasonable but avers that the rates fixed by the various railroads named, on iron ore shipments from mines whose output B. Nicoll & Co. sell, to consuming points in New Jersey and Eastern Pennsylvania are unjust and discriminating in that they represent a much higher charge per ton per mile. Comparison is made in the petition between the rate on Lake Superior ores from Buffalo and the rate on New Jersey and New York ores to Eastern points to which lake ores are shipped. Comparison is made also between the rate from Fort Montgomery, N. Y., near which is located the iron mine of the Hudson Iron Company, whose product is sold by B. Nicoll & Co., and the rate on Port Henry ore to New Jersey and Eastern Pennsylvania points, which is $1.85. It is shown that while the rates on Lake Superior and Port Henry ores to Eastern furnace districts average about 1-3 cent per ton per mile the rates from Ringwood, N. J., and from Fort Montgomery to the same furnace districts average about 1 cent per ton per mile. B. Nicoll & Co. ask for a refund of $38,000, which they claim is excess freight paid in the past three years, and for the establishment of reasonable and non-discriminating rates on the ores from the Eastern mines they represent.

An issue of excessive freight rates is also made in the case of the Wharton Steel Company, Wharton, N. J., against the Central Railroad of New Jersey and the Pennsylvania Lines, which has been pending for some time and on which a decision will soon be handed down. The Wharton Steel Company's allegation is that on June 24, 1909, a joint through rate of $1.05 per gross ton was fixed on pig iron from Wharton, N. J., to Harrisburg, Pa., and that a tariff filed on August 15, 1910, made the rate $1.15 per ton. The company asks that the $1.05 rate be restored and maintained.

The Philadelphia Foundry Foremen's Outing

The Associated Foundry Foremen of Philadelphia and Vicinity held their first annual outing September 16, at Central Park, Philadelphia. About 500 persons identified with the foundry trade attended. An elaborate programme of outdoor sports was carried out during the afternoon, for which numerous prizes were presented to the winners.

At an appropriate opportunity Clarence R. Brown, president of the association, introduced Thomas Devlin, president of the Philadelphia Foundrymen's Association, who said, in part, that he believed he had been selected to address the assembled foundry foremen because he was one of the oldest local foundrymen, having been in the business for 57 years. Up to a few years ago, he said, the foundry trade was not beset by the many difficulties now being encountered. Tariff agitation, financial policies, etc., had some influence from time to time, but the multitude of hindrances which the trade has met was not so pronounced. The interference with business today, he believed, was largely due to the disturbing influences of investigating commissions, composed to a great degree of men lacking practical knowledge in the work in which they are engaged.

Dancing followed in the evening. Music was rendered during the afternoon and evening by the Municipal Band. The general committee in charge of arrangements comprised Clarence R. Brown, John Alexander, C. J. Krayer, Charles Muir, James Whitehead, George Moore, C. Gorman, H. Bing, H. Freiler and J. Schram. The Athletic Committee was composed of John Alexander, J. Fasey, T. J. Connelly, Thomas Smith, M. S. Hare, R. R. Rentlinger, H. Taylor, H. A. White, F Hack, A. W. Carr and W. Elkins. James Whitehead and Charles Muir had charge of the music and dancing.

The Thomas Iron Company's Meeting.—The stockholders of the Thomas Iron Company held their annual meeting September 12 at Hokendauqua, Pa. The reports for the year submitted by the officers were quite satisfactory to the stockholders. The dividends paid were earned. The occasion brought out a large attendance. The old board of directors was re-elected, consisting of B. F. Fackenthal, Jr., W. P. Hardenbergh, Edwin Thomas, F. R. Drake, A. D. Chidsey, J. S. Krause and William H. Hulick. The board reelected the old officers, consisting of B F. Fackenthal, Jr, president; William H. Hulick, vice-president, and James W. Weaver secretary and treasurer. As to the immediate condition of business, the president reported that practically all consumers having contracts for pig iron are pressing for prompt shipments. A noteworthy feature is that buyers will use their utmost endeavors to get a price under that asked, probably consuming much time in such negotiations, and immediately after giving the order will urge shipments as speedily as possible, indicating that stocks at foundries are very low.

The Baldwin Locomotive Works, Philadelphia, states that the report that a steel plant is to be erected at its works at Eddystone, Pa., is untrue. The company is putting in foundations there for a 500 ft. addition to its erecting shop, but does not contemplate the immediate building of the superstructure. It is taking the precaution of having the foundations completed so that should the demand for the heavier type of locomotives, which are too large to handle at its Philadelphia plant, develop at any time, it could be in position, on short notice, to take care of the work. The Baldwin Works has enough orders on hand to enable it to operate at its present rate for the next 60 or 90 days, but the demand is extremely light, being quieter, in fact, that at any time since 1907.

The directors of the American Hardware Corporation at a meeting at New Britain, Conn., September 18, voted to change it from a holding company to an operating company. Recent interpretations of the Sherman law, a desire to economize in management and to extend the business in foreign countries are the reasons given for the action. Charles E. Wetmore, who has been secretary, was made treasurer and Andrew J. Sloper, formerly treasurer, becomes secretary. The corporation has a capital of $10,000,000 and the five controlled companies $2,600,000.

The Linde Air Products Company, Buffalo, New York, reports an apparently unlimited demand for its oxy-acetylene welding and cutting apparatus and for compressed oxygen. Its business has not been affected appreciably by the depression of the past months, and the present year is expected to establish a record. The growth of the company's business has been so rapid that it has increased its capital stock to $1,000,000 and now has four extensive plants in operation at various points, while the construction of others in the early future is under contemplation.

Commerce of the United States with foreign countries was prosperous in August, which closed with a balance of trade for the month of more than $18,000,000 in our favor. With exports of $144,241,515, August this year made a new record for the month, surpassing August exports in all previous years and August of a year ago by almost $10,000,000, according to statistics of the Department of Commerce and Labor.

The Book Department of the David Williams Company, of which Edward P. von Gogh is manager, has arranged to have a representative stock of books on display at 50 Wilsey street, Newark, N. J. It is in charge of C. Donsaft, who has been specially trained to assist an inquirer in selecting books he may require on building, estimating, house planning, carpentry, drawing, plumbing, heating, sheet metal work, hardware, and iron and steel.

The Williams Tool Company, Erie, Pa., is erecting a new shop, 45 x 175 ft., as an addition to its present plant. This is made necessary by a steady increase in business which in the past year has been the largest in the company's history. Its products are pipe-threading and bolt-cutting machinery and transverse-current water heaters.

The Metal Manufacturers' Association, Philadelphia, Pa., held its regular quarterly meeting at the Bellevue-Stratford Hotel on the evening of September 13. About 200 were in attendance. F. W. Taylor was the speaker of the evening, making an address on "Scientific Management."

The Iron and Metal Markets

A Comparison of Prices

Advances Over the Previous Week in Heavy Type. Declines in Italics.

At date, one week, one month and one year previous.

	Sept. 20, 1911.	Sept. 13. 1911.	Aug. 16, 1911.	Sept. 21, 1910.
PIG IRON, Per Gross Ton:				
Foundry No. 2 standard, Philadelphia	$15.00	$15.00	$15.00	$16.00
Foundry No. 2, Valley furnace	13.50	13.50	13.50	13.75
Foundry No. 2 Southern, Cincinnati	13.25	13.25	13.50	14.25
Foundry No. 2, Birmingham, Ala.	10.00	10.00	10.25	11.00
Foundry No. 2, at furnace, Chicago*	14.50	14.50	14.50	16.25
Basic, delivered, eastern Pa.	14.75	14.75	14.75	15.00
Basic, Valley furnace	*12.60*	13.00	13.00	13.50
Bessemer, Pittsburgh	15.90	15.90	15.90	15.90
Gray forge, Pittsburgh	13.90	13.90	13.90	14.25
Lake Superior charcoal, Chicago	16.50	16.50	16.50	18.25
COKE, CONNELLSVILLE, Per Net Ton, at Oven:				
Furnace coke, prompt shipment	1.50	1.50	1.50	1.60
Furnace coke, future delivery	1.60	1.60	1.65	1.75
Foundry coke, prompt shipment	1.85	1.85	1.85	2.10
Foundry coke, future delivery	2.10	2.10	2.10	2.25
BILLETS, &c., Per Gross Ton:				
Bessemer billets, Pittsburgh	21.00	21.00	21.00	24.50
Forging billets, Pittsburgh	26.00	26.00	26.00	29.00
Open hearth billets, Philadelphia	*22.40*	23.40	23.40	26.50
Wire rods, Pittsburgh	27.00	27.00	27.00	28.00
OLD MATERIALS, Per Gross Ton:				
Iron rails, Chicago	14.50	14.50	14.00	16.00
Iron rails, Philadelphia	17.00	17.00	17.50	18.00
Car wheels, Chicago	12.75	12.75	12.75	14.00
Car wheels, Philadelphia	12.50	12.50	13.00	14.00
Heavy steel scrap, Pittsburgh	12.75	12.75	13.25	14.50
Heavy steel scrap, Chicago	10.50	10.50	10.75	12.25
Heavy steel scrap, Philadelphia	*12.50*	13.00	13.50	14.00
FINISHED IRON AND STEEL, Per Pound:	Cents.	Cents.	Cents.	Cents.
Bessemer rails, heavy, at mill	1.25	1.25	1.25	1.25
Refined iron bars, Philadelphia	*1.22½*	*1.27½*	*1.27½*	1.40
Common iron bars, Pittsburgh	1.25	1.25	1.25	1.45
Common iron bars, Chicago	1.25	1.25	1.25	1.37½
Steel bars, Pittsburgh	1.20	1.20	1.20	1.40
Steel bars, tidewater, New York	1.36	1.36	1.36	1.56
Tank plates, Pittsburgh	1.30	1.30	1.35	1.50
Tank plates, tidewater, New York	1.46	1.46	1.51	1.56
Beams, Pittsburgh	1.35	1.35	1.35	1.40
Beams, tidewater, New York	1.51	1.51	1.51	1.56
Angles, Pittsburgh	1.35	1.35	1.35	1.40
Angles, tidewater, New York	1.51	1.51	1.51	1.56
Skelp, grooved steel, Pittsburgh	1.20	1.20	1.20	1.40
Skelp, sheared steel, Pittsburgh	1.30	1.30	1.30	1.50
SHEETS, NAILS AND WIRE, Per Pound:	Cents.	Cents.	Cents.	Cents.
Sheets, black, No. 28, Pittsburgh	1.90	1.90	2.00	2.15
Wire nails, Pittsburgh†	1.65	1.65	1.70	1.70
Cut nails, Pittsburgh†	*1.55*	1.60	1.60	1.65
Barb wire, galv., Pittsburgh†	1.95	1.95	2.00	2.00
METALS, Per Pound:	Cents.	Cents.	Cents.	Cents.
Lake copper, New York	12.50	12.75	12.75	12.75
Electrolytic copper, New York	12.37½	12.37½	12.50	12.50
Spelter, St. Louis	5.90	5.90	5.95	5.45
Spelter, New York	6.05	6.05	6.15	5.60
Lead, St. Louis	4.37½	4.40	4.45	4.30
Lead, New York	4.50	4.50	4.50	4.40
Tin, New York	*38.87½*	39.75	44.00	34.55
Antimony, Hallett, New York	7.75	7.75	7.75	7.87½
Tin plate, 100-lb. box, New York	$3.84	$3.84	$3.94	$3.84

* The average switching charge for delivery to foundries in the Chicago district is 50c. per ton.

† These prices are for largest lots to jobbers.

Prices of Finished Iron and Steel f.o.b. Pittsburgh

Freight rates from Pittsburgh in carloads, per 100 lb.: New York, 16c.; Philadelphia, 15c.; Boston, 18c.; Buffalo, 11c.; Cleveland, 10c.; Cincinnati, 15c.; Indianapolis, 17c.; Chicago, 18c.; St. Paul, 32c.; St. Louis, 22½c.; New Orleans, 30c.; Birmingham, Ala., 45c. Pacific coast, 80c. on plates, structural shapes and sheets No. 11 and heavier; 85c. on sheets Nos. 12 to 16; 95c. on sheets No. 16 and lighter; 65c. on wrought boiler tubes.

Plates.—Tank plates, ¼ in. thick, 6¼ in. up to 100 in. wide, 1.30c. to 1.35c., base, net cash, 30 days. Following are stipulations prescribed by manufacturers, with extras:

Rectangular plates, tank steel or conforming to manufacturers' standard specifications for structural steel dated February 6, 1903, or equivalent, ¼ in. thick and over on thinner edge, 100 in. wide and under, down to but not including 6 in. wide, are base.

Plates up to 72 in. wide, inclusive, ordered 10.2 lb. per square foot, are considered ¼-in. plates. Plates over 72 in. wide must be ordered ¼ in. thick on edge, or not less than 11 lb. per square foot, to take base price. Plates over 72 in. wide ordered less than 11 lb. per square foot down to the weight of 3-16-in. take the price of 3-16-in.

Allowable overweight, whether plates are ordered to gauge or weight, to be governed by the standard specifications of the Association of American Steel Manufacturers.

Extras.	Cents per lb.
Gauges under ¼ in. to and including 3-16 in. on thinnest edge	.10
Gauges under 3-16 in. to and including No. 8	.15
Gauges under No. 8 to and including No. 9	.25
Gauges under No. 9 to and including No. 10	.30
Gauges under No. 10 to and including No. 12	.40
Sketches (including all straight taper plates) 3 ft. and over in length	.10
Complete circles, 3 ft. in diameter and over	.20
Boiler and flange steel	.10
"A. B. M. A." and ordinary firebox steel	.20
Still bottom steel	.30
Marine steel	.40
Locomotive firebox steel	.50
Widths over 100 in. up to 110 in., inclusive	.05
Widths over 110 in. up to 115 in., inclusive	.10
Widths over 115 in. up to 120 in., inclusive	.15
Widths over 120 in. up to 125 in., inclusive	.25
Widths over 125 in. up to 130 in., inclusive	.50
Widths over 130 in.	1.00
Cutting to lengths or diameters under 3 ft. to 2 ft., inclusive	.25
Cutting to lengths or diameters under 2 ft. to 1 ft., inclusive	.50
Cutting to lengths or diameters under 1 ft.	1.55

No charge for cutting rectangular plates to lengths 3 ft. and over.

Structural Material.—I-beams, channels and angles, 3 to 15 in., inclusive, 1.35c. net. Other shapes and sizes are quoted as follows:

	Cents per lb.
I-beams over 15 in.	1.45 to 1.50
H-beams over 18 in.	1.50 to 1.55
Angles, 3 to 6 in., inclusive, ¼ in. and up	1.35 to 1.40
Angles over 6 in.	1.45 to 1.50
Angles, 3 in. on one or both legs, less than ¼ in. thick, plus full extras as per steel bar card Sept. 1, 1909	1.40 to 1.45
Tees, 3 in. and up	1.40 to 1.45
Zees, 3 in. and up	1.35 to 1.40
Angles, channels and tees, under 3 in., plus full extras as per steel bar card Sept. 1, 1909.	1.40 to 1.45
Deck beams and bulb angles	1.65 to 1.70
Hand rail tees	2.45
Checkered and corrugated plates	2.45

Sheets.—Makers' prices for mill shipments on sheets of U. S. standard gauge, in carload and larger lots, on which jobbers charge the usual discounts for small lots from store, are as follows:

Box Annealed Sheets.

	Cents per lb.
Nos. 3 to 8	1.30 to 1.35
Nos. 9 and 10	1.40 to 1.45
Nos. 11 and 12	1.45 to 1.50
Nos. 13 and 14	1.50 to 1.55
Nos. 15 and 16	1.60 to 1.65

Box Annealed Sheets, Cold Rolled.

	One Pass.	Three Pass.
Nos. 10 to 12	1.55 to 1.60	.....
Nos. 13 and 14	1.60 to 1.65	.....
Nos. 15 and 16	1.65 to 1.70	1.75 to 1.80
Nos. 17 to 21	1.70 to 1.75	1.80 to 1.85
Nos. 22, 23 and 24	1.75 to 1.80	1.85 to 1.90
Nos. 25 and 26	1.80 to 1.85	1.90 to 1.95
No. 27	1.85 to 1.90	1.95 to 2.00
No. 28	1.90 to 1.95	2.00 to 2.05
No. 29	1.95 to 2.00	2.05 to 2.10
No. 30	2.05 to 2.10	2.15 to 2.20

Galvanized Sheets, Black Sheet Gauge.

Nos. 10 and 11	1.90 to 1.95
Nos. 12, 13 and 14	2.00 to 2.05
Nos. 15, 16 and 17	2.15 to 2.20
Nos. 18 to 22	2.30 to 2.35
Nos. 23 and 24	2.40 to 2.45
Nos. 25 and 26	2.60 to 2.65
No. 27	2.75 to 2.80
No. 28	2.90 to 2.95
No. 29	3.00 to 3.05
No. 30	3.20 to 3.25

All above rates on sheets are f.o.b. Pittsburgh, terms 30 days net, or 2 per cent. cash discount in 10 days from date of invoice, as also are the following base prices per square for painted and galvanized roofing sheets, with 2½-in. corrugations:

Gauge.	Painted.	Galvanized.	Gauge.	Painted.	Galvanized.
29	.....	$2.40	23	$2.40	$3.50
28	$1.40	2.25	22	2.60	3.70
27	1.55	2.60	21	2.80	4.05
26	1.65	2.63	20	3.05	4.35
25	1.85	3.05	18	4.05	5.70
24	2.10	3.15	16	4.90	6.50

Wire Rods and Wire.—Bessemer, open hearth and chain rods, $27. Fence wire, Nos. 0 to 9 per 100 lb., terms 60 days, or 2 per cent. discount in 10 days, car-

THE IRON AND METAL MARKETS

load lots, to jobbers, annealed, $1.50; galvanized, $1.80. Carload lots, to retailers, annealed, $1.55; galvanized, $1.80. Galvanized barb wire to jobbers, $1.95; painted, $1.65. Wire nails, to jobbers, $1.65.

The following table gives the price to retail merchants on wire in less than carloads, including the extras on Nos. 10 to 16, which are added to the base price:

Fence Wire, Per 100 lb.

Nos	0 to 9	10	11	12 & 12½	13	14	15	16
Annealed	$1.65	$1.70	$1.75	$1.80	$1.90	$2.00	$2.10	$2.20
Galvanized	1.95	2.00	2.05	2.10	2.20	2.30	2.70	2.80

Market and Stone Wire in Bundles, Discount from Standing List.

Bright and Annealed:
9 and coarser 80
10 to 18 ..... 80 and 10
19 to 26 ..... 80 and 10 and 2½
27 to 36 ..... 80 and 5

Galvanized:
9 and coarser ..... 75 and 10
10 to 16 ..... 75 and 10
17 to 26 ..... 72½ and 10
27 to 36 ..... 72½

Coppered or Liquor Finished:
9 and coarser ..... 75 and 10
10 to 26 ..... 75 and 10
27 to 36 ..... 70 and 10 and 5

Tinned:
6 to 18 ..... 75 and 10 and 10

Wrought Pipe.—The following are the jobbers' carload discounts on the Pittsburgh basing card on wrought pipe, in effect from October 1, 1910:

Butt Weld.

	Steel Black.	Steel Galv.	Iron Black.	Iron Galv.
⅛ to ½ in.	75	63	71	59
¼ to 1¼ in.	79	69	75	65
1½ to 3 in.	80	70	76	66

Lap Weld.

2 in.	76	66	72	62
2½ to 4 in.	78	67	74	64
4½ to 6 in.	77	67	73	63
7 to 12 in.	75	59	71	55
13 to 15 in.	51½	..	..	..

Butt Weld, extra strong, plain ends, card weight.

⅛, ¼, ⅜ in.	69	59	65	55
½ in.	74	68	70	64
¾ to 1¼ in.	78	72	74	68
2 to 3 in.	79	73	75	69

Lap Weld, extra strong, plain ends, card weight

2 in.	75	69	71	65
2½ to 4 in.	77	71	73	67
4½ to 6 in.	76	70	72	66
7 to 8 in.	69	59	65	55
9 to 12 in.	64	54	60	50

Butt Weld, double extra strong, plain ends, card weight

¼ in.	64	58	60	54
½ to 1¼ in.	67	61	63	57
2 to 3 in.	69	63	65	59

Lap Weld, double extra strong, plain ends, card weight

2 in.	65	59	61	55
2½ to 4 in.	67	61	63	57
4½ to 6 in.	66	60	62	56
7 to 8 in.	59	49	62	50

Plugged and Reamed.

1 to 1¼, 2 to 3 in. Butt Weld } will be sold at two (2) points lower basing (higher price) than merchants' card weight pipe. Butt or lap weld, as specified.
2, 2½ to 4 in. Lap Weld }

The above discounts are for "card weight," subject to the usual variations of 5 per cent. Prices for less than carloads are 1½ to 3½ points lower basing (higher prices) than the above discounts.

Boiler Tubes.—Discounts on lap welded steel boiler tubes to jobbers in carloads are as follows:

	Steel.
1¼ to 2¼ in.	65
2½ in.	67½
2¾ to 3½ in.	70
3¾ to 4½ in.	72½
5 to 6 in.	65
7 to 13 in.	82½

Less than carloads to destination east of the Mississippi River will be sold at delivered discounts for carload lowered by two points for lengths 22 ft. and under; longer lengths f.o.b. Pittsburgh. Usual extras to jobbers and boiler manufacturers.

Pittsburgh

PITTSBURGH, PA., September 20, 1911.

Several of the larger steel interests report that in the last few days specifications against contracts for finished material have been coming in a little better, but probably because of the lower prices being made on nearly all kinds of finished iron and steel. The market on steel bars seems especially weak, and while 1.20c. is now the open market 1.15c. has been done on desirable orders. Structural material is also slightly weaker, and 1.30c. on beams and channels up to 15-in. is being done. The smaller open-hearth steel plants are going after new business very aggressively and are offering open-hearth billets at about $19 and open-hearth sheet bars at about $20, f.o.b. Pittsburgh, for prompt specifications. The leading mills that make Bessemer and open hearth billets and sheet bars, and which have their customers covered by contracts, state they are not making these prices on the small amount of new business that is being offered in billets and sheet bars and have not been asked to do so by their customers. While the near future in the iron trade is not promising there is still hope that the demand will pick up in October and that business will be better in the last three months of the year than in the current quarter. It is pointed out that prices on pig iron, steel billets and on nearly all lines of finished iron and steel are low. One thing is practically certain to happen, and it is that, unless conditions soon improve, labor will be asked to take a reduction.

Pig Iron.—The most important sale reported is one of 1000 tons of basic iron made by a local dealer for prompt delivery at $12.60, Valley furnace, or $13.50, Pittsburgh. There is no inquiry for Bessemer, and while prices are nominally $15, Valley furnace, it could readily be bought at $14.60 to $14.75 from dealers. Several sales of No. 2 foundry iron have been made for remainder of the year delivery, aggregating probably 3000 tons, at about $13.50 at Valley furnace. Prices on malleable Bessemer iron are weaker and it has been offered at $13 at furnace. We quote as follows: Bessemer iron, nominally, $15; basic, $12.60; No. 2 foundry, $13.50; gray forge, $13, and malleable Bessemer, $13, all at Valley furnace, the freight rate to Pittsburgh district being 90c. a ton.

Steel.—Mills having contracts with consumers for billets and sheet and tin bars report that specifications so far this month have been coming in at a fair rate, but not so freely as in August. Regular prices on Bessemer and open hearth billets are not being strictly held, a number of the smaller open hearth plants offering billets and sheet and tin bars at $20, delivered, Pittsburgh. It is claimed that the quality of this open hearth steel is not up to the usual standard, but nevertheless these makers are taking practically all the new business that is being offered. Regular prices are as follows: Bessemer and open hearth billets, 4 x 4 in. and up to but not including 10 x 10 in., $21, base; sheet and tin bars in 30-ft. lengths, $22; 1¼-in. billets, $22; forging billets, $26, base, usual extras for sizes and carbons, all prices being f.o.b. Pittsburgh or Youngstown district, with freight to destination added.

Ferromanganese.—Prices have advanced, several of the leading importers now asking as high as $38.50, Baltimore, for foreign 80 per cent. for delivery through the first half of next year. For the remainder of this year the quotation is about $37, Baltimore, the freight rate to Pittsburgh being $1.95 a ton.

Ferrosilicon.—As yet nothing has been done with the inquiry of a local interest for 300 tons, owing to the high prices asked. We quote 50 per cent. at $57 to $58, and blast furnace as follows: 10 per cent., $23; 11 per cent., $24, and 12 per cent., $25, f.o.b. cars, Ashland, Ky., and Jackson, Ohio, furnaces.

Muck Bar.—In the absence of sales we quote best grades of muck bar, made from all pig iron, at nominally $28.50 to $29, Pittsburgh.

Skelp.—A sale of about 1000 tons of grooved steel skelp for this and next month delivery is reported on the basis of about 1.20c., delivered buyer's mill. All the mills are in need of orders. We quote: Grooved steel skelp, 1.20c.; sheared steel skelp, 1.30c.; grooved iron skelp, 1.45c. to 1.55c., and sheared iron skelp, 1.65c. to 1.70c., all for delivery at consumers' mills in the Pittsburgh district.

Wire Rods.—A sale of 300 tons of Bessemer rods, equal deliveries in October, November and December, is reported at slightly under $27, Pittsburgh. Consumers are not specifying freely against contracts. We continue to quote Bessemer, open hearth and chain rods at $27, but reports are that $26 to $26.50 has been done in some recent sales.

Steel Rails.—The Carnegie Steel Company did not take any orders of moment for standard sections in the past week, total sales amounting to less than 4000 tons. The order to the Pittsburgh & Lake Erie Railroad, referred to extensively in the daily press in the past week as 7500 tons, and pointed to as indicating that the railroads were buying liberally of rails, was taken by the Carnegie Steel Company about a month ago and was referred to in this report at the time. Light rails are fairly active, the Carnegie Steel Company having taken new orders and received specifications in the past week for nearly 3000 tons. Prices on

THE IRON AND METAL MARKETS

light rails are as follows: 12-lb., 1.25c.; 16, 20 and 25-lb., 1.21c. to 1.25c.; 30 and 35-lb., 1.20c., and 40 and 45-lb., 1.16c. These prices are f.o.b. at mill, plus freight, and are the minimum of the market in carload lots, small lots being sold at a little higher price. Standard sections are held at 1.25c. per lb. for Bessemer.

Plates.—New orders for steel cars have been light for the past two or three weeks, but some fair-sized inquiries are in the market. The Pennsylvania Railroad is inquiring for 1150 freight cars for its own lines and 75 to 100 suburban service cars for the Long Island Railroad; Buffalo, Rochester & Pittsburgh for 1086 steel underframes for wooden cars; the Baltimore & Ohio for 10 passenger and 10 baggage cars, and the Western Maryland will shortly be in the market for upward of 5000 freight cars, 50 passenger coaches and about 50 locomotives, in contemplation of the opening of its Connellsville extension. Nothing has been done as yet on the inquiry of the Missouri Pacific for 4400 freight cars, but it is believed the road will buy them within a short time. A local mill has received a contract for about 700 tons of plates for delivery at Akron, Ohio. The general demand for plates is quiet, especially from the steel car companies, and all the leading mills are in need of orders. While we quote ¼-in. and heavier plates in the wide sizes at 1.30c., f.o.b. Pittsburgh, this price has been shaded, and on narrow sizes of plates 1.25c. is being named by some mills.

Structural Material.—It is understood the Jones & Laughlin Steel Company will furnish 3000 tons for the spillway gates and valves for the Panama Canal on which the McClintic-Marshall Construction Company was the lowest bidder and will also furnish 400 tons of steel for a high school at Schenectady, N. Y. Prices on structural steel are reported firm and we quote beams and channels up to 15 in. at 1.35c., Pittsburgh.

Sheets.—As far as new demand and specifications against contracts are concerned, the situation is fairly satisfactory to the sheet mills, but concessions in prices are still being made. On No. 28 gauge, box annealed, one-pass cold rolled black sheets the market has settled down to about 1.90c. in carload and larger lots to the large trade and to 2.00c. on the same gauge of galvanized sheets. The margin of profit to mills that have to buy their sheet bars in the open market is very small, and it is said that some find present prices on sheets are at cost or below. The American Sheet & Tin Plate Company continues to operate to about 70 per cent. of its hot sheet mill capacity, but reports specifications quite active, and expects to put on additional hot sheet mills in the near future. The leading independent mills are also operating to from 70 to 75 per cent. of capacity.

Tin Plate.—Specifications against contracts from can makers and packers have been coming in quite freely for several months, with the result that the mills shipped out more tin plate in August than in any one month for a long time, but shipments so far this month show a falling off and operations of the leading mills are at a slightly less rate of capacity. Prices on tin plate are fairly strong on the $3.60 basis for new orders, while shipments are still being made on contracts taken some time ago at $3.70 for coke plates per box of 100 lbs. We continue to quote 100-lb. cokes at $3.60 to $3.70 per base box f.o.b., Pittsburgh.

Bars.—With most consumers now covered by contracts, against which specifications are not coming in very freely, the bar market has quieted down to some extent and new orders being placed are light. The mills rolling steel bars are fairly well filled up for some time, and are operating on an average of about 75 per cent. of capacity. Makers of iron bars are trying to get slightly better prices, but in the face of a light demand, and also owing to the decline in prices of scrap, they have not been successful. We continue to quote steel bars at 1.20c. to 1.25c. and iron bars at 1.25c. to 1.30c., Pittsburgh.

Merchant Steel.—This trade is quiet, the new demand being confined to small lots to cover actual needs, while specifications against contracts are not coming in this month as freely as in August. Shipments this month will show a falling off as compared with last month. Regular prices, which are more or less shaded, are as follows: Iron finished tire, ¼ x ½ in. and heavier, 1.40c., base; under these sizes, 1.55c.; planished tire, 1.60c.; channel tire, 1.80c., base; toe calk, 1.90c; flat sleigh shoe, 1.55c.; concave or convex, 1.75c.; cutter shoes, tapered or bent, 2.25c.; spring steel, 2c.; machinery steel, smooth finished, 1.90c.

Hoops and Bands.—Two leading makers report that specifications on hoops and bands so far this month have held up equally as well as in the same period in August, but the new demand for both hoops and bands is quiet, and only for small lots to cover actual needs. We quote steel hoops at 1.35c. to 1.40c. and bands at 1.20c. to 1.25c., extras on the latter as per the steel bar card.

Rivets.—There is a steady flow of small orders for structural and boiler rivets to meet current needs of consumers, but specifications against contracts are slow. We quote structural rivets at 1.70c. and boiler rivets at 1.80c., but these prices are shaded.

Wire Products.—Makers report that new orders for wire and wire nails so far this month have been fairly heavy and specifications against contracts are moderate. Buyers, however, are confining their purchases to actual needs. We quote wire nails at $1.65; cut nails, $1.55; galvanized barb wire, $1.95; painted, $1.65; annealed fence wire, $1.45, and galvanized, $1.75, all f.o.b. Pittsburgh, usual terms, full freight added to point of delivery.

Spelter.—The market has about held its own in the past week, but the new demand is reported quiet. We quote prime grades of Western spelter at 5.80c., East St. Louis, equal to 5.92½c., Pittsburgh. Prices are weak and buyers are placing orders only for spot shipment.

Shafting.—There is some betterment in specifications for shafting from the implement makers, but from the automobile trade they are very dull. New orders being placed are only for small lots to meet actual needs. Prices on shafting continue irregular, and while the official discount on carload and larger lots is 60 per cent. off list, actual prices on carload and larger orders range from 60 and 5 per cent. to 60 and 10 per cent. off list, the latter discount being named only to the very largest trade.

Railroad Spikes.—Only small orders are being placed, but specifications from three or four of the leading railroads have been coming in a little better of late. We quote railroad spikes at $1.45 to $1.50 per 100 lb., base sizes, f.o.b. Pittsburgh.

Merchant Pipe.—A Western consumer has placed an order with a local mill for about 27 miles of 1 to 4-in. line pipe. The new demand for merchant pipe this month has shown a falling off as compared with the same time in August, persistent reports being current that a new card naming lower discounts on iron and steel pipe will be issued about October 1, but the leading mills refuse to state what their policy will be. Slight concessions are being made, but they are not any heavier than usually prevail in the pipe market and are being given only to the large trade and in most cases on line pipe. Prices on iron and steel pipe have been guaranteed by the mills to October 1, so that on that date the guarantee will either have to be extended or else a reduction in prices made. It can be said that jobbers favor very strongly maintaining the present card of discounts on both iron and steel pipe.

Boiler Tubes.—Specifications against contracts for locomotive tubes are coming in at a fairly satisfactory rate, but the new demand is only for small lots. The market on merchant tubes is neglected and discounts on merchant and locomotive tubes continue to be shaded, as they have been for some months.

Coke.—While there is at present enough labor to supply the demand it is claimed that if 2000 or 3000 more ovens were started there would be difficulty in finding men to operate them. A sale of 5000 to 6000 tons of standard furnace coke for October delivery was made last week by a local dealer at $1.55 per net ton at oven. The output of coke in the Upper and Lower Connellsville regions last week was 320,750 tons, a decrease over the previous week of about 18,000 tons. We quote standard makes of furnace contracts for prompt shipment at $1.50 to $1.55 and on contracts for remainder of this year at $1.65 to $1.70 per net ton at oven. We quote 72-hr. foundry coke for prompt shipment at $1.85 and up to $2, and on contracts from $2.10 and as high as $2.40, the latter price being paid for some brands of coke that have a very high reputation in the trade.

Iron and Steel Scrap.—The Baltimore & Ohio Railroad scrap lists closed last week, and in a general way the prices realized were about 25c. a ton lower than on the previous lists. The consumption of heavy steel scrap is fairly large, partly due to the fact that the Republic Iron & Steel Company is buying from 10,000 to 12,000 tons per month in the open market for its open hearth steel plant. Some dealers are refusing to sell, holding their scrap for higher prices later on. Sales have been very light in the past week, mostly in carload

THE IRON AND METAL MARKETS

lots, and usually of material already loaded on cars and that had to be moved. Prices are as follows per gross ton f.o.b. Pittsburgh, unless otherwise noted:

Heavy steel scrap, Steubenville, Follansbee, Sharon, Monessen and Pittsburgh delivery	$12.75
No. 1 foundry cast	$12.75 to 13.00
No. 2 foundry cast	12.25 to 13.00
Bundled sheet scrap, f.o.b. consumers' mill, Pittsburgh district	10.75 to 11.00
Rerolling rails, Newark and Cambridge, Ohio, Cumberland, Md., and Franklin, Pa.	13.00 to 13.25
No. 1 railroad malleable stock	11.75 to 12.00
Grate bars	9.50 to 9.75
Low phosphorus melting stock	15.50 to 15.75
Iron car axles	22.00 to 22.50
Steel car axles	17.00 to 17.25
Locomotive axles	23.00
No. 1 busheling scrap	11.50 to 11.75
No. 2 busheling scrap	8.00 to 8.25
Old car wheels	12.50 to 12.75
Sheet bar crop ends	15.25 to 15.50
*Cast iron borings	9.00
*Machine shop turnings	9.10 to 9.25
Old iron rails	14.50 to 14.75
No. 1 wrought scrap	13.50
Heavy steel axle turnings	9.75 to 10.00
Stove plate	9.50 to 9.75

*These prices are f.o.b. cars at consumers' mills in the Pittsburgh district.

Chicago

CHICAGO, ILL., September 20, 1911.—*(By Telegraph.)*

The market conditions in this territory indicate a growing acceptance of the existing status for the remainder of the year, and a general tendency to postpone aggressive action until the first of the year is beginning to make itself apparent. That the railroads continue to limit themselves in their expenditures to minor requirements is illustrated by a fairly active specifying for track fastenings as compared with practically no buying of rails during the past week, the principal sale having been 3000 tons of Bessemer rails taken by the South Chicago plant. An order for 1000 steel gondola cars was placed by the Monon system and the Frisco lines are reported as buying 2500 refrigerator cars. Structural steel continues to move in good tonnage, and fabricating shops in increasing number are reporting their capacity well filled. The greatest eagerness for structural tonnage seems now to be displayed by certain of the Eastern mills working with local fabricators. Concessions from regular prices for plates and sheets continue to rule, and despite rumors of an arbitrary stiffening of prices the volume of business fails to evidence any immediate prospects of improved conditions. The steel and iron bar market remains about as it has been. Interest in pig iron for the remainder of the year is light, while the local furnaces are bolstering their prices with acceptances of first quarter delivery business. Consumption of both iron and steel scrap locally is at a minimum and there is very little trading reported. Prices are slightly lower, and the basis upon which leading melters now out of the market will renew purchases is largely problematical. The scale of operation in the general foundry and manufacturing business seems to be upon a slightly higher percentage of activity.

Pig Iron.—The fairly active inquiry, largely for shipment in first quarter, that was prevalent in this market a fortnight ago is now almost entirely absent. A considerable quantity of local Northern iron was sold for first quarter delivery but Southern furnaces have been less active in booking forward shipment. The outlook for local furnaces has been such that a delay in selling for next year promised little in the way of higher prices, while the speculative opportunity permitted the obtaining of slight advances over current prices. A booking of this first quarter business has thus supported the otherwise lifeless situation. Asking prices for Southern pig iron show considerable variance, it being possible to obtain certain spot shipment iron as low as $10, Birmingham, while from other furnaces $10.50 is the best price obtainable for any delivery for the remainder of the year. A number of sales are also reported on the basis of $10.25, Birmingham, for No. 2. It seems likely that a considerable tonnage taken by consumers for delivery in the last half of this year will be carried over on their yards into the first quarter. The inference generally conceded as correct is that the melt during the past several months has not been as large as was anticipated. Sales during the past week have included a number of lots of several hundred tons each to supply routine requirements. We quote for Chicago delivery, except for local irons, which are f.o.b. furnace, the following prices on prompt shipments:

Lake Superior charcoal	$16.50 to $17.00
Northern coke foundry, No. 1	15.00 to 15.50
Northern coke foundry, No. 2	14.50 to 15.00
Northern coke foundry, No. 3	14.25 to 14.50
Northern Scotch, No. 1	16.00
Southern coke, No. 1 foundry and No. 1 soft	14.85 to 15.10
Southern coke, No. 2 foundry and No. 2 soft	14.35 to 14.60
Southern coke, No. 3	14.10 to 14.35
Southern coke, No. 4	13.85 to 14.10
Southern gray forge	13.60 to 13.85
Southern mottled	13.60 to 13.85
Malleable Bessemer	14.50 to 15.00
Standard Bessemer	17.40
Basic	15.50
Jackson Co. and Kentucky Silvery, 6 per cent	17.90
Jackson Co. and Kentucky Silvery, 8 per cent	18.90
Jackson Co. and Kentucky Silvery, 10 per cent	19.90

(By Mail.)

Rails and Track Supplies.—Rail contracts placing during the past week with the leading interest amounted to considerably less than 5000 tons, the principal item being an order for 3000 tons of Bessemer rails for an Iowa railroad. Orders for track fastenings are in much better volume. The Cincinnati, Indianapolis & Louisville Railroad Company, commonly known as the Monon, has placed an order for 1000 steel gondolas with the American Car & Foundry Company and the Frisco lines are reported to have placed their order for 2500 refrigerator cars. We quote standard railroad spikes at 1.65c. to 1.75c., base; track bolts with square nuts, 2.10c. to 2.20c., base, all in carload lots, Chicago; standard section Bessemer rails, 1.28c.; open hearth, 1.34c.; light rails, 40 to 45 lb., 1.16c. to 1.20½c.; 30 to 35 lb., 1.19½c. to 1.24c.; 16, 20 and 25 lb., 1.20½c. to 1.25c.; 12 lb., 1.25c to 1.30½c.; angle bars, 1.50c. to 1.60c., Chicago.

Structural Material.—The principal letting of fabricated steel announced in the week was the contract for 3400 tons for the Kesner Building, Chicago, awarded to the Hansell-Elcock Company. Bids closed on Monday for 6000 tons for the new Chicago, Burlington & Quincy Railroad office building, work on which is to be rushed with all possible speed. Other contracts placed brought the total reported for the week up to about 7000 tons, which included a factory building for the Brunswick-Balke-Collender Company, Dubuque, Iowa; a warehouse of reinforced concrete construction for Sickles & Preston, Davenport, Iowa; an addition to the power house of the Indiana & Michigan Electric Company, South Bend, Ind., 497 tons, to the Rochester Bridge Company; a new plant for the Haskell-Barker Car Company, Michigan City, Ind., 326 tons, to the Lackawanna Bridge Company; 900 tons for a coal handling plant at Duluth, Minn., to the Minneapolis Steel & Machinery Company, and 1000 tons for storage sheds and conveyor business for the same plant to the Milwaukee Bridge Company. Prices for both plain material and fabricated work are somewhat firmer. We quote for mill shipment, Chicago delivery, 1.53c. and from store 1.75c.

Plates.—The material for the 1000 steel gondolas mentioned in a preceding paragraph will be furnished, it is expected, by the Illinois Steel Company, and will include a larger tonnage of plates than has been required for car building in a number of weeks. The general demand for universal plates seems to have assumed some prominence and the starting of the universal plate mill at Gary is contemplated. Prices continue subject to shading and the current tonnage available seems insufficient to make a firmer status possible. Our quotations continue to be nominally, for Chicago delivery, mill shipment, 1.53c. and from jobbers' stocks 1.75c.

Sheets.—The Indiana Harbor mill continues to operate all of its sheet mills, though the tonnage output incident thereto is maintained only with difficulty and in a more or less hand-to-mouth fashion. The presence of the new capacity at Gary is beginning to be felt in this territory, particularly with reference to blue annealed sheets in the heavier gauges. No improvement is noted in the situation regarding prices and concessions of from $1 to $2 per ton continue. We quote Chicago prices as follows: Carload lots, from mill: No. 28 black sheets, 2.18c.; No. 28 galvanized, 3.18c.; No. 10 blue annealed, 1.68c. Prices from store, Chicago, are: No. 10, 1.95c. to 2.05c.; No. 12, 2c. to 2.10c.; No. 28 black, 2.45c. to 2.55c.; No. 28 galvanized, 3.45c.

Bars.—The principal bar iron mills continue to adhere as strictly as possible to prices close to 1.25c. and

THE IRON AND METAL MARKETS

a good proportion of the current business is reported as being placed at that figure. Material concessions are not entirely absent, however. The shading of the prices on steel bars is as extensive as it has been and the volume of new business remains much less than mill capacity. We quote as follows, f.o.b. Chicago: Soft steel bars, 1.38c. to 1.43c.; bar iron, 1.22½c. to 1.25c.; hard steel bars rolled from old rails, 1.20c. From store, soft steel bars, 1.70c. to 1.80c., Chicago.

Wire Products.—Comparisons of the current trade in wire products with the bookings of a year ago are very favorable and an increase in 1911 fall business over 1910 seems quite likely. The demand for wire nails and barb wire indicates clearly, however, a restriction within the limits of actual requirements. Consumers are beginning to accept shipments on the customary spring dating basis and as the fall season advances the price situation is becoming more settled. Jobbers' carload prices, which are quoted to manufacturing buyers, are as follows: Plain wire, No. 9 and coarser, base, 1.68c.; wire nails, 1.88c.; painted barb wire, 1.88c.; galvanized, 2.18c.; polished staples, 1.88c.; galvanized, 2.18c., all Chicago.

Cast Iron Pipe.—The past week was without municipal lettings of importance, the tonnage at Muskegon, Mich., still remaining unplaced. At Omaha, Neb., 200 tons was bought and contracts for like amounts were awarded at Lacyne, Kan., and Montgomery City, Mo. The two latter were for 4-in. pipe, for which size the leading interest is promising no better than 60 days' delivery. We quote as follows, per net ton, Chicago: Water pipe, 4-in., $26.50; 6 to 12-in., $24.50; 16-in. and up, $24, with $1 extra for gas pipe.

Old Material.—At the present writing the local market is almost without outlet among the principal melters of this district. A disposition to reduce stocks on the yards of the mills has removed most of them from the list of buyers. As a result prices of almost all classes of scrap are off from 25c. to 50c. per ton. A sale of 1500 tons of heavy melting steel scrap was made in the week at $10.75. A small quantity of No. 1 railroad wrought brought slightly less than $11 and a carload of pipes and flues went at $8. The leading melter of cast scrap is said to be out of the market and the price is off to $10.75 maximum. A comparatively small amount of scrap is offered by the railroads this week, the lists including one of several hundred tons from the various shops of the Big Four Route, 400 tons from the Soo Line and a small quantity from the Chicago & Alton Railroad. We quote for delivery at buyer's works, Chicago and vicinity, all freight and transfer charges paid, per gross ton, as follows:

Old iron rails	$14.50 to $15.00
Old steel rails, rerolling	12.50 to 13.00
Old steel rails, less than 3 ft.	11.50 to 12.00
Relaying rails, standard sections, subject to inspection	24.00
Old car wheels	12.75 to 13.00
Heavy melting steel scrap	10.50 to 11.00
Frogs, switches and guards, cut apart	10.50 to 11.00
Shoveling steel	10.25 to 10.75
Steel axle turnings	8.50 to 9.00

The following quotations are per net ton:

Iron angles and splice bars	$12.50 to $13.00
Iron arch bars and transoms	13.50 to 14.00
Steel angle bars	10.25 to 10.75
Iron car axles	18.00 to 18.50
Steel car axles	16.00 to 16.50
No. 1 railroad wrought	10.75 to 11.25
No. 2 railroad wrought	9.75 to 10.25
Steel knuckles and couplers	10.25 to 10.75
Steel springs	10.25 to 10.75
Locomotive tires, smooth	15.00 to 15.50
Machine shop turnings	6.25 to 6.75
Cast and mixed borings	6.00 to 6.50
No. 1 busheling	8.75 to 9.25
No. 2 busheling	6.75 to 7.25
No. 1 boilers, cut to sheets and rings	7.50 to 8.00
Boiler punchings	12.00 to 12.50
No. 1 cast scrap	10.50 to 11.00
Stove plate and light cast scrap	9.00 to 9.50
Railroad malleable	10.00 to 10.50
Agricultural malleable	9.25 to 9.75
Pipes and flues	8.00 to 8.50

Philadelphia

PHILADELPHIA, PA., September 19, 1911.

General business in the iron and steel trade continues along rather narrow lines. Moderate purchases of foundry iron for fourth quarter delivery are being made at unchanged prices. In the finished material trade price irregularities restrict buying. Billets are $1 a ton lower and iron bars are easier, but in other lines quotations are nominally unchanged. Railroad buying is light. In old material prices are lower in nearly all grades. Coke remains rather quiet.

Iron Ore.—Nothing of importance has developed. Consumers are pretty well supplied for this year's requirements and negotiations for 1912 supplies have not yet been opened. Importations during the week ending September 16 included 12,600 tons from Newfoundland, 4500 tons from New Brunswick, 5634 tons from Spain and 5400 tons from Cuba.

Pig Iron.—The market continues comparatively strong, although the volume of business transacted is no doubt somewhat smaller. With consumers taking deliveries freely and the majority of the furnaces pretty well sold up for the near future, sellers are not particularly anxious for extended contracts at the present level of prices, and still refuse to quote on inquiries covering deliveries extending beyond the year end. Sales in the foundry grades have been confined, as a rule, to small lots, with occasional sales of 300 to 500 tons for prompt and fourth quarter shipments, for which standard Northern brands of No. 2 X foundry command from $15 to $15.25, and Virginia brands range from $15 to $15.50, delivered. A sale of 100 tons of No. 1 X Virginia foundry for fourth quarter delivery is reported at $12.75 at furnace. While the class of recent buyers covers a pretty general range, there is a trifle more business being transacted with the stove foundries. The most pronounced inquiry recently comes from the cast iron pipe makers, who are again actively in the market. Practically all of the Delaware River pipe makers are making inquiries, some for definite quantities, but others have not stated exact amounts. One concern has been in the market for 5000 tons of No. 3 foundry, against which some purchases are reported to have been made. Another interest has an inquiry out for several thousand tons of analysis iron, while practically all would take on low grade iron if they could get it at a satisfactory price, but as Northern low grade iron has been comparatively scarce the makers are either not in a position to quote or will not make price concessions and little business of this character has been done. No transactions of importance in Southern iron have developed. After the recent heavy purchases of rolling mill forge iron, interest in this grade has again quieted down. No new inquiries of importance have come out. Steel making grades are inactive. A few sales of standard low phosphorus iron at both $20 and $20.50, delivered, have been made, but the demand for basic iron is practically at a standstill. The following range of prices is named for standard brands, delivered in buyers' yards in this vicinity, shipment ranging from prompt to the remainder of the year:

Eastern Pennsylvania No. 2 X foundry	$15.00 to $15.25
Eastern Pennsylvania No. 2 plain	14.75 to 15.00
Virginia foundry	15.00 to 15.50
Gray forge	14.50
Basic	14.75 to 15.00
Standard low phosphorus	20.00 to 20.50

Ferroalloys.—Prices of 80 per cent. ferromanganese have been moved upward, and practically every seller now quotes $38.50, Baltimore, for either prompt or forward business. No business is being done, however, at the new price basis. While no transactions in 50 per cent. ferrosilicon are reported prices are said to be stronger at $58 to $59, delivered. Some little inquiry for 11 to 13 per cent. ferrosilicon is reported, with occasional sales at unchanged prices.

Billets.—Business coming to the mills continues light, notwithstanding the fact that price concessions are to be had. Sales of axle billets have been made at a reduction from recent prices, while open hearth rolling billets are to be had at $22.40 and ordinary forging billets at $27.40, delivered in this vicinity. Consumers, however, continue to place orders for quantities covering their immediate needs rather than for extended requirements.

Plates.—The demand continues of an irregular nature, principally confined to miscellaneous orders, which together with specifications on contracts about enables Eastern mills to maintain an even rate of production. Structural plates continue the most active, although the demand for ship plates is promising. While no definite information is available reports of price concessions continue to be heard and it is not unlikely that quotations for desirable business would be lower than those for miscellaneous orders, for which 1.50c., delivered, is quoted for ordinary plates.

Structural Material.—While there is a fair inquiry for small lots of plain shapes the demand for fabricated material of any importance in this district is less pro-

THE IRON AND METAL MARKETS

nounced. Contracts covering several buildings involving a few hundred tons of material have been closed. New bids will probably be asked for the new Municipal Convention Hall, as proposals exceed the appropriation for the work. Several hotel projects are talked of, but have not yet been sufficiently developed. Several small bridge contracts are pending, and an inquiry for a new span, requiring about 500 tons, for one of the Pennsylvania Railroad bridges crossing the Schuylkill River is before the trade. Current reports of price concessions are heard, but neither buyers nor sellers admit that any cutting has been done, and 1.50c., delivered, continues to be named for ordinary business in plain shapes.

Bars.—Makers of refined iron bars appear to need business, and competition has been sharper for what few orders have come out. Extremely low prices are talked of, but 1.15c., mill, appears to be the minimum for desirable business and not all the mills are willing to go so low. A full range of the market is from 1.22½c. to 1.27½c., delivered, the inside quotation being available for desirable specifications only. Steel bars continue quiet at 1.35c. to 1.40c., delivered.

Sheets.—A moderate amount of small business is being placed with Eastern mills, not sufficient, however, to keep them operating satisfactorily. Producers in this district have had to meet concessions on Western sheets, and low prices have resulted in a wage reduction of 10 per cent. to be made October 1 at the mills at Conshohocken, Pa.

Coke.—Occasional sales of foundry coke, both on contract and for prompt shipment, have been made, but transactions are not large. Heating coke is a trifle more active and is becoming scarcer. Very little business is moving in furnace coke; one fair inquiry is before the trade, but the bulk of the business is in small lots for early delivery. Prices are unchanged, the following range per net ton being named for delivery in buyers' yards in this vicinity:

Connellsville furnace coke	$3.80 to $4.00
Foundry coke	4.25 to 4.40
Mountain furnace coke	3.40 to 3.50
Foundry coke	3.65 to 4.20

Old Material.—A further decline in prices of practically all grades is to be noted. Consumers are still out of the market and take on only bargain lots, which, as a rule, represent forced sales. No. 1 heavy melting steel scrap commands from $12.50 to $12.75, delivered, at which figures occasional odd lots are moved. Any effort, however, on the part of consumers to take on any tonnage would immediately develop higher prices. Transactions between dealers are extremely light. Moderate sales of wrought scrap at lower prices are noted, but the demand for the rolling mill grades of old material is comparatively light and sales made are usually small and at a lower range than quoted last week. The following range of prices, while largely nominal, about represents the basis at which business could be done for delivery in buyers' yards, eastern Pennsylvania and nearby points, taking a freight rate from Philadelphia varying from 35c. to $1.35 per gross ton, for shipment ranging from prompt to the remainder of the year:

No. 1 heavy melting steel scrap	$12.50 to $12.75
Old steel rails, rerolling (nominal)	12.75 to 13.25
Low phosphorus heavy melting steel scrap	16.75 to 17.25
Old steel axles (nominal)	18.00 to 18.50
Old iron axles (nominal)	23.50 to 24.00
Old iron rails	17.00 to 17.50
Old car wheels (nominal)	12.50 to 12.75
No. 1 railroad wrought	11.50 to 12.00
Wrought iron pipe	11.75 to 12.25
No. 1 forge fire	10.50 to 11.00
No. 2 light iron (nominal)	6.50 to 7.00
Wrought turnings	8.00 to 8.50
Cast borings	7.50 to 8.00
Machinery cast	12.50 to 13.00
Railroad malleable (nominal)	11.00 to 11.50
Grate bars, railroad	9.50 to 10.00
Stove plate	12.00 to 12.50

Cincinnati

CINCINNATI, OHIO, September 20, 1911.

Pig Iron.—Including stove makers, the foundry iron melt in this vicinity shows an increase, and as a consequence shipments on contracts are moving along in a very satisfactory manner. However, this improvement has not produced any new business, and if anything there is a slackened demand for foundry grades that is said to have brought out offers from a few Southern producers to extend deliveries through the last quarter at the minimum prompt shipment quotation. There is an inquiry before the trade for about but aside from this little interest is taken in the situation by consumers as the majority of orders now placed 20,000 tons of basic iron for a southern Ohio melter, cover only immediate requirements. Northern foundry grades are holding reasonably well and $13, Ironton, for No. 2 foundry is the minimum quotation, with some producers holding out for $13.50. A 400-ton lot of No. 2 foundry was taken by a northern Ohio buyer at $13.25, shipments running through December. For shipment this year 500 tons of Southern No. 1 soft was contracted for by a Central Western consumer on a basis of $10.50, Birmingham. Continued hesitancy is manifested on the part of both buyer and seller as to next year's business, though it is rumored that orders have been solicited at figures very close to present quotations for first quarter delivery. For nearby shipment 1000 tons of malleable went to a Michigan manufacturer at the prevailing market price, and it is rumored that an additional round lot will be bought by another consumer before the end of the week. Based on freight rates of $3.25 from Birmingham and $1.20 from Ironton, we quote, f.o.b. Cincinnati, as follows, for prompt shipment:

Southern coke, No. 1	$14.00 to $14.25
Southern coke, No. 2	13.75 to 13.75
Southern coke, No. 3	13.50 to 13.50
Southern coke, No. 4 foundry	12.50 to 13.00
Southern gray forge	12.50 to 13.00
Ohio Silvery, 8 per cent. silicon	16.95 to 17.20
Lake Superior coke, No. 1	14.70 to 14.95
Lake Superior coke, No. 2	14.20 to 14.45
Lake Superior coke, No. 3	13.70 to 13.95
Basic, Northern	14.20 to 14.45
Standard Southern car wheel	25.50 to 25.75
Lake Superior car wheel	19.00

(By Mail.)

Coke.—The inquiry is very light. The only business transacted in foundry grades is for carload lots, for prompt shipment, to cover immediate requirements. A southern Ohio furnace contracted for a supply of 48-hr. coke up to April of next year. The amount involved averages about 150 tons per day. Quotations are unchanged, with Connellsville furnace coke offered around $1.55 per net ton at oven for prompt shipment and at about $1.65 for future delivery. Both Wise County and Pocahontas furnace grades are quotable at an advance of 10c. to 15c. above these figures. Foundry coke is selling in all three fields around $2 to $2.30 per net ton at oven, with rumors that concessions have been made for desirable business.

Finished Material.—Sheets show considerable activity. Buyers seem to think that bottom prices have been reached and are reported to be placing orders quite freely. Both structural material and steel bars are also in fair demand, although there are rumors that mill prices on steel bars have softened somewhat. The local warehouse quotation on bars is around 1.65c. and that on structural material is about 1.75c. Hoops and bands are quiet and railroad track material is very sluggish.

Old Material.—The market continues weak. Consumers do not show any desire to contract very far ahead, and the principal business transacted is of a hand to mouth variety. The railroads have large quantities of scrap to sell, but present prices are not at all attractive. The approximate prices paid by buyers delivered in their yards, southern Ohio and Cincinnati, are as follows:

No. 1 railroad wrought, net ton	$10.25 to $10.75
Casting borings, net ton	4.50 to 5.00
Steel turnings, net ton	5.50 to 6.00
No. 1 cast scrap, net ton	9.25 to 9.75
Forest scrap, net ton	6.25 to 6.75
Old iron axles, net ton	16.25 to 16.75
Bundled sheet scrap, gross ton	7.25 to 8.25
Old iron rails, gross ton	13.25 to 13.75
Relaying rails, 50 lb. and up, gross ton	20.75 to 21.50
Old car wheels, gross ton	10.25 to 10.50
Heavy melting sheet scrap, gross ton	9.75 to 10.25

Cleveland

CLEVELAND, OHIO, September 19, 1911.

Iron Ore.—One of the leading independent steel interests that cut down its shipping schedule from its ore properties very materially early in the season has decided to ship 100,000 tons more of ore than was planned and has contracted for vessel capacity to move it. One sale of 25,000 tons, half Bessemer and half non-Bessemer, was made during the week. No other business is in prospect, although it is probable that a few small lots will be sold before the season closes. Shipments are falling off. Some of the shippers are planning to have about all of their ore brought down by

THE IRON AND METAL MARKETS

November 1, so that shipments after next month will be very light. We quote prices as follows: Old range Bessemer, $4.50; Mesaba Bessemer, $4.25; old range non-Bessemer, $3.70; Mesaba non-Bessemer, $3.50.

Pig Iron.—There is some demand for foundry iron for delivery over the remainder of the year in lots of 200 to 300 tons. A local consumer has bought 300 tons of No. 2 foundry from a Cleveland furnace at $13.90, delivered. Another sale was 200 tons of No. 1 for outside shipment. Two sales are reported in central Ohio, one of 1200 tons of malleable and another of 1500 tons, about two-thirds malleable and the remainder foundry iron. A northern Ohio stove foundry has bought 1000 tons of high silicon iron. Another sale is 350 tons, part Northern and part Southern, to a northern Ohio stove works. All of the sales noted were for delivery during the remainder of the year. A local foundry is negotiating for several hundred tons of Northern and Southern iron. A northern Ohio furnace manufacturer has an inquiry out for 1000 tons for the first half. There are indications that regular quotations on Northern grades are not being firmly adhered to in all cases. Furnaces are asking 50 cents a ton over current prices for first half delivery but the advanced price is not bringing out any business for that delivery. Southern iron is quoted at $10.25 to $10.50, Birmingham, for No. 2, but it does not appear that $10 iron has entirely disappeared. For Cleveland delivery we quote as follows for prompt shipment and for the last quarter:

Bessemer	$15.90
Basic	$13.75 to 13.90
Northern foundry No. 2	13.75 to 14.00
Gray forge	13.00 to 13.25
Southern foundry, No. 2	14.25 to 14.85
Jackson Co. silvery, 8 per cent. silicon	17.30 to 17.55

Coke.—The condition of the market remains practically the same as it has been for several weeks. The only demand is for small lots of foundry grades, mostly for prompt delivery. Prices are stationary. We quote standard Connellsville furnace coke at $1.50 to $1.55, per net ton, at oven, for spot shipment, and $1.60 to $1.70 for the remainder of the year. Connellsville 72-hr. foundry coke is held at $1.85 to $2 for prompt shipment and $2 to $2.40 for contract.

Old Material.—The market is practically at a standstill. Both buyers and sellers are now playing a waiting game. There is a little inquiry but it appears to be in the nature of market feelers. While prices are weak the decline appears to have stopped and quotations are about the same as a week ago. A small degree of activity would have a tendency to stiffen prices. The Nickel Plate Railroad has a list out. Dealers' prices, per gross ton, f.o.b. Cleveland, are as follows:

Old steel rails, rerolling	$12.50 to $12.75
Old iron rails	14.50 to 15.00
Steel car axles	17.50 to 18.00
Heavy melting steel	11.50 to 11.75
Old car wheels	11.50 to 12.00
Relaying rails, 50 lb. and over	22.50 to 23.50
Agricultural malleable	10.75 to 11.25
Railroad malleable	12.00 to 12.50
Light bundled sheet scrap	9.50 to 10.00

The following prices are per net ton, f.o.b. Cleveland:

Iron car axles	$18.75 to $19.25
Cast borings	6.50 to 6.75
Iron and steel turnings and drillings	7.00 to 7.25
Steel axle turnings	8.00 to 8.50
No. 1 busheling	9.50 to 10.00
No. 1 railroad wrought	11.75 to 12.00
No. 1 cast	11.25 to 11.75
Stove plate	9.50 to 10.00
Bundled tin scrap	11.00 to 11.50

Finished Iron and Steel.—Mills continue to get a moderate volume of small orders but consumers are buying only for immediate requirements. The unsatisfactory price situation has been aggravated by reports published in the daily press regarding further concessions and the market appears to be more unsettled. Structural material seems to be firmer than most other finished lines but there appears to be some shading in it also. Steel bars are being sold at 1.20c., Pittsburgh, but it is very probable that buyers can secure a concession of $1 a ton on a desirable order. Sheets are being well maintained at 1.90c., Pittsburgh, for No. 28 black, and 2.90c. for No. 28 galvanized. Plate orders are being taken mostly at a concession of $1 a ton from the 1.35c. price. The published report of a 2½ per cent. cut on wrought steel pipe by the Republic Iron & Steel Company is unfounded as far as this territory is concerned. The demand in structural lines is holding up well. The contract for the Cleveland Press Building, about 750 tons, has been awarded to the McMyler-Interstate Company, Cleveland. Bethlehem sections will be used. Bids are being received for 4500 tons for the Cleveland Leader Building, the erection of which will not be started until next year. The city of Cleveland and the Nickel Plate Railroad are planning a grade crossing elimination at Kinsman road that will require about 1000 tons. The demand for iron bars is more active than for some time but prices are weak. We quote iron bars at 1.20c. to 1.25c., Cleveland. Hard steel bars are firm at 1.10c.

St. Louis

ST. LOUIS, MO., September 18, 1911.

Pig Iron.—With an inquiry for 300 tons of carwheel iron as the only indication of business, pig iron agents in the St. Louis territory cling to the idea that conditions are better than they have been for some time and that business will pick up before the turn of the year. Despite this belief, No. 2 Southern is quoted all the way from $10.50 down to $10, Birmingham, with not a single taker, and Northern iron can be had at $13 to $13.50, Ironton. The inquiry for the 300 tons of carwheel iron comes from a concern in Illinois to which a St. Louis sales agent sold 200 tons of the same grade last week. Stocks on the yards of the furnacemen are said to be decreasing, however, and the available supply of cars has diminished to such an extent that the opinion prevails that railroads will soon manifest a disposition to place car orders that will result in a better demand for iron.

Coke.—One large inquiry for coke is pending, and an agency reports a sale of 25 to 30 cars of Connellsville foundry coke last week. Otherwise business has been quite dull. Prices remain unchanged.

Finished Material.—All orders for structural material are being placed for quick shipment, with the tonnage about normal. Very little of the material is for stock purposes. Prices are unchanged from last week. A new 20-story office building is said to be in process of promotion, which will require about 4000 tons of steel. Specifications for bars have been coming in fairly well, with instructions for quick shipments. The Wrought Iron Range Company, St. Louis, let the contract last week for about 250 tons of reinforcing bars to G. S. Bergendahl, St. Louis, for the group of buildings for its new plant. Standard rails are not much in demand, and the prospects are not bright for any large tonnage before the turn of the year. One St. Louis road added 250 tons to a contract placed several weeks ago. Light rails are in fair demand only because of a lack of activity in the coal trade. Track fastenings are in fair demand.

Old Material.—The scrap iron market remains extremely dull. Dealers' prices, per gross ton, f.o.b. St. Louis, are unchanged, as follows:

Old iron rails	$13.00 to $13.50
Old steel rails, rerolling	13.00 to 13.50
Old steel rails, less than 3 ft	11.50 to 12.00
Relaying rails, standard section, subject to inspection	23.00 to 23.50
Old car wheels	13.00 to 13.50
Heavy melting steel scrap	11.50 to 12.00
Frogs, switches and guards cut apart	11.50 to 12.00

The following prices are per net ton:

Iron fish plates	$11.00 to $11.50
Iron car axles	19.50 to 20.00
Steel car axles	18.50 to 19.00
No. 1 railroad wrought	11.25 to 11.75
No. 2 railroad wrought	10.25 to 10.75
Railway springs	9.75 to 10.25
Locomotive tires, smooth	14.50 to 15.00
No. 1 dealers' forge	8.50 to 9.00
Mixed borings	6.50 to 7.00
No. 1 busheling	9.50 to 10.00
No. 1 boilers, cut to sheets and rings	8.00 to 8.50
No. 1 cast scrap	10.00 to 10.50
Stove plate and light cast scrap	8.00 to 8.50
Railroad malleable	8.50 to 9.00
Agricultural malleable	7.50 to 8.00
Pipes and flues	8.50 to 9.00
Railroad sheet and tank scrap	8.50 to 9.00
Railroad grate bars	8.00 to 8.50
Machine shop turnings	7.50 to 8.00

Birmingham

BIRMINGHAM, ALA., September 18, 1911.

Pig Iron.—The largest transaction reported for the past week involved 1200 tons of No. 3 foundry, for shipment within 60 to 90 days, at $9.75 per ton at furnace. A lot of 750 tons of No. 4 foundry for comparatively early shipment was sold at $9.50 per ton at furnace, and 250 tons of No. 2 soft, to cover the remainder of the year, was sold at $10.50 per ton at furnace. With these exceptions the sales reported in-

THE IRON AND METAL MARKETS

volved carloads and lots of less than 100 tons each, the aggregate of which is very small. There has been no change in open quotations by any of the producing interests; but it is now certain that the market for deliveries extending over the remainder of the year, even in strictly Southern territory, where round lots are offered, is represented by lower figures than $10.50 for No. 2 foundry at Birmingham furnaces. It is stated that 25 cents per ton only has been conceded on Southern deliveries, although no large tonnages have come up recently to test the market. Buyers are apparently still indisposed to contract for first quarter shipment, and indications are that they provided for advanced requirements more extensively at the $10 schedule than has been conceded heretofore. It is quite certain that prices now obtainable are not attractive, whether due to the extent of previous purchases or to the condition of the foundry trade generally. Active foundry capacity is considerably less than normal, but it has been well understood for some months that blast furnace activities were closely adjusted to the requirements of the foundry trade. Owing to the continued scarcity of low grades, we consider the market on a $10.50 basis for grades below No. 3 foundry, but quote No. 2 foundry, for delivery over the remainder of the year, at $10.25 at Birmingham furnaces, with a differential of 50 cents per ton for No. 3 foundry. Standard Southern basic iron is quoted at $10.25 to $10.75 per ton Birmingham furnaces, and charcoal iron at $22.50 per ton at Birmingham.

Cast Iron Pipe.—A lot of 1000 tons of water pipe for Clarksville, Miss., the largest order placed in the week, was awarded the United States Cast Iron Pipe & Foundry Company. Quotations are so far unaffected by the manifest weakness in the pig iron market, but such conditions are largely due to the volume of business now on books of Southern producers. We continue to quote as follows for water pipe per net ton f.o.b. cars here: 4-in. to 6-in., $23; 8-in. to 12-in., $22; over 12-in., average $21, with $1 per ton extra for gas pipe.

Old Material.—There is a fairly good demand for all steel grades and more inquiry is being received for light cast and machinery scrap. The trading in wrought grades and old car wheels has been very light, with practically no demand for relaying rails and iron and steel axles. The status of prices is very uncertain, owing to the condition of the pig iron market, but dealers are making an effort to maintain a schedule as below. We quote these prices as nominal per gross ton f.o.b cars here.

Old iron axles (light)	$13.50 to $14.00
Old steel axles (light)	12.50 to 13.50
Old iron rails	12.50 to 13.00
No. 1 railroad wrought	11.00 to 11.50
No. 2 railroad wrought	9.50 to 10.00
No. 1 country wrought	7.50 to 8.00
No. 2 country wrought	7.00 to 7.50
No. 1 machinery	9.50 to 10.50
No. 1 steel	8.50 to 9.00
Tram car wheels	8.00 to 8.50
Standard car wheels	9.50 to 10.50
Light cast and stove plate	7.00 to 7.50

San Francisco

SAN FRANCISCO, CAL., September 12, 1911.

In some departments a little more inquiry is noted than for the last few months, but the market is spasmodic and uncertain, and on the whole trading is still slow. Both merchants and consumers are inclined to limit their supplies as closely as possible. A feeling of uncertainty is apparent regarding the outlook both for prices and for prospective requirements, and this feeling is at the moment intensified by the labor situation. The question of hours in the local shops, which was temporarily settled a year ago, has again been opened. The employers are endeavoring to restore the nine-hour day, which prevails at other coast points, and their success would doubtless involve a material increase of local business.

Bars.—Merchants are still carrying fairly large stocks of both soft steel and reinforcing bars, and their purchases are almost entirely of a small nature for sorting-up purposes. While business is coming out a little more freely in a small jobbing way, there is no real life to the market, important inquiries being almost entirely lacking. Most recent sales of reinforcing bars have also been small, but the movement is keeping about up to the recent average, and several buildings requiring a fair tonnage will be in the market shortly. Local merchants are now maintaining bar prices quite firmly, the quotations from store, San Francisco, standing as before at 2. c. for steel and 1.90 c. for iron.

Structural Material.—A few fairly good orders have been placed recently on buildings which have been in the market for some time, but the situation is rather quiet all over the coast, with comparatively little new work in prospect. Last month's building records in the leading cities were fairly satisfactory, but included very few Class A structures, and plans for a number of important buildings around San Franciisco have been changed from steel to reinforced concrete. The principal recent contracts placed in this city were about 850 tons for the Girls' High School and 250 tons for the Mendell Building, both of which were taken by the Ralston Iron Works. The McClintic-Marshall Construction Company has taken about 370 tons for the Southern Pacific station at Sixteenth street, Oakland. The Central Iron Works has a small job for the American Forge Company. The Union Iron Works job, on which figures were taken some time ago, is still withheld, and now appears rather uncertain. The Spokane, Portland & Seattle Railway is in the market for 22 bridges, which will require a heavy tonnage, but aside from this very little is coming up in Oregon and Washington. An inquiry is expected shortly on the Masonic Temple at Sacramento, Cal., and figures will soon be taken on the Mount Zion hospital in this city, but plans are still incomplete for several other local buildings on which inquiries have been expected. The Harbor Commissioners have ordered plans for three ferry slips, six piers, and a viaduct from the ferry building to Market street, which, if carried out, will require a considerable tonnage.

Rails.—A number of small orders were placed about the end of August, and since then a northern interest has ordered 9,000 tons from the Illinois Steel Company. There is considerable inquiry for grooved girder rails from street railroads all over the coast, and the outlook is favorable for quite a heavy tonnage in this line in the next few months. Small orders for standard sections are not as numerous as last month, but a few substantial inquiries are coming out. The demand for light rails for the summer has been below expectations, and there is no present indication of improvement.

Sheets.—Business is dull. A heavy movement of currugated sheets usually occurs at this season, but merchants report general apathy in the consuming trades. The weakening of prices has caused a rather uneasy feeling, and there is a tendency to hold off until the market reaches a firmer basis. Moreover, merchants are fairly well supplied at present, and are anxious to work off the stock on hand before placing any further orders.

Plates.—Shipbuilding firms along the coast are still buying to some extent, though their principal requirements have been taken care of, and there is little additional work in prospect. There is a moderate demand for tank plates, but the large inquiries which have been counted on are slow to materialize. The Long Beach Consolidated Gas Company, Long Beach, Cal., is planning to erect another gas container of 1,000,000 cu. ft. capacity.

Merchant Pipe.—Orders for a considerable tonnage for the Western Water Company of the Coalinga oil field have been placed with the mills, after a delay of several months. Aside from this no large orders have been placed, and while some small business has been picked up from various water and gas companies the situation is not satisfactory. The jobbing trade has not noticeably improved, and although supplies in store are beginning to show signs of depletion, merchants are very reluctant to place their orders at the moment. This is due principally to the fact that some manufacturers are offering concessions in prices, and still further shading is anticipated by the local trade. There is a prospect of a fair buying movement among local merchants when values are definitely established.

Cast Iron Pipe.—Large individual orders are not in evidence this month, the principal transaction being the purchase of 650 tons of small pipe by the town of Porterville, Cal., from the United States Pipe Company. Small sales, however, have been sufficiently numerous to cause an increase in the aggregate tonnage over the early part of August. The city of Honolulu, T. H., will receive bids September 23 for 1700 tons of pipe. Considerable small waterworks development is to be undertaken in this State before the end of the year, and many towns are issuing bonds for improvements to be carried out next year.

THE IRON AND METAL MARKETS

Pig Iron.—The local trade is quiet, as for some time past, sales being almost entirely of small lots. The range of prices remains about as before, foreign foundry iron being obtainable at $20 to $24, while No. 2 Southern is nominally valued at $20.50.

Old Material.—The demand is gradually working into better shape, numerous small sales of steel melting and cast iron scrap having been closed of late, though no single transactions of special importance are reported. Supplies of steel melting scrap in local yards are becoming burdensome, and a considerable tonnage will probably be sent to East as soon as the rush of grain shipping is over. Mills using rerolling rails are well supplied at present, and are keeping out of the market, but several good-sized lots of relaying rails have changed hands lately, and offerings in this line find a fairly ready demand.

The German Iron Market

Pig Syndicate Arranges with Luxemburg-Lorraine Furnaces

BERLIN, September 7, 1911.

When the negotiations for an arrangement between the Pig Iron Syndicate and the Luxemburg-Lorraine furnaces were broken off last week without result it was generally believed that this would end all efforts for bringing about an understanding between the two parties. However, a few days later another meeting was arranged for to-day at Luxemburg, and this evening a dispatch from that city announces that an agreement has been reached. It is not known at this moment whether the Southwesterners have agreed to join the syndicate or only to work in harmony with it as to prices. In any case it appears that there will now be peace in the pig iron trade. It is expected that the syndicate will at once proceed to adopt a price schedule for 1912 and begin to take orders for delivery after January 1. Hitherto the furnaces have been refusing to take orders beyond the end of the year in the hope that the great combination might still be completed. It is probable that the syndicate will adopt somewhat higher prices. In expectation of this the Siegerland group have already put up their prices by 3 or 4 marks for supplementary orders for 1911 delivery, and it is reported that they have been doing considerable business on that basis.

Some belated commotion has been caused by the fact that the Steel Works Union had succeeded in obtaining an order for 27,000 tons of heavy steel rails from the South African Union. The price is given at 105 marks. The order was reported last month. American, English and Belgian works also put in bids, but were beaten by the Germans. The London newspapers indicate that considerable chagrin is felt there over the defeat of the English mills by their German competitors. The export demand for rails remains active and some promising orders are being negotiated. The activity in structural material remains unabated. The foreign markets are calling for increased amounts and export prices are steady at 105 to 106 marks f.o.b. seaport. Consumers of semi-manufactured steel products have begun to order for the fourth quarter. It is expected that their requirements will continue at about the same level as hitherto, and hence that the big mills of the Union will be able to keep on turning out product in excess of their allotments.

Activity in Bars, Plates and Wire

The bar trade continues in good shape, although new business has grown rather quieter, but prices are well maintained. According to one report the mills are making bars somewhat above their allotments. At any rate it is certain that they are very busy, and consumers are calling for shipments with considerable urgency. Dealers are trying to place orders pretty far ahead and to induce makers to cut prices, but they find the latter firmer in holding up their prices, and some of them, it is asserted, will take no orders beyond December, while some that do so are demanding higher prices. At the meeting last week of the bar mills the old plan of keeping up home prices by giving a heavy export drawback on the material consumed was again brought up, but it met with strong opposition.

In heavy plates the previous briskness is fully maintained and prices show a tendency to rise. The activity in this section has affected the trade in tin plates, in which the demand has grown more active and prices have hardened. At the fortnightly trading on the Düsseldorf Exchange last week the price of hard iron was quoted at 127 to 130 marks, as compared with 125 to 130 marks at the previous trading. Wire mills are better employed, but prices remain very unsatisfactory. Mills running on wire rods are turning out somewhat more than their allotments call for.

It is announced that the new establishment of the Thyssens, near Diedenhofen, mentioned in this correspondence some months ago, is making rapid progress toward completion, especially the blast furnaces. The stoves are nearly finished. Work was only begun in March.

The stock markets, which have been greatly excited for some weeks over the probable dividend of the great Phoenix Company, were much disappointed to-day when an unchanged dividend of 15 per cent. was declared, and a heavy fall in Phoenix shares followed. The movement of iron shares for about two weeks has been pretty sharply downward, although it is stated there is nothing in the trade situation to justify this. The fall is due to overtrading on the stock exchanges, to political anxieties in connection with the Morocco affair, to the protracted drought and its damage to the growing crops. The Exchange need not have been disappointed with the Phoenix report, for it shows a gain of 3,677,000 marks in the net earnings on a total of 24,475,000 marks.

The reports this week from the Belgian market are again good, but prices are mostly unchanged. Bar prices are very firm, however, while heavy plates are rising.

A meeting of the International Rail Convention will be held at Munich about the end of this month. It is expected that among foreign rail mills Belgian, English and French interests will be represented.

Buffalo

BUFFALO, N. Y., September 19, 1911.

Pig Iron.—Inquiry for an aggregate of about 9000 tons of foundry iron has been received in the Buffalo market in the past week, including one for 1000 tons, one for 1500 tons and one for 2500 tons, and most of this tonnage—practically all for this year's delivery—is still under negotiation. Sales have not run quite as large as in the previous week, attributable probably to the fact that furnaces are in such a well sold up condition for the remainder of the year that new orders are not specially sought after, and present price schedules are firmly adhered to. Contract shipments from furnaces have been exceedingly heavy, with a daily increasing demand for iron in foundry grades. Consumers who have been running on low stocks have undoubtedly found need of replenishing them, causing urgent requisitions to be placed with furnaces at a time when they are all shipping to full present capacity. For prompt and fourth quarter delivery we quote as follows, f.o.b. Buffalo:

No. [illegible] foundry	$14.00 to $14.25
No. [illegible] foundry	13.75 to 14.00
No. 2 plain	13.75 to 14.00
No. 3 foundry	13.50 to 13.75
Gray forge	13.50
Mottled	13.75 to 14.25
Basic	13.75 to 14.25
Charcoal	16.50 to 17.50

Finished Iron and Steel.—Business in general lines is of about the same volume as for last week, with prices still showing a lack of stability. In bars and plates buyers seem to hesitate about purchasing in any considerable quantities for their future requirements and are buying for present needs only, very little stocking being done by either consumers or jobbers. In some instances consumers are experiencing more difficulty in obtaining prompt shipment of bar material from mills. In wire products considerable inquiry has developed, particularly from Canadian buyers, and manufacturers of wire fence are sending out inquiries covering their needs running well into next year. Some business in wire nails has been done and prices in this line are somewhat steadier. The demand for sheets has been fairly active but at prices which yield little profit to producers. Structural material continues to lead in activity, with a large amount of business in sight. Bids will be received next week for steel for the Prudence Risley Hall, Ithaca, N. Y., requiring about 300 tons. Bids are also being received for the steel work for the foundry, pattern shop and warehouse buildings at Whitesboro, N. Y., being erected by Munson Bros., of Ithaca, about 300 tons. Sherman, Stillwell & Stalter, canal contractors, Lyons, N. Y., are taking bids for steel for highway bridges over the Erie Canal on their section and the Kinzer Construction Company, Montezuma, N. Y., for steel for locks and bridges for the Erie Canal contract which it holds. The Henry P. Burgard

THE IRON AND METAL MARKETS

Construction Company, Buffalo, is also taking bids for steel for Erie Canal construction work at Fulton, N. Y., on the section for which it holds contract. The Eastern Concrete Steel Company, Buffalo, which has the general contract for the Victor Truck Company's new factory building, Buffalo, requiring a considerable tonnage of reinforcing bars, is taking bids for 100 tons of steel trusses. The Buffalo Structural Steel Company has secured contract for fabrication and erection of 200 tons for the Washington B. French store and office building, Buffalo; also for steel for the U. S. Hame Company's warehouse, Buffalo, requiring a small tonnage, and for structural steel for the Wheat Ice Cream Company's factory of reinforced concrete, for which the Buffalo Expanded Metal Company holds the general contract.

Old Material.—The market continues very dull and stagnant with very little interest displayed by consumers, who are sufficiently supplied for present needs. The only material moving is on contract shipment. Prices are stationary. We quote as follows, per gross ton, f.o.b. Buffalo:

Heavy melting steel	$12.75 to $13.25
Low phosphorus steel	16.00 to 16.50
No. 1 railroad wrought	14.00 to 14.50
No. 1 railroad and machinery cast scrap	13.50 to 14.00
Old steel axles	18.50 to 19.00
Old iron axles	22.00 to 22.50
Old car wheels	13.00 to 13.50
Railroad malleable	12.75 to 13.00
Boiler plate	12.50 to 13.00
Locomotive grate bars	11.00 to 11.50
Pipe	9.25 to 9.50
Wrought iron and soft steel turnings	7.15 to 7.40
Clean cast borings	7.00 to 7.25

Boston

BOSTON, MASS., September 19, 1911.

Old Material.—Prices remain unchanged. The market has weakened, if anything, and little business of any sort has been transacted. Producers are not coming into the market, neither are the mills showing activity as purchasers. The prices quoted below are those offered by the large dealers to the producers and to the smaller dealers and collectors, per gross ton, carload lots, f.o.b. Boston and other New England points, taking Boston rates from eastern Pennsylvania points. In comparison with Philadelphia prices the differential for freight of $2.30 a ton is included. Mill prices are approximately 50 cents a ton more than dealers' prices. The quotations follow:

Heavy melting steel	$10.00 to $10.50
Low phosphorus steel	11.45 to 11.95
Old steel axles	14.20 to 14.70
Old iron axles	17.70 to 18.70
Mixed shafting	12.75 to 13.25
No. 1 wrought and soft steel	11.00 to 11.25
Wrought iron pipe	9.25 to 9.50
Skeleton (bundled)	7.75 to 8.00
Cotton ties	8.00 to 8.25
No. 2 light	4.50 to 5.00
Wrought turnings	5.75 to 6.00
Cast borings	5.00 to 5.50
Machinery cast	12.50 to 13.00
Malleable	11.00 to 11.50
Grate bars	6.00 to 6.50
Stove plate	8.50 to 9.00

New York

NEW YORK, September 20, 1911.

Pig Iron.—A number of the inquiries mentioned last week are still before the trade and some are about to be closed. A Connecticut jobbing foundry has bought 3000 tons for the first half of 1912, but this is the only considerable contract on which deliveries run beyond this year. It appears to have gone to a central Pennsylvania furnace or to have been divided between that and a New York State furnace. For some time Pennsylvania competition with Buffalo furnaces for New England business has been sharp. Another Connecticut inquiry for 3000 tons has developed competition from Virginia. Furnaces there can reach New England water points at $2.75 and thus deliver No. 2 X iron at $15. In New Jersey some portion of an inquiry for 3000 to 6000 tons for this year has been closed this week by Eastern furnaces. Another New Jersey buyer is in the market for 750 tons and a Brooklyn melter for about 1000 tons. A sale of 500 tons for New Jersey delivery this year is reported. Prices have not changed in the past week. Buffalo furnaces find little canal boat tonnage available for the remainder of the season, and $1.00 to $2 would have to be paid as canal freight from Buffalo to New England water points. The amount of cheap iron for this year's Eastern delivery is thus rather circumscribed. It is developing that even under the present limitations of the foundry trade more iron is being wanted for 1911 delivery than had been thought likely. We quote Northern iron as follows at tidewater: No. 1 foundry, $15.50 to $15.75; No. 2 X, $15 to $15.25; No. 2 plain, $14.75 to $15. Southern iron is quoted at $15.25 to $15.50 for No. 1 foundry and at $14.75 to $15 for No. 2.

Finished Iron and Steel.—In structural lines the amount of business placed has not been as large as in the preceding week. Plain material to jobbers and to manufacturers in lines apart from fabricating for bridges and buildings appears to be held at 1.35c., Pittsburgh; but, as heretofore, on building contracts this price is cut considerably. The New York Central, in addition to contracts reported last week, has let some New York barge canal bridges, requiring nearly 2000 tons. It will receive bids Saturday on two additional areas of the New York terminal work—KS50 and KV50—probably upward of 1000 tons. The Baltimore & Ohio has let a contract to the Baltimore Bridge Company for 300 tons of pier work on Staten Island, and the Boston & Maine has let a bridge of 225 tons to the Boston Bridge Works. Pending railroad work includes 300 tons for a Scherzer rolling lift bridge over the Manasquam River for the New York & Long Branch Railroad and 300 tons for Erie transfer bridges. Bids are to go in this week on the redesigned Filene department store building at Boston, 5000 tons. In the past week the local plate trade has been very quiet. On steel bars the 1.20c., Pittsburgh, basis is now common in the East, whereas until early this month 1.25c. was generally secured on ordinary Eastern business. Quotations are continued as follows: Plain structural materials and plates, 1.51c. to 1.56c.; steel bars, 1.30c. to 1.41c.; bar iron, 1.30c. to 1.35c., all New York. Plain material and plates from store, New York, 1.80c. to 1.90c.

Cast Iron Pipe.—The New York Board of Water Supply, which has charge of the work now under way for bringing water from the Catskills to this city, will open bids September 26 from contractors for furnishing and laying 8900 tons of 40-in. pipe and 340 tons of special castings in Brooklyn. This is the first contract involving cast iron pipe to be placed by this body. Quite a number of private undertakings of good size are under quiet negotiation. More general inquiry is coming out. While carload lots of 6-in. pipe are to be had from some foundries at $21 to $22 per net ton, New York, others are refusing to take orders under $23.

Old Material.—Conditions appear to be growing worse from the standpoint of sellers of old material. Rejections of scrap bought at the prices prevailing a month or so ago are numerous. On low-priced scrap, such as cast borings and wrought turnings, those who are making reiections are declining to accept the material at less than an allowance of $2 per ton. The eastern Pennsylvania steel mills are purchasing no steel scrap, but an occasional sale is being made to a dealer who still has a contract to fill. Rolling mill scrap is absolutely neglected. Foundries are buying cast scrap in small quantities only, and even then their purchases are far apart. Dealers report practically no inquiry in the market. Quotations are largely nominal, as follows, per gross ton, New York and vicinity:

Old girder and T-rails for melting	$10.25 to $10.50
Heavy melting steel scrap	10.25 to 10.50
Relaying rails	20.50 to 21.50
Rerolling rails (nominal)	12.00 to 12.50
Standard hammered iron car axles	21.50 to 22.00
Old steel car axles	16.00 to 16.50
No. 1 railroad wrought	12.50 to 13.00
Wrought iron track scrap	11.00 to 11.50
No. 1 yard wrought, long	11.00 to 11.50
No. 1 yard wrought, short	10.00 to 10.50
Light iron	4.25 to 4.75
Cast borings	5.50 to 6.00
Wrought turnings	6.00 to 6.50
Wrought pipe	10.00 to 10.50
Old car wheels	10.50 to 11.00
No. 1 heavy cast, broken up	10.50 to 11.00
Stove plate	8.50 to 9.00
Locomotive grate bars	8.50 to 9.00
Malleable cast	10.50 to 11.00

Ferroalloys.—An important consumer is asking for 200 tons of ferrosilicon and sellers here are quoting $60, Pittsburgh, for delivery over the first half of next year. It is understood that in other markets a lower price is made. There are a few inquiries for ferromanganese which is quoted $38.25 to $38.50 for delivery over the first half of next year.

THE IRON AND METAL MARKETS

Latest Pittsburgh News.

PITTSBURGH, PA., September 20, 1911.—(*By Telegraph.*)

The American Bridge Company has taken a contract for 7500 tons of structural steel for new buildings to house the open-hearth steel plant and new finishing mills of the Youngstown Sheet & Tube Company, Youngstown, Ohio, and has also taken a contract for 2200 tons of steel for a new railroad bridge for the Monongahela Railroad Company across the Monongahela River at New Geneva, Pa.

No. 1 furnace of the Shenango Furnace Company, Sharpsville, Pa., which has been out of blast for several months, has been rebuilt and enlarged and will be started on Thursday, September 21. It will be blown in on Bessemer iron, but in a short time will be put on basic and will have a daily capacity of 350 to 400 tons.

A leading local steel interest has just closed for the purchase of 6000 tons of ferromanganese for delivery over the first half of next year, paying $37, Baltimore, for first quarter and about $38 for second quarter. This is one of the largest purchases made in this district for some time, and the prices paid indicate a stronger market. Prices on ferrosilicon are very firm and 50 per cent. is being held at $58, Pittsburgh.

Metal Market

NEW YORK, September 20, 1911.

The Week's Prices

Cents Per Pound for Early Delivery.

	Copper, New York.			—Lead—		—Spelter—	
	Lake.	Electro-lytic.	Tin. New York.	New York.	St. Louis.	New York.	St. Louis.
Sept 14	12.75	12.37½	39.75	4.50	4.37½	6.05	5.90
15	12.75	12.37½	40.75	4.50	4.37½	6.05	5.90
16	12.75	12.37½	....	4.50	4.35	6.05	5.90
18	12.60	12.37½	39.55	4.50	4.35	6.05	5.90
19	12.60	12.37½	38.55	4.50	4.35	6.05	5.90
20	12.60	12.37½	38.87½	4.50	4.35	6.05	5.90

Pig tin has sharply declined, being more plentiful. Copper is very weak. Lead is lower in St. Louis. Spelter is the only nonferrous metal holding its own.

Copper.—So little is being done in copper that quotations are largely nominal. A few lots of electrolytic were sold during the week at 12.37½c., cash, New York, for delivery to brass manufacturers in the Naugatuck Valley. Other large consumers are taking no interest in the market and sellers of Lake have reduced their price about 10 points, in order to induce trade, without any noticeable effect. Declines in other metal prices are influencing consumers, who predict that copper will recede further. Exports of copper continue very good and so far this month 15,474 tons have been shipped from American ports. The London market holds fairly firm and spot copper this morning was £54 18s. 9d. and futures £55 13s. 9d.

Pig Tin.—For the first time in several weeks consumers seem to be having their own way to a large extent in the pig tin market. Early in the week things were very quiet, but following several successive sharp declines in London there was considerable price cutting here which brought out a small amount of business. Several dealers who were somewhat overloaded as a result of buying freely of the heavy arrivals of last week developed a keen desire to get out and consumers in urgent need of stocks reaped the benefit. There was a sharp slump in London on Thursday, and on Friday the market recovered as the result of heavy buying on the part of one London house. On the following day, however, the stringency of the money market there forced the bull element among the speculators to dispose of some of their holdings. The news that London speculators were parting with their tin had an immediate effect on this market and on Monday the price declined more than 1c. per pound. To-day the market was weak and this morning pig tin was offered in the New York market at 38.87½c., as against last week's price of 39.70c. The London market was quoted at £177 7s. 6d. for spot and £173 15s. for futures, which is about £5 below last week's quotations. Heavy arrivals of tin continue to come in. So far this month 4185 tons have been received and there are 1814 tons afloat, all of which is expected to reach here before the end of the month. From all appearances the month's arrivals will be record breaking.

Tin Plates.—The market in foreign tin plates has declined to 13s. 7½d. at Swansea, Wales. It is stated that the recession has been caused by the invasion of the foreign tin plate market by American manufacturers. Important buyers of tin plate who as a rule purchase foreign material for re-export have made contracts with American producers with the result that very little foreign tin plate is coming into this country. Two large sales were noted on the Pacific coast where American manufacturers took contracts in competition with foreigners who were trying to sell for re-export. The domestic market is quiet. The usual quotation is $3.84 for 100-lb. coke plates.

Lead.—Lead has declined in St. Louis to 4.35c., which puts the Western price down to the equivalent of that demanded in New York. This is the first time in many weeks that such has been the case, and now Western dealers are competing for New York business with the leading producer. The New York price remains at 4.50c. and there is sharp competition for what little business there is in sight.

Spelter.—Quotations on spelter are well maintained, but although inquiries are good consumers are holding off in the expectation of a lower price. They point to recent declines in the lead market as an argument in favor of cheaper spelter. Sellers are fairly firm in their intention to keep the price up to 5.90c., St. Louis, and 6.05c., New York, but several instances of price cutting have come to light.

Antimony.—A reduction has been made in the price of Cookson's, which is now quoted at 8.25c. Hallett's is still firm at 7.75c. and Chinese and Hungarian grades are weaker at 7.20c. The demand is light.

Old Metals.—The market continues dull. Dealers' selling prices, New York, are somewhat lower, as follows:

Copper, heavy cut and crucible	$11.75 to $12.00
Copper, heavy and wire	11⅛ to 11.50
Copper, light and bottoms	10.50 to 10.75
Brass, heavy	8.00 to 8.25
Brass, light	6.75 to 7.00
Heavy machine composition	10.50 to 10.75
Composition turnings	8.50 to 8.75
Clean brass turnings	8.00 to 8.25
Lead, heavy	4.20 to 4.25
Lead, tea	3.95 to 4.00
Zinc, scrap	4.25 to 4.30

Chicago

SEPTEMBER 18.—Although the metal market of the week has been generally dull values have held quite steady and quotations are changed but little. We quote at Chicago: Casting copper, 12.62½c.; Lake, 12⅞c., in carloads, for prompt shipment; small lots, ¼c. to ⅜c. higher; pig tin, carloads, 42c.; small lots, 44c.; lead, desilverized, 4.45c. to 4.50c. for 50-ton lots; corroding, 4.72½c. to 4.75c. for 50-ton lots; in carloads, 2½c. per 100 lb. higher; spelter, 5.95c. to 6.00c.; Cookson's antimony, 9¼c., and other grades, 8¼ c. to 8¾c., in small lots: sheet zinc is $8, f.o.b. La Salle, in carloads of 600-lb. casks. On old metals we quote for less than carload lots: Copper wire, crucible shapes, 10¾c.; copper bottoms, 9½c.; copper clips, 10¼c.; red brass, 9½c.; yellow brass, 7½c.; lead pipe, 4c.; zinc, 4¼c.; pewter, No. 1, 26c.; tinfoil, 32c.; block tin pipe, 36c.

Iron and Industrial Stocks

NEW YORK, September 20, 1911.

Liquidation was again in evidence, continuing several days, but on Friday the market hardened and some advance was made from the low point which had been reached. During this period of decline some stocks made new low records for the year. The immediate cause of these extreme declines was the circulation of rumors that the United States Department of Justice was about to institute proceedings for the dissolution of prominent industrial companies. The market again declined on Tuesday of this week. The range of prices on active iron and industrial stocks from Wednesday of last week to Tuesday of this week was as follows:

Allis-Chalm., com	6¼- 6½	Pressed Steel, pref.	94
Allis-Chalm., pref	17¾- 18	Railway Spring, com.	26½- 29¼
Beth. Steel, com	27½- 29¼	Railway Spring, pref.	98 - 98¼
Beth. Steel, pref	58½- 61⅜	Republic, com	23 - 24⅝
Can. Car, com	9½- 10¼	Republic, pref.	87⅞- 89⅞
Can, pref	83 - 85½	Sloss, com	35½- 37
Car & Fdry., com	45⅝- 47⅝	Pipe, com	12¾- 13
Car & Fdry., pref	115 -116½	Pipe, pref	45 - 45⅞
Steel Foundries	26 - 28	U. S. Steel, com	65 - 68⅝
Colorado Fuel	27 - 28	U. S. Steel, pref.	113⅜-115
General Electric	148 -151	Westinghouse Elec.	60 - 64
Gr. N. Ore Cert.	45¼- 46¾	Am. Ship, com	54½
Int. Harv., com	100¾-105¾	Chic. Pneu. Tool	42 - 45⅜
Int. Harv., pref	118 -118½	Cambria Steel	42½- 43⅜
Int. Pump, com	29 - 31⅜	Lake Sup. Corp.	21½- 22¾
Int. Pump, pref	83¼- 85	Pa. Steel, pref.	106
Locomotive, com	34 - 35	Crucible Steel, com.	10½- 11
Locomotive, pref.	106 -106½	Crucible Steel, pref.	79½- 81

Dividends Declared

The Western Electric Company, regular quarterly, $2 per share, payable September 30.

The Yale & Towne Mfg. Company, regular quarterly, 1½ per cent. and 1 per cent. extra, payable October 2.

The United Shoe Machinery Company, regular quarterly, 1¼ per cent. on the preferred stock and 2 per cent. on the common stock, payable October 5.

The General Motors Company, regular semi-annual, 3½ per cent. on the preferred stock, payable October 2.

The Westinghouse Air Brake Company, regular quarterly, 2½ per cent., extra dividend 1½ per cent. and special dividend 1 per cent., payable October 5.

The Lake Superior Corporation will pay 2½ per cent. on its income 5s on presentation at First National Bank, Philadelphia, on and after October 1.

The Union Switch & Signal Company, regular quarterly, 3 per cent. on the preferred and common stocks, payable October 10.

The American Iron & Steel Mfg. Company, regular quarterly, 1¼ per cent. on both preferred and common stocks, payable October 2.

The American Mfg. Company, regular quarterly 1½ per cent., payable September 30.

The International Harvester Company, regular quarterly, 1¼ per cent. on the common stock, payable October 14.

Banquet of American Ingot Iron Salesmen

Coincident with the starting up of its new East Side Works, the American Rolling Mill Company, Middletown, Ohio, tendered its entire sales and operating departments a banquet on the evening of September 1, following which addresses were made by members of the executive staff and heads of departments. The early history of the company, its remarkable growth during the past decade, and its firm stand for quality and square dealing were outlined in a most admirable manner by the president. The importance of co-operation between the sales and operating departments, as the best and only means of maintaining these standards, and the resultant benefit to all concerned, formed the main topic of discourse, and brought out many excellent talks. The occasion also served as a reception to the younger employees in the respective departments, who were given an insight into the company's broad principles and generous policies, as well as its comprehensive plans for future development.

The American Rolling Mill Company manufactures roofing, siding, conductor and eaves-trough from American ingot iron, a chemically pure, homogeneous iron of guaranteed analysis. Its great durability under accelerated corrosion and actual service tests has become the subject of favorable comment throughout this country, as well as abroad. The demand for this material made necessary the erection of a new $4,000,000 plant, which makes this company practically the largest independent exclusive manufacturer of sheets in the United States. Its present position in the iron and steel industry can be largely attributed to an unceasing watchfulness of the character of its products, fair treatment of its patrons, and a spirit of loyalty and co-operation infused into every man in the organization.

Negotiations are under way for the purchase of the Inter-Ocean Steel Company, Chicago, Ill., by the Railway Steel Spring Company, 50 Church street, New York. At a meeting of the stockholders of the first-named company, held in Chicago September 19, a proposition to sell the property was ratified. It is understood that it is proposed by the Railway Steel Spring Company to issue $3,500,000 bonds to pay for the Inter-Ocean plant, which was only completed about a year ago. The Inter-Ocean Company controls patents on a special process of manufacturing car wheels and tires. Its outstanding capital consists of $2,500,000 stock and $478,000 in 6 per cent. convertible notes. It is understood to have been successful from the start.

W. J. Holliday & Co., iron, steel and heavy hardware merchants, 326 to 390 West Georgia street, Indianapolis, Ind., have acquired a tract of about seven acres and will immediately erect steel frame buildings to accommodate their stock of structural steel and plates. The buildings will be equipped with electric cranes for handling material and machines will be installed for shearing, punching, etc. On the completion of these buildings the firm will add very largely to its stock of structural material and plates.

American Engineers for the New Steel Works in India

Arthur E. Woolsey and Lansing W. Hoyt, who have been connected with the South works of the Illinois Steel Company, South Chicago, Ill., sailed this week for India to take important positions with the Tata Iron & Steel Company, Sakchi, Bengal, whose new steel plant will soon be put in operation. Mr. Woolsey will become general superintendent and Mr. Hoyt assistant general superintendent. O. O. Laudig, also formerly of the South Chicago works and more recently of Sault Ste. Marie, Ont., will sail soon to become superintendent of blast furnaces at the same plant.

Reference has been made in *The Iron Age* from time to time to the development of the plans of the Tata Company, for which Charles T. Perin, New York City, has been consulting engineer. The first of the two blast furnaces will be blown in early in October. The first of the four open hearth furnaces will be started soon after. The coke ovens, which are of the Koppe non-recovery type, are already in operation. The company has mined 200,000 tons of iron ore and has 60,000 tons of this in the stock bins at its blast furnaces. The cost of a 62 per cent. ore, much of it Bessemer, laid down alongside furnace, is but 46c. a ton. Mining is extremely cheap and the freight rate on a new line of railroad built from the company's iron mines to the steel plant is three mills per ton per mile. H. E. Judd, who has been superintendent of iron mining operations for the Tata Company, will arrive in this country from India next month. He was formerly with the Keokee Coal & Coke Company in Virginia. The general manager of the Sakchi plant is Robert G. Wells, who was at one time connected with the Youngstown Sheet & Tube Company, Youngstown, Ohio. The Government of India has guaranteed the new plant orders for 100,000 tons of rails to be taken at the rate of 20,000 tons a year, the price to be equal to that of English rails laid down in India. The output of the plant will be about 120,000 tons of finished material a year and it is expected a market will be found for all of it in India, the iron and steel imports at present being at the rate of about 600,000 tons a year.

Connellsville Coke Producers Demand Lower Freight Rates

The coke producers of the Connellsville region held a meeting September 9 at the Summit Hotel, Uniontown, Pa., in the interest of securing equitable freight rates. Howard D. Mannington of Columbus, Ohio, was the principal speaker, and addresses were also made by E. H. Reppert, L. W. Fogg, T. S. Lackey, W. A. Stone, and O. W. Kennedy, all of Uniontown. It is proposed to wage a vigorous fight before the Interstate Commerce Commission to secure an adjustment of coke freight rates to correspond with the rates made from other coke producing regions to the various markets. The Connellsville producers are very much in earnest, and the meeting was characterized by forcible expressions of opinion. The following were present in addition to those named:

W. F. Soisson, W. W. Smith, Rockwell Marietta, Connellsville; J. P. Brennen, W. L. Kelley, Scottdale; J. U. Kuhn, W. A. Wilson, L. E. Walters, Greensburg; W. G. Rock, Pittsburgh; R. L. Bailey, Carmichaels; M J. Garlow, W. H. Morris, J. M. Morris, Waynesburg; W. L. Graham, Masontown; John H. Moredock, Joseph Moredock, George B. Moredock, Jefferson; John A. Keys, Clarksville; Hamilton Newcomer, H. A. Davis, Brownsville; C. M. Lingle, Indiana; W. H. E. Royce, Republic; F. W. Forsythe, California; John Shultz, Fairbanks; John Husband, Mount Pleasant; L. H. Brownfield, Thomas B. Semans, R. E. Umbel, W. W. Parshall, John H. Walker, Samuel Stern, McClelland Leonard, Geo. H. Bortz, Geo. Whyel, A. Plumer Austin, O. P. Stone, A. Gaddis, F. C. Keighley, J. P. Topham, Guy B. Gilmore, J. Edgar Hustead, Harry Whyel, A. L. Moser, S. W. Henshaw, R. W. Gilmore, James R. Cray, C. J. McCormick, J. Ellsworth Hess, Walter Hess, W. M. Thompson, A. C. Sherrard, Francis Rocks and son, Geo. F. Titlow, D. B. Stauft, W. B. Beeson, F. M. Semans, Jr., I. W. Semans, J. W. Abraham, John T. Robinson, Uniontown; R. L. Martin, Pittsburgh and Ernest H. Rowe, secretary of the Coke Producers' Association.

The British Iron Trade

Reviews of the British iron and steel trade point out that conditions differ in the pig iron and finished material markets. The steel works are busy, and, according to the Iron and Coal Trades Review of London, there has been a recovery from the setback caused by the railroad strike disturbances. Demand is well maintained and there is an improved tone. Higher prices are being asked for galvanized sheets, particularly for forward contracts. Business in bars holds up well. The competition from foreign makers of semi-finished steel is spoken of as less keen, though this may be due to transportation difficulties. The general minimum for Bessemer sheet bars and billets is now £5. The plate mills have well filled order books, and specifications are coming in satisfactorily. The rail mills are fairly well employed, and recently Bolckow, Vaughan & Co. and the North Eastern Steel Company divided an order from Victoria for 22,000 tons. British newspapers complain, however, of the placing of an order with the German Steel Works Union last month for 27,000 tons of rails for the Union of South Africa. Concerning this and the loss of some other colonial orders for rails The Ironmonger says: "As we have often pointed out, the whole secret of British colonial orders for rails being taken by foreign mills is that the British manufacturers have tied themselves up in a combine as a result of which this country is unquestionably a loser in the long run." British rail manufacturers recently held a conference in London and it is now stated that an international meeting of rail interests will soon be held at Munich at which British, German, French and Belgian rail mills will be represented.

The British pig iron market is very dull, and the effect of the railroad strike is still felt. The Cleveland district producers are said to have lost fully a week's make during the strike, or about 45,000 tons. Statistics of stocks in Connal's stores show a decrease in August for the first time since June, 1908. On August 31 the total was 595,791 tons, or 4718 tons less than at the end of July. The increase in the past three years has been about 550,000 tons. Before the railroad strike the price of Cleveland warrants had been rising steadily, and 47s. 7½d. was reached. The decline up to September 7 was 11½d., 46s. 8d. being touched in the first week in September. Hematite iron has not responded to the activity in steel. This is attributed to the very plentiful supply of scrap steel. The latter can be bought at 45s. to 50s. a ton, whereas hematite pig iron stands at 61s. per ton for mixed numbers.

More Factories Wanted in Pittsburgh

On a recommendation submitted by the Committee on Trade and Commerce of the Chamber of Commerce, Pittsburgh, F. R. Babcock, president of that organization, has appointed 12 leading business men to constitute the Industrial Development Commission, the main object of which is to secure new manufacturing plants for Pittsburgh and to further the manufacturing interests of the city in any way possible. The commissioners appointed are as follows: Chairman, H. P. Bope, vice-president Carnegie Steel Company; vice-chairman, F. F. Nicola, president Schenley Farms Company; treasurer, W. H. Donner, Union Improvement Company; Robert Garland, president Garland Nut & Rivet Company; J. M. Schoonmaker, vice-president Pittsburgh & Lake Erie Railroad; Morris Baer, of Kaufmann Brothers; A. M. Schoyer, general superintendent Pennsylvania Lines West; D. P. Black, president Real Estate Trust Company; James C. Chaplin, vice-president Colonial Trust Company; W. C. Coffin, Jones & Laughlin Steel Company; James F. Keenan, of Haugh & Keenan; Robert Finney, general agent Baltimore & Ohio Railroad.

The S. G. Taylor Chain Company, 315 to 319 West Indiana street, Chicago, is now running full force at its new plant at Hammond, Ind., on which construction was started early in the year and to which were moved in March and June, respectively, the plants formerly at Maxwell, Ind., and at Chicago. It is making a complete line of welded chain, notably its Taylor-Mesaba steam shovel chain. Advantages are obtained by operating one modern and fully equipped factory.

The Board of Trade of Welland, Ontario, has closed negotiations with the following companies for the necessary ground on which to erect manufacturing plants: John Deere Plow Company (Deere & Co., Moline, Ill.); Chemical Laboratories, Ltd., Midland, Mich.; United Motors, Ltd., Detroit, Mich.; Bemis Brothers Bag Company, Boston. The Canadian Automatic Transportation Company, which builds electric trucks for warehouse service, has its new plant at Welland nearly ready. The Page-Hersey Iron, Tube & Lead Company's new plant, which is nearing completion, will employ an additional force of about 300 men. The Canadian Billings & Spencer Company, also of Midland, has built an addition to its plant and Quality Beds, Ltd., has completed a new factory building. The Canadian Steel Foundries, Ltd., reports its full capacity occupied and the implement works in the same city are being operated overtime.

Two large additions to the plant of the Thomas B. Jeffery Company, manufacturer of Rambler motor cars, at Kenosha, Wis., are now being made. An extension of the drop forge shop, 64 x 106 ft., is in course of erection, while another building, 257 x 257 ft., is being added to the finished car department, making a total of 66,029 sq. ft. of floor space for these enlargements. Ninety-six per cent. of all Rambler parts are now made in the Kenosha plant. The addition to the drop-forge shop is to provide for the making of new forgings for the 1912 output. The factory is being enlarged to take care of the extension of facilities for the making of parts, rather than for an increased output, as the Rambler output has for the past three years been limited to 2500 cars.

The Destructor Company (Power Specialty Company, manager), 111 Broadway, New York, states that the Heenan high temperature destructor which it built for the city of Montgomery has been in operation for several months, fulfilling all guarantees and giving highly satisfactory results, and that the following Canadian cities have placed contracts for such destructors: Calgary, plant of 75 tons capacity per 24 hours; Moose Jaw, plant of 55 tons capacity per 24 hours. Both these plants have been so arranged that they can be duplicated when the necessity for extension arises.

The Superior Charcoal Iron Company, Grand Rapids, Mich., states that the item relating to that company published in *The Iron Age* of September 7 was erroneous in the assertion that all the company's blast furnaces are now making the Superior Special brand of charcoal pig iron. The Superior Special brand is made only at the Pioneer, Antrim and Marquette furnaces, all the company's other furnaces making regular charcoal iron only. The additional statement is made that the company is getting most satisfactory results from the use of this high grade of iron.

The Publicity Industrial Bureau of Ottawa, Canada, states that building construction in the city and outlying districts is now being carried out on a larger scale than ever before in the history of the city. The districts immediately outside the city limits are building both industrially and for residential purposes as rapidly as material and labor can be secured to carry on the work. That every trade in the city is in a most healthful condition is emphasized in the great demand for labor in the "want" columns of the daily papers, the demand including sheet metal workers, carpenters, electricians and other skilled mechanics as well as ordinary labor of all classes. Building permits in the city proper for 1910 amounted to $7,577,040. Much of this work is just being completed.

The Millersburg Fifth Wheel Company, Millersburg, Pa., in addition to making a complete line of clip fifth wheels and iron rings, has taken up the manufacture of special rings used in the construction of automobile wheels; also of rings used in machine shops, foundries, boiler works and brass and coppersmithing works. It has just installed in its factory a new 100 h.p. boiler.

The Knoxville Iron Company, Knoxville, Tenn., is now rolling steel bars of all sizes. This is a new departure for the company, which heretofore has been an iron manufacturer exclusively. It is now prepared to furnish practically all sizes in steel that it has been making in bar iron.

Personal

The office of the Electric Properties Company has been removed from 165 Broadway to the Maritime Building, 10 Bridge street, New York, directly opposite the south front of the Custom House, at the foot of Broadway. John F. Wallace, president of the company as well as of Westinghouse, Church, Kerr & Co., which has had offices for some time in the Maritime Building, requests that all business and personal communications be addressed to him at 10 Bridge street.

Albert E. White, at present in charge of the iron ore dressing experiments being carried on by the Jones & Laughlin Steel Company, has resigned in order to give the courses in the metallurgy of iron and steel and metallography which are offered at the University of Michigan. While connected with the university it is his intention to devote a portion of his spare time to consultation work, particularly with reference to those matters dealing with the microstructure of steel and ore dressing as applied to iron ores.

John Sargent, president of Domhoff, Joyce & Co., Cincinnati, Ohio, has returned from an extended vacation trip spent in the East.

Theron Crane, of the Eastern Steel Company, Pottsville, Pa., was among the arrivals in New York from Europe September 17.

Charles Booth, vice-president of the Chicago Pneumatic Tool Company, Chicago, has tendered his resignation to the board of directors to be acted upon at the September meeting.

James A. Lister has associated himself with the Hildreth Jones Company, Chicago, and will be the manager of the bridge, steel and cement departments of that company. He was formerly in charge of the Chicago branch of the Pittsburgh Testing Laboratory.

G. W. Wilson, who has been connected with the Iron City Coal & Coke Company, Pittsburgh, Pa., for the past eight years, is now associated with J. K. Dimmick & Co., Philadelphia, Pa., in the coal, coke and pig iron business.

Willis L. King, vice-president of the Jones & Laughlin Steel Company, Pittsburgh, has returned from Europe. Mr. King was one of the representatives of the United States at the international steel conference held at Brussels in July.

C. B. Nash, advertising manager of the Standard Sanitary Mfg. Company, Pittsburgh, is conducting a students' advertising club at the Pittsburgh Y. M. C. A.

Judge Elbert H. Gary, chairman of the United States Steel Corporation, arrived in New York from Europe September 17.

Nathan A. Taylor, of the N & G. Taylor Company, Philadelphia, has returned from a European trip, landing in New York September 17.

Powell Evans, of the Merchant & Evans Company, Philadelphia, is again at home, having arrived in New York September 17 from a sojourn in Europe.

The Pittsburgh Foundrymen's Association.—On the evening of September 15 the Pittsburgh Foundrymen's Association gave a smoker on the roof garden of the Hotel Lincoln, Pittsburgh. A dinner was served, after which H. A. McConnaughey related his experience of two years among the Slavic and Magyar people, who make up so much of the labor in the foundries all over the United States. The lecture was extremely interesting and was illustrated with lantern slides. The next regular meeting of the association will be held on the evening of October 2, inaugurating at that time the fall and winter season.

A reduction in wages, amounting to about 10 per cent., has been posted by the Alan Wood Iron & Steel Company and the J. Wood Brothers Company, sheet manufacturers, Conshohocken, Pa. The reduction becomes effective October 1 and brings the wage rate back to that in force just prior to April, 1910.

Obituary

JOHN EATON, president of the Oil Well Supply Company, Pittsburgh, died September 16 of heart failure at Atlantic City, aged 71 years. He was born in Esopus, N. Y. His education was obtained in the public schools of Brooklyn, night school and a commercial school. When 20 years of age he entered the employ of Joseph Nason & Co., New York, manufacturers of brass and iron fittings. In 1867 he started in business for himself, and in 1869, with E. H. Cole, formed the firm of Eaton & Cole, succeeded by the firm of Eaton, Cole & Burnham. In 1878 the Oil Well Supply Company was formed by a consolidation of a number of oil well supply concerns, including the supply department of Eaton, Cole & Burnham. Mr. Eaton had been president of the company for years and also was president of the Continental Tube Company when that concern became a part of the National Tube Company and he became one of the directors of the consolidated company. He remained on the board until the absorption of the company by the United States Steel Corporation. He also was interested in a number of Pittsburgh's financial institutions. He leaves two daughters. He was a member of the Duquesne, Union, Civic and Country clubs of Pittsburgh, of the Engineers' Club of New York and the Pennsylvania Society of the Sons of the American Revolution.

JOHN SOUTHER, inventor of the steam shovel and other devices, and builder of the first locomotive to take a train across the continent, died September 12 at Newton, Mass., aged 95 years. He was born in South Boston, served his apprenticeship in a local foundry and established the Globe Locomotive Works, continuing in active business for 60 years, retiring in 1881. In 1849 Mr. Souther sent around Cape Horn the first locomotive and steam shovel for the railroad from Sacramento to Fulton, a distance of 35 miles. About 18 years later, when the Union Pacific and the Central Pacific Railroad tracks were completed he sent two locomotives around Cape Horn, and they took the first train through from the Pacific. During the civil war the government had the exclusive use of Mr. Souther's works, and the machinery for 16 war vessels was built at his plant. In 1851 he instituted a 10-hour schedule for his employees, being the first manufacturer in the country to do so. For more than 25 years he manufactured nearly all the sugar machinery that was used in Cuba. He leaves a son and a daughter.

CHARLES HEGEWALD, head of the C. Hegewald Company, New Albany, Ind., died last week, aged 80 years. He had not been actively engaged in business, owing to failing health, for two years. He had operated a foundry and machine shop under the name given above since 1873, although it was not incorporated until 1889. The company turned out a great many boilers for steamboats when the Ohio River traffic was at its hight.

The newly equipped and excellent structural steel fabricating plant of Geo. W. Jackson, Inc., whose affairs have been in the hands of a creditors' committee, has been sold to the Vierling Steel Works. The Vierling Steel Works is successor to Vierling & McDowell, for many years one of the leading fabricating concerns of Chicago, with a plant at Twenty-third street and Stewart avenue. The present plant of this company has been extended to a point where it is now restricted from further expansion at the present location. The plant obtained from Geo. W. Jackson, Inc., is located on the North Branch of the Chicago River and on the Chicago & Northwestern Railway, Chicago. Its equipment is adapted to a wide range of fabricating work, and its facilities will afford to the new owner a fabricating capacity in Chicago second only to that of the American Bridge Company

The Norwegian steamship Themis, under charter by the Nova Scotia Steel & Coal Company, discharged during the month of August three cargoes of Wabana iron ore at Philadelphia, Pa., aggregating 37,600 tons. Under ordinary conditions the voyage from Newfoundland to Philadelphia and return requires about two weeks, but this steamship discharged its cargoes at Philadelphia on August 1, 15 and 31, resulting in an unusually heavy total for a single month. The vessel has a normal carrying capacity of 12,600 tons of ore.

Pittsburgh and Vicinity Business Notes

Hubbard & Co., Pittsburgh, manufacturers of shovels, spades, scoops and railroad track tools, are building an addition to their plant 100 x 200 ft. The building is to be of concrete, steel and brick construction. It will contain a new 25-ton electric traveling crane, bulldozers, punches and shears, drop hammers, roll threaders and motors. The building will be used as an addition to the bolt and nut department and for the manufacture of other lines, such as drop forgings and steel towers for the carrying of high transmission high tension electric wires. A new 35-ft. galvanizing kettle is also being added. The addition will be ready for operation in December.

The Mesta Machine Company, West Homestead, Pa., has received a contract for the building of a large metal mixer for the Pittsburgh Crucible Steel Company at Midland, Pa.

W. N. Kratzer & Co., Pittsburgh, builders of structural steel and iron work, report recent contracts booked as follows: Boiler shop and power house, Hagerstown, Md.; coaling stations for the Baltimore & Ohio Railroad at Rollsburg, W. Va., and La Paz Junction, Ind., and for the Delaware, Lackawanna & Western at Binghamton, N. Y.; St. Mary's Roman Catholic Church, Uniontown, Pa., roof trusses, roof girders, etc.; W H. Park residence, East End, Pittsburgh, steel work; office and warehouse for the Pennsylvania Coal & Coke Company, Cresson, Pa.; First National Bank, Masontown, Pa.; water tank for the American Sheet & Tin Plate Company, New Kensington, Pa.; steel work for the C. W. Hartman building, East End, Pittsburgh, and steel work for a club house for the B. P. O. E.

The Beler Water Heater Company, Pittsburgh, has been reorganized by the election of James Hay, president; John Ellis, vice-president and W. J. Langenheim, secretary and treasurer. The new president was until recently president of the Ruud Mfg. Company, Pittsburgh. Mr. Ellis and Mr. Langenheim have also until recently been connected with the Ruud Company. It is the intention of the new board of directors to increase the company's capital stock to $250,000 and secure a larger factory until the lease expires on the factory building at Twenty-ninth and Smallman streets, owned by Mr. Hay New branch sales offices have been established in the principal cities.

It is the intention of the Youngstown Sheet & Tube Company, Youngstown, Ohio, to build at once an open-hearth steel plant of six 100-ton furnaces and the necessary blooming mill for rolling the output and it will also build a light plate mill for rolling plates from Nos. 8 to 16 gauge. It is the intention of the company to build additional finishing capacity, but definite plans have not yet been made.

The Allegheny Steel Company, Pittsburgh, Pa., works at Brackenridge, Pa., manufacturer of plates, sheets, boiler tubes and specialties, has opened an office in room 322 Ford Building, Detroit, Mich., in charge of E. R. Perkins, who has been connected with the company for eight years.

The Sebring Water Company, Sebring, Ohio, has employed Chester & Fleming, engineers, Pittsburgh, to prepare plans and specifications for the installation of additional pumping machinery.

The Keystone Bronze Company, Pittsburgh, has removed its general office from Thirty-ninth street to the Farmers' Bank Building, thus securing a central location from which it can handle its business between its three plants and its customers to better advantage. John S. Craig is secretary and treasurer of the company.

The Russell Machine Company, Twenty-eighth street and Allegheny Valley Railroad, Pittsburgh, Pa., has found its business increasing to such an extent that more room is required. It is therefore having plans made for a steel building in addition to its present warehouse, in which will be installed a 15-ton traveling crane. The company's principal business is dealing in second-hand machinery and other equipment, all material being thoroughly refitted in its shops before delivering.

The Braeburn Steel Company, Braeburn, Pa., manufacturer of crucible tool steels and special shapes, has established a branch sales agency at Rochester, N. Y., in charge of Joseph N. King. This office will look after all New York territory except New York City proper.

The Pittsburgh Steel Company, Frick Building, Pittsburgh, works at Monessen and Glassport, Pa., manufacturer of wire rods, wire nails, wire, hoops and bands, has opened an office at Kansas City, Mo., in charge of John A. Graff, formerly connected with the sales department at the Pittsburgh office.

The Hudson Export & Import Company, 91-93 Wall street, New York, announces that it is now sole agent in the United States for RBF ball bearings.

President Farrell on the Steel Corporation's Plans for Duluth

In connection with the recent trip of President James A. Farrell and other officers of the United States Steel Corporation and the presidents of its subsidiaries to Duluth the works of the Minnesota Steel Company, the corporation's Duluth subsidiary, were inspected. At a luncheon at the Commercial Club at Duluth a number of leading Duluth business men were present and an address was made by Mayor Cullum. In responding President Farrell said in part:

"The Steel Corporation has already expended large sums in the development of its mining properties and the extension of its transportation facilities, which work will be pushed until the best results possible have been obtained. It is the aim of the corporation to build a steel plant here complete in every respect for the manufacture of every class of steel product for which a market can be found.

"The estimated expenditures for the Minnesota Steel Company in Duluth, exclusive of land values, administrative expenses, personal injury and taxes, is $10,170,000. This does not contemplate a cement plant, which will undoubtedly be built and will cost in the neighborhood of $1,250,000, so that you will see that the expenditures on the steel plant alone for manufacturing purposes will reach a total of between $10,000,000 and $12,000,000. I would figure in round numbers that the corporation and subsidiary companies will eventually have invested on account of the Minnesota Steel Company and the Interstate Transfer and Spirit Lake Transfer Railroads $16,000,000 or $17,000,000. The contracts for a considerable part of this equipment have already been made. Those for the blast furnaces and stoves and accessories amounting to $2,300,000 were placed within the past month and the engineers are already at work. The Interstate and Spirit Lake Transfer Railroad will connect the steel plant and other manufacturing plants on this site with all railroads entering Duluth and all future docks constructed on St. Louis Bay.

"A large enterprise such as the steel plant now being built here requires much patient study of conditions as to markets and their requirements; methods of production and manufacture; character of plant and future development. There are many other details that must receive the most thoughtful consideration in order that success may crown our efforts.

"As practical men of affairs you will agree that closed factories and idle workmen spell misery and disaster to any community. We should plan our work so that progress will be steady until the maximum of efficiency has been attained. There should be no retrogression, and, with reasonable co-operation and encouragement from you, we feel confident that the largest measure of success will be achieved with consequent benefit and prosperity to this great community."

The Taft-Peirce Mfg. Company, Woonsocket, R. I., is constructing a fourth story to its main building, about 60 x 300 ft., in which it proposes to locate its engineering department, factory and general offices. No additional machine tool equipment will be required at present. The company conducts a business as mechanical engineer and machine designing and contract manufacture of light machinery, tools and metal specialties.

The Thomas Laughlin Company, manufacturer of marine hardware, Portland, Maine, recently built a large machine shop, which it now has in complete running order. This company reports its business far ahead of the average at this time of the year.

American Opportunity in Europe

Under the above title Capt. Godfrey L. Carden, well known to many of our readers, contributes an article to Harper's Weekly, which is in part as follows:

The important difference between manufacturing work abroad and at home lies in the ability of the American manufacturer to specialize. Under existing fiscal conditions our manufacturers have enjoyed the benefits of an enormous territory in which foreign competition has been practically eliminated. The result has been that many of them have been able to specialize; in other words, to confine their efforts to the manufacture of a very limited number of designs of special machinery; and in some instances American manufacturers have centered their efforts, as in the case of machine tools, on one design only, and have further restricted these efforts to even one size of a particular design.

Under such conditions, it has been possible for individual works to concentrate energy on the development of a special type of machine or machinery, and it is not to be wondered at that the superlative, seemingly, has been attained in some instances in the building of special machines. As the antithesis, there is a prominent French machinery house which undertakes to build 152 different designs of machinery for making machinery. The head of this establishment declared to the writer that the reason for handling so many machines was because of the limited territory available, adding that perhaps he, too, could specialize as do the Americans if his own country was practically restricted to French manufacturers. As in the case of this French house, so it is in general throughout Europe. Manufacturing works must expand their lines of output in order to be assured of sufficient business to keep the shops going. All this means the maintaining of great quantities of patterns and with the certainty of periods of idleness for much of this equipment. Here at once arises an increase in cost of manufacture. In other words, specializing, when accompanied by good executive control, generally means production at minimum cost and rapid building; and the firm which is not specializing may generally be classed as a follower.

Italy, France, and Austria-Hungary are prominent markets for machinery. There is activity throughout the whole of western Europe, but the developments going ahead in the countries mentioned are particularly noticeable. Russia must not be overlooked; but Russia to-day offers more in the line of future possibilities than immediate opportunity. In northern Italy, France, Bohemia, and Hungary will be found the best available markets to-day for American machinery; that is to say, markets which are the most readily accessible and where Americans will probably find a predilection in their favor.

The enormous demand in Italy to-day for machinery of all descriptions is in consequence of the tremendous development now going forward in the north of Italy. There is probably no section in western Europe that has a greater future than the territory lying on the southern slopes of the Alps. Electric power in great quantities is available for the plain country in and around Milan. The best engineers of both Italy and Switzerland are working in conjunction with the industrial leaders of northern Italy, and it is fair to predict that the next ten years will see enormous strides in Italian industrial development. Italy possesses her own iron mines, a climate in the northern section wonderfully adapted for industrial enterprises, excellent transportation facilities, and a seaboard close at hand

The great manufacturing sections in northern Italy lie in or around Milan, Turin, and Genoa; there are also important manufacturing plants at Terni and elsewhere. The iron mines are more to the southward. Milan and Turin may be regarded as the two most important manufacturing centers, but to appreciate the situation rightly one must consider the entire southern slope of the Alps as given over to industrial activity. Manufacturing plants dot this territory in all directions, and there is no line of work, especially the working-up of iron and steel, to which the Italian does not seem capable of turning.

Hungary is rapidly developing into a manufacturing country, and the locomotives turned out from the Budapest Locomotive Works are largely patterned on American lines. Some of the most notable electric work in Europe has had its origin in Budapest shops. In Hungary there is a decided pro-American sentiment; the very word America appeals to the Hungarian mind, and the cordiality and hospitality accorded to visitors from the United States are proverbial. The manufacturing works of Hungary and Austria proper are independent of outside countries for raw material, and the steel produced at Resicza, Hungary, and Witkowitz, Moravia, is of exceptionally high grade. Bohemia includes manufacturing works covering almost every line of industry. The building of the new Dreadnoughts for the Austro-Hungarian navy, together with their armaments and equipment, will be accomplished wholly within the monarchy.

The American representative who enters Austro-Hungarian territory can do so free from the prejudices that exist toward many Europeans. The question of the languages is always an important one, but it is the writer's experience that a knowledge of English, French and German will suffice for this territory. Austria-Hungary comprises 17 crown lands in which 20 different languages are spoken in everyday life. There is probably no territory in Europe more unfamiliar to our manufacturers than this Austro-Hungarian monarchy, and, when one considers the multitude of languages spoken, this is not strange.

The Need of Stronger Packing

The Pennsylvania Railroad, through its department of publicity, emphasizes the necessity of better packing. It says:

Flimsy, insufficient packing of goods for shipment costs American manufacturers many thousands of dollars every year. The introduction of cheap substitutes for substantial wooden cases is responsible for much of the trouble, although modern conditions of transportation and freight handling make it more necessary than ever before that goods in transit should be thoroughly protected. American consuls abroad have protested for years that bad packing lost a vast amount of trade to our exporters. Now the abuse has become a serious matter in respect to domestic shipments. More attention is given all the time to making packages attractive in appearance, but less care is taken to make them safe. A Pittsburgh traffic expert lately estimated that "in 85 per cent. of the small-lot shipments moving to-day the construction of the material forming the box or crate, the size of the nails, etc., are entirely inadequate to protect the contents."

Fruit is shipped in paper-thin crates that are sometimes literally churned into pulp in transit. Tobacco is sent by rail in cases so flimsy that they can be perforated with a lead pencil. A shipment of tobacco in small bags arrived recently at Philadelphia with one-third of the cases so badly damaged that the contents could be easily removed through the breaks. Heavy hardware is seldom packed carefully enough to keep it from breaking through its casing. Very often no thought is taken of the damage that may be done to freight when packed in cars with heavy, rough or pointed articles.

It is impossible for the carriers to prevent damage under such circumstances. The greatest care may be used in stowing goods in a car at the beginning of a haul, but, as consignments for different stations are taken out, disarrangement follows that may be dangerous to the remaining freight, but a restowage at each stop of the train is impossible. All authorities agree that the way to save the large sums now lost through insufficient packing is to go back to substantial wooden cases. No safe substitute has been found for them, although the first cost of the flimsy materials may be less.

The Tuthill Spring Company, 760 Polk street, Chicago, having increased the capacity of its works about 25 per cent. last year, finds its ability to take care of its business fully up to the demand and will make no further increase this year. Its customers, who are largely wagon and buggy builders, are ordering springs in fair quantity and it is the expectation that this year's business will be good as to amount. The company also has a trade with pleasure automobile builders, who seem to be doing fairly well. It is the experience of the company, however, that motor truck builders are not having as great a demand as a year ago.

New Portable Welding Machine

A Recent Product of the Oxy-Carbi Company

A new portable oxy-acetylene machine has been recently placed on the market by the Oxy-Carbi Company, 516 Orchard street, New Haven, Conn. The acetylene generator is of the carbide to water feed type and it is emphasized that there is no possibility of the carbide rattling into the water while the machine is being moved from place to place and thus generating gas. Fig. 1 is a general view of the machine, while Figs. 2 and 3 show repairs that have been made with it. The former illustrates a gas engine base before and after being repaired in this way and in the latter a view of a group of typical repairs is given.

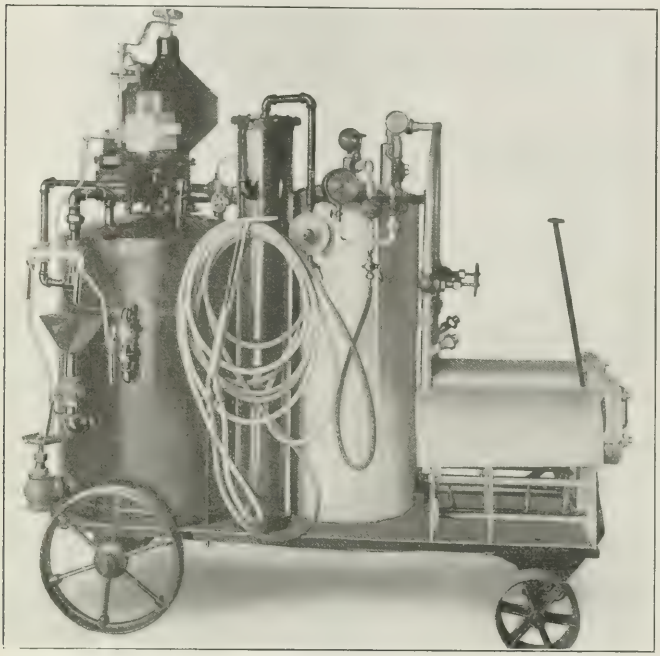


Fig. 1.—The New Portable Oxy-Acetylene Welding Machine Built by the Oxy-Carbi Company, New Haven, Conn.

The Machine in Detail

The generator is said to be very simple in operation as it is actuated by the weight falling against pressure and the action regulates the pressure of the gas at the blow pipe very closely. Two of the special features of the generator are that the carbide chamber is entirely shut off from the water when not in operation, thus eliminating the danger of the carbide falling through and generating gas and the very small amount of air that is admitted to the machine when the machine is emptying. This air is not exhausted upon recharging with water and as the expansion tank which is the upper section of the generator is entirely shut off at this time the formation of any dangerous mixture of air and acetylene is eliminated since the only air left in the generator is the small amount in the tube through which the calcium carbide falls to the water. In operation it is pointed out that the amount of gas generated is so closely proportioned to the work being done that regardless of where the weight is placed on the safety valve lever the valve is not called upon to operate. In this way any escape of gas in the vicinity of the machine when an operation is prevented and even though used in a closed room there is no apparent odor. After the machine is charged and the generation of the gas started the action is entirely automatic. The generation of the gas begins simultaneously with the consumption and continues as long as there is any demand, stopping when the consumption ceases. As soon as there is a demand for a fresh supply of gas, the generating process automatically starts again and can be kept up continuously or intermittenly as long as any calcium carbide remains in the holder. It is emphasized that the process of generation does not give off any tarry substance to clog the pipe or the valve and there is no possibility of the carbide heating and igniting if the generator should be opened after it has become clogged.

The oxygen used is generated in the oxygen tank at the front of the machine from potassium chlorate as it is required. The oxygen is generated under pressure which the company believes gives as safe or safer a device than a steam boiler. If ordinary care is employed in preventing organic matter from mixing with the chemicals, there is very little danger of an explosion from this source. If the valve betwen the retort and the storage tank were closed and no provision made for the escape of gas through a safety valve an explosion might occur. An ordinary safety valve is of little use, for in blowing the oxygen carries with it a considerable amount of chlor-

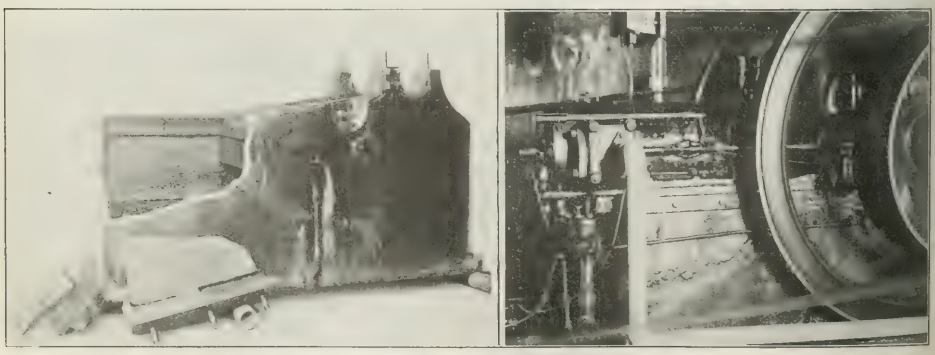


Fig. 2.—A Gas Engine Before and After Being Repaired by this Machine.

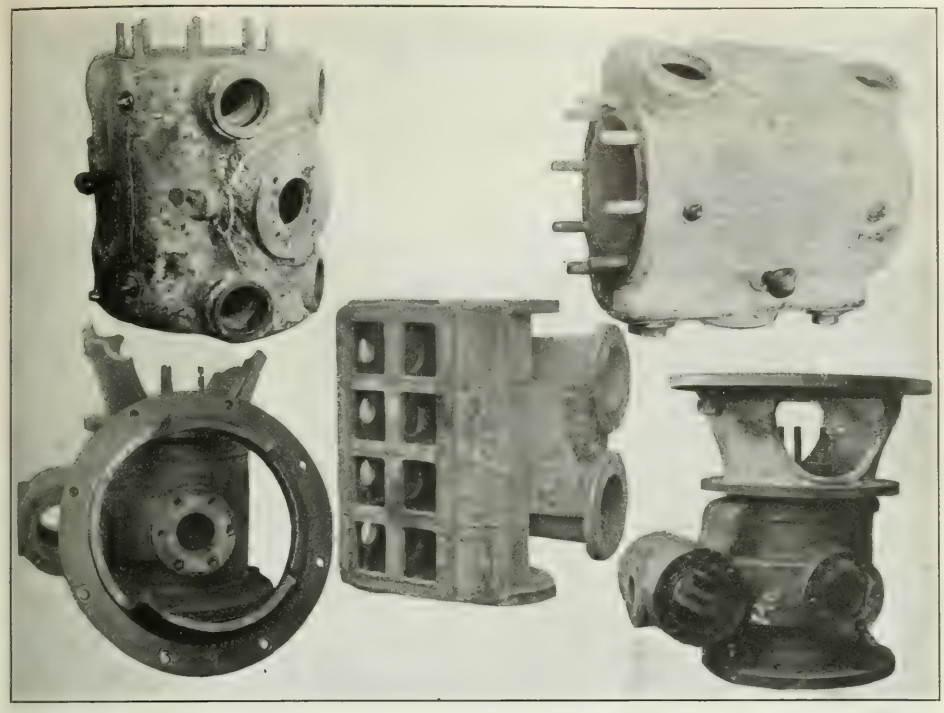


Fig. 3—A Group of Typical Repairs.

ine which will cut a channel in the valve seat making it worthless after a few times. In this machine, however, a special alloy is employed for the valves which overcomes this objection and at the same time the gas can be retained in the tank indefinitely if it is not used at the time of generation.

The blow pipe used with this outfit is very light in weight and can be used in close quarters. A number of tips have been provided which enables the one blow pipe to be used for handling a wide range of work extending from the very thinnest sheets to the heaviest of metal ordinarily encountered. By removing the welding tip and inserting the auxiliary nipple and cutting tube and the cutting tip it is possible to convert the blow pipe almost instantly into a very rapid-acting cutting torch.

Typical Repairs Made

The gas engine base shown in Fig. 2 is an example of the quick repairs which it is possible to make by using this machine. The base of the engine which was used for charging batteries was wrecked by a cylinder getting loose on one side. On account of the work performed by the engine it was necessary to have it back in service as quickly as possible and with the exception of drilling a few holes no other machine work was required to place it in commission a few days after the trouble occurred.

In Fig. 3 a group of typical repairs is illustrated. In the upper portion two views are given of a large air compressor cylinder in which expansion and contraction had to be overcome. At first the trouble with this cylinder apparently was the cracking of both sides of the water jacket by freezing. After the water jacket had been welded a further test showed a crack in the air chamber. The repairing of this crack seemed rather difficult as the cylinder consisted of three sections, the cylinder proper, the water jacket and the air chamber. The air chamber had the top removed after welding and was tested before the air chamber was replaced. Another crack developed and it was again necessary to remove this section. A second attempt was made to weld the chamber which proved sucessful and the cylinder has now been in operation for some little time.

The large bronze pump base casting shown in the central portion of this engraving is another example of a difficult operation performed by this torch. A cold shut was found in the casting of the partition 12 in. down in the center hole. As the space was tapered to 2 in. at this point it made it difficult to operate the blow pipe and weld a piece into the partition. The use of an exceptionally short tip enabled a piece to be welded over this hole satisfactorily in spite of the limited space. Another hole in the partition was repaired by removing a piece from the end of the cylinder and replacing it. The two lower views show the replacing of the flange on a 16-in. high pressure cylinder of a tandem engine. This repair was made quickly at the power station in which the engine was installed and the engine was put back in commission without any machine work being necessary.

Railroad Equipment Orders.—The Frisco Refrigerator Line, a subsidiary of the St. Louis & San Francisco Railroad, has ordered 2500 refrigerator cars from the American Car & Foundry Company. The Erie Railroad has given orders for 45 passenger cars, 10 to be built by the Barney & Smith Car Company and 35 by the Pullman Company. The Cincinnati, Indianapolis & Louisville has ordered 1000 steel gondola cars from the American Car & Foundry Company. The Western Maryland may place orders for 5000 freight cars, 50 passenger coaches and 50 locomotives. The Vandalia has ordered 47 steel underframe box cars from the Pressed Steel Car Company. The Isthmian Canal Commission will buy 40 electric towing locomotives for towing vessels through the locks. The Chicago, Indianapolis & Louisville is taking prices on nine mikado locomotives. The Grand Trunk has ordered 10 switching locomotives from the Lima Locomotive & Machine Company. The Grand Trunk is also having 1000 steel underframe box cars, each of 60,000 lb. capacity, built at the Turcot works of the Canada Car & Foundry Company; the order is to be completed this year.

The Racine Steel Castings Company, Racine, Wis., manufacturer of crucible steel castings, is now furnishing vanadium and titanium steels in addition to its regular product.

The Youngstown Sheet & Tube Company

Details of Its Important Extensions in Recent Years—Finishing Mills Followed by Steel Works and Blast Furnaces

(With Supplement)

The plants of the Youngstown Sheet & Tube Company, Youngstown, Ohio, represent the development of an important independent steel company in a period identical with the life of the leading consolidation in the industry. They are an interesting example of the evolution of a rolling mill company, starting with finishing plant only and reinforcing its position by the erection of steel works and later of blast furnaces, meanwhile broadening its operations by adding a third line of finished products to those which it set out to manufacture. When it was organized in 1901 the company secured about 300 acres of ground at East Youngstown, upon which was erected in 1901 and 1902 a plant comprising 15 double puddling furnaces, a muck mill consisting of two 20-in. trains, a skelp mill for rolling up to 22⅝ in. wide, three tube mills and six sheet mills. The product then consisted of black and galvanized sheets, roofing sheets and pipe up to 8 in. in diameter, all made in both iron and steel.

In 1904 important additions were made to the pipe department, permitting 12-in. pipe to be turned out, and the output was brought up to 1000 tons per day of sheets, skelp and pipe. In 1905 the company made extensive additions, consisting of a Bessemer steel plant and finishing mills, to supply its own requirements of steel, and also to furnish billets and sheet and tin bars for the open market. The improvements included a cupola building, equipped with four 10-ft. 6½-in. cupolas; converter house, equipped with two 12-ton converters; bottom house for making converter bottoms and the necessary equipment incidental to that operation; pit furnace building, equipped with electric stripper and charging crane and four 4-hole pit furnaces; blooming mill with blooming shears, for making slabs; Morgan continuous billet mill; Morgan continuous sheet-bar mill; 42-in. universal plate mill and Morgan continuous 10-in. skelp mill. At the same time the shops were enlarged to meet the new requirements and the necessary boiler and electric power plants were installed. In its issue of August 2, 1906, *The Iron Age* gave a detailed description of the company's plants at that time, including the socket shop, machine shops, foundry, blacksmith shop, boiler shop and pattern shop.

Important Later Additions

In the past four years the company has been making extensive additions and improvements to its plants, and mention of them has been made from time to time. The present article is designed to give with some detail a connected account of these, as a supplement to the description of the plant as it existed in 1906.

The additions consist of three blast furnaces, a mixer and pig-casting plant; eight sheet mills complete, including three galvanizing kettles; six tube mills; 10 puddling furnaces; a mixed pressure turbo-generator plant and other improvements. Including the additions, the company is now operating 14 sheet mills, six galvanizing kettles, 10 tube mills and 50 puddling furnaces. About two years ago the company bought the Morgan Spring Company's plant at Struthers, Ohio, near Youngstown. This has been completely remodeled and its capacity doubled. It consists of a Morgan continuous rod mill, double strand, complete with the following finishing departments: wire drawing, wire nails, galvanizing, barb wire, square and diamond mesh fence. A description of the various additions and improvements follows:

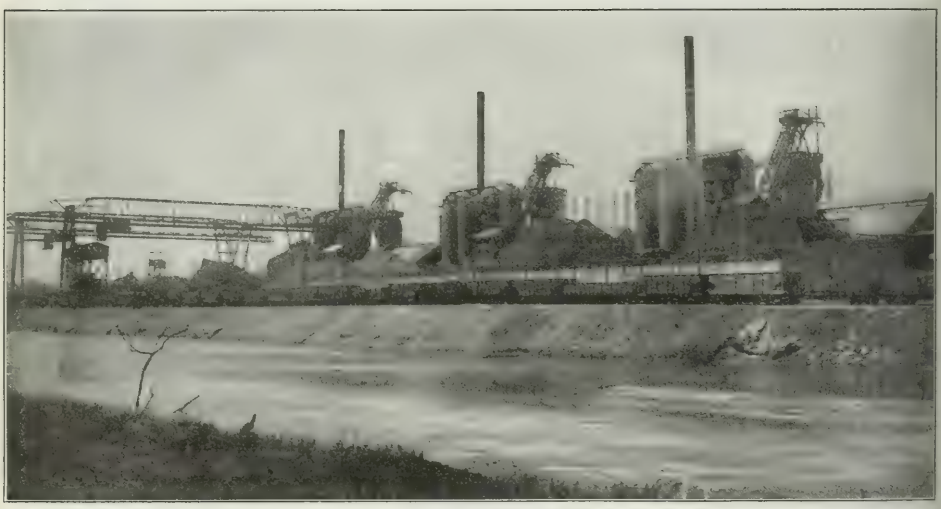


Fig. 1. Blast Furnaces of the Youngstown Sheet & Tube Company as Seen from the River Side.

Blast Furnaces

The blast furnaces, of which a general view is shown in Fig. 1, are situated east of the steel plant, as indicated in the plan view in the accompanying Supplement, and occupy the whole of the eastern end of the site of the main plant. Two stacks have been in operation since November, 1908, and one stack since August, 1910, with provision made for a fourth. The furnaces were designed by Julian Kennedy, Pittsburgh, and are laid out with stoves, furnaces and cast houses in a line extending east and west.

STACK CONSTRUCTION

The stacks are 22 ft. bosh by 88 ft. high. The hearth level is 17 ft. above that of the yard, giving ample height

to run the hot metal into ladle cars on the yard level. The stoves and cast houses are on the same elevation as the stacks. The crucibles are 15 ft. 2 in. diameter and 7 ft. 10 in. to the center line of tuyeres. They are jacketed with cast-iron cooling plates which have cast-in water-circulating pipes. There are also riveted steel hearth jackets 1½-in. thick, extending 6 ft. 9 in. below the hearth level. The furnaces have six cast-iron columns. These have cast-iron bases, which are tied together by 5-in. tie bolts and sleeve separators.

Five brick blocks, 4 x 9 x 13½ in., extend 10 ft. 10 in. below the hearth level, the blocks being laid on end in courses, each course being laid at an angle of 45 deg. with the one beneath. Hard-burned common brick are laid from the fire brick to the yard level. The common brick foundation is graduated in three steps, beginning with a diameter of 37 ft. at the top, then stepping out to an intermediate diameter of 44 ft., while the bottom or yard diameter is 51 ft. Each section is enclosed in a steel foundation jacket 4 ft. high. Below the yard level the foundation is of concrete, the pad being octagonal, 72 ft. in diameter and 12 ft. thick. The furnaces are built with 12 6-in. tuyeres. There is a row of copper cooling plates below the tuyeres, and two rows of copper cooling plates between the tuyere coolers. The bosh has nine rows of copper cooling plates with bosh bands and separators, leaving very little exposed brick. The two furnaces first constructed have eight rows of cooling plates above the mantle, while furnace C has 10 rows. The coolers are fed from a combination trough over the bustle pipe, a manifold just above the tuyeres and a manifold above the mantle.

TOP FILLING ARRANGEMENTS

But one bell is used, the usual small bell being replaced by a sliding plate operated by oil cylinders. The large bell is 11 ft. 6 in. in diameter and is operated by a 12-in. oil cylinder. Double rods are used, slotted for keys a distance from the regular keys, providing for the making of a double lift to remove bell or hopper. The gas hood is bolted over the hopper and forms the seat on which the skip bucket rests while discharging. The skip bucket is cylindrical, with a bell bottom and rod to which the skip carriage is attached. When the bucket seats on the top ring of the gas hood the bucket bell is lowered by the over-travel of the skip carriage, thus delivering the charge on the large bell. The skip bucket comes to rest at the bottom of the skip pit on a revolving table, which is operated by oil cylinders, thus giving uniform distribution. The skip is operated by an Otis Elevator Company's electric hoist, located in a hoist house over the bottom part of the skip bridge and adjoining the bins. The bell, top slide, skip carriage, turning cylinders and stock testers are all operated from the hoist house. The charging side of the blast furnaces is shown in Fig. 2.

The furnaces have closed tops and are equipped with four gas outlet connections, which lead to two downcomers and thence to a dust catcher. On one outlet is an 18-in. bleeder. From the dust catcher, which is 24 ft. in diameter with conical bottom and top, the gas passes through two stationary Kennedy centrifugal gas cleaners and then to a 26-ft. Mullin gas washer. From this it is sent to the stoves and boiler house. Each furnace is served by four hot-blast stoves, 22 ft. x 102 ft., of the Kennedy two-pass type with central combustion chambers.

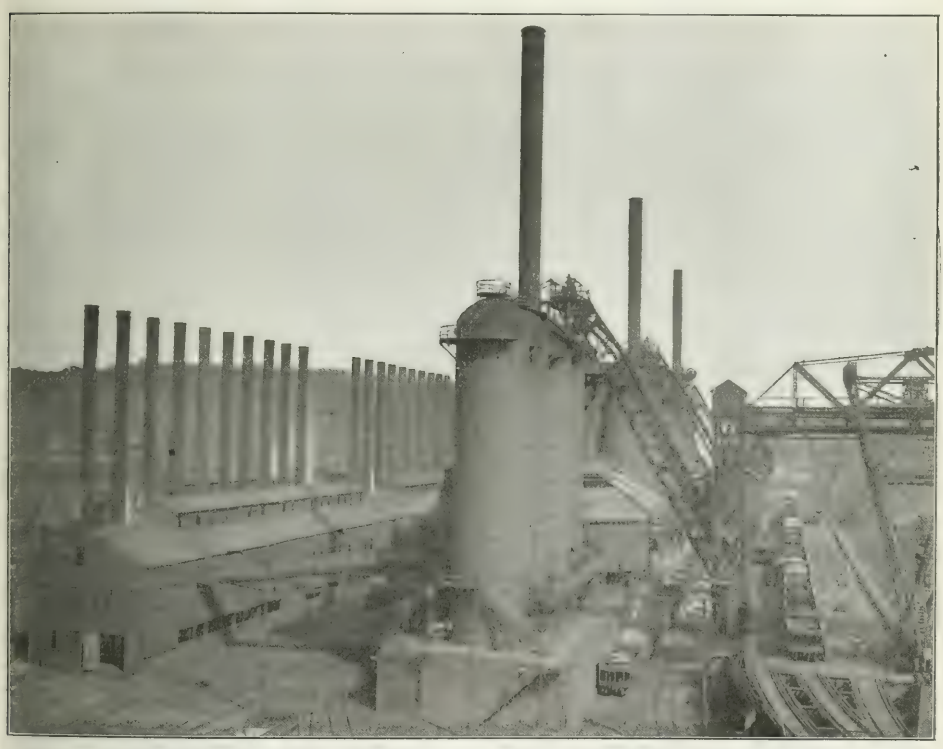


Fig. 2.—A View of the Blast Furnace, Showing in Detail the Charging Side.

CAST HOUSES

The cast houses are 95 ft. 10 in. x 42 ft. 5¼ in., and have pockets in the east end into which a spur leads from the yard tracks. Each cast house is served by a 25-ton Morgan Engineering Company's electric crane with 5-ton auxiliary hoist. The furnaces are equipped with Vaughn steam-operated mud guns and clamping cylinders built by Felix McCarthy.

The flue dust and molten cinder or granulated slag, as well as the iron, are delivered to standard gauge cars or ladles on the yard level. There is a brick-lined cinder pit

24 ft. in diameter and 35 ft. deep for granulating the slag, served by a Browning Engineering Company cinder trolley with 2-cu. yd. bucket. The iron notch is on an angle of 45 deg. with the center of the cast house. Iron runners lead to the north side of the cast house, with spouts for four ladles. The molten slag is delivered to ladles on the south side or to the granulating pit from two cinder notches and from the iron notch.

Ore Yard

The ore yard is 207 ft. 9 in. wide and 1051 ft. 6 in. long, its capacity being 600,000 tons, with provision made for further extension. It is spanned by two bridges, designed and built by Heyl & Patterson, with cantilever extensions over bins on the north side and river wall, and car unloader on the south side of the yard. The total trolley travel with bucket is 305 ft. 3 in. The buckets are the well-known Hulett type, of 10 tons capacity. From the bottom of ore yard to the highest lift of the ore buckets is 75 ft., which allows an area of cross-section through the ore pile of 11,340 sq. ft. Ore is dumped from cars by a Hulett car dumper, which travels on a track parallel to the south line of the ore yard and dumps directly to the yard, from which the ore is distributed by the bridges. Fig. 3 gives a good view of the ore bridges and car dumper.

Stock House and Bin System

The stock yard is parallel to the line of the furnaces and is 15 ft. below yard level and 32 ft. below hoist level. It is equipped with 29 ore bins, 21 coke bins and eight limestone bins of Hoover & Mason design, serving three furnaces. The bins are arranged to fill the scale car, which runs on a standard-gauge track on the stock-house floor beneath the center line of the bins. The stock is weighed on the car, then carried and discharged from it through a hopper into the skip bucket. The ore pockets occupy the south side of the stock house and extend its entire length; they can be filled from cars brought up the trestle approach or by a transfer car loaded by an ore bridge. Coke is carried to the bins via the trestle approach, and from the bins it is run into the scale car in the same manner as ore, except that the dust is screened from it. Limestone is handled in the same manner as ore. The limestone bins are filled from cars brought up the trestle approach.

Boilers

The boiler plant parallels the furnace, lying 127 ft. to the north, and is equipped with 26 500-hp. Rust boilers, housed in a steel building 42 x 704 ft., covered with corrugated double-refined puddled iron. The boilers are in single settings with individual stacks 5 ft. 2 in. x 120 ft. The boilers are gas fired, coal being used only when gas is insufficient. The plant furnishes all of the steam required in the blowing room, power and pumping stations at the furnaces, and the surplus is carried in a 12-in. line to other departments.

The boilers are equipped with Murray regulating feedwater valves and Foster non-return checks in the steam outlet to header. Filtered water is fed to the boilers by three Epping-Carpenter compound duplex 14 x 25 x 24-in. pumps.

Ashes from the boilers are taken care of by two Heyl & Patterson ash elevators, which raise them to bins suspended from roof trusses; from the bins they are discharged through chutes into cars on the yard track south of the boiler plant.

The water-purifying plant for boiler feed water is the We-Fu-Go system, installed by William B. Scaife & Sons, and now has a daily capacity of 92,000 gal. of purified water. The system now comprises seven filter beds, six 100,000-gal. settling tanks and a purified-water cistern of 50,000 gal. capacity.



Fig. 3.—Ore Yard and Stock Bins and the Ore Bridges and Car Dumper Which Serve Them.

Blowing Room and Power Station

The blowing room and power station is north of and parallel to the boiler house. The building is of steel and brick construction, 56 x 528 ft. The three furnaces are served by four Corliss cross-compound condensing blowing engines, 48 and 90 in. x 96 x72 in., built by the William Tod Company, Youngstown, Ohio. The air inlet valves connect to air ducts, which extend beneath the cylinders and are carried to the outside, being so arranged that a dry-blast system can be installed. The blast from the engines is discharged into one header beneath the floor, with connections and valves so arranged that the middle engines can be used as spares for either furnace. One engine can supply a furnace, but the connections allow of using an engine and a half on a furnace if desired. The cold-blast mains to the furnace are laid underground.

The west end of the building is occupied by the power equipment, which comprises one Westinghouse Parsons turbo-generator, 1500 r.p.m., 2000 kw., 6600 volts, 3-phase, 25-cycle condensing; one Allis-Chalmers turbo-generator, 1500 r.p.m., 1500 kw., 6600 volts, 3-phase, 25-cycle condensing, one Allis-Chalmers turbo-generator, 1500 r.p.m., 1500 kw., 6600 volts, 3-phase, 25-cycle non-condensing; three Allis-Chalmers motor generator sets of 500 kw., each consisting of one 750-hp. synchronous motor, 6600 volts, 3-phase, 25-cycle; one 500-kw., 220 volts direct-current generator; one Allis-Chalmers 75-kw. exciter, driven by 112 hp., 220 volts direct-current motor; one Allis-Chalmers 75-kw. exciter, driven by 112-hp., 220 volts alternating motor; three Allis-Chalmers 160-kw. oil-cooled, 6600 volts to 220 volts power transformers; one Allis-Chalmers 15-kw. balancer set for lighting; one General Electric 25-panel switchboard.

In this building is a 50-ton Morgan Engineering Company traveling crane having a 10-ton auxiliary hoist. The The oil-pressure pumps for hydraulic cylinders at the furnaces are located in this building and consist of two 12 x 4 x 18-in. duplex pumps and one 10 x 2½ x 12-in. pump, all operated at a pressure of 750 lb. per square inch. An accumulator is located close to the pumps and return pipes lead to the tank placed near the pumps.

34 x 24-in. air pumps, built by the Mesta Machine Company, Pittsburgh. Provision is made for extending the pumping equipment.

Mixer and Pig Casting Plant

From the blast furnaces hot metal is carried in 40-ton ladle cars direct to hot-metal mixers, of which there are two with a capacity of 300 tons each. The hot metal is transferred from the ladles to the mixers by two 80-ton electric traveling cranes, which have a 25-ton auxiliary hoist for pouring. The track from the mixer house to the Bessemer converter parallels the cupolas, the direct and remelted metal being handled by the same equipment.

Two double-strand pig machines lead north from the mixer building. The hot metal is transferred from ladles to the pig machine by the mixer cranes, which place the ladles in a cradle while pouring. The pig machines discharge the metal into standard-gauge cars on the yard level. The mixer building is of steel construction, 230 x 94 ft.

The Bessemer converting department, as described in the article of August 2, 1906, was served by four cupolas. The cupola plant now consists of five cupolas, 10 ft. 6½ in. diameter by 22 ft. high, with a total daily capacity of 1500 tons.

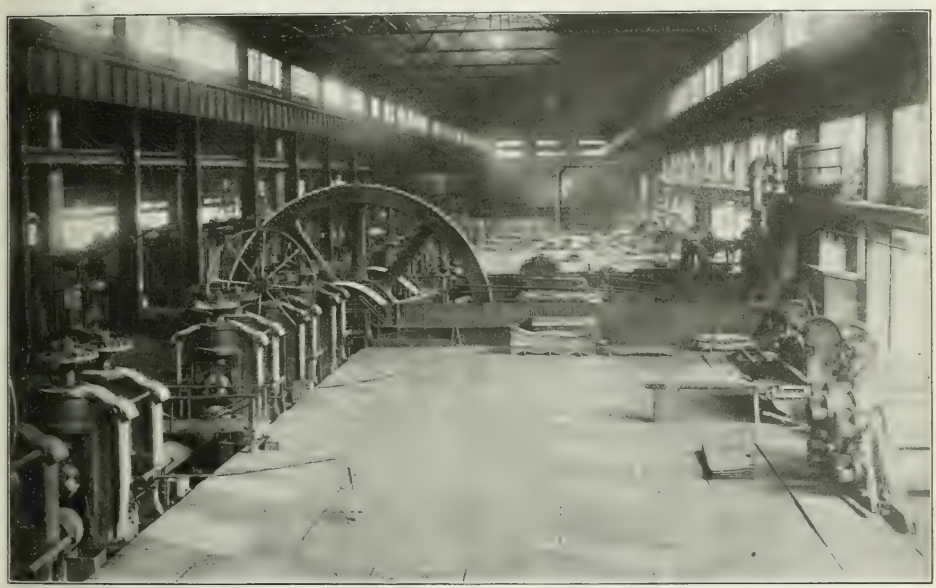


Fig. 4 The Sheet Mill Building. New Mills in the Foreground.

Pumping Station

The pumping station is located in line with and at the west end of the blowing-engine room and power plant. It is of brick and steel construction above yard level; below yard level it is of concrete. The pump-house floor is 15 ft. below yard level and 9 ft. above low-water line of the Mahoning River, the building being 34 x 162 ft. It is equipped with a 15-ton hand crane.

The water is lifted by pumps from concrete wells, into which it flows from a concrete aqueduct extending underground to a river intake. The pumping equipment includes the following: One 20,000,000-gal. DeLaval turbo-driven single-stage turbine pump, supplying water for the condenser which serves pumps, blowing engines and power turbines; three 12,000,000-gal. DeLaval turbo two-stage turbine pumps for tank service; one 16,000,000 DeLaval turbine service pump, driven by a 500-hp. Crocker-Wheeler motor at 6600 volts; two 10,000,000-gal. DeLaval turbine service pumps, driven by a 150-hp. induction motor at 220 volts. The station has a total pumping capacity of 92,000,000 gal. in 24 hours.

The blowing engines, power turbines and pump turbines are served by a 114-in. Helander condenser and two 14 x

The soaking-pit equipment for the blooming mill now consists of five 4-hole pit furnaces, with a total capacity of 80 ingots.

Mixed Pressure Turbo-Generator Plant

A mixed pressure turbine plant is located north of the blooming mill engine house and consists of a General Electric 1500-kw. generator, 6600 volts, 3-phase, 25-cycle, driven by a 2000-hp. horizontal Curtis mixed pressure condensing turbine. It is supplied by exhaust steam from the blooming mill engine, the steam exhausting from the engine through a receiver into three Rateau regenerators, 6 ft. diameter by 40 ft. long, from which it flows into the turbine.

The plant is equipped with an 84-in. Helander condenser, built by the Mesta Machine Company, and a 12 x 26 x 21-in. air pump; one 35-kw. General Electric motor-driven exciter; one 35-kw. General Electric turbo-driven exciter, and one 6-panel Western Electric Company switchboard.

The building is of steel and brick construction, equipped with Whiting traveling crane of 15 tons capacity and operated from the floor. The arrangement is with a view to further extensions.

Sheet Mills

The new sheet-mill building is 76 ft. wide by 340 ft. long and has a lean-to over the furnace department 36 ft. wide and 375 ft. long. The construction is of steel, with roof and siding of double-refined puddled iron sheets. The new building is in line with the old sheet-mill building, the latter having been altered to join the new construction, thus putting the combined equipment of 14 hot mills and six cold mills under one roof. Two cranes of 40 and 25-ton capacities with 5-ton auxiliary hoists serve the entire sheet and annealing department. The additional sheet-mill capacity placed in operation on April 16, 1910, is as follows:

One 56-in. hot mill.
One 44-in. hot mill.
Four 38-in. hot mills.
Two 34-in. hot mills.
Two 56-in. cold mills.
One 42-in. cold mill.
One 40-in. cold mill.

There are the necessary heating and annealing furnaces and other equipment.

The hot and cold mills are in one line with four hot and two cold mills on each side of the engine, the cold mills being on the end of the train and acting as drags. They are driven by a direct-connected Corliss tandem-compound condensing engine, 34 x 64 x 60 in., 2000 hp., 30 r.p.m. The engine is connected to an 84-in. Helander condenser with 12 x 21 x 30-in. pump. The engine, condenser and pump were built by the Mesta Machine Company. There are eight combined sheet and pair furnaces of the Bailey type, each furnace having two sheet-heating chambers and one pair-heating chamber. The furnaces are built in pairs and conveniently located with reference to the mills they serve. The bars are brought in on narrow-gauge tracks between each pair of furnaces, there being ample room for piling a sufficient stock of bars. The furnaces are coal-fired and equipped with stokers built by the American Stoker Company. Blast pressure is furnished by a motor-driven fan with a capacity of 15,000 cu. ft. of free air per minute at 3 oz. pressure. The fan was built by the Buffalo Forge Company. The air blast is carried in a concrete conduit beneath the floor at the back of the furnaces. The furnaces of the original six mills have been changed to the double-combustion type and are equipped with stokers. The coal and ash-handling machinery described below serves these furnaces as well as the eight new ones.

The general coal supply for the stoker system is kept in a 150-ton concrete coal bin located under the coal trestle, which parallels the original sheet-mill plant. From this point the coal is distributed to small circular coal bins of 5 tons capacity, one to each pair of furnaces, by a 4-ton overhead coal trolley of single I-beam type, built by the Sprague Electric Company. The trolley has a coal bucket with a drop bottom, which is operated by a craneman from the traveling cage. The coal is delivered to the stokers by hand from the small bins.

Ashes from the furnace are carried in a drop-bottom ash bucket by the overhead coal trolley to a concrete ash bin in the northwest corner of the furnace lean-to. Beneath this bin is a narrow-gauge track, which is an extension of the skelp-mill gas-producer ash track. Ashes are discharged from the bin into a car by hand-lever operated gates in the bottom of the bin, and the cars are transferred to the ash hoist which serves the skelp-mill producers and the yard boilers, and this hoist loads the ashes into standard-gauge cars.

The additions to the annealing department consist of four double 4-box gas-fired furnaces. These are east of and in line with the sheet and pair furnaces and are adjacent to the original annealing furnaces of somewhat similar design. Gas is furnished by two 10-ft. Morgan Construction Company's gas producers, which are located in a building adjoining the main lean-to and directly north of the annealing furnaces. Ashes from the producers are disposed of by the same trolley system described above.

The new plant is equipped with scales for weighing the product; with three 126-in. and one 154-in. sheet-squaring shears, four steam doublers and roll lathes. The mills, shears, doublers and lathes were built by the United Engineering & Foundry Company, Pittsburgh.

The new warehouse is of steel and brick construction, 66 x 180 ft., and has been built at right angles to the main building and adjacent to the original warehouse. This



Fig. 5.—The Handling of Sheet Bars.



Fig. 4.—Method of Handling Slabs Coming from the Conveyor at the Slab Shear in Blooming Mill.

plant is equipped with a 10-ton traveling crane, built by the Morgan Engineering Company, Alliance, Ohio, and has a sheltered shipping platform on the south end.

Fig. 4 is a view in the sheet mill, while Fig. 5 shows the handling of sheet bars.

Sheet Galvanizing Department

The galvanizing department of the sheet mill has been enlarged until it now occupies a new building of steel and brick construction, 50 x 314 ft., with a lean-to of similar construction for storing spelter, coke, dross, acid, etc. The building contains four complete motor-driven mechanical pickling units of two vats each and six complete hot galvanizing units.

In galvanizing the so-called New Process is employed, the company being sole owner of the patent rights. The galvanizing units are driven by Lincoln variable-speed motors. The sheets are delivered from the galvanizing pots into the adjoining building, which was occupied by the original galvanizing department. This building is now used for the shearing, corrugating and bundling departments and for warehouse purposes.

Tube Mill Department

The tube mill department occupies the western end of the site and now consists of 10 mills, six buttweld and four lapweld.

No. 1 is lapweld, for sizes from 5 in. to 14 in.
No. 2 is lapweld, for sizes from 2 in. to 8 in.
No. 3 is buttweld, for sizes from 1¼ in. to 3 in.
No. 4 is buttweld, for sizes from ⅜ in. to ¾ in.

These were described in *The Iron Age* of August 2, 1906.

No. 5 is buttweld, for sizes from 1 in. to 1½ in.
No. 6 is buttweld, for sizes from 1 in. to 1½ in.
No. 7 is buttweld, for sizes from ½ in. to 1 in.
No. 8 is buttweld, for sizes from ⅜ in. to ¾ in.
No. 9 is lapweld, for sizes from 8 in. to 20 in.
No. 10 is lapweld, for sizes from 4 in. to 10 in.

The last six mills have been recently installed. They are housed in steel and brick buildings, with threading departments of the same construction conveniently located. These mills are somewhat similar in design to Nos. 1, 2, 3 and 4. They are motor-driven throughout. The furnaces are gas-fired, fuel being supplied by the original producers and from a line of new Duff producers, some of which are equipped with Treat automatic pokers.

The socket shop occupies three connecting buildings, each 60 x 390 ft., of brick and steel construction and equipped with traveling cranes. In this department are furnaces, hammers and welding machines for making all sizes of sockets up to 6 in. for steam, gas and oil-country goods.

The skelp yards have been extended and new yards added. Warehouses of steel and double-refined puddled iron sheet construction have been added. They are fully equipped with cranes and all have standard-gauge tracks entering them.

The pipe-galvanizing plant is of brick, with wood trusses and roof. The building is 80 x 333 ft. The equipment is laid out in units, there being three hot-galvanizing units and one electro-galvanizing unit, each capable of handling all sizes of pipe. There is also a tar-coating plant.

Rod and Wire Department

The rod and wire mills are located on the Mahoning River in the town of Struthers, about one mile east of the main plant. The site contains 90 acres. The products manufactured are rods, wire (including black, galvanized, coppered and barbed), nails, staples, field fence, etc.

The rod mill equipment includes a Morgan continuous heating furnace and 16-stand double-strand Morgan continuous mill, housed in a building 55 x 350 ft. The mill is driven by a 34 x 64 x 48-in. horizontal vertical combination piston and Corliss valve condensing engine, built by the William Tod Company. The condenser is a 72-in. Helander, which, with the dry-air pump, was built by the Mesta Machine Company. The steam is furnished by seven Stirling water-tube boilers, six of which are of 250-hp. and one of 350-hp. capacity. The engine and drive are in a building 40 x 160 ft. adjoining the main building.

The cleaning house is 80 x 100 ft. and contains pickling vats, lime-coating vats, rusting conveyor and two jib cranes for serving this equipment, as well as loading trucks for the baker. The latter has eight tracks with a total capacity of 64 trucks.

DRAWN WIRE

The wire-drawing equipment consists of 18 benches with a total of 177 blocks, divided as follows:

Five benches with nine 25 in. blocks.
Three benches with eight 25 in. blocks.
Two benches with six 25 in. blocks.
Three benches with twelve 16 in. blocks.
Five benches with twelve 12 in. blocks.

The equipment was built by the Morgan Construction Company, Worcester, Mass., and by Humphrey & Sons, Joliet, Ill. The wire-drawing department is housed in a steel building, brick lined, 120 x 260 ft.

In the annealing department are seven pit annealing furnaces, arranged to hold four pots each, and two muffle furnaces. All are served by overhead electric traveling cranes.

NAIL FACTORY

The nail factory is of brick and steel construction, 85 x 396 ft., and contains 98 nail machines, of which 92 are National Machinery Company's make and six were built by George Angell. The nails produced on these machines are polished in three 50-keg, one 40-keg, four 25-keg, one 12-keg and one 8-keg tumblers. The tumblers are driven by motors independent of the 225-hp. motor driving the nail machines. The nails are trucked from the machines and elevated by means of an Otis elevator from the nail-mill floor level to a charging platform over the nail tumblers. Sawdust for polishing the nails is stored in a steel bin with sufficient capacity to hold one month's supply. The sawdust is unloaded from cars into bins by means of a motor-driven exhauster. The polished nails to be shipped are weighed and filled into kegs. These are placed in a conveyor on the floor level and taken to a Morgan motor-driven nailing machine, from which they are automatically discharged to a second conveyor and carried to warehouses. The capacity of the factory is 50,000 kegs per month.

In this department are located barbing blocks for barbing wire used in making barbed nails, Humphrey staple machines, which make polished and galvanized staples, and Humphrey coating machines for coating nails. Electro-galvanizing and blued nails are also manufactured in this department.

COOPERAGE PLANT

The cooperage shop is a 40 x 60-ft. two-story brick building with a one-story addition, 40 x 100 ft., of frame and corrugated double-refined puddled-iron sheet construction. Here the wood is stored and kiln dried in a double-chamber dry kiln and made into kegs. The kegs are conveyed from the second story of the cooperage shop over the billet-yard crane runway and deposited in the nail department convenient to the tumblers. The heads are stenciled at this point by a Hooper stenciling machine.

BARB WIRE AND FENCING

In the barb-wire department 18 Bates machines are used, making two and four-point hog and cattle barb-wire fence in even weights and 80-rod spools. There are also two machines for making coiled spring fence wire, and several wire-hoop machines. The spools for the barb wire are made from especially seasoned and treated wood, automatic machinery doing most of the work.

Field fence is made in a building 100 x 146 ft., of steel and brick construction, adjoining the warehouses and barb-wire department. There are now in operation nine machines for producing Buckeye wrapped-stay fence, two diamoned mesh-fence machines and two staple lock-fence machines. The wrapped-stay and staple-lock machines are capable of making all the prevailing heights, types and spacing on the market. This department also contains six straightening and cutting machines, which will handle sizes from No. 16 up to ⅜-in. wire in lengths up to 30 ft. A tool room is fitted out with modern motor-driven lathes, shapers, milling machines, drill presses, etc. Bale-tie machines are also under construction.



Fig. 7.—Two Butt Weld Tube Mills.

The wire-galvanizing department consists of three 30-wire galvanizing units, each having 30-reel strands; two lead-annealing furnaces, muriatic-acid fluxing bath, spelter furnace and take-up blocks of the Humphrey continuous type. The building can accommodate two more units, or a total of five.

WAREHOUSES

There are two warehouses in which finished material is stored. The first of these, 70 x 390 ft., is partly occupied by the barb-wire machines, the storage space being used exclusively for barbed and galvanized wire. This building is provided with a covered shipping platform running along one side, 10 ft. wide by 300 ft. long. Parallel to it is another warehouse, 85 x 480 ft., with a shipping track and platform on each side of it. Between these two buildings is a three-track yard. The two outside tracks serve for shipping tracks and the center track is on a grade The latter is used for the storage of billet cars, the grade



Panoramic View, Bessemer Works in Middle Ground, and near the River Bank the Site of the New Open Hearth Furnaces



...Plan Showing Arrangement ... 14 Open Hearth Furnaces Eventually, and Two Fourth Blast Furnace...

...YOUNGSTOWN WORKS OF THE YOUNGSTOWN SHEET & TUBE COMPANY, YOUNGSTOWN, OHIO

allowing the cars to be dropped down by gravity to the billet-unloading crane at the billet yard mentioned above. There is shipping track capacity for 40 cars around these two warehouses.

Open Hearth Plant

At a recent meeting of the stockholders of the company an increase of $5,000,000 in the capital stock was authorized. Most of this money will be used to build six

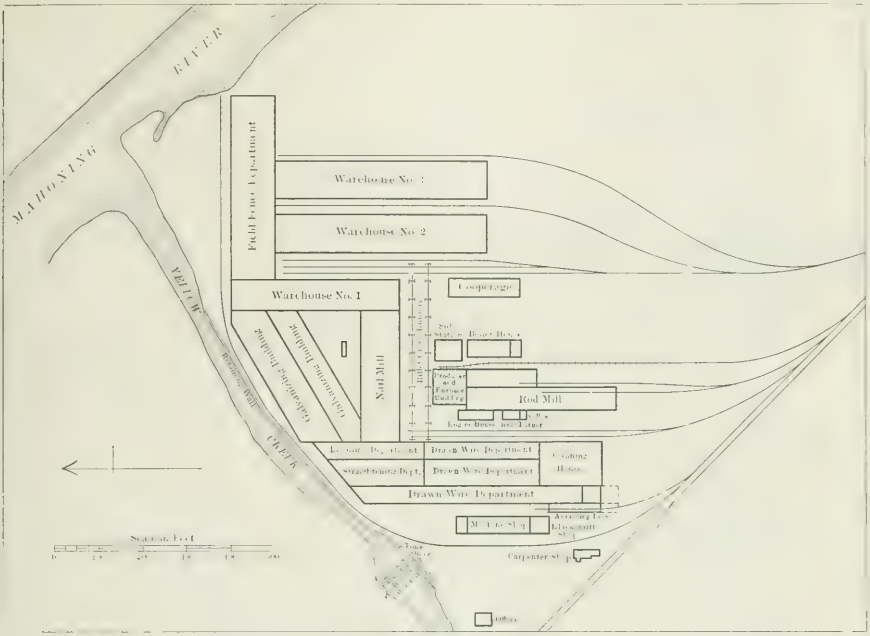


Fig. 8.—Plan of the Rod and Wire Mills at Struthers, Ohio.

ELECTRICAL EQUIPMENT

All the machinery in the Struthers plant except the rod mill is electrically driven. Electricity is supplied from the main plant, one-half mile away, to the substation, which contains one 300-kw. Crocker-Wheeler motor generator set, 6600-volt, 3-phase, 25-cycle, 500-r.p.m. generator, 220-volt, 3-phase, 25-cycle; seven 300-kw. Crocker-Wheeler water-cooled transformers, 6600 to 220 volts; one 300-kw., 220-volt generator, driven by direct-connected Skinner engine.

Water for the plant is taken from Yellow Creek, this stream having been dammed, and from the Mahoning River. A pumping station distributes the water to the various departments. There are a machine shop, forge shop and carpenter shop of ample capacity, and with facilities for taking care of repairs and building such machines as are added from time to time.

open-hearth furnaces with a total monthly capacity of 20,000 tons, together with a new blooming mill. New finishing mills to take care of the additional steel will also be built, but at this writing the type of these mills has not been decided upon. The location of the new open-hearth plant is shown in the plan on the accompanying Supplement, which contains also a panoramic view of the East Youngstown plant. Figs. 6 and 7 are views taken at the tube mill and blooming mill, while Figs. 8 and 9 relate to the wire plant at Struthers.



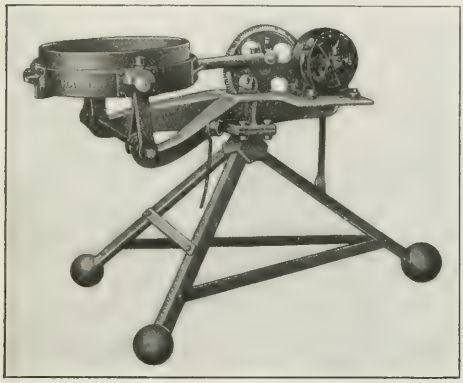
Fig. 9.—General View of the Rod and Wire Department

The Byron Jackson Iron Works, Inc., 351 to 355 Market street, San Francisco, with works at West Berkeley, Cal., is finding a good demand for centrifugal pumps for irrigation work. The company manufactures Jackson centrifugal and turbine pumps and Dubois gold dredgers and gold dredge pumps.

Hanna Electric Riddle Oscillator

Almost exact reproduction of the action of a molder screening sand by hand is claimed as one of the special features of a motor-driven oscillator for foundry riddles recently placed on the market by the Hanna Engineering Works, 2059 Elston avenue, Chicago, Ill. This action, it is pointed out, keeps the sand under a continuous motion which tends to clear the meshes of the screen to a great extent.

The general design and dimensions of the oscillator closely follow the small pneumatic tripod shaker of this firm. The construction is such that there is no dead center, and as a result there is no danger from undue



A Motor-Driven Oscillator for Foundry Riddles Made by the Hanna Engineering Works, Chicago, Ill.

shock or overload to the ⅓-hp. motor operating it. The screen holder can accommodate the ordinary 18-in. foundry riddle and has a quick-acting clamp device to facilitate removal. The oscillator is furnished with a motor wound for any of the ordinary types of electric current and is shipped complete with a switch, short piece of cable and a plug ready for attaching to the lighting circuit. The motor and the gearing are protected by a housing to prevent sand from being thrown into the working parts. It is claimed for this machine that it will screen all the sand which one man can shovel into the riddle, while another feature is that the proportion of core sand to the core compound or the core oil used is increased fully 50 per cent. and a better mixture secured than is possible by hand riddling.

Job Handling System

Details of the System Employed by the Triumph Electric Company

For keeping in close touch with each particular job that goes through the different departments of its shop a simple and satisfactory system is used by the Triumph Electric Company, Oakley, Cincinnati, Ohio. One of the especially good features of the system is that it prevents the foremen of the different departments from sidetracking important work in favor of easier and less important orders without consulting the superintendent. Three forms are all that are required by the system and these are the schedule card shown in Fig. 1, the record of shop promises, Fig. 2, and the tracer employed by the production department which is illustrated in Fig. 3.

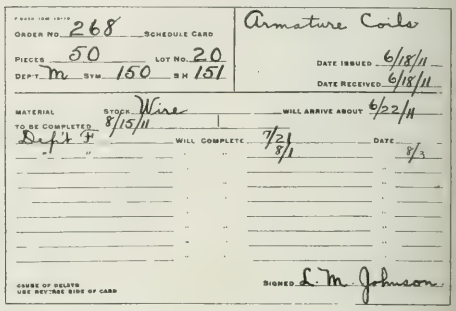


Fig. 1.—Schedule Card Used by the Triumph Electric Company, Oakley, Cincinnati, Ohio.

Report of Shop Promises

Date - July 1911

Department	Total No of Orders finished	Total Orders finished on time		Percentage of Orders finished on time, not held up by material or otherwise	Fall Downs	Due to own Dept.		% of Fall Downs Due to-			
		No	%	%	No.	No.	%	Other Dept	Material	Drafting Room	Eng. Dept.
A	[illegible]	244	86.52	99.64	38	1	2.63	1 2.63 Work more important 16 42.10	17 44.73	2 5.26	2.63
B	170	149	87.64	99.41	21	1	4.76	8 38.10 Work more important 4 19.05	3 14.28	Boring Mill in use 4 19.05	1 4.77
C	107	85	79.44	100.00	22	0	0	4 18.18 Work more important 10 45.45	4 18.18	Mistakes made by other dept 4 18.18	
D	88	43	48.86	93.18	45	6	13.34	26 57.78 Work more important 3 6.67	2 4.14	Mistakes made by other dept. 5 11.10	
E	82	82	100.00	100.00	0	0	0	0	0	0	0
F	[illegible]	45	72.58	95.16	17	3	18.23	2 11.82 Work more important 6 36.47	Repairing Press 3 18.23	Too much work ahead of Press 3 18.23	
G	[illegible]	7	100.00	100.00	0	0	0	0	0	0	0
Total	798	655	82.08	98.62	143	11	7.69	41 28.74 Work more important 39 27.27	Material 29 20.27		

Fig. 2.—Record of Shop Promises.

As soon as the orders are received by the company a copy of each is promptly sent out from the office to the production department clerk, together with a memorandum giving the desired shipping date. This clerk immediately assembles all the necessary parts or orders those which

are not already in stock and the unfinished materials are distributed to the foremen of the various departments which are to handle any of the work under the superintendent's supervision. The schedule card shown in Fig. 1 is made out in duplicate by this clerk after an estimated date of completion is obtained from the foreman of the first department handling the work. This foreman retains the original card until his department has completed the work. As soon as the work is completed by any one department the date upon which the piece is turned over to the next department is filled in in the space opposite the word Date. In case there is any delay the reason is noted on the back of the card and it is then sent back for the insertion of a second date, as shown in Fig. 1, and for investigation by the superintendent as to the reason. When the job is entirely completed the card is returned to the production department, where it is attached to the duplicate which has been retained while the work has been making the rounds of the shop and filed under the regular order number.

At the end of each month these cards are looked over and the report on shop promises illustrated in Fig. 2 is made up, a copy going to each foreman. This report shows the percentage of orders completed on time, together with the number of orders not completed on time, and the number and percentage of falldowns due to the different shop departments, lack of material, the drafting room and the engineering department, together with any explanations that are needed. This report shows the superintendent every month just how each department stands as far as production is concerned, and it is also said to be helpful in creating good-natured rivalry among the different foremen.

"D. C." TRACER.

Sales No. 268 Promise 9/11

Shop No.
Req. Issued
Order Issued
Order Returned

Description 2-5 h.p. 110 v 935 r.p.m. Generators

Let	PART	Dept	Purchase No.	Material Received	Issued To Shop	Promise	Finished
	Crown						
	Rim						
	Front Brackets	B	2682	8/22/11	8/22/11	8/15/11	8/30/11
	Back Brackets						
	Front Pedestal Caps						
	Back Pedestal Caps						
	Brush Yokes						
	Insulate Brush Yokes						
	Brush Yoke Brackets						
	Pole Shoes						
	Field Supports						
	Front Bearings						
	Back Bearings						
	Oil Rings						
	Poles						
	Pole Tips						
	Pole End Plate						
	Commutation Poles						
	Doors						
	Back Gear						
	Flexible Idlers						
	Shaft						
	Discs						
	Keys						
	Spider						
	Cones						
	Commutator Shells						
	Armature						
	Shunt Fields						
	Series Field						
	Comm. Pole Fields						
	Rails or Sliding Base						
	Brush Holders						
	Brush Holder Studs						
	Collecting Rings						
	Collecting Ring Ells						
	Coll. Ring Terminal						
	Mic. Adjustment						
	Mic. Adjus. Screws						
	Mic. Adjus. Brackets						
	Pos. Contact Board						
	Neg. Contact Board						
	Con. Bd. Terminals						
	Series Leads						
	Series Lead Terminals						
	Armature Leads						
	Assemble and Test						

Fig. 3.—Tracer Employed by Production Department.

The tracer kept by the production department clerk which is illustrated in Fig. 3 also forms a very useful part of the system. It is printed on sheets measuring 9¼ x 14 in., and punched for binding. This form is partly compiled from the schedule cards and refers only to materials that are not in stock and have to be ordered. These tracers carry the same sales number as the order number on the schedule card, and if any job is delayed reference to this sheet shows at a glance whether the delay was with the stock department or elsewhere.

This system enables the office to ascertain at all times the approximate date when any particular order will be ready for shipment by referring to the schedule cards. Where any part of the raw material is not in stock a glance at the tracer sheet will show when the material is expected or when delivered to the proper shop department.

Richard Honey, an American now resident in the city of Mexico, and who has been prominently identified with the iron industry of Mexico for nearly 40 years, has made a contract with the Department of Fomento of the Mexican Government which promises the establisnment of iron and steel works in that republic on quite an extensive scale. The concessionaire is to manufacture iron by the electric process and is to produce a minimum output of 1200 tons within two years after the signing of the contract. He is given the right to import free of duty all machinery and accessories needed for the establishment of the industry, buildings and electric apparatus. The duration of the concession is to be 10 years from the date of ratification of the contract by the Mexican Congress.

The American Institute of Mining Engineers

A meeting of members of the New York section of the American Institute of Mining Engineers will be held in the assembly room of the United Engineering Societies Building, 29 West Thirty-ninth street, New York, on the evening of September 22. Charles P. Perin, consulting engineer of the Tata Iron & Steel Company, Sakchi, Bengal, will deliver a lecture illustrated by lantern slides on "The Iron and Steel Industry of India."

The secretary of the institute has issued a notice that the adjourned annual business meeting of the society will be held at its headquarters in New York City September 20 for the purpose of giving formal notice of intention of proposed amendments to the constitution so that they may be acted upon at the annual meeting to be held on the third Tuesday of February, 1912. Among these proposed amendments is one which changes the name of the institute to "American Institute of Mining and Metallurgy."

The Electric Furnace Company is erecting a plant at Alliance, Ohio, for the purpose of testing out its electric furnace for heating bars, billets, etc., for the working of steel. It is incorporated under Ohio laws with an authorized capital stock of $20,000. Among those who are interested are Kenneth Seaver, chief engineer Harbison-Walker Refractories Company, Pittsburgh, Pa.; G. W. Shem, chief engineer Alliance Machine Company, Alliance; C. B. Hunt, sales manager and director Buckeye Engine Company, Salem, Ohio. T. F. Bailey, patentee of the furnace, is president and general manager; H. F. Bohecker, vice-president, is cashier of the Alliance Banking Company, Alliance; F. O. Humberger, Jr., Massillon, Ohio, is secretary and treasurer.

F. P. Smith & Co., Sharon Hill, Pa., manufacturers of hardware specialties, are giving particular attention at present to some new assortments of spring cotters which are put out for the automobile, hardware and agricultural trade.

The Lagonda Automatic Cut-Off Valve

A Device for Protecting the Boilers in Case of Accident

Using automatic cut-off valves to protect the steam line and the boiler in case of accident has been compulsory in France for a number of years and their use in this country has been recommended by various insurance organizations. These valves are designed first, to close automatically should a tube or any other part of the boiler give way, thus isolating the disabled boiler from the others or if a steam pipe should burst or a cylinder head blow out; second, to keep a boiler closed until its pressure equals that in the header, thus avoiding all accidents due to opening valves either through carelessness or incorrect steam gauges while there is a considerable difference of pressure, and third, as an added protection to a man working in a boiler when cold, since a valve of this nature prevents the possibility of turning steam into a boiler in which a man is working since the pressure in the header renders it impossible to open the valve. Recently the Lagonda automatic cut-off valve made by the Lagonda Mfg. Company, Springfield, Ohio, has been admitted to the Museum of Safety Devices which is maintained in the Engineering Societies Building, 29 West Thirty-ninth street, New York City, and up to the present time is the only one. This valve is built in two styles and a view showing the internal construction of the standard valve is given in Fig. 1, while Fig. 2 illustrates the low-down type which is intended for use on shipboard and in other locations where the headroom is limited.

This valve is of the double-acting type and works in either direction. Thus if a single tube in a boiler ruptures, or if a break occurs in the steam main between the boiler and the engine or in any part of the steam loop, all of the valves, it is emphasized, will close instantly, thus preventing the escape of any live steam. In action the valve depends upon the actual flow of steam and not upon the difference in pressures so that whenever an abnormal flow occurs in either direction the valve shuts at

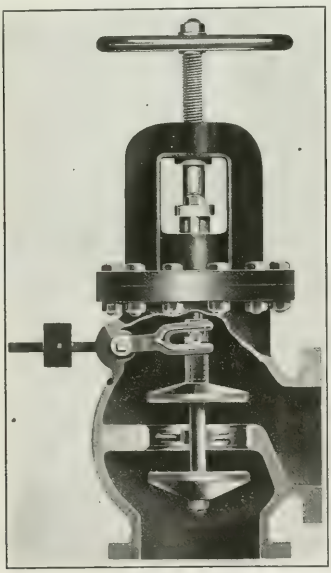


Fig. 1.—Interior View of the Automatic Cut Off Valve Made by the Lagonda Mfg. Company, Springfield, Ohio.

once. It is designed to take the place of the ordinary stop valve and if desired can be used as such, but it should not be confused with the ordinary single-acting non-return valve. One of the special features of this valve is



Fig. 2 Exterior View of the Low-Down Type.

that there are no internal working parts. The dash pot on the outside is designed to prevent chattering or too quick closing of the valve when sudden overloads occur. This feature is clearly brought out in Fig. 1, which is an interior view of the regular type of valve. The check disk in this valve is not attached to the valve stem which enables the valve to be used as an ordinary stop valve by screwing the stem down until it holds the disk securely on its seat.

Tests to show the reliability of the cut-off valve were made in Washington, D. C., before the Board of Supervising Engineers of the Department of Commerce and Labor. These tests showed that when an opening equivalent to a 1 5-16-in. outlet was made between the valve and the boiler the valve closed promptly. A quick-release valve was opened until it corresponded to an outlet of 1½ in. in diameter to show the action of the valve when a break occurred on the header side. In this case the steam pressure was reduced from 180 to 140 lb. and the rush of steam closed the valve in 2 seconds. To test the action of the valve under a sudden overload, the quick-release valve was opened as in the previous test, 30 seconds being required to perform the operation, and at the same time the pressure dropped from 180 to 190 lb. without causing the valve to close. These last two tests showed that the valve can take care of any unusual but, nevertheless, legitimate demand for steam and at the same time be sensitive enough to close quickly in case of accident.

These valves are built in a number of sizes for use with pipes ranging from 3 to 12 in. in diameter and a special style designated as the low-down type illustrated is made for use where the head room is limited as is the case on shipboard. The dash-pot and the weight provide a means for adjusting the valve to suit the special steam pressure and overload conditions of any particular installation.

The Triumph Electric Company, Cincinnati, Ohio, intends to increase the length of its main machine shop by 300 ft., making a total length of 800 ft., and to build six ells at right angles to this. The plans for the new work have not as yet been made, and some little time may elapse before the extension is in hand. In the past year the company has developed new lines as follows: Alternating generators, of both belted and engine type, three wire generators, transformers and fractional horsepower motors. The company finds business very satisfactory. June was the biggest month in its history. The aggregate for the first six months of 1911 was 15 per cent. greater than for the corresponding period of 1910, notwithstanding the fact that the business of 1910 was 33 1-3 per cent. greater than the average of the previous 10 years.

The Twisting of Reinforcing Bars

Machines at the Mill of the Inland Steel Company

The Inland Steel Company, Chicago, has come to be one of the largest factors in the tonnage of reinforcing bars for concrete construction in the Western territory. Thus far one end of its continuous bar mill at Indiana Harbor, Ind., has been the only overflow capacity available outside of its Chicago Heights works. The accompanying illustration shows two of the twisting machines, built by the Mesta Machine Company, Pittsburgh, and installed in the continuous bar mill. So many different lengths are required in reinforcing bars that the 60-ft. pieces in which they are rolled cannot be sheared with any uniformity, the result being that the sheared ends tend to accumulate until they can be worked in. To accommodate itself to the increasing tonnage and to provide more adequate facilities for handling the stock, the Inland Steel Company will begin construction at once of an additional 100 ft. at the south end of the bar mill, providing 10,000 sq. ft. of floor space to be used exclusively for reinforcing bars.



Machines for Twisting Bars at the Mill of the Inland Steel Company, Chicago, Ill.

Molybdenum Steel from the Electric Furnace

Some experiments made on a small scale as thesis work in the Colorado School of Mines by E. T. Dittus and R. G. Bowman were described in the paper read at the meeting in Toronto of the American Electrochemical Society, September 21 to 23. The investigations were in general qualitative rather than quantitative, so it is emphasized that experiments will be necessary to determine the loss and distribution of molybdenum and also to ascertain what proportions of sulphur are removed by the ferrosilicon and the slag. The conclusions of the authors are as follows:

Molybdenum steel can be made in the electric furnace by the direct reduction of iron ore and the addition of molybdenum in the form of molybdenite MoS_2.

Molybdenum steel of low sulphur content can be produced from molybdenite by the use of ferrosilicon as a desulphurizer.

Molybdenum steel of low sulphur content can be produced from molybdenite in the form of low grade concentrates by the use of ferrosilicon as a desulphurizer.

With regard to the design of a furnace for small scale operations, the experiments indicate that: The Girod principle as used was superior to the Heroult; a tilting furnace would be more effective than a stationary furnace; the tap hole on a stationary furnace should be made short, with a steep inclination; ample provision for heating the tap hole should be made; tar does not make a satisfactory binding material for crushed magnesite.

Root & Van Dervoort Factory Expansion

The Root & Van Dervoort Engineering Company, East Moline, Ill., is adding materially to its manufacturing capacity. The following buildings are under construction: An addition to the present foundry, 70 x 150 ft.; an assembling building, 85 x 258 ft., one story, brick construction, block floor, lantern roof, equipped with electric crane; a test and painting building, 70 x 375 ft., of which 225 ft. will be for painting and 150 ft. for testing, one story, brick construction, with basement and floor of concrete, lantern roof design, except the north side, also equipped with electric crane.

The company doubled its output the past year and hopes that with these new buildings and the additional equipment it will be able to more than double its present production. Orders have been given for the necessary automatic screw machines and other automatic machinery as well as lathes, grinding machines, etc., to equip the machine shop fully.

This company manufactures gas and gasoline engines in the medium sizes. Besides its regular line, or what the company terms its volume governing as well as hit-and-miss line of engines, it has just brought out a new line of hit-and-miss engines which is named the Triumph line. This new line has been brought out to meet the great demand for a lighter and faster running engine of the same power as the company's older line at a cheaper price. It will be well understood from the above that the company considers its prospects for the future very bright.

An affiliated company, whose plant adjoins the engine plant, is the Moline Automobile Company. It has the same officers and managers. Its entrance in the automobile field occurred in 1904, when the manufacture of the Dreadnaught Moline was begun. Motor cars built by this company have won a remarkable number of trophies for economy and endurance runs.

William J. Linton, manufacturers' agent, 136 Liberty street, New York, is now selling agent for the Badenhausen safety water tube boiler, which is built by the New York Shipbuilding Company, Camden, N. J., J. P. Badenhausen, advisory engineer. This boiler can be furnished in capacities from 100 hp. up to 1000 hp. in single units. No cast-iron parts, hand-hole plates, gaskets, dogs, nuts or stay bolts are used in its construction. It is capable of being forced to almost any degree, one installation having been operated at 250 per cent. of normal rating for 24 hours per day for over one year without detriment. Mr. Linton reports his power equipment business of the past month as having been very good. He has just closed for one 50-kw. and one 60-kw. direct connected units and one 600-hp. cross compound condensing Corliss engine, including condenser and pumps.

The Cost of Southern Pig Iron

Recent references in our columns to the cost of Southern pig iron, showing that the conditions in the Southern pig-iron trade are far from being satisfactory to producers, have brought out some interesting correspondence. From a gentleman whose connections are such that he is exceedingly well informed with regard to the subject, we have received the following:

"Throughout the South generally the iron makers are in distress. Conditions are particularly acute in Virginia. There prices have fallen far below the cost of production. The iron makers in the States of Alabama and Tennessee also, with only a few exceptions, are finding it impossible to make both ends meet. There has been in the past five year a great advance in freight rates on Southern iron—a full dollar in all cases. Some years ago the rate per ton from Birmingham to Cincinnati was $2.25, as against $3.25 today. This increase in freights, coupled with the building of many more furnaces in the North, has fearfully circumscribed and restricted the territory where Southern iron is on a really competitive basis. For example, take a town as near the Ohio River as Dayton. The choicest No. 2 Northern foundry costs the buyer there today $14.15. On the basis of $10.50, Birmingham, for No. 2, the Southern product would cost $14.20 f. o. b. Dayton. There used to be enormous quantities of Southern iron sold in Pittsburgh, Cleveland and Buffalo. Now the Southern iron sold there is practically a negligible quantity. It is all very well for Congressman Underwood to boast over the Woodward Iron Company's record, but there are very few ironmasters in the South who are jubilant over either the past or the future. In fact, the record of at least seven out of ten of the Southern furnaces is a record of exhausting natural resources with no adequate return."

Another correspondent, writing on the same subject, says: "There are two very queer conditions to me at present. The first is that we hear no talk about reduction of miners' or furnace workers' wages, although it is admitted that $10, Birmingham, for No. 2 foundry is exceedingly dangerous to fool with. The second is that there is no agitation on the part of furnace owners to secure a reduction in the freight rate on pig iron to the North. If the same rate of freight was made on Southern iron now that has prevailed heretofore when it was selling on the basis of $10, Birmingham, for No. 2 foundry, and $9 or less for gray forge, there would be a considerable reduction in the freight rate and we would be allowed to move our stocks North. Years ago the freight rate from Birmingham to Cincinnati was $2.25 per ton, based on $12 per ton for gray forge at Birmingham. The railroads are getting $3.25 now from Birmingham to Cincinnati, and the price of gray forge is but $9, Birmingham. One of two things must happen—either consumption must increase, and under the laws of supply and demand Southern pig iron advance, or wages and freight rates must decline, if Southern furnaces are going to be able to keep in blast."

Customs Decisions

Steel Rods

Thomson & Stacy, Inc., failed before the Board of United States General Appraisers to substantiate their claim for a reduction in the duty assessed by the collector on merchandise invoiced as "round bars." The articles consist of rods about ¼ to ½ in. in diameter and about 13 to 18 ft. in length. Duty was assessed at the rate of 6/10 of 1 per cent a pound as "iron in rods." It was claimed that the merchandise should be granted entry as "wire rods" with a duty of only 3/10 of a cent per pound.

The testimony in the case shows that the rods are used in the manufacture of bedsteads. Judge Fischer says that the evidence, while it establishes that the rods are steel rods and not iron, does not show that they are "wire rods." He says in his decision for the board that it is evident that the article in question may be a rod and not necessarily a "wire" rod. The decision says that if it were a wire rod the fact that it was iron and not steel, or steel and not iron, would be of little importance as the provision in paragraph 134 of the present tariff act includes iron as well as steel wire rods. The General Appraiser states that the only claim raised is that the goods are subject to duty as wire rods, and this, the decision holds, fails for lack of proof. The protest is accordingly overrruled.

Iron Drums

The board has sustained a protest filed by Robert B. Ways relating to the classification of iron drums containing permanganate of potash. The drums were assessed separately from their contents at the rate of 30 per cent ad valorem as "unusual" coverings. It was claimed by the importers that the drums are dutiable at the ad valorem rates applicable to their contents. This claim General Appraiser Fischer sustains and directs the collector to make a reliquidation in harmony with the finding of the board.

The board has taken adverse action on a protest filed by James Garcia concerning the classification of iron drums used in the transportation of linseed oil. The drums were returned for duty as "unusual" coverings, whereas the importers maintained that they are the usual containers for this class of merchandise. Judge Fischer denies the contention of the protesting firm, and holds that the drums in question are of such a substantial kind that it is possible to use them for other purposes after they have been emptied of their original contents.

Arnold, Hoffman & Co. and other importers scored a customs victory when the board handed down a ruling relative to the classification of iron drums which were assessed at the rate of 30 per cent ad valorem as "unusual" coverings. The importers set up the contention that they are the "usual" coverings for the merchandise which they contain. It was agreed that either free entry should be granted or, in lieu of that, that the coverings should be allowed to enter at the same ad valorem rates as their contents. The protest for free entry is sustained.

While the present tariff act, that of 1909, was framed with the intention of doing away with the numerous controversies arising under the Dingley act of 1897, the legislation enacted by Congress does not appear to have been successful in eliminating litigation on the point of iron drums used as containers. The Illinois Central Railroad Company, one of the many litigants, succeeded in securing free entry for such coverings used for the transportation of bleaching powder, but at the same time the board denied the company's contention for the free entry of iron drums used as containers for peanut oil. The board has sustained claims filed by several importers regarding the classification of drums used in the transportation of various chemicals on the ground that the coverings are unfit for use after their contents have been removed. It has taken unfavorable action on protests affecting drums imported by C. H. Wyman & Co., John L. Vandiver & Co., F. B. Vandegrift & Co., Read, Holliday & Co., William F. Jobbins, Inc., John H. Boden & Co., Inc., and others.

Nut Washers

The board, after a request by the government for a rehearing in the matter of the classification under the tariff act of 1909 of so-called nut washers, has again decided the controversy in favor of the importers of automobile supplies. This action virtually settles the question during the life of the present tariff. The government alleged that the articles are dutiable at 45 per cent. ad valorem under the provision in the law for "manufactures of metal." On the other hand, the Motor Equipment Company and Jacob Friedenberg maintained, as was done in the earlier test case, that the articles are taxable as "nuts" or "washers" at ¾ of 1 cent a pound. These articles are an improved kind of washer, so arranged by a special device that it is impossible for the nut to slip off after it has been adjusted. The government sought to prove that they are commercially known as "nut locks" and not as "washers." Judge Fischer says that there is no provision in the existing tariff for "nut locks," and that as the board views the record it fails to prove the government's contention. Among the witnesses called by the government were William C. Dodd, president of the National Lock Washer Company; John B. Ress, general manager of the Positive Lock Washer Company, and Fred S. Sayre, of the same concern.

Wanted.—The Circulation Department of *The Iron Age* desires to secure a copy of the issue of May 22, 1902, including the Supplement sent out with that issue.

The La Belle Iron Works

Annual Report for Year Ended June 30, 1911

The La Belle Iron Works, Steubenville, Ohio, has issued its annual report, covering the operations of the fiscal year ended June 30, 1911. The income account makes the following showing as compared with the previous fiscal year:

	1911.	1910.
Net profits	$1,424,108	$2,167,585
Interest on bonds	131,955	137,895
Balance	$1,292,153	$2,029,690
Dividends	991,515	892,339
Surplus	300,638	1,137,351
Previous surplus	2,950,569	2,063,218
Total surplus	$3,251,207	$3,200,569
Appropriation for depreciation	250,000	250,000
Surplus	$3,001,208	$2,950,569

The general balance sheet, as of June 30, compares as follows:

Assets.

	1911.	1910.
Property account	$11,658,021	$11,579,315
Sinking fund	6,500	3,500
Deferred charges	19,238	14,397
Inventories	3,492,153	3,117,452
Bills and accounts receivable	1,063,238	1,722,006
Cash	1,306,151	941,423
Total	$17,545,301	$17,378,093

Liabilities.

Capital stock	$9,915,400	$9,915,400
Bonded debt	2,164,500	2,260,500
Wages, taxes and royalties accrued	250,186	251,897
Accounts payable	265,450	289,928
Accrued interest	16,985	18,995
Depreciation and other reserve funds	1,931,572	1,690,803
Surplus	3,001,207	2,950,570
Total	$17,545,301	$17,378,093

The report states that the company's ore properties were operated on a basis only sufficient to supply such tonnage as was required by the Steubenville furnaces, the total production for the year being 252,899 gross tons, or 36 per cent. less than for the previous year. Owing to the prevailing low price of coke, and the fact that no advantage would accrue to the company by its operation, its Fayette County coke plant was kept closed practically the whole of the year, conserving to this extent the company's coking coal deposit for future use. The demand for the company's products not being such as to permit of full operations during the greater part of the year, production in most departments shows a considerable curtailment over that of the previous year, the comparison being as follows: Pig iron, 228,425 gross tons, an increase of 9 per cent.; billets and slabs, 264,970 tons, a decrease of 24 per cent.; finished goods, 347,498 tons, a decrease of 10 per cent. The average number of workmen employed during the year was approximately 3500, the pay roll aggregating $2,869,738, as against $3,095,507 for the previous year. The aggregate value of the shipments for the year was $10,378,279.00, showing a decrease, when compared with the previous year, of about 24 per cent. Not only was there a decrease in the tons shipped, but in the amount per ton realized as well.

President Isaac M. Scott adds:

The unsatisfactory business conditions referred to as existing at the time our last report was made not only continued throughout the twelve months just past but became more pronounced as the year advanced. Not only was there a less active demand for all kinds of steel articles, but the average price per ton realized shows a very material decrease when compared with the previous year's results. Therefore, the company was confronted with a slack market and lower prices, enjoying no compensating advantages in the way of lower labor rates.

A large part of the falling off in demand can be attributed to the slow condition of the car building trade, brought about by the disinclination on the part of the transportation companies of the country to buy much-needed equipment; and as a very considerable tonnage of the company's production has heretofore gone into this channel, the loss of the business referred to left a shortage which it was impossible to make up through other sources.

It was the aim of the company to hold, so far as possible, such trade as rightfully belonged to it, and, all things considered, it would appear that this was accomplished, but inasmuch as there was not sufficient tonnage to go round, this company, as well as others engaged in the same line of business, was compelled to submit to a curtailment of operations.

Owing to the fact that so many things have happened, and are happening, of a nature tending to disturb the purchaser, it is difficult to form an intelligent opinion as to what might be expected in the near future, or when buying will again be resumed on what may be termed a normal basis. Underlying conditions still remain sound, and sooner or later the transportation companies must come into the market as buyers on a large scale, but, until this comes about, no real improvement in the steel business can reasonabiy be expected.

A Slocomb Tool Store in New York

Dealers in and users of small fine tools will be interested to know that the J. T. Slocomb Company, Providence, R. I., has established a store in New York City. This store is located at 126 Chambers street, and A. Z. Boyd is the manager. Mr. Boyd has a wide acquaintance with the hardware dealers in that vicinity inasmuch as he represents a number of well-known tool manufacturers.

The J. T. Slocomb Company has been manufacturing for a number of years a very superior line of small tools. Its micrometers are of a style of their own, having a flat frame and varying from the general pattern by having the decimal equivalent in raised letters instead of stamped into the frame. The general line of these micrometers is of the I-beam construction and black enameled. The black enamel not only gives them a handsome appearance but also serves as a non-conductor of heat which, of course, has a tendency in the use of such tools as these to make the micrometer measurements more uniform when having them in the hands quite constantly. All sizes to 6 in. inclusive are drop-forged from high grade bar steel and these are solid frames. The larger sizes are made from steel castings and these frames have holes through them, which helps considerably in their use, making a convenient way of holding them but being more attractive because of the lightness of the tool itself. The tool is made in all sizes to 24 in. inclusive for outside dimensions.

The company also manufactures a screw-thread micrometer, a comparative screw-thread micrometer, a micrometer for measuring flutes of taps or drills, tube micrometers, micrometer heads and quick-acting micrometers. It also takes these different sizes and makes them up into sets which are very useful in factories. It further manufactures reference discs, end measures, inside micrometers, and hight and depth gauges. One of the most important items which it makes is the line of combined center drills. The Slocomb Company was the first to put these on the market as a commercial product and it is enjoying an excellent business in them, due to the fact that a great deal of attention has been paid to making a tool which would give an exceedingly large amount of service.

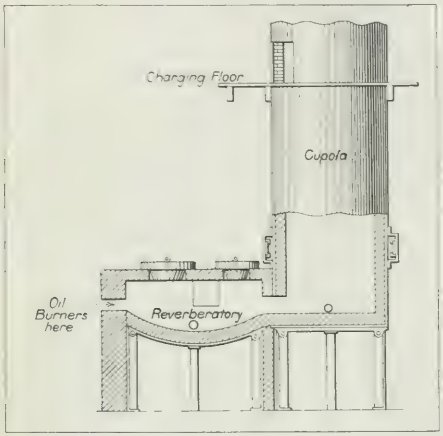
The Slocomb Company has lately done considerable to improve the attractiveness of its tools and felt that there was an opportunity to take care of the trade which it enjoys in New York City by having a store from which the dealers can draw to advantage. A catalogue is issued by the company covering the line of tools made.

The Brown-Ketcham Iron Works Failure.—More light has been thrown on the cause of the failure of the Brown-Ketcham Iron Works, Indianapolis, Ind. A former paymaster has been arrested, charged with embezzlement, has made confession, and the shortage is placed by the receiver, Frank B. Salnaker, at something over $10,000. It will be recalled that a former auditor of the company was arrested some time ago, also charged with embezzlement, the amount being placed at $60,000. The paymaster's method was the old one of padding the payroll. A peculiar feature of the case is that the company's books were examined regularly by a Chicago auditing company. While further examination of the affairs of the company is being made the works are closed. The plant is one of the best-equipped in the country, and whatever may be the outcome of the present trouble, it is believed that there will be a purchase or a reorganization that will result in the continuation of the business.

Cupola and Air Furnace Combined

Utilizing Borings and Turnings in Melting Iron

A combination of the reverberatory or horizontal air furnace and the ordinary vertical cupola is in use at the foundry of the Holland-Domschke Foundry Company, Norman avenue and Monitor street, Brooklyn, N. Y., where among other things what are known as unit window sash weights are manufactured. The combination has been patented by Timothy Holland, president of the Holland-Domschke Company and founder of the Holland Radiator



A Combined Air Furnace and Cupola Patented by Timothy Holland, Brooklyn, N. Y.

Company, now a part of the American Radiator Company. While the activities of the company are directed to a considerable extent to the production of the unit window weight, it is the intention to install the combination Holland cupola as widely as may be possible throughout the country. Incidentally it may be mentioned that the sash weight is one made in a few sizes, so that any desired weight may be obtained by combination of two or three sizes, minimizing the stock which the dealer in such supplies needs to maintain.

The accompanying sketch has been prepared to outline the arrangement and mode of operation of the Holland cupola. As used at the Holland-Domschke plant, the vertical cupola is charged in the usual way and the iron may be drawn from the cupola in part, leaving the remainder to flow into the reverberatory or air furnace. Oil fuel is used in the latter and of course a close degree of control may be had over the oil-burning flame in the heating and purification of molten metal in the reverberatory. Into the molten mass in the reverberatory the finely divided particles of metal, such as filings, borings and turnings are added. When the attempt is made to utilize them in the vertical cupola, the metal granules are of course carried away by the blast or to a large extent quickly oxidized.

The heated gases from the reverberatory are conducted to the cupola, as indicated, so that a maximum utilization of the heat generated is regarded as accomplished with a resultant increase in melting capacity, as the plant in Brooklyn has shown. It has also been found that the use of the fine steel scrap has produced a soft steel from the reverberatory. The slag from the cupola passes into the reberberatory on top of the molten iron, andthe purifying quality of the floating slag is regarded as a highly satisfactory feature of the cupola operation, while incidentally it is kept in a liquid state, facilitating its removal.

When all the metal from the cupola is drawn through the reverberatory furnace, itis emphasized that a higher grade product will be obtainable than would otherwise be the case, and this procedure is intended to be the normal operation. Arrangements can be made for using other forms of fuel than oil for the reverberatory furnace and the blast can be preheated slightly by locating the air pipes in close enough proximity to the furnace to absorb heat of convection and radiation from the furnace. It is claimed also that owing to the economy of heat and the control of combustion and the fact that supplementary purification can be obtained in the reverberatory, coal and gas-house coke can be employed in the cupola. Emphasis is also placed on the large reservoir for hot metal created by the combined floor of the cupola and the reverberatory furnace, this fact minimizing the danger of overflow and as already stated, allowing for satisfactory control of the slag.

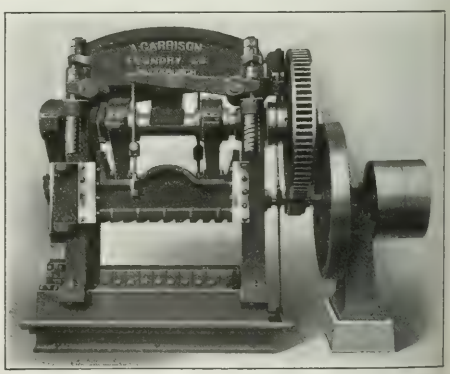
The charging of the fine material, of course, takes place at the top of the reverberatory. Downward application of the heat and blast is, of course, counted on to bring the small particles into a mass and protect them from the oxidizing action of the blast.

The long-time identification of Mr. Holland with the founding and melting of iron lends the proposition more than ordinary interest. Aside from the opportunity of turning out iron of high grade, it is felt that the special value of the furnace lies in its accepting the low-cost material which borings and turnings constitute and turning out even pig iron at a profitable price, not to mention the direct conversion of the cupola product into commercial shapes.

Double-Crank Forging Press

Recently the A. Garrison Foundry Company, Pittsburgh, Pa., has completed and shipped to England a 110-ton double-crank, spring-balanced forging press that possesses a number of new features. The machine is adapted for a wide line of forging work, including the forming of hammer heads, pick eyes, hatchets and the general line of forgings handled by makers of mining supplies, agricultural implements, etc., although in the accompanying engraving it is shown equipped with a special set of die holders. One of the special features of the press is an entirely new design of counterbalance. The strains to which the housings are subjected are taken by through bolts and the caps are cast in one piece, an arrangement which facilitates the easy removal of the crankshaft. When presses of this character are equipped with dies the moving parts are comparatively heavy, and since the machines are speeded up as much as possible when handling piece work the cross head must of necessity be provided with a counterbalance.

Adjustable rods connect the cross head to two levers, one of which is shown extending across the press above the shaft in the accompanying engraving. Each of these



A 110-Ton Spring Balanced Forging Press Built by the A. Garrison Foundry Company, Pittsburgh, Pa

levers is keyed to a short shaft, running through the cap, and the end of the shaft to which the rear lever is connected is shown at the left of the engraving, while the shaft to which the front lever is connected is clearly visible. Each of these levers has an extension straddling a rod by which a heavy coil spring is compressed as the crosshead descends. Four of these springs are used in all, two being attached to each housing. One lever controls the springs in each housing operating the one on the

opposite face through an extension of the short cross shaft already mentioned, as illustrated on the left housing. The design of these springs is such that when the cross head is at rest at the top of its stroke they are fully extended and consequently are subjected to comparatively little tension. When the automatic steel crab clutch is thrown in the cross head and its attached parts alone are started instead of both the cross head and an equally heavy counterbalance, which is the usual method. In this way out the blow upon the clutch at starting is greatly reduced, with a consequent increase in the life of the clutch and the gears. Another feature of this arrangement is that it is not necessary to use a brake.

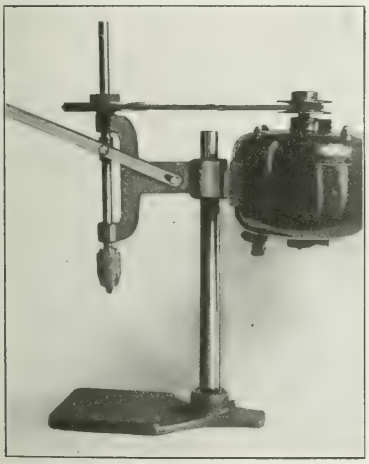
The following table gives the principal dimensions and specifications of the press.

Distance between housings, in.	54
Maximum distance between bed and crosshead, in.	27
Stroke, in.	6
Pressure exerted, tons	110
Approximate weight of press, lb.	31,000

This press can be supplied either with or without an outside trimming shear or auxiliary press and can be fitted with a friction clutch placed on the pinion shaft instead of the mechanism illustrated.

Motor-Driven Bench Drill.

A tool designed to meet the demand from light metal workers, model makers and amateurs for a bench-drilling machine capable of taking ¼-in. and smaller drills, illustrated herewith, has been built by the Willey Machine Company, Jeffersonville, Ind. The spindle has a travel of



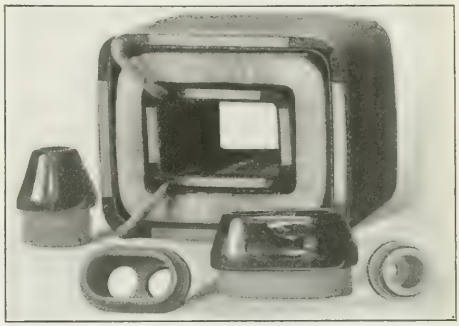
Motor-Driven Bench Drill Built by the Willey Machine Company, Jeffersonville, Ind.

3 in. and the sliding head a movement of 7 in. on the column. The speed of the spindle is 1000 r.p.m. and the motor capacity is 1/20 hp., furnished for direct or alternating current. The weight of the machine is 30 lb. The maximum size of hole drilled by this tool is approximately ¼ in.

The next annual meeting of the Society of Automobile Engineers will be held in New York City on January 18, 19 and 20, 1912, during the Commercial Vehicle Division of the Automobile Show at Madison Square Garden. Papers of unusual interest will be presented and discussed as well as reports of the standards committees, and officers for the ensuing year will be elected. A trip of the members of the society will be made to Europe this fall, the party leaving this side of the water for England about November 1. The first few days in England will be spent in examining the exhibits of the automobile show which will then be in progress at Olympia, London. The visiting engineers will be entertained by the Institution of Automobile Engineers, which is the corresponding English society. An interesting programme is being arranged.

Improved Westinghouse Transformer

At the time the type S transformer was placed on the market about three years ago by the Westinghouse Electric & Mfg. Company, East Pittsburgh, Pa., it was thought that the last word in the design of single-phase distributing transformers had been spoken. The improvements made in existing design at that time consisted principally of an entirely new shell type of magnetic circuit in which a low



The New Type S Transformer Built by the Westinghouse Electric & Mfg. Company, East Pittsburgh, Pa.

magnetic reluctance was obtained without increasing the mean length of a turn of the coil winding. This improvement enabled silicon steel to be employed for the magnetic circuit and resulted in increased efficiency, better regulation and a reduction in the amount of current employed for excitation.

Recently, however, this type of transformer has been brought to a higher state of development and several marked changes have been made. These have been along the line of improved material and better mechanical design rather than any improvement in the electrical construction. One of the features receiving attention was the insulation, as the life of a transformer largely depends upon this point. The insulating materials now employed, it is emphasized, are of better quality both electrically and mechanically considered, with the result that a further increase in the efficiency and a reduction in the amount of exciting current has been secured. Formerly the 7½-kva. type S transformer had an iron loss of 62 watts and a copper loss of 125 watts and these figures have now been reduced to 57 and 110 watts respectively. The exciting current has been reduced ½ per cent and the regulation improved. A very uniform temperature is maintained throughout the entire transformer and under normal conditions the temperature rise does not exceed 50 deg.

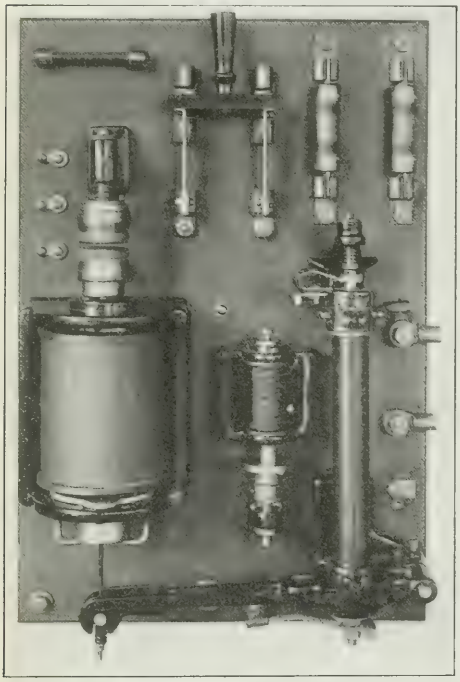
In conjunction with the insulation improvement the high-tension coils have been subdivided still more to reduce the voltage between adjacent layers of the windings as well as between coils and relieve the strain on the insulation. To prevent grounding to the case as a result of the collection of dust between the bushing and the case and to prevent siphoning of the cooling oil from the case, slight changes have been made in the terminal bushings, one and two-hole bushings being illustrated in the lower part of the accompanying engraving. The transformer leads consist of very flexible weatherproof cable which meets the rigid new requirements of the National Board of Fire Underwriters, the wires being insulated with rubber of a grade that would deteriorate very slowly if exposed to the weather, while as a further protection a braid covering is added.

The International Oxygen Company has removed its New York headquarters from 68 Nassau street to 115 Broadway, where increased facilities have been secured for transacting its steadily growing business. The new location is especially well fitted for the company's needs and easy of access, for parties coming into New York City who may desire to investigate the methods of its system of oxygen and hydrogen manufacture for commercial purposes. The success of the system, since its introduction into this country a few months ago, would indicate a continued increase in the company's business.

Allen-Bradley Motor Starters

To protect motors from the bad effects of accelerating too rapidly apparatus has been developed by the Allen-Bradley Company, Milwaukee, Wis., to prevent an excessive inrush of current through the armature. This new line of direct-current electric motor starters is designed for automatically starting shunt, series or compound motors, and is especially adapted for starting motors under a heavy load. These starters are built in sizes ranging from 1 to 150 hp., and for use on direct-current circuits where the voltage is either 110, 220 or 550 volts. One of the special applications of the starters is for pump work where they are used in connection with float switches or with air compressors or any similar service where the motor operates between two fixed limits.

The motor is started by simply closing the line switch and the starter will automatically accelerate the motor and its load and bring them up to full speed. The operator is not called upon to exercise either skill or judgment,



The Type Z 20-Hp. Automatic Motor Starter Made by the Allen-Bradley Company, Milwaukee, Wis.

even though there is a very heavy load upon the motor when it is started. The device employs the Allen-Bradley carbon compression resistance which was illustrated in *The Iron Age*, September 22, 1910. The resistance is secured through the imperfect contact between the surface of prepared graphite disks, which are stacked within an insulated metal tube. These disks are constantly in more or less intimate contact with one another and the more perfect the contact the lower is the resistance, while by varying the pressure applied to the column of disks it is possible to adjust the resistance throughout a wide range. The insulated steel tube containing these disks has the necessary terminals and plungers for transmitting the pressure to the disk. These disks, it is pointed out, are well adapted for this class of service, since they will not crush or break, are not affected by any temperature changes that they have to encounter, cannot fuse into a solid mass, will not corrode and do not deteriorate in service.

In operation when the main switch is closed current flows through the fuses, the resistance unit, the current relay and the motor armature. Simultaneously with the closing of the main switch the solenoid circuit which is connected directly across the line and consumes only a small fraction of ampere is closed, and the plunger of the solenoid is drawn up. This subjects the disks of the resistance unit to pressure and increases the current in the motor circuit to the predetermined value at which the current relay is set. When this point is reached the current relay operates and opens the solenoid circuit, which permits the plunger to drop back slightly. This action increases the resistance in the motor circuit by decreasing the pressure on the disks of the resistance unit, and this increase in the resistance of the circuit lowers the current enough to permit the relay to close again. As the motor accelerates this operation is repeated, and each time the plunger is drawn a little further into the solenoid until the short-circuiting contacts on the top are forced together. This short circuits the current relay and the resistance unit, rendering them inoperative and completing the operation of starting the motor.

It will be noticed that in starting the motor with a device of this character the current is always kept down to a certain predetermined value which it is emphasized eliminates any possibility of the motor becoming overloaded by too rapid starting. The current relay is calibrated in amperes, and may be set to suit existing conditions. One of the special features of this device is the absence of any face plates, sliding contacts or dash pots with the accompanying trouble and expense for renewals. In this device, too, it is pointed out that all delicate adjustable parts to regulate the acceleration of the motor have been eliminated, the time element in starting being controlled automatically and directly by the load.

These starters can be furnished without the line switch, which enables it to be placed in the most convenient location to meet the requirements of any special case, or if desired, the main line switch shown in the accompanying engraving can be replaced with a solenoid switch operated by a push button. McCoy & Brandt, 410 House Building, Pittsburgh, Pa., are the local agents for Pittsburgh and vicinity.

Important Westinghouse Electric Contracts

The Westinghouse Electric & Mfg. Company, East Pittsburgh, Pa., has secured from the Bureau of Yards & Docks, Navy Department, a contract for furnishing and installing a complete equipment consisting of motors and control apparatus for two large electrically operated pumps, for dry dock No. 2, at the United States Navy Yard, Norfolk, Va. This equipment is to replace engine-driven pumps installed some years ago with a view to making the operation of pumping much more economical. There will be two centrifugal pumps, each having a discharge opening of 42 in. in diameter and each driven by a Westinghouse 300-hp., type HF induction motor. There will also be one smaller pump, having a 15-in. discharge and driven by a 65-hp., type CCL induction motor, and in addition a small bilge pump with a 3-hp. motor. The pumps are being built by R. D. Wood & Co., Philadelphia.

The United States Reclamation Service has recently ordered from this company for installation on the Boise project, Idaho, three 625-kva., 22,000-volt, three-phase, air-blast type transformers. The government has installed on this project a hydroelectric power plant for furnishing energy to motor-driven pumps used for irrigating purposes. As the irrigation season occupies only the summer months, the plant will be kept in part operation during the winter for the purpose of supplying light to farmers and to the small towns on the project.

The company also received a contract recently from the United States Quartermaster's Department for furnishing the necessary transformers, wattmeters and switchboards for the army post located at Fort Bliss, Texas, and at the Angel Island recruit depot near San Francisco. The post is to have an electric lighting system installed, energy being purchased from the local electric power company. The company has further recently furnished two 75-kw., direct-current, engine-type generators for installation in the McKinley Manual Training School at Washington, D. C. This school is under the direction of the commissioners of the District of Columbia. The order represents an addition to the plant already installed in the school which consists of a Washington direct-current generator.

Judicial Decisions of Interest to Manufacturers

ABSTRACTED BY A. L. H. STREET

Risk Assumed by Employee.—An employee injured by angle bars falling from a truck while he was assisting in moving it assumed the risk of the bars falling on account of the failure of the employer to provide standards on the truck, he having as full opportunity as anyone to know whether the bars were piled too high to be safely hauled, though the foreman ordered plaintiff and his fellow employees to pile on more bars after they thought the truck had been sufficiently loaded. (West Virginia Supreme Court of Appeals, Chandler vs. American Car & Foundry Company, 71 Southeastern Reporter 387.)

Duty to Warn Employee Against Dangers.—An employer must warn a workman against concealed dangers, especially where the latter is inexperienced. (United States Circuit Court of Appeals, Second Circuit, Zulkowski vs. American Manufacturing Company, 185 Federal Reporter, 42.) The employer must not also warn against dangers, but must instruct as to how they can be avoided. (Pennsylvania Supreme Court, Kearns vs. Carnegie Steel Company, 79 Atlantic Reporter, 575.)

Duty to Provide Safe Place to Work for Employees.—A foundry company engaged to erect an appliance for a railroad company is not relieved from duty to an employee to use ordinary care to provide a safe place to work for him because it has no control over the premises. (Missouri Supreme Court, Clark vs. Union Iron & Foundry Company, 137 Southwestern Reporter, 577.)

Liability for Injury to Machinist.—A machinist cannot recover for injury received through a piece flying from the head of a chisel which he was using, where he selected it from a number reasonably safe and knew that he could get safe ones on application. (Texas Court of Civil Appeals, Pope vs. Railway Company, 135 Southwestern Reporter, 1066.)

Risks Not Assumed by Employee.—An employee does not assume an extraordinary risk of injury arising from the use of a machine, such as a lathe, unless he remains at work after comprehending the danger. (Connecticut Supreme Court of Errors, Baer vs. Baird Machine Company, 79 Atlantic Reporter, 673.)

Liability for Injury to Foundry Employee.—A foundry company is not liable for injury to an employee caused by a fellow employee throwing molten metal on wet sand and thus creating an explosion; the sand having been dampened by rain leaking through a roof. (Alabama Supreme Court, Jones vs. Union Foundry Company, 55 Southern Reporter, 153.)

Liability for Injury to Bridge Construction Employee.—A bridge construction employee ordered to go upon a partly suspended section to release a foul, and injured through the section falling into place because not held by the cable, has the right to assume that the cable was taut or that he would be notified to the contrary. (New York Supreme Court, Second Appellate Division, McGlynn vs. Pennsylvania Steel Company, 129 New York Supplement, 45.)

Liability for Injury to Minor Employed in Violation of Statute.—One employing a boy under sixteen years of age in operating a punch press, in violation of the Illinois law, is liable for injury sustained by him, though he misrepresented his age in applying for employment. The law is not unconstitutional as placing the age limit too high. (Illinois Supreme Court, Beauchanp vs. Sturges & Burn Manufacturing Company, 95 Northeastern Reporter, 204.)

Liability for Injury to Laborer in Boiler.—A laborer injured by boiling water flowing into a boiler which he was engaged in cleaning can recover, where he was not informed of a connection with another boiler and no steps were taken to prevent interference with a valve controlling the flow. (Indiana Appellate Court, Parsell vs. Fort Wayne Iron & Steel Company, 94 Northeastern Reporter, 770.)

Duty to Guard Revolving Shafts. —An employer is negligent in failing to guard a revolving shaft, if employees, in doing their work, are apt to come in contact with it, and if it is practicable and customary to guard in such circumstances. (Maryland Court of Appeals, Dettering vs. Levy, 79 Atlantic Reporter, 476.)

Rights of Buyer on Breach of Warranty.—Warranty that a machine sold is of good material and first-class workmanship is independent of further provision that for one year the seller will make good, particularly at its expense, all breakage not caused by ordinary wear or accident, misuse, or neglect; and therefore, recovery can be had on the warranty without proof that the seller was requested to make breakage good. The measure of general damages for breach of the warranty is the difference in the market value between the article as it was, and as it should have been, at the time of delivery. Special damages can be recovered only when it is clear that they were fairly within the contemplation of the parties when the contract was made, and when their amount can be ascertained with reasonable certainty. A buyer of an engine under warranty must use ordinary diligence to minimize special damages resulting from a breach of the warranty, and cannot recover damages which he could have prevented. (Wisconsin Supreme Court, Hammond vs. Sandwich Mfg. Company, 131 Northwestern Reporter, 1907.)

Liability for Delaying Repair of Machinery.—A manufacturer, who under warranty made in selling a gasoline marine engine, agrees to repair it within a certain time, and is informed that the boat from which it has been taken is urgently needed, is liable for damages resulting from delaying the repairs without just cause. (Louisiana Supreme Court, Christie & Lowe vs. Pennsylvania Iron Works Company, 54 Southern Reporter, 742.)

Liability of Seller for Defects in Machinery Not Waranted.—A buyer of machinery not warranted by the seller cannot defeat liability on a note given for the purchase price a month after the buyer took possession, on the ground that the machinery was defective. (Arkansas Supreme Court, Dover vs. Spencer Lumber Company, 138 Southwestern Reporter, 985.)

Liability Incurred in Shipping Goods for Another.—Where a seller of goods agrees that, in consideration of the purchase and reimbursement of expenses he will receive, care for and ship to the buyer goods bought elsewhere by the latter, he must use ordinary care in handling and shipping such goods. In law, he becomes a bailee for hire and not a gratuitous bailee. (Colorado Supreme Court, Michigan Stove Company, vs. Pueblo Hardware Company, 116 Pacific Reporter, 340.)

Right to Repudiate Contract.—Unless one has been induced to enter a written contract through fraud, undue influence, force or threats, he cannot avoid his obligations under it on the ground that he did not intend to agree to the provisions. (Rhode Island Supreme Court, J. Weil & Company vs. Quidnick Mfg. Company, 80 Atlantic Reporter, 447.)

Damages Recoverable from Carrier for Delay in Transportation.—An express company which has delayed delivery of part of a machine is not liable for profits lost to the shipper under contracts to manufacture articles on the machine, in the absense of notice to the company of the necessity for immediate delivery. (New York Supreme Court, Appellate Term, Goodfield vs. Platt, 130 New York Supplement, 180.)

Effect of Fire Policy Provision for Adjustment of Loss.—A clause in a fire policy providing that on disagreement as to the amount of loss the same should be ascertained by two competent and disinterested appraisers, insurer and insured, each selecting one, is an agreement for an appraisement, and not an arbitration, subject to the strict rules governing arbitration and award. There being no requirement for notice nor necessity for witnesses, an appraisement under such clause is not invalid because the appraisers met without notice to the company, while insured's officers were present and pointed out the damaged property, where there is no evidence of undue influence or bad faith, and the appraisers made their valuation on their own knowledge. (United States Circuit Court of Appeals, Third Circuit, American Steel Company vs. German-American Fire Insurance Company, 187 Federal Reporter, 730.)

Personal Liability of Corporate Officers on Contracts.—A corporation's officer is not personally liable on a contract shown on its face to have been made for the corporation, merely because he signed it in his individual name instead of as an officer. New York Supreme Court, Appellate Term; J. & E. Homan Company vs. Payne, 127 New York Supplement, 418.)

Scope of Authority of Agent to Sell.—In the absence of provision to the contrary an agent authorized to sell is authorized to sell for cash only. (Maryland Court of Appeals, Jones vs. Ortel, 78 Atlantic Reporter 1030.)

New Tools and Appliances

This is essentially a news department for which information is invited.

Boring and Turning Machine for Cocks.—Beaman & Smith, Providence, R. I., have recently completed a special machine for boring and turning cocks which will be used in the shops of the National Transit Company, Oil City, Pa. The pieces handled by the machine are about 3 in. in diameter at the large end and 6¼ in. deep. The body is first threaded with an external thread at the lower end which fits over a threaded end on the hollow spindle. The boring tool does not rotate, and is carried in a traversing head on diagonal guides which are set to the proper taper. Each spindle is driven independently and can be stopped at any time by throwing the lever controlling its clutch. The boring bar feed can also be thrown out of engagement at any point. The plugs are turned on the opposite side of the machine. They are first centered in the usual way and the end of the spindle has a center which centers the large end of the plug, the small end being centered in a sort of vertical tailstock. The plug is driven by a washer fitting loosely the square on the large end and having lugs that engage slots on the spindle end. The tool post is of the turret type, and carries roughing and finishing tools. The output of this machine is from 70 to 80 bodies and finished plugs per day.

A Machine Vise.—A new machine vise possessing the advantage of ability to accommodate a great variety of work has been placed on the market by Schuchardt & Schutte, West Street Building, New York City. The two individual members, which can be separated as far as the work demands, consist of a base clamped to the machine platen, having a jaw mounted upon it which works in an inclined slide. This jaw is actuated by a double screw which is of two different diameters. That of the upper part of the screw is large and fits the thread cut in the jaw, while the lower part of the screw is smaller than the upper and is cut so as to have a thread going in the opposite direction to that of the upper part to give quick action. This screw works in a nut in the body of the member. In addition to clamping the work the sliding jaws by advancing on an incline force it down to a seat on the parallels or the work table.

Quick-Acting Jig Clamp and Pipe Vise.—Two recent products of the St. Louis Sales Company, St. Louis, Mo., are a quick-acting jig clamp to hold the work while drilling and a quick-action pipe vise designed especially for repetition work. The clamp is adapted for use in connection with various types of machine tools and the base is bolted to the bed plate, pressure being applied and released by a lever at the side. The pipe vise which is designed for pipe up to 2-in. internal diameter is operated by an upward movement of a lever at the side.

Circular Heater.—The Improved Appliance Company, 456 Kent avenue, Brooklyn, N. Y., has recently brought out a piece of apparatus which, while designed primarily as a heater for automobile tires, can also be used in connection with the setting of built-up gear rims and other similar work. The appliance can be used for all classes of work where the diameter does not exceed 42 in. and the width 14 in., adjustments for varying the positions of the different parts being furnished. A new type of burner is used in the heater which is said to be proof against back firing or blowing out.

Spline Miller.—Recently the Berghausen Machine Company, Cincinnati, Ohio, has brought out a high and low-speed spline miller. The jaws are independent of one another, closing and opening by right and left-handed screws which permit work to be keywayed where the diameter is not the same throughout. The work is placed in the jaws and after the cutter has been placed in position the head is lowered by a screw, the handle of which has a micrometer dial controlling the depth of the cut. An automatic stopping device consisting of a rod directly under the jaw controls the length of the cut. For rounding out the ends of the keyway a vertical end mill is employed which is lowered to the required depth and kept in position by clamping the upper sleeve of the spline. The feed employed for the horizontal cut of the end mill is the same as that used for the keyway cutter. In addition to the regular cutter one for the Woodruff key has been provided which is held in the collet and is raised and lowered in the same way as the regular cutter. The machine will cut keyways ½ in. deep and 12 in. long in shafting ranging from ½ to 3 in. in diameter at speeds of ¾ and 1 in. per minute.

A Continuous Filter Press.—A filtering press designed to remove liquid from mash or anything of a similar nature and differing from the majority of continuous filters which are designed on the roller principle has been brought out by J. J. Berrigan, 136 North Center street, Orange, N. J. In this press there are 54 buckets or links in the chain, which travels under two pulleys and over two others. These buckets open when going over the pulleys and close when going under them, the amount of pressure on whatever substance is between the pan and the rocker of the bucket depending upon the weight of the chain used. When all the buckets are full the chain underneath is almost straight, and if a stick or stone be placed in one of the buckets the chain will adjust itself automatically without damage. The material to be filtered is fed from hopper at one end and the chain travels toward the other, the buckets emptying into whatever is placed to receive their contents, while the liquid runs out through troughs placed under the intermediate pulleys. The speed of operation is very low, and as the machine is almost entirely back geared the power consumed even when all the buckets are filled is very little.

Valve Grinder.—The R. K. LeBlond Machine Tool Company, Cincinnati, Ohio, has recently developed a grinder for grinding the angular seats on automobile valves. The machine is essentially a single purpose machine, and grinds the parts accurately and rapidly. It consists of a base column and knee cast in one piece to insure rigidity. The latter carries a saddle gibbed throughout its entire length and having a long bearing on the knee. The table slides on a large V and is gibbed to the saddle. The upper part of it carries the chucking mechanism and will swivel so that accurate setting to the proper angle is easily accomplished by micrometer adjustment. The chucking mechanism, which is incorporated in the swiveling part of the table, consists of a draw-in attachment and collet for holding the work. This enables the valve to be chucked and held close to the part to be ground, an arrangement which relieves the stem from all tendency to spring. The chuck is operated by a lever and the valve can be chucked almost instantly after the attachment is set. The work spindle is driven at any one of three speeds by a belt running from a grooved wheel on it to the countershaft. The grinding head has a hardened steel spindle and carries a wheel 8 in. in diameter and ½ in. wide. The cross feed is equipped with a graduated dial reading to 0.001 in. and the table movement is equipped with adjustable stop.

Drilling Machine for Caster Wheels.—It is essential that in making caster wheels the shaft hole be drilled as rapidly as possible, and for this class of work the Hoefer Mfg. Company, Freeport, Ill., has recently designed a special seven-spindle drilling machine. One of the special features of the machine is the feed mechanism, which consists of bronze rings pivoted to arms by cone point set screws having lock nuts. The end of this feeding arm near the shaft has two semi-elliptical lugs cast on each side, which hook under a milled and turned ring fastened to a plate that contains the seven bronze sleeve boxes for the spindles. A long roller riding on a cam gives the drill a uniform feed with a rapid return which fully clears the caster wheel as it is released from the machine and with a short rapid advance until the drill point nearly touches the new caster wheel to be drilled. The feed, the limits of which are from 1 to 2 in. in order to keep the drills working at their maximum economical feed, depends upon the speed of rotation of the entire drum of castings around the central axis. In use all the operator has to do is simply place the wheels in a receiving spout which is adjustable for different widths of wheels so that as they roll down the spout into the machine they will maintain their upright position. At the bottom of the spout they are gripped by a device which receives, centers and automatically grips the pieces. The output of the machine is from 25 to 30 wheels per minute, or one in a trifle over 2 sec

Trade Publications

Lubricating Appliances.—The Richardson-Phenix Company, Milwaukee, Wis. Bulletin No. 54. Describes the round and square types of the Phenix lubricator oil pump, which forces oil at stated intervals into the engine cylinders. Following a discussion of the lubrication of auxiliary pieces of machinery in a power plant, the applications of this lubricator are taken up. There are a number of engravings showing the lubricator in use on engines, electric generators, air compressors and steam hammers. A complete description of the design and operation of the device completes the bulletin.

Planers.—Niles-Bement-Pond Company, 111 Broadway, New York, N. Y. Catalogue. Shows the various types of planers which this company is prepared to equip with a reversing motor drive. This type of drive was illustrated in *The Iron Age*, July 7, 1910, and can be supplied for machines handling work ranging from 30 to 120 in. in length. The great variety of cuts possible with the reversing motor drive are shown in a half-tone engraving which illustrates cuts taken with a 76-in. planer driven by a 30-hp. reversing motor in a cast-iron slab. These cuts were various roughing and smoothing cuts at different feeds and cutting speeds ranging from 25 to 40 ft. per minute, a 1¼-in. coo-tant cut with a cross feed tapering from 1/64 to ¼ in. and showing the small margin required for the over travel of the tool with varying feeds and another section showing the possibilities in shortness of stroke and small variation.

Converters.—Tropenas Converter Company, 50 Church street, New York, N. Y. Pamphlet. Size, 6 x 9 in.; pages, 52. After a brief description of steel, what it is and how it is made, the manufacture of steel castings and the use of the Tropenas process are described at length. The illustrations show converter installations and different stages in the process together with some of the castings produced.

Gas Producers.—Standard Gas Power Company, Walton Building, Atlanta, Ga. A brochure giving an elementary discussion regarding what producer gas is, how made, what it will do, how to select a producer, etc. Some useful tables are given, including the power output for different types of steam engines and also for internal combustion engines using oil, gas, gasoline and producer gas.

Springs.—Harrow Spring Company, Kalamazoo, Mich. Folder Describes the various types of Burdick springs which this company can furnish. The different kinds include car, wagon, truck and locomotive springs. The stock entering into these springs is selected by the maker, the process including even the ore used.

Car Trucks.—Bettendorf Axle Company, Bettendorf, Iowa Book. Size, 8 x 9 in.; pages, 14. Is a book of jingles illustrated in colors and, like its predecessor, relates to the experience of a railroad official in visiting the shop of the "Bettendorf Bears." The story of the manufacture of the Bettendorf truck is told in Mother Goose style and the text is supplemented by a number of illustrations.

Metal Spinning Lathes.—P. Pryibil, 512 West Forty-first street, New York, N. Y. Catalogue No. 11. Covers a line of metal spinning lathes which are made in both the straight and extension bed types and their various accessories. All of these parts are described and the text is supplemented by engravings. The lathes are made regularly for spinning round work only, but if desired the larger sizes of the straight tool and the extension bed lathe can be equipped to produce oval or elliptic shapes.

Turnbuckles and Clevis Nuts.—Michigan Bolt & Nut Works, Detroit, Mich. Bulletin No. 17. Concerned with a line of drop forged turnbuckles and clevis nuts. The turnbuckles are made with or without stub ends and drop forged hooks and eyes or loop welded eye stubs of any combination, plain or galvanized. Two types are made, one with a round head and the other with an hexagonal one, the latter being tightened and slackened by a wrench. These turnbuckles are made for screws ranging from ¼ to 2½ in. in diameter and the clevis nuts range from ⅞ to 2 in. diameter of the screw. In addition to the regular turnbuckle a number of special styles with welded eye loops, drop forged eyes or hooks, and with threaded or swivel ends in any desired combination are also briefly mentioned.

Alternating-Current Rectifier.—Wagner Electric Mfg. Company, 6400 Plymouth avenue, St. Louis, Mo. Bulletin No. 93 Points out the advantages of using the Wagner alternating-current rectifier for charging small storage batteries from alternating-current light or power circuits. The use of this device enables the small storage batteries used to supply the current for ignition in automobiles and launches to be charged at home or wherever alternating current is available without having to send the batteries to a direct-current power house for charging with the accompanying inconvenience and liability to damage.

Electrolytic Generation of Oxygen and Hydrogen.—International Oxygen Company, 68 Nassau street, New York, N. Y. Pamphlet. Size, 6 x 9 in.; pages, 16. Refers to the I. O. C. system of generating oxygen and hydrogen for cutting, welding and other purposes which was illustrated in *The Iron Age* August 17, 1911. A description of this system which employs electrolytic cells for decomposing the water into the oxygen and the hydrogen is given, the text being supplemented by line and halftone engravings of the generators. The merits of the oxy-hydrogen and the oxy-acetylene flames for autogenous welding are compared and this is followed by a brief description of the oxy-hydrogen process of cutting and welding together with the results of a number of tests.

Roller Bearing Cars and Trucks.—Chase Foundry & Mfg. Company, Columbus, O. Supplement to Catalogue No. 11. Lists a variety of roller bearing cars and trucks for different purposes. These include a car for cement block and brick, one with portable forks, a roller bearing stationary rack car for drying cement block, brick, tile, gypsum, starch, etc.; a transfer car, roller bearing turntables and hand trucks. All of these are illustrated and briefly described. Space is also given to a switch with and without a stand.

Hoists.—The Cleveland & Moore Mfg. Company, Lakeside avenue and East Forty-ninth street, Cleveland, O. Catalogue. Calls attention to a line of chain hoists and trolleys which include the Cyclone high speed chain hoists, an illustrated description of which appeared in *The Iron Age* November 10, 1910; the Moore anti-friction chain hoist, standard screw chain hoist, geared and plain yoke trolleys and Cyclone trolley hoists. Space is also devoted to hand power traveling cranes and trolley hoists for handling shells and guns. Tables of dimensions of the different types of hoists and a brief description of door hangers of different types complete the catalogue.

Ballbearings.—The Hess-Bright Mfg. Company, Twenty-first street and Fairmount avenue, Philadelphia, Pa. Loose leaf data sheets. Give a number of details regarding the use and application of the various types of ball bearings. These sheets are issued from time to time and are intended to be bound by the engineer receiving them in a binder supplied by the company.

Jacks.—Belleville Pump & Skein Works, Belleville, Ind. Pamphlet. Call attention to an extensive line of rack, lever, screw and thrust screws; ratchet and axle jacks and foot valves and strainers. Among the jacks mentioned are a locomotive jack screw and a lever ratchet track jack.

Blowers and Ventilating Fans.—American Blower Company, Detroit, Mich. Bulletions and circulars. Circular No. 310 is concerned with the Ventura electric ventilating set which is a reversible device for use in top sashes of windows, transoms and ends of skylights. An illustrated description of this set appeared in *The Iron Age*, May 25, 1911. Pulletion No. 315 gives general description and specifications for the Ventura disk ventilating fan which is the latest development in curved blade disk fan design and construction and possesses the ability to overcome resistance and throw an air current straight ahead. *The Iron Age*, May 18, 1911, contained an illustrated description of this fan. The other circulars give descriptions of various other products, including the Sirocco and the A B C exhaust fans for exhausting, elevating and conveying and ventilating, and the Sirocco electric forge blowers which were illustrated in *The Iron Age*, June 29, 1911.

Water Cooler.—Power Specialty Company, 111 Broadway, New York, N. Y. Bulletin No. 201. Refers to the Power water cooler, which is designed for cooling circulating water; for treating air requiring heating, cooling, washing, humidfying and dehumidfying and for concentrating liquid solutions of all kinds. The operating principle of the cooler is described and its applications to gas and oil engines, air cooling and dry blast are briefly described.

Fireproof Construction.—Suspension Steel Concrete Company, 1808 Fisher Building, Chicago, Ill. Loose leaf catalogue. Describes a system for constructing reinforced concrete fireproof buildings without forms and at a low cost. The system employs iron pipe columns and beams, the centers of which are filled with concrete before erection. The vertical and horizontal members are fastened at the joint with angle straps and constitute the frame of the building. Wire stretched around the beams makes the horizontal frame for the floors and ceilings while the vertical frames for the inner and outer walls are made by running the wire from one floor to the other. A number of line engravings show the application of the system and this is supplemented by halftone engravings showing buildings in course of erection. Suggestive floor plans for various classes of buildings with a brief description of each on the pages facing the engravings complete the catalogue.

Brass and Copper.—The Michigan Copper & Brass Company, Detroit, Mich. Price list. Contains data regarding the terms of shipment and the information required to fill orders and specifications for standard lengths of brass, bronze, copper and German silver materials are given. Two pages are devoted to the base prices of the different metals and this is followed by tables of the various extras and the weights of sheet brass and bronze, brass wire, brass and bronze rods, tubing, angles and channels, sheet and rolled copper, copper wire and yellow metal. Tables of diameters, circumferences and areas of circles and of copper wire and decimal equivalents follow with tables showing the difference between the standard wire gauges and the decimal equivalents of the different sizes of wire.

Oil Engines.—Busch-Sulzer Bros.-Diesel Engine Company, South Side Bank Building, St. Louis, Mo. Bulletin No. 101. Concerned with the stationary type A-3 and A-6 Diesel oil engines which are of the vertical inclosed crank design and develop from 75 to 450 hp. The construction of the engine is briefly described and the text supplemented by line drawings. The advantages claimed to be possessed by this engine are minimum fuel consumption, simplicity of construction, regular ignition, accurate speed regulation and space economy. Results of tests made on several of these engines are included and a brief table of specifications completes the bulletin.

The Machinery Markets

One of the largest machine tool lists issued this year has been distributed among Western dealers by the Chicago & Alton Railroad. It calls for 91 machines, many of them of the larger sizes. In addition to this there is a $5,000 list in the Chicago market from an industrial interest, with good inquiries from other sources. Sales in that market have been good. A steady increase in business is noted in Detroit and inquiries are better. Reports from Cleveland are not encouraging, inquiries and sales being principally for single machines, but engines and boilers are in better demand and a good second-hand business is being done. A better feeling exists in Cincinnati, where the foreign trade continues good and inquiries are coming in in good volume. There is an unusual call for power equipment in the South. In Texas many new industrial plans are maturing and a big business is expected during the fall and winter. Small machine tools and shop supplies are in demand on the Pacific coast, and logging and mill equipment is selling well. Some business is being done in paper-making machinery in Philadelphia, but otherwise conditions there are unchanged. The New York market is equally quiet. New England machinery dealers find inquiries increasing and orders are promised. The export demand is good in all markets.

New York

NEW YORK, September 20, 1911.

Machinery houses handling a general line of mechanical equipment continue to do a reasonably good business in filling orders for small lots of tools required principally for replacements. The demand for some classes of machine tools is not very active and trade is unevenly distributed. Some manufacturers' representatives who handle a limited line of machinery are getting very little business, while others are doing well. The railroads are practically out of the market in this vicinity. A tool is being purchased here and there, but no buying of consequence is being done by the railroads, although there are some good prospects ahead. The Delaware, Lackawanna & Western Railroad is looking into the question of machinery with a view to equipping a new shop which it is expected will be built at Scranton, Pa. The Delaware & Hudson Railroad is not progressing very rapidly with its plans for shop extensions at Watervliet, N. Y, but this business should come before the trade within the next few weeks. The Erie Railroad has been buying a little and the New York Central places an occasional order. Machinery sellers are uncertain as to whether the New York Central is purchasing against the list it has had out so long or whether the machinery it is buying in small lots from time to time is for replacements. A number of railroad shops in the East are being overhauled in the expectaton of freight car repairs incident to the crop haulage. Whether this work will result in machinery purchases remains to be seen, but the master mechanics and superintendents of motive power are making requisitions. It is expected that the Pennsylvania Railroad will soon come into the market for power machinery and other equipment to carry out its plans for extending its electric zone through New Jersey and Pennsylvania.

The Riverside Steel Casting Company, Newark, N. J., is building a new plant on the Newark meadows at the Plank road and Passaic River which the company expects to occupy about November 1. The foundry will consist of a main bay, 40 x 150 ft., and two small bays 25 ft. in length. There will be a power house, 25 x 50 ft., capable of producing about 100 hp. The foundry will be served by a 5-ton electric traveling crane and it will be equipped for making castings up to 2000 lb. in weight. The company makes a line of fine steel castings, subject to extensive machine work. All the equipment of the plant has been purchased.

The Merschell-Spillman Company, North Tonawanda, N. Y., has begun the erection of a three-story, reinforced concrete building which will be used for a machine shop and assembling department. The building will be so arranged as to admit of the construction of a fourth story later on and will give the company increased facilities for the manufacture of its line of automobile, marine and gasoline motors.

The Luitwieler Pumping Engine Company, 123 Ames street, Rochester, N. Y., will shortly let contracts for the enlargement of a factory wing. The addition will be 60 x 135 ft., two stories, of brick, steel and concrete construction. The additional space will give better facilities for the construction of a new motor fire apparatus the company is building.

The Utica Fixture Company, Utica, N. Y., has had plans prepared for additions to its machine shop to take care of its heavy machine business. The addition will be 24 x 100 ft. and one story, to be built of hollow glazed tiles. Harry Lancaster is general manager.

The North Tonawanda Musical Instrument Company, North Tonawanda, N. Y., is preparing to erect a large plant for the manufacture of mechanical and automatic musical instruments. The company is not decided as to its machinery equipment and desires manufacturers' catalogues.

The Pratt & Letchworth Company, Buffalo, N. Y., is arranging to construct an 80-ft. extension to its main steel building. No additional equipment will be required.

Norbert H. Schickel, 52 East Eighty-third street, New York, is purchasing machine tool equipment for a small plant he is establishing at Stamford, Conn., to manufacture a motor cycle of his own design.

The Castle Lamp Company, Amesbury, Mass., will shortly move its plant to Elmira, N. Y. The company is constructing a large plant there for manufacturing its line of lamps.

Henry Pels & Co., 90 West street, New York, have recently sold several large beam shears, all of them to replace old-style shape-cutting devices, and are taking a number of orders for combination machines. Their export business is especially favorable.

The L. J. Wing Mfg. Company, 90 West street, New York, is contemplating additional manufacturing equipment in the line of machinery.

The West Side Foundry Company, Troy, N. Y., in the past year has built an addition of 140 ft. in length to its third shop and has also doubled the capacity of the core room. These additions have increased the output about ten tons per day of custom gray iron castings.

The Positive Clutch & Pulley Works, 30-32 Lansing street, Buffalo, N. Y., has practically doubled its capacity since the beginning of August by acquiring an adjoining building, which is of the same size as its original factory. This seemed necessary in view of the very encouraging demand for its line of goods, and in order to handle orders with satisfaction and promptness. In addition to clutches and pulleys, the company is bringing out a complete line of hangers, compression couplings, pillow blocks, etc., covering practically the general run of transmission appliances. Concerning the condition of business, the company reports the outlook very promising. Starting as it did from the beginnng of the year, and manufacturing only practically since July 1, it has been developing its business through the vacation season, and from indications believes that before the first of the year it will have all the business the factory can possibly take care of.

W. E. Tuttle, Industrial Commissioner, Niagara Falls, N. Y., has arranged with the Gaso-Electric Motors Company to establish a plant in that city.

Fire damaged the factory of the Peerless Furniture Company, Jamestown, N. Y., September 16, to the extent of $25,000.

The Shipwell Wardrobe Case Company, Rochester, N. Y., has been incorporated, with a capital stock of $100,000, to manufacture shipping cases for clothing, etc. J. A. Moss, J. C. Freeman and G. A. Brayer Rochester, are the incorporators.

Munson Bros., Utica, N. Y., have commenced construction of their new plant at Whitesboro, N. Y. A foundry building, 100 x 200 ft., one-story, and a pattern building, 50 x 160 ft., and a warehouse and shipping room, 50 x 30 ft., all to be of steel and brick.

The Wheat Ice Cream Company, Buffalo, now located at 72 Elm street, has let general contract to the Buffalo Expanded Metal Company for erection of a new factory, 150 x 175 ft., three stories and basement.

THE MACHINERY MARKETS

at 271 Elm street, near Broadway, to cost $120,000.

The Krotzer Company has been incorporated at Buffalo with a capital stock of $10,000. The company will make motors, engines, etc., and is arranging for the establishment and equipment of a plant in that city. The directors are Louis E. R. French, Israel G. Holender, Christopher M. Baldy and Chas. H. Taylor.

The B. V. Covert Motor Vehicle Works is building an addition to its plant at Lockport, N. Y.

A large addition to the plant of the Niagara Textile Company on South Transit street, Lockport, N. Y., is to be begun immediately .

The Philadelphia Wrecking Company, Buffalo, has established a plant and storage yard at South Division street and the New York Central Railroad and is equipping it with hoisting and unloading machinery and a small amount of metal-cutting and welding machinery.

The Kunz-Adams-McNamara Company, Buffalo, has been incorporated, with a capital stock of $10,000. Specialties and novelties in wood will be manufactured. The company has purchased the two-story brick factory, 90 x 120 ft., at 41-49 Letchworth street, which it will equip for the purpose. The incorporators and officers are Wm. Kunz, Weber M. Adams and Omer B. McNamara.

The Binghamton Soap Works has been incorporated at Binghamton, N. Y., and will build and equip a plant for the manufacture of soaps, candles and perfumes. N. G. Wilcox, W. C. Kingsbury and H. L. Hart, Binghamton, are the incorporators. The capital stock of the company is $50,000.

The U. S. Hame Company, Buffalo, is building a large 1¼-story brick addition to its plant at Tonawanda street and the New York Central Railroad.

Groff & Co., Johnstown, N. Y., are building and equipping a glove factory on North Market street, two stories and basement, 61 x 73 ft.

The Buffalo Steam Roller Company, now located at Carolina and Efner streets, Buffalo, in premises leased from the Buffalo Pitts Company, will move its plant to Springfield, Ohio, about December 1, a plant in that city having been recently acquired. The headquarters of the company will remain in Buffalo and it is possible a Buffalo plant may be re-established later. H. S. Cunningham is president of the company.

The Lippard-Stewart Motor Truck Company, Buffalo, has leased factory premises in the Century Telephone Company's Building at Elmwood avenue and the New York Central Railroad line which it will at once equip for manufacturing purposes.

The Overland-Rochester Company, Rochester, N. Y., has been incorporated, with a capital stock of $30,000, and is arranging for a factory for the manufacture of automobile engines, etc. The incorporators are E. D. Creed and F. C. Cribb, Rochester, and R. R. Scott, Canandaigua.

The Niagara Chocolate Company, which is building a factory on Erie avenue, Niagara Falls, will install up-to-date chocolate and confectioner machinery, steam plants, icemaking and electric motors.

The Niagara Machine & Tool Company, Buffalo, will build a four-story, reinforced concrete and brick addition to its new plant established last year at Northland avenue and the New York Central Railroad Belt Line. The cost of the building will be $30,000.

The Rochester Stamping Company, 141 Jones street, Rochester, is receiving bids for a four-story and basement factory building, 60 x 109 ft.

The Standard Furniture Company, Herkimer, N. Y., has let the contract for its new factory building, which is to be 100 x 200 ft. and six stories and basement, of reinforced concrete.

New England

BOSTON, MASS., September 19, 1911.

The machinery dealers report an increased number of inquiries, with the promise of more actual orders. The General Electric Company's big list for the new shop building at Lynn will in itself give a large amount of new business. The Boston & Maine Railroad is proceeding toward the issuing of new stock, the proceeds of which will be devoted to the building and equipment of the new locomotive and car repair shops at Billerica, Mass., which call for the expenditure of some $2,500,000. On the other hand the builders of machine tools are not feeling any improvement, and some of them are reducing production, by shorter hours and reduced working forces. Word comes from Greenfield that the tap and die industry is in a satisfactory condition, and some of the chuck makers report a good business.

The Baird Machine Company, Oakville, Conn., manufacturer of special machinery, presses and tumbling barrels, is about to occupy its new plant at Bridgeport, Conn. The company will have greatly increased space for the devedopment of the rapidly growing business, with every facility afforded by a modern shop building and equipment.

The city of Boston proposes to establish a central electric power station in the new city hall annex, with power great enough to supply the needs of the present city hall. Another electric station will be created by the city at Gallup's Island.

Announcement is made that the business of the McCue Company, manufacturer of automobile axles and forgings, will be removed entirely from Hartford, Conn., to Buffalo, N. Y., where the company has acquired the works and business of the Superior Axle & Forge Company. As has already been stated the two industries have been merged into a New York corporation, continuing the name of the McCue Company. The first announcement was that the Hartford works would not be disturbed, but now the new factory building is advertised for rent.

A Massachusetts syndicate headed by J. A. Coram, Boston, proposes to expend $6,000,000 in developing the water power of Kootenai Falls, Mont., for distribution in western Montana, northern Idaho and northeastern Washington. The published estimate is 80,000 hp.

The Union Pin Company has been organized at Waterbury, Conn., to manufacture pins, using machines of a type recently developed by James Kelley and manufactured by him at Torrington, Conn. The new company will have the factory at Waterbury now occupied by the Harrison Chair Company, and will move to the premises in about two months. The concern will be operated as a copartnership between Mr. Kelley, Peter Allison and Thomas Murray, foundry manager for the Turner & Seymour Mfg. Company, Torrington.

The works of the Brown & Sharpe Mfg. Company, Providence, R. I., are normally busy, running full time without decrease in working forces. During the annual summer vacation of two weeks a large amount of rearrangement of equipment was carried out, the location of upward of 300 machines being changed.

The Butler Chuck Company, Greenfield, Mass., manufacturer of drill chucks, has incorporated with a Massachusetts charter and $10,000 capital stock, the incorporators being Harry E. Ward, Harry A. Weymouth and William H. Gould. The business has been established for some years.

Sargent & Co., New Haven, Conn., manufacturers of hardware, will enlarge one of their factory buildings by carrying it up two stories. The building is 32 x 128 ft.

The Williamsville Buff Mfg. Company, Danielson, Conn., manufacturer of cotton buffs, has started operations in its new factory in that place, having removed from Williamsville. A new boiler of 100 hp. has been installed. The company will continue to manufacture the A1 buffs as well as the other grades which it has established in the market. The officers, all of whom have been identified with the business since the manufacture of buffs was begun, are C. W. Atwood, president and treasurer; H. C. Atwood, vice-president and assistant treasurer, and H. B. Atwood, secretary.

The Skowhegan Novelty Works, Skowhegan, Maine, manufacturer of wooden specialties, states that its new building will be used for setting up and storage purposes and that no new machinery will be required excepting a small motor.

Chace & Harriman, Inc., who are identified with developing the water power of the upper Connecticut River and its tributaries, has filed plans for extensive developments on the Deerfield River, including the erection of a large dam and the building of a tunnel 2800 ft. long, which will carry the water to Shelburne Falls, Mass., where a large power plant will be established.

The Commerce, Industrial and Educational Exposition of the Boston Chamber of Commerce will be held in Mechanics' Building, that city, October 2 to 28, inclusive. The management already has the assurance of exhibits by a large number and great variety of industries, including a considerable showing of metal goods and machinery.

The Austin Mfg. Company, Grand Rapids, Mich., has made a proposition to the city of Cambridge, Mass., with a view to locating in that city.

THE MACHINERY MARKETS

Additions to general manufacturing plants of New England include the following: Montello Heel Company, Brockton, Mass., 45 x 100 ft., four stories; Lowell Bleachery Company, Lowell, Mass., additions; American Net & Twine Company, Cambridge, Mass., additional factory building, 70 x 180 ft., two stories and basement; Cloggston & Son, New Haven, Conn., paper boxes, addition, 60 x 175 ft.; Downer, Hawes & Co., Bridgeport, Conn., additional building, 30 x 100 ft., one story; Thomas Taylor & Son, Hudson, Mass., addition, 18 x 45 ft., four stories; Crown Mfg. Company, Pawtucket, R. I., cotton goods, new mill, 138 x 340 ft., and power house, 40 x 56 ft.; American Hide & Leather Company, Lowell, Mass., beam and hide house, covering 48,000 sq. ft.; Housatonic Power Company, South Norwalk, Conn., addition to gas plant, for the manufacture of water gas; Hutchings Organ Company, Waltham, Mass., buildings, 40 x 80 ft., four stories, 30 x 100 ft., four stories, and 15 x 40 ft., two stories.

The Sampo Mfg. Company, Gardner, Mass., manufacturer of automobile tire pumps, is considering the removal of its factory to Fitchburg, Mass.

The Veeder Mfg. Company, Hartford, Conn., is building an addition to its plant which will about double its size and is reconstructing the old building to make it a modern and practically fireproof structure. This has been necessitated by the large demand for some new instruments that company has brought out and others which it is bringing out. The hub odometer put on the market about a year ago has been a great success, filling the demand for an instrument giving an accurate record of the mileage of the automobile to which it is attached. In the near future the company will bring out a setback counter, the demand for such an instrument being extremely great. It has been crowded to its greatest capacity for over two years.

Boynton & Plummer, Inc., manufacturer of machinists' tools and blacksmiths' supplies, now located at 54 Hermon street, Worcester, Mass., have acquired the Knowlton factory at Gardner, which has been vacant for some time. After repairs are made to these buildings the Boynton & Plummer company will move its equipment there. This concern is one of the oldest tool companies in Worcester, having been in existence for more than 50 years.

Philadelphia

PHILADELPHIA, PA., September 20, 1911.

Little actual improvement in the demand for either standard or special machinery or tools is noted. In occasional instances manufacturers of certain lines of equipment are comparatively busy, this being particularly noticeable in certain types of heavy machinery, such as equipment for paper making, etc., and the smaller classes of special tools. For the general run of machine tools, however, for either wood or metal working purposes, or for special tools used in industrial plants, no active betterment in the demand is shown. Sales continue unimportant, single tool business predominating, with an occasional transaction covering a few small tools. Very little large buying is in sight. Inquiries appear less numerous and are confined to small and single tools. An occasional inquiry for a few small tools for railway shop equipment have recently come out, but these close very slowly. Locomotive builders report a diminishing volume of business. In second hand equipment there has been a fair scattered demand, confined to no particular class of tools or machinery, the larger portion of the inquiries being for equipment of a special nature. New business in boilers and engines continues light and confined principally to those of the smaller horsepowers. Iron and steel castings are in unsatisfactory demand.

The Pennsylvania Railroad Company has sent out inquiries for a few tools, including an engine lathe and a sensitive drill, against which bids have gone in, but orders have not yet developed.

The Schofield Engineering Company will engineer and supervise the construction and installation of equipment of an electric light plant to be installed for the city of Danville, Va. The plant will cost about $150,000.

Dodge, Day & Zimmerman, engineers, are progressing favorably on plans for the new plant of the Hess-Bright Mfg. Company to be erected at Erie avenue and B street. The main building will be three stories, of brick and concrete. They also have preliminary plans under way for several other industrial enterprises, but as a rule these develop rather slowly.

The League Island Navy Yard is in the market for a double circular saw, for which proposals will be received under schedule 3895, until September 26. Blank proposals and specifications may be obtained on application to the Navy Pay Office, Philadelphia.

The Pennsylvania Equipment Company, West End Trust Building, is in the market for a two to five-ton quick handling standard gauge locomotive crane, also for a second-hand 36-in. gauge locomotive crane, three to five-ton capacity, and a steam turbine outfit of 300 to 400 K. W., 250 volt., 150 steam, 26 to 28-in. vacuum, in one or two units. This concern also desires to purchase 10 to 15 100,000-lb. capacity steel gondola cars.

The commission to erect a State hospital for the insane at Fairview, Pa., will receive bids until September 26 for the construction of new buildings, including a laundry building, power building, ice house and system of sewage disposal, together with equipments for the kitchen, laundry and power building connected with the institution. Drawings and specifications may be had on application to J. C. M. Shirk, architect, 518 Philadelphia Bank Building, Philadelphia.

The Callister Mfg. Company, Harrisburg, Pa., was recently incorporated, under the laws of the State and will engage in the manufacture of the Case railroad tie-plate and safety clamping bolt rail fastening, under patents of Homer W. Case. The officers of the company are as follows: Dickinson McAllister, president; H. W. Case, secretary and treasurer. While the company is yet in the formative stage, the plant will be located in Harrisburg.

The Weimer Machine Works Company, Lebanon, Pa., reports orders received for two cinder cars for the Wellston Steel & Iron Company and a blowing engine for the Stephenson Charcoal Iron Company. A furnace top is being built for the Warwick Iron & Steel Company and orders for a large quantity of castings, for use in connection with coke ovens, have been received from the Lackawana Steel Company.

An Eastern concern is in the market for a roll lathe of modern design; maker's name, description and price are desired. Communications should be addressed to Roll Lathe, care Philadelphia office of *The Iron Age*, Real Estate Trust Building.

The Standard Pressed Steel Company reports the demand for wrought steel hangers as comparatively active. There has been a good foreign demand, heavy orders being received from Holland, Switzerland and Canada. The domestic demand has been confined to a large number of small orders, which have aggregated a very good total. The demand for the other steel specialties manufactured by this concern has also been quite good. The plant is running at full capacity and the company has considerable forward work on its books. Some little additional machinery for its special work is being added to its equipment.

Proposals for the sale of the machinery located at the Fairmount pumping station of the city of Philadelphia will be received by John E. Reyburn, Mayor, until September 27.

The Lebanon Steel Casting Company, Lebanon, Pa., has completed the construction of a new factory at Easton, Pa., which is to be operated under the name of the Treadwell Engineering Company, and within a short time the company's present plant at Lebanon will be abandoned and the plant will be moved to Easton. The foundry is well equipped for handling castings ranging from one to 500 lb. in weight. The Easton plant in addition to the steel foundry consists of a large machine shop and iron foundry.

The Lycoming Foundry & Machine Company, Williamsport, Pa., which makes castings, special machinery and automobile motors, finds business so good that it is contemplating putting on two shifts in its machine department. The company has enough business in sight to keep its shops busy through the first half of 1912.

The Tabor Mfg. Company, Eighteenth and Hamilton streets, Philadelphia, has purchased about five acres near the Westmoreland Street station of the Chestnut Hill Branch of the Pennsylvania Railroad on which it contemplates erecting new factory buildings. The plans are in the hands of Dodge, Day & Zimmerman, engineers. The company reports that its business has resumed approximately normal proportions, and the prospects are that it will continue for some time.

Bancroft & Co., Harrison Building, Philadelphia, are marketing their Never Rust in a new form of package.

THE MACHINERY MARKETS

For the past ten years they have been selling it in bulk to manufacturers only, for protecting finished steel and metal surfaces from the action of rust or tarnish, but recently they perfected arrangements for placing this same material, in a refined form, on the market for sale through hardware stores and are meeting with considerable success.

The Williamson Bros. Company, engineer, machinist and founder, Philadelphia, is at present engaged in making quite extensive additions to its plant, which will require more equipment in the near future. Both the machine shop and the foundry department are exceedingly busy.

The A. P. Witteman Company, 112 to 116 North Broad street, Philadelphia, is erecting a power building and installing a new power plant, now well under way and nearly completed, at its works at Chester, Pa. The company is confining its energies to the manufacture of forgings, both rough and finished, especially crankshafts. It recently completed the contract for the finished crankshafts for the submarines being built by the Wm. Cramp & Sons Ship & Engine Building Company, Philadelphia. It has not only been able to get enough business to keep running full time, but has two or three months' work ahead.

The Kensington Mfg. Company, 1109 to 1119 North Front street, Philadelphia, has just completed a plant for the manufacturing of packing, wiping and railroad waste. The plant is now in full operation, the company having booked almost sufficient business to run it until the first of the year.

The Hershey Machine & Foundry Company, Manheim, Pa., has in course of construction a good-sized addition to its foundry, and regards the outlook for its business in the near future as very bright.

The Milled Screw & Machine Company, manufacturer of screws and thread milling machines, Sayre, Pa., is contemplating increasing its equipment to take care of the large volume of business in its custom screw cutting department. The matter is not yet in such shape as to enable definite information to be given out.

Chicago

CHICAGO, ILL., September 19, 1911.

Miscellaneous inquiry for machine tools has increased during the past fortnight in a most encouraging manner. A Gibson City, Ill., interest is in the market for tools to the amount of $5,000, and a Harvey, Ill., manufacturer is inquiring for an aggregate of $10,000 in new equipment. Sales of the past week include a number of milling machines and radial drills, a hobbing machine and gear cutter and a number of lathes. The nearby plant of the leading oil interest is inquiring for a few drills and lathes.

The Chicago & Alton Railroad has issued an extensive list as follows:

One 6-ft. double cam brake.
One slip roll stove and tin pipe former.
One 30-in. adjustable pipe holder.
One hollow mandrel.
One 36-in. reach, 21-in. gap, 70-ton compression riveter.
One double punch and shear, 36-in. throat, with capacity to punch 1¼-in. hole through 1-in. steel, to shear 1-in. plate, 2-in. round iron, and 5 x 5 x ⅜-in. angle bars, to be equipped with motor drive.
One heating furnace 6 ft. 8 in. x 10 in.
One car axle journal turning lathe, 42-in swing, with motor drive.
One 3-ft. radial drill.
One 2-in. triple bolt cutter.
One new panel carver and freezer combined, including dove tail attachment.
One chain saw mortizer, belt-driven.
One 16-in. cutoff saw.
One 24-in. circular self-feed rip saw.
One double surfacer, 26 x 8 in.
One extra range vertical hollow chisel car mortizer with 12 ft. traveling table and two universal boring attachments.
One band, rip or re-saw sharpener, capacity 2 to 6 in.
One band gang circular and re-saw swage.
One automatic rip and cut-off circular saw sharpener.
One combined band saw filing and setting machine, capacity ¾ to 12 in.
One tool and dowell machine.
One automatic traversing gaining machine, motor drive.
Two 18 x 6-in. brass and turret lathes, self drive.
Two 16-in. x 18-ft. patent head machine lathes, motor drive.
One 18 in. clotter with link attachment, belt drive.
Two 16-in. sensitive drill presses, self drive.
Six double emery tool grinders; wheels 18 in. diameter x 3 in.
One nut-facing machine, capacity ¼ to 3 in.
One horizontal milling machine, 24 x 30 in. x 14 ft., motor drive.
One 2 in. triple bolt cutter.
Two 18-in. x 6-ft. tool room lathes.
One No. 4 universal milling machine.
One 16-in. sensitive drill.
One 18 x 36 x 96-in. gap grinding machine for [illegible], motor drive.
One drive bar grinder with traveling table to take guides 18 in long, motor drive.
One 36-in. engine lathe, 10 ft. 6 in. between centers, motor drive.
One 36 x 36-in. x 10-ft. heavy pattern planer with two heads on the cross rail, motor drive.
One 90-in. extra heavy driving wheel lathe.
One 6-ft. radial drill, self drive; 1 to 5-ft. radial drill, motor drive.
Three 24-in. back gear crank shapers, single pulley drive.
One 30 in. boring and turning mill with single swivel turret head and three-jaw scroll chuck.
One 42-in. boring and turning mill with two heads, motor driven.
One 52 in. boring and turning mill, heavy pattern, two heads, motor drive.
One draw-cut shaper, 26-in. stroke.
One 100-in. boring and turning mill, motor drive.
One 48 x 36-in. x 16-ft extra heavy planer, two heads, motor drive.
Two 3 x 36-in. flat turret lathes, motor drive.
One rotary splitting shear, 24 in. throat, capacity ½-in. steel, belt drive.
One four-spindle mud ring drilling machine, belt drive.
One horizontal punch, capacity 1½ in. through 1-in. steel, 12 in. throat, motor drive.
One 36-in. vertical high-speed punch, capacity 1 in. through ½-in. plate, motor drive.
One rotary bevel shear, capacity 1-in. plate, motor drive.
One water flue cleaner, overhead framework type.
One pneumatic hot saw with tube expander and safe magazine.
One pneumatic hot saw with tube expander.
One automatic safe end cutter.
One key-seating machine, capacity 1¼ to 6-in. keys.
One pneumatic reversible motor.
Fourteen corner air drills.
One crank-pin turning machine.
One 2-in. triple bolt cutter.
One heating furnace, 2 ft. 10 in. x 4 ft. 4 in.
One 6000-lb. double-frame guide ram steam hammer, cylinders 22 x 60 in.
One 200-lb. helve hammer, belt drive.
One 2½-in. forging machine, belt drive.
One hammer furnace, 5 x 8 ft.
One double bulldozer furnace, each compartment 3 ft. 2½ in. x 9 ft.
Two forging furnaces.
One double emery tool grinder, wheels 18 x 3 in.
One roll-over straight-top molding machine to take flasks up to 60 in. in length and permit a draw up to 18 in.
One double-chamber melting furnace, capacity 1000 lb.
Two portable pneumatic screen shakers.
One core machine.
One power sprue cutter.
One 10-ton E.O.P. foundry crane, span about 55 ft.,, lift 17 ft.
One portable emery grinder.
One 10-ft. cornice brake, capacity No. 16 steel.
One 10-ft. squaring shear, capacity No. 16 steel.
One pipe-threading and cutting-off machine.
One double emery tool grinder, wheels 18 x 3 in.
One 12-in. sensitive high-speed drill, belt driven.
One 22-in. drill, belt drive.
One 90-in. extra heavy double quartering machine, motor drive.
One gutter beater, capacity 8 ft. x ⅝-in. rod.
One power double-seamer.
One giant groover, capacity 8-ft. sheets.
Two encased small burrs.
One encased small turner.
One encased large turner.
One encased wearing machine.
One setting down machine.
One 36-in. bar folder.
One encased ring and surface shearer.
Prices to be quoted f.o.b. Chicago & Alton tracks.

The Excelsior Cycle Company, Chicago, has been incorporated to do a general manufacturing business, with a capital stock of $30,000. The incorporators are Geo. A. Chritton, R. R. Raymond and J. G. Anderson.

Western Steel Car & Foundry Company, Chicago, will build at its Hegewisch plant several new factory buildings at a total cost of $60,000.

The Railway Sales Company, Chicago, has been organized to engage in the manufacture and sale of metal specialties, with a capital stock of $34,000. The incorporators are Geo. S. Andres, Chas. W. Switson and Lawrence J. Walsh.

The Calumet Foundry Equipment Company, Chicago, with a capital stock of $1000, has been organized to do a general manufacturing business by Arthur S. Basse, Chas. R. Young and C. W. Clark.

The Universal Draft Gear Attachment Company, Chicago, capital stock $50,000, has been incorporated to manufacture and deal in railroad equipment and supplies by M. G. Lockhart, J. K. Murphy and G. R. Faust.

C. V. Oversmith, Brooklyn, Mich., announces the proposed incorporation of the Oliver Concrete Machinery Company, with a capital stock of $100,000. The company will build a plant at Des Moines, Iowa, for which new machinery will be required.

The Chicago, St. Paul, Minneapolis & Omaha branch of the Northwestern Railway has taken out a building permit for the erection at Omaha, Neb., of a 16-stall round house to cost $37,000.

The Northwestern Malleable Iron Company has taken out a permit to erect an addition to its foundry in Milwaukee, Wis., to cost $2,500.

Wendnagel & Co., manufacturers of tanks, Twenty-second and Jefferson streets, Chicago, who added to

THE MACHINERY MARKETS

their line about a year ago structural steel towers, are receiving very satisfactory business in the new department and are running their factory full force.

The Prime Steel Company, manufacturer of steel castings, Milwaukee, Wis., is now adding about 100 ft. on its Crucible Works, the construction of which is practically finished. This, however, is being done as a matter of the company's convenience and not in contemplation of increased business for some time to come.

The Vilter Mfg. Company, Milwaukee, Wis., has acquired additional property across the street from its present location for the purpose of erecting thereon a pipe shop to be 270 ft. in length and 120 ft. in width. The company builds icemaking and refrigerating machinery, Corliss engines and brewers' machinery.

The Matthews-Davis Tool Company, St. Louis, Mo., is about to erect a new factory building to cost $18,000 upon the site purchased recently at 3724 Forrest Park boulevard.

The Mississippi Glass Company, 4136 North First street, St. Louis, Mo., is about to build a one-story machine shop to cost $6,200.

The citizens of Campbell, Mo., have approved a bond issue of $22,000 for a water works system.

The City Council of Springfield, Mo., has under consideration the sale of bonds to the amount of $600,000, proceeds of which are to be used for construction of a municipal water works system.

The citizens of Bellevue, Neb., have voted for the issuance of $20,000 in bonds for municipal water works.

The citizens of Dustin, Okla., will issue $25,000 in bonds for the installation of a water works system.

Cleveland

CLEVELAND, OHIO, September 19, 1911.

The machine tool market shows little life. The only change that has developed druing the past few days is a little better demand for second-hand tools. Dealers have very little to work on in the way of inquiries and sales are limited almost entirely to scattering single tools orders. There is a fair demand for engines and boilers for small installations, this business coming largely from manufacturers outside of metal working lines. Makers of electrical equipment are getting a moderate volume of orders for small equipment but have no inquiries for large installations. More new construction work in the line of small manufacturing plants is under way or being planned than earlier in the year. Automobile builders in this territory are unusually busy for this time of the year and makers of automobile parts are fairly well supplied with orders. These plants are generally well equipped, however, and are buying very little machinery. In the foundry trade conditions show little change, the demand for castings not being active.

The Nungesser Electric Battery Company, Cleveland, will erect a new power house and will shortly place contracts for engines, boilers and stokers for a 450-hp. plant. This company has recently purchased from the Cleveland Steel Company property adjoining its plant near King avenue and Thirty-eighth street with the view of enlarging its output of carbons and carbon brushes, which it makes in addition to electric batteries.

The Home Power Company, Ashtabula, Ohio, has been organized with a capital stock of $60,000 to take over the business of the H. Beider Mfg. Company of that city. The company will manufacture gas engines, washing machines, vacuum cleaners, bread mixers and other products. The present plant will probably be enlarged. The old company is said to have been very successful during the short time that it has been in business and a reorganization was found necessary to provide additional capital to increase the capacity. The officers are: David Loeb, president; H. Beider, vice president; H. A. McKinnon, secretary, and R. R. Wason, treasurer.

The Virden Mfg. Company, Cleveland, will shortly move from its present quarters at 5109 Euclid avenue to a new factory that is being erected at 6013 Longfellow avenue, S. E. The building is of brick, two stories and 36 x 100 ft. The company does brass spinning and makes a line of sheet metal products.

The Defiance Pressed Steel Company will enlarge its plant by the erection of three additions and will install a large electric galvanizing plant. One building, 70 x 80 ft. will be used for the galvanizing department and one 24 x 130 ft. and another 50 x 130 ft. will be used for warehouse purposes. The buildings will be of brick, one story.

The City Ice Delivery Company, Cleveland, is having plans prepared for a large ice manufacturing plant to be built on the West Side of the city, that will involve an expenditure of about $100,000.

The Hubbard Caloric Pump & Mfg. Company, Toledo, Ohio, has been incorporated with a capital stock of $25,000 by F. B. Hubbard, B. B. Brun, W. B. Duck, F. M. Landis and A. Schaefer.

The Cleveland office of the Detroit Stoker Company, Detroit, Mich., has recently closed contracts for two stokers for boilers of 300-hp. capacity each for the American plant of the American Bridge Company, Chicago, two stokers for two 350-hp. boilers for the La Belle works of the Crucible Steel Company at Pittsburgh, and four stokers for 150-hp. boilers for the West Side Technical High school, Cleveland.

A new ice manufacturing plant will be built in Alliance, Ohio. Friedman & Scanlon, ice dealers, and others are interested in the project.

The Packard Electric Company, Warren, Ohio, has increased its capital stock from $50,000 to $100,000.

The Ohmer Fare Register Company, Dayton, Ohio, has acquired a 4½-acre site on the Big Four Railroad near the plant of the Ohio Rake Works, and it is announced that the company will shortly begin the erection of a large plant, having outgrown its quarters in the Callahan power building. A five-story building, 50 x 240 ft., is being planned, and also a power plan.

G. E. Gearing of Findlay, Ohio, and T. E. Bishop of Lima, inventors of a new line of pipe and monkey wrenches are planning the organization of a company to build a plant in the former city for the manufacture of their wrenches.

The Summit Brick Company, Summitville, Ohio, has been organized with a capital stock of $150,000 to build a large plant for the manufacture of paving blocks and face brick. Ross Rue of Alliance, Ohio, will be the manager.

The Canton Casting Company, Canton, Ohio, a new concern that is being organized to manufacture radiators and castings for school desks, is negotiating with the Commercial Club of Kenton, Ohio, for the establishment of a large plant in that city.

The Craig Foundry Company, Bucyrus, Ohio, has been incorporated with a capital stock of $30,000 by A. T. Dennis, H. C. Howland, Edson Scott, J. H. Shaw and W. J. Porter.

The National Tool Company, Cleveland, has let a contract for an addition to its plant, 35 x 150 ft., three stories, and expects to add considerable machinery for use in manufacturing not only milling cutters and special tools but several new products.

The Park Drop Forge Company, Cleveland, has such confidence in the future that it is planning a considerable increase of facilities. It is prompted to do this by strong evidence of its steadily gaining the confidence of the larger users of high-grade automobile crankshaft forgings, alloy steel gear work and the heavier class of truck axles. Its equipment of hydraulic presses and heavy steam hammers puts it in a position that is second to none in the country.

The Toledo Machine & Tool Company, Toledo, Ohio, reports a marked improvement in trade since September 1, and as the capacity of its works has always been felt to be quite limited during normal business conditions, it is now considering additions that will enable it to properly take care of the business which it feels sure will be offered as soon as general conditions again reach normal.

Cincinnati

CINCINNATI, OHIO, September 19, 1911.

The National Association of Stationary Engineers held its annual convention in Cincinnati last week, and as a result manufacturers of valves and other engineering specialties feel very much encouraged over the outlook for an excellent fall business. The supply business generally is very good, with the exception of those houses depending on the larger railroads for support.

In machine tool circles there is a growing optimistic feeling, as the inquiry continues good both from the domestic and foreign trade. Foundries making a specialty of jobbing work are also more active, and the stove foundries are practically all operating up to capacity.

THE MACHINERY MARKETS

The recently completed addition to the plant of the Smith & Mills Company, Cincinnati, manufacturer of shapers, is 60 x 60 ft., one story and of concrete construction. Part of this building is used for a power plant, in which has been installed a 100-hp. Miller Improved gas engine, together with a remodeled electric lighting system. The company reports its export business as holding up remarkably well.

The Rahn-Larmon Company, Cincinnati, lathe manufacturer, is contemplating an addition to its plant on Spring Grove avenue. This company, which owns a controlling interest in a plant at Knoxville, Tenn., has recently incorporated at that point under the name of the Knoxville Machine Tool Company.

The Warner Equipment Company, a new Cincinnati organization, has purchased the plant of the Cincinnati Equipment Company and will operate it as a repair shop for all kinds of railway and contractors' equipment. P. B. Warner, formerly with the Cincinnati Equipment Company, is president of the new company, and John R. Warner secretary and treasurer.

To manufacture ignition apparatus, the Blackburn-Allen Company has been incorporated at Dayto, Ohio, with $30,000 capital stock, by W. J. Blackburn, E. B. Allen and others. No definite plans as to the location of its plant have yet been given out.

The Cincinnati Gear Company, whose headquarters were heretofore in the Murdock Building, has leased part of the old Victor Safe & Lock Company's plant at Eighth street and Broadway, in which the necessary machinery is now being installed. This move will nearly double the company's present capacity.

The Safety Mfg. Company, Wheeling, W. Va., has been incorporated, with $75,000 capital stock, to manufacture brake shoes and railroad safety devices. J. H. Young of Wheeling is named as one of the principal incorporators.

W. A. Clark, clerk of the Board of Water Works, Wyoming, Ohio, a Cincinnati suburb, will open bids October 2 for furnishing and installing two 150-hp. water tube boilers, complete with automatic stokers, piping, etc. Specifications and blanks may be procured from Mr. Clark, or from B. S. Hughes, consulting engineer, Commercial-Tribune Building, Cincinnati.

The Ault & Wiborg Company, Cincinnati, will build an extensive addition to its varnish manufacturing plant in Idlewild suburb.

The Clifton Springs Distilling Company, Cincinnati, has taken out a permit for a three-story concrete dry-house, to cost about $18,000, and for which some special equipment will be required.

The Chesapeake & Ohio Railroad Company has prepared plans for a large reinforced concrete depot to be erected in Newport, Ky., for which a considerable quantity of reinforcing steel bars will be required.

It is reported that some extensive additions will be made to the plant of the Hazel-Atlas Glass Company at Wheeling, W. Va.

The large addition to the plant of the Cincinnati Milling Machine Company at Oakley is now under cover and interior work is expected to be completed before cold weather sets in.

Detroit

DETROIT, MICH., September 19, 1911.

A steady increase is noted in the number of inquiries received by local machinery dealers, and actual orders booked show a satisfactory volume of business. While the majority of sales are confined to single tools, a number of lots of three and four tools have also been purchased. There is a very general feeling among dealers now that September will show a marked improvement over August in the amount of business transacted. The market also seems broader and the buying is not confined to any one line, which is looked upon as a favorable sign. Standard shop equipment is showing quite a little activity at present and a good demand exists for contractors' supplies. Foundry consumption seems to be improving and the period of depression in this line is now thought to be at an end. Second-hand machinery is moving quite freely and dealers handling it are inclined to be pleased with the outlook. Building circles are still quiet and the new work on which figures are being asked is of an ordinary nature.

A good deal of interest is being manifested in the purchase by W. C. Durant, head of the new Chevrolet Motor Company, of a 40-acre tract of land on the northern city limits, which it is generally understood will be used as a site for a new plant for the company. The Crucible Steel Castings Company and the Metzger Motor Car Truck department both have plants under construction adjoining this tract.

The McCord Mfg. Company, maker of automobile and railroad supplies, is building a one-story addition to its present factory.

The Penberthy Injector Company, manufacturer of injectors, oil cups, etc., has completed plans for the erection of a Canadian branch at Windsor, Ont., across the river from Detroit.

The Automobile Mfg. & Engineering Company, which recently organized with a capital stock of $100,000, has secured an option on a modern plant and expects soon to commence the manufacture of commercial vehicles and motors. The company's offices are at 1209 Majestic Building.

W. H. C. Burnett has sold the Superior Motor Car Company to Petrolia, Ont., capitalists, and the plant will be removed to that city.

The Detroit Metal Window Screen & Strip Company has been organized, with a capital stock of $18,000, by A. F. Chapaton, W. N. Crayden and Joseph E. Lee. The company will manufacture metal window trimmings.

The Schwartz Mfg. Company has been incorporated, with a capital stock of $25,000, and will engage in the manufacture of metal specialties. Jacob L. Summers, W. S. Thomas and Josef Schwartz are the principal stockholders.

The Folding Scaffold Bracket Company has been incorporated by Edward N. Hayes, W. C. French and W. W. Morreson. The capital stock of the new company is given at $10,000.

The Ignition Starter Company, maker of automatic starters for automobiles, has decided to remove its entire plant from Grand Rapids to this city. In connection with this decision, the capacity of the company's plant will be increased.

Following the announcement made recently that F. J. Gorma had purchased the old Ford motor plant, it has now become known that practically the entire plant has been acquired by the E-M-F Automobile Company and will be utilized for the manufacture of motor cars. This addition will increase the capacity of the E-M-F Company by one-fourth, and will add 1000 men to the payroll. The buildings will be immediately equipped with new machinery, some of which has already been ordered.

Claude N. Briggs has resigned as general manager of the Brush Runabout Company and will head a new automobile concern to be organized with a capital stock of $200,000. A factory site is now being negotiated for and the manufacture of cars will be begun as soon as a plant can be put in operation.

The Miller Car Company has been incorporated, with a capital stock of $50,000, by Theodore and Nellie Miller and C. B. Carven. No manufacturing plans have been announced.

The National Sad Iron Company has been organized by R. E. Sack, F. D. Decker and O. E. Schubert. The company has a capital stock of $9,000 and will manufacture flat irons.

A. B. Read, North Branch, Mich., is establishing a heading mill near that village.

C. F. Boyce has broken ground for a factory building to be utilized as a fruit evaporating plant at Jonesville, Mich.

The Marshall Furnace Company, Marshall, Mich., is completing a new plant which it expects to occupy about January 1. G. H. Dobbins, manager of the company, states that the capacity of the present factory is greatly overtaxed.

The plant of the Holland Veneer Company, Holland, Mich., will be sold by trustee, Harvey F. Wonderly, at a receiver's sale, September 22.

The Banner Brewing Company, Saginaw, Mich., has broken ground for an addition which will double the capacity of the company's present plant.

The German-American Sugar Company, Bay City, Mich., is contemplating the enlargement of its factory and the installation of a molasses reduction process. The company will also make some improvements to its mill at Pauling, Ohio.

The American Sewer Pipe Company will soon reopen its factory at Grand Ledge, Mich. Considerable improvements will be made to the plant.

An automatic fire sprinkler company has been organized at Kalamazoo, Mich., by Victor L. Palmer and George Higgins. The company will have a capital stock of $25,000.

THE MACHINERY MARKETS

The capacity of the plant of the Von Pltaen Lumber Company at Iron Mountain, Mich., is to be doubled at once, including the purchase of additional equipment, some of which has already been contracted for. The company has under consideration the establishment of a flooring mill, shingle mill and dry houses.

The McMullen Machinery Company, Grand Rapids, Mich., report a fairly good demand for requirement in nearly every line, and now that the furniture strike has been settled, are optimistic over the outlook for the remainder of the year. The company has recently furnished the equipment for the two Grand Rapids manual training schools.

C. W. Post, capitalist, Battle Creek, Mich., has large projects in hand in that city which will include the construction of a huge power plant to heat all of Mr. Post's properties in the business section and the erection of a building for the Battle Creek Enquirer.

The Michigan Sugar Company has decided to double the capacity of the plant at Sebewaing, Mich., and will also install a molasses reduction house similar to those recently installed at the other plants of the company. Slicing machinery will be required among other equipment.

Breymann Bros., Toledo, Ohio, who have the contract for dredging the Saginaw River, near Bay City, Mich., are reported to be in the market for hydraulic dredging machinery.

The Public Lighting Commission, Grand Rapids, Mich., is contemplating the installation of the boulevard system of street lighting in the business section. Additional generating machinery will be required should the system be established.

The Stewart Sanitary Feed Trough Company has been incorporated at Grand Rapids, Mich., with a capital stock of $25,000, and will engage in the manufacture of feed troughs of a new design and farm tools.

The Brock Brothers Mfg. & Construction Company, St. Louis, Mo., manufacturing cement roofing, is reported to be preparing to locate its factory in Kalamazoo, Mich.

The American Electric Fuse Company's plant at Muskegon, Mich., will be sold at receiver's sale at some date before November 1.

The Wolcott Packing Company has been organized at Flint, Mich., with a capital stock of $60,000, and is constructing a modern packing house and refrigerating plant. W. C. Wolcott and F. D. Crissman are at the head of the company.

Baldwin, Tuthill & Bolton, Grand Rapids, Mich., are planning the erection of an additional factory building, 125 x 160 ft., to be of steel and concrete construction, work on which will be begun before next spring. This company recently completed a two-story addition to its existing plant and has instituted motors throughout for power purposes. A new line of knife grinding machines equipped with motor drive, is being developed by the company and some large-sized machines are to be made for use in metal-working plants for use in grinding large and heavy shear blades.

The Nichols & Shepard Company, Battle Creek, Mich., manufacturer of threshing machinery, intends to build a new factory, plans for which have not been prepared as yet.

The Michigan Steel Casting Company, Detroit, Mich., intends to erect a new building which will give the company additional storage space and facilities for a carpenter shop, etc.

The Dodge Brothers, Detroit, Mich., manufacturers of special machinery, tools, gears and automobile parts, have in course of construction a blacksmith shop, 65 x 40 oft., and a foundry, 120 x 200 ft., both of which are to be of steel fireproof construction. These buildings will complete a new manufacturing plant, part of which is now occupied.

The Manistee Iron Works, Manistee, Mich., is to extend its line of manufacture to include rotary pumps, and in this connection it is understood that the capital stock of the company will be increased to $800,000.

The Diamond Mfg. Company, Detroit, Mich., is erecting a new all-concrete, fireproof building, which it expects to occupy early in the winter. Its business so far this year has been far beyond expectations, having been much larger than in any previous year.

The Hildreth Mfg. Company, Lansing, Mich., has just added two new engines to its Novo line of vertical gasoline engines, namely a 1½ hp. and an 8 to 10 hp., making the line much more complete. The condition of business in the gas engine line has been good all summer and is still keeping up.

The South

LOUISVILLE, KY., September 19, 1911.

An unusually large number of new manufacturing enterprises in various parts of the South is calling for an increased amount of power equipment. Machine tools are selling better in Southern territory, and the number of metal-working plants is being added to consistently. Crop conditions are good, and now that the fall business has begun to develop manufacturers and dealers are looking forward to excellent trade conditions.

The report that the Alvey-Ferguson Company will abandon its Louisville plant has been denied from the offices of the company. The general offices will be removed to Oakley, Ohio, near Cincinnati, October 1, the company's new plant being located there. The Louisville factory, it has been definitely stated will continue to be operated.

The Myer-Bridges Company, Louisville, is in the market for an elevator to be installed in a three-story warehouse now under construction.

The Louisville Cement Company, which has mills at Speeds, Ind., has under consideration plans for enlarging the plant. These are at present only general in nature.

The Central Concrete Construction Company, Louisville, will shortly purchase a new block machine as well as a conveying outfit for handling concrete blocks.

The Abell Elevator Company, Louisville, has been incorporated with $50,000 capital stock, George Abell, Garland H. Mourning and Garland H. Mourning Jr., being the incorporators. The company states that for the present no additional machinery will be required, the equipment having been purchased within the past month. All kinds of elevators will be made.

The Kentucky & Indiana Terminal Railroad Company has announced plans for extensive improvements, which include machine shops and a roundhouse at a cost of $350,000. These will be used by the Baltimore & Ohio Southwestern, the Southern and the Monon railroads which jointly own the Kentucky & Indiana Company. In addition a coal-handling plant and a sand-drying outfit are to be installed. The work will be carried on during the next few months. W. M Mitchell is superintendent of the company.

The East Kentucky Publishing Company, Whitesburg, Ky., is asking for prices on a gasoline engine of limited capacity. Address W. M. Hall.

A. J. Baldwin & Co., Dawson, Ga., are inquiring for prices on an engine lathe with 12 or 13-in. swing and 6 to 8-ft. bed.

Andrew Hess, Conway, Ark., is erecting a machine shop and also has undeveloped plans for a foundry to handle iron and brass.

The Pinncale Wagon Mfg. Company, Cumberland Gap, Tenn., will erect a factory at Middlesboro, Ky., it is reported. The estimated cost is $10,000. Building will not be begun until next year.

The Hazard Light & Water Company, Hazard, Ky which was recently reported incorporated, is now ready to purchase machinery for its electric light plant.

Kenneth Meguire, Louisville, and L. W. Farmer Barbourville, Ky., have taken under lease 10,000 acres of coal lands in Harlan County. As soon as railroad extensions are completed to the property, operations on a large scale will be begun.

The Kentucky Sand & Gravel Company, Owensboro, Ky., is installing new equipment and greatly enlarging the capacity of its plant.

R. G. Goodin and Taylor Estes are building a plant for the manufacture of brick and drain tile at Lebanon, Ky.

The Consumers' Ice & Cold Storage Company, Lexington, Ky., has completed plans for a new factory to cost $60,000 and has purchased a site. Contracts for the erection of the plant and the installation of equipment will be let at once.

The Kentucky Southwestern Railway, Light & Power Company, recently reported in process of organization for the purpose of constructing traction lines in western Kentucky, has filed articles of incorporation at Wilmington, Del. E. F. Wheaton, Henderson Ky., is the promoter of the company.

The American Rotary Hoisting Engine Company Owensboro, Ky., which recently incorporated, is having its machine made in a local shop and will not erect a plant immediately, although this is intended to be done later on.

THE MACHINERY MARKETS

J. E. Burke and W. E. Daily, Morristown, Tenn., have announced plans for a garage and automobile repair shop. They will purchase machine tools and other equipment for the shop.

The American Cotton Hull & Fiber Company, Charlotte, N. C., will erect a plant at Memphis, Tenn. The material used will be cottonseed hulls. C. H. Reynell is general manager of the company.

L. S. Colyar is reported to be planning the organization of a company for the purpose of establishing a steel plant at Chattanooga, Tenn. He is quoted as saying that he has acquired a large acreage of ore lands.

The Chattanooga Milling Company, Chattanooga, Tenn., has been incorporated with $25,000 capital stock by R. B. Henderson, D. S. Henderson and others.

The Rockwood Machine Works, Rockwood, Tenn., will build a machine shop. A building, 50 x 100 ft., will be erected. E. W. Morris is manager of the concern, which has secured most of its equipment.

A plant for the manufacture of Portland cement may be built at Knoxville, Tenn., by H. R. Blauvelt. A company has been proposed with a capital stock of $600,000.

The Nashville Bridge Company, Nashville, Tenn., has secured the contract for the erection of a municipal garbage plant. Water-tube boilers of special design which are required for the plant will be manufactured by contract.

The Hicks Sheet Metals Works is erecting a plant at Knoxville, Tenn., for handling general sheet metal business. J. C. Hicks is manager.

J. P. Smartt, Ed McCallie and associates of Chattanooga, Tenn., have purchased the plant of the Hercules Mfg. Company, Chattanooga, and will continue it, planning enlargements in the near future. It turns out gas generating plants.

John W. Staples, Harriman, Tenn., will erect a mill for the manufacture of tight cooperage stock.

The Chilhowee Mountain Mining & Mfg. Company, Chilhowee, Tenn., is reported to be planning the development of iron ore lands in that vicinity. The company has established offices at Maryville, Tenn.

The Virginia Bridge & Iron Company, Roanoke, Va., has been awarded a contract for the erection of a steel bridge over Hiwassee River at Charleston, Tenn. The award was made by the commissioners of Bradley County, the company's bid being $21,975.

John G. Duncan Company, Knoxville, Tenn., is asking for prices on woodworking machinery, including a planer and matcher.

The Agricultural and Mechanical College for Negroes, Huntsville, Ala., will erect a manual training school for girls at a cost of $17,000.

The Choctaw Portland Cement Company, Hartshorne, Okla., is in the market for a second-hand hoisting engine.

The Beaver Dam Machinery Company has filed articles of incorporation at Spartansburg, S. C. A. D. Cudd is president of the company, Arthur Irwin, vice-president, and E. P. Parks, secretary and treasurer.

The city of Jessup, Ga., is planning the construction of a system of water works and will require a steel stand-pipe, a power plant, etc. James Steele is city clerk.

Bonds of $25,000 have been voted on for the installation of water works at Dayton, Tenn.

The Herb Mfg. Company, Bristol, Tenn., has purchased the plant of the Ordway Mfg. Company at that place and will install motor-driven machinery for the manufacture of bank, store and office fixtures. The company will require woodworking machinery and a dry kiln, in addition to electric power equipment.

The Henry Vogt Machine Company, Louisville, Ky., is in the market for power plant equipment, a 28-in. or 30-in. planer, die blocks, a power shear for handling stock up to 3½ in., and a drilling and tapping machine for use in a forging plant.

The National Paper Company, Atlanta, Ga., will erect a four-story factory building, 150 x 200 ft., at a cost of $60,000.

The Southern Casket Company, Louisville, Ky., is in the market for a small cut-off saw table.

The Moss Point Fertilizer Company, Moss Point, Miss., intends to build a plant for producing about 10,000 tons of fertilizer a year. The company will shortly let contracts for the building and will install special machinery.

Indianapolis

INDIANAPOLIS, IND., September 19, 1911.

The Merchants' Heat & Light Company, Indianapolis, has increased its capital stock from $500,000 to $3,000,000. For several months negotiations have been in progress for a merger of this company with the other public utility companies of the city, but the effort has failed and the Merchants' Company is preparing to enlarge its plant and extend its service. Edward L. McKee is president of the company.

The Michigan City Commercial Club, Michigan City, Ind., has been organized to develop the manufacturing and commercial interests of the city. The directors are William B. Manny, J. N. Lautmann, Fred N. Smith, George T. Vail and A. J. Henry.

The Vulcan Steam Shovel Works, Evansville, Ind., will start operations September 25, and the event is to be celebrated by a meeting of citizens at the plant who will listen to speeches by those through whose efforts the large industry was secured for the city.

Robert W. Howard has secured from the Town Council of Kentland, Ind., a franchise for an electric light plant.

The contract for a new high school at South Bend, Ind., Jno. A. Wood, superintendent, has been let. The equipment of the school will include a machine shop.

Fire destroyed more than one-half the buildings of the Big Four Railroad shops at Brightwood, a suburb of Indianapolis, September 14, including the coach shops, millrooms, power house, paint shops and engine room. The roundhouse, storerooms, machine shops, tinshops and repair sheds were saved. The loss was $300,000, with insurance of $150,000. F. M. Lawler is master mechanic.

The Merchants' and Manufacturers' Club has been organized at Elwood, Ind., to promote the commercial and manufacturing interests of the city. The president is M. J. Fogarty; the secretary, R. J. Weber.

A turbine engine and electric generator will be purchased for the municipal electric plant at Anderson, Ind. The members of the Board of Public Works are visiting various manufactories inspecting their products.

The Kerr Murray Cressler Mfg. Company, Ft. Wayne, Ind., has increased its capital stock from $100,000 to $300,000. The company conducts a foundry, machine and boiler manufacturing business. Alfred D. Cressler is president.

A building permit has been taken out at Evansville, Ind., has been incorporated, with $10,000 capital stock, factory to be built by the H. Fendrich Cigar Company.

The Dean Brothers & Daniels Mfg. Company, South Bend, Ind., has been incorporated, with $40,000 capital stock, to manufacture washing machines. The directors are A. J. Dean, F. M. Dean, A. J. Daniels.

The Utica Stone, Lime & Supply Company, Utica, Ind., has been incorporated, with $10,000 capital stock, to quarry stone. The directors are L. H. Meyer, Joseph Keehner and C. W. Kelly.

The Metal Wheel Company, Knox, Ind., has decreased its capital stock from $30,000 to $20,000.

The Central Indiana Gas Company, Muncie, Ind., has increased the common stock from $500,000 to $5,000,000 and has issued $500,000 preferred stock.

The Pacific Coast

PORTLAND, ORE., September 12, 1911.

The month has opened with a fairly good demand for small machine tools and general shop supplies, though few inquiries have been received for more than two or three tools, and few shops in this territory are buying any heavy equipment. The local shops are well occupied, however, and there is no complaint regarding the general situation. The lines of machinery which occupy the leading position in this territory, logging and mill equipment, continue in strong demand, and projects are under way for the installation of several new mills during the coming year. The coastwise lumber trade is now in good shape, and a movement has been started among the lumber interests of the entire Pacific Northwest for the formation of a corporation to control the export business, from which considerable ultimate benefit is expected. The demand for agricultural and irrigating equipment is well sustained, and numerous inquiries are coming out for electric and hydro-electric machinery.

THE MACHINERY MARKETS

The United States Steel Products Company has leased the sixth floor of the Selling Building, Sixth and Alder streets, this city. E. R. Eldredge, Portland representative of the company, has for some time been located at Ninth and Irving streets.

Bids will be received up to September 30 at the Quartermaster's office, Fort Stevens, Ore., for the construction of an addition to the ordnance shops at that place.

It is announced that contracts will be let for the erection of the plant of the Olympic Portland Cement Company at Bellingham, Wash. The Spaulding Lumber Company, Salem, Ore., is planning to make a large addition to its mill within the next few months.

Inquiries have been received at Everett, Wash., from an Eastern concern which proposes to erect a veneer plant at a cost of about $150,000.

The Seattle Tool Company, Seattle, Wash., has been incorporated, with a capital stock of $40,000, by J. H. Talbott, O M. McConnell and W. M. Hamlin.

It is reported that the C. A. Smith Lumber Company will add a re-manufacturing plant to its mill at Marshfield, Ore., increasing its daily capacity by about 100,000 ft.

The Seattle Frog & Switch Company, Seattle, Wash., is planning to move to larger quarters at Earlington, on the Chicago, Milwaukee & Puget Sound Railroad.

The O'Connell Lumber Company, whose plant at Winlock, Wash., was recently destroyed by fire, has about completed plans for its new mill. It will have a daily capacity of 150,000 ft., and will be operated by electricity.

J. M. Clapp has secured a $113,000 contract for harbor work at Everett, Wash., and is now assembling the necessary equipment.

The Albina Engine & Machine Works, this city, has taken a contract for repairs to a Columbia River lightship.

The Vulcan Iron Works, this city, has a contract for repairs to the lighthouse tender Manzanita. The Vulcan Iron Works is moving its plant to the Alaska dock, where the work will be done.

Texas

AUSTIN, TEXAS, September 16, 1911.

Noticeable improvement is observed in the demand for machinery of various kinds in Texas and throughout the Southwest. Many new industrial plants are being installed and others are in contemplation. It is expected that during the fall and winter months the activity in machinery trade will exceed all previous records in this State. The political situation in Mexico is still very acute and business is practically suspended all over the republic. The favorable indications for tranquillity that seemed to exist a short time ago proved to be but a temporary lull in the disturbed situation. American machinery manufacturers are not attempting at this time to do much business in that country.

The Continental Wax Company which recently installed a large plant at Sanderson, for the manufacture of wax out of the candelilla plant which grows wild in that region, is preparing to install 10 other plants of similar character in the upper Rio Grande border section of the State. Oscar Pascius is manager.

The St. Louis, Brownsville & Mexico Railroad will soon begin the erection of a pre-cooling plant at San Benito, to cost $75,000. The Commercial Club has donated a site for the proposed plant.

The Commercial Club of San Benito is promoting the establishment of a creamery.

D. B. Chapin and associates, who are preparing to erect a large dam across Devil's River near Del Rio, to obtain water supply for irrigating about 150,000 acres of land and to operate a hydroelectric plant that they will install, have completed the surveys for the proposed works. The dam will be about 185 ft. high. The main canal will carry the water over a large scope of country, enabling the reclamation of land that is now unsuited for agriculture.

The Sabine Supply Company, Orange, is in the market for a second hand Soule steam feed made by the Soule Steam Feed Works, Marine, Miss. The company is also inquiring for a second hand 10-hp. reversible hoisting engine and second hand 14 x 6 Bradford lathe with a 6-ft. bed.

The Decatur Electric Lighting & Power Company's plant at Decatur was entirely destroyed by fire, entailing a loss of about $6000. The plant will be rebuilt and the damaged machinery replaced as soon as possible.

Laredo is planning the erection of a modern water works plant.

The San Antonio, Rockport & Mexican Railway Company has been formed with headquarters at San Antonio for the purpose of constructing a line of railroad from San Antonio to Brownsville, 240 miles, with a branch line to Port Aransas, 110 miles. It has a capital stock of $350,000. Incorporators are James A. White and Thomas C. Berry of San Francisco, Samuel Collver of Seattle and, H. W. Quinan, R. R. Russell, J. H. Haile, John T. Rives, A. L. Davis, J. G. Fowler and A. L. Matlock of San Antonio.

The Western Mines & Development Company will erect considerable new machinery at its property near Tombstone, Ariz

The Live Oak Development Company will install a 150-ton ore reduction mill at its mine near Miami, Ariz.

The Alamos Mining & Exploration Company will build a reduction mill at its mine at Plamosos, Sonora, Mexico.

The Compania el Barrenoy Anexas will install a 20-stamp mill at its mine near San Luis Potosi, Mexico.

The Cananea-Boston Mining Company will add an electric hoist and other equipment to its property near Cananea, Mexico.

The Mowry Mining Company, Nogales, Ariz., will spend about $1,500,000 in development work and machinery at its Nowry and Selaro mine.

The City Council of Tucumcari, N. M., has taken steps to erect a fire proof fire house and a 100,000-gal. steel tower for the water works plant.

The Red River Valley Company, Tucumcari, N. M., is sinking four deep wells on the Bell ranch near that place for the purpose of developing a water supply.

The Canadian & Ute Creek Oil, Land & Irrigation Company will drill a deep well near Tucumcari, N. M., for the purpose of developing water for irrigation.

L. J. Carter will build a pumping plant for the purpose of irrigating a large tract of land near Deming, N. M.

The Land Vineyard Company will install a 1500-gal. pump at a well on its land near Deming, N. M., for irrigation.

Morris & Co. will build a cold storage plant at El Paso at a cost of $18,450.

The City of Las Cruces, N. M., has voted $75,000 bonds for constructing a new sewer system and water works plant.

The Las Cruces Electric Light Company, Las Cruces, N. M., has issued $75,000 of bonds for the addition of new machinery and other improvements to its electric light and power plant.

Eastern Canada

TORONTO, ONT., September 18, 1911.

The election campaign has extended into the period when the autumn trade becomes vigorous. It cannot be said that the public are so engrossed in the campaign as to be inattentive to their proper business to any extent. As a matter of fact, trade is not falling off, but if there were no election excitement, and if there were no uncertainty as to tariff changes, it would probably be of materially greater volume than it is. Manufacturers of machinery and some other classes of articles are showing a lively interest in the issue, being apparently apprehensive that if the present reciprocity agreement is established, it will soon be followed by another embracing manufactured articles. It is also held that if railroads carry farm produce from Canada to the United States they will not return light, but will bring back manufactured articles. The supply of money is somewhat stinted, but no serious contraction in operations is caused thereby. Funds ought to be more plentiful a month hence, when the crop movement, the financing of which calls for careful husbanding of energy on the part of the banks, will then be through the period of greatest strain. Keen interest is being taken in this market by British, German and American selling agencies at the present time, and this fall there promises to be more activity on the part of outside houses than ever before.

It is estimated that fully 90 per cent. of the equipment of Canadian machine shops is either American or what is described as American-Canadian. British manufacturers of equipment make slow headway here because of delay in delivery.

THE MACHINERY MARKETS

German manufacturers are giving a great deal of attention to the Canadian market at the present time.

Ham, Baker & Co., London, England, have the contract for supplying the sewage screening plant, elevation and conveyors for the city of Toronto's new sewage disposal system.

The citv of Quebec will spend $700,000 on new water works.

J. Grant Henderson, commissioner of industries at Hamilton, Ont., announces that the Grasselli Chemical Company of Cleveland will in a short time establish a Canadian branch in Hamilton. A site of 160 acres has been purchased for the company in the northeastern part of the city. It is stated that a plant to cost $1,000,000 will be erected and that 1000 hands will be employed.

The factory of the Woodstock Wool Working Company, Woodstock, Ont., was destroyed by fire.

The McClary Mfg. Company, London, Ont., is adding to its factory buildings a three-story structure with a ground area of 100 x 120 ft.

The Smith Foundry Company, Fredericktown, N. B., has awarded a contract for the erection of a large new building to take the place of the one recently destroyed by fire.

The ratepayers of Hamilton are expected to vote next January on a by-law to raise $150,000 for the laying of a new water intake, the installing of new high-level pumps and the purchase of machinery.

The Hamilton Gear & Machinery Company, Toronto, is building a new factory.

The Hull Electric Company, Aylmer, Que., is preparing to erect a substation to furnish additional power for railway operations.

The John Palmer Company, Fredericktown, N. B., is about to erect a building to be used for factory purposes to cost $25,000.

J. Darch & Son, London, Ont., are preparing to add to their factory capacity and put in new machinery.

The Hobbs Mfg. Co., London, Ont., maker of plate and stained glass, is adding to its factory buildings.

G. A. Hulland & Son, Montreal, are erecting stores and offices to cost $100,000.

The Steele Briggs Seed Company, Toronto, is putting up a warehouse to cost $100,000.

The city of Montreal is planning the erection of a machine shop to cost $60,000. Machinery worth $20,000 for iron-working purposes will be required.

J. L. Dennison-Taylor, Toronto, is putting up a grain elevator and feed mill in the city to cost $100,000.

The American Cyanide Company, Niagara Falls, Ont., will put up another building to cost $225,000.

The Montreal Terra Cotta Lumber Company is building a plant at Lakeside, near Montreal, to cost $200,000.

U. H. Dandurand, Montreal, has organized a syndicate to build near that city a model municipality on a site of 363 acres near the Lachine Rapids Hydraulic & Power Company's plant.

The Canadian Consolidated Rubber Company, Montreal, is building a large extension to its factory premises in that city. The additon is to cost $250,000.

The Thorold Silver Smelter Company, Thorold, Ont., in which R. W. Leonard, president and general manager of the Coniagas mines at Cobalt, is largely interested, has been offered inducements to move to Niagara Falls, N. Y. The smelter sends $500,000 worth of silver to the United States every year. About 150 men are employed at the smelter.

The Harbor Commissioners of Montreal will spend $6,000,000 on improvements within the next two years. The announcement is repeated that Vicars Sons & Maxim will install a large shipbuilding plant adjoining the dry dock site.

The Algoma Iron Works, Ltd., Sault Ste. Marie, Ont., which does a general jobbing, foundry and machine business, is building new shops as the property it now occupies has been purchased by other parties.

Western Canada

WINNIPEG, MAN., September 16, 1911.

Though the crop, which is now entirely harvested, is large, it is not quite up to the expectations that were held to when cutting began. Early frost did some damage. Another point to be noted is that creditors are taking advantage of the prosperity of the Western farmers to press for settlement. Land speculation will not be allowed to absorb and tie up so much money as in past years. Bankers will insist more than ever before that customers keep their assets in as compact a form as possible for the requirements of their own business. It is evident that of the money realized from the crop the proportion left in first hands as spending power will not be more than the farmers need, and it will be a not excessive stimulus to business.

The Hall mines smelter at Nelson, B. C., covering 13 acres of ground, and one of the largest plants of its kind in Canada, was destroyed by fire. An estimate of the loss is $750,000.

R. V. Winch, Vancouver, B. C., is acting as agent for an English syndicate that is preparing to erect a very large cement plant near Chilliwack, B. C.

The Saskatchewan Co-operative Elevator Company, Regina, Sask., has given contracts for the construction for 40 elevators, to be built on concrete foundations with frames of extra heavy steel. The equipment is to be of the most modern character.

The Dryden Timber & Power Company at Dryden, Ont., near Kenora, is now busy upon the construction of its works.

Officials of the Grand Trunk Pacific Railway Company say that the company's coast fleet will be equipped with oil-burning apparatus in the near future.

Among the cities visited by representatives of the Mueller Mfg. Company, Decatur, Ill., to select a site for a Canadian factory is Edmonton, Alberta.

G. M. Phillips, secretary-treasurer of the town of Scott, Sask., will receive up to noon, September 25, tenders for supply and delivery of the following machinery and materials: Tender A., generator and exciter and switchboards, transformers and meters, series tungsten street lighting system, pumping machinery; Tender B., two pneumatic storage tanks.

The Gaetz Mfg. Company, Red Deer, Alberta, has instructed C. A. Julian Sharman, architect, to get out plans for the extension and doubling of its factory building on the corner of First avenue East and First street North. Tenders will be called for at once. The addition will be two stories and basement, uniform with its present factory.

The by-law which was submitted to the ratepayers of Portage la Prairie, Man., to issue debentures to the amount of $110,000 for the purchase by the city of the plant of the Central Electric Company, was approved by a majority of 228, and the city takes possession of the plant at once.

Plans are far advanced for the building of a smelter for the treatment of zinc ores of the Slocan District, B. C., by natural gas. The plant will be located at some point in the natural gas belt along the line of the Canadian Pacific Railway, either at Medicine Hat or at Dunmore Junction, a few miles distant.

The City Engineer of Chilliwack, B. C., which has a large programme of public works in hand, has under consideration the purchase and erection of a large concrete pipe building plant.

A viaduct to cost $550,000 is being recommended by the City Council of Vancouver, B. C., and a by-law for that purpose will be voted on by the ratepayers in January.

The Hudson Bay Company is pushing forward the construction of new buildings at Victoria, B. C., Calgary, Alberta and Regina, Sask.

George White & Son, manufacturers of agricultural machinery, are putting up a building at Brandon.

The city of Edmonton, Alberta, has under consideration the ordering of a 10,000,000 gal. pump as a reserve for its new water works system.

By-laws are being prepared for water works, sewerage, etc., for the city of Regina, Sask. The whole expenditure proposed by the city is not far short of a million dollars.

The Canadian West Lumber Company, West Vanvouver, is planning the construction of a mill to cost $60,000.

The Canadian Summer Iron Works, Vancouver, B. C., headquarters at Everett, Wash., will erect a small foundry and iron works at Burnaby, B. C.

The ratepayers of Prince Albert, Sask., have indorsed a by-law to raise $775,000 for the purpose of developing 3500 hp. at La Colle Falls, near that city.

The Town Council of Innisfail, Alberta, has decided to submit a by-law to the people to raise $15.000 to instal an electric light plant.

The Anthes Foundry Company, Ltd., Toronto, has decided to build a $125,000 foundry in Winnipeg.

The plans and specifications for the new 4,000,000 gal. per day water works plant to be installed in Saskatoon, Sask., are being prepared by Consulting Engineer Moley of New York.

Current Metal Prices.

The following quotations are for small lots, New York. Wholesale prices, at which large lots only can be bought, are given elsewhere in our weekly market report

IRON AND STEEL—

Bar Iron from Store—

Refined iron,
1 to 1½ in. round and square ..... ℔ lb 1.70c
1½ to 4 in. x ⅜ to 1 in. ..... ℔ lb 1.80c
1½ to 4 in. x ¼ to 3 in. ..... ℔ lb 1.80c
Rods, ⅜ and 11-16 round and square ..... ℔ lb 1.80c
Angles, Cts. ℔ lb.
3 in. x ¼ in. and larger 1.50c
3 in. x 3-16 in. and ⅛ in. 2.00c
1½ to 2½ in. x ⅜ in. 2.05c
1½ to 2½ in. x ¼ in. and thicker 1.95c
1 to 1½ in. x ⅛ in. 2.05c
1 to 1½ in. x ⅜ in. 2.10c
⅝ x ⅛ in. 2.20c
¾ x ⅛ in. 2.25c
⅞ in. x ⅛ in. 2.30c
1 in. x 3-32 in. 2.30c
Tees,
1 in. 2.35c
1¼ in. 2.20c
1½ to 2½ in. x ¼ in. 2.00c
1½ to 2½ in. x 3-16 in. 2.10c
3 in. and larger 1.95c
Beams 1.90c
Channels, 3 in. and larger 1.90c
Bands, 1½ to 6 x 6-16 to No. 8 ..... 2.10c
Buffalo's "H. B. & S." iron, base price 2.85c
Burden's Best iron, base price 3.15c
Norway bars 3.60c

Merchant Steel from Store—

per lb.
Bessemer machinery 1.80c
Low carb. tire and sleigh shoe ..... 2.50@3.00c
Best cast steel, base price in small lots 7c

Sheets from Store—

Black

	One pass, C R soft steel	R. G. cleaned
No. 16	℔ lb 2.45c	2.75c
Nos. 18 to 20	℔ lb 2.50c	2.85c
Nos. 22 and 24	℔ lb 2.55c	2.95c
No. 26	℔ lb 2.60c	3.05c
No. 28	℔ lb 2.95c	3.30c

Russia, Planished, &c.

Genuine Russia, according to assortment ..... ℔ lb 12 @14½
Patent planished, W. Dewees Wood ..... ℔ lb A, 10c; B, 9c net

Galvanized

Nos. 12 and 14 ..... ℔ lb 2.75c
No. 24 ..... ℔ lb 3.10c
No. 26 ..... ℔ lb 3.30c
No. 28 ..... ℔ lb 3.60c
No. 20 and lighter 56 inches wide, 25c larger.

Genuine Iron Sheets—

Galvanized

Nos. 22 and 24 ..... ℔ lb 5.50c
No. 26 ..... ℔ lb 6.00c
No. 28 ..... ℔ lb 7.00c

Corrugated Roofing—

2½ in. corrugated	Painted	Galvd
No. 24 ..... ℔ 100 sq ft	$3.75	$4.70
No. 26 ..... ℔ 100 sq ft	2.85	3.90
No. 28 ..... ℔ 100 sq ft	2.50	3.65

Tin Plates—

American Charcoal Plates (per box)

A A A A charcoal:
IC, 14 x 20 ..... $6.65
IX, 14 x 20 ..... 7.90
A charcoal:
IC, 14 x 20 ..... 5.60
IX, 14 x 20 ..... 6.70

American Coke Plates—Bessemer—
IC, 14 x 20, 107 lb $4.50
IX, 14 x 20 ..... 5.50

American Terne Plates—
IC, 20 x 28 with an 8 lb coating $8.70
IX, 20 x 28 with an 8 lb coating 10.70

Seamless Brass Tubes—
Last November 13, 1908. Base price, 18c

Brass Tubes, Iron Pipe Sizes—
Last November 13, 1908. Base price, 18c

Copper Tubes—
Last November 13, 1908. Base price, 21c

Brazed Brass Tubes—
List February 1, 1911. 19½c ℔ lb

High Brass Rods—
List February 1, 1911. 14⅜c ℔ lb

Roll and Sheet Brass—
List February 1, 1911. 14⅜c ℔ lb

Brass Wire—
List February 1, 1911. 14⅜c ℔ lb

Copper Wire—
Base price, Carload lots mill 13½c

Copper Sheets—
Sheet copper hot rolled, 16 oz. (quantity lots) ..... ℔ lb 17c
Sheet copper cold rolled, 1c ℔ lb advance over hot rolled.
Sheet copper polished 20 in. wide and under, 1c ℔ square foot.
Sheet copper polished over 20 in. wide, 2c ℔ square foot.
Planished, copper, 1c ℔ square foot more than polished.

METALS—

Tin—

Straits pig ..... ℔ lb 46 @47 c

Copper—

Lake ingot ..... ℔ lb 14 @14¼c
Electrolytic ..... ℔ lb 13¾@14 c
Casting ..... ℔ lb 13¾@14 c

Spelter—

Western ..... ℔ lb 7 @ 7¼c

Zinc—

No. 9, base, casks ..... ℔ lb 8½c Open ..... ℔ lb 9c

Lead—

American pig ..... ℔ lb 5¼@5½c
Bar ..... ℔ lb 6⅝@6¾c

Solder—

½ & ½, guaranteed ..... ℔ lb 27½@28c
No. 1 ..... ℔ lb 25½@26c
Refined ..... ℔ lb 24½@25c
Prices of solder indicated by private brand vary according to composition.

Antimony—

Cookson ..... ℔ lb.. @10½c
Hallett's ..... @10 c
Other brands ..... 9@9½c

Bismuth—

Per lb ..... $2.00@$2.25

Aluminum—

No. 1 aluminum guaranteed over 99% pure, in ingots for remelting ..... 21c and 22c
Rods and Wire ..... Base price 35c
Sheets ..... Base price 38c

Old Metals—

Dealers' Purchasing Prices Paid in New York.

	Cents.
Copper, heavy and crucible	10.75 to 11.00
Copper, heavy and wire	10.50 to 10.75
Copper, light and bottoms	9.50 to 9.75
Brass, heavy	7.25 to 7.50
Brass, light	5.75 to 6.00
Heavy machine composition	9.25 to 9.50
Clean brass turnings	7.00 to 7.25
Composition turnings	8.00 to 8.25
Lead, heavy	3.75
Lead, tea	3.25
Zinc scrap	4.00



THE IRON AGE

Established 1855 | New York, September 28, 1911 | Vol. 88: No. 13

Published Every Thursday by the
DAVID WILLIAMS COMPANY
239 West 39th Street, New York

Entered at the New York Post Office as Second-Class Mail Matter.

Subscription Price, United States and Mexico, $5.00 per Annum; to Canada, $7.50 per Annum; to Other Foreign Countries, $10.00 per Annum. Unless receipt is requested, none will be sent. Credit for payment will be shown by extending the date on the wrapper of your paper.

W. H. Taylor, - - - - - - President and Treasurer
I. A. Mekeel, - - - - - - - First Vice-President
Harold S. Buttenheim, - - - - Second Vice-President and Secretary

Geo. W. Cope, - - - - } Editors
A. I. Findley, - - - - }
W. W. Macon, - - - - }

M. C. Robbins, - - - - Manager
Charles S. Baur, - - - Assistant Manager

Branch Offices

Philadelphia, Real Estate Trust Building
Pittsburgh, Park Building
Boston, Compton Building
Chicago, Fisher Building
Cleveland, American Trust Building
Cincinnati, 807 Andrews Building

CONTENTS.

The Steel Trade Disturbed 661
The Steel Corporation and Disintegration 662
Basing Prices on a Normal Business 663
Misrepresenting Machinery Deliveries 663
Turbo-Electric Hoisting Engines in Lake Mines 664
The Extended Use of Oil for Fuel 664
The Treadwell-Stoever Consolidation 664
Sixth Testing Society Congress 665
The Steel Corporation Stands on Its Record 665
The Iron and Metal Markets 666
Personal 677
Excursion Features of Mining Engineers' San Francisco Meeting 677
Obituary 677
Iron and Steel Electrical Engineers 678
The American Manufacturers' Export Association 678
Pittsburgh and Vicinity Business Notes 679
The Steel Corporation's Value 680
Cincinnati and Its Manufacturing Suburbs 681
The Virginia Iron, Coal & Coke Company's Report 681
A Southwestern Virginia Ore Development 681
Mining Engineers' New York Section 682
The Atlas Ore Dryer 682
Steel Men Inspect Knox Water-Cooled Devices 683
Pacific Coast Selling Department of the Steel Corporation 683
The Development of Blast Furnace Size 683
Inland Steel Company's Bolt and Rivet Works 684
The Wiederholt Chimney 689
A New Lackawanna Merchant Mill 690
Standard Scale and Truck Orders 691
The Tangelier Hammering Machine 692
The Burt Ventilator 693
Unusual Service Records in Wire Works 693
Electric Switching Locomotive 694
The Atkins Hack Saw Machine 694
Steam Shovel Work 695
Motor-Driven Sheet and Strip Mill 696
The First Mesaba Range Steam Shovel 697
French Blast Furnace Consolidation 697
Solar Pumping Plant 698
A New Foundry and Mechanical School at Boston 699
Janney, Steinmetz & Co.'s Business 699
The Globe Iron Works to Remove Its Plant 699
Flywheels for Motor-Driven Rolling Mills 700
The Western Wheel Barrow & Mfg. Company's New Plant 700
The Machine Tool Builders' Programme 700
Chinese Exports of Pig Iron and Iron Ore 700
An Iron and Steel Trust in Italy 701
Washburn Motor-Driven Drill 701
New Finds of Lake Iron Ores 702
Gaco Specialties 703
Special Reading Cranes 704
The Winona Technical Institute 704
United States Bureau of Mines Demonstrations 705
A New Feature of the Gandy Belt 705
The Slatington Mill Again in Operation 705
The Machinery Markets 706

The Steel Trade Disturbed

More Irregularity in Prices

New Discounts on Merchant Pipe—Rail Inquiry for Next Year

Uncertainty about the future of the United States Steel Corporation has commanded the attention of the steel trade in the past week and buying and selling have suffered. The air has been so charged with disturbing rumors, accompanied by rapid declines in the corporation's securities, that it may take a week or longer to give any clear view of the trade situation. Some help has been given by the statement of the corporation's directors, referred to elsewhere.

Two things need to be emphasized at a time when real conditions are apt to be obscured. One is that consumption, as shown by the operation of blast furnaces and steel works and the close connections that are now regularly made between rolling mills and consumers, is but little below the maximum for this year. The other is that at the low prices reached on finished materials some buyers are showing more confidence in the market.

The statement of the Steel Corporation, given out Tuesday, refers to 4,500,000 tons on its books including 929,000 tons of inter-company business. The first of these figures is evidently not exact, but deducting from it the second, leaves 3,571,000 tons of orders, a decline of 125,000 tons from the amount reported for September 1, which was 3,695,985 tons.

All market reports indicate that finished steel prices have been under more strain and in some cases are $1 to $2 a ton lower. But the lowest prices named are not general and a good many buyers find that they cannot place business at these figures. This unevenness has caused much confusion.

The appearance of a 30,000-ton Bessemer rail inquiry from the Norfolk & Western Railroad for 1912 is encouraging in this between-season period for the rail mills. The business may be placed soon and it is possible that this and other lines will permit the rolling of some of their 1912 rails this year. There is considerable foreign inquiry for rails, and the Chilian State Railways have placed 10,000 tons in this country.

A new card of discounts on merchant pipe, to be issued by the National Tube Company, October 2, will show a reduction of $2 a ton on black and a greater reduction on galvanized pipe. Boiler tubes, on which there has been sharp competition for some time, are reduced $3 to $5 a ton on sizes above 2½ in. A line-pipe inquiry, on which foreign mills will be close competitors, comes from the Canadian Western Gas, Light, Heat & Power Company for 40,000 tons of 4½ to 16½ in. pipe.

A more aggressive attitude on structural shapes has been taken by some mills and 1.27½c. has been reached on large business in the Pittsburgh district, while Chicago reports business taken at the equivalent of 1.25c., Pittsburgh. At Cleveland bids have been

taken on 5000 tons for crossing work for the Pennsylvania Railroad. The Burlington office building at Chicago, 6500 tons, was taken by the American Bridge Company, and at Pittsburgh the Bethlehem Steel Company was awarded 2600 tons for the First National Bank extension.

What low prices may do in bringing business to a head is illustrated in the inquiry from the Central Railroad of New Jersey for 10,000 tons of steel for two bridges which will not be erected for a year or more.

Plate mills are drifting into quieter conditions. Orders from car and locomotive works are dwindling, and the latter in particular are facing a lean winter. For one of the American Hawaiian Steamship Company's proposed steamers an inquiry has come up at Philadelphia for 5400 tons of plates and shapes.

Low prices were named on the 8900 tons of 40-in. cast-iron pipe which will be bought for Brooklyn, N. Y., and pipe foundries report fewer inquiries from private buyers. Muskegon, Mich., has placed an order for 5000 tons.

In the Pittsburgh district prices on open-hearth billets and sheet bars have declined further and as low as $19 and $19.50 respectively are reported, some of the smaller open-hearth mills showing more eagerness for orders.

Pig-iron markets are even quieter, buyers having evidently been driven off by recent weakness in this year's prices and the failure of furnaces to establish advances for next year.

Several ferromanganese contracts are pending in the Central West, the recent advances having hurried buyers into the market for their entire requirements for 1912.

The Steel Corporation and Disintegration

The securities market has been shaken in the past week by reports which, while not new, were repeated with more positiveness than before, that steps were about to be taken to bring about a dissolution of the United States Steel Corporation. It was said that the officers of the corporation, following the example of the International Harvester Company, were initiating plans for reorganization which would be submitted for the approval of the Government. It was also said that the Department of Justice had made preparations to proceed in the courts to compel the dissolution of the Steel Corporation. This last report was denied by the Attorney-General. He also denied that he had said, as quoted by one newspaper, that "the United States Steel Corporation is plainly a combination in violation of the law."

The officers of the Steel Corporation have maintained a strict silence. One might hazard the surmise that they had no clearer idea than the Department of Justice as to the steps to be taken, if any, "to square themselves with the decision of the Supreme Court," to use the words Attorney-General Wickersham applied generally to large business interests. Indeed, until recently it had been considered that the Government, after five years of investigation more thoroughgoing than it has made of any other consolidation, had not found ground on which to bring dissolution proceedings against the Steel Corporation. Its great size, the wide use of many of its products which carry protective duties, the identification with it of banking interests which in popular thinking incarnate the "money power," the leading position of the steel trade—all were considered reasons in particular for attacking the Steel Corporation. Well known as were all these conditions, it is somewhat surprising that the situation should suddenly have become so portentous.

Another surprising feature of the week is the glibness with which in some quarters disintegration has been discussed. The dismemberment of a consolidation that fairly staggers the mind with the gigantic scale of its operations has been talked of as though it were some routine clerical proceeding. The task of bringing together the great companies now known as subsidiaries of the Steel Corporation was monumental. But it was simplicity itself compared with an attempt to resolve the consolidation and its subsidiaries, with their ten years of accretions and structural changes, into the original units. Corporeal resurrection, by the coming together of elements that had gone back to earth, would be little less a marvel. Not only have companies utterly disappeared, but in more than a score of cases entire plants have been blotted from the map. New combinations have been made, old lines obliterated, millions of dollars' worth of property created, traceable to none of the original constituents, and in many cases new and old have been intermeshed in a way that makes separation impossible.

There may be features of the Steel Corporation's organization and operations that Government oversight would change. If there were Federal incorporation and some such regulation of the largest industrial companies as the Hepburn law provides for railroads, it is not improbable that ownership of the two Minnesota roads by the Steel Corporation and the rate charged by these roads would be called in question. So far as the rate is concerned, that is now and has been subject to revision by the Interstate Commerce Commission. The extent of the corporation's control of the Lake Superior ore supply and its large ownership of Southern ore might also be regarded as matters for adjustment, in view of their bearing on future competition in the industry. If the Tennessee Company purchase and the Hill ore deal should be considered as tending toward undue control of ore supply, such a decision, if made on Government authority, would put the country well on the way toward certainty on a question on which the Government just now is unable or unwilling to give any clear light. It may be claimed, also, that the existence of a powerful interest like the Steel Corporation has alone made possible the policy of co-operation and price maintenance in the steel industry. The answer is found in the open market of to-day and that of 1909, and the power in the hands of the Department of Justice to put a stop to this mode of "co-operation" whenever it finds it to exist in undue restraint of trade.

Attorney-General Wickersham, in his latest deliverance, lays down "undue restraint of trade" and "attempting monopoly" as the Supreme Court tests which the Department of Justice is now applying. Since the Steel Corporation's officers will deny that either of these things exists or is aimed at by their organization, how can they be expected to accept Mr. Wickersham's general invitation to "work out a plan of separation to avoid illegal conditions? It would seem that in justice to their bondholders and stockholders they must leave the whole question to the decision of the courts; not in a spirit of hostility or opposition to the Government, but of seeking light from nothing less than the highest judicial authority in the land on one of the

most momentous issues that has arisen in modern business.

The events of the week have given telling emphasis to the need of some source of Federal discretion for corporate business. It is inconceivable that large corporations are to be done away with. But there must be some security to those charged with their management; it must be possible for them to know whether their policy or their proposals are within the law. If "each case stands on its own footing and depends upon its own particular facts," as the Attorney-General has said, it is plain that the decision in the case of one corporation cannot become a rule for others, unless it be applied to them by competent authority.

The day of Government regulation of large business is certainly here; but just now a monopoly of such regulation, apart from that of railroads, is in the hands of the Department of Justice, which can be heard from only by indictment or by dissolution suits, or perchance by its response to a confession by a corporation's officers that their action has been contrary to law. Manufacturers may protest against the Government "running" their business, but Federal regulation of the form if not of the scale of business is a fact. What is of the greatest moment now is that the regulation be constructive and not destructive; that the benefits of consolidation shall be preserved and their evils eliminated; and that manufacturers shall be able to know before the fact whether a plan of procedure is within the law. Whether the new legislation to that end provide for a bureau, a commission or an industrial court is not so material as that provision be made for lifting the siege upon business. Present conditions, which are close to an *impasse,* may prove less calamitous than they now appear if they increase the conviction that some such way out must be found, and found soon.

Since the above was prepared a statement has been issued by J. Pierpont Morgan and Elbert H. Gary as a committee of the Steel Corporation's board of directors, giving their stockholders the assurance many of them have needed, that no disintegration of the corporation is contemplated, either voluntary or at the demand of the Government. It said further that the corporation had not been operated to restrain trade or to obtain a monopoly; that it had observed the law and recognized the just rights of its competitors and the consumers of its products, and that its counsel had advised that it was not in violation of the Sherman act as interpreted in the recent decision of the Supreme Court. The statement will quiet much of the apprehension excited by recent rumors. The Government might clear up the situation further by a statement of like definiteness from its Department of Justice; but that, it is evident, would be inconsistent with the Attorney-General's policy of forcing "voluntary" action by giving all large consolidations to understand that they are in peril of civil or criminal proceedings.

Basing Prices on a Normal Business

The practice is growing in certain branches of the machinery trade of basing industrial values on a normal business. The idea is to establish, in a thoroughly organized way, a system by which a given profit shall be earned covering a series of years, in all the ups and downs of business. Manufacturers differ, of course, in the definition of the word normal as applied to trade conditions and for the purpose of the system under discussion the expression is taken as meaning average production in its ratio to capacity.

In an industry the product of which is a staple metal article the manufacturers have got together to the extent of fixing a standard 75 per cent. average production, upon which all prices are based. In a period of 10 years it was found that this figure represented the experience of the industry as a whole. Therefore, it was decided, if a given profit is to be earned, year in and year out, prices must always be reckoned on that basis. If an investment of $100,000 is to earn $10,000 a year, or $100,000 in 10 years, the profits of good times must be high enough to cover the losses or failures to earn the full shares of other years. The general proposition should be true of all systems, of course. But in the case in question the manufacturers decided that the way surely to bring about the result was always to reckon prices on an average production. In rush times, with every possible producing facility working at the top limit, prices are made as if only 75 per cent. capacity was operating, which naturally results in a large margin of profit. To earn a given amount on an investment at three-fourths capacity requires higher prices than would be the case on a full capacity basis. Therefore, if 75 per cent is taken when as a matter of fact works are running at 100 per cent., actual profits are proportionately greater.

This rule does not prevail in most machine tool establishments. Ordinarily, manufacturers are content to accept the high profits of good times and put them against the failures of lean years, paying too little attention to the co-relation of the varying years in its effect upon the earnings of their investments. In this branch of industry also 75 per cent. is not far from the average production, according to those who have investigated the subject. In determining prices the variation in capacity need not be considered, except in its ratio to production during any week or month or year.

The belief is expressed that this system has a most healthful influence upon an industry. It acts against too rapid an expansion in prosperous times, and a wise conservation of cash resources. Money with which to pile up stocks during dull years, when cost of production is lowest, earns more than abnormal enlargements, with their large interest charges. Expansion must come for every growing business, but it is better to prepare for a good business when times are dull than to wait for the rush before beginning construction and the purchase of equipment.

The whole point of the system of placing prices on the basis of normal production is that profits must be shown for the past and the future as well as for the present. It is claimed that business, as a consequence, is conducted more intelligently.

Misrepresenting Machinery Deliveries

The question of keeping territorial selling agreements with dealers is often a vexatious one with machinery and supply manufacturers who frequently but unwittingly violate contracts with their representatives through the cupidity of other dealers who make misrepresentations as to where the material is to be delivered. Export dealers of a certain type are responsible for differences which have recently come up between manufacturers in some parts of the country.

These export firms have developed the practice

of seeking business in this country and supplying the demand with material ostensibly bought for shipment abroad. In this way they often have a distinct advantage over the dealer supplying the domestic trade, as the manufacturer, taking into consideration the extra freight costs attached to selling machinery abroad, is likely to shade his profits somewhat in order to compete for foreign business. Several instances have come up of late where exporters have purchased machinery at an advantageous price on the representation that it was to be shipped to South America and later sold the equipment in this country for a price so low that the domestic dealers were unable to compete.

In the machinery trade this trick is difficult to repeat, as the field is limited and the average manufacturer can be duped only once, but in the supply business the wily exporter can distribute his operations among a larger number of firms. With this in mind, machinery and supply dealers would do well to investigate the seller when they find their field invaded before they conclude that the manufacturer has willfully broken his agreement.

Turbo-Electric Hoisting Engines in Lake Mines

The recent report of Prof. J. R. Finlay covering the value and cost of operating the mines of the upper peninsula of Michigan, both iron and copper, made public figures much less favorable than was generally anticipated. With reference to the copper mines, it was brought out that the cost of operating failed to admit of even a normal profit on the basis of the present selling price of copper and that the possibility of continued profitable operation depended upon new economies in mechanical equipment and a market permitting the mining of increased tonnages. The mine workings in the Keeweenaw Peninsula have now been developed at great depth, and the cost of hoisting has become an important item of expense.

It is interesting, therefore, in this connection to note that not only in the copper country, where the case is most advanced, but also among the iron mines of the Marquette Range, steam turbines, driving electrically operated hoists, have entered the field to displace the present types of steam hoisting engines. For many years the remarkable engines of the copper country, with their complicated and highly finished designs, great size and immense hoisting sheaves, have been unique. Although the first cost of these plants was undoubtedly enormous, operating economy is understood to have been compensatory. The advent of both the low and high pressure steam turbine, direct connected to electric generating units, is none the less an interesting transition. It enters the field hand in hand with the generation of electricity for similar purposes through the development of water power plants.

During the past summer account was kept at a large manufacturing plant, employing about 6,000 men, of the time saved by the substitution of drinking fountains for coolers and cups. Exclusive of noon time, each man averaged about four drinks for the working hours of the day. Formerly he would go to the cooler, fill the cup, raise it to his lips and take a look round the shop, as almost everyone does under like circumstances. This process consumed at least a minute longer than the present method of going to the fountain, taking a drink and going directly back to the tool. On that basis the saving effected in a day is equal to 400 hours for the force as a whole, or enough to run a fair-sized shop. This saving, of course, looks larger in figures than it is in fact, for the reason that there are pauses in the operations which can be taken advantage of by the men. Nevertheless, an economy of time is effected; and this, added to the elimination of expense for filling the coolers and stocking them with ice, makes the innovation well worth while.

The Extended Use of Oil for Fuel.—Facts occasionally coming to light show the increasingly wide geographical range over which oil is used as fuel in a large way. An open-hearth steel furnace, for instance, requires not only a large quantity of oil per day but an assurance of continuous supply, as a shutdown of such a furnace means a very large expense. The statement is made that furnaces in Boston, Mass.; Portland, Me.; Londonderry, Nova Scotia; Seattle, Wash.; San Francisco, Cal.; St. Louis, Mo., and Washington, D. C., in addition to 75 open-hearth furnaces scattered through the better known steel making territory, have been equipped by Tate, Jones & Company, Inc., Pittsburgh, with their fuel oil burners, reversing valve stands, etc., which indicates the present very extended use of this abundant fuel.

The Treadwell-Stoever Consolidation.—E. R. Euston, vice-president of the Stoever Foundry & Mfg. Company, who has been in charge of its New York office for the past ten years, will remove to the new plant at Easton, Pa., October 2. As that company has been absorbed by the Treadwell Engineering Company, it will discontinue its New York office and its plant at Myerstown, Pa., and in the future will maintain general sales offices at Easton, Pa., under the name of the Treadwell Engineering Company, where the line of pipe-threading, cutting and banding machines will be manufactured. It is the expectation to add kindred lines of machine tools in the very near future, due announcement of which will be made.

The Southern Stamping & Mfg. Company, Nashville, Tenn., which manufactures specialties on contract, has this year been making for the Standard Tag Company, Augusta, Ga., a metal tag for marking cotton bales. This is the first year that the article has been put on the market extensively. Each tag has the name of the ginner and the consecutive number embossed in the tin. The metal tag is a decided improvement over the paper tags generally used, being practically indestructible and it being almost impossible to remove it from the bale without taking off the band to which it is attached. The company is manufacturing quite a number of specialties for other parties in various sections of the country. It has no connection with the sale of the articles it manufactures. Business in this line has been found to be very good.

The George M. Newhall Engineering Company, Philadelphia, Pa., with branch office at 50 Church street, New York City, reports the following recent sales of equipment: Three 120-ton wrecking cranes and two locomotive coaling cranes to the Baltimore & Ohio Railroad; a 120-ton wrecking crane to the New York Central; two 30-ton transfer cranes and a lifting magnet to the Delaware & Hudson; an electric wrecking crane to the Boston Elevated; a 12-ton magnet locomotive crane to the Norfolk & Western, and a 20-ton locomotive crane to the Pennsylvania Salt Mfg. Company. This equipment is built by the Industrial Works, for which company the Newhall Engineering Company is Eastern representative. It also reports the sale of one especially designed 100,000-lb. Riehle testing machine to the Pennsylvania Railroad for its test department at Altoona.

Canada has refused to accept reciprocity with the United States. At the Canadian general election, held September 21, the opposition to reciprocity secured a large majority in the House of Commons. The Laurier government had a majority of 43, which has been turned into an opposition majority of about the same size. R. L. Borden will be the new prime minister and Sir Wilfrid Laurier will be the leader of the minority in the next House of Commons.

Sixth Testing Society Congress

Committees for the Meeting in New York in 1912

Bulletin No. 1 has been issued by the Organizing Committee of the American Society for Testing Materials for the Sixth Congress of the International Association for Testing Materials to be held in the Engineering Societies Bldg., New York City, in September, 1912. Mention has already been made of the election of H. F. J. Porter, 1 Madison avenue, New York, as secretary of the organizing committee. Several special committees have been appointed to be added to the Organizing Committee and an Executive Committee has been constituted as follows, the members consisting of the officers of the Organizing Committee and the chairmen of the special committees: Henry M. Howe, chairman; Robert W. Lesley, vice-chairman; H. F. J. Porter, secretary; Edgar Marburg, F. E. Schmitt, F. H. Clark, Richard L. Humphrey, Rudolph Hering, Joseph A. Holmes, Robert W. Hunt. The membership of the special committees is as follows:

Finance.—Edgar Marburg, chairman, University of Pennsylvania, Philadelphia; W. A. Bostwick, E. M. Hagar, John McLeod, R. S. Perry, A. A. Stevenson.

Reception.—Robert W. Hunt, chairman, The Rookery, Chicago; John Birkinbine, Mansfield Merriman, C. C. Schneider.

Papers.—F. E. Schmitt, chairman, Engineering News, 220 Broadway, New York; William K. Hatt, George F. Swain, Arthur N. Talbot, F. E. Turneaure.

Transportation.—F. H. Clark, chairman, B. & O. Railroad, Baltimore, Md.; E. B. Ashby, Charles S. Churchill, Theodore N. Ely, J. P. Snow.

Information.—Richard L. Humphrey, chairman, 805 Harrison street, Philadelphia,; Jesse J. Shuman, Gustav W. Thompson, John C. Trautwine, Jr., George S. Webster.

Local Committees.—New York—Rudolph Hering, chairman, 170 Broadway, New York; George F. Kunz, Richard Moldenke, W. O. Wiley. Washington—Joseph A. Holmes, chairman, Bureau of Mines, Washington, D. C.; William H. Bixby, Allerton S. Cushman, Logan Waller Page, S. W. Stratton, Charles E. Munroe, Harvey W. Wiley.

The Committee on Excursions and the Ladies' Committee are yet to be appointed.

At the coming congress, as at previous ones, the sections will be separately dealt with in three sets of parallel sections. Section A deals with metals; Section B, with stone, cement and artificial stone, and Section C, with miscellaneous materials.

The sectional sessions of the congress will give first consideration to the subjects of reports and discussion formulated by the council. There are two classes of subjects: 1. Principal questions. These number fifteen and each has been assigned to an authority on the subject matter of the question as reporter. The reporter will present a summary of present knowledge concerning the question. 2. Technical problems, of which there are about forty. Most of these have been assigned to committees international in composition and scope. The above two classes of subjects are open for the submission of papers independent of the reporters' views or the committee reports. Papers are not expected to exceed 2500 to 3000 words. All papers prepared in the United States should be sent to F. E. Schmitt, chairman of the Committee on Papers, 220 Broadway, New York, by January 1, 1912, in order that they may reach the general secretary in Vienna by February 1, 1912.

In the article in *The Iron Age* of September 7, page 526, on "The Stock Process for Steel Castings," the table showing tensile strength of Stock converter steel, in which the figures ranged from 27.4 to 30 should have indicated in the heading that tons of 2240 lb. were represented rather than "1000 lb. per sq. in. original area."

The National Limestone Company, Harrisburg, Pa., expects to have in operation October 1 its Edison roll crushing plant near Martinsburg, W. Va. This plant will have a capacity of 5000 tons daily of 5-in. high carbonate and extremely low silica fluxing limestone. Walter P. Maguire is general sales agent of the company.

The Steel Corporation Stands on Its Record

The United States Steel Corporation is determined to stand on its record, and will resist any effort of the Government to force it to dissolve. This was made known just before midnight on Tuesday in a statement signed by J. Pierpont Morgan and Judge Elbert H. Gary, acting as a committee of the board of directors. The statement is as follows:

"Pursuant to the unanimous vote of the board of directors of the United States Steel Corporation at a meeting held this afternoon, at which there were present J. Pierpont Morgan, H. C. Frick, Norman B. Ream, P. A. B. Widener, Robert Winsor, Elbert H. Gary, George W. Perkins, John F. Dryden, Samuel Mather, Daniel G. Reid, Henry Walter, James A. Farrell and James H. Reed, the following statement is published:

"No negotiations whatever have taken place between the Steel Corporation and the Department of Justice looking to the dissolution or disintegration of the corporation. The corporation was organized for business reasons, and purchased its various plants to promote such business and not to restrain trade or obtain a monopoly. In all its operations the company has scrupulously observed the law and recognized the just rights of its competitors and the consumers of its products. So far as its directors are aware, no complaint has ever been made against it by either of these interests. The directors are advised by its counsel that its existence is not in violation of the Sherman act as interpreted in the recent decisions of the Supreme Court.

"In view of this record and this advice, the directors feel that their duty to their stockholders, their employees and the public requires that they should set at rest all rumors to the effect that they are contemplating the dissolution or disintegration of the corporation, either voluntarily or at the demand of the Government. We believe that the organization is legal, that its management is proper, that its properties are of immense intrinsic value and that the corporation is of benefit to the public interest."

A merger of the Saurer Motor Truck Company with a plant at Plainfield, N. J., and the Mack Bros. Motor Car Company, of Allentown, Pa., has been effected. The new corporation will be known as the International Motor Truck Company. C. P. Coleman, president of the Saurer Company, will be president of the consolidation, and J. M. Mack will be vice-president. The capital of the Saurer Motor Truck Company is $1,600,000, and of the Mack Company $1,000,000. The Saurer truck is of the heavier type and will continue to be manufactured at the Plainfield plant, while the Mack truck, which is designed for lighter service, will be built at the Allentown plant.

The Samuel L. Moore & Sons Corporation, Crescent Iron Works, Front and Franklin streets, Elizabeth, N. J., has recently completed improvements at its plant and has others in contemplation with a view to increasing its facilities. The company has developed its engine known as the Crescent fuel oil engine, for pumping purposes, by directly connecting it with a pump, and has been doing considerable in this line with railroads for their water stations. A good amount of such business is in hand and more is in prospect. The company's general business is fairly good, its sales this year running considerably over those of previous years.

The Cortland Carriage Goods Company, Cortland, N. Y., is building an addition to its forging department comprising a little over 11,000 sq. ft. of floor space. It has also just put in opeartion a new power house, with a Smith gas producer and a Buckeye engine, which will furnish the additional power desired. The line of carriage hardware made is being extended by the manufacturer of body hangers, body loops and other heavy forgings required for the carriage trade.

There are no definite plans for the resumption of operations at the plant of the New York State Steel Company at Buffalo. The blast furnace went out early in July and the steel works was shut down shortly after. It is understood that some consideration has been given to the building of finishing mills.

The Iron and Metal Markets

A Comparison of Prices

Advances Over the Previous Week in Heavy Type, Declines in Italics.

At date, one week, one month and one year previous.

	Sept. 27. 1911.	Sept. 20, 1911.	Aug. 30, 1911.	Sept. 28. 1910
PIG IRON, Per Gross Ton:				
Foundry No. 2 standard, Philadelphia	$15.00	$15.00	$15.00	$16.00
Foundry No. 2 Valley furnace	*13.25*	13.50	13.50	13.75
Foundry No. 2 Southern, Cincinnati	13.25	13.25	13.50	14.25
Foundry No. 2, Birmingham, Ala.	10.00	10.00	10.25	11.00
Foundry No. 2, at furnace, Chicago*	14.50	14.50	14.50	16.25
Basic, delivered, eastern Pa.	*14.50*	14.75	14.75	15.00
Basic, Valley furnace	12.60	12.60	13.00	13.50
Bessemer, Pittsburgh	15.90	15.90	15.90	15.90
Gray forge, Pittsburgh	*13.65*	13.90	13.90	14.15
Lake Superior charcoal, Chicago	16.50	16.50	16.50	18.25
COKE, CONNELLSVILLE, Per Net Ton, at Oven:				
Furnace coke, prompt shipment	1.50	1.50	1.50	1.60
Furnace coke, future delivery	1.60	1.60	1.60	1.70
Foundry coke, prompt shipment	1.85	1.85	1.85	2.10
Foundry coke, future delivery	2.10	2.10	2.10	2.25
BILLETS, &c., Per Gross Ton:				
Bessemer billets, Pittsburgh	*20.00*	21.00	21.00	24.00
Open hearth billets, Pittsburgh	*19.00*	20.00	21.00	24.50
Forging billets, Pittsburgh	*25.00*	26.00	26.00	29.00
Open hearth billets, Philadelphia	22.40	22.40	23.40	26.00
Wire rods, Pittsburgh	*26.00*	27.00	27.00	28.00
OLD MATERIALS, Per Gross Ton:				
Iron rails, Chicago	*14.00*	14.50	14.00	16.00
Iron rails, Philadelphia	17.00	17.00	17.00	18.00
Car wheels, Chicago	12.75	12.75	13.00	14.00
Car wheels, Philadelphia	*12.00*	12.50	13.00	13.75
Heavy steel scrap, Pittsburgh	*12.50*	12.75	13.00	14.25
Heavy steel scrap, Chicago	*10.00*	10.50	11.00	12.25
Heavy steel scrap, Philadelphia	*12.00*	12.50	13.25	14.00
FINISHED IRON AND STEEL, Per Pound:	Cents.	Cents.	Cents.	Cents.
Bessemer rails, heavy, at mill	1.25	1.25	1.25	1.25
Refined iron bars, Philadelphia	1.22½	1.22½	1.27½	1.40
Common iron bars, Pittsburgh	1.25	1.25	1.25	1.45
Common iron bars, Chicago	*1.20*	1.22½	1.20	1.37½
Steel bars, Pittsburgh	*1.15*	1.20	1.20	1.40
Steel bars, tidewater, New York	*1.31*	1.36	1.36	1.56
Tank plates, Pittsburgh	*1.25*	1.30	1.30	1.40
Tank plates, tidewater, New York	*1.41*	1.46	1.46	1.56
Beams, Pittsburgh	*1.30*	1.35	1.35	1.40
Beams, tidewater, New York	*1.46*	1.51	1.51	1.56
Angles, Pittsburgh	*1.30*	1.35	1.35	1.40
Angles, tidewater, New York	*1.46*	1.51	1.51	1.56
Skelp, grooved steel, Pittsburgh	*1.15*	1.20	1.20	1.40
Skelp, sheared steel, Pittsburgh	*1.25*	1.30	1.30	1.50
SHEETS, NAILS AND WIRE, Per Pound:	Cents.	Cents.	Cents.	Cents.
Sheets, black, No. 28, Pittsburgh	1.90	1.90	1.95	2.15
Wire nails, Pittsburgh†	1.65	1.65	1.65	1.70
Cut nails, Pittsburgh†	1.55	1.55	1.60	1.65
Barb wire, galv., Pittsburgh†	1.95	1.95	2.00	2.00
METALS, Per Pound:	Cents.	Cents.	Cents.	Cents.
Lake copper, New York	*12.50*	12.60	12.75	12.75
Electrolytic copper, New York	*12.25*	12.37½	12.50	12.50
Spelter, St. Louis	*5.85*	5.90	5.90	5.45
Spelter, New York	*6.00*	6.05	6.05	5.60
Lead, St. Louis	*4.32½*	4.35	4.42½	4.27½
Lead, New York	*4.47½*	4.50	4.50	4.40
Tin, New York	38.87½	38.87½	42.87½	35.12½
Antimony, Hallett, New York	*7.70*	7.75	7.75	7.87½
Tin plate, 100-lb. box, New York	$3.84	$3.84	$3.94	$3.84

* The average switching charge for delivery to foundries in the Chicago district is 50c. per ton.
† These prices are for largest lots to jobbers.

Prices of Finished Iron and Steel f.o.b. Pittsburgh

Freight rates from Pittsburgh in carloads, per 100 lb.: New York, 16c.; Philadelphia, 15c.; Boston, 18c.; Buffalo, 11c.; Cleveland, 10c.; Cincinnati, 15c.; Indianapolis, 17c.; Chicago, 18c.; St. Paul, 32c.; St. Louis, 22½c.; New Orleans, 30c.; Birmingham, Ala., 45c. Pacific coast, 80c. on plates, structural shapes and sheets No. 11 and heavier; 85c. on sheets Nos. 12 to 16; 95c. on sheets No. 16 and lighter; 65c. on wrought boiler tubes.

Plates.—Tank plates, ¼ in. thick, 6¼ in. up to 100 in. wide, 1.25c. to 1.30c., base, net cash, 30 days. Following are stipulations prescribed by manufacturers, with extras:

Rectangular plates, tank steel or conforming to manufacturers' standard specifications for structural steel dated February 6, 1903, or equivalent, ¼ in. thick and over on thinnest edge, 100 in. wide and under, down to but not including 6 in. wide, are base.

Plates up to 72 in. wide, inclusive, ordered 10.2 lb. per square foot, are considered ¼-in. plates. Plates over 72 in. wide must be ordered ¼ in. thick on edge, or not less than 11 lb. per square foot, to take base price. Plates over 72 in. wide ordered less than 11 lb. per square foot down to the weight of 3-16-in. take the price of 3-16-in.

Allowable overweight, whether plates are ordered to gauge or weight, to be governed by the standard specifications of the Association of American Steel Manufacturers.

Extras.	Cents per lb.
Gauges under ¼ in. to and including 3-16 in. on thinnest edge	.10
Gauges under 3-16 in. to and including No. 8	.15
Gauges under No. 8 to and including No. 9	.25
Gauges under No. 9 to and including No. 10	.30
Gauges under No. 10 to and including No. 12	.40
Sketches (including all straight taper plates) 3 ft. and over in length	.10
Complete circles, 3 ft. in diameter and over	.20
Boiler and flange steel	.10
"A. B. M. A." and ordinary firebox steel	.20
Still bottom steel	.30
Marine steel	.40
Locomotive firebox steel	.50
Widths over 100 in. up to 110 in., inclusive	.05
Widths over 110 in. up to 115 in., inclusive	.10
Widths over 115 in. up to 120 in., inclusive	.15
Widths over 120 in. up to 125 in., inclusive	.25
Widths over 125 in. up to 130 in., inclusive	.50
Widths over 130 in.	1.00
Cutting to lengths or diameters under 3 ft. to 2 ft., inclusive	.25
Cutting to lengths or diameters under 2 ft. to 1 ft., inclusive	.50
Cutting to lengths or diameters under 1 ft.	1.55

No charge for cutting rectangular plates to lengths 3 ft. and over.

Structural Material.—I-beams, 3 to 15 in.; channels, 3 to 15 in., and angles, 3 to 6 in. on one or both legs, ¼ in. and over, 1.30c. to 1.35c. Other shapes and sizes are quoted as follows:

	Cents per lb.
I-beams over 15 in.	1.40 to 1.45
H-beams over 18 in.	1.50 to 1.55
Angles, 3 to 6 in., inclusive, ¼ in. and up	1.30 to 1.35
Angles over 6 in.	1.40 to 1.45
Angles, 3 in on one or both legs, less than ¼ in. thick, plus full extras as per steel bar card Sept. 1, 1909	1.35 to 1.40
Tees, 3 in. and up	1.35 to 1.40
Zees, 3 in. and up	1.30 to 1.35
Angles, channels and tees, under 3 in., plus full extras as per steel bar card Sept. 1, 1909	1.35 to 1.40
Deck beams and bulb angles	1.60 to 1.65
Hand rail tees	2.45
Checkered and corrugated plates	2.45

Sheets.—Makers' prices for mill shipments on sheets of U. S. standard gauge, in carload and larger lots, on which jobbers charge the usual discounts for small lots from store, are as follows:

Blue Annealed Sheets.

	Cents per lb.
Nos. 3 to 8	1.30 to 1.35
Nos. 9 and 10	1.40 to 1.45
Nos. 11 and 12	1.45 to 1.50
Nos. 13 and 14	1.50 to 1.55
Nos. 15 and 16	1.60 to 1.65

Box Annealed Sheets, Cold Rolled.

	One Pass.	Three Pass.
Nos. 10 to 12	1.55 to 1.60	
Nos. 13 and 14	1.60 to 1.65	
Nos. 15 and 16	1.65 to 1.70	1.75 to 1.80
Nos. 17 to 21	1.70 to 1.75	1.80 to 1.85
Nos. 22, 23 and 24	1.75 to 1.80	1.85 to 1.90
Nos. 25 and 26	1.80 to 1.85	1.90 to 1.95
No. 27	1.85 to 1.90	1.95 to 2.00
No. 28	1.90 to 1.95	2.00 to 2.05
No. 29	1.95 to 2.00	2.05 to 2.10
No. 30	2.05 to 2.10	2.15 to 2.20

Galvanized Sheets, of Black Sheet Gauge.

Nos. 10 and 11	1.90 to 1.95
Nos. 12, 13 and 14	2.00 to 2.05
Nos. 15, 16 and 17	2.15 to 2.20
Nos. 18 to 22	2.30 to 2.35
Nos. 23 and 24	2.40 to 2.45
Nos. 25 and 26	2.60 to 2.65
No. 27	2.75 to 2.80
No. 28	2.90 to 2.95
No. 29	3.00 to 3.05
No. 30	3.20 to 3.25

All above rates on sheets are f.o.b. Pittsburgh, terms 30 days net, or 2 per cent. cash discount in 10 days from date of invoice, as also are the following base prices per square for painted and galvanized roofing sheets, with 2½-in. corrugations:

Gauge.	Painted.	Galvanized.	Gauge.	Painted.	Galvanized.
29	....	$2.40	23	$2.40	-3.50
28	$1.40	2.55	22	2.60	3.70
27	1.55	2.60	21	2.80	4.05
26	1.65	2.65	20	3.05	4.35
25	1.85	3.05	18	4.05	5.70
24	2.10	3.15	16	4.90	6.50

Wire Rods and Wire.—Bessemer, open hearth and chain rods, $26 to $26.50. Fence wire, Nos. 0 to 9 per 100 lb., terms 60 days, or 2 per cent. discount in 10 days,

THE IRON AND METAL MARKETS

carload lots, to jobbers, annealed, $1.45; galvanized, $1.75. Carload lots, to retailers, annealed, $1.50; galvanized, $1.80. Galvanized barb wire to jobbers, $1.95; painted, $1.65. Wire nails, to jobbers, $1.65.

The following table gives the price to retail merchants on wire in less than carloads, including the extras on Nos. 10 to 16, which are added to the base price:

Fence Wire, Per 100 lb.

Nos.	0 to 9	10	11	12 & 12½	13	14	15	16
Annealed	$1.65	$1.70	$1.75	$1.80	$1.90	$2.00	$2.10	$2.20
Galvanized	1.95	2.00	2.05	2.10	2.20	2.30	2.70	2.80

Market and Stone Ware in Bundles, Discount from Standing List.

Bright and Annealed:
- 9 and coarser 80
- 10 to 18 ..... 80 and 10
- 19 to 26 ..... 80 and 10 and 2½
- 27 to 36 ..... 80 and 5

Galvanized:
- 9 and coarser ..... 75 and 10
- 10 to 16 ..... 75 and 10
- 17 to 26 ..... 72½ and 10
- 27 to 36 ..... 72½

Coppered or Liquor Finished:
- 9 and coarser ..... 75 and 10
- 10 to 26 ..... 75 and 10
- 27 to 36 ..... 70 and 10 and 5

Tinned:
- 6 to 18 ..... 75 and 10 and 10

Wrought Pipe.—The following are the jobbers' carload discounts on the Pittsburgh basing card on wrought pipe, in effect from October 1, 1910:

	Butt Weld. Steel Black.	Steel Galv.	Iron Black.	Iron Galv.
1 to 1½ in.	79	69	49	43
⅛ in.	75	63	71	59
¾ to 1¼ in.	79	69	75	65
2 to 3 in.	80	70	76	66
Lap Weld.				
2 in.	76	66	72	62
2½ to 4 in.	78	67	74	64
4½ to 6 in.	77	67	73	63
7 to 12 in.	75	59	71	55
13 to 15 in.	51½	..	..	..
Butt Weld, extra strong, plain ends, card weight.				
⅛, ¼, ⅜ in.	69	59	65	55
½ in.	74	68	70	64
¾ to 1¼ in.	78	72	74	68
2 to 3 in.	79	73	75	69
Lap Weld, extra strong, plain ends, card weight.				
2 in.	75	69	71	65
2½ to 4 in.	77	71	73	67
4½ to 6 in.	76	70	72	66
7 to 8 in.	69	59	65	55
9 to 12 in.	64	54	60	50
Butt Weld, double extra strong, plain ends, card weight.				
½ in.	64	58	60	54
¾ to 1¼ in.	67	61	63	57
2 to 3 in.	69	63	65	59
Lap Weld, double extra strong, plain ends, card weight.				
2 in.	65	59	61	55
2½ to 4 in.	67	61	63	57
4½ to 6 in.	66	60	62	56
7 to 8 in.	59	49	62	56

Plugged and Reamed.

1 to 1½, 2 to 3 in. Butt Weld
2, 2½ to 4 in. ..... Lap Weld

} will be sold at two (2) points lower basing (higher price) than merchants' or card weight pipe. Butt or lap weld, as specified.

The above discounts are for "card weight," subject to the usual variations of 5 per cent. Prices for less than carloads are three (3) points lower basing (higher price) than the above discounts.

Pittsburgh

PITTSBURGH, PA., September 27, 1911.—*(By Telephone.)*

Pig Iron.—The market is lifeless and in the absence of any new inquiry for pig iron prices are entirely nominal. Valley furnaces continue to ask $15 at furnace for Bessemer iron, but no sales have been made at this figure for a long time. Several small sales of Bessemer ranging from 200 tons to 400 or 500 tons have been made by dealers in the past two weeks at $14.60 to $14.75 at Valley furnace. Foundry iron is weaker in sympathy with other grades. We have no sales to note and we quote Bessemer nominally at $15; basic, $12.60; malleable Bessemer, $13; No. 2 foundry, $13.25, and gray forge, $12.75, all at Valley furnace, the freight rate to the Pittsburgh district being 90c. a ton.

Steel.—New inquiry is very dull and some of the smaller steel mills are anxious for orders and are willing to cut prices to get them. Bessemer steel is firmer than open hearth, the recent price on the former being cut about $1, while the open hearth price is cut about $2 a ton. We quote Bessemer billets, 4 x 4 in., at $20 to $21; Bessemer sheet and tin bars, $21 to $22; open hearth billets, $19 to $20; open hearth sheet and tin bars, $19.50 to $20, and forging billets, $25, f.o.b. cars Pittsburgh or Youngstown.

Merchant Pipe.—A new card of discount to be issued by the National Tube Company this week, effective October 1, will show a reduction of 1 point or $2 a ton on merchant black pipe and a heavier reduction on galvanized merchant pipe. A new card of discount has been issued on boiler tubes, showing a general average reduction of $4 per ton. Prices on boiler tubes have been severely cut for some time, but it is stated that the market is firm on the new basing card. The new discounts on lap welded steel boiler tubes are now as follows:

Tube size, in.	Discount.
1¾ to 2¼	65
2½	67½
2¾ to 3¼	72
3½ to 4½	75
5 to 6	67½

(By Mail.)

The iron trade is going through one of the most critical periods in its history, and how long it will be until conditions improve is only a guess. The demoralization in prices caused by an open market has scared buyers, and purchases are limited to what may be wanted for current needs. It would seem, however, that prices of nearly all products are now about as low as they are likely to go. The smaller mills that buy their semifinished material in the open market are having trouble to come out even. Everything from pig iron to the smallest finished product is weak. Such low prices have been made on some finished products that one or two large interests are reported as not trying to make sales at present, waiting until some of the uncertainties in the market have been removed. Steel plates have sold as low as 1.20c., structural material 1.27½c., steel bars 1.15c., and other products in proportion. Bessemer billets have gone off $1 a ton and open hearth about $2 a ton.

Ferromanganese.—Three or four consumers outside of the Pittsburgh district have inquiries out for 2000 tons or more for delivery in first half of next year. One is for 500 tons, another 750 tons and another about 1000 tons. Importers are still asking $38.50, Baltimore, for 80 per cent. for first half of next year, but, as far as known, no actual sales have been made at this price, and it is probable that on a firm offer a lower price would be named. Conditions in the steel trade are not conducive to obtaining any higher prices for ferromanganese than were paid on the large contracts closed two or three weeks ago. The freight rate to the Pittsburgh district from Baltimore is $1.95 a ton.

Ferrosilicon.—No sales are reported, but high prices are still being asked, and we quote 50 per cent. at $58, f.o.b. Pittsburgh. Blast furnace ferrosilicon is quoted as follows: 10 per cent., $23; 11 per cent., $24, and 12 per cent., $25, f.o.b. cars, Ashland, Ky., and Jackson, Ohio, furnaces. It is considered probable that on a firm offer for reasonably prompt shipment these prices would be shaded.

Muck Bar.—A local maker of muck bar, ordinarily not a seller in the open market, has recently sold about 1000 tons of high grade, made from all pig iron, at $28, Pittsburgh. The sale was made to reduce a stock of muck bar before taking inventory, and the price is regarded as slightly under the actual market. A. M. Byers & Co., Inc., at Girard, Ohio, are now operating 88 puddling furnaces, but all the muck bar there made is used in the pipe mills of the same ownership in this city, none being sold in the open market.

Skelp.—The new demand for skelp is dull, and prices have shown a decline. We quote grooved steel skelp at 1.15c. to 1.20c.; sheared steel skelp, 1.20c. to 1.25c.; grooved iron skelp, 1.40c. to 1.45c., and sheared iron skelp, 1.60c. to 1.65c., all for delivery at consumers' mills in the Pittsburgh district.

Wire Rods.—The market is quiet and prices are weak. One large maker of rods reports that it has not had a new inquiry for several weeks. The nominal price of Bessemer, open hearth and chain rods, is $27, Pittsburgh, but on a firm offer for reasonably prompt shipment $26 to $26.50 could be done.

Steel Rails.—No important orders for standard sections have been placed, but it is reported that a good deal of export tonnage is under negotiation and may be given out in the near future. Actual sales and specifications on light rails received by the Carnegie Steel Company in the past week amounted to upward of 2500 tons. There is still severe competition in the light rail market from the mills rerolling old rails. Nos. 1 and 2 rail mills of the Carnegie Steel Company at Bessemer, Pa., on which heavy sections are rolled, are being operated to

THE IRON AND METAL MARKETS

about 60 per cent. of capacity. No. 3 light rail mill at Bessemer is down this week, but will probably be started next week. A part of the 7500 tons of standard sections taken some time ago by the Carnegie Steel Company for the Pittsburgh & Lake Erie Railroad was for open hearth rails and was rolled at the Ohio Works of this company at Youngstown. Prices on light rails from new steel are being quite well maintained, and we quote as follows: 12-lb., 1.24½c.; 16, 20 and 25-lb., 1.20½c.; 30 and 35-lb., 1.19½c. and 40 and 45-lb., 1.16c. These are mill prices, plus freight, and are the minimum of the market in carload lots, but small lots bring slightly higher prices. Standard sections are held at 1.25c. per lb., Pittsburgh, for Bessemer.

Plates.—No actual orders for steel cars were reported in the past week, but it is believed that several inquiries that have been in the market for some time will develop into actual orders shortly. No large plate work jobs are in the market at present, with disquieting rumors as to prices being named by some mills, especially by the smaller makers rolling only a limited range of sizes. We quote ¼-in. and heavier plates in the wide sizes from 1.22½c. to 1.25c., and on the narrow sizes from 1.20c. to 1.22½c., f.o.b. Pittsburgh.

Structural Material.—The Bethlehem Steel Company has taken the contract for the steel, 2600 tons, for the addition of 20 stories to the First National Bank building in this city, and has placed the contract for the fabrication of the material with the Riter-Conley Mfg. Company, of this city. Of this job 1500 tons will be Bethlehem sections to be rolled by the Bethlehem Steel Company, while the other 1100 tons will be rolled by the Carnegie Steel Company. The Jones & Laughlin Steel Company has taken 800 tons for a new building for the H. J. Heinz Company, and the McClintic-Marshall Construction Company has taken some bridges at Black River, in Louisiana, for the Louisiana & Arkansas Railroad, about 1400 tons. The Fort Pitt Bridge Works has a contract for about 50 signal bridges for the New York Central Railroad, about 500 tons. The Farris Bridge Company, Pittsburgh, has a contract for a bridge for the Grafton Traction Company, Grafton, W. Va., about 400 tons, and a bridge for Gassoway, W. Va., 200 tons. Reports are current of low prices being made on plain material, and from reliable sources it can be stated that the market is 1.30c. on beams and channels up to 15 in., while on an especially desirable order for reasonably prompt shipment 1.27½c. could be done. We therefore quote beams and channels up to 15 in. at 1.27½c. to 1.30c., f.o.b. Pittsburgh.

Bars.—The volume of new business in both iron and steel bars is light, and specifications against contracts taken some time ago are coming in at only a fairly satisfactory rate. There is still decided weakness in prices of steel bars, and while 1.20c. is still being quoted on most inquiries we note that 1.15c. is being done on attractive orders. The makers of iron bars are firmer in their views as to prices, but new business is light and specifications against contracts are only for such quantities as are absolutely needed by consumers. We quote steel bars at 1.15c. to 1.20c., Pittsburgh, but it should be noted that the price of 1.15c. is made only to the very large trade and on desirable specifications. We quote iron bars at 1.25c., Pittsburgh.

Sheets.—The low prices ruling for some time have had a stimulating effect. Both new demand and specifications have been so urgent recently that a number of the leading makers have within the past week somewhat increased their rate of operations by starting up additional hot sheet mills. We may also note that prices have shown a stronger tone and the minimum of the market on one pass box annealed black sheets seems to be 1.90c. for 28 gauge and 2.00c. for galvanized. Prices on sheets are thought to have touched bottom, and, if the improved demand continues, slightly higher prices are not improbable. The leading sheet mills are now operating to an average of close to 75 per cent. of capacity.

Tin Plate.—There is no new buying at present, but about November 1 consumers are expected to come in the market for their spring requirements, shipments on which will commence in January or February. Specifications against contracts are only fair and the amount shipped out by the mills this month will show a falling off as compared with August. Operations among leading tin plate mills are also at a lower rate of capacity this month than last. It is said that the tone of prices is slightly stronger and $3.60 base at mill for 100-lb. cokes seems to be bottom. Shipments on old contracts are still being made on the basis of $3.70 for 100-lb. cokes. The American Sheet & Tin Plate Company is receiving some heavy orders for tin plate for export, one order for 10,000 boxes having been filled recently from its Sharon Works. We continue to quote 100-lb. cokes at $3.60 to $3.70 per base box, f.o.b. Pittsburgh.

Merchant Steel.—Buying is of a hand-to-mouth character. Jobbers are carrying as light stocks as possible. September so far has shown a considerable falling off in orders and specifications, as well as in shipments, as compared with August. Prices are lower and we now quote as follows: Iron finished tire, ¼ and ½ in. and heavier, 1.40c.; under these sizes, 1.45c.; planished tire, 1.50c.; channel tire, 1.70c., base; toe calk, 1.80c.; flat sleigh shoe, 1.45c.; concave or convex, 1.60c.; cutter shoe, tapered or bent, 2.15c.; spring steel, 1.85c.; machinery steel, smooth finish, 1.75c.

Hoops and Bands.—New orders are light, being mostly for small lots to cover actual needs, but shipments against contracts are coming in at a fairly satisfactory rate, especially on hoops. We quote steel hoops at 1.35c. and bands at 1.20c., extras on the latter as per the steel bar card. On a firm offer and for a very desirable order these prices might be slightly shaded.

Rivets.—Purchases are still confined to small lots to cover actual needs and specifications from boiler shops and other consumers of rivets are slow. We quote structural steel rivets at 1.60c. to 1.65c. and boiler rivets at 1.70c. to 1.75c., f.o.b. Pittsburgh.

Wire Products.—Orders for wire nails and wire and specifications against contracts have been fairly heavy this month, the amount of actual business entered by the mills being reported as slightly in excess of the same period in August. The tone of the market seems to be slightly firmer. We quote wire nails at $1.65; cut nails, $1.55; galvanized barb wire, $1.95; painted, $1.65; annealed fence wire, $1.45, and galvanized, $1.75, all f.o.b. Pittsburgh, usual terms, full freight added to point of delivery.

Spelter.—Prices have gone off further. We quote prime grades of Western at 5.70c., East St. Louis, equal to 5.82½c., Pittsburgh. Buyers are placing only small orders for prompt shipments, fearing that prices will go still lower.

Shafting.—The demand is only for small lots. Specifications from the implement makers are reported as coming in in better volume, but not so well from the automobile builders. Prices on shafting continue irregular, and while the official discount on carload and larger lots is 60 per cent. off list, actual prices on carload and larger orders range from 60 and 5 per cent. to 60 and 10 per cent. off list, the latter discount being named only to the very largest trade.

Railroad Spikes.—No important contracts have been placed recently and new orders are still confined to small lots, mostly for repair work. We quote railroad spikes at $1.45 per 100 lb., base sizes, f.o.b. Pittsburgh.

Merchant Pipe.—Owing to the cutting in prices on black and galvanized merchant pipe, the National Tube Company will send out in a few days a new card of discounts on black and galvanized merchant pipe, naming slightly lower prices. It is not known how much the reduction will be, but it is believed that it will be heavier on galvanized pipe than on black. The largest inquiry for line pipe that has come in the market for some time is that of the Western Gas, Light, Heat & Power Company, of Canada, which is asking prices on 40,000 tons of line pipe, sizes ranging from 4½ in. up to 16½ in. It is believed that some foreign pipe mills are bidding on this inquiry, but it is hoped that the contract will come to American mills. The result will be known within a week or two. The new demand for merchant pipe is really better than might have been expected in view of the unsatisfactory condition in prices that has existed for some time. It was just one year ago, or on October 1, 1910, that the present card of discounts on merchant pipe was put into effect.

Boiler Tubes.—The market on locomotive and merchant tubes is dull, and prices are cut still deeper. It is probable that a lower discount card will be issued to take effect October 1. Present discounts have not figured in the market in actual sales for some time.

Coke.—The coke trade continues dull, a natural reflection of conditions existing in the pig iron trade. In the past week two sales of probably 4000 to 5000 tons of standard Connellsville furnace coke have been

THE IRON AND METAL MARKETS

made at about $1.50 per net ton, at oven. There is no new demand for furnace coke, but one or two Valley furnaces continue to buy their supply from month to month. The output of coke in the Upper and Lower Connellsville regions is steadily falling off, and last week was 310,743 tons, a decrease over the previous week of 19,000 tons. We quote standard makes of furnace contracts for prompt shipment at $1.50 to $1.55 and on contracts for remainder of this year at $1.65 to $1.70 per net ton at oven. We quote 72-hr. foundry coke for prompt shipment at $1.85 and up to $2, and on contracts from $2.10 and as high as $2.40, the latter price being paid for some brands of coke that have a very high reputation in the trade.

Iron and Steel Scrap.—The local scrap market is lifeless, a good deal of material being offered by producers, but it is practically impossible for dealers to make sales except at very low figures. The situation is peculiar in the fact that consumers will not pay above $12.50 for heavy steel scrap, if that much, while dealers would probably have trouble in finding producers that would sell it to them below $12.75 to $13. All the leading consumers are taking in as little as possible. While no actual embargoes are on at present, dealers are receiving notices from nearly all their customers to hold up shipments as much as possible. There have been no sales of moment in this market in the past week. Prices are as follows per gross ton f.o.b. Pittsburgh, unless otherwise noted:

Heavy steel scrap, Steubenville, Follansbee, Sharon, Monessen and Pittsburgh delivery	$12.50 to	$12.75
No. 1 foundry cast	12.75 to	13.00
No. 2 foundry cast	12.25 to	13.00
Bundled sheet scrap, f.o.b. consumers' mill, Pittsburgh district	10.75 to	11.00
Rerolling rails, Newark and Cambridge, Ohio, Cumberland, Md., and Franklin, Pa.	13.00 to	13.25
No. 1 railroad malleable stock	11.75 to	12.00
Grate bars	9.50 to	9.75
Low phosphorus melting stock	15.50 to	15.75
Iron car axles	22.00 to	22.50
Steel car axles	17.00 to	17.25
Locomotive axles		23.00
No. 1 busheling scrap	11.50 to	11.75
No. 2 busheling scrap	8.00 to	8.25
Old car wheels	12.50 to	12.75
Sheet bar crop ends	15.25 to	15.50
*Cast iron borings		9.00
*Machine shop turnings	9.10 to	9.25
Old iron rails	14.50 to	14.75
No. 1 wrought scrap		13.50
Heavy steel axle turnings	9.75 to	10.00
Stove plate	9.50 to	9.75

*These prices are f.o.b. cars at consumers' mills in the Pittsburgh district.

Chicago

CHICAGO, ILL., September 26, 1911.

Chief interest in this market attaches to the decidedly unsettled condition regarding structural material. This line of finished product, the price of which was credited with being maintained with considerable firmness, has been found to have been subject to shading for contracts for some time past. More important, however, is the open cutting inaugurated within the past week which has brought quotations down to the level of at least 1.25c., Pittsburgh. As intimated in a previous report, certain Eastern mills have been especially eager for tonnage, which condition is understood to have precipitated the present situation. The principal letting of fabricated material was the award to the American Bridge Company of the 6490 tons for the Chicago, Burlington & Quincy office building, Chicago. The entire list of products is suffering from a shading of prices, and, although the week has brought somewhat larger tonnages, the market is considered both in its present status and in its immediate future as most unsatisfactory. Old materials are moving at prices which are the lowest that have been quoted here for nearly a decade.

Pig Iron.—A number of sales in lots up to 500 tons are reported and such inquiry as is current is limited to similar tonnages. The only favorable indications are a number of requests for advance shipment on contracts. The sellers' position is far from strong. While they have been successful for the most part in delaying consideration of first quarter business, some low prices are reported on orders covering shipments beginning this year and running over into next. The impression prevails that a large tonnage would be taken promptly by consumers for first quarter on the basis of $10, Birmingham. As it is this price is obtainable only on spot shipments of small lots, the major portion of the iron moving being held by the furnaces at $10.25. The local situation is unchanged and the week brought out exceedingly few sales of Northern iron. We quote for Chicago delivery, except for local irons which are f.o.b. furnace, the following prices on prompt shipments:

Lake Superior charcoal	$16.50 to $17.00
Northern coke foundry, No. 1	15.00 to 15.50
Northern coke foundry, No. 2	14.50 to 15.00
Northern coke foundry, No. 3	14.25 to 14.50
Northern Scotch, No. 1	16.00
Southern coke, No. 1 foundry and No. 1 soft	14.85 to 15.10
Southern coke, No. 2 foundry and No. 2 soft	14.35 to 14.85
Southern coke, No. 3	14.10 to 14.35
Southern coke, No. 4	13.85 to 14.10
Southern gray forge	13.60 to 13.85
Southern mottled	13.60 to 13.85
Malleable Bessemer	14.50 to 15.00
Standard Bessemer	17.40
Basic	15.50
Jackson Co. and Kentucky Silvery, 6 per cent	17.90
Jackson Co. and Kentucky Silvery, 8 per cent	18.90
Jackson Co. and Kentucky Silvery, 10 per cent	19.90

Rails and Track Supplies.—The rail market continues to be void of interesting sales and the railroads themselves deny a knowledge of future requirements. Bookings by the leading interest were comparatively meager. While specifications for track fastenings have held up in fairly good volume, prices have gradually sagged and the basis of 2.10c. for bolts is undoubtedly at the top of the market. Prices on railroad spikes have likewise yielded under stress of the competitive situation. The Louisville & Nashville Railroad has placed with the Mount Vernon Car Company a contract for 500 steel underframe and 500 gondola cars. We quote standard railroad spikes at 1.60c. to 1.70c., base; track bolts with square nuts, 2.05c. to 2.10c., base, all in carload lots, Chicago; standard section Bessemer rails, 1.28c.; open hearth, 1.34c.; light rails, 40 to 45 lb., 1.16c. to 1.20½c.; 30 to 35 lb., 1.19½c. to 1.24c.; 16, 20 and 25 lb., 1.20½c. to 1.25c.; 12 lb., 1.25c. to 1.30½c.; angle bars, 1.50c. to 1.60c., Chicago.

Structural Material.—Prices for plain structural shapes, in connection with which the market has exhibited perhaps greater firmness than in any other finished line, have at last succumbed to the necessities of some of the Eastern mills. Low prices emanating from one source brought out similar concessions from all the other mills, and quotations $2 a ton below the Pittsburgh basis of 1.35c. are freely reported. It also develops that a large number of contracts for plain material were placed in this territory in the past few months on the basis of 1.30c. At the present writing the local market is decidedly unsettled. Contracts for fabricated steel placed the past week include 6490 tons for the Chicago, Burlington & Quincy office building, Chicago, awarded to the American Bridge Company; 1265 tons for the Medinah Temple, Chicago, to A. Bolter's Sons, and 185 tons for the Chicago, Milwaukee & St. Paul Railroad to the Milwaukee Bridge Company. While calling attention to the concessions named above, we continue to quote for mill shipment, Chicago delivery, the nominal price of 1.53c. and from store 1.75c.

Plates.—Specifications for plates are reported as somewhat improved. Generally speaking, however, the tonnage is not what it should be and mills are inclined to cater to offerings of desirable specifications. Concessions from full prices to the extent of at least $1 a ton are quite general. Our quotations continue to be nominally, for Chicago delivery, mill shipment, 1.53c., and from jobbers' stocks, 1.75c.

Sheets.—The tonnage of sheet orders continues in fair volume, but competition for orders is undiminished and concessions by sheet bar makers have augmented rather than diminished the prevalent shading. Prices $2 a ton below the regular basis are the usual quotations. We quote Chicago prices as follows: Carload lots, from mill: No. 28 black sheets, 2.18c.; No. 28 galvanized, 3.18c.; No. 10 blue annealed, 1.68c. Prices from store, Chicago, are: No. 10, 1.95c. to 2.05c.; No. 12, 2c. to 2.10c.; No. 28 black, 2.45c. to 2.55c.; No. 28 galvanized, 3.45c.

Bars.—The steel bar situation shows a tendency toward lower prices. Reports are rife of extremely low quotations. At Chicago a price of 1.33c. is no longer uncommon. Some encouragement is lent to the situation by reports of much heavier specifications. Bar iron moves slowly and a willingness on the part of some manufacturers to accept 1.20c. and even lower has operated against maintaining the position recently taken on the basis of 1.25c. We quote as follows, f.o.b. Chicago: Soft steel bars, 1.38c. to 1.43c.; bar iron,

THE IRON AND METAL MARKETS

1.22½c. to 1.25c.; hard steel bars rolled from old rails, 1.20c. From store, soft steel bars, 1.70c. to 1.80c., Chicago.

Wire Products.—Following the recent prevalence of concessions in the price of wire nails, in connection with which a considerable tonnage was placed, an effort generally well received by the trade is being made to re-establish full quotations. Sales of both wire nails and barb wire leave room for some improvement, but the buying of fence wire following the announcement of spring dating terms has assumed decidedly large proportions. Jobbers' carload prices, which are quoted to manufacturing buyers, are as follows: Plain wire, No. 9 and coarser, base, 1.68c.; wire nails, 1.88c.; painted barb wire, 1.88c.; galvanized, 2.18c.; polished staples, 1.88c.; galvanized, 2.18c., all Chicago.

Cast Iron Pipe.—The Lynchburg Foundry Company, Lynchburg, Va., has obtained the order for 5000 tons of pipe for the city of Muskegon, Mich. New bids will be asked in the spring on the remainder of this city's requirements, consisting of 2500 tons of 48-in. pipe. A letting of 2100 tons is appointed for Kansas City September 27. Smaller lettings, including 200 tons for Canton, Mo., and 400 tons for a lower Michigan city, are reported. We quote as follows, per net ton, Chicago: Water pipe, 4-in., $26.50; 6 to 12-in., $24.50; 16-in. and up, $24, with $1 extra for gas pipe.

Old Material.—The market for old materials in this territory is experiencing the lowest prices that have obtained in a number of years. Buying by the larger consuming interests is practically at a standstill and every purchase apparently brings out a lower price. Such trading as is current is largely between dealers covering unfilled orders. A lot of 500 tons of rerolling rails, disposed of direct to a consumer from a railroad, brought only $12.50, Chicago. Railroad offerings of scrap the past week included lists from the Chicago, Burlington & Quincy for about 2500 tons; Chicago, Rock Island & Pacific, about 3000 tons; Chicago & Great Western, 500 tons, and small lists from the Chicago & Eastern Illinois, Iowa Central, Vandalia Line and New York Central. We have revised our prices on almost all items and quote for delivery at buyer's works, Chicago and vicinity, all freight and transfer charges paid, per gross ton, as follows:

Old iron rails	$14.00 to $14.50
Old steel rails, rerolling	12.25 to 12.75
Old steel rails, less than 3 ft.	11.00 to 11.50
Relaying rails, standard section, subject to inspection	24.00
Old car wheels	12.75 to 13.00
Heavy melting steel scrap	10.00 to 10.50
Frogs, switches and guards, cut apart	10.00 to 10.50
Shoveling steel	9.50 to 10.00
Steel axle turnings	8.50 to 9.00

The following quotations are per net ton:

Iron angles and splice bars	$12.00 to $12.50
Iron arch bars and transoms	13.25 to 13.75
Steel angle bars	9.75 to 10.25
Iron car axles	17.75 to 18.25
Steel car axles	16.00 to 16.50
No. 1 railroad wrought	10.50 to 11.00
No. 2 railroad wrought	9.50 to 10.00
Steel knuckles and couplers	9.75 to 10.25
Steel springs	10.00 to 10.50
Locomotive tires, smooth	14.50 to 15.00
Machine shop turnings	6.00 to 6.50
Cast and mixed borings	5.50 to 6.00
No. 1 busheling	8.50 to 9.00
No. 2 busheling	6.50 to 7.00
No. 1 boilers, cut to sheets and rings	7.25 to 7.75
Boiler punchings	12.00 to 12.50
No. 1 cast scrap	10.25 to 10.75
Stove plate and light cast scrap	9.00 to 9.50
Railroad malleable	9.75 to 10.25
Agricultural malleable	9.00 to 9.50
Pipes and flues	7.50 to 8.00

Philadelphia

PHILADELPHIA, PA., September 26, 1911.

Developments outside the trade have had a rather disturbing influence on the market and business continues dull. Price uncertainties also exert an influence on the situation and consumers still make purchases conservatively. While the movement in pig iron is largely confined to prompt lots a few sizable sales are reported, and at least one inquiry for a large quantity of foundry iron for this year's delivery is before the trade. New business in basic iron has also developed. Plates and structural shapes are now quotable a dollar a ton under recent prices, but concessions have not resulted in any better buying in any of the rolled products. It is doubtful, however, that present open quotations represent the full concession that might be had if attractive business was offered. Further inquiries for vessels have come to the shipyards. Estimates are now being made on one large vessel for the Pacific coast trade, involving 5400 tons of plates and shapes, and plans for two additional vessels are under way for the same interest. The old material market continues inactive, with prices weak and further concessions noticeable in some grades.

Iron Ore.—A sale of an occasional odd cargo of foreign ore to piece out this year's requirements is noted, but there have been no developments in the way of contracts for extended deliveries. Importations during the week ended September 23 include 3900 tons from Greece, 5200 tons from Cuba and 6594 tons from Spain.

Pig Iron.—The inquiry of the Pennsylvania Railroad, covering its pig iron needs for the last quarter of the year, is of particular interest, being considerably larger than that for several quarters past. It covers from 1700 to 5200 tons of high silicon foundry iron, 1700 to 5200 tons of low silicon foundry, 900 to 1800 tons of Lake Superior and 900 to 1800 tons of Southern charcoal iron—an aggregate of from 5200 to 14,000 tons, the company reserving the right to take the minimum or any part of the maximum amount. It is said, however, that indications point to the purchase of the maximum quantity. An inquiry for 1000 tons of malleable pig is also reported, and the cast iron pipe foundries are feeling around for several large blocks of low grade iron. While the trade is particularly encouraged by these larger inquiries the general demand for the higher foundry grades has been unimportant. Consumers are inclined to place orders for moderate quantities for early delivery and then await developments rather than to cover fully for several months ahead. Under such conditions producers find themselves constantly urged for deliveries, as buyers' stocks are necessarily low and delays in shipment become a serious inconvenience. As a rule shipments are exceeding the current daily production. Sales of standard brands of eastern Pennsylvania No. 2 X foundry continue to be made at $15 to $15.25, delivered, and quotations for fourth quarter are firm at that basis. In a few instances inquiries for iron for next year's delivery are reported more numerous, one which recently came out being for 1200 tons for shipment over the first half of 1912; but each seller appears to be waiting for the other to make a move, and no definite prices for such delivery have come out. The cast iron pipe makers, who have been active inquirers recently for low grade iron, are reported to have made moderate purchases, but are still in the market for a considerable quantity, the negotiations including one large block of Southern iron. Virginia foundry iron, particularly in the higher grades, has not been very active, small and moderate lots of No. 2 X going at $12.50, furnace, for last quarter shipment. A sale of 2500 tons of pipe iron to a Virginia interest, delivery over the next three months, is reported at a comparatively good price. Very little inquiry for rolling mill forge is noted. Basic iron shows a tendency to become more active. One sale, covering 3000 tons for fourth quarter shipment, at $14.50, delivered, is reported, and it is said that the same buyer purchased an additional like amount at the same price. Another steel maker is inquiring for 1000 tons of basic for October shipment, while a third is sounding the market for several thousand tons for somewhat later delivery. Low phosphorus iron has been rather quiet, transactions being confined to small lots. The following range of prices is named for standard brands, delivered in buyers' yards in this vicinity for prompt or fourth quarter shipment:

Eastern Pennsylvania No. 2 X foundry	$15.00 to $15.25
Eastern Pennsylvania No. 2 plain	14.75 to 15.00
Virginia foundry	15.00 to 15.50
Gray forge	14.50
Basic	14.50 to 15.00
Standard low phosphorus	20.00 to 20.50

Ferroalloys.—Some little inquiry for ferromanganese is noted, but at the quotations now named, $38.50, Baltimore, no business is moving in this district. Prices of 50 per cent. ferrosilicon have been moved up and $60, delivered, is now being quoted. Several inquiries are reported, but orders are still lacking.

Billets.—Almost an entire lack of interest in the market is noted on the part of consumers. Specifications against orders come to mills rather slowly, and new business is confined to customers' immediate wants, which are usually small. Mills, therefore, are operating on a very unsatisfactory basis and have little business ahead. While the market has not been seriously tested small transactions are being made at about $22.40 for

THE IRON AND METAL MARKETS

open hearth rolling billets and $27.40 for ordinary forging billets, delivered in this vicinity.

Plates.—Very little change in the nature or scale of the business coming to the mills is reported. Current orders continue small and are largely of a miscellaneous nature, one of several hundred tons being considered particularly good. The general run of orders and specifications, however, enables mills to maintain a fairly even rate of production, although rolling schedules cannot be prepared very far ahead. Plates for structural work continue the most active, although additional inquiries for ship plates are noted, one of which is for 3600 tons. Prices are now openly quoted at a slightly lower price, the market ranging from 1.45c. to 1.50c., delivered here, for ordinary plates.

Structural Material.—There is still an absence of any important demand in this immediate territory. Several of the smaller projects under way have, however, been closed, while a fair demand for plain shapes is reported. Plans have been revised for the proposed municipal convention hall and bids will be opened October 9. A much smaller amount of structural material will be required. An inquiry covering 1800 tons of boat shapes is noted. Several bridge contracts are pending, but recent orders for this class of work in this vicinity have been small. Quotations for plain shapes have been reduced $1 a ton, and open prices ranging from 1.45c. to 1.50c., delivered here, are now named.

Sheets.—A slight betterment in the demand for sheets is reported by Eastern makers, but orders are not of sufficient size to change mill operations. There is still considerable complexity regarding prices, competition is sharp and definite quotations are uncertain.

Bars.—The demand for either steel or iron bars is extremely quiet. Consumers' requirements are light and competition for such business as may be offered is sharp. Steel bars are practically on a 1.35c., delivered, basis. Refined iron bars are being fairly well maintained at 1.22½c. to 1.27½c., delivered, but the market has not been tested by any substantial inquiries.

Coke.—While moderate contracts for foundry coke are made from week to week there is a lack of snap in the demand, and the larger share of the business is in prompt lots. Some moderate lot business in furnace coke is pending, but the bulk of the transactions in this grade are also in small lots. Prices are unchanged, although somewhat firmer, the following range per net ton being named for deliveries in this vicinity:

Connellsville furnace coke	$3.80 to $4.00
Foundry coke	4.25 to 4.60
Mountain furnace coke	3.40 to 3.60
Foundry coke	3.85 to 4.20

Old Material.—The market continues weak, consumers showing practically no interest in the situation. Several of the heavy melting steel buyers refuse to consider purchases even at what are considered attractive prices, their requirements being fully covered. One sale of something over 1000 tons of No. 1 heavy melting steel scrap, through a dealer, is reported at $12.50, while transactions between dealers have been made as low as $12. Rolling mill scrap has been moved in small quantities, usually, however, at slight price concessions. A recent transaction of 1000 tons of old car wheels at $12.50 is reported, but the same buyer has, it is said, now reduced the offering price to $12. In few grades has sufficient business been transacted to establish prices, and quotations named are largely nominal. The following range about represents the basis at which business could be done, for delivery in buyers' yards, eastern Pennsylvania and nearby points, taking a freight rate from Philadelphia varying from 35c. to $1.35 per gross ton, for shipment ranging from prompt to the remainder of the year:

No. 1 heavy melting steel scrap	$12.00 to $12.50
Old steel rails, rerolling (nominal)	13.50 to 14.00
Low phosphorus heavy melting steel scrap	16.75 to 17.25
Old steel axles (nominal)	18.00 to 18.50
Old iron axles (nominal)	23.50 to 24.00
Old iron rails	17.00 to 17.50
Old car wheels	12.00 to 12.50
No. 1 railroad wrought	14.00 to 14.50
Wrought iron pipe	11.75 to 12.25
No. 1 forge fire	10.50 to 11.00
No. 2 light iron (nominal)	6.50 to 7.00
Wrought turnings	8.00 to 8.25
Cast borings	7.50 to 7.75
Machinery cast	12.50 to 13.00
Railroad malleable (nominal)	11.00 to 11.50
Grate bars, railroad	9.50 to 10.00
Stove plate	9.50 to 10.00

Cleveland

CLEVELAND, OHIO, September 26, 1911.

Iron Ore.—Sales aggregating 10,000 tons, mostly low-grade ore, were made by one ore firm during the week, and a few other sales of quite small lots are reported. No business of any size, however, is in prospect and it is probable that only a very limited tonnage will be sold during the remainder of the season. Ore firms are well up on shipments and the movement has fallen off. We quote prices as follows: Old range Bessemer, $4.50; Mesaba Bessemer, $4.25; old range non-Bessemer, $3.70; Mesaba non-Bessemer, $3.50.

Pig Iron.—A new low price on basic iron is being made by a Cleveland interest, which is quoting at $12.50 for shipment from Canal Dover, this price being 10c. a ton lower than the selling price made by the same interest for 1000 tons for shipment to Pittsburgh last week. The low quotation, however, has as yet brought out no additional business. While recent prices of local furnaces for foundry iron for Cleveland delivery are being well maintained, the market is weaker in the Valley. The quotation of $13.50, Valley furnace, for No. 2 foundry, which has prevailed for some time, is being shaded 25c. a ton. While there is little demand for foundry grades in this territory the foundry melt appears to have improved during the past few weeks and consumers are taking all of their iron on contract. Business is rather quiet with jobbing foundries but the foundries of manufacturing plants making various lines of products are fairly busy. One local selling agency covering a wide territory reports that its business in foundry iron at present is about 80 per cent. of normal. The demand for malleable iron is as light as that for steel making iron. A Canton, Ohio, malleable plant had an inquiry out for a few days for 1000 tons of malleable but decided not to buy for the present. Cherry Valley furnace will be blown in this week. For Cleveland delivery we quote as follows for prompt shipment and for the last quarter:

Bessemer	$15.90
Basic	13.40
Northern foundry, No. 2	13.75
Gray forge	$13.00 to 13.25
Southern foundry, No. 2	14.35 to 14.85
Jackson Co. silvery, 8 per cent. silicon	17.30 to 17.55

Coke.—The only activity in the market is a light demand for foundry grades in small lots, mostly for prompt shipment. There is no inquiry for furnace coke. We quote standard Connellsville furnace coke at $1.50 to $1.55, per net ton, at oven, for prompt shipment, and $1.60 to $1.70 for the remainder of the year. Connellsville 72-hr. foundry coke is held at $1.85 to $2.15 for prompt shipment and $2.10 to $2.40 for contract.

Finished Iron and Steel.—There is an open market now on steel bars, plates and structural material and competition is extremely active for orders to fill mills with tonnages. The open quotation on steel bars is 1.15c., Pittsburgh, but it appears probable that this price can be shaded to 1.10c. for a round lot order with desirable specifications. On structural material and plates the open quotation is 1.25c., Pittsburgh. While there are no reports of lower prices on shapes, light plates are being sold as low as 1.20c. Sheet prices are also weaker. While the nominal quotation is 1.90c., Pittsburgh, for No. 28 black, and 2.90c. for No. 28 galvanized, these prices are being shaded $1 a ton, and in some cases an additional concession is being made of selling on a Valley instead of a Pittsburgh shipping basis. The activity of the mills after the business has resulted in considerable increase in the volume of orders. While some buyers are holding off to see if the bottom of the market has been reached, others have placed quite liberal stock orders for bars and structural material. Consumers for some time have been buying largely in small lots as material is needed and stocks are generally low. They are now taking advantage of the low prices to replenish their stocks. Bids have been received for the bridges for the Pennsylvania Railroad crossing elimination in Cleveland requiring 5000 tons. No new building work has developed, but it is expected that the low price on structural material will stimulate some activity. The demand for sheets is fairly good. Forging billets are weaker, being quoted in this market at $25, Pittsburgh. The demand for iron bars is a little more active. We quote iron bars at 1.20c., Cleveland mill.

THE IRON AND METAL MARKETS

Local mills will probably not meet steel bar prices. Hard steel bars are unchanged at 1.10c., Pittsburgh.

Old Material.—The market is very dull. The absence of a demand together with the decline in prices on finished lines has resulted in further price reductions of 25c. to 50c. a ton on several grades of scrap. Some of the mills are willing to buy material at about present quotations but little is to be had at the current market prices. Producers as well as dealers are holding their scrap for a firmer market. Dealers believe that prices have now reached the bottom. Dealers' prices, per gross ton, f.o.b. Cleveland, are as follows:

Old steel rails, rerolling	$12.50 to $12.75
Old iron rails	14.50 to 15.00
Steel car axles	17.50 to 18.00
Heavy melting steel	11.25 to 11.50
Old car wheels	11.25 to 11.50
Relaying rails, 50 lb. and over	22.50 to 23.50
Agricultural malleable	10.75 to 11.25
Railroad malleable	11.50 to 12.00
Light bundled sheet scrap	9.50 to 10.00

The following prices are per net ton, f.o.b. Cleveland:

Iron car axles	$18.75 to $19.25
Cast borings	6.50 to 6.75
Iron and steel turnings and drillings	7.00 to 7.25
Steel axle turnings	8.00 to 8.50
No. 1 busheling	9.25 to 9.75
No. 1 railroad wrought	11.50 to 11.75
No. 1 cast	11.25 to 11.75
Stove plate	9.25 to 9.50
Bundled tin scrap	11.00 to 11.50

Cincinnati

CINCINNATI, OHIO, September 27, 1911.—*(By Telegraph.)*

Pig Iron.—A significant feature of the present situation is that shipments on contract are good. Last month all Southern furnaces shipped out more iron than they made. The present month will probably end with as satisfactory a record. While the reduction in stocks is comparatively small, it seems to be steady, and many dealers consider this a hopeful sign. The inquiry for foundry iron is very light, and with the exception of a couple of 200-ton lots wanted by Indiana melters business under negotiation practically covers only carload quantities. Buyers are evincing an unusual degree of timidity and cannot be persuaded to cover for more than immediate requirements. An Eastern railroad is asking for 1800 tons of charcoal iron and is expected to contract soon for half this quantity for shipment this year. A northern Ohio melter bought 300 tons of Southern No. 2 foundry for last quarter delivery at $10, Birmingham. Other smaller lots have been contracted for at the same figure, and it is rumored that where a desirable tonnage was involved the shipments could probably be extended over into the fore part of next year. As far as known, books have not been opened for 1912 business and the only quotations out are considered prohibitive. Northern iron is in no better demand and is quoted at $13, Ironton, for last quarter shipment, although several furnaces are holding out for $13.25. Malleable is dull and unchanged around $13.25, Ironton. Based on freight rates of $3.25 from Birmingham and $1.20 from Ironton, we quote, f.o.b. Cincinnati, as follows, for prompt shipment:

Southern coke, No. 1 foundry and 1 soft	$14.00 to $14.25
Southern coke, No. 2 foundry and 2 soft	13.25 to 13.75
Southern coke, No. 3 foundry	12.75 to 13.25
Southern coke, No. 4 foundry	12.50 to 13.00
Southern gray forge	12.50 to 13.00
Ohio Silvery, 8 per cent. silicon	16.95 to 17.20
Lake Superior coke, No. 1	14.70 to 14.95
Lake Superior coke, No. 2	14.20 to 14.45
Lake Superior coke, No. 3	13.70 to 13.95
Basic, Northern	14.20 to 14.45
Standard Southern car wheel	25.50 to 25.75
Lake Superior car wheel	19.00

(By Mail.)

Coke.—Local interests are figuring on a year's supply of furnace coke that will average between 6000 and 8000 tons per month. With this exception there is little new inquiry before the trade for either furnace or foundry grades. However, the foundries, which are nearly all covered for this year's requirements, are taking coke on their contracts in a very satisfactory manner, and shipments are moving much faster than present conditions presumably warrant. This is especially true in the Connellsville and Wise County districts. Prices are unchanged in all three fields on 72-hr. coke, which is quoted around $1.90 to $2 per net ton at oven for prompt shipment, with the usual advance of about 10c. to 25c. on future business. Furnace coke is offered in the Connellsville field around $1.50 to $1.60 for prompt movement, with a few cents advance asked for future shipment. Pocahontas and Wise County brands are usually bringing from 10c. to 15c. per net ton above these figures.

Finished Material.—The market has apparently slipped into a hole and there is very little activity in any particular line, although business during the first half of the month will probably be sufficient to bring the total average for September up to August's record. It is also possible that the small order business that does not attract attention until final statements are made up will make a better showing for the present month than is now anticipated. Prices are not firm, and while the nominal price for steel bars is 1.20c., Pittsburgh, it is understood that offers would be accepted at a little below this figure. The local warehouse quotation remains around 1.65c. There is a slightly better inquiry for hoops and bands.

Old Material.—Dealers are certainly not expecting any immediate improvement in market conditions, and, as consumers of scrap are contracting sparingly, a further reduction in prices seems apparent. No change upward is expected until there is an improvement in pig iron. The approximate prices paid by buyers, delivered in their yards, southern Ohio and Cincinnati, are as follows:

No. 1 railroad wrought, net ton	$10.00 to $10.50
Casting borings, net ton	4.50 to 5.00
Steel turnings, net ton	5.50 to 6.00
No. 1 cast scrap, net ton	9.25 to 9.75
Burnt scrap, net ton	6.25 to 6.75
Old iron axles, net ton	16.25 to 16.75
Bundled sheet scrap, gross ton	7.25 to 8.25
Old iron rails, gross ton	13.25 to 13.75
Relaying rails, 50 lb. and up, gross ton	20.75 to 21.50
Old car wheels, gross ton	10.00 to 10.50
Heavy melting steel scrap, gross ton	9.75 to 10.25

Birmingham

BIRMINGHAM, ALA., September 25, 1911.

Pig Iron.—This market is extremely quiet, with current quotations on prompt shipments or for delivery the remainder of the year ranging from a basis of $10.25 to $10.75, Birmingham, for No. 2 foundry. Recent sales consist of an aggregate of 1250 tons of a favorite brand for shipment the remainder of the year at $10.50 for No. 2 soft; an aggregate of 2500 tons of Nos. 3 and 4 foundry, for shipment the remainder of the year, at a slight advance over a basis of $10.25 for No. 2 soft: 300 tons of high manganese iron, with a comparatively low silicon content, for shipment commencing immediately, at $11, and 200 tons of high manganese, high silicon iron, for last quarter delivery, at $11.50. Carload lots of No. 1 soft were sold in the week at $10.75 and such lots of gray forge and mottled as were available could not be had at lower figures than a strict $10.50. Birmingham, basis for No. 2 foundry. The demand covered a very wide range of territory and but a small proportion of the inquiries received resulted in sales. So far but few propositions in definite form have been submitted for shipment after January 1, and the market price for such deliveries is no more determined than for some weeks past. It is believed that with certain interests the price being accepted for deliveries over the remainder of this year could be made applicable to shipments through the first quarter of next: however, the majority of producers still refuse to entertain offers for any deliveries after January 1. The movement from furnace yards continues at a fairly satisfactory rate, but mention is now frequently made of the tonnage that is being held up on contracts, and it is quite likely that considerable iron engaged for delivery during the third quarter will, of necessity, be carried over the later delivery. At this time the most significant inquiry pending is a round lot of charcoal iron for delivery the last quarter of this year.

Cast Iron Pipe.—Kansas City, Mo., is to place a contract for some 2000 tons of water pipe the coming week and smaller lots are to be placed for requirement at Dothan, Ala., and a point in Colorado. With these exceptions the business actually in sight consists of comparatively small lots for maintenance work. The local operations at plants have not been changed, although repairs to the North Birmingham plant of the United States Cast Iron Pipe & Foundry Company are now well under way and it will probably be put in operation early in November. It is understood that, with the operation of the North Birmingham plant, the Bessemer plant of the United States Company, as well

THE IRON AND METAL MARKETS

as the Anniston plant, will be repaired in the order given. The schedule of prices for water pipe has not changed and we continue to quote as follows, per net ton, f.o.b. cars here: 4 to 6-in., $23; 8 to 12-in., $22; over 12-in., average, $21, with $1 per ton extra for gas pipe.

Old Material.—Dealers' asking prices are considered 50 cents per ton lower for all grades and we revise quotations accordingly. Recent trading involved a fair tonnage, but with the steel grades principally in demand. So far none of the recent inquiries from Eastern mills have resulted in sales and the buying continues on a hand-to-mouth order by Southern consuming interests. Recent additions to dealers' stocks are comparatively small. We revise quotations as follows, per gross ton, f.o.b. cars here:

Old iron axles (light)	$13.00 to $13.50
Old steel axles (light)	12.00 to 12.50
Old iron rails	12.00 to 12.50
No. 1 railroad wrought	10.50 to 11.00
No. 2 railroad wrought	9.00 to 9.50
No. 1 country wrought	7.00 to 7.50
No. 2 country wrought	6.50 to 7.00
No. 1 machinery, cast	9.00 to 9.50
No. 1 steel	8.50 to 9.00
Tram car wheels	8.00 to 8.50
Standard car wheels	9.50 to 10.00
Light cast and stove plates	6.50 to 7.00

Announcement is made that the charcoal furnace of the Eagle Iron Company at Attalla, Ala., will be blown in for a period of three months' operation. It will run on ore from a deposit recently found in Mississippi and the results obtained will be watched with interest.

The Gadsden Car Works, Gadsden, Ala., is now in full operation and affords employment to some 500 men.

The steel works and finishing plant of the Southern Iron & Steel Company at Alabama City, Ala., are now in full operation, but no definite announcement has been made as to when the blast furnace at that plant will be blown in.

The German Iron Market

BERLIN, September 14, 1911.

In pig iron quiet still reigns, new ordering being held in abeyance till the new syndicate has adopted its price list for 1912. It is stated in an apparently authentic form that small advances will be made in the highest grades, as well as in the low-class Luxemburg-Lorraine grades; other prices will be left unchanged. It is reported that selling for 1912 delivery will not begin before October 1. The organization will meet to-morrow to complete the formalities requisite to beginning operations under the new arrangement. It now appears that the Luxemburg-Lorraine furnaces have entered the syndicate as regular members, instead of merely making a price arrangement, as seemed probable at first.

The production of pig iron in August amounted to 1,285,942 metric tons, or about 4160 tons less than in July. The slightly down tendency of production since the spring months is thus seen to continue. The August output was only 23,000 tons more than for August, 1910. The shipments of the Steel Works Union in August make a better impression than these figures. They amounted to 475,467 tons for steel rails, structural forms and billets, comparing with 461,357 tons in July and 446,590 tons in August, 1910. The shipments of billets gained 14,400 tons over July and rails 6900 tons, while structural shapes dropped off 7200 tons. The export figures are less satisfactory than the splendid showing made by July. Exports of billets registered the best gain; the total was 57,900 tons, against 33,560 tons for August, 1910; and structural shapes also rose from 31,878 to 33,670 tons; but steel rails to the amount of only 38,195 tons, against 48,900 tons last year, were exported. The imports of iron ores reached 1,061,000 tons, which compares with 1,016,000 tons last year.

From the Silesian district it is reported that rolling mill products have been sold in large quantities since August 1, and that the mills can take on but little additional work for the rest of the year. Prices are firmly held, after advances had taken place in most products quite recently. Pig iron and steel billets are scarce. The position of the market in that part of the country is evidently even better than in the west.

The manufacturers of high-grade steel in the region of Krefeld have recently tried to induce some of the West German chambers of commerce to appeal to the government to increase the duty on steel of that kind. They argue that they cannot make headway in the foreign markets against the old, well-established English, Swedish and Austrian brands, while even at home they are closely crowded by their foreign competitors, and they further point out the unreasonableness of collecting the same duty on the highest grades as on the ordinary qualities. The chambers took the matter under consideration, but the majority of them were opposed to an increase of the duty. Others pointed out that it would be impossible to persuade the government to interfere with the tariff law before the expiration of the existing commercial treaties. The steel producers also asked the influence of the chamber to secure a more extensive use of German steel of the highest grades in all government establishments. Such assistance was promised, but the answer of the chambers indicated that it would be impossible to shut out all steel of this kind from the German market.

Some further dividends have been declared in the iron trade, showing much better results than the Phoenix dividend referred to last week. The Rombacher Hüttenwerke, a big Lorraine concern with a capital of 50,000,000 marks, pays 9 per cent, as against 5 per cent. for last year, although this year's capital is 5,000,000 marks greater than last year's. The Rheinische Stahlwerke (capital 40,000,000 marks, against 35,000,000 marks last year) will distribute 8 per cent., as compared with 7 per cent. last year. The Hasper Eisen und Stahlwerk has declared a dividend of 10 per cent.; last year it paid 8 per cent.

The announcement of these dividends, splendid as they are, made very little impression on the stock mraket. For some days the Morocco tangle has weighed heavily on the exchanges and prevented anything like a hopeful spirit from coming into play in response to such dividends. The Berlin market was in a panicky state for several days last week, and iron shares suffered severely. This week an advance was made at first, but a weaker tone was noted again to-day in connection with *The Iron Age* weekly review, a summary of which was cabled to Berlin.

Buffalo

BUFFALO, N. Y., September 26, 1911.

Pig Iron.—Inquiry in the Buffalo district has fallen off in volume during the past week and the total would probably not exceed 2500 tons. The aggregate of orders placed is also less, reaching only about 4000 tons of foundry grades with small quantities of malleable and charcoal and confined almost entirely to 1911 delivery. The slackened inquiry is due undoubtedly to the fact that customers do not require iron for spot shipment and the recent advance in prices has retarded placement. Neither buyers nor sellers are as yet inclined to consider 1912 orders. Furnaces are still making heavy shipments on contracts and stocks on yards are being steadily reduced. Prices are unchanged. We quote as follows, f.o.b. Buffalo, for prompt and fourth quarter shipment:

No. 1 X foundry	$14.00 to $14.25
No. 2 X foundry	13.75 to 14.00
No. 2 plain	13.75 to 14.00
No. 3 foundry	13.50 to 13.75
Gray forge	13.50
Malleable	13.75 to 14.25
Basic	13.75 to 14.25
Charcoal	16.50 to 17.50

Finished Iron and Steel.—Inquiry for steel bars has been light for the week and the price situation somewhat unsettled, 1.20c. being the ruling quotation. For bar specialties, tire, shoe and spring steel, etc., the price has been more stable. The market in wire nails has been active at $1.65 to dealers and $1.70 to $1.75 to smaller users and consumers. Orders in general lines for the week seem to have been less in volume than for some time past. Fabricating shops are still busy, having work enough to keep them going for the next three or four months; but the week has shown a lull in new business. Bids are now going in for the steel for the Duguid Building at Syracuse requiring about 100 tons and bids are soon to be received for the remodeling of the Broadway Arsenal, Buffalo, into a City Convention Hall and Exposition Hall, for which revised plans have been prepared calling for a considerable amount of steel.

Old Material.—There has been no improvement from the pronounced dullness that has existed for the past two weeks. Very little new business has developed and shipments on contracts are light. There has

THE IRON AND METAL MARKETS

been some demand for turnings from outside the district, but no transactions except for small amounts have been noted. Prices remain stationary. We quote as follows, per gross ton, f.o.b. Buffalo:

Heavy melting steel	$12.50 to $13.00
Low phosphorus steel	16.00 to 16.50
No. 1 railroad wrought	14.00 to 14.50
No. 1 railroad and machinery cast scrap	13.50 to 14.00
Old steel axles	18.50 to 19.00
Old iron axles	22.00 to 22.50
Old car wheels	13.00 to 13.50
Railroad malleable	12.75 to 13.00
Boiler plate	12.50 to 13.00
Locomotive grate bars	11.00 to 11.50
Pipe	9.25 to 9.50
Wrought iron and soft steel turnings	7.15 to 7.40
Clean cast borings	7.00 to 7.25

Boston

BOSTON, MASS., September 26, 1911.

Old Material.—While prices are unchanged from last week, as far as current transactions have been affected the market is weaker. Little business has been done, either between dealers or with the mills, the latter buying from hand to mouth only. The prices quoted below are those offered by the large dealers to the producers and to the smaller dealers and collectors, per gross ton, carload lots, f.o.b. Boston and other New England points taking Boston rates from eastern Pennsylvania points. In comparison with Philadelphia prices the differential for freight of $2.30 a ton is included. Mill prices are approximately 50c. a ton more than dealers' prices. The quotations follow:

Heavy melting steel	$10.00 to $10.50
Low phosphorus steel	11.45 to 11.95
Old steel axles	14.20 to 14.70
Old iron axles	17.70 to 18.70
Mixed shafting	12.75 to 13.25
No. 1 wrought and soft steel	11.00 to 11.25
Wrought iron pipe	9.25 to 9.50
Skeleton (bundled)	7.75 to 8.00
Cotton ties	8.00 to 8.25
No. 2 light	4.50 to 5.00
Wrought turnings	5.75 to 6.00
Cast borings	5.00 to 5.50
Machinery cast	12.50 to 13.00
Malleable	11.00 to 11.50
Grate bars	6.00 to 6.50
Stove plate	8.50 to 9.00

St. Louis

ST. LOUIS, MO., September 25, 1911.

Pig Iron.—With an increased number of inquiries, almost wholly for immediate shipment, there is hope in some parts of the market, while others with few or no inquiries insist that there is nothing to be expected for some time. No. 2 Southern is quotable from $10 to $10.25, Birmingham basis, with some even holding for $10.50. Northern iron continues at $13 to $13.50, Ironton basis. The fact remains, however, that all business is being done on the hand-to-mouth order, and while there is no open lowering of quotations it is pretty well established that buyers have an opportunity to negotiate.

Coke.—With one sale of 20 carloads of 72-hr. foundry coke and about 150 tons of 48-hr. furnace coke, the coke market can be said to be as quiescent as the pig iron situation. Quotations show no change and practically all the business doing is on the spot basis, if new, or immediate delivery on contract specifications.

Finished Iron and Steel.—The movement in finished products is keeping up fairly well in the aggregate, but there are no especially large orders being placed. Such as are coming in are for immediate shipment and consumption, nothing going into stock apparently. Structural steel is keeping up about the same tonnage that has prevailed in recent weeks, all going forward quickly and for immediate use. Standard rails have been quiet except for the closing of an additional order by the Missouri Pacific for 1800 tons for use on the southern end of the Iron Mountain system. Lack of activity in the coal trade as well as in the lumber trade is keeping down the demand for light rails. Track fastenings are in fair request and firm in price. Agricultural implement and vehicle concerns are making no especial impression on the bar market. Plates are quiet. An order to the Mount Vernon Car Company for 500 cars from the Louisville & Nashville is expected to bring in a good order soon. Otherwise there is nothing indicating special life.

Old Material.—The scrap iron market is affected at present largely by the same conditions that seem to rule the pig iron and finished steel markets. In consequence there is practically nothing doing in any division of the business and dealers are simply waiting for something to turn up. No new lists have come out from the railroads. An incidental deal of the past week has been the purchase by Harry Benjamin, of the Harry Benjamin Equipment Company, of the yards and business of the Block-Pollak Iron Company, with which he was connected before organizing the company bearing his name. The quotations to-day show a decided revision as a result of the prevailing dullness. Dealers' prices, per gross ton, f.o.b. St. Louis, are as follows:

Old iron rails	$12.00 to $12.50
Old steel rails, rerolling	11.50 to 12.00
Old steel rails, less than 3 ft.	10.50 to 11.00
Relaying rails, standard section, subject to inspection	22.50 to 23.00
Old car wheels	12.00 to 12.50
Heavy melting steel scrap	10.50 to 11.00
Frogs, switches and guards cut apart	10.50 to 11.00

The following prices are per net ton:

Iron fish plates	$10.50 to $11.00
Iron car axles	18.00 to 18.50
Steel car axles	16.00 to 16.50
No. 1 railroad wrought	10.75 to 11.25
No. 2 railroad wrought	9.75 to 10.25
Railway springs	9.50 to 10.00
Locomotive tires, smooth	14.00 to 14.50
No. 1 dealers' forge	8.50 to 9.00
Mixed borings	5.50 to 6.00
No. 1 busheling	8.50 to 9.00
No. 1 boilers cut to sheets and rings	7.00 to 7.50
No. 1 cast scrap	8.50 to 9.00
Stove plate and light cast scrap	7.00 to 7.50
Railroad malleable	8.00 to 8.50
Agricultural malleable	7.00 to 7.50
Pipes and flues	7.50 to 8.00
Railroad sheet and tank scrap	7.00 to 7.50
Railroad grate bars	6.50 to 7.00
Machine shop turnings	6.75 to 7.25

New York

NEW YORK, September 27, 1911.

Pig Iron.—Inquiry shows a considerable falling off from last week. Demand comes up in spots and when this has been satisfied there is a lull. Of the 3000 tons under inquiry for Bridgeport it is understood that one-half was purchased. Deliveries run into November. Virginia furnaces are said to have secured a portion of this tonnage. A New Jersey foundry making furnace castings has closed for about 3000 tons, of which 2000 was taken by an Eastern Pennsylvania furnace. Another New Jersey buyer has taken 1000 tons and two lots of from 400 to 500 tons were placed, one in Brooklyn and one in New Jersey. In Brooklyn a pattern makers' strike has cut down the output of two or three foundries. A feature of the past two weeks with Buffalo and Eastern furnaces has been the urgency with which iron has been ordered forward by foundries on their contracts. In a few cases requests are reported for anticipation of October shipment. This condition is not attended, however, by any greater firmness in prices. In New England some low prices have been named, both by Virginia and Pennsylvania furnaces. Little inquiry has appeared for next year's shipment, and this week there is small interest apparently in pig iron for any delivery. We quote Northern iron as follows at tidewater: No. 1 foundry, $15.50 to $15.75; No. 2 X, $15 to $15.25; No. 2 plain, $14.75 to $15. Southern iron is quoted at $15.25 to 15.50 for No. 1 foundry and at $14.75 to $15 for No. 2.

Finished Iron and Steel.—An indication of the belief that present prevailing prices in finished lines are close to bottom is had in the request for bids by October 5 by the Central Railroad of New Jersey on two bridges aggregating 10,000 tons of material. The point is emphasized by the fact that the bridges are not wanted for at least a year. Each comprises a number of double track plate girder spans and one draw span; one is over the Passaic River and the other over the Hackensack River. It is generally believed that structural purchases have lately been made on the basis of 1.30c., Pittsburgh, and this price is given for plates, although one sale of 300 tons of plates has been made in this territory at less than 1.25c., Pittsburgh. Bar iron is moving in good volume, but prices, manufacturers take occasion to mention, are extremely low. The general contract for the Filene building, Boston, requiring 5000 tons, has been given to the Wells Brothers Company. Definite decision is expected within two weeks on the 1000 tons involved in the building for the Man-

THE IRON AND METAL MARKETS

hattan Soap Company. The Hay Foundry & Iron Works is to fabricate the 200 tons for the Essex County National Bank building, Newark, and the McClintic-Marshall Construction Company has taken the 200-ton contract for the Hackensack school. The Pennsylvania Steel Company has 900 tons for approach work, including rails, for the Manhattan Bridge; L. F. Shoemaker & Co. have 200 tons for two bridges for the New York, New Haven & Hartford, and the Passaic Steel Company will roll for Ravitch Brothers 250 tons for a theater building on Delancey street, and 1000 tons for two apartment houses. The Seaman's Institute, Coenties slip, John Downey, general contractor, requiring originally 1500 tons of steel, is being refigured; the New York Central has asked for bids for a bridge at Oswego over the Barge Canal; bids for steel work for the 500-ton extension to the American Exchange National Bank will probably be asked in a few weeks, Marc Eidlitz & Son, general contractor, and a theater building has been projected in Washington, D. C. Quotations are now: Plain structural material, 1.46c. to 1.51c.; plates, 1.41c. to 1.46c.; steel bars, 1.31c. to 1.36c.; bar iron, 1.30c. to 1.35c., all New York. Plain material and plates from store, New York, 1.75c. to 1.85c.

Cast Iron Pipe.—The city of Providence, R. I., opened bids on Tuesday for 900 tons. No other public lettings of importance are announced in this territory. Inquiries from private buyers are fewer, doubtless as a result of the general feeling of disquiet in connection with the stock market. It is stated that some very low prices have been received by contractors who bid Tuesday on the 8900 tons of 40-in. pipe to be furnished to the New York Board of Water Supply. Carload lots of 6-in. are still quoted at $21 to $22 per net ton, New York.

Old Material.—Bad as the situation was last week, a still worse condition of affairs now exists. Dealers report that it is almost impossible to ship any kind of material on contracts that will be accepted. Consumers seem to have decided to reject everything. Under such circumstances the market is almost demoralized. Local dealers have sharply reduced their bids to railroads and other holders of scrap, and even then hesitate to purchase for fear that they may not be able to dispose of what they thus secure. At a time like this numerous rumors are current of steel plants and other consumers of scrap closing down in the near future for lack of business. Quotations are largely nominal, but the following represent the views of local dealers, per gross ton, New York and vicinity:

Old girder and T-rails for melting	$9.75 to $10.00
Heavy melting steel scrap	9.75 to 10.00
Relaying rails	20.00 to 21.00
Rerolling rails	11.50 to 12.00
Standard hammered iron car axles	21.00 to 21.50
Old steel car axles	15.50 to 16.00
No. 1 railroad wrought	11.75 to 12.00
Wrought iron track scrap	10.75 to 11.00
No. 1 yard wrought, long	10.50 to 11.00
No. 1 yard wrought, short	9.75 to 10.00
Light iron	4.00 to 4.50
Cast borings	5.00 to 5.50
Wrought turnings	5.50 to 6.00
Wrought pipe	9.50 to 10.00
Old car wheels	10.00 to 10.50
No. 1 heavy cast, broken up	10.00 to 10.50
Stove plate	8.00 to 8.50
Locomotive grate bars	8.00 to 8.50
Malleable cast	10.00 to 10.50

Metal Market

NEW YORK, September 27, 1911.

The Week's Prices

Cents Per Pound for Early Delivery.

	Copper, New York			Lead		Spelter	
Sept.	Lake.	Electrolytic.	Tin. New York.	New York.	St. Louis.	New York.	St. Louis.
21	12 60	12 37½	38 10	4.50	4.35	6.05	5.90
22	12.50	12.25	37.50	4.50	4.35	6.05	5.90
23	12.50	12.25	....	4.50	4.35	6.05	5.90
25	12.50	12.25	37.45	4.50	4.35	6.05	5.90
26	12.50	12.25	37.80	4.47½	4.32½	6.00	5.85
27	12.50	12.25	37.87½	4.47½	4.32½	6.00	5.85

Copper is neglected at lower prices. For the first time in many weeks lead is below 4.50c. in New York. Spelter has declined slightly. The pig tin market, which sagged during the week, recovered somewhat yesterday and to-day.

Copper.—Notwithstanding that some large dealers in copper have sold out their holdings solidly for October, and there is very little prompt copper to be had, the market has declined. This is due to the fact that consumers are showing no interest and the little spot copper that is offered is attracting very few bidders. Exports of copper have fallen off and so far this month only 20,531 tons have been sent abroad. The decline in exports is influencing the consumers' attitude. The London market holds firm, however, and has been steady for a week past. This morning spot copper was offered at £54 13s. 9d. and futures at £55 10s. To-day's London price for spot was only 5s. below the quotation of a week ago.

Pig Tin.—The chief interest in the pig tin situation this morning was in the Banca sale which took place to-day. The tin offered brought an unexpectedly good price, equivalent to 39.30c., New York, whereas spot tin could be obtained in this city to-day for 38.87½c. The stiff price paid for the Banca tin was due to the fact that certain London dealers had sold the sale short. Until yesterday the tin market here was dull and buyers adopted a waiting policy. It is probable that the high Banca price may influence some trading. The course of the market will bear watching within the next few days. If the American market continues firm a good buying movement may result, as consumers show a tendency to purchase at present prices. If it becomes topheavy, however, buyers claim that they can wait as they are supplied with tin for their immediate needs. The London market advanced slightly this morning, but New York dealers did not follow suit. There have been very heavy arrivals of tin this month which may tend to keep the price down. Up to date 5230 tons of tin have arrived here during September and there are 964 tons afloat. In London this morning spot tin was sold at £177 10s. and futures at £175.

Tin Plates.—Dealers who sell foreign tin plates in this country are getting very little business, as they cannot compete with American producers at the existing price of foreign plates, which is 13s. 7½d. at Swansea, Wales. A good amount of buying of tin plates for re-export is being done, but the domestic demand is quiet. The usual quotation is $3.84 for 100 lb. coke plates.

Lead.—Lead is down to 4.37½c., New York. Outside dealers are now taking business away from the leading interest, which continues to maintain its quotation at 4.50c. A great deal of price cutting is going on in the West, and the usual quotation is 4.32½c. in St. Louis, but this price has been shaded in some quarters.

Spelter.—Spelter has kept fairly steady all week. Stocks for immediate delivery are not very plentiful, but sellers seem anxious to dispose of futures. In some cases concessions are being freely made to induce purchases of November and December spelter. A reduction in the price of spot spelter was made yesterday when New York dealers began to quote 6c. and St. Louis sellers 5.85c.

Antimony.—Antimony continues to decline, and Hallett's is now down to 7.70c. Some heavy sales of Chinese and Hungarian grades have been induced by rather sharp price cutting. These grades are now quoted at from 7c. to 7.10c.

Old Metals.—The market is weak, but dealers' selling prices, New York, are nominally unchanged, as follows:

Copper, heavy cut and crucible	$11.75	to	$12.00
Copper, heavy and wire	11.37½	to	11.50
Copper, light and bottoms	10.50	to	10.75
Brass, heavy	8.00	to	8.25
Brass, light	6.75	to	7.00
Heavy machine composition	10.50	to	10.75
Composition turnings	8.50	to	8.75
Clean brass turnings	8.00	to	8.25
Lead, heavy	4.20	to	4.25
Lead, tea	3.95	to	4.00
Zinc, scrap	4.25	to	4.30

Chicago

SEPTEMBER 26.—Failure to support the price of tin resulted in a pronounced slump. Trade in other metals has been sluggish and prices are without change. We quote at Chicago: Casting copper, 12.62½c.; Lake, 12.87½c., in carloads, for prompt shipment; small lots, ¼c. to ⅜c. higher; pig tin, carloads, 38½c.; small lots, 41c.; lead, desilverized, 4.45c. to 4.50c. for 50-ton lots; corroding, 4.72½c. to 4.75c. for 50-ton lots; in carloads, 2½c. per 100 lb. higher; spelter, 5.95c. to 6c.; Cookson's antimony, 9¼c., and other grades, 8¼c. to 8¾c., in small lots; sheet zinc is $8, f.o.b. La Salle, in carloads of 600-lb. casks. On old metals we quote for less than carload

THE IRON AND METAL MARKETS

lots: Copper wire, crucible shapes, 10¾c.; copper bottoms, 9½c.; copper clips, 10¼c.; red brass, 9½c.; yellow brass, 7½c.; lead pipe, 4c.; zinc, 4¼c.; pewter, No. 1, 26c.; tinfoil, 32c.; block tin pipe, 36c.

St. Louis

SEPTEMBER 25.—The metal market shows a weakening tendency, due to a falling off in demand except for immediate consumption. Lead to-day is quotable at 4.37½c.; spelter, 5.85c. bid and 5.90c. asked; tin, 37.97½c.; Lake copper, 12.85c.; electrolytic, 12.65c.; Cookson's antimony, 8.60c. In the Joplin mining district zinc blende the past week brought $48 per ton, top grade, the basis being $45 per ton for 60 per cent. ore. On some poorer grades the basis ranged down to $42 per ton. The top prices showed no variation from the preceding week, but the commoner grades were about $1 per ton weaker. Calamine brought $32 per ton for the top on a basis of $25 per ton for 40 per cent. ore, with poorer grades running down to $23 per ton. Lead ore was weaker at $58 to $60 per ton. Following are the prices for old metals: Light brass, 4c.; heavy brass and light copper, 8c.; heavy copper and copper wire, 9c.; zinc, 3c.; lead, 3.25c.; pewter, 20c.; tinfoil, 29c.; tea lead, 3c.

Iron and Industrial Stocks

Heavy Decline in Steel Stocks

NEW YORK, September 27, 1911.

The past week has been marked by furious selling of United States Steel stocks, which on one or two days came perilously near to a collapse. On Thursday no less than 572,100 shares and on Friday 717,000 shares of the common stock changed hands. The latter broke all previous records for a day's transactions in this stock. The preferred was likewise under severe pressure, but the transactions were on a much smaller scale with relation to the number of shares outstanding. The lowest price realized on the common stock was on Monday of this week, when 51⅝ was touched, but the lowest price on the preferred was reached on Friday at 103¼. The cause of this severe decline is referred to editorially. Other industrial stocks also suffered seriously, but not to the same extent. A marked rebound occurred on Tuesday. The range of prices on iron and industrial stocks from Wednesday of last week to Tuesday of this week was as follows:

Allis-Chalm., com...	6	6⅞	Pressed Steel, com..	25	27½
Allis-Chalm., pref...	16½	17½	Pressed Steel, pref..	91	94
Beth. Steel, com....	26	28	Railway Spring, com.	26⅞	28½
Beth. Steel, pref....	54	58	Railway Spring, pref	94	98
Can. com.....	9¼	10	Republic, com.....	21¼	23
Can. pref.....	80½	85	Republic, pref.....	84⅜	87½
Car & Fdry., com.	42½	46½	Sloss, com.....	34	36¼
Car & Fdry., pref ...	113	118	Pipe, com.....	11	13
Steel Foundries ...	25	28	Pipe, pref.....	40½	45
Colorado Fuel.....	25	26¾	U. S. Steel, com....	51⅝	64
General Electric....	142	149	U. S. Steel, pref....	103¼	110¼
Gr. N. Ore Cert....	43½	45⅝	Westinghouse Elec..	58⅜	61
Int. Harv., com...	100	102½	Am. Ship, com.....	50	54
Int. Harv., pref. ...	115	117¾	Chi. Pneu Tool....	39½	43½
Int. Pump. com	27⅜	30	Cambria Steel.....	40⅞	42½
Int. Pump. pref.....	78	81	Lake Sup Corp.....	21⅛	23½
Locomotive, com	33⅜	34⅝	Warwick	10¾	
Locomotive, pref....	104½	105	Crucible Steel, com	9	10¼
Lackawanna Steel	30		Crucible Steel, pref	73	76⅝
Nat. En. & St. com.	14	15½	Harb. Wk. Ref., pref...	..	99
Nat. En. & St., pref....	92				

Dividends Declared

The Otis Elevator Company, regular quarterly, 1½ per cent. on the preferred stock and 1 per cent. on the common, payable October 16.

The McCrum-Howell Company, regular quarterly, ¾ of 1 per cent. on the common stock, payable October 1.

The Chicago Railway Equipment Company, regular quarterly, 1¾ per cent., payable October 2.

The Union Typewriter Company, regular semi-annual, 3½ per cent. on the first and 4 per cent. on the second preferred stock, payable September 30.

The American Seeding Machine Company, regular quarterly, 1½ per cent. on the preferred and 1 per cent. on the common stock, payable October 15.

The Reece Buttonhole Sewing Machine Company, International Buttonhole Sewing Machine Company and Reece Folding Machine Company, regular quarterly dividends of 2 per cent., 1 per cent. and 1 per cent., respectively, payable October 16.

The American Brake Shoe & Foundry Company, regular quarterly, 1¾ per cent. on the common and preferred stocks, payable September 30.

The Sloss-Sheffield Steel & Iron Company, regular quarterly, 1¼ per cent. on the preferred stock, payable October 2.

Lignites and the Use of Producer Gas in Texas

Bulletin No. 169 of the University of Texas deals with the composition of Texas coals and lignites and the use of producer gas in Texas. It is a pamphlet of 134 pages. Chapters 1 and 2, treating of coal and lignite respectively, were prepared by Dr. William B. Phillips, director of the Bureau of Economic Geology and Technology, and by S. H. Worrell, chief of the testing laboratory. Chapter 3 on "The Use of Producer Gas in Texas" is by Drury McNeill Phillips. There has been a marked increase in Texas in the past few years in the use of lignite in gas producers, the gas thus made going to gas engines for the generation of power. Lignite is also used in gas producers for fuel to be empolyed in the burning of lime, etc. The lignite fields in Texas are estimated to be in excess of 60,000 square miles. The original supply is estimated in the pamphlet to have been beyond 30,000,000,000 tons, varying in fixed carbon content from a few per cent. to nearly 45 per cent, with volatile and combustible matter ranging from 30 to 76 per cent. The beds run to 15 ft. and more in thickness and are found at various depths to as much as 400 and 600 ft.

The total producer horsepower operating on lignite in the State is put at 13,000, while the total engine horsepower is 12,270. The plants are scattered over a wide area so that in many cases the by-products such as tar and ammoniacal liquor would have to be transported over considerable distances to a central plant for treatment. At present the saving of by-products is possible only at the large plants. The average value of the lignite mined in the State in 1910 was 96 cents a ton at the mine and the production was 979,232 tons, the largest in the history of the industry. Many valuable data are given concerning practice at individual plants making producer gas from lignite, the subject matter being of interest not only to manufacturers of gas producers but to users of gas for power. The entire pamphlet covers the ground ably and is a noteworthy contribution to the fuel literature of Texas.

A New Industry for South Africa.—Cartwright & Eaton, Ltd., Johannesburg, South Africa, have commenced the erection of an iron and steel works near Benoni for the purpose of working up iron and steel scrap into products to meet the local requirements. Rolling mills and other machinery of the latest type are being shipped from England by Thomas Perry & Sons, Francis Berry & Son and others. Mitchell Cotts & Co., 4 London Wall Buildings, are their London agents. Skilled men are being engaged in England to run the plant. J. K. Eaton, of the above named company, has just returned to Johannesburg from a tour in Great Britain. In the meantime options have been secured on large quantities of scrap.

The Inventors' International Exposition has been organized for the purpose of holding a convention of inventors and manufacturers in Buffalo, N. Y., December 5, 6, 7, 8 and 9. It will be held in the great Convention Hall, which has been furnished free of cost by the city of Buffalo for that purpose. It is the intention to exhibit models of all kinds, blue prints and designs. Exhibitors are urged to attend and demonstrate in person, but experienced men will be provided by the management to demonstrate models and explain blue prints and designs for inventors who are unable to attend. The programme will include lectures and addresses by prominent patent attorneys, manufacturers and investors. B. B. Pannett, Mutual Life Building, Buffalo, is general manager and secretary.

The North Wales Machine Company, North Wales, Pa., is building a specially constructed furnace for hardening small steel parts in large numbers. Recently it designed and built a furnace for hardening thin discs perfectly flat, which has a capacity of 25,000 hardened pieces per day.

Personal

Horace P. Tobey, who for more than 40 years has been treasurer of the Tremont Nail Company, Wareham, Mass., resigned that position September 15. Proper attention to his personal affairs makes it impracticable for him to continue to give the time necessary for the performance of the duties of that office. His successor is William A. Leonard, who has for nearly 20 years been superintendent of the works of the company. Mr. Tobey retains, as stockholder and president, a close connection with the company with which he has so long been identified.

J. S. Cothran, Charlotte, N. C., has been appointed sales agent of the Terry Steam Turbine Company for North and South Carolina.

C. R. Vincent, for many years president of the Ball & Wood Company, has assumed the management of the Monel metal department of the Ruggles-Coles Engineering Company, 50 Church street, New York, general agent for the Bayonne Casting Company, Bayonne, N. J., maker of Monel metal castings. Sheets, rods, wire and screens of the same metal will also be handled by the company with which Mr. Vincent is associated.

H. E. Higgins, who has been treasurer and general manager of the Cleveland Steel Company, Cleveland, Ohio, for many years, will sever his connection with that company October 1, having tendered his resignation some time ago. He will be succeeded by J. C. Jones, at present purchasing and sales agent, who has been connected with the company 14 years.

T. S. Crane, of Pilling & Crane, Philadelphia, Pa., returned September 19 from a month's vacation abroad.

Albert E. Newton, secretary of the Prentice Bros. Company, Worcester, Mass., has returned from a two months' European trip.

Albert Ladd Colby, New York, consulting engineer, specializing in by-product coke ovens, sailed last week for a six weeks' absence in Germany.

Albert Broden, manager of the blast furnace department of the Reading Iron Company, Reading, Pa., has returned from a trip of several months abroad, a large portion of the time having been spent in Sweden.

Robert E. Brooke, of the E. & G. Brooke Iron Company, Birdsboro, Pa., has returned from a short trip abroad.

W. J. Gilmore, formerly with the H. C. Frick Coke Company and the Sunshine Coal & Coke Company, is now vice-president and general manager of the Producers' Coke Company, sales agent for coal and for foundry and furnace coke, with office in the First National Bank Building, Uniontown, Pa.

B. A. Prince, Worcester, Mass., has been elected director of the new industrial school at Westfield, Mass. Mr Prince is a graduate of the Worcester Polytechnic Institute, class of 1868.

Excursion Features of Mining Engineers' San Francisco Meeting

Plans are now completed for the itinerary across the country to the San Francisco meeting of the American Institute of Mining Engineers, and the personnel of the party which is to make the extended journey to Japan immediately after the meeting is now obtainable. A special train de luxe leaves Chicago, September 30, at 8 p. m. The Japan party will leave San Francisco October 17 on the steamship Manchuria, and the trip allows for 18 days in Japan. The party plans to leave Yokohama for San Francisco on the steamship Siberia November 21, arriving in San Francisco December 7. Among those who will join in the Japan excursion are the following:

Prof. J. W. Richards, Lehigh University, South Bethlehem, Pa.; Dr. H. S. Drinker, president Lehigh University; Dr. Joseph Struthers, secretary American Institute of Mining Engineers, New York; A. J. Smink, president Reading Iron Company; C. Le Boutillier, chemist, Tayler Iron & Steel Company; W. S. Morse, American Smelting & Refining Company, David Williams, New York; Eli Whitney, New Haven, Conn.; Dr. R. W. Raymond, secretary emeritus American Institute of Mining Engineers, Mr. William H. Wiley, John Wiley & Sons, New York, Capt. Robert W. Hunt, Chicago; W. L. Saunders, president Ingersoll-Rand Company; F. H. Daniels, chief engineer American Steel & Wire Company; W. V. Morse, American Smelting & Refining Company; D. W. Brunton, past president American Institute of Mining Engineers, W. B. Mamy, president North American Copper Company, W. L. Clark, assistant general manager United Verde Copper Company; Edwin Thomas, Thomas Iron Company, Catasauqua, Pa.; E. W. Parker, chief statistician United States Geological Survey.

Obituary

JAMES DWYER, vice-president Peninsular Stove Company, Detroit, Mich., died September 17, aged 60 years. He was one of the earliest manufacturers of stoves in Detroit. His brother Jeremiah, now and for many years president of the Michigan Stove Company, established the stove industry in that city in 1861, when the Detroit Stove Works was founded, of which he was manager. Two years afterward Jeremiah removed from Detroit and James stepped into his place, resigning that position in 1879 to start the Peninsular Stove Company. He was born in Springwells, now a part of the city of Detroit. Left an orphan at an early age, he managed to make a living and attend the common schools. Removing to New York he served a four years' apprenticeship as machinist. His own experience made him exceedingly sympathetic with orphans and apprentices. His charities were extensive, but conducted with the desire to escape public notice as much as possible. He leaves three daughters and three sons. One son, James M., is treasurer, and another son, Edwin L., is purchasing agent of the Peninsular Stove Company.

JOHN B. RHOADS, of John E. Rhoads & Sons, leather belting manufacturers, Philadelphia, Pa., died at his home in Moorestown, N. J., September 20, aged 46 years. He had been identified with the business for 29 years and had been secretary of the Philadelphia Leather Belting Association for a number of years. He leaves a widow and three children.

C. FRANKLIN WEILER, secretary and treasurer of the Cortland Corundum Wheel Company, Cortland, N. Y., died at Saranac Lake September 17 of tuberculosis, after an illness of about two years, aged 39 years. Mr. Weiler became associated with the company at its organization in March, 1902, and by close attention to its growing needs gradually worked his way up until elected to the position he held at his death.

The A. P. Smith Mfg. Company, East Orange, N. J., has gone into the manufacture of two new specialties. One of these is a water motor for operating large valves, by the use of which water superintendents are enabled to periodically inspect their large and important valves and thereby be sure that when the occasion arises for them to be opened or closed they are in operative condition. In the past it has generally happened that on the occasion of a break in a main the men sent to close the valves have operated them in the wrong manner, breaking the stem, thus causing much damage, on account of the valves not having been operated for a long time. With this motor all such danger is eliminated, the valves being kept in perfect condition as to their operating mechanism. The other new product is a meter tester, by means of which it is possible to test all meters as to efficiency and accuracy when received from the factory and also to test meters which the consumer complains of as not being accurate. Annoyance is thus saved while revenue may be obtained by testing these meters for the consumer, as in nine cases out of ten it will be found that the meter registers accurately.

Robert Gilchrist & Co., Third and Trumbull streets, Elizabethport, N. J., importers and manufacturers of ground ferromanganese, ferrosilicon, manganese dioxide and carbon, are moving their plant into a new building situated on the water front. As their business runs largely into tonnage, the advantages of water front and sidings are not to be overlooked. In equipping this plant the company is gradually increasing its capacity and is putting in new machinery. The capacity of the old plant will be more than trebled. Special units will be installed for grinding the chief products. The firm reports that the demand for its products has been steadily growing since it started in business, the increase being noticeable from month to month.

The Wheeler Condenser & Engineering Company, 149 Broadway, New York, is building some improved types of condensers, and shortly expects to bring out a new design of cooling tower and other apparatus. The company reports that its establishment has been running night and day for nearly two years and business conditions are quite satisfactory.

Iron and Steel Electrical Engineers

Fifth Annual Convention

The special problems of electricity in the steel plant and the activities of works' electrical engineers in relation to safety provisions were given special attention in the early sessions of the meeting this week in New York of the Association of Iron and Steel Electrical Engineers. The meeting, which is the fifth annual convention, was opened at the Imperial Hotel on Monday morning and provided for seven professional sessions besides business sessions, a number of excursions, an illustrated lecture on safety on Tuesday evening by R. J. Young, of the Illinois Steel Company, and a dinner on Wednesday evening. The concluding excursions are scheduled for Saturday.

The first work of importance taken up by the convention was the reception and discussion of the report of its Safety Committee, B. R. Shover, B. W. Gibson and H. Hughart Laughlin. The report took the form of a printed pamphlet of 39 pages, compiling verbatim the rules of such of the members as had supplied the committee with copies of individual shop regulations. The compilation was made to attract the contribution of other rules and also to develop discussion regarding detail provisions, all for the guidance of next year's safety committee, which may be expected to draw up a uniform set of rules or a set of as wide application as possible. The rules in the present report are grouped as follows: Rules for cranemen; general rules relative to employees of electrical department; miscellaneous; standard rules. It is possible that the report may be had by applying to the secretary of the association, James Farrington, La Belle Iron Works, Steubenville, Ohio.

Besides the safety committee report and the illustrated lecture on safety, F. W. Woodhull, of the Lukens Iron & Steel Company, described at the Tuesday morning session by means of lantern slides numerous safety devices used in the iron and steel industry. On Tuesday afternoon papers were read by M. A. Whiting, General Electric Company, "New Developments in Control Apparatus for Steel Mills," describing a series contactor designed to provide emergency dynamic braking in the case of failure of the line voltage; by Arthur C. Eastwood, Electric Controller & Mfg. Company, "Automatic Motor Control," describing a magnetically operated switch designed to act not only as a switch for closing a circuit and holding it closed, but also as a current relay limit, refusing to close until the current is reduced to the so-called critical value; by H. C. Soule, transformer engineer, Westinghouse Electric & Mfg. Company, on "Transformers for Steel Mill Service," giving details of construction and of care and operation of transformers, and by George W. Richardson, American Bridge Company, explaining the successful application of one of his own double armature motors to a planer, securing desired acceleration of planer speed, low peak loads and slow armature speed, the last point regarded as important with a machine periodically reversing like a planer.

The papers scheduled for the later sessions cover in part cranes, motors, an electrically driven pumping station and shop illumination, the last subject for Friday afternoon.

Among those present were the following, with the total attendance at this writing numbering 115:

O. R. Jones, Youngstown Sheet & Tube Company, Youngstown, Ohio.
D. J. Jones, Republic Iron & Steel Company, Youngstown, Ohio.
G. H. McFeaters, Lorain Steel Company, Johnstown, Pa.
F. A. Wiley, Wisconsin Steel Company, South Chicago.
H. A. Cox, American Steel & Wire Company, Donora, Pa.
C. E. Miller, Clairton Steel Company, Clairton, Pa.
E. W. Yearsley, Philadelphia.
C. C. Hunsberger, American Bridge Company, Philadelphia.
C. J. Brinker, American Sheet & Tin Plate Company, Vandergrift, Pa.
E. H. Wentz, National Tube Company, Lorain, Ohio.
A. B. Bartholomew, American Steel & Wire Company, Donora, Pa.
F. W. McKee, Jones & Laughlin Steel Company, Woodlawn, Pa.
Wm. O. Oschmann, Oliver Iron & Steel Company, Pittsburgh.
B. F. Coombe, Carnegie Steel Company, Mingo Junction, Ohio.
John Cooper, Carnegie Steel Company, Bellaire, Ohio.
R. B. Davenport, Carnegie Steel Company, New Castle, Pa.
E. Friedlaender, Edgar Thomson Works of Carnegie Steel Company.
James Farrington, La Belle Iron Works, Steubenville, Ohio.
Fred. H. Woodhull, Lukens Iron & Steel Company, Coatesville, Pa.
B. G. Beck, American Sheet & Tin Plate Company, Gary, Ind.
H. A. Lewis, Alan Wood Iron & Steel Company, Conshohocken.
W. E. Watters, National Malleable Casting Company, Melrose Park, Ill.
H. B. Smith, Illinois Steel Company, Joilet, Ill.
C. T. Healy, American Steel & Wire Company, Cleveland.
A. C. Cook, Carnegie Steel Company, Youngstown, Ohio.
R. J. Nicholson, Republic Iron & Steel Company, Youngstown, Ohio.
A. R. Foster, Republic Iron & Steel Company, Youngstown, Ohio.
L. R. Palmer, Jones & Laughlin Steel Company, Pittsburgh.
L. R. Rankin, Carnegie Steel Company, Sharon, Pa.
George W. Richardson, American Bridge Company, Philadelphia.
D. R. Knapp, Eastern Steel Company, Pottsville, Pa.
B. R. Shover, Carnegie Steel Company, Youngstown, Ohio.
S. Henderson, Central Furnace, American Steel & Wire Company, Cleveland.
W. F. Detwiler, Allegheny Steel Company, Brackenridge, Pa.
W. Greenwood, Carnegie Steel Company, Youngstown, Ohio.
J. D. Lindstrom, Shelby Steel Tube Company, Ellwood City.
W. T. Snyder, National Tube Company, McKeesport, Pa.
F. D. Egan, Pittsburgh Crucible Steel Company, Pittsburgh.
Edw. C. Smith, Harrisburg Pipe & Pipe Bending Company, Harrisburg, Pa.
R. J. Young, Illinois Steel Company, South Chicago.
John C. Reed, Pennsylvania Steel Company, Steelton, Pa.
D. M. Petty, Bethlehem Steel Company, South Bethlehem, Pa.
A. J. Woodworth, Maryland Steel Company, Sparrows Point, Md.
Clark S. Lankton, Seneca Iron & Steel Company, Buffalo.
T. E. Tynes, Lackawanna Steel Company, Buffalo.
Charles A. Kafer, Bethlehem Steel Company, South Bethlehem, Pa.
H. H. Laughlin, Jones & Laughlin Steel Company, Pittsburgh.

The American Manufacturers' Export Association

The second annual convention of the American Manufacturers' Export Association, which comprises in its membership about 300 of the leading exporters of the country, was held on Monday and Tuesday of this week in the Hotel Astor, New York. In connection with the convention and indorsed by the association an exposition was held at the hotel by the United States Marine Association, which plans to send out next spring two vessels of its own of 7000 and 10,000 tons, laden with samples of American manufactures, for exhibition and sale in all the chief ports of Central and South America.

At the sessions of the convention W. B. Campbell, of the Perkins-Campbell Company, Cincinnati, presided. A. H. Baldwin, chief of the Bureau of Manufactures of the Department of Commerce and Labor, told the members what the Government is doing to help them in their export work. A. J. Wolfe, manager of the Russian-American Messenger, a paper devoted to fostering trade between Russia and this country, declared that owing to the present dependence of American manufacturers on German agents in Russia they were being discriminated against in favor of German competitors. The effect of drawback of duties on American export trade was explained by Leonard Hall Jerome.

William Harris Douglas, for 40 years in the export and commission business, urged the restoration of an American merchant marine. He declared that, in addition to freight charges, 30 per cent. of American trade is being lost through the failure to cary American goods in American ships. From Edward A. Keith, of the George B. Keith Company, who recently returned from a trip round the world, the convention heard a description of the progress American manufactures were making in various parts of the world. Reciprocity treaties with the countries of Central and South America were urged at the second day's session by President Campbell. At the same time the entire trade policy heretofore adopted by manufacturers of this country toward South American tradesmen was raked vigorously over the coals by Senor J. P. Santa Marina, a trade expert from the Argentine Republic, who has been studying trade conditions between the two countries for the last 12 years. His criticism of the rude and negligent methods of American manufacturers toward his countrymen came as a distinct surprise to the convention.

A dinner on Tuesday evening wound up the proceedings. Addresses were made by Congressman William C. Redfield, John Ball Osborne, Chief of the Bureau of Foreign Relations of the Department of State; John Candler Cobb, president of the National Tariff Commission Association; Robert P. Skinner, American Consul General at Hamburg; and Prof. John L. Stewart, head of the Department of Business Administration at Lehigh University.

Lockwood, Greene & Co., architects and engineers for industrial plants, 93 Federal street, Boston, have established a Chicago office in the First National Bank Building, Chicago, which will be under the managership of Harold V. Coes, until recently mechanical engineer for the Liquid Carbonic Company.

Pittsburgh and Vicinity Business Notes

The United Engineering & Foundry Company, Pittsburgh, has received orders for a 600-ton forging press from the A. P. Witteman Company, Philadelphia, Pa.; a 1000-ton press to be installed in the new plant of the American Bridge Company at Gary, Ind., and a 150-ton forging press for the Cleveland Pressed Steel Company, Cleveland, Ohio.

The General Refractories Company, Pittsburgh, manufacturer of fire brick, is enlarging its W. H. Wynn works at West Decatur, Clearfield County, Pa., proposing to make its daily output 70,000 brick. The company is also enlarging its Blair silica brick works at Sproul, Blair County, Pa., the improvements to be finished about November 1, when this works will have a capacity of 75,000 brick daily. The capacity of its Olive Hill works at Olive Hill, Ky., is being increased to 70,000 brick daily. The erection of a new fire brick works has been begun by the company at E. K. Junction, Ky.

The Balbrook Company, Machesney Building, Pittsburgh, agent for the Moorhead Mfg. Company, Detroit, Mich., recently installed Moorhead steam traps in the W. J. Rainey Coal Company's new power plant at Mitchell Station, Pa.; the Wheeling Steel & Iron Company's works at Benwood, W. Va., and the Saxonwald greenhouse at Castle Shannon, Pa.

The S. Severance Mfg. Company, maker of spikes and rivets, Glassport, Pa., has elected F. W. Severance president and E. F. Conley secretary and treasurer. President Severance reports that the company has been extremely busy for the last two months, rushed to capacity, and now has sufficient business booked to run full for at least two months. While prices are low, conditions in general are as satisfactory as could be expected.

The property of the West Virginia Bridge & Construction Company will be offered at receivers' sale October 7 at the Ohio County Court House, Wheeling. The property includes two tracts of land just outside of Wheeling, a plant with switching connections, machinery, erecting tools, etc. Charles E. Woods and J. B. Handlan are the receivers.

The Pittsburgh office of the Oil City Boiler Works, House Building, Pittsburgh, has sold a 225-hp. Geary water-tube boiler to the Universal Rolling Mill Company, Bridgeville, Pa.

The Southern Connellsville Coke Company, Uniontown, Pa., recently completed 64 new ovens at Cheat Haven, Pa., on the Baltimore & Ohio Railroad, and the new plant is now producing coal and coke. S. A. Carson is general manager of the company, with office in the First National Bank Building, Uniontown, Pa.

Joseph G. Armstrong, director of public works, Oliver Building, Pittsburgh, is asking for proposals for shop and mill inspection of the structural steel to be used in the construction of the Point Bridge across the Allegheny River, for which the general contract was given to the American Bridge Company.

Charles Y. Knight, mechanical engineer, Coventry, England, delivered an address at a special meeting of the Engineers' Society of Western Pennsylvania on the evening of September 27, on "Gas Motors in Automobiles with Special Reference to Valve Gear." Mr. Knight is the inventor of the Knight motor.

The sheet mills of the Whitaker Iron Company, Wheeling, W. Va., have been closed down and will probably be idle for some time. Most of the product of sheets made in this plant is used by the Wheeling Corrugating Company, an identified interest.

The New York Shipbuilding Company, Camden, N. J., launched successfully on September 23 the battleship Moreno, building for the Argentine Republic. This vessel is a sister ship to the Rivadavia, launched recently from the yards of the Fore River Shipbuilding Company, Quincy, Mass. Each ship is 595 ft. long, 98 ft. beam, and has a displacement of 27,600 tons.

The M. Rumely Company, La Porte, Ind., has for a considerable period been shipping a number of trainloads each month of its Oil Pull plow engines and threshing machines for its Canadian trade, each trainload consisting of 40 to 50 cars and with often two machines on a car.

The W. S. Tyler Company, Cleveland, Ohio, maker of iron and bronze ornamental work, wire screen, etc., has purchased a portion of the plant of the Webster Mfg. Company in Chicago. The purchase includes a large 5-story building, a machine shop and considerable land. The Tyler Company has as yet made no plans for the operation of its new acquisition. Although it has largely increased the capacity of its Cleveland plant in the past few years, it finds that more room is needed. While it has additional building room, the building of extensions at the present time would be interfered with by the track elevation of the Pennsylvania Railroad which adjoins the plant, work on which has just been started. The Webster Mfg. Company, maker of metal products, has a large plant in Tiffin, Ohio, where it will probably concentrate its interests.

The Association of Edison Purchasing Agents held its annual meeting at the Monmouth Hotel, Spring Lake, N. J., September 21, at which the following officers were elected for the ensuing year: President, J. W. Brennan, Detroit Edison Company; first vice-president, W. H. Francis, Boston Edison Company; second vice-president, J. B. Eaton, Rochester Electric Light Company; treasurer, Andrew Banks, Jr., Consolidated Electric Light & Power Company, Baltimore; secretary, H. F. Frasse, Brooklyn Edison Company; stock controller, E. H. Shufro, Union Electric Light Company, St. Louis, Mo.

The number of idle freight cars in the United States and Canada on September 13, as reported by the American Railway Association, was 64,283, a reduction of 20,258 in the preceding two weeks. On September 14, 1910, the total surplus was 47,076.

The M. Mitshkun Company has purchased the old Blue Line Car Works, which occupy about eight acres of land, with over a mile of railroad tracks under cover. The property is bounded by Dix and Waterman avenues and three trunk lines—the Michigan Central, Wabash and Lake Shore & Michigan Southern. The shops are fully equipped with the most approved machinery to build and repair all kinds of freight cars, either of wood or steel construction. Employment will be given to several hundred men.

A special meeting of the Cleveland Engineering Society, Cleveland, Ohio, was held September 26 to listen to a paper on "Smoke Prevention" by Paul P. Bird, of the Commonwealth Edison Company, Chicago, formerly chief smoke inspector of Chicago. This society has recently adopted the policy of taking an interest in civic matters, especially those of an engineering character. Owing to agitation in behalf of smoke prevention, Mr. Bird's paper was especially interesting.

The Toledo Bridge & Crane Company, Toledo, Ohio, announces the appointment of E. T. & F. E. Mathewson, Real Estate Trust Building, Philadelphia, Pa., as its representatives for that city and vicinity, effective October 1.

The Jones Mfg. Company, Youngstown, Ohio, patentee and manufacturer of the Jones oil filters, is considering the question of securing a site in some growing community and erecting a new plant thereon for the manufacture of sheet metal specialties or converting some suitable old building to its needs.

The Commonwealth Title, Trust & Insurance Company, Philadelphia, Pa., sold as trustee, on September 21, under a deed of trust, given by the Hazelton Sheet Steel Company and later assumed by the Union Sheet & Tin Plate Company, the plant of that company at Hazelton, Pa. The plant consists of two main mill buildings, four hot mills, one cold mill, engines, furnaces, power plant, machinery and general equipment. The property was bought in by the bondholders.

The Brylgon Steel Casting Company, New Castle, Del., has about completed additions to its plant, consisting of a new shop 20 x 60 ft., a new laboratory, and an extension of 20 x 26 ft. to the pattern shop. The installation of an additional 200-hp. Coatesville boiler and stack, with several new machine tools, will complete the improvements and additions for the present. Besides the usual carbon steel castings, the company manufactures various alloy castings to meet the special requirements of its customers.

The Steel Corporation's Value

Vast Growth of Assets

The heavy decline in the securities of the United States Steel Corporation last week because of a growing belief that it must dissolve voluntarily or face a suit brought by the Department of Justice has naturally caused much uneasiness among those who hold such securities. It may be said, notwithstanding the remarkable deliverance of Attorney General Wickersham, that the trade does not share in his view that the Steel Corporation must follow in the footsteps of the Standard Oil Company and resolve itself into its original parts. In the iron trade there is no such antagonism to the Steel Corporation as has always existed among oil producers and refiners with regard to the Standard Oil Company. If the Department of Justice is confident that the Steel Corporation exists in violation of the Sherman anti-trust act and manifests that confidence in a suit for dissolution the trade will be greatly surprised if the corporation is not able to make a good defense. In view of what has happened in the stock market, however, and of apprehensions now prevailing with regard to the status of the corporation's securities, the following article from the New York Times is of interest:

"Although the possibility that the United States Steel Corporation might have to dissolve is not a new idea by any means, it has never been brought home to stockholders as strongly as in recent weeks that the disruption of the organization might mean a distribution of assets representing potential loss.

Seeking Worth of Stocks

"The corporation during the past decade has been piling up assets in the shape of accretions of value in ore lands, new plants and other tangible results of the vast sums spent out of earnings, and that the properties are immensely more valuable today than at the time of organization has been generally conceded.

"For the purpose of putting a liquidation value on the assets and figuring out the equities behind the common and preferred shares, however, little positive information was obtained by stockholders because of the wide differences of opinion about the values of the original plant and the extent to which earnings put back into the property may be actually counted as additions to worth. Another drawback, of course, was the problem of what would become of profits should the integral parts of the corporation, which has been the chief stabilizer of the erratic steel trade for the past decade, be turned loose to fight each other.

Bureau of Corporation's Appraisal

"The report of the Bureau of Corporations of its investigation of the 'Steel Trust' made public last July, after an investigation extending over several years, asserted that the tangible property representing the $1,402,000,000 of capitalization at the time of organization was worth only $682,000,000. By a persistent reinvestment of earnings, the report concedes, however, much of the water in the original combination has been squeezed out, and the present valuation is placed by Commissioner Herbert Knox Smith's report at $1,187,000,000, as against $1,486,000,000 outstanding securities, an increase of only about $66,000,000 in capitalization, against $487,000,000 increase in valuation which has taken place under Judge Gary's management. To be exact, the grand total of securities outstanding at present is $1,486,001,553, and these consist of $465,189,500 United States Steel bonds, $131,130,661 subsidiary company bonds and $3,097,792 purchase money obligations, a total of $599,417,953 in obligations ahead of the stock. On Commissioner Smith's valuation this would leave an equity of $587,582,047, consisting of actual property against which is outstanding a total stock capitalization of $868,583,600. The common stock would therefore have behind it, supposing that the underlying obligations and the preferred stock were paid off at par, a valuation of $267,300,000, or something over $52 a share.

Estimates Differ Widely

"The valuation put on the property by the commissioner is, of course, not conceded, and private estimates of the equities in the corporation's properties run to far greater amounts, though some are less. One estimate of what has been accomplished since organization in the way of increasing the tangible property has been made by W. E. Hazen of the Wall Street Journal, with the tacit approval of the officials of the corporation. It figures $335,170,521 as having been actually added to assets through the accumulation of surplus, the payment of capital obligations and construction from net income, and appropriations to cover capital expenditures. In addition to this is an increase in 'proved' ore holdings, which at $1 a ton aggregates $350,000,000. This grand total of $685,170,521 added to assets since 1901 takes no account of $265,639,000 put into depreciation and sinking funds, which if tagged on would make a total of $1,216,809,521 accruing to the property since organization. Leaving out of consideration the depreciation, sinking fund, and repair expenditures, and adding the increase of $685,170,521 in assets and ore values to the $682,000,000 valuation which the government concedes to have been the worth of the properties at the time of organization, there would appear a present valuation of $1,367,170,521, which, after settling obligations, would leave an equity of $767,752,568 for both classes of stock. The retirement of the preferred at par would leave $407,471,468, or about $80 a share for the common stock.

"Judge Gary, according to current Wall Street stories, has himself figured assets behind the common stock which give it a valuation of $110 a share, but he has never, so far as is known, made any public statement of the equity represented.

Gates on Corporation's Value

"During the Stanley investigation many of the corporation's bitterest enemies had their day in court, and some far from encouraging views were expressed of the values behind the securities. The late J. W. Gates, in giving his testimony in Washington, spoke of the second mortgage bonds of the United States Steel Corporation as 'merely a promise to pay.' It is worth noting, however, that he made this statement while on the subject of the relative value of the stock of the Tennessee Coal, Iron & Railroad Company and the United States Steel bonds for which the shares of the Tennessee Company had been exchanged during the panic of 1907. He said in reply to the question, 'What is the tangible value behind these bonds and this common and preferred stock?' put by Chairman Stanley: 'Oh, anywhere from $500,000,000 to $1,000,000,000.'

"When asked if he thought there was any tangible value behind the common stock, his reply was 'I decline to answer.' Mr. Gates's attitude toward United States Steel is, however, well known not to have been of the friendliest.

"In its latest balance sheet, that of December 31, 1910, the corporation carries its properties at a valuation of $1,547,884,381. Deduction of balances to the credit of various funds leaves $1,430,212,860, and the addition of current assets of $288,742,419, sinking and reserve fund assets of $16,067,905, outside investments of $2,369,394, and deferred charges balances of $8,331,704, brings the total of assets up to $1,745,724,284 against which there are total capital and current liabilities of $1,521,488,398.

Trade Would Lose Balance Wheel

"One of the vital questions before stockholders, and undoubtedly a consideration of the first moment in the decline which took place in the shares last week, is what will be the course of the steel trade should the corporation be forced to dissolve and the various subsidiaries forced into competition by the disruption of centralized control. The course of prices in the steel trade before and since the organization of the corporation is evidence in itself of the stabilizing influence of the consolidation in one company of about half of the country's capacity. If dissolution occurs and the trade loses this balance wheel, it is generally conceded that there will be drastic changes in the trade, and a situation evolved which would be the more acute at this time of halting business because of the large increase in productive capacity of the country. It is generally estimated that there would result from dissolution about 17 different corporations, provided the railroad, ore, and other affiliated properties are grouped separately.

The Subsidiaries

"There are 13 manufacturing concerns alone. These are Carnegie Steel Company, Illinois Steel Company, Indiana Steel Company, Illinois Steel Warehouse Company, Lorain Steel Company, American Steel & Wire Company,

National Tube Company, American Sheet & Tin Plate Company, American Bridge Company, Union Steel Company, Clairton Steel Company, Tennessee Coal, Iron & Railroad Company, and Universal Portland Cement Company. Most of these manufacturing subsidiaries are consolidations in themselves, and if they, too, are forced to split up as was the case with the Standard Oil subsidiary, the National Transit Company, there would be still greater multiplicity of the separate corporations. If the railroads and ore properties are not permitted to consolidate as separate entities the confusion would, of course, be still greater.

Enormous Total Earnings

"From the point of view of earning power the showing of the United States Steel Corporation for the past decade makes a strong argument for the higher valuations put upon the stock capital. Up to the close of the last fiscal year, the corporation had earned since organization $5,813,243,724 gross and its net earnings were $1,202,214,515. The surplus for dividends on the common stock has averaged 9 per cent. a year since the organization in 1901, and from the point of view of the preferred stockholder it is interesting to note that the balance after charges, before deducting dividends, has amounted to an average of over 20 per cent. per annum on the preferred stock. Capacity has been increased 80 per cent. since 1901.

Loss by Disruption

"From the stockholders' side of the question there is no doubt that the disruption of the company would mean heavy losses in profits. This is conceded by the Bureau of Corporations in its report, which makes this interesting comment:

> It is probably true that the various properties acquired by the Steel Corporation, taken together with the organization of this company as a going concern, do have a value in excess of the sum of their values as separate entities. The co-ordination and integration made possible by the combination of such properties under a single control undoubtedly tend to reduce costs, either through economies or through the removal of the necessity of paying profits to others.
>
> Further, in so far as the concentration of the industry under the control of a single concern gives to it a monopolistic power over prices and production, this may result in an increase in its earning power, and, consequently, in an increase in its earning power as a going concern. This involves, however, the reduction of actual or potential competition. To allow a single company which has secured the bulk of a given industry credit for such merger value as a basis on which to earn profits, raises, therefore, a question of far-reaching public policy.

"The above citation of the corporation's position is one of the items which in Wall Street has found indications of the government's attitude toward the corporation."

Cincinnati and Its Manufacturing Suburbs

The Cincinnati Commercial Association calls attention to the fact that the rank of Cincinnati among the manufacturing cities of the country, as shown by the figures of the Census Bureau, is impaired by the non-inclusion in those figures of the establishments located in its immediate suburbs. In 1905 the Census Bureau recognized the principle that the industrial development of a community is not confined to the corporate limits of its principal city and at that time gave figures for the industrial districts of which the leading cities were the center. That report, it is claimed, gave Cincinnati its proper rank. The census for 1909 departs from this principle and covers only corporate limits, thus giving an advantage to cities which have annexed a large area of contiguous territory. The association says:

The report just issued for Cincinnati includes only industries located within the city limits. It does not include Norwood, with its immense establishments, several of which are the largest of their kind in the world. It does not include St. Bernard, with the Proctor & Gamble plant and other big soap companies, the fertilizer companies and other industries. It does not include Lockland, with a number of industries, one of which is the largest in the world of its kind. Nor does it include the factory districts of Oakley, Carthage, Elmwood Place or any other of the suburbs of Cincinnati.

It is a well-known fact that the industrial development in this community has been moving toward the suburbs for several years, due to the desire of the manufacturers to get away from the crowded districts of the city and where they can have more room for expansion. In the case of a dozen immense establishments which have grown from small beginnings in Cincinnati this removal to the suburbs has taken place. Since this report is confined to the city limits the moving of these industries to the suburbs shows a loss for Cincinnati, while as a matter of fact the industries have doubled and trebled in size, and their growth has been of benefit to the entire community.

The true story of Cincinnati's standing as a manufacturing city will not be told until the government prints its report for industrial districts corresponding to the bulletin issued in 1905 for the industrial districts named. This report will include all the industries in Hamilton, Kenton and Campbell counties.

The Virginia Iron, Coal & Coke Company's Report

The Virginia Iron, Coal & Coke Company has issued its report for the year ended June 30, 1911, which shows a deficit of $262,786, against a deficit of $129,927 for the previous fiscal year. The income account compares as follows:

	1911.	1910.
Gross earnings	$3,370,923	$3,695,225
Expenses	3,034,688	3,177,345
Net earnings	$336,235	$517,879
Other income	35,506	41,003
Total income	$371,741	$558,882
Charges, etc.	634,527	688,809
Deficit	$262,786	$129,927

The general balance sheet of the company as of June 30 compares as follows:

Assets.	1911	1910
Real estate	$14,056,448	$13,795,732
Equipment	310,107	278,848
Securities owned	197,363	197,363
Ledger balance	359,888	625,051
Open accounts	44,809	45,588
Bills receivable	70,470	106,919
Advance to cashier, etc.	5,275	5,325
Cash and sinking fund	104,428	89,772
Material on hand	3,222,810	2,747,707
Profit and loss deficit	653,644	377,500
Total	$19,025,241	$18,269,807
Liabilities.		
Capital stock	$10,000,000	$10,000,000
Bonds	5,305,000	5,332,000
Unpaid vouchers and pay rolls	267,797	217,978
Bills and accounts payable	2,127,262	1,706,603
Interest and taxes	86,604	86,958
Depreciation, replacement funds, etc.	1,238,577	916,266
Total	$19,025,241	$18,269,807

A Southwestern Virginia Ore Development

Walter Graham, Graham, Va., is developing an extensive Oriskany iron ore property and has just opened a mine. The vein is 22 ft. thick and averages 50 per cent. of iron, the ore being massive. Pure limestone of the Trenton measures is in place just north of the ore. The ore and flux are within half a mile of three railroads at the falls of New River, Giles County, Virginia. The water-power at the water gap is estimated at several thousand horse. Hydroelectric treatment of the ore may be indicated, as the falls are immediately at the ore and limestone measures and the Pocahontas coke fields are only 40 miles away by the Norfolk & Western and Virginian railroads from the Falls Gap iron mines. The properties cover the whole field about eight miles on the strike of two veins. Four miles from the Falls Gap mine, on the strike, says Mr. Graham, he has opened the same vein with a cut 10 ft. thick, not yet through the ore; the vein dips about 30 deg. and at this point is practically without cover, the sandstone cap rock having been almost eroded. This looks like an important vein of iron ore and from its excellent location may prove of unusual interest.

Times are good in that section, Mr. Graham reports, and the railroads are moving the largest tonnage in their history. The population is increasing rapidly and manufacturing of all kinds is needed to supply the many new towns and mines. Bond issues to the amount of over $2,000,000 have been voted by the several counties for roads, steel bridges, etc., and the farms are being improved; in fact, prosperity and a general uplift and activity are found in every direction, particularly in mining.

Mining Engineers' New York Section

An Address on Iron and Steel Making in India

Charles P. Perin, consulting engineer of the Tata Iron & Steel Company, Sakchi, Bengal, gave a very interesting address Friday evening, September 22, at the United Engineering Societies Building, New York, on "The Iron and Steel Industry of India." While it is impossible to give an extended synopsis of the address, particularly as much of the information given by the speaker was imparted or supplemented by means of lantern slides, some of the principal points brought out may be reproduced.

In his introductory remarks Mr. Perin told of previous iron enterprises in India. In a small way iron and steel were made in India many years ago. Rich ores found here and there were worked with bamboo charcoal in small forges. Remains of the early iron works are found in central and southern India. Failure to establish a larger industry was not due to any lack of ores, but generally to the difficulty of making good charcoal from the watery woods characteristic of the country. The Bengal Iron Company operated a plant from 1874 to 1879. Its failure was due to lack of capital. The property was taken over by the Bengal Iron & Steel Company in 1890 and this company now has three blast furnaces producing foundry iron which are at Barrakar, 110 miles distant from the plant of the Tata Iron & Steel Company. Their output is about 120 tons a day. In 1905 the company spent $500,000 on an open hearth steel plant, but its operation has not been successful.

Mr. Perin told how in the preliminary investigations made for the Tata enterprise the engineers entered India at Bombay and worked across the central portion of the country through the jungles, winding up at Calcutta. He described the geological formation as revealed by drill work and spoke of the proofs furnished by fossils that India was at one time joined to Africa. The finds of iron ore made by the Tata company's engineers followed by some years unfavorable reports by British engineers whose explorations had shown ores of inferior quality. The Tata enterprise dates from 1902. The elder Tata, who was an influential Parsee merchant and manufacturer, died after the work was started, and the company is now largely in the control of his two sons and a nephew.

C. M. Weld, who was sent out by Mr. Perin, began his exploratory work in 1903. It was thorough and systematic, and resulted in the development at Gurumaishini, 44 miles from the steel plant, of a very large ore body running high in iron. The width of the vein as shown at Rajara Hill is 180 ft., where the ore shows 67 per cent. metallic iron and runs 0.06 to 0.08 per cent. in phosphorus. Mr. Perin also described the coal, limestone and dolomite properties which the company had developed. Eighteen well-defined coal seams have been found in the Jherria field ranging from 5 to 32 ft. in thickness. The coal mines are about 100 miles from the steel plant and the dolomite and limestone quarries about 120 miles. The town of Kalimati, near which is Sakchi, the location of the Tata Iron & Steel Company's plant, on the Bengal & Nagpur Railroad, is 152 miles west of Calcutta. The steel company has secured from the Government a rate of 3 mills per ton mile on its raw materials and the same rate on finished materials, when bound for export.

There are two blast furnaces, a 300-ton mixer, four 40-ton open-hearth furnaces and rail, beam and bar mills; also 180 coke ovens of the Coppee non-recovery type. It was decided that it would be impractical to attempt by-product recovery, in view of the impossibility of condensing ammonia with water at temperatures ranging from 98 to 110 degrees. The volatile content of the coal ranges from 19 to 28 per cent., and its average ash is about 18 per cent. It produces a hard, strong coke. Coal costs $1.04 at the works and the estimated yield is 75 per cent. Coking costs 65 cents a ton, and the total cost of coke in bins at the furnaces will not exceed $2.05. The cost of limestone and dolomite delivered at the plant is 64 cents a ton, including 40 cents freight. Women working in the quarries receive 3½ to 4 cents a day and men 5 to 6 cents a day.

Pig iron cost is expected to be somewhat above $6 a ton, and the estimated profit on pig iron sold in the market is $6 a ton. For rails the cost is figured at 56 rupees, while the average selling price on which estimates of profits are based is 83 rupees, the rupee being equal to 32 cents. On beams and bars a profit of 20 to 30 rupees is estimated. The capitalization of the Tata Iron & Steel Company is $7,000,000, and there is a bond issue of $2,000,000. One of the difficulties in connection with the enterprise was securing a sufficient supply of water. About $80,000 was spent on impounding basins and a capacity of 260,000,000 gal. was provided. The average number of laborers in the employ of the company in July was 4661.

New York Section Organized

Mr. Perin's address was preceded by a business meeting at which the organization of the New York Section of the Institute was completed. C. F. Rand, chairman of the Committee on Organization, presented a report which included the bylaws for the government of the new section and a list of officers. By action of the meeting the bylaws were adopted and officers were elected as follows: Chairman, B. B. Lawrence; vice-chairman, Dr. James Douglas; secretary and treasurer, Bradley Stoughton. These three, with C. P. Perin and George F. Kunz, constitute the executive committee.

The Atlas Ore Dryer

Mine owners on the iron ranges of upper Michigan have been greatly interested in the experimental ore drying plant erected by M. A. Hanna & Co. at their Hollister mine, near Crystal Falls, where Frank Scadden is manager. The apparatus installed, which was furnished by the Atlas Dryer Company, Cleveland, Ohio, has a capacity of approximately 400 tons per 24 hours, as the ore is fed, and dries from 14 or 15 per cent. down to about 4 per cent., at an expenditure for fuel of about three cents per ton.

It consists of a revolving steel cylinder, about 5 ft. in diameter and 30 ft. long, set at an incline toward the discharge end, and with lifting blades for cascading the material in its passage toward that end. This is inclosed in a steel casing like a boiler setting, with a furnace at the front and a fan which draws the heated air from it through suitable inlets in the cylinder and into direct contact with the ore as it passes toward the rear. The design is such that the air at its highest temperature and greatest velocity is brought in contact with the ore in its wettest state; and these are gradually lessened in degree, until at the discharge end there is practically no heat or fan suction remaining and very little moisture in the material.

This elimination of the air suction at the rear of the cylinder obviates the necessity for a dust chamber, and the dried ore falls by gravity, through the open end, to an elevator. The shape of the air inlets, coupled with the cascading effect, prevents any leakage from the cylinder during the passage of the material.

As a result of the satisfactory operation of this trial plant, J. D. Ireland, general manager of the mining department of M. A. Hanna & Co., Duluth, has contracted with the Atlas Dryer Company for the installation of two dryers, with an aggregate capacity of 2,000 tons per day, at the Brunt mine.

The Hollister mine was the first one visited during the recent meeting of the Lake Superior Mining Institute and many of the members made notes at that time of the operation of the drying plant but were unable to secure any details of its construction other than what were visible from the exterior of the casing.

The Old Dominion Iron & Nail Works Company, Richmond, Va., is making a specialty of quality irons which are marketed under the brands of Old Dominion Extra Staybolt Iron and Old Dominion Extra Engine Bolt Iron, which are guaranteed to standard specifications. The company states that while the general apathy of buyers has affected the trade of railroads and engine builders, yet this has by no means occurred to the degree affecting the bulk purchases of ordinary material for which there are no specifications as to quality. The fact is mentioned that a growing tendency is noticed to scrutinize the quality of materials and standardize specifications to the end of securing efficiency, as the cost of materials in most cases is much less than the labor cost expended on them.

Steel Men Inspect Knox Water-Cooled Devices

In response to the invitation of the Knox Pressed & Welded Steel Company, Pittsburgh, Pa., to operators of iron and steel works to inspect its plant at Niles, Ohio, formerly owned by the Niles Boiler Company, a large number of visitors gathered September 21. They came from Pittsburgh, Duquesne, Sharon, Homestead, Youngstown, Alliance, Cleveland and other cities, arriving on various trains during the day. The Pittsburgh party, headed by Irvin F. Lehman, treasurer of the Knox Company, arrived at Niles about 10 a. m. It was received by various representatives of the company and escorted to the plant. After registering, the visitors examined different blue prints, showing details of Knox water-cooled devices for open-hearth furnaces, which had been mounted on the walls of the office for their inspection. They were then taken through the plant.

The boiler shop is about 120 x 176 ft. and contains a 200-ton United Engineering & Foundry Company's hydraulic forging press, crane, rolls, pneumatic equipment, etc. Here different designs of Knox water-cooled welded steel ports, door frames, doors and welded steel chills for rolling open-hearth furnaces were shown, which had blue prints attached giving the interior construction. The welding department was next visited. It is 50 x 110 ft., equipped with a crane and two systems of welding—the Linde and the H. W. Dopp Company's. The possibilities of oxy-acetylene were practically shown and received much attention. The machine shop is 32 x 80 ft. and contains a full line of drills, boring mills, punches, etc. The oxy-generating room is 48 x 60 ft. and the gas room is 12 x 20 ft. The power plant is 50 x 72 ft. and contains boilers, engines and generators for lighting and power.

Formerly doors and door frames for open-hearth furnaces were made of castings. The Knox idea is to use plates which are pressed and welded together, making an absolutely tight device. These doors and frames should last for an indefinite period, as they can be made absolutely water tight. One user remarked that he had had a Knox service door in service for the past 15 months and it is as good to-day as when he put it on. The life of the cast-iron door has been shown by experience to be very uncertain.

The water-cooled ports exhibited caused much favorable comment. The Knox Company showed its cross port, which is removable from the furnace on the charging floor side, with the aid of the charging machine. Two types of long ports were shown, the first being the cooling of the arch and the second the cooling of the arch and two sides. All of these ports are intended to cool refractories in the open hearth furnace, as the Knox theory is absolutely to cool the brick work, thus prolonging its life, and is opposed to exposed water cooling, as that undoubtedly slows down the furnace.

Steel manufacturers using the Knox type of water-cooled equipment include the Carnegie Steel Company, Cambria Steel Company, Pennsylvania Steel Company, Maryland Steel Company, Jones & Laughlin Steel Company, Upson Nut Company, Andrews Steel Company and others.

A luncheon was served to the visitors at the Allison Hotel at Niles. In the afternoon small parties were made up and taken to various steel works within easy reach, where the Knox specialties were seen in actual use. The Knox Company was represented by L. L. Knox, vice-president and general manager, Niles, Ohio; L. S. Schmidt, William Pendleburry, superintendent: Geo. W. Gerwig, Pittsburgh; Irvin F. Lehman, treasurer, and the following directors: John S. Craig, William C. Coffin and F. M. Bowman, all of Pittsburgh.

Electric furnace treatment of nickel ore was discussed in a paper read before the American Electrochemical Society in its general meeting at Toronto, September 21 to 23, by Walter Leonard Morrison. It was a thesis presented to the Case School of Applied Science for the degree of Engineer of Mines. It included an extended study of the development of a commercial process and estimated the cost of operation of a 100-ton smelter, operating 300 days per year, with power at $25 per kilowatt year, at $885, producing 15 tons of ferro-nickel-silicide, or 1 ton of the metal alloy, for $59. The cost of a 100-ton smelter, including aerial tramway, rockhouse, crusher, cars, buckets, etc., was itemized, total $280,540.

Pacific Coast Selling Department of the Steel Corporation

The United States Steel Products Company, whose chief business is handling the export trade of the United States Steel Corporation subsidiaries, has organized a Pacific coast department. It will have charge of selling and distributing the products of the various subsidiaries of the Steel Corporation on the Pacific coast territory. The enlargement of the corporation's operations in that territory and the carrying of much larger stocks of finished material than heretofore were indicated some time ago by the acquisition of the Risdon Iron Works, with their extensive water frontage. It was then stated that the building of large warehouses for the carrying of various forms of finished iron and steel was contemplated, particularly stocks of sheets and tin plates, pipe and tubes, wire products, structural steel and bars. The Pacific coast department will embrace all the territory now defined by each of the subsidiary companies as comprising its Pacific coast territory.

The warehouse business of the corporation on the Pacific coast will also be consolidated under the jurisdiction of the new department, which will take over, carry and handle the stocks of the subsidiary companies at the established distributing points in that territory. These offices and warehouses are located at San Francisco and Los Angeles, Cal., Portland, Ore., and Seattle, Wash. The offices' addresses are: San Francisco, Rialto Building, on Mission street, corner of New Montgomery street; Los Angeles, Jackson street, corner Central avenue; Portland, Selling Building, Sixth street, corner of Adler street, and Seattle, Fourth avenue south, corner of Connecticut street. The executive offices of the United States Steel Products Company in charge of the new department are: A. T. De Forest, vice-president; W. A. Ross, assistant treasurer; H. F. Wilson, auditor and assistant secretary. The headquarters will be in the Rialto Building, San Francisco.

The consolidation of the Steel Corporation's Pacific coast interests under the direction of one subsidiary company is aimed to afford to its patrons the greatest efficiency as to shipments and a general distribution service. The new department will not only sell from warehouse stock but for direct shipment from mill the product manufactured by the American Bridge Company, the American Sheet & Tin Plate Company, the American Steel & Wire Company, the Carnegie Steel Company, the Illinois Steel Company, the Lorain Steel Company, the National Tube Company, the Shelby Tube Company and the Tennessee Coal, Iron & Railroad Company. The new selling arrangement is effective October 1.

The Development of Blast Furnace Size

The first furnaces for treating iron ores known were not very high and had a square section of uniform size throughout the height. Later, according to Stahl und Eisen, they were subjected to a narrowing at the two extremities to concentrate the heat toward the interior and to utilize the combustible better. Little by little modifications have taken place. The first indication of the change from the polygon section to the round was shown in 1826, but in the meanwhile, until 1858, blast furnaces were constructed octagonal in section, a design which did not disappear definitely until artificial refractory bricks were used for furnace construction. It was about this time that efforts were made to heat the air blast by means of the blast furnace gases and also to supply this source of heat to the steam boilers. A chart given in Stahl und Eisen indicates that in the period from 1821 to 1825 blast furnaces were of about 300 cu. ft. contents; that from 1825 to 1830 there was a notable increase in size up to perhaps over 900 cu. ft.; that beginning about 1865 they again sharply increased until in 1870 the size was over 3500 cu. ft., where it remained until about 1880, when a sharp increase was again made, reaching, in 1890, 7500 cu. ft.; in 1900, 8800 cu. ft., and in 1905, 14,000 cu. ft.

The total operating cost of an Atlas Diesel-type engine of 300 hp., running a division of the shops of the Atlas Engine Works, Indianapolis, is approximately $7 a day. The engine, which was described at length in *The Iron Age* of September 14, is built by the Atlas Engine Works.

Inland Steel Company's Bolt and Rivet Works

Construction Features and Equipment of a Plant Representing Noteworthy Economies

The Inland Steel Company recently put in operation at Indiana Harbor, Ind., its new plant for the manufacture of railroad track bolts, spikes and structural rivets. The growth of the Indiana Harbor Works of this company and its expansion within a comparatively few years into the several finished lines, including sheets, sheet bars, structural shapes, steel bars, and finally bolts and rivets, has been one of the interesting chapters in the development of Chicago mill capacity. The Western market for bolts and rivets has been dependent largely upon the Joliet, Ill., mills and has obtained a part of its requirements from eastern manufacturers. The situation, therefore, indicates the opportuneness of this new capacity which is capable of producing about 125 tons daily. The Inland Steel Company has emphasized the fact that it will supply bolts and rivets made from open-hearth steel, such as is used in this company's other finished products.



Fig. 1. General View of the Heating Furnace and Machine Floor in the Main Bay, with the Nut Machines in the Foreground, and the Rivet, Bolt and Spike Machines Beyond

The new plant is located directly west of the company's continuous bar mill, from which the stock is supplied. It is 120 ft. wide and 460 ft. long. The framework is of structural steel, all of the material for which, with the exception of a few gusset plates, was rolled by the Inland Steel Company. For the side walls a type of construction has been used which has been adopted as a standard at the Indiana Harbor Works, consisting of concrete slabs 6 in. thick, poured in steel forms. Fig. 1 is a general view of the interior of the building, giving the general layout and character of the equipment. Crane service is provided over the entire floor area by two 5-ton Alliance Machine Company cranes, one being installed in each of the two bays into which the full span of the building is divided. The wider bay has a width of 80 ft. to accommodate the furnace and forging machine floor, while the other has a span of 40 ft., in which are the machines for finishing the nuts, bolts and rivets. At the east end of the building where machine shop, stock room and shop offices are located, in the narrower bay and at the north end of the building which is used as a storage and packing floor, the mill floor is at the yard level. The furnace and forming maching floor, as shown in the illustrations, is elevated to a height of 4½ ft. With this elevation the arrangement of the machines provides for the dropping of the product from the machines by gravity directly on sorting conveyors, by means of which they are continuously delivered to the burring, tapping or bolt-threading machines. The furnace floor is built of cinders filled in within concrete retaining walls. The balance of the flooring, which is filled sand, is surfaced over suitable sleepers and subflooring with a matched hard pine.

Furnace and Forging Floor

The general contour of the elevated floor may be seen from the illustration. Recesses are provided at the east end for a general approach from the main floor and for the spur track on which the bar stock is brought from the continuous bar mill into the building and under the crane. Along the machine side of the floor recesses are arranged so that the ends of the conveyors may be located directly under the discharge from the machines above.

At the time of taking the views accompanying this description the complete complement of machines and furnaces, the bar racks in front of the furnaces and the conveyors had not been installed. Foundations have been provided for six 4-in. hot-pressed nut machines with six heating furnaces arranged in two rows, three on either side of the furnace floor approach. Provision is made for 10 rivet and bolt machines and for five spike machines. In front of each of these machines the arrangement pro-



Fig. 2.—Ferguson Heating Furnaces for Rivet and Bolt Stock and the Relative Position of the Machines Into Which the Stock is Fed Direct from the Furnaces.

vides for a heating furnace, or 15 in all, the entire group being in a continuous line and 12 ft. 6 in. between centers. In front of each of these furnaces will be an inclined gravity bar rack, the positions of the racks being indicated in the illustrations by the temporary wooden horses now substituted. The bars are brought directly from the cars by the crane, deposited on these racks, fed into the furnaces, heated, drawn directly into the feed jaws of the machines, headed and cut off in a single operation, dropped on the conveyor, inspected and sorted, delivered to the several finishing tools, filled into kegs, then trucked to the shipping floor, where the kegs are headed, labeled, checked out and loaded into cars on the shipping track that parallels the building. Lost motion and manual operations which would be excessively expensive in the handling of a product comprising small pieces in large numbers have been practically eliminated.

The furnace and machine equipment now installed and in operation includes four nut machines built by the National Machinery Company, Tiffin, Ohio, with an aggregate capacity of 4000 1-in. nuts every 10 hours and four 3 ft. 8 in. x 4 ft. 7 in. Ferguson oil-burning hot pressed nut furnaces built by the Railway Materials Company, Chicago. These are shown in Fig. 4. The heating furnaces are located with reference to the machines so that the machine operator can, with almost no change of position, take the heated bar from the furnace turn and feed it into the machine. Six continuous feed rivet heading machines with interchangeable dies for rivets or track bolts were furnished by the Ajax Mfg. Company, Cleveland. These machines have a capacity for every 10 hours of 40,000 rivets in sizes from ½ to 1½ in. There are three spike machines, built by the Youngstown Foundry & Machine Company. These are equipped with ratchet-operated automatic feed rolls and have a capacity of 10 tons per day. In Figs. 2 and 3 views of the rivet and spike machines with their furnaces are shown. These furnaces are the Ferguson continuous rivet type, built by the Railway Ma-



Fig. 3.—View from the End Opposite That in Fig. 1. Spike Machines in the Left Foreground. The Blowers Supplying Air for the Furnaces Appear on the Lower Level, and at the Extreme Right the Fuel Oil Pumps.



Fig. 4.—View of the Row of Nut-Making Machines and Heating Furnaces. On the Lower Level are Two Thread Rolling Machines and Beyond Them Three Vertical Burring Tools for Removing the Burrs from the Hot Pressed Nuts.

terials Company. They are 2 ft. 1 in. by 24 ft. with four combustion chambers and two waste gas outlets. At the feeding end the furnaces are equipped with vertical sliding doors externally water cooled. Each furnace has a Worthington oil meter for registering the fuel consumption. This is estimated at 21 gal. of fuel per ton of bars heated, and the furnaces will heat approximately one ton per hour, depending somewhat upon the size of the stock.

In Fig. 3 the blowers supplying the air for the heating furnaces and the oil pumps supplying the fuel are shown. The two air blowers deliver into a common pipe and have an aggregate capacity of 46,000 cu. ft. of free air per minute. They are direct driven by 100-hp. shunt-wound, 220-volt Westinghouse motors running at 1150 revolutions and were furnished by the National Blower Works, Milwaukee. The blast pipe is laid in a floor conduit that extends to all of the furnaces and is covered with a removable flooring. The same conduit carries the oil and water pipes, all of which are thus easily accessible. The two oil pumps are 3¾ x 4 in. Fairbanks, Morse & Co. type, gear driven from 2¼-hp., 22-volt, Westinghouse motors. The oil supply is drawn from two 12,000-gal. tanks outside of



Fig. 5.—View of the Auxiliary Bay in which are the Machines for Finishing the Nuts, Rivets and Bolts, and from the Further End of Which They are Packed and Shipped.



Fig. 6.—The Multiple Continuous Nut Tapping Machines, Which Are Also Included in the General View Fig. 5.

the building into which oil is pumped through a direct pipe line from the Whiting plant of the Standard Oil Company.

Finishing Department

A general view of the finishing bay is shown in Fig. 5. In Fig. 4 are seen the group of three 1¼ in. vertical semi-automatic nut burring machines and the three 1-in. thread rolling machines. Fig. 6 shows the installation of six multiple spindle nut tapping machines. The equipment also includes a 1-in. bolt pointer and two 3-spindle rapid horizontal 1-in. bolt threaders. The nut burring machines, nut tapping machines and bolt pointer were furnished by the National Machinery Company. The thread rolling machines are of the type built by the Waterbury Farrel Foundry & Machine Company, Waterbury, Conn., and the thread-cutting machines were built by the Acme Machinery Company, Cleveland. All of the machines have semi-automatic feeding devices. The burring machines have a feeding slot accommodating a number of nuts and delivering them to the burring tool consecutively as the operator fills up the slot. The spindles of the tapping machines are staggered at intervals determined by the time of the tapping operation, so that the operator may work continuously from one spindle to the other. The tapped nuts



Fig. 7.—Machine Tool Floor. These Tools are Chiefly Employed in Making Dies for the Forging Machines.

accumulate on the tap until the chuck jams. This pressure on the chuck brings into operation a counter tap releasing arrangement and the tap drops down permitting the nuts to fall off. The operator has only to push aside the tapped nuts, rechuck the tap with one motion and the spindle is again in service. These machines have a capacity of 9500 1-in. nuts every 10 hours. Following the machining operations the bolts, nuts and other products are rattled in two 36 x 48 in. tumblers to remove the scale. The tumblers were furnished by the Northern Engineering Works, Detroit. The completion of the installation will increase the number of burring machines from three to six, thread-rolling machines to six, tapping machines to 10, thread-cutting machines to four, and bolt-pointing machines to two.

Power System

All of the machines in the plant, with the exception of the spike machines, are geared or direct connected to motor drive. The three spike machines are belt driven through a jack shaft to two 75-hp. Westinghouse motors running at 475 revolutions. Westinghouse motors are used throughout. The drive system is under the Electric Controller & Mfg. Company's remote control. The speed of the machines is regulated from controllers placed in steel cabinets, and the starting and stopping of the machines is controlled by push buttons on the machines.



Fig. 8.—View of the Shipping Floor.

Current for the plant is continuous and is generated at the central mill station which operates on blast-furnace gas. Current is distributed to the plant in sections which may be operated independently of each other. The same plan is applied to the lighting system, which is made up of seven distinct lighting circuits. The lighting units are 500 candle-power individual tungsten lamps at the corners of 20 x 40 ft. spaces and hung at a height of 25 ft. above the floor.

An unusually complete equipment for the making of dies is included in the plant. In Fig. 7 a view of the machine shop is shown. The character of the equipment is clearly illustrated and includes a No. 3 Cincinnati universal miller, three Gould & Eberhardt shapers, two Cincinnati upright drills, a Cincinnati planer, three Lodge & Shipley lathes, a Greenfield Machine Company grinder, a new type Acme Machinery Company hobbing die grinder, Higley metal saw and the usual equipment of smaller auxiliary tools. For hardening and tempering two Ferguson oil furnaces are installed.

The mill offices and stock room are located adjoining the machine shop. These are entirely inclosed and in addition to offices for superintendent and master mechanic, provide commodious and convenient facilities for the time-keeping, shop drafting, shop cost and storeroom departments. While a plant naturally presents its best appearance when new, the manner in which the layout of this mill provides for the continuous and mechanically handled movement of material through the various stages, the conduiting of all pipes and wires, and the splendid system of power drive and control give promise of a permanent absence of disorder.

The Warwick Iron & Steel Company, Pottstown, Pa., is about finishing its new thin-lined blast furnace, the dimensions of which are 14 x 80 ft. While this furnace is in most respects of the same character as the thin-lined furnaces, which have been described in our columns, some improvements have been made in its construction. The company this year is manufacturing low phosphorus pig iron in addition to other grades. A slight turn for the better is observed in the business of the company, as it is obtaining a little more money for pig iron.

In South Russia 41 blast furnaces are now in operation, or six more than at this time last year. Several old furnaces are to be started up and a new one is building at the works of the Société de Makeevka.

The Detroit Seamless Steel Tubes Company, Detroit, Mich., recently decided to make a specialty of cold-drawn seamless steel tubing for mechanical purposes, and has made up a large stock of this material, which will be maintained at all times for the convenience of consumers desiring immediate shipment from stock. A monthly stock list is issued and mailed to the trade.

The Seitz Automobile & Transmission Company, Detroit, Mich., has just completed its new plant, 80 x 350 ft., and has part of its machinery installed. The factory will be running full force in about 60 days, enabling the company to double its output of motor trucks and delivery wagons.

The F. R. Patch Mfg. Company, Rutland, Vt., manufacturer of stone working machinery, has made an addition to its erecting shop 50 x 100 ft. and 30 ft. high. A 15-ton crane runs through both the new and old shop. The latest product of this company is an open side diamond saw used for striping and jointing stone. When used for striping the platen travels, carrying the stone under the saw; when jointing, the platen is stationery and the saw travels across the stone. The platen is 12 ft. long, 4 ft. wide, wholly of iron, planed level and lined every 6 in. so that a stone can be set accurately and quickly. The machine is either motor driven or arranged to be driven by belt.

The Wiederholt Chimney

A New Type Employing Fire and Pressed Brick and Reinforced Concrete

The reinforced concrete chimney has been one of the important developments in that type of construction within the past few years. Although chimneys of concrete are not new, some having been built a considerable time ago, it is only within the past decade that the use of reinforced concrete has been a matter of interest throughout the country. Probably this was due to the fact that the few concrete chimneys built a long time ago were not successes from a commercial standpoint since the cost was so much higher than that for chimneys constructed of brick or other material as to be prohibitive. It has remained, however, for the Wiederholdt Construction Company, Commonwealth Trust Building, St. Louis, Mo., to develop a new type of chimney in which fire brick, reinforced concrete and pressed face brick are used. The advantages of this type of chimney, which is an adaptation of the tile chimney built by it for some time, are that the use of inner and outer brick walls eliminate entirely the cost of temporary forms and framing required by reinforced concrete chimneys, while the inner wall of fire brick protects the concrete and the outer one of pressed brick enables attractive chimneys, architecturally considered, to be built. At the present time the company has under construction a large chimney for the International Harvester Company at Chicago, Ill., and one for the Illinois Glass Company at Alton, Ill., the latter being the one illustrated. Fig. 1 is an exterior view of the chimney, while Fig. 2 is a sectional elevation giving the details of its construction.

The use of these three materials gives a combination that not only possesses strength and freedom from the effects of expansion and contraction, but also one that entirely protects the middle layer of reinforced concrete which gives the chimney its stability from the hot gases passing through the center and from the cooler air on the outside. Protection from the heated gases is secured by the inner wall of fire brick which covers the concrete at every point, while the outer wall enables the chimney to be built in accordance with any design or plan and presents an attractive exterior. The intervening wall of reinforced concrete is stronger than an equal volume of brickwork and the reinforcement entirely eliminates the danger of cracking which frequently occurs in chimneys where brick alone is used. The concrete portion of the chimney wall is confined permanently and is not subjected to the removal of temporary forms. This arrangement prevents the development of weak points which sometimes cause the entire structure to collapse. Another advantage of this type of construction is a chimney of any desired wall thickness can be built without changing the character of the brick.

The cross section of a part of the wall of the chimney being constructed for the Illinois Glass Company, shown in the lower portion of Fig. 2, illustrates the peculiar shape of the inner faces of the brick by which they are locked in place as the concrete sets. At the point where the section is taken the wall is 20 in. in thickness, so that an idea can be gained of the thickness of the two brick faces and also that of the concrete intermediate section. The hight of the chimney, exclusive of the base, will be 175 ft. and the internal diameters are 9 ft. at the top and 7 ft. at the base respectively. The chimney is divided into five sections, each 35 ft. in length, and the wall thicknesses for the different sections are respectively 20, 17, 14, 12 and 10 in. In the bottom section the reinforcement

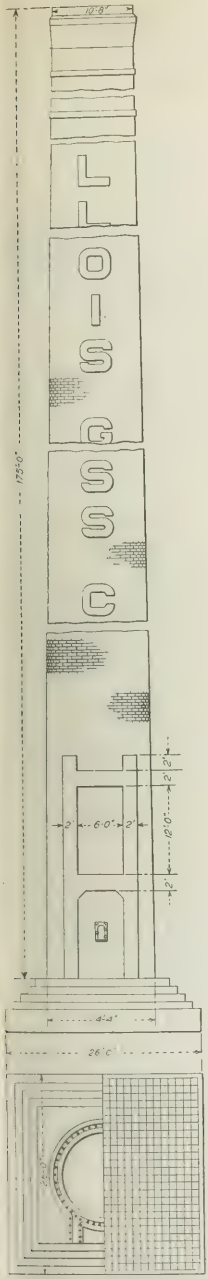


Fig. 1.—Exterior View.

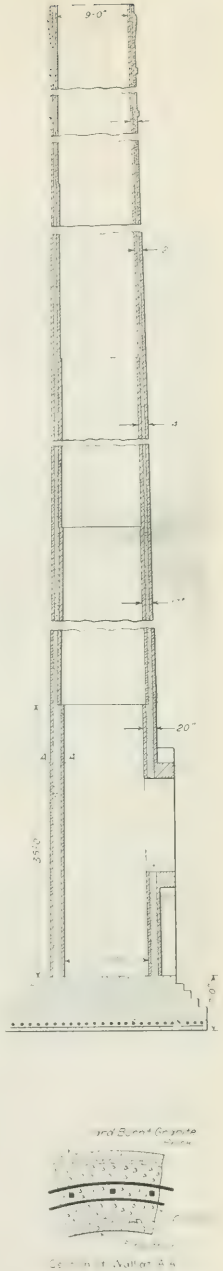


Fig. 2.—Sectional Elevation.

consists of 1-in. square twisted vertical bars spaced 11 in. on centers and held in place by horizontal rings composed of ½-in. twisted bars placed 9 in. apart. These rings are used throughout the entire chimney, the spacing being 9 in. in the two lowest sections and 18 in. in the other three. The vertical bars employed as reinforcement for the concrete are ¾ in. square in the second and third sections counting from the base upward, while in the last two sections ½-in. square twisted bars are used.

At the present time this company has a large number of its chimneys in use in various types of industrial plants. Among the different classes of establishments where these chimneys have been erected are glass works, zinc smelters, clay works, oil refineries; power houses of electric railway, light and power companies; milling and brewing companies, office buildings, warehouses, railroad shops and plants of refrigerating, packing and ice companies. These chimneys vary in hight from 57 to 212 ft. and the internal diameters range from 3 ft. to 13 ft. 3 in. Practically all of the chimneys used by the glass and clay works, zinc smelters and oil refineries are subjected to temperatures of 150 deg. F., and over.

A New Lackawanna Merchant Mill

A 12-Inch Roughing and Four 10-Inch Finishing Trains—The Product Ranges from 1-4 to 7-8 Inch Sections

The new merchant mill for the production of bars, wire rods and other merchant shapes which was begun about a year ago at the Buffalo plant of the Lackawanna Steel Company has been completed recently and was placed in operation the first week in September. It is to be known as the company's No. 9 mill and is designed to roll rounds from ¼ in. to ⅞ in. in diameter and equivalent sections of squares, flats, ovals and shapes, and will have a capacity of 10,000 to 12,000 tons per month. It is located parallel to the present merchant mill in a steel building 105 ft. wide by 1050 ft. long.



Fig 1.—General View of the New No 9 Merchant Mill of the Lackawanna Steel Company, Buffalo, N. Y.

The new mill, which was furnished by the Morgan



Fig. 2.—Nearer View of Morgan Double Inclined Escapement Type Cooling Bed.

Construction Company, of Worcester, Mass., consists of one six-stand, 12-in. continuous roughing train and four two-stand 10-in. finishing trains. The billets, which are 30 ft. in length and 1¾ in, 2 in. or 2½ in. square, are brought from the billet mill on cars and delivered to the billet storage, which occupies a space 105 ft. wide by 156 ft. long in the south end of the mill building, and is commanded by a 15-ton electric overhead crane furnished by the Morgan Engineering Company, Alliance, Ohio.

From storage the billets are handled by crane, weighed and introduced into furnace by means of a Morgan conveypr of the usual type. The heating furnace, which was installed by the Morgan Construction Company, is its suspended roof continuous type, having a hearth 30 ft. by 25 ft. The furnace is gas fired, gas being furnished by four 10-ft. Morgan gas producers. After heating the billets are delivered to the first stand of the continuous roughing mill and a power driven toggle shear located between the furnace and the roughing mill shears them to proper length. This shear is arranged to operate independently on two separate lines of billets, cutting them as

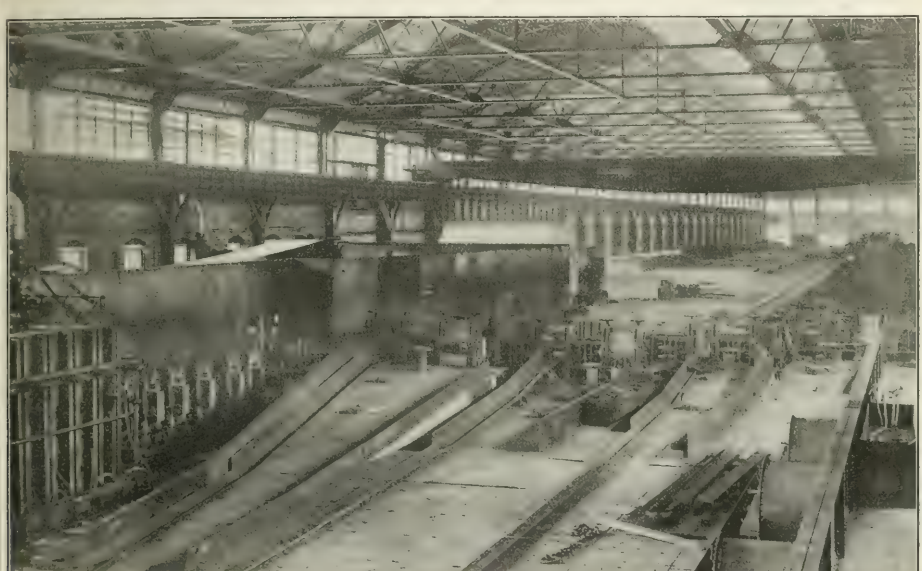


Fig. 3.—Continuous Roughing and Finishing Trains.

they are passing through the rolls. From the continuous roughing mill the bar passes to the 10-in. finishing mills.

After passing through the finishing stands the bar is delivered to a double cooling bed 360 ft. long. This is of the Morgan inclined escapement type and is designed to handle sections from ¼-in. rounds up to 3-in. wide flats. For preparing this material for shipment there are two bar shears and two back shear tables 75 ft. long complete with bundling pockets and 30-ton scales. The back shear tables are each equipped with gauges and electrically operated pushoffs. There are also four pouring type automatic reels for coiling wire, rods, nut flats and other sections. The reels mechanically discharge the coils on a conveyor which delivers them to a hook carrier. The later automatically takes the coils from the first conveyor and delivers them to any point on the loading dock.

Including the crane at the billet storage, there are three 15-ton electric overhead traveling cranes, all furnished by the Morgan Engineering Company. The crane runway extends the full length of the mill.

The engines for driving both the roughing and finishing mills were furnished by the Mesta Machine Company. The continuous mill is driven by a heavy duty tandem Corliss engine and the finishing mill by a heavy duty horizontal cross compound Corliss engine. Both engines are connected with a 72-in. type A Helander barometric condenser furnished by the Mesta Machine Company.

In addition to constructing the new mill, the old merchant mill has been extended 350 ft. on the north end to provide additional room for finishing and shipping. An electrically operated stock transfer car 90 ft. long has been installed to deliver material from one mill to the other, thus saving the switching of cars in cases where material from both mills is to be loaded out in the same car.

Standard Scale and Truck Orders.—The Standard Scale & Supply Company, Pittsburgh, Pa., has made shipment of ten carloads of scales and trucks for use at the new meat-packing plant of the Sulzberger & Sons Company, at Oklahoma City, Okla. This order and one for 35 scales, mostly 120-ton railroad track, for the Department of Water Supply, Gas and Electricity, New York, also recently shipped, are the largest for this class of goods that have been placed in recent years, and the selection of Standard scales and trucks on such large orders strikingly points to the merits of the products manufactured by this company. In the equipment for the Sulzberger & Sons Company were included a large number of special new pattern portable suspension scales with steel plate platforms which have lately been put on the market by the Standard Company. This scale obviates the necessity of cutting the floor where the scale is placed and it is only necessary to use an incline of two inches at each end to run on the platform. This type of scale is particularly desirable for users where the floors are damp or wet, as there is no opening to allow the water to run through to the floor below. Because of this advantage, it is being adopted by packers and others who have to contend with such conditions.

The Riter-Conley Mfg. Company, Pittsburgh, has completed in record time the erection of the steel work on the Gary Screw & Bolt Company's new plant at Gary, Ind. Ground was broken June 16 and the first shipment of steel was received August 10. The erection of the steel work was completed August 28. The plant consists of 10 bays, each 360 ft. long, with a total width of 475 ft. There are seven crane runways through the building, which will be equipped with four 3-ton and three 10-ton cranes. The Gary Screw & Bolt Company is an identified interest of the Pittsburgh Screw & Bolt Company.

The Langelier Hammering Machine

Details of a Machine Equipped with a Pneumatic Chuck for Handling Heavy Work

Recently the Langelier Mfg. Company, Providence, R. I., has added to its standard line of hammering and swaging machines a heavy No. 4 hammering machine equipped with a special rotary attachment having an automatic pneumatically-operated chuck for handling work. This machine can be used for producing an immense variety of different forms of hammered pieces from hollow stock, and the output is six pieces per minute finished within limits of 0.0015 in. in diameter. A very good idea of the general appearance of the machine from the operating side is given in Fig. 1, which also shows the pneumatic rotary attachment and the main drive very clearly. A specimen piece of work turned out by the machine is illustrated in Fig. 2.

The pneumatic attachment consists essentially of a U-shaped casting oscillating on a shaft at the rear of the head and made with arms which straddle this part and extend toward the front of the machine. The left arm carries the work arbor which fits into the tubing to prevent the walls from crimping under the hammer blows and reducing the diameter. The chain-driven pneumatic chuck holding the work and a special air cylinder for opening and closing the chuck and for feeding and withdrawing the chuck pistons are supported by the other arm. The chuck and the work are revolved in order that the blank may be properly formed. All the functions of the air cylinders are accomplished by a single movement of the lever at the right of the machine. The air closes the chuck in such a way as to hold the work tightly while the hammering operation is being carried on, and when the chuck is brought back to the extreme rear position the air pressure is removed from the jaws and the air exhausts into the atmosphere, thus permitting the work to be removed.

The base of the machine is a large substantial casting of square cross section, serving to support the head and attachment on top and the main drive at the side in addition to inclosing the lower vertical plunger with its operating mechanism. The head contains the main spindle, the spindle rolls and the upper vertical plunger. A belt from an overhead countershaft running to the pulley at the rear end drives the spindle, which in turn revolves the heavy balance wheel provided to maintain smooth running and absorb the vibration of the hammer blows and also the driving pulley for the rotary attachment which is located at the rear. The spindle rolls which operate the upper vertical plunger and the upper die are located at the front. Twelve blows are struck for every revolution of the main spindle, which operates at a speed of 325 r.p.m., so that the blank receives 3900 blows every minute, the intensity of them being controlled by the top screw on the head. The lower die, which is the moving one, is held in a holder on the top of the lower plunger. This works vertically between the two members of the head which extend down inside the base of the machine at the front. Reciprocating motion is imparted to this plunger by a powerful toggle lever fulcrumed on the trunnion shaft journaled in the two hanging members of the head. This shaft is actuated through a lever arm and roller by the large wiper cam at the rear of the base which receives its motion from the main driving shaft at the side through worm and spur gearing.

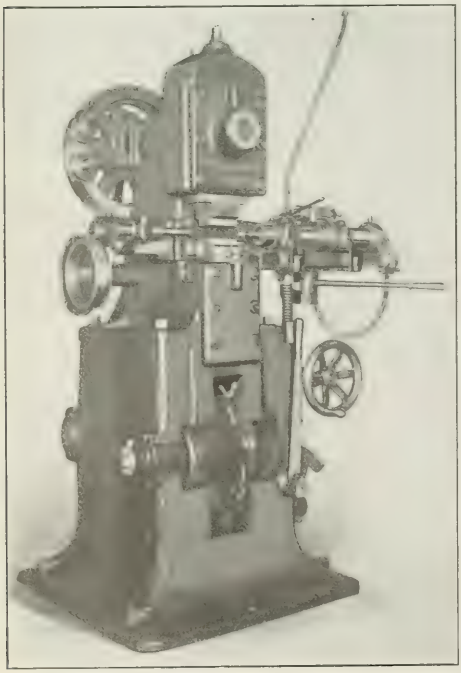


Fig. 1.—The No. 4 Hammering Machine with Pneumatic Attachment Built by the Langelier Mfg. Company, Providence, R. I.

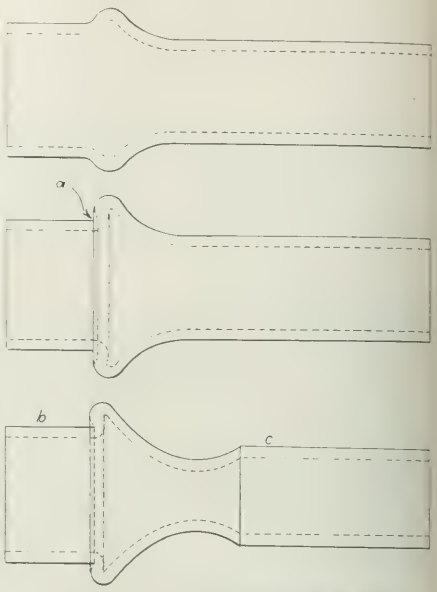


Fig. 2.—Specimen of Work Done by this Machine.

As the wiper cam revolves the toggle lever arm is alternately raised and depressed, thus simultaneously lifting and lowering the plunger and the bottom die and bringing it gradually into contact with the upper die. This contact is maintained a sufficient time to finish the work uniformly, after which the lower plunger recedes quickly and stops. The trunnion shaft bearing cap of the toggle lever is extended into a fork-shaped journal, in which is pivoted a crank lever that is keyed to the shaft projecting through the side of the base, near the floor. The rocking motion of this shaft is imparted to a segment cam, which in turn transmits it through the roller riding upon it to a vertical slide extending under the pneumatic attachment. This alternate raising and lowering of the attachment is required to keep the work central with the dies until it is entirely finished.

The blanks used by this machine are previously reduced and formed in the swaging machine until they assume the shape shown at the top of Fig. 2. The shoulder at *a* in the middle view is produced by a power press and tools. After the shoulder is completed the pieces are then ready for working in the hammering machine, where they are made to assume their final form, which is straight from the point *b* to the shoulder and concave from the shoulder to the point *c* as illustrated in the lowest view.

The operation of the machine is not interrupted between the ejection of the finished piece and the insertion of a new blank. This is accomplished by having the main driving pulley revolve continuously and making a cam trip a ratchet pawl at every revolution. This stops the roll clutch in the rear and as soon as the operator has slipped a new blank into the chuck, the clutch is released by a downward pressure of the hand on the starting lever across the front of the machine and the hammering process is continued.

The complete weight of the machine is approximately 5900 lb.

The Burt Ventilator

A new ventilator equipped with a power-driven fan is being placed on the market by the Burt Mfg. Company, Akron, Ohio. This ventilator is especially designed for use in factories where large volumes of smoke, steam

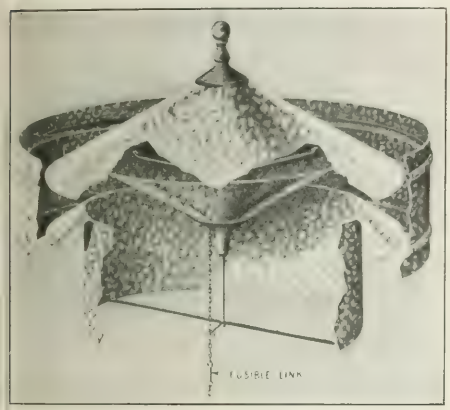


Fig. 1.—A New Ventilator with Power-Driven Fan Made by the Burt Mfg. Company, Akron, Ohio.

or impure air have to be removed, the fan being placed in the lower part of the exhaust pipe. It is claimed that with the use of the fan for carrying a strong current of air through the pipe the efficiency of the ventilator is increased approximately ten times. An exterior view of

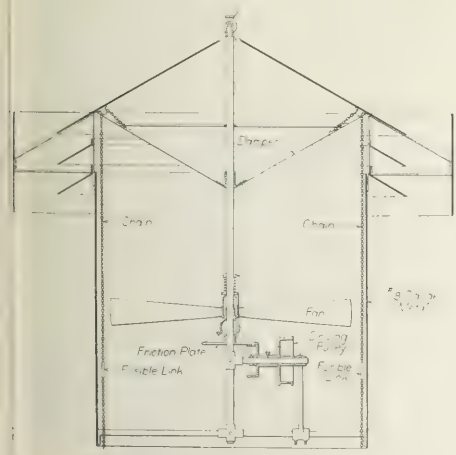


Fig. 2.—Sectional View, Showing Details.

the ventilator is given in Fig. 1, while Fig. 2 is a sectional view showing the details of its construction.

The fan, the position of which is clearly illustrated in Fig. 2, revolves on a 1¼-in. shaft extending from the top to the bottom of the ventilator. A belt drive can be used for the fan or it can be motor driven by a direct-connected individual motor or by employing a single motor to drive a group of fans. In Fig. 2 the fan is shown driven by a pulley and a friction plate. The power required to drive each fan at a speed of from 200 to 300 r.p.m. is approximately ¼ hp. for each fan.

The ventilator which is illustrated in Fig. 1 is equipped with a cone damper, shown in the upper portion of Fig. 2, that slides up and down. This damper is supported from either side by a fusible link, so that it will drop and close automatically and shut off the draft in case of fire, a spring being placed above the fan to relieve the shock when the damper drops. As the automatic closing of the damper on account of fire is a somewhat remote contingency the spring is considered superfluous, and will be omitted in the construction of future ventilators.

Galvanized iron and Toncan metal are employed in the construction of the ventilator. Two sizes, namely, 36 and 48-in., are made, and metal tops alone are furnished. The company has recently installed 20 of the larger size ventilators, 14 in the plant of the Goodyear Tire & Rubber Company, Akron, Ohio, and 6 in the works of the Lima Locomotive Company, Lima Ohio.

Unusual Service Records in Wire Works

The long record of service of many of the employees of its Spencer, Mass., works makes the Spencer Wire Company, Worcester, Mass., noteworthy among industrial companies. About 150 men are employed. Three—Louis Sherman, Albert Snow and Anthony Aegis—have been in the company's employ over 50 years, the first named holding the record of 54 years of continuous service. Four men have a record of 47 and 48 years, and another group of four have been with the company over 40 years. Eight others have worked continuously in the Spencer plants over 30 years, five between 25 and 30 years, ten between 20 and 25 years, twenty between 15 and 20 years, fifteen between 10 and 15 years and twenty-four between 5 and 10 years. In some cases grandfathers, fathers and sons are working side by side.

It is believed that wire drawn at Spencer, Mass., about 1820 or 1821 was the first fine iron wire made in this country. The operation was performed in the kitchen of a farmhouse and antedated the establishment of the Washburn & Moen Wire Works at Worcester, Mass., by ten years. From this beginning the present extensive works of the Spencer Wire Company have been developed. The officers of the company show an order dated September, 1826, for 50 lb. of wire from Charles Sigourney, Hartford, Conn., a merchant of that time. There was intermittent drawing of wire at Spencer until 1845, when the present works were established by Richard Sugden and Nathaniel Myrick. Mr. Sugden continued at the head of the works for 50 years and died in 1895, but the Spencer Wire Company, which was incorporated in 1876, still operates the Spencer mills, although the headquarters of the company were removed to Worcester in 1900. Work at the Spencer plant has been continuous under the present ownership and there has been no labor difficulty. The mill village, of which the industry is a center, is of a type rarely met with outside of New England.

The Buffalo Forge Company, Buffalo, N. Y., was recently awarded the contract for supplying the new Taft Hotel, New Haven, Conn., with heating and ventilating apparatus. The system is so arranged that the main portion of the hotel, the kitchens, the ballrooms, the bathrooms, the boiler-rooms and the laundry each has a separate and independent outfit. The main unit and the kitchen unit, in addition to the usual Buffalo steel plate supply and exhaust fans, are equipped with Carrier air conditioners for washing and humidifying the air. The main unit delivers 40,000 cu. ft. of air per minute. The supply fan for this unit is almost 12 ft. in diameter. The kitchen unit is so designed that the exhaust fan is capable of handling 25,000 cu. ft. of air per min., while the supply fan delivers 18,000 cu. ft. With this arrangement, all objectionable fumes are removed from the kitchen All the fans, pumps and disk wheels in this installation are electrically driven.

Electric Switching Locomotive

Although designed primarily for shifting coal cars and other switching service on an interurban trolley line, the new 240-hp. 30-ton all-steel electric switching locomotive designed and built by the Terre Haute, Indianapolis & Eastern Traction Company is also available for use in industrial establishments where cars have to be moved. A number were designed and built at the company's Indianapolis shops under the supervision of L. M. Clark, master mechanic for the company, and many unique features are incorporated in the construction.

With switching locomotives there are of necessity frequent movements of the controller handle to the first and second notches with an almost continuous breaking of heavy currents. For that reason the HL control of the Westinghouse Electric & Mfg. Company, East Pittsburgh, Pa., which also furnished the other electrical apparatus, was used in preference to the K type. A further advantage of this type of control for locomotive work is that the controller occupies but little space in the usually crowded cab and leaves plenty of room for the operator to move about as his duties may require. As will be noticed from the accompanying engraving, which shows the interior of the cab, the wiring and the arrangement of apparatus have been very carefully worked out. All



View in the Cab of a New All-Steel Switching Locomotive, Showing Arrangement of Controlling Apparatus Supplied by the Westinghouse Electric & Mfg. Company, East Pittsburgh, Pa.

of the conductors in the cab are carried in wrought-iron conduits and the incandescent lamps for lighting the cab are arranged on condulet outlets.

The controller and the engineer's valve are mounted on a wrought-iron support away from the sides of the cab, so that the motorman can walk entirely around them. The switch group for the control and the reverser are mounted under one of the sloping hoods at one end of the cab, while the compressor and the other air brake details, with the exception of the apparatus that must be available for manipulation, is mounted under the other. The grid control resistors are mounted underneath the car and the entire arrangement of the equipment is such as to facilitate inspection. Small incandescent lamps for illuminating the air gauges in the cab are used and are connected with the lamps in the hoods.

The locomotive body is constructed entirely of steel, with an underframing of 7-lb. I-beams and the extreme dimensions are length over buffers, 30 ft.; overall width, 10 ft., and hight from rail to trolley base, 12 ft. 3½ in. The total wheel base is 22 ft. 4 in. and the rigid wheel base is 4 ft. 10 in. The body bolsters, the journals and the couplers all conform to the M. C. B. standards. Solid steel wheels 34 in. in diameter are used and are mounted on axles 5 in. in diameter and 4¼ in. long. The dimensions of the journals are 4¼ x 8 in. The motive power is supplied by four No. 93-A-2 motors and the gear ratio is 16 to 71. Westinghouse air brake equipment is employed throughout, the brake cylinder measuring 12 x 12 in. The total weight of the locomotive is 60,880 lb. The miscellaneous equipment of the locomotive includes pneumatic standers and electric heaters.

The Atkins Hack Saw Machine

A New Type with Automatic Stroke Variation

Increased capacity due to the use of the entire length of the blade is the principal advantage claimed by E. C. Atkins & Co., Indianapolis, Ind., for its No. 7 Kwik Kut

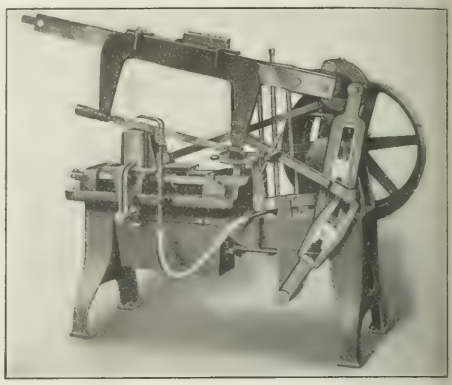


Fig. 1.—The No. 7 Kwik-Kut High Speed Power Hack Saw Machine, Built by E. C. Atkins & Co., Indianapolis, Ind.

power hack saw machine. This variation in the length of stroke is automatically secured through the operation of closing the vise, an arrangement which is said to secure a saving of from 50 to 200 per cent. in the blades used, together with a corresponding increase in the efficiency. Other features of the machine include a raising device which lifts the saw from the work during the back stroke, a special type of lubricating system, a quick return of the saw arm and an adjustable depth gauge. Fig. 1 is a general view of the machine, while Figs. 2 and 3 show the automatic adjustment for changing the stroke of the saw frame and the mechanism for driving the saw respectively. The contrast between the shavings produced by this machine as compared with one of the others now on the market is clearly shown in Figs. 4 and 5, the latter showing the shavings produced by the Atkins machine.

The automatic adjustment to any size of stock is covered by a patent granted to this company and the arrangement is shown in Fig. 2. The steel bar connecting the back vise jaw with the link hanger changes the stroke of the saw frame to correspond with the dimensions of the stock being cut. This arrangement automatically insures the use of the entire length of saw blade, a feature which it is claimed was not possible heretofore without the use of some hand-controlled device for changing the stroke. The saw operates on the draw cut principle, that is, with a pulling instead of a pushing motion, the mechanism being illustrated in Fig. 3. The adjustment of the stroke

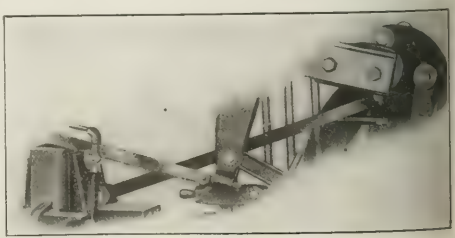


Fig. 2.—The Automatic Adjustment for the Stroke.

and the way in which the saw teeth come in contact with the stock, in conjunction with the pulling motion, are said to cause the blade to come into more direct contact with the stock and thus increase the efficiency. The auto-

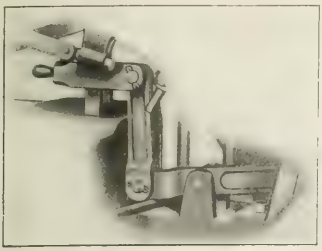


Fig. 3.—The Mechanism for Driving the Saw.

matic raising device is also illustrated in Fig. 3, which lifts the blade from the work during the back stroke, thus avoiding unnecessary wear of the saw teeth and adding materially to their life. If desired the saw may be lifted to any desired angle and automatically kept in that position.

The construction of the machine is very strong, as will be seen by referring to Fig. 1. The base is of the extra heavy cabinet pattern which permits no vibration, while the draw cut feature also adds to the smoothness of the operation of the machine. A long compensating bearing for the saw frame insures an accurate cut. A two-speed pulley is provided which enables the machine to be used at its highest efficiency in all sizes and classes of stock, since the operator is enabled to regulate the speed to suit the requirements of the particular material being handled. With this pulley a variation of 30 strokes per minute is possible which can be used to great advantage on the various kinds of material cut in this machine. The depth gauge is a special adjustment which controls the saw arm and will stop the saw automatically at any desired depth of cut. The lubricating system consists of a tank and pump. The latter forces the cooling compound upon the saw blade while it is cutting the metal and the tank catches the liquid and filters it. It is returned to the point of contact by the pump. A quick reverse motion of the saw after each cutting movement adds materially to the speed of operation.

The easy, even, steady motion of the saw, together with the draw cut feature, produces shavings which differ materially from those of other machines. The contrast in the shavings produced by this machine as compared with some of the others, is clearly brought out in Figs. 4 and 5, which are photographs slightly magnified of shavings produced by one of the standard machines now on the market, Fig. 4, and those produced by the No. 7 Kwik Kut machine, Fig. 5. These shavings were pro-



Fig. 4.—Shavings Produced by a Machine Now on the Market.

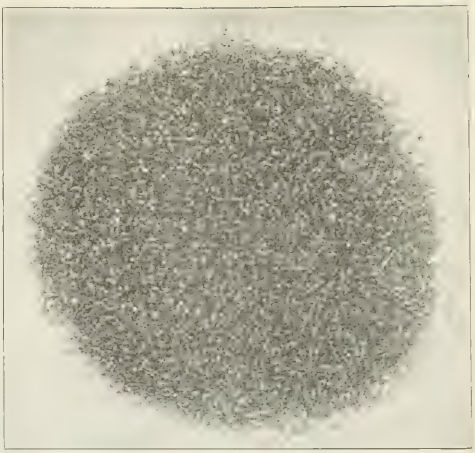


Fig. 5.—Shavings Produced by the Atkins Machine.

duced by the same blade operating in the same piece of steel and it will be noticed that in the older machine the shavings are small and broken instead of being larger and in one piece.

Steam Shovel Work

An exceedingly thorough and complete treatise with reference to steam shovel performance has been issued by the Bucyrus Company, South Milwaukee, Wis., under the title "Hand Book of Steam Shovel Work." To our knowledge, no similar record is in existence, and its exceptional value to engineers and contractors in general can scarcely be appreciated without a perusal of the book itself. It is in hand-book size and neatly bound, the text of 374 pages being divided into 10 chapters. The first four chapters deal with the nature of the problem involved in the use of the steam shovel as compared with other methods of excavation; the general conditions under which a steam shovel normally operates, with formulae and diagrams for preparing and plotting cost curves; field conditions having to do with the general economical handling and superintendence of the job, and suggestions for the classification of work in preparation for estimates. The following five chapters present a total of 45 actual reports of steam-shovel operation in six different kinds of work, including sand and gravel, earth and glacial drift, clay, iron ore and rock. The final chapter is general in character, offering many pointed and extremely valuable suggestions covering daily incidents likely to be encountered. The reports presented are completely illustrated and are detailed in every particular, presenting an exact record of actual performances and offering models for future records.

The writer, who has himself spent considerable time in the open-pit mines of the Mesaba Range and has also collected from personal observation a large amount of data regarding the operation of steam shovels, finds this book by comparison not only an infinitely greater and more comprehensive presentation of facts but with an accuracy and an adherence to circumstances most commendable. The work is published at this time in its first edition and is developed from a report by the Destruction Service Company to the Bucyrus Company. The price is $1.50.

The new home of the Gary Commercial Club, Gary, Ind., is regarded as one of the finest in the country for a city of the size. The building cost $50,000. The first floor is devoted to business purposes. On the two upper floors are the library, committee rooms, banquet room, billiard room, reception parlors and an auditorium with a seating capacity of 400. The officers and directors are: President, H. S. Horton; vice-president, H. F. McCracken; secretary, A. D. Highlands; treasurer, E. C. Simpson; other directors, A. S. Hess, H. G. Hay, Jr., H. H. Highlands, A. P. Melton and H. H. Harries.

Motor-Driven Sheet and Strip Mill

Details of a Recent Installation of the Philadelphia Roll & Machine Company

For cold rolling special metals, such as Monel metal sheets and strips as well as finished rods and wire, a new 20-in. motor-driven sheet and strip mill has been recently completed by the Philadelphia Roll & Machine Company, Philadelphia, Pa. This mill was installed in the plant of Shimer, McGlynn & Co., of that city, who make a specialty of Monel metal cold rolled planished sheets and strips as well as finished rods and wire. In addition to this sheet mill a 12-in. rod mill was reequipped and connected so as to be driven by the motor operating the sheet and strip mill.

The sheet mill equipment consists of one stand of 20 x 36 in. two-high roughing rolls and one stand of 20 x 30 in. two-high finishing rolls and a set of 20-in. two-high pinions. It was specially designed to meet the extraordinary heavy duty requirements encountered in this class of work. The area of the housing posts is 196 sq. in., the housings being 7 ft. 6 in. high and the total width at the central point being 4 ft. 8 in. The total weight of the mill, including the gearing and one set of rolls, was 181,130 lb. All the castings are made of a special charcoal air-furnace iron. The 12-in. rod mill, which is not illustrated, is of the ordinary three-high type equipped with a special design of rolls for cold rolling Monel metal bars as well as the ordinary rolls for use in connection with the rolling of other alloys.

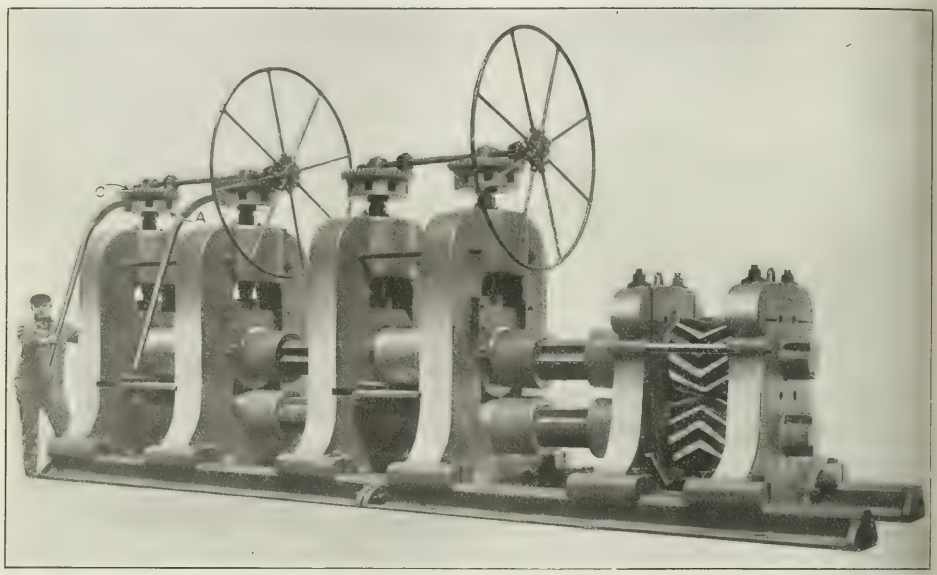


Fig. 1.—A Motor-Driven Sheet Mill for Cold Rolling Monel Metal Built by the Philadelphia Roll & Machine Company, Philadelphia.

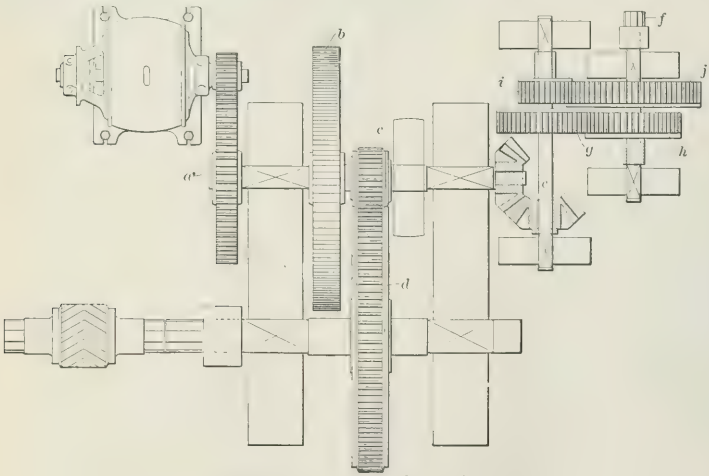


Fig. 2.—Details of the Motor Drive.

A view of the 20-in. mill is given in Fig. 1, while Figs. 2 and 3 show the details of the motor drive and the adjustable gearing forming a special feature of the mill respectively.

The entire installation is motor driven, a 200-hp. 220-volt 375-ampere General Electric induction motor being used. The current, which is supplied at a potential of 2200 volts, is reduced to 220 volts in a transformer house located approximately 100 ft. from the motor, the voltage drop between the secondary of the transformer and the armature terminals of the motor being ¼ volt.

The motor operates at a speed of 650 r.p.m. and is geared to a secondary shaft. *a*, Fig. 2, running at 143 r.p.m. An 8-ft. fly-wheel, *b*, weighing 12,500 lb., and having a rim speed of approximately 3600 ft. per minute is fastened upon this shaft. It is designed to equalize the motor load, and experience has proved that the kinetic energy which it possesses is sufficient to complete the rolling of an ordinary bar through the 20-in. mill even though the power was shut off at the instant the bar entered the rolls. The 20-in. mill is driven directly from the secondary shaft by gears *c* and *d*, the speed being reduced to 28 r.p.m. On

account of the different metals to be rolled in the 12-in. rod mill, which stands at right angles to the 20-in. mill, it was necessary to provide for its operation at different speeds and for this purpose selective change gears are employed. The extended secondary shaft operating through a bevel gear, *e*, drives the shaft *f*, operating the 12-in. mill at a speed of 143 r.p.m. Two sets of gears provide for a speed variation for the rolls, the rate being either 143 or 47 2/3 r.p.m. The first set of gears *g* and *h* are of cast steel with cut teeth, while a special air-furnace charcoal iron gear metal is employed for those of the second set *i* and *j*. In Fig. 2 these gears are both shown in mesh, but in actual operation the idle gear is kept out of mesh by a split spacing sleeve bolted on the shaft. In this way a substantial variable speed drive is provided by slipping the gears in and out of position, or if the mill is not to be operated, the spacing sleeves will keep both gears out of mesh.

The sheet and strip mill is of the usual counterbalanced type with the exception that new features have been adopted in the adjustable gearing, details of which are given in Fig. 3. This gearing consists of a lever adjusting disk, A, Fig. 1, and *a*, Fig. 3, which is secured to the top of the screws by keys *b* and serves as a means of backing up the screws in case the machine should stall. The bevel gear wheel C, Fig. 1, and *c*, Fig. 3, is fitted into this adjusting disk by a projection entering into an annular boss and is held in place by a securing plate, *d*, which clamps it fast in any desired position. This plate is also fastened to the adjusting disk and also holds the horizontal shaft chair *e* in position. Pin holes *f* are also provided in the bevel gear and the adjusting disk for use in case it is desired to secure them in any one relative position, an arrangement which, it is claimed, overcomes one of the objections frequently made to the bevel gear type of adjustment and enables adjustment to 0.001 in. to be made.

Ample provision has been made for the lubrication of the roll and the pinion necks because of the great pressure which the metal exerts upon them during the rolling process. To accomplish this, specially designed deep pockets were cored in the castings to retain the lubricant. The wearing parts are so constructed and fitted in position that they can readily be removed in case of wear and replaced at a very slight cost.

The mills and the rolls were designed under the supervision and direction of William P. McGlynn, general manager of Shimer, McGlynn & Co., who also had charge of the installation work, and the various special features embodied are the result of his extensive experience in connection with the rolling of special metals and alloys.

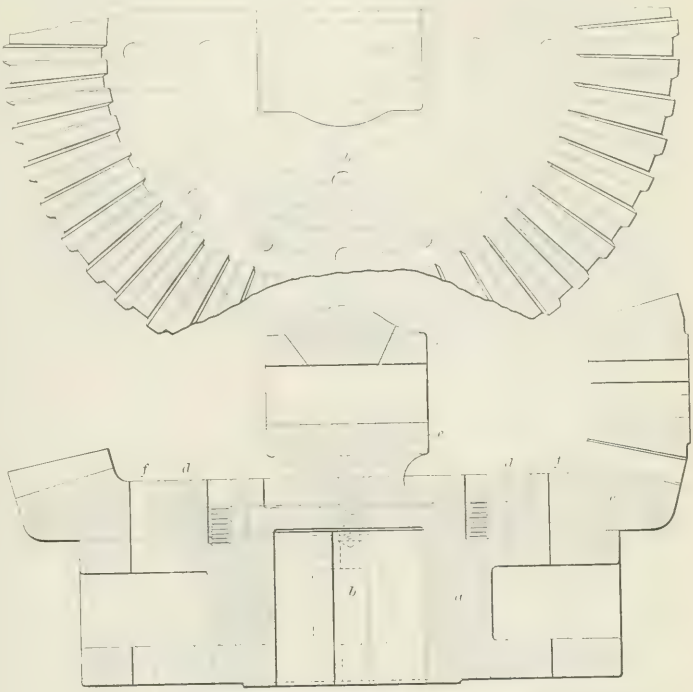


Fig. 3.—The Adjustable Gearing, Forming a Special Feature of the Mill.

The First Mesaba Range Steam Shovel

The fact has been recalled recently that the first stripping of ore beds on the Mesaba iron range was done at Biwabik, Minn., on what is now the property of the Biwabik Mining Company. The shovel used was a Marion style A, sold originally to the Hamilton Ore Company, which used it in 1891 for loading from its stockpiles at Iron Mountain, Mich. Systematic exploration of the Biwabik property was begun by J. A. Brown in 1892. The following year the Biwabik Ore Company was organized by John T. Jones, now of Iron Mountain, and P. L. Kimberley, since deceased. This company purchased the steam shovel mentioned and shipped it to Missabe Station, where it was dismantled, hauled piecemeal to Biwabik and there reassembled for stripping.

This shovel was a friction machine. It carried a 1½-yd. dipper and weighed 40 tons. As compared with any shovel previously built it was a veritable monster and admired as the wonder of the excavating world; but, beside the 150-ton 6-yd. machines of the same company's design which are now operating in the district, notably at the St. Paul mine of Corrigan, McKinney & Co., it was a pygmy, both as regards size and the quantity of material which can be handled in a given time. The contrast shows what an advance there has been in methods of ore mining in the open workings of the Mesaba range in less than two decades. C. A. T.

French Blast Furnace Consolidation.—Negotiations have been under way, it is reported, for the consolidation of five important blast furnace companies in the Longwy district of France, namely: La Société Metallurgique de Senelle-Maubeuge, F. de Saintignon et Cie, Marc Raty et Cie de Saulnes, La Société Lorraine-Industrielle de Hussigny-Godbrange, and La Société Metallurgique de Gorcy. Altogether the proposed amalgamation would control 24 blast furnaces.

Owing to his appointment as one of the nine councilmen of Pittsburgh, P. J. McArdle has resigned as president of the Amalgamated Association of Iron, Steel and Tin Plate Workers. New officers of that association have been elected as follows: John Williams, president; M. F. Tighe, secretary and treasurer; David J. Davis, assistant secretary; Benjamin I. Davis, managing editor of the Amalgamated Journal, the official organ of the association; Joseph A. Bowers insurance secretary.

The Philadelphia Steel & Forge Company, Tacony, Philadelphia, Pa., is doubling the power plant in its rolling mill and is also installing a 12-in. train of rolls and a heat-treating plant.

Solar Pumping Plant

Utilizing the Sun's Rays to Generate Mechanical Power

Absorbing the heat of the sun's rays and utilizing it to generate mechanical power has been a line along which considerable experimenting has been done for some time.



Fig. 1.—View of the Sun Absorber Used by the Sun Power Company, Tacony, Philadelphia, Pa.

One of those who have followed this line of investigation is Frank Shuman, Tacony, Philadelphia, Pa., and an early type of engine built by him was illustrated in *The Iron Age*, December 19, 1907. Since that time Mr. Shuman's plans have been entirely revised and a new pumping plant has been constructed along the revised designs by the Sun Power Company. Fig. 1 is a view of the sun absorber, which, as its name indicates, gathers the rays of the sun and extracts the heat from them. Fig. 2 is a front view of the engine shed, showing the various mechanical appliances employed in connection with the plant, while in Fig. 3 the plant is shown pumping 3000 gal. of water per minute to a hight of 33 ft.

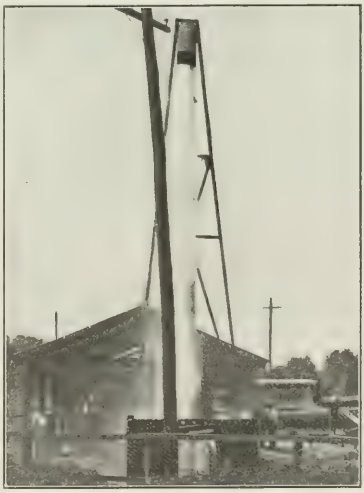


Fig. 3.—The Plant Pumping 3000 Gal. of Water per Minute to a Hight of 33 Ft.

One of the methods of generating heat by the sun's rays is to employ concave mirrors to concentrate the rays from a relatively large area upon a smaller one and so intensify the temperature to a degree sufficient to vaporize water or other liquids. The principle of the Shuman hot box is entirely different. No attempt is made to concentrate the heat, but only to absorb the direct rays of the sun and eliminate as far as possible the losses by radiation. The first generator consisted of a small wooden box covered by two layers of glass with a small intervening air space, and in the box was placed a miniature ether boiler. This apparatus was exposed to the sun's rays, the ether distilled and the amount of heat which might be absorbed was determined. As an experiment, a small toy engine was successfully run with the original apparatus. A second generator consisted of a 2-in. steam pipe 16 ft. long and insulated at the bottom and inclosed in a box covered by a double layer of glass. A third type of power plant, which was the one illustrated in *The Iron Age*, December 19, 1907, was composed of a bed of water pipes properly insulated against heat loss, the unit measuring 18 x 60 ft. and the motor being an ether engine. With this apparatus 3½ hp. was developed.

Details of the Plant

In the new power plant which has been built in Philadelphia the component parts are the absorber, a low-pressure steam engine, condenser and the necessary auxiliaries. In a general way the absorber, which is shown in Fig. 1, is composed of a series of units, each containing a flat metal honey-comb water vessel rectangular in shape and closely resembling in appearance a large waffle. This vessel is inclosed in a flat wooden box covered with two layers of glass having a 1-in. air space between them and having the under surface of the box protected from loss of heat downward by a layer of cork 2 in. thick and two layers of waterproof cardboard. These boxes are mounted on supports which raise them approximately 30 in. above the ground, and which enable them to be inclined perpendicular to the sun at the meridian, the adjustments of the inclination being made approximately once in three weeks. On two sides of the boxes plane mirrors are mounted, so that it is possible to absorb more rays of the sun and reflect them upon the surface of the water vessel, which is connected at one end to a feed pipe from the water supply and at the other to a steam pipe. The steam pipes from the various units



Fig. 2.—Front View of the Engine Shed, Showing the Mechanical Appliances and the Sun Absorber in the Background.

are connected together and enter into a main 8 in. in diameter which conveys the steam to the engine.

The engine, which, together with the other auxiliaries is shown in Fig. 2, is a new type, low-pressure, reciprocating steam engine, and connected to it is a condenser of the ordinary type and auxiliaries such as will be regularly, found in any condensing plant. The water from the condenser is pumped back into the absorber, thus insuring a continuous closed circuit and the only water loss, it is stated, is that due to accidental leakage.

The power from this plant is used for pumping water with an ordinary reciprocating steam pump, and in Fig. 3 the plant is shown operating at its capacity in the latitude of Philadelphia, which is 3000 gal. of water per minute lifted to a hight of 33 ft. Tests made in August, 1911, showed that 4825 lb. of steam could be developed in 8 hr. from 26 banks of units. Each of these banks contains 22 single units and has a light absorbing area of 10,296 sq. ft. and an actual area of 5148 sq. ft. While the power produced was much lower than normal to the plant, it is believed that when it is put in operation in the tropical countries, where it was designed to be used, much more power will be developed, as the losses of heat by conduction and convection in the northern latitudes which are considerable will be eliminated and the average air temperature is higher, or approximately 100 deg. F.

As compared with a 100-hp. coal plant employing a modern compound condensing engine with a coal consumption of approximately 3 lb. of coal per b.h.p., it is shown that the approximate cost of operating the sun and the coal plant are $3,750 and $2,750 per annum respectively, exclusive of the cost of coal. It is estimated 375 gross tons of coal would be required for a year for the coal plant, which, when divided into the $1,000 excess operating cost of the sun plant over the coal plant, gives an average cost per ton of $2.66. In the localities, however, where the sun plant is intended to be used, namely, in the tropics, the cost of coal per ton varies from $5 at seaports to $30 at inaccessible points, the general average being approximately $15 per ton. In localities such as these the sun plant should be able to supply power for different purposes, including irrigation projects, cheaply.

A New Foundry and Mechanical School at Boston

Announcement is made of the completion of the buildings of the Wentworth Institute, Huntington avenue and Ruggles street, Boston, work on which was begun in October, 1910. The institute is named after its founder, Arioch Wentworth, and it was established "for the purpose of furnishing education in mechanical arts." The buildings include the foundry, the main shop building, 145 x 49 ft., five stories high, including the carpenter shop, plumbing shop and electrical wiring room, a large power house 80 ft. square and a wing for administration offices. Laboratories are planned for work in practical mechanics, electrical appliances and electrical machinery, building materials and power plant operations. There are also rooms for mechanical drawing and tool designing besides lecture and recitation rooms.

Special reference is made in the announcement of the opening of the school to the course in foundry practice. This will cover all branches of molding, core making and a study of the mixing of iron in connection with cupola practice. The shop work will be supplemented by practical talks on materials used in the foundry, the selection of sands and the handling of the cupola. E. A. Johnson, who was at the head of the foundry department of the Winona Technical Institute at Indianapolis, will have charge of the foundry work at Wentworth Institute. It is stated, as indicating the practical character of the work planned at Boston, that the proceeds from the sales of the students' work at the Winona Institute foundry in the past year amounted to over $15,000. The sales of castings have been sufficient to pay the running expenses of the department and to give the students a small dividend, thus reducing the cost of their education. All the graduates of the Winona School are now holding responsible positions, and a number of them are commanding high salaries.

While ample endowment was left for Wentworth Institute it has been decided to charge a small fee to students. This is $6 a term for day students and $6 per season of two terms for evening students. The directors of the institute have provided part time courses in addition to the full time courses, the former requiring students to attend their classes at the institute every other week, while in the alternate weeks they have opportunity to work at some regular employment. An employment bureau will be started which will, so far as possible, secure employment for the graduates of the institute. Arthur L. Williston, principal of Wentworth Institute, is a graduate of the Massachusetts Institute of Technology and for a time was a member of the faculty of Ohio State University, Columbus, Ohio. He has been engineer on a Western railroad, and was a member of the commission which established the Carnegie Technical Schools at Pittsburgh. At Pratt Institute, Brooklyn, N. Y., he was for twelve years at the head of the School of Science and Technology.

The Globe Iron Works to Remove Its Plant

The Globe Iron Works, at present at Stockton, Cal., will move its entire business before January 1 to North Sacramento, Cal., where it is now building an extensive plant comprising a foundry, machine shop, pattern shop, forge, car shop, warehouse, office, etc. These buildings will consist mostly of steel and concrete and will be fireproof. The new plant occupies a ground space of four and a half acres and is located on the Western Pacific Railroad and the Northern Electric Railroad, a spur track running directly into the center of the works from the Western Pacific. It also has a shipyard site on the American River which will be equipped for the handling of dredger and boat work. The entire plant will be driven by electric power, and the products will be mining cars, mining machinery, centrifugal pumps, dredger machinery, power transmission appliances, roll grinding and corrugating, and in addition the company will do general foundry and machine work. No new machinery will be needed, as the present equipment is ample for the new plant.

Janney, Steinmetz & Co.'s Business

Janney, Steinmetz & Co., Fourth and Market streets, Philadelphia, Pa., manufacturers of pressed and seamless drawn steel specialties, contemplate putting in some large presses in the early part of 1912, particularly in view of the fact that they have received some important contracts for high pressure air tanks for automobile self-starting devices. They are also increasing their line of cooking utensils of the larger capacities, such as big soup stock pots of 20 to 25 gallons capacity and large seamless steel cruller pots and have added a new line of French grease pans, including some large sizes not heretofore made. The demand for seamless steel baker bowls is increasing, as to a large degree they are supplanting the use of the old style wooden bowls. They further state that nearly all motor boat owners who are having high class crafts built for delivery next year are specifying their seamless steel, leakless, tested gasoline tanks to replace the old style riveted sheet-iron tanks which have been the cause of so much danger from leakage, with consequent fires and explosions and, in many instances, loss of life. They further report that their business has been good for the past year and they are booked ahead for the next four months. Prospects are very encouraging for both domestic and export business.

The Indiana State Federation of Labor will bring suit to prevent a continuance of the contract which the Indiana Mfg. Company has with the State Reformatory at Jeffersonville, Ind., to use convict labor in its foundry. The contract was made five years ago after the passage of an act by the State Legislature prohibiting such employment of convict labor but before the act became effective. The five years is about to expire, but the contract has a clause in it giving the company the right to extend it five years. The State Federation will attack the contract on the ground that, being made between the time of the passage of the act and its taking effect, it was contrary to the will of the Legislature. The foundry contract is the only one remaining of several of the kind which were in existence when the law became effective.

Flywheels for Motor-Driven Rolling Mills

An outline of the procedure to be taken in selecting flywheels for motor-driven rolling mills was contributed by Edward J. Cheney recently to the General Electric Review. While illustrating his thesis with a few examples of the relation of flywheel effect, speed and electric resistance loss, he emphasized that no definite conclusions can be reached without investigating each specific problem. Some of the points made, however, are of general practical application, as the following notes will show:

Rolling mills are all of comparatively low speed. Even when motors are geared or connected by rope drive, the motor speed is usually comparatively low; and where a speed reduction is employed, it is better, mechanically, to put the flywheel on the mill shaft, in order that the driving system may be relieved of the loads and shocks which are taken by the flywheel, and the wheel should not be located on the motor shaft where it is feasible to avoid it.

On account of the low motor speed and the good regulation necessary, flywheels may run into prohibitive sizes and it will be impossible to put on as large a flywheel as might otherwise be desired. In practice one must usually be content with a flywheel which will materially reduce the short, high peaks, and which will be of service only on the long peaks by causing the load to go on and off the motor gradually, and so ease off the sudden jolts, which would otherwise be demanded from the power supply.

In order properly to study the problem it is necessary to make up diagrams of the total load by combining the individual portions. Different flywheels may be assumed for the various mills and the resulting power curves combined in the various possible relations. In doing this the diversity factor and the laws of chance must be properly considered in addition to all the facts peculiar to the particular installation. If there are a large number of motors it is reasonably certain that all of them will never be working on their worst cycles simultaneously and with coincident peaks; but if there are only three or four motors it is equally certain that they will, at times, arrange themselves in the worst possible relation. It can be depended upon, however, that not more than two or three will ever remain in such relation with each other for any length of time.

Having plotted out our load curves for various conditions, we shall find that there are three factors influenced by the flywheel sizes which affect the supply system. These are, 1, peak load; 2, suddenness of fluctuations; 3, power-factor.

Where power is purchased from an outside company it is only necessary to determine how the changes which we can make in the above factors will affect the power bill. But ordinarily current is generated by the company which uses it, and a detailed study is required to find how the cost of producing power will vary. The relative importance of each factor depends upon the general type of the system and particularly upon the generating equipment.

High peaks will generally mean an increase in first cost and a decrease in generator efficiency, but these effects will be more marked with gas engine generators than with turbines, since the latter have higher overload capacity and flatter efficiency curves. The effect of peaks upon station capacity depends also upon their frequency. When a certain maximum load can only occur at rare intervals, due to a particularly unfortunate combination of loads, much less margin may reasonably be allowed than if this maximum is expected to recur frequently.

Violent fluctuations disturb voltage and frequency and may affect parallel operation. In general, a higher peak can be carried when the load comes on gradually. In some cases it may be absolutely necessary to equip the motors with flywheels in order to obtain satisfactory operation of the generators, and in others the use of flywheels may permit of considerable reduction in generating capacity, due solely to their steadying effect. Here again turbine generators have the advantage over gas engines, due to their better governing characteristics on swinging loads.

To sum up the matter, we can say that first the load curves on each individual motor must be determined, particularly the most irregular loads. It must then be determined what alterations can be made in these curves by flywheels of practical size, and how these alterations will affect cost and operating characteristics. The effect of different flywheels must be considered on the individual motors and then on the supply system. A careful study made upon these lines will indicate whether it is advisable to install flywheels or not and, if so, what their sizes should be. It should be needless to say that good judgment and a complete practical knowledge of the working conditions are essential aids to the mathematical treatment.

The Western Wheel Barrow & Mfg. Company's New Plant

The Western Wheel Barrow & Mfg. Company, Kansas City, Mo., states that contracts for the new plant which it is building at Fort Smith, Ark., have been let and the buildings are now being erected. The company recently acquired all of the assets of the Fort Smith Stove Works at South Fort Smith, Ark., and will use the foundry for the manufacture of castings for the wheel barrow and truck business and continue to operate the stove foundry for the manufacture of the former owner's complete line of ranges, cooking and heating stoves.

The buildings which the company is erecting there are composite—of brick, concrete and partly fire proof construction and partly mill construction—and will consist of a two story office, a machine shop about 50 x 150 ft., main wood working building 100 x 150 ft., bending rooms, dry kilns, paint shop, and a large warehouse, together with boiler and engine room. It is installing a 350 hp. engine and will remove the machinery it has in Kansas City to that point. It is making additions in the way of machinery so that its equipment will be complete for the manufacture of not only the line it has been making, but steel trays and tubular wheelbarrows. It is manufacturing its own wheels and for 1912 is offering a new wheel which will be called the Cooper patent self oiling wheel.

A branch will be maintained at Kansas City, Mo., but the main office will be located at South Fort Smith, Ark. The plant will be located on the Arkansas Central and the Frisco tracks. The company has been organized under the laws of the State of Arkansas with a paid up capital of $200,000. T. G. Dade is president and J. P. Ellison is secretary and treasurer.

The Machine Tool Builders' Programme

The programme of the annual convention of the National Machine Tool Builders' Association, at the Hotel Astor, New York City, Tuesday and Wednesday, October 10 and 11, will include the following addresses:

"Task Work as a Basis for Proper Management," Henry L. Gantt, consulting engineer, Singer Building, New York.

"Shop Hygiene as a Factor in Efficiency," Winthrop Talbot, M.D., Cleveland, Ohio.

"Standardization of Machine Tools with Relation to the Interchangeability of Fixtures and Cutting Tools," L. P. Alford, editor American Machinist.

The convention will hear fewer papers than formerly. A feature will be made of discussion, including suggestions as to the field of the association's work. Members will be invited to introduce various subjects under that head.

On Tuesday evening the members will be the guests of Machinery at a supper and entertainment at the Hotel Astor, and on Wednesday evening of the American Machinist at a theater party at the Hippodrome.

Chinese Exports of Pig Iron and Iron Ore.—A statement from the commercial attaché to the British Legation in Pekin says that the Tayeh iron mines, the only ones in China now systematically worked, produced 713,000 tons of ore in 1909. They are near the Yangtse River, 70 miles below Hankow, where the ore is largely used in the manufacture of pig iron and steel at the Hanyang Iron Works. The Chinese company which owns these works and the Tayeh mines (also the Pinghsiang collieries) exported 129,000 tons of ore and 63,500 tons of pig iron to Japan and the United States last year.

An Iron and Steel Trust in Italy

A correspondent of the London Economist says: A compact between various companies for the constitution of an iron and steel trust has been finally signed, and Italy will have, thanks to the strenuous exertions of the Director-General of the Bank of Italy, a trust similar in extent and scope to the great iron combinations of Germany and the United States. The six companies which already produce most of the iron and steel manufactured in Italy—the Siderurgica Savona, Altiforni ed Acciolerie Piombino, Ferriere Italiane, Elba, Ilva, Metallurgica di Sestri—have agreed to confer upon the Ilva Company (which has a newly erected establishment at Pozznoli, in the Gulf of Naples), the authority necessary to regulate all their respective establishments from July 1, 1911, to December 31, 1922. From the net income of the trust will be deducted the following assignations: Two million lire to the Elba Company in consideration of its mineral rights; two millions to the Ilva Company, and one million to the Piombino for the same reason; and, for other reasons, 800,000 lire to the Savona Company and 180,000 lire to the Piombino.

The reason put forward for the constitution of the trust was the better regulation of the industry, the specialization of production and distribution, the saving of wasteful transports, etc. The real reasons, however, appear to be, first, that all the companies were in a perilous financial situation, were overloaded with stock and short of ready money. A sum of 96 million lire has been calculated as necessary to insure the life of the industry; 39½ million lire were furnished by discount at 5.90 per cent. of long-dated bills, scaled up to December 31, 1912; 16 million lire were loaned at a minimum interest of 6 per cent. net by banks on current account to be amortized by December 31, 1919; 23 millions will be obtained by debenture issues, to be issued shortly, and seven after a delay. The remaining 17½ million lire will be supplied to the Ilva Company.

To insure the position of the banks furnishing the money (all the high finance has to be mustered on the occasion, from the Bank of Italy to Banca Commerciale, Credito Italiano, Banco di Roma, Banco Zaccaria Pisa, and some of the great savings banks), it was stipulated that the net income shall be pledged to pay the interest on the debt and the bills yearly repayable; and that only after settling these prior charges shall be distributed to share capital a dividend not greater than 24 lire per share (12 per cent.) for the Savona Company, 20 lire (8 per cent.) for the Elba Company, 12 lire (6 per cent.) for the Ferriere Italiane, 18 lire (9 per cent.) for the Ilva Company.

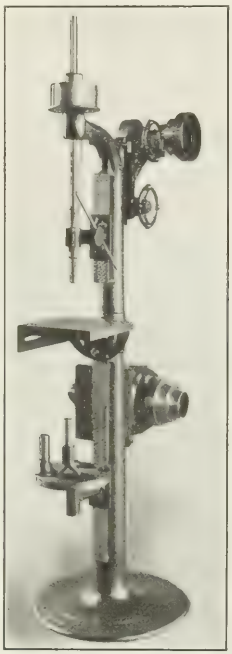
This has been called the moralizing of the industry; but the Italian Bourses have readily observed that the maximum dividends were fixed at a very much higher level than the last dividends, notwithstanding that the financial arrangements, as above described, resembled strongly a moratorium conceded from the creditors' bankers to debtors in distress.

Another reason which prompted the constitution of the trust was the greater possibility of joint action against the workpeople, which are of a peculiarly riotous nature, particularly in the Elba Isle. A lockout was soon proclaimed in the Elba and Piombino mines and works. But as the trust is unpopular the wisdom of the action is doubtful. Third, and last, the prices will have to be raised against the consumers. A press campaign is already on foot with the object of inducing the government to raise the already enormous duties on unmanufactured and semi-manufactured iron and steel. The pretext is the lumping exercised by German syndicates, and the occasion of the raising of duties will be the renovation of the commercial treaties with the European central powers in 1916.

The Pennsylvania Engineering Works, New Castle, Pa., builder of steel plate work, blast furnaces, slag cars, etc. is receiving the material required in the construction of the two new blast furnaces for which it recently secured a contract from the Minnesota Steel Company, Duluth, Minn., and this work will now be started. It has also received a contract from the Dominion Steel Corporation, Sydney, Nova Scotia, for a hydraulic accumulator.

Washburn Motor-Driven Drill

Recently the Washburn shops of the Worcester Polytechnic Institute, Worcester, Mass., placed on the market a new type of motor-driven sensitive drill press. The special features of this new tool are the way in which the motor is attached and the ease with which the tension of the belt can be varied. As will be noticed from the accompanying engraving the motor is attached to the rear side of the column, thus balancing the tables at the front and giving a symmetrical effect to the whole machine. A base plate bolted to the column supports the motor. The armature of the motor has a cone pulley mounted upon it and the drive is by belt from this pulley to a corresponding one on the driving shaft, and then by quarter-turn belt to the spindle, the tensions on these belts being controlled automatically by locked belt tighteners. The drive shaft bearing slides in and out on a bracket which has a vertical movement through a gibbed slide on the column, both movements being controlled by hand wheels operating a rack and pinion movement.



A New Motor-Driven Drill Built by the Washburn Shops of the Worcester Polytechnic Institute, Worcester, Mass.

An automatic locking device is attached to and forms a part of the pinion shaft. This device is so arranged that the bracket and the slide are locked in every position and the only labor necessary to change the belt tension is to turn the hand wheel. This device corresponds to the arrangement used by the builder on its drawing stands and drafting tables and is very simple. It is thus possible to give the belt the exact tension required for the best results and it is so easily operated that when a job is completed the tension of the belt can be released instantly, thus increasing its life.

Two types of drill press known as the 14 and 13 in. tools are built. The larger is provided with both a square and a round table, the former having an apron of ample proportions and swinging about the column. The round table can be adjusted vertically on the column or removed entirely, and either a cup or a crotch center placed in the supporting bracket. The square table can also be tipped to any desired angle. The 13-in. drill is constructed in the same way, but has the square table only. This is supported by a slide which runs the entire length of the column, the head bracket being on the same slide. Both machines will accommodate drills having a maximum diameter of 9/16 in., and three spindle speeds, namely, 644, 1130 and 1976 r. p. m. are available. While the tools can be driven by any type of induction or direct current motor if the speed range mentioned is desired the regular cone pulley arrangement and a motor operating at a speed of 1130 r. p. m. should be used. The weight of the drill press equipped with a constant speed motor is 430 lb.

Ring-oiling bearings are provided for both the motor and the drive shafts. An independent bearing which takes the entire pull of the belt supports the spindle pulley so that the spindle runs absolutely free. This bearing is flooded with oil at all times, a retaining ring being cast concentric with the bearings and forming a basin which holds the lubricant and prevents it from spattering.

Officials of the United Shoe Machine Company have been indicted for violating the Sherman anti-trust law.

New Finds of Lake Iron Ores

Recent Developments on the Mesaba and the Older Ranges

MARQUETTE, MICH., September 23, 1911.—Important among recent discoveries of iron ore on Lake Superior have been the results attained by the Newport Mining Company, controlled by Ferdinand Schlesinger, of Milwaukee. This company has been most successful in its exploratory work several miles east of its great Newport mine at Ironwood, Gogebic range, having discovered an immense deposit of high-grade ore that it is now preparing to develop. The property bids fair to equal in proportions the Newport itself. Diamond drills were operated for some time under discouraging conditions, but the management persisted. It will be a substantial addition to the wealth of the district. The Newport mine, itself, is one of the most valuable on the Gogebic, and has been so appraised by the Michigan State Tax Commission's mining engineer. For many years it was only a small producer, but finally it entered a new zone that proved to be of great size and richness. The Newport has now been valued for taxation purposes at $13,000,000.

A strike of much significance and apparently of considerable value has been made at the Silverman property east of Ely, Vermilion range. The tract is near the Section Thirty-nine, now in the second year of its productive career, and is owned in fee by the Lazarus Silverman estate. Exploratory work has been in progress a comparatively short time. Two diamond drills are in commission in Section 25,63-12, and each of these has encountered a body of high-grade ore that appears of large proportions. The deposit is only a little more than 100 ft. beneath the surface. The Silverman property is in the hands of Chicago parties who hold it under an option. Between it and the Section 39 the Section Thirty Development Company is at work. Ore in this latter property was encountered by a drill some time ago, and is now being opened by means of a shaft which already is bottomed in the deposit at a depth of 100 feet. The Silverman strike is only 150 ft. west of the west line of the Section Thirty Development Company's tract and apparently is not alone the same body found in the latter, but is an extension of that which the St. Clair interests are mining in the eastern portion of Section 30. The Section Thirty Development Company's property is expected to go onto the shipping list next spring.

The belief that important ore deposits exist in the vicinity of Grand Rapids, western Mesaba range, has been further strengthened as a result of recent exploratory work. Not long ago ore was encountered in a well being driven by the village. Many feet of mineral were cut. Now a similar strike has been made in a well originally sunk by a creamery association, but which has been bored to greater depth by a party of business men. In time the field will be given systematic and thorough exploration.

Still another new strike is one made by the Iron River Ore Company in the Iron River district of the Menominee range. Two diamond drills are in operation and one of these has encountered a deposit at a depth of 190 ft. It is expected that ore will be found in the second hole also. Little is yet definitely known concerning the extent of the deposit, but the outlook is at least considered promising.

A work that will be watched with interest on the Menominee is an exploratory campaign that the United States Steel Corporation is instituting in Felch Township of Dickinson County. A considerable tract owned in fee be the Michigan Land & Iron Company, National Pole Company, Ford River Lumber Company and J. M. Longyear, of Brookline, Mass., is to be drilled. The lands are in the Sturgeon River district. Included in the area is the old Deerhunt property, which at one time promised to develop a mine, but which, like all of the territory concerned, never was adequately tested. No deep drilling was ever done in the area, all past exploratory operations being confined to shallow shaft work and trenching.

The Breitung interests of Marquette have diamond drills at work in the vicinity of their Baron mine at Humboldt, Marquette range. The principal point of attack is several hundred feet east of where Richard A. Parker sunk a shaft—famous in the old days because it followed a 4-in. vein of ore for a distance vertically of several hundred feet—and then quit the work in disgust. The location of the drill is in line with the iron-bearing formation of the vicinity. The Breitung interests have been fortunate in their exploratory work, particularly in the Negaunee district, and have become one of the most important mining concerns of the region.

The Catherine Mining Company, in which the Graham Nut & Bolt Company of Pittsburgh is interested, has made a promising discovery west of Michigamme, Marquette range. A new run of ore, north of the old in this field, has been encountered, and while its extent has not yet been determined the find looks as if it would be of much importance. What this Michigamme district needs is a few mines producing ore of Bessemer grade, and it is within the range of possibility that these will be found. The product so far mined has been a limonite of low grade and selling at a low figure. Of the few producers in the field only the Cleveland-Cliffs Iron Company's Imperial property is now in commission. And this mine, notwithstanding the trade depression, is being provided with new surface buildings.

The Hanna Acquisition of a Maas Property

Brief mention was recently made of the fact that through a lease procured from the North Range Mineral Lands Company, controlled by George J. Maas, of Negaunee, Mich., and associates, the M. A, Hanna interests of Cleveland have added an important deposit of iron ore to their Marquette Range holdings. The property concerned consists of 200 acres adjoining the American Mine on the west. It has been explored extensively with diamond drills, and is known to possess great mineral value. Some account of it has already been given in *The Iron Age*. The lease runs to the American-Boston Mining Company. This corporation is a Hanna subsidiary concern, operator of the American Mine, and for the time being both properties will be wrought as one. In addition to the lease there has been executed between the same interests an option covering 160 acres still further west in the same section. It is believed that this latter tract contains a large ore body also. The 200-acre tract just leased to the American-Boston Mining Company was explored by Mr. Maas and his associates for more than three years. A large number of diamond drill holes were put down; one of these, bottomed at 3200 ft., is the deepest ever bored in America, and what is described as an "exceptionally large" deposit of ore was proved up. The deposit was followed to within 300 ft. of the American Mine. The initial development work will be prosecuted from drifts extended from the American property. The American-Boston Company is at present producing at the rate of 200,000 to 300,000 tons a year, with more than 300 men employed. With the drifts extended into the ground newly leased 500 to 600 men will be on the payroll and within five years, it is figured, the company's annual production will exceed half a million tons.

A number of prominent upper Michigan men have recently organized the Forty-Six-Thirty Mineral Lands Company, with its head office at Negaunee. It has acquired more than 1400 acres in Sections 6, 18, 20 and 30, 46-30, directly west of Republic, and on the same formation as the Cambria Steel Company's Republic Mine, Marquette Range. This formation is styled by geologists "the Republic trough." Except for three sections owned in fee by the Michigan Iron & Land Company and now being explored by the United States Steel Corporation intervene, the holdings of the newly organized concern extend for three miles along the trough. Sufficient work has already been done to disclose the presence of Bessemer ore, but its extent can be determined only by systematic exploration. The company will not develop mines on its own account, but will option and lease to operators making mining their business. The president is J. C. Kirkpatrick, Escanaba; vice-president, Abram Mathews, Marquette; secretary and treasurer, Joseph H. Winter, Negaunee. The directors include Edwin L. Thompson, of Detroit, and A. F. Mayer, of Chicago.

The rail mill of Guest, Keen & Nettlefolds, Ltd., at Dowlais, Wales, was closed down last week, acording to a cablegram, by a strike. The advances asked are reported to range from 15 to 27 shillings a week.

Gaco Specialties

Details of Two New Products

The Pittsburgh Gage & Supply Company, Pittsburgh, Pa., has recently brought out two new specialties. These are designed to be used in combination as shown in Fig. 1 and are the Gaco self-closing safety water gauge, details of which are given in Fig. 3, and the Gaco take-down gauge cock, illustrated separately in Fig. 2. The special advantages claimed for the gauge cock are strength, safety, longer life and lessened cost, while the special features of the water gauge are a substantial and simple type of construction, economy in operation, positive action and the accurate indication of the correct water level at all times.

The gauge cock which is shown at the right of Fig. 1, and in detail in Fig. 2, cannot, it is claimed, be twisted out of shape or broken off, while clogging and corrosion are prevented by the use of large ports. This gauge cock is one that it is pointed out can be taken down under a full head of pressure and repaired in a few minutes by replacing a protected disk gasket which is all that is ever required in making repairs. The end shank is never removed, but remains in the boiler while the repairs are being made, and the self-closing inner seat prevents steam or water from escaping. The seat A, Fig. 2, is removable and is of the double type, so that when taking the cock down the inner seat closes, keeping the steam and the water in the boiler while repairing gaskets. This feature, together with the cap-protected, non-grinding disk, are said to insure long life. The spring B and the stuffing box are so arranged as to keep the seat closed positively, the packing in place, and prevent leakage in the other steam. An adjustable lever, C, enables the attendant to operate the gauge at any desired angle from the floor.

The mechanism of the water gauge illustrated in Fig. 3 is very simple, and its construction is said to embody all the safety features necessary for protecting employees and safeguarding property. The side bar operates so as to throw the check upward, thus allowing the reamer to pass into the water column or the boiler for cleaning after the front stem has been removed. The port, which is sufficiently large to permit the seat to be removed, is of uniform size throughout the entire gauge, a feature that prevents clogging or corrosion. The disk is suspended from above and swings freely, thus making it practically impossible for scale or sediment to become lodged upon it, as would be the case if the hinge were placed at the bottom. When using the reamer the disk is raised out of its path by the side bar. The valve seat can be readily removed without damage by unscrewing, the large opening enabling tools to be used.

After connections are made to the water column or the boiler and the gauge glass is in place, the chain is attached as shown in Fig. 3. The wheel D is turned to the left until the valve stem E is opened wide. The chain attached to the small end of the side lever F is then pulled down, which opens the clapper disk G and permits the glass to fill. When the gauge glass has become filled the chain fastened to the small end of the side lever should be pulled down as far as it will go, leaving the arrow end down as shown. When it is desired to blow the gauge glass down the chain attached to the small end of the side lever is pulled down and held, thus holding the clapper disk open. The pet cock or drain pipe valve is then opened, allowing the steam and the water to pass freely from the gauge glass. After the pet cock or drain pipe valve is closed the chain attached to the arrow end of the side lever should be pulled down. This brings the clapper disk into the operating position and the arrow ends of the side lever should be kept down as shown in Fig. 3 at all times except when starting and blowing down.

Two sizes of water gauge and gauge cock are made, having diameters of ½ and ¾ in. respectively. The water gauges can be furnished with plain, polished or nickel-plated bodies, while the gauge cock mountings are either polished or nickel plated.

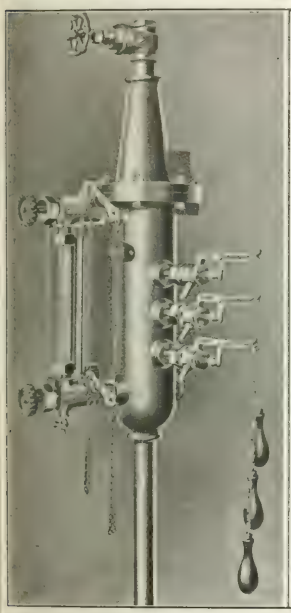


Fig. 1.—The Water Gauge and the Gauge Cock.

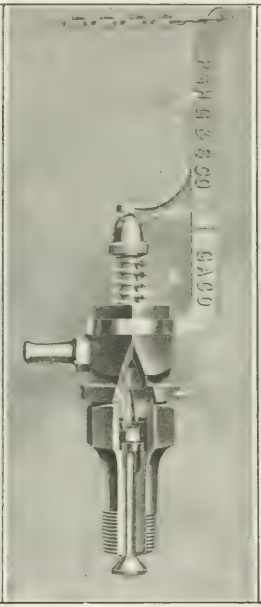


Fig. 2.—Details of the Take Down Gauge Cock.

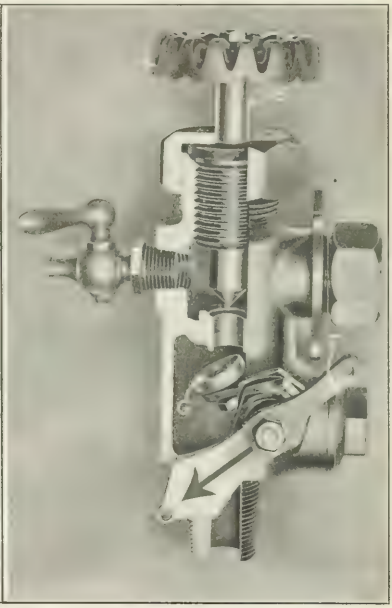


Fig. 3—Details of the Self-Closing Water Gauge.

Two New Specialties Made by the Pittsburgh Gage & Supply Company, Pittsburgh, Pa.

The new 5-story Times Building in New Bedford, Mass., is constructed with fireproof and sound-proof material—metal lumber, metal lath, metal ceilings, etc., the contract for which was let to the Berger Mfg. Company, Canton, Ohio. The metal work in the building includes joists, rafters, studs, lath, window frames, sashes, door frames, base boards, wainscoting, ballusters, ceilings and stairways. It was the pioneer of its kind in New Bedford and since its construction others in that city have followed with metal construction as the chief characteristic.

Special Reading Cranes

Two 10-ton hand-power overhead traveling cranes having a span of 24 ft. 10 in., have been recently installed in the testing room of the United States Bureau of Standards, Washington, D. C., by the Reading Crane & Hoist Works, Reading, Pa. These cranes will be used to handle I beams and other heavy material which is to be tested in the $150,000 machine now being installed. One of the special features of these cranes is a very fine control of the movement which was made necessary on account of the delicacy and accuracy required in handling these sections. Fig. 1 shows one of the cranes, while Fig. 2 is a view of the room in which the two cranes were installed, showing them in position.

The hoist had to be built to give different speeds in lifting loads weighing three, five, eight and ten tons each, and as the material tested was of irregular shape and size, and must be turned frequently in the testing machine, it was found necessary to depart from the usual method of racking the trolley on the crane bridge and use a lead screw throughout the entire length, these two features resulting in the design of a special crane and hoist. The variation of the lifting speed was accomplished by using one of the builder's multiple-gear combined hoists and trolleys with interchangeable chains for the different capacities. The gearing for the hoists was all cut from solid steel blanks and runs in an oil bath contained in a dust-proof casing. Both ratchet and friction brakes form a part of the equipment of the hoists, the former taking care of the load while it is being lifted and the latter regulating the speed at which it descends and being capable of a fine adjustment.

The lead screw which is used to control the movement of the trolley on the crane bridge is securely fastened in brackets at each end of the crane. An arm which extends from the side of the trolley carries a brass nut of special design that is not inserted in a sprocket or hand chain wheel. This brass nut is so designed that the turning of the nut by the hand chain wheel operated by a pendant chain propels the trolley along the tracks on the top of the crane. This arm also carries the hand chain wheel for operating the crane bridge and serves as a support for the bridge shaft.



Fig. 2.—View Showing the Cranes Installed.

Box construction is used for the trucks, which are built up of steel plates and channels with heavy reinforcement at the axle bearing points. The truck wheels have chilled and ground treads and run on roller bearings in bronze cages. All of the gears are cut from solid blanks and the axles are hollow bored to permit the lubricant to be forced into the centers of the roller bearings.

Although these cranes are intended to be used independently of each other, if the load to be lifted is too much for one to handle they can be used in multiple. In a recent test of this character a piece weighing 23 tons was lifted by the two cranes.

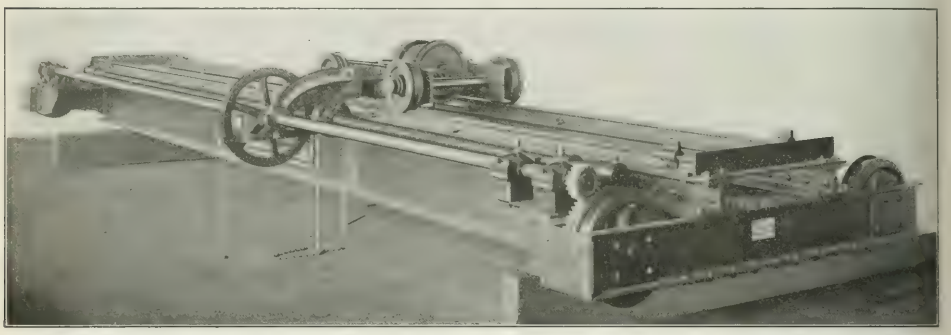


Fig. 1.—One of the Two Cranes Built for the Bureau of Standards by the Reading Crane & Hoist Works, Reading, Pa.

The Winona Technical Institute.—The suit which is to settle the future of the Technical Institute at Indianapolis will be heard October 16 at Danville, Ind., by change of venue from Indianapolis. Some of the donors to the fund raised by the city to purchase the Technical Institute grounds from the government are suing to have the property sold because the institute is in the hands of a receiver. If this litigation is settled satisfactorily, either in court or out of it, the property, now valued at over $1,000,000, will go to the school city of Indianapolis, by authorization of an act of the Legislature passed last winter, the act also providing for taxation for the support of the institute. The International Stewards' Association is awaiting a settlement of the trouble before starting to build a training school for stewards on the grounds to cost $200,000. The title to the Technical Institute property rests in a board of five trustees. The tax levy of 3 cents on the $100 for the operation of the school will not be available until next year, and the receiver is continuing the departments until that time by means of the sale of receiver's certificates, authorized by the court.

The Journal of Industrial Safety for August-September, issued by the Industrial Safety Association, 29 West Thirty-ninth street, New York, presents as its leading article a description of the movement on the lines of the Chicago & Northwestern Railroad to secure greater attention to safety provisions through the organization of a Safety Committee. An illustration is given of a method of safe-guarding motor-driven lathes. Mine fires is a topic which receives attention. The safeguarding of women workers in Germany is the subject of an illustrated article. A safeguarded sectional switchboard is described, which is so built that a section can be moved out of its place for the purpose of making adjustments, the pulling out of the frame disconnecting the switches so that the workman is safeguarded as long as he keeps the section in front of the rest of the cabinet. A method of safeguarding a small crosscut saw is also illustrated.

A Diesel motor of 2000 hp. installed in the electric generating station of Saint-Chamond was described recently in Le Génie Civil. It was built by Sulzer Frères, Winterthur, and is believed to be the largest Diesel engine yet constructed. The oil, received in wagon tanks, is stored in two large reinforced-concrete reservoirs provided with a vitreous lining.

United States Bureau of Mines Demonstrations

At the Arsenal grounds, Fortieth and Butler streets, Pittsburgh, Pa., beginning at 9 a. m. October 30, and closing at 12 m., a demonstration will be given of the work of the United States Bureau of Mines, with an exhibit of detonation of permissible and other explosives, in the steel lined gallery, filled with dust and gas. It will include exhibits and tests of mine safety lamps; of electric sparks in the presence of an inflammable mixture of air and gas; of training in rescue work with oxygen helmets; of investigations and tests of explosives; views of smokeless combustion of coal; briquetting of coal and lignite, etc.

In the afternoon there will be an actual explosion at the experimental mine of the bureau at Wallace Station, near Bruceton, Pa. This mine has been opened and equipped by the bureau with instruments for recording pressures, speed of travel of detonation wave, with various equipment for the making of actual mine explosions due to gas and dust and their observation and study; also of conducting tests of coal-cutting machines, gasoline motor, electric motor and other mine locomotives, and apparatus under working conditions within a mine.

At Forbes Field, Pittsburgh, on the morning of October 31, a demonstration will be given under the joint auspices of the American Red Cross, Pittsburgh Coal Operators' Association, and the United Mine Workers of America, but under the management of the Bureau of Mines. A parade of miners will be made under the auspices of the United Mine Workers of America. Other features of the programme are as follows:

At 9 a. m. an exhibit of skill in first aid to the injured by teams of five miners from various coal operations in the United States.

At 11 a. m. a demonstration by the Bureau of Mines in steel-lined mine gallery 200 ft. long, of a permissible shot, followed by an explosion of black powder detonated in the presence of coal dust, with a resulting explosion of coal dust ignited by the nonpermissible explosive, followed by a demonstration of rescue work. Men equipped with oxygen helmets will enter the gallery stair still filled with smoke and poisonous gases, will bring out injured men and give them artificial respiration and first aid. There will also be a demonstration in dangerous practices within gaseous or dusty mines.

At 12 m. President Taft will deliver souvenir prizes to the participants. Short addresses will be made by the President, Governor J. K. Tener of Pennsylvania, Secretary Walter L. Fisher of the Department of the Interior and others.

At 1 p. m. the President will proceed to the river front to review the marine parade in honor of the centenary of opening navigation on the Ohio River.

A New Feature of the Gandy Belt

The Gandy Belting Company, Baltimore, Md., sole manufacturer of the Gandy belt in the United States, has adopted a novel as well as an entirely original idea for distinguishing the Gandy belt from the other stitched cotton duck belts. Hereafter one edge of the Gandy belting will be painted green, while the rest of the belt will remain red as before, and it will continue to bear the brand "The Gandy Belt" and the trademark, a coil of belt and a bale of cotton laid across it, printed on the belt at intervals throughout the entire length of the roll, the same as has been the rule heretofore. The company explains that this step is made necessary because some unscrupulous competitors have endeavored to imitate its belt in appearance, color and texture. As the imitation belts are usually of an inferior quality of material and workmanship, they have failed to give the same degree of satisfaction as is experienced by the Gandy belt users.

The foundation of the Gandy belt is a very heavy cotton duck, woven in the duck mills of the Gandy Company. The sewing machines on which the belts are stitched are built in its own machine shop, and have features possessed by no other sewing machine, in that they stitch with an imbedded stitch, making the surface of the belt smooth and holding the plies solidly together. The belt is then treated by a secret process, which renders it water, heat and steam proof. Every Gandy belt is thoroughly stretched and seasoned before leaving the factory. It is uniform in width, runs straight and true, and will not slip or harden. The company fills all orders on the day received, as it carries in stock at Baltimore more than 1200 rolls of roll belting in all widths from 1 in. 4-ply to 30 in. 10-ply. In addition to this it carries in stock more than 4,000 Gandy thresher belts in every recognized thresher length and width.

The Slatington Mill Again in Operation

The Slatington Rolling Mills, incorporated July 6 under the laws of Pennsylvania, successor to the Slatington Rolling Mill Company, Slatington, Pa., started up its plant September 11. Many alterations and improvements have been made by the new owner, a large amount of money having been expended in placing the plant in thoroughly modern condition. The yearly capacity of the mill is 7500 tons of merchant bar iron. It is equipped with two coal heating furnaces, six single puddling furnaces, one busheling furnace, one rotary squeezer and three trains of rolls. The mill will manufacture rounds, squares, flats, special boiler and bridge rivet iron, small even-leg angles, round edge tire iron, half rounds, ovals, half ovals, bevels, reinforcing bars, etc. Special attention will be given to strictly high grade bar iron under the following brands: Slatington, Slatington D.R., Slatington S.B., Slatington Special, and Slatington Norway. Edwin German is president and Walter H. Andrews is secretary and treasurer. Esau Prestwood is superintendent.

The electric power developed at Niagara Falls is placed at 275,000 hp., or about 5.5 per cent. of the available power of the cataract, by A. J. Jones, in a paper on the transforming stations of the Niagara electrochemical and electrometallurgical industries, read before the American Electrochemical Society, which held its general meeting in Toronto, September 21 to 23. From the seven hydroelectric stations, he states that 128,000 hp. is used for electrochemical purposes, 46 per cent. of the total amount and 87 per cent. of the amount used at the Falls. For railroad service 56,000 hp. is used; for lighting, 36,000 hp.; for various industrial purposes, 55,000 hp.

A new bi-monthly illustrated magazine entitled Vocational Education is being started this month by the Manual Arts Press, Peoria, Ill., the subscription price of which is $1.50 per year. It has been established to meet a demand for the latest information concerning the results of vocational school experiments. It will contain a series of illustrated articles dealing with different types of such schools and especially of institutions supported at public expense. Another feature will be articles on methods of teaching certain courses of instruction that have been found helpful in meeting vocational demands. The list of members of the editorial staff and advisory board comprises educators of prominence connected with technical schools throughout the country.

The Corey Land Company of the new town of Corey, near Birmingham, Ala., where the American Steel & Wire Company has been building a large plant in the past year, recently sold to the Tennessee Land Company, a holding company for the Tennessee Coal, Iron & Railroad Company 106 town lots, the consideration being $101,850. The Tennessee Land Company has let a contract to the Realty Construction Company for 31 houses to be built in Corey and the latter company has a contract from the Corey Land Company for the building of 15 houses. Most of these 46 houses are nearing completion.

The Smooth-On Mfg. Company, 572-574 Communipaw avenue, Jersey City, N. J., publishes a note from the De Lamar Copper Refining Company, Chrome, N. J., relating to the service rendered by corrugated Smooth-On gaskets supplied to that company in May, 1906. These gaskets numbered about 614. This summer, after the passage of five years, the De Lamar Company was asked about the results obtained with the use of these gaskets, and the gratifying reply was received that the steam lines have remained tight, the gaskets having given no trouble whatever. The Smooth-On Mfg. Company has issued a circular giving the facts in this case.

The Machinery Markets

A New York firm is getting bids on about $100,000 worth of machinery for export to South America and the general export demand continues excellent. Manufacturers of motor trucks are buying in New York. The Chicago trade is bidding on a large list of machinery for the International Harvester Company and the railroads are buying in small lots. A better demand has developed in Cleveland where there are two small lists out, each calling for $3,000 worth of machinery. Power transmission machinery is in good demand in Detroit and inquiries have increased. The volume of inquiries is also better in Cincinnati, where local buying has improved. Purchasers are showing more interest in New England, and inquiries for machine tools are on the increase. Texas dealers are waiting for renewed buying from Mexico, following the presidential election in October. Business is generally quiet in the South, the principal demand being for electrical equipment. Reports from the Pacific coast indicate that the past four weeks there have been the duliest this year.

New York

NEW YORK, September 27, 1911.

There is a better volume of new inquiries in the machinery trade and some good orders have been placed. The most important list before the trade in this vicinity has been issued by Fox Brothers & Co., 126 Lafayette street, New York, for equipment for railroad shops in South America. The company is buying fully $100,000 worth of machinery, and its list includes a large amount of machine tools. It is understood that orders for most of this material will be placed within a few days. The Pennsylvania Railroad is asking for bids on a few machine tools, but otherwise the railroads are doing nothing of consequence in the buying line. There is renewed demand for equipment for automobile plants. The Only Motor Car Company, 1919 Broadway, New York, placed orders during the week for about $30,000 worth of equipment, and it is understood that the company has more purchases to make. There are some inquiries in this market from the D. K. Snyder Sons Company, Portsmouth, Va. This company makes motor trucks. There is also a request for machinery bids from the B. F. Board Motor Truck Company, Alexandria, Va., which desires especially to obtain quotations on lathes and drill presses. The company is also interested in other machine-tool equipment. Several New York houses have received inquiries from the Frick Company, Waynesboro, Pa., which manufactures traction engines and agricultural equipment. This company is making a large addition to its plant, and from all accounts it will purchase about $25,000 worth of machinery. New York machinery men are also expecting some business from the Lehigh Coal & Navigation Company for its plant at Lansford, Pa. Another good prospect is the Lebanon Iron & Steel Company, Lebanon, Pa., which is looking into the matter of purchasing equipment for an extensive addition it now has under way. There seems to be a lull in the demand for heavy machine-tool equipment and for automatics, but the call for metal-working machinery for handling light stock is very good. Metal presses, small punches and drills of the lighter sizes are being sold principally in lots of from one to five machines. There is a good deal of competition for business in sight and the attitude of buyers seems to indicate that prices quoted them are varied as prospective purchasers show a disposition to bargain in filling their wants. The export demand continues good, but export agents are somewhat worried about the political unrest in Europe.

Naval engineers are advocating extensive improvements to the Brooklyn Navy Yard, and a movement is on foot among them to influence the Navy Department in that direction. Naval Engineer F. R. Harris and Naval Constructor W. G. Groesback have submitted a report to the department, said to be a consensus of opinion of a number of naval officers, which recommends that about $14,300,000 be spent in making the navy yard one of the biggest of its kind in the world. The report suggests enlarging the dry docks, modernizing the shops and adding to the mechanical equipment.

The International Automobile League Tire & Rubber Company, Buffalo, N. Y., now located at 72 Pine street, has secured a site at Northland avenue, Chelsea Place and the New York Central Railroad Belt Line, and is having plans prepared for an extensive plant which it will erect for the manufacture of pneumatic tires and inner tubes for automobiles. The company has a capital stock of $1,000,000. A. C. Bidwell is president.

The Board of Water Commissioners, Tarrytown, N. Y., is receiving bids for about 11,000 ft. of 10-in. cast-iron pipe and some additional quantity of smaller sizes with valves, specials and hydrants.

The Victor Milling Company has been incorporated at Victor, Ontario County, N. Y., with a capital stock of $50,000, and will erect a mill for the manufacture of flour, feed, etc. The incorporators are W. H. Draper, J. Fairles and J. J. Child, of Troy, N. Y.

The Martin Pulp & Paper Company has been incorporated at Norfolk, St. Lawrence County, and will engage in the manufacture of pulp, paper, etc., with a capital stock of $50,000. The incorporators are O. E. Martin, M. J. Martin and H. W. Martin, of Norwood, N. J.

The Rotary Pump Transmission Company, 103 Park avenue, New York, has been incorporated with $200,000 capital stock to manufacture iron pumps and transmission systems. The incorporators are Charles R. Hoffman, Copeland Townsend, George A. Burkhard, all of New York. No manufacturing plans have as yet been made.

The Uehling Instrument Company, Passaic, N. J., contemplates increasing its manufacturing equipment considerably, although not proposing to undertake any new building construction. It is bringing out several new recording instruments and making important improvements on those which have been on the market for some time.

Kraeuter & Co., Inc., 571 to 585 Eighteenth avenue, Newark, N. J., manufacturers of mechanics' tools, are about to erect a four-story, reinforced-concrete factory. The contract for this building will be signed shortly.

The Sloan & Chace Mfg. Company, Sixth avenue and North Thirteenth street, Newark, N. J., is contemplating an addition to its plant, including manufacturing equipment. The company, which manufactures precision machinery, reports its business as having been quite good for the whole of the past two years and states that it is now better than ever before in its 39 years' experience.

The Patten & Stafford Company, Canastota, N. Y., manufacturer of a line of farm implements and related products, is retiring from business, owing to the late fire which destroyed its plant.

Joseph A. Morrow, manufacturer of tools, dies and special machinery, Albion, N. Y., is contemplating enlarging his plant by the erection of a three-story building, 75 x 200 ft. Business with this company has been extraordinarily good for the past five months.

New England

BOSTON, MASS., September 26, 1911.

An increase in inquiries for machine tools is noted, including heavy tools, but on the whole actual buying has not improved. In some lines of manufacture business is very good. Some of the wire mills are quite busy, the demand for many specialties keeping up.

The tool steel people have been disappointed in promised business from the car builders and manufacturers of other classes of railroad equipment, advices from their representatives on the road indicating that little is in sight from these sources. But in spite of the unfavorable conditions in the stock market the week seems to have developed a slightly greater optimism.

The G. H. Bushnell Press Company, Thompsonville, Conn., has sold its cottonseed oil machinery business to the American Machine & Mfg. Company, Greenville, S. C., the transaction including equipment as well as patterns and stock on hand. The removal

THE MACHINERY MARKETS

to Greenville will be made in the near future. This business was established by G. H. Bushnell & Co. 25 years ago. The Bushnell company will devote much attention to the development and manufacture of a three-wheel automobile for light, quick delivery, which will soon be ready for the market. The company is not yet ready to take on new tools, as it has a reasonable equipment, but will probably require some special machinery later on. The sale to the American Machine & Mfg. Company is confined to the cotton seed oil mill business, the company proposing to continue the manufacture of its general line of presses for the present.

The Lamson Consolidated Store Fixture Company, Lowell, Mass., manufacturer of carriers for service in and between buildings, will erect an additional building, 50 x 120 ft., four stories, of reinforced concrete throughout and fireproof in all particulars. A small amount of equipment will be purchased, but the company states that no decision has been reached as to what will be required. The additional space was made necessary by the large growth of the business. It will greatly facilitate the handling of materials, patterns, etc.

The New Milford Cold Rolled Steel Company, New Milford, Conn., has been organized to manufacture cold rolled strip steel, and will make a specialty of the finer grades to meet the demand for an even gauge and extra bright surface for the drawing and plating trade. A plant is being prepared at New Milford. Orders for present requirements in the way of machinery have been placed, but the company expects to be in the market for more equipment in the near future. The factory will be prepared to make shipments about November 1. Charles de L. Ensign, 311 State street, Bridgeport, Conn., is the president, Robert G. Ashman, vice-president, and Charles A. Bottomly secretary and treasurer.

The Norton Grinding Company, Worcester, Mass., manufacturer of grinding machinery, is occupying the new drafting room and the engineering quarters in the new brick building, which is the head house of the large addition to the works. The brick structure is 40 x 70 ft., three stories, while the main body of the addition will be 84 x 265 ft., one story with balconies. At present the space will be used for erecting and storage, and no new machinery will be installed. The two occupied units of the works are greatly crowded, owing to the rapid growth of the industry.

The Norton Company, Worcester, Mass., manufacturer of grinding wheels, contemplates several additions to its present buildings, which will require some additional equipment.

The Eastern Blaugas Company, 195 Middle street, Portland, Me., will erect works in that city for the manufacture of gas for lighting and heating purposes, the fuel being stored in steel tanks for use where no gas plant is available as a source of supply. The parent corporation, the Blaugas Company of America, already controls works at Montreal, Canada, and on Long Island, New York. The Portland plant will consist of three buildings. Much of the equipment has been contracted for abroad.

The Lorraine Mfg. Company, Pawtucket, R. I., textile manufacturer, will erect a machine shop 63 x 150 ft., three stories, according to a published announcement in that city.

The Morgan Silver Plate Company, Winsted, Conn., will build a plating shop 27 x 33 ft., two stories.

A foundry will be erected at Bridgeport, Conn., from plans drawn by Beckwith & Johnson, architects of that city, the name of the owner being withheld. The building will be located on State street, and will be 40 x 80 ft., one story, with steel truss roof. It will have a machine shop as well as a foundry room.

The business of the American Pressed Steel & Machine Company, 352 Atlantic avenue, Boston, manufacturer of pressed steel products and special machinery, has been incorporated as the Nevelson Machine Company, with a capital stock of $15,000. Julius Nevelson remains at the head of the business, the other incorporators being Robert M. Clark and Isadore Niditch.

A tentative announcement, lacking details, is that the Mt. Croyden and Mt. Kearsarge valleys in New Hampshire are to be converted into a chain of reservoirs, creating one of the most extensive water powers in the country, the purpose being to distribute electric power to New Hampshire and Massachusetts manufacturing industries.

The Aerial Construction Company, Hartford, Conn., has been incorporated by a number of well known citizens of that city to manufacture a commercial airship, in which are combined the dirigible and the aeroplane. F. W. Dart is the president, F. W. Stickle vice-president, F. C. Billings treasurer, Franklin Wells secretary, and Joseph K. Kopacka managing director. The company's engineer is John Twardus, well known in Germany, who has made a detailed study of aeronautics in this country and abroad. An office has been established at 212 Asylum street.

The Scovill Mfg. Company, Waterbury, Conn., manufacturer of brass and brass goods, proposes to increase its capital stock to $5,000,000, by issuing 9,386 shares at $100, which will be offered to stockholders at par in the ratio of their holdings. The question will be submitted to the stockholders at a special meeting called for September 29.

Projected increases in general manufacturing industry include the following: J. & J. Cash Company, South Norwalk, Conn., textiles weave shed 36 x 125 ft., one story, and a building 32 x 50 ft.; Webster Paper Box Company, Webster, Mass., building 26 x 92 ft., two stories, to replace factory recently destroyed by fire; Fisk Rubber Company, Chicopee Falls, Mass., factory building 36 x 66 ft., two stories, and a cement house.

The American Tap & Die Company, Greenfield, Mass., maker of screw cutting tools, has recently acquired the plant of E. S. Hulbert & Co., Inc., at Bernardston, Mass., and will make some alterations with a view to manufacturing part of its product there.

Philadelphia

PHILADELPHIA, PA., September 26, 1911.

While there is a little more business in sight, some of which will develop into pretty fair purchases, as measured by the recent standards of buying, there has been little change in the immediate market situation. Several moderate lists for both metal and woodworking machinery are expected to develop in the near future, but in the majority of the cases purchasers have not fully decided on their general requirements, although orders for some tools, principally those of a special character, have already been placed. In instances some little quiet buying has been under way, not sufficient, however, to make any apparent change in market conditions, manufacturers and merchants reporting the same irregular demand that has been noted for many weeks. General inquiry still continues light and competition for business offered is keen. New business coming from the railroads is light; a few scattered orders have been placed against recent inquiries, but purchases as well as inquiries are unimportant. Engine builders are figuring on considerable work, although immediate orders have been light. The second-hand machinery market continues dull, scattered general sales representing the usual run of business. Machine tool and general machinery manufacturers report conditions as practically unchanged, in instances, however, builders of special equipment have taken on more work and have enough orders on hand to keep them comfortably engaged for some time ahead.

F. A. Havens & Co., contractors, have been awarded the contract to erect the new machine shop to be built for the Harlan & Hollingsworth Corporation, Wilmington, Del. The building will be of brick and steel construction, about 100 x 150 ft. Working plans are now being completed. Orders for some of the equipment for the new shop have, it is said, already been placed.

The United States Asbestos Company, Manheim, Pa., manufacturer of asbestos packing and rings, for high pressure service, is erecting a number of new buildings for manufacturing purposes. When completed the capacity of the plant will be doubled.

George S. Throp, Media, Pa., has let a contract for the erection of hollow tile and plaster addition 20 x 35 ft., two stories, to be used as an addition to his wheelwrighting department.

The George Oldham & Son Company, Frankford, Philadelphia, manufacturer of pneumatic tools and appliances, reports business conditions as being fairly good. The outlook for further business is encouraging, more particularly for certain classes of its special equipment.

Smith, Drum & Co., manufacturers of dyeing and finishing machinery, are taking bids for an addition to their machine shop. The building will be 70 x 100 ft., two stories, and will be used particularly as an extension to their woodworking and light machinery department. While the machinery requirements for the new addition have not yet been determined upon, consider-

THE MACHINERY MARKETS

able in the way of wood-working equipment will be purchased.

The Swartz Wheel Company, Worth and Margaret streets, Frankford, Philadelphia, is building a two-story factory addition, 58 x 95 ft., which will be used as an extension to its dry rooms and warehouse. An elevator will be installed in the new addition.

The A. Buch & Son's Company, Elizabethtown, Pa., is increasing the capacity of its wood-working and planing department 50 per cent. The necessary machinery has already been purchased.

Bids have been taken for a one-story power house and coal pocket to be erected for the American Dredging Company, Camden, N. J. The power house will be one story, 55 x 78 ft.

Deinelt & Eisenhardt, Inc., manufacturers of special machinery, are quite busy. Orders have been taken recently for two large oilcloth printing machines, one for delivery to Portland, Maine, the other for shipment to the West. Considerable business in special paper bag making machinery has also been booked. The demand for power hammers has also been good and a number, particularly those of the smaller types, have recently been shipped. This concern has been gradually adding to its machinery requirements, which are now pretty fully covered and is operating its plant at full capacity.

Considerable is heard from time to time of proposed improvements to be made to the Broad street station of the Pennsylvania Railroad and the electrification of its suburban trains. Tentative plans have been drawn and have been considered by officials of the company, but the work is of such magnitude, embracing also terminal facilities for both the freight and passenger service, that nothing definite is available or has been decided upon at this time.

Chicago

CHICAGO, ILL., September 26, 1911.

Selling effort among machinery dealers during the past week has been directed for the most part toward the closing of inquiries carried over from the week previous. In addition to business pending and mentioned in our report of a week ago, none of which is as yet closed, the International Harvester Company is about to buy a considerable quantity of machines for the addition to its Tractor Works plant. A number of the railroads are in the market for one and two tools for roundhouse and shop equipment, but floor sales from the various dealers' stocks have been less active.

The Maxant Engineering & Mfg. Company, Chicago, organized to conduct an engineering and manufacturing business in mechanical and electrical products, has been incorporated by Basil Maxant, Frank Maxant and William B. Johnson with a capital stock of $100,000.

The Acorn Brass Mfg. Company has moved its works and principal office from Chicago to Aurora, Ill., where it will occupy the buildings vacated by the Richards-Wilcox Mfg. Company.

The Lake Shore & Michigan Southern Railway Company has taken out a building permit at Chicago covering the erection of a one-story roundhouse, to cost approximately $124,000.

The estate of George M. Pullman, through Frank O. Lowden, trustee, Chicago, has purchased a site at Pullman, Ill., for the erection of a mechanical training school, for which provision was made in the will of the late car manufacturer. The equipment of this school will include a practical and extensive mechanical equipment.

The La Salle County Electric Railway Company has been incorporated with a capital stock of $5,000, to build an electric railroad in La Salle County, Ill. The principal offices will be in Chicago, and following is a list of the directors: George H. Dodge, 1131 East Sixty-fourth street, Chicago; O. D. Weaver, Jr., 4425 North Winchester avenue, Chicago; Edward Horsman, 4633 Kenmore avenue, Chicago; Boyd C. Weaver, 4425 North Winchester avenue; Fred S. Abraham, 1937 Morse avenue, Chicago.

The electric light plant at Prairie City, Ill., was seriously damaged by fire.

The Rockford Drop Forge Company, Rockford, Ill., has broken ground for its new factory, the building for which will be 100 x 160 ft.

The Richards Hardware & Specialty Company, Aurora, Ill., has been incorporated with a capital stock of $100,000 by W. S. Cumming, Henry M. Hodson and William J. Pringle, all of Chicago. The new company, it is understood, will provide for the enlargement of the Richards Standard Company, Aurora.

The Dexter Mfg. Co., Fairfield, Iowa, has begun work on a new factory building in that city, 60 x 124 ft., three stories.

The Frost Mfg. Company, Kenosha, Wis., has sold to the Chicago Brass Company, of that city, the land and buildings it now occupies. The transfer, it is announced, will anticipate the building of a new plant for the Frost Mfg. Company and an extension of the present capacity of the Chicago Brass Company.

The McGowan Water, Light & Power Company, Milton Junction, Wis., has been incorporated with a capital stock of $30,000 by E. C. McGowan, William A. Dodd, Jennie M. McGowan and Ray E. McGowan.

The Wonches Mfg. Company, Deerfield, Wis., has been incorporated with a capital stock of $30,000 by S. M. Hanson, J. N. Brown and H. B. Fargo.

C. F. Hankwitz, Merrill, Wis., is negotiating for the purchase of a site preparatory to erecting a plant for the manufacture of broom and shovel handles. Machinery, the purchase of which is contemplated, includes a cut-off saw, one bolter, equalizer, automatic rip saw, tool lathe and a chucking and boring machine, together with power equipment.

The Plymouth Foundry & Machine Company, Plymouth, Wis., has been organized by R. W. Robertson, W. N. Holling and L. A. Becker with a capital stock of $30,000.

The Lyle Corrugated Culvert Company will erect a new one-story factory on Twenty-seventh avenue, Minneapolis, Minn., at a cost of $8,000.

The city of Creston, Ia., has voted the issuance of $10,000 in bonds for the installation of a water works plant.

Cleveland

CLEVELAND, OHIO, September 26, 1911.

The demand for machine tools shows a little more activity. Dealers are doing a somewhat better volume of business in single tools and inquiry is a little better. Two lists have come from manufacturers who are planning the enlargement of their existing plants. One is for 8 tools and the other for about 12 tools. Each lot will amount to about $3,000. The demand for second-hand machinery is also a little more active. The outlook for small orders for equipment for new plants has improved as a number of small plants are being planned in this territory to engage in metal working lines. The general machinery market continues quiet. Makers of handling machinery of various kinds are getting a fair volume of small orders and are figuring on considerable other small work, but there is a scarcity of inquiry for handling equipment for large plants. Makers of automobile parts are quite busy. In other manufacturing lines conditions remain about stationary.

To secure new industries for Cleveland and to extend the trade in the city's present products the industrial development committee of the Cleveland Chamber of Commerce, of which D. T. Croxton, president of the Cleveland Furnace Company, is chairman, has formulated a plan to establish a buyers' bureau to be maintained in some of the rooms of the Chamber, in which all of the products of the city can be shown in photographs, and catalogues of manufacturers can be kept on file. The matter has been placed in a buyers' bureau committee, of which F. F. Prentiss, formerly president of the Chamber is chairman.

The Board of Education, Cleveland, is in the market for complete foundry equipment for the West Technical High School, specifications for which are being prepared. Bids will be received October 16. Contracts for $11,000 worth of machine tools for the new school have been awarded. Bids for about one-half of the machinery requirements, however, were rejected and new bids will be received about November 1 on a new list which includes 18 14-in. lathes, two motor driven 14-in. lathes, 4 shapers, three milling machines and an automatic screw machine.

The Peerless Gear Tester Mfg. Company, Cleveland, has been incorporated with a capital stock of $50,000 by Worthington Hoyt, 623 Schofield Building, R. L. Ford, A. W. Kilbourne and others.

The Director of Public Service, Cleveland, will receive bids October 9 for an asphalt tandem steam roller and a portable asphalt mixing plant.

The Buckeye Twist Drill Company, Alliance, Ohio,

THE MACHINERY MARKETS

has been incorporated with a capital stock of $150,000 by E. D. Rogers, George F. Glass, H. C. Koeher, D. D. Hurlburt and O. F. Transue.

The Ashland Wrench Company, Ashland, Ohio, has been incorporated with a capital stock of $15,000 by John Gabrill, Samuel Miller and others to manufacture a new type of wrench The company has under consideration a site for a plant. Toledo and Ashland men are interested in the company. The wrench is at present made by W. E. Golden, Fremont, Ohio.

The Ashtabula Red Spring & Swing Company, Ashtabula, Ohio, has been incorporated with a capital stock of $10,000 by George A. Sternburg and others.

The Trolley Bread Machinery Company, Cleveland, has been incorporated with a capital stock of $20,000 by William Robertson, S. R. Fraser and others for the manufacture of bread-making machinery.

F. E. Pomerene and C. B. Hunt, receivers of the Spellacy-Raiff Enameling Company, Coshocton, Ohio, have practically completed a deal for the sale of the plant to a new company in which Chicago men are interested, which will be incorporated with a capital stock of $50,000. The manufacture of enameled novelties is planned.

It is announced from Toledo, Ohio, that A. C. Berry, representing Pittsburgh capitalists, has closed a deal for the purchase of 27 acres in Toledo to be used as a site for a large plant for the manufacture of automobile parts. It is stated that plans are being prepared for three buildings and that $200,000 will be spent in the erection of a plant.

The Portage Rubber Company, Barberton, Ohio, will purchase considerable new equipment, mostly tire making machinery. It is also stated that the company will install a pumping station and sprinkling system.

Considerable new machinery was destroyed in a $150,000 fire that on September 14 burned the plant of the Woodville Lime & Cement Company, Woodville, Ohio. The plant will probably be rebuilt at once.

The Pioneer Motor Car Company, Marietta, Ohio, has been incorporated with a capital stock of $18,000. The company will build a three-story garage, 58 x 190 ft. with a machine and repair shop on the upper floors. The incorporators are T. B. Bosworth, A. J. Watson and others.

The Electric Cleanser Company, Canton, Ohio, is planning the erection of a new plant.

The plant of the McCalister-Byrne Construction Company, Girard, Ohio, boiler maker, has been sold to Pittsburgh men. It is announced that the new owners will enlarge the plant. James MacGregor will remain as manager.

The city of Cleveland will vote November 7 on the question of issuing $2,000,000 in bonds to build a new municipal lighting, heating and power plant.

Cincinnati

CINCINNATI, OHIO, September 26, 1911.

Some good business has lately been received by local machine-tool builders from Australia. Nearer export fields are not being overlooked, and orders from this particular trade are coming in at a fairly satisfactory rate. Many local manufacturing firms do not anticipate any great revival in domestic business until after the election next year, and are making strenuous efforts to obtain export orders. The fall season, however, is opening up encouragingly; there is an increasing number of inquiries and a spurt of activity is anticipated, to last throughout the last quarter of the year and probably through the forepart of next year.

Much interest is manifested locally in the coming annual convention of the National Machine Tool Builders' Association, to be held in New York next month. It is quite probable that the attendance from this part of the country will be much larger than usual.

J. M. Manley, secretary of the Cincinnati Branch, National Metal Trades Association, has issued a report for three months ending September 15, showing manufacturing plants in this section as operating up to 85 per cent., as compared with the quarter ending June 15, 1907. The report of June 15, 1911, placed operating activities at 87 per cent., and that for June 15, 1910, at 92 per cent. It is also worthy of note that the report of September 15, 1910, was 91 per cent., showing a loss of 6 per cent. for the corresponding period this year.

C. R. Greer, secretary of the Chamber of Commerce, Hamilton, Ohio, reports rapid progress being made on the new pressed-brick plant for the Eagle Woodenware Mfg. Company, which will soon move from its present location at Circleville, Ohio. Among other new manufacturing industries recently established at Hamilton are the Reeves Rigling Egg Tester Company, the Geore Automatic Roller Bearing Company and the Kern Machine Tool Company.

The Pothoff Construction Company, Cincinnati, has been awarded the contract for the steel work on the large grandstand to be erected in National League ball park, which was recently mentioned. A large amount of structural iron will be required for this particular job.

The Cincinnati Business Men's Club expects to move into its new home at Ninth and Race streets during the first week in October.

The University of Cincinnati opened its doors for the fall and winter term, October 25. Over 300 students were enrolled to take the co-operative course in engineering, and there were many additional applicants who cannot be admitted until the completion of the new building for the engineering department. The interior work of the building is being rushed, and it will probably be ready for occupancy within the next six weeks.

It is rumored that Frank L. Bransom, Cincinnati, formerly president of the American Fence & Iron Works, has about completed the organization of a new company to manufacture wire fencing.

The Roche Bruner Building Company, Johnston Building, Cincinnati, has been awarded the contract for a large reinforced concrete convention hall to be erected for the National Cash Register Company at Dayton, Ohio. The new structure will cost over $100,000.

The Defiance Machine Works, Defiance, Ohio, has increased its capital stock from $100,000 to $600,000.

The National Electric Welder Company, Warren, Ohio, has been incorporated with $40,000 capital stock. Fred P. McBerty and A. C. Taylor are named among the incorporators.

It is announced that the Cellular Metal Company, a new Cincinnati incorporation with $100,000 capital stock, will take over the business of the Steel Construction Company. Max S. Goldsmith, former head of the Steel Construction Company, will be president of the new company.

The large car barns of the Interurban Railway & Terminal Company at California, Ohio, were totally destroyed by fire last week. Rebuilding operations will begin at an early date. The company's headquarters are in Cincinnati.

The Piqua Hosiery Company, Piqua, Ohio, has had plans prepared by W. E. Russ, Dayton, Ohio, for a large new concrete factory.

The New Era Gas Engine Company, it is stated, will move its plant from Dayton to Portsmouth, Ohio, where it will be operated in connection with the plant of the Portsmouth Machine & Casting Company. A new building will probably be erected to accommodate the plant.

Indianapolis

INDIANAPOLIS, IND., September 26, 1911.

The Cole Motor Car Company, Indianapolis, has obtained a building permit for its new factory which is estimated to cost $45,000.

The Veneer Barrel Machine Company, Indianapolis, is a new industry incorporated with $20,000 capital stock, to manufacture machinery for making cylindical veneer packages. The directors are J. T. Horne, W. H. Burton and Lewis A. Coleman.

The Specialty Mfg. Company, Greenfield, Ind., has been incorporated, with $20,000 capital stock to manufacture vending machines, meat slicers and similar articles. The directors are Thomas C. Gettle, Anderson, Ind.; George W. Davis, Cassius M. Curry and Elmer J. Binford of Greenfield.

The City Council of Anderson, Ind., has granted a 25-year franchise for a steam-heating plant to Otis P. Crim of that city, who has bought the plant of the defunct Home Heating Company and will rebuild it.

The Indiana & Michigan Electric Company has begun the building of a concrete dam across the St. Joseph River at Elkhart, Ind., where it will erect a power house similar to the large plants at South Bend, Berrien Springs, Hen Island and other points below Elkhart.

The Stockford Reel & Novelty Company, South Bend, Ind., has been incorporated, with $20,000 capital

THE MACHINERY MARKETS

stock, to manufacture fishing tackle and other articles. The directors are W. F. Stockford, F. M. Bonine, F. L. Davis, William Miller and Albert Slick.

It is not expected that the Big Four shops at Brightwood, Indianapolis, recently burned, will be rebuilt as the removal of the machinery to the Beech Grove yards had been contemplated for some time. New equipment, however, is expected to be required.

At La Porte, Ind., a contract was closed with A. M. Osborn of Chicago, for the rebuilding of the waterworks plant on the Kankakee River.

The Reed Stone Company, Bedford, Ind., is in the market for a second-hand boring mill from 10 to 12 ft. in diameter.

The J. Q. Clark Tank Company, Crawfordsville, Ind., has begun the construction of a new factory building 80 x 90 ft.

Detroit

DETROIT, MICH., September 26, 1911.

The local machine tool market continues to show a large number of inquiries and a very good average of orders. The volume of business showing, perhaps, a slight increase over last week, but no large lots of tools have been disposed of. The demand for power transmission machinery is reported as quite active. Second-hand machinery is moving freely, although most of the orders for this line are coming from out of town purchasers. Automobile factories are busy and with plans in view for the erection of several new plants, some good business will probably be secured from this source soon. Makers of railroad equipment are operating at about 50 per cent. of their capacity, but the shipbuilding companies are busy. General industrial conditions seem to be improving and the outlook for a brisk fall business is good. The building trade is stagnant, but this condition can only be temporary as a number of large projects are soon to be figured on.

The State Railroad Commission has authorized the organization of the Consolidatead Light & Power Company, with a capital stock of $100,000. The company will erect five dams along the Chippewa River and a high-tension transmission line connecting the cities to be served. The total cost of the system will be $2,000,000 and work is to be started at once. J. L. Hudson is president and C. S. Abbott general manager of the new company.

Work has been started on the new plant of the Herreshoff Motor Company on Woodward avenue. The new buildings will include a large two-story manufacturing building, a boiler house, dynamo house, machine shop and testing house.

The Colonial Electric Company, a newly organized company making electric vehicles, is contemplating the erection of a large plant. Albert H. Webb, A. D. Stansell and F. C. Willie are among those interested in the company.

The Thaime-Gill Company, manufacturer of steam and hot-water filters, has changed its name to the Detroit Heating & Refrigerating Company and increased its capital stock from $10,000 to $15,000.

The Continental Motor Company, Detroit, has completed plans and is about to begin construction on a very large plant.

The Dongan Electric Mfg. Company has been organized with a capital stock of $10,000 to manufacture electrical and mechanical instruments. L. J. Hicks and G. J. Sscherling are the principal stockholders.

The Christie-Kline Forge Company has been incorporated with a capital stock of $3,000. Harry E. Kline and E. H. Christie are the organizers of the new company.

The Mexico Latex Company, operating a rubber factory at San Juan Bautista, Mexico, has established headquarters in Detroit. Lewis F. Newman, president of the company, states that the capacity of the factory is to be largely increased.

The National Coil Company, Lansing, Mich., having completely outgrown its present quarters, has purchased the large building formerly occupied by the Ideal Motor Company and will remodel and equip it for its own use, thereby doubling the capacity of the plant. The company manufactures a large line of coils.

The Bates & Edmonds Motor Company, Lansing, Mich., maker of gas engines, is increasing the size of its plant by the erection of an addition having a floor space of 4500 sq. ft. A new boiler house is also being constructed and the assembly room enlarged. The company reports an increase in business of 40 per cent. over last year.

The large planing mills of the Fuller & Rice Lumber Company, Grand Rapids, Mich., were destroyed by fire last week, entailing a loss of $250,000. The company manufactures sash and doors and the mills were equipped with modern wood-working machinery. It is expected that the work of rebuilding will be started in the immediate future.

The Helvetia Company, Hudson, Mich., manufacturer of condensed milk products, is making extensive improvements to its plant. Considerable new mechanical equipment will be installed, including additional refrigerating machinery and two large boilers.

The Central Welding Company has been organized at Lansing, Mich., by J. E. Rork and H. D. Weise. The new company has secured quarters and will do automobile and general machinery welding.

Fire destroyed the saw mill plant of the Central Lake Lumber Company, Central Lake, Mich., causing a loss of $20,000. The plant will be rebuilt at once and operations resumed.

Chippewa County, Mich., has begun the construction of an agricultural school to be located near Sault Ste. Marie. The mechanical equipment will include the fitting up of machine shops, a blacksmith shop and the installation of a large boiler. Address the Board of Supervisors.

The plant of the Egyptian Portland Cement Company will be sold at receiver's sale at a date to be fixed by the court. E. C. Forte is receiver of the company.

The Western Wheel Works, Sturgis, Mich., is erecting a small addition to its plant.

The Shelby Flour Mills, Shelby, Mich., has under construction an addition 25 x 50 ft. and two stories in height.

The City Council of Stanton, Mich., is calling for bids for furnishing and installing new machinery at the municipal electric light and power plant.

The Allegan Light & Power Company, Allegan, Mich., has been sold to W. A. and J. B. Foote, of Jackson, Mich. The purchasers will make extensive improvements to the plant in the near future.

The Michigan Cut Glass Company, Lansing, Mich., has plans under way for doubling the capacity of its factory.

The National Auto Truck Company, Bay City, Mich., has started work on the erection of its new buildings. The company expects to begin the manufacture of cars by January 1.

The E. C. Slocum Mfg. Company has been organized at Fenton, Mich., with a capital stock of $5,000, and will engage in the manufacture of grass seeders.

The Ithaca Industrial Company, Ithaca, Mich., has organized to manufacture and deal in machinery and various iron and steel products. The company is capitalized at $6,000.

The Mt. Clemens Sugar Company, Mt. Clemens, Mich., has expended $30,000 in improvements to its plant, mostly in mechanical equipment, including pressing, drying and slicing machinery. The presses were imported from Germany.

The West Bay City Sugar Company, Bay City, Mich., will greatly increase its capacity this Fall. This announcement means that every sugar plant in the State has either been enlarged or improved during 1911. Sugar manufacturers have been heavy purchasers of machinery this Summer.

The National Turpentine Company, with headquarters at Cleveland, which recently opened a factory at AuSable, Mich., is looking over the ground at Alpena, Mich, with the view of establishing another branch in that city.

The Advance Mfg. Company has been organized at Hastings, Mich, with a capital stock of $25,000 and will engage in the manufacture of suction cleaning machines, etc.

The National Motor Starter Company has been organized at Grand Rapids, Mich., with $10,000 capital, to manufacture ignition devices. J. W. and T. H. Goodspeed are among those interested in the new company.

A new company has been incorporated at Saginaw, Mich., under the style of the C. & C. Engineering Company. The company will manufacture and deal in gasoline motors and has a capital stock of $50,000.

The J. E. Greilick Company, Traverse City, Mich., maker of chairs and tables, has increased its capital stock from $25,000 to $50,000 and is making considerable additions to its mechanical equipment.

Warren Clizbe and O. E. Jennings, of Detroit, are

THE MACHINERY MARKETS

conducting negotiations with the Board of Trade of Benton Harbor, Mich., for the location of an automobile truck plant in that city.

The Marquette Box & Lumber Company, Marquette, Mich., has plans under way for the erection of a one-story concrete addition to its plant, 100 x 150 ft.

The Twin Falls Land Company, of Dickinson County, Mich., is planning the construction of a large dam across the Menominee River and a power house to be located near Iron Mountain.

The Walsh Mfg. Company, Frederick, Mich., maker of headings, is constructing a factory building 40 x 120 ft. and a dry kiln 22 x 100 ft. Modern machinery will be installed. F. J. Fitzgerald is superintendent of the plant.

The Nelson Bros. Company, Alma, Mich., has begun work on the erection of its new $25,000 plant in that city. The company manufactures gas engines and pump jacks.

The Olds Motor Works, Lansing, Mich., has let the contract for the inaugurating of construction work on its new plant.

The Detroit Wire Spring Company, Marston court and Morrow streeet, Detroit, Mich., intends to build another plant adjacent to its present factory, with 231 ft. on Morrow street, but has not decided when to begin construction. It may not be done this fall. The company's product is exclusively used for automobile manufacturers. The past has been the largest year in the history of the company, and the sales for the past month were nearly 100 per cent. larger than for the same month a year ago.

The Nichols & Shepard Company, builder of threshing machinery, Battle Creek, Mich., contemplates the erection of a foundry as an addition to its plant. The company says that as yet it is not prepared to state what machinery may be needed for the new department.

The South

LOUISVILLE, KY., September 26, 1911.

While the general situation remains fairly quiet in machinery trade circles in this section, a good deal of business nevertheless is being done. Manufacturers and dealers are not altogether satisfied with the volume of business, but concede a marked improvement over summer conditions. There is a good demand for electrical equipment from the coal mining sections of Kentucky, and with the development of properties which have been taken over recently by operating companies still more will be sold. There is keen competition for the business that is offering.

E. C. Walker, of the E. C. Walker Mfg. Company, Louisville, who has operated a machine shop for the manufacture of gasoline engines, has announced plans for a new company which will make gasoline motor trucks exclusively. The new concern will erect a plant separate from that now being conducted, and the plans provide for the manufacture of 50 cars during the first season. The Walker plant at present is at Jackson and Lampton streets, and here the first models for the new car have been made.

The Continental Car & Equipment Company, Louisville, has completed the equipment of a section of its plant, heretofore devoted exclusively to the manufacture of contractors' dump cars, for the manufacture of electric trucks. The first models have been completed, and have a load capacity of 7,000 pounds. Other cars built to carry 5, 2, 1 and one-half tons will also be built later on. The line heretofore manufactured will be continued by the company. A. B. McKinley is general manager of the concern.

John M. Mulloy, 212 West Market street, Louisville, is organizing a company for the manufacture of an automatic weighing device to be used in the coffee trade. A small shop has been equipped for the work, but this is to be enlarged if plans now under consideration are carried out. The machine is made of aluminum chiefly.

Berton B. Bales, president of the American Automobile Mfg. Company, New Albany, Ind., has resigned, and George H. Wilson, Louisville, will succeed him. The company is just preparing to market a line of pleasure cars, and trucks are to be made a little later.

The Inland Steel Company is furnishing the reinforcing bars for the concrete framework of the Henry Watterson Hotel in Louisville. Five hundred tons of material will be used. Caldwell & Drake are the contractors.

E. D. Morton & Co., Louisville, have secured the agency for the injectors and boiler-room specialties of the Desmond-Stephen Mfg. Company, Urbana, O.

The Louisville & Nashville Railroad Company has purchased for installation in its South Louisville shops an Ingeroll-Rand air compressing outfit having a capacity of 4,000 cu. ft. per minute. This is one of the largest installations contracted for recently. The Brandeis Machinery & Supply Company, Louisville, made the sale.

The Red Chief Mfg. Company, Louisville, has incorporated with $7600 capital stock. L. E. Gaisser is president of the company and George T. Cross is secretary and treasurer. The company has a plant which has been in operation for some time, manufacturing corn shellers and feed mills, but expects to extend its line considerably and to enlarge its capacity later on.

A better demand for refrigerating machines and boilers is noted by the Henry Vogt Machine Company, Louisville. The demand is still somewhat below expectations, however.

The James Clark, Jr., Electrical Company, Louisville, reports some inquiries on large installations, but adds that the number of prospects is less than had been expected.

Scottsburg, Ky., is considering the installation of a system of waterworks, principally with reference to fire protection.

Preston Gibson, Scott Brown and Clarence Julian will erect a flour mill at Frankfort, Ky., the enterprise having been granted exemption from municipal taxation for a period of five years.

Robert Starkweather, of the Victoria Limestone Company, Bowling Green, Ky., has secured a site for the cut-stone plant which the company will build, and plans the equipment of it in the immediate future.

Chattanooga, Tenn., iron interests are prominent in the Appalachian Exposition now in progress at Knoxville, Tenn. Among the exhibitors from that city are the Chattanooga Implement & Mfg. Company, Cahil Iron Works, Chattanooga Saw Works, Chattanooga Plow Company, Chattanooga Machinery Company, Chattanooga Iron Works, Citico Furnace Company, Dixie Logging Tool Company, Frictionless Metal Company, Hercules Mfg. Company, Jones Machinery Company, Mountain City Stove & Mfg. Company, Nixon Mining Drill Company, Southern Queen Range Mfg. Company, Tennessee Stove Works, Vesta Gas Range Mfg. Company, Walsh & Weider Boiler Company and Wheland Machine Works.

The Spalding Mfg. Company, Grinnell, Ia., is reported to be contemplating the removal of its plant to Memphis, Tenn. It manufactures wagons, buggies and other farm vehicles.

D. F. White and J. D. Stoltz, Adams, Tenn., are interested in the organization of a company for the operation of an electric light plant.

Clarksville, Tenn., has disposed of $60,000 of bonds recently authorized for the reconstruction of its water plant, and is now ready to go into the purchase of equipment for the plant.

The Corinth Engine & Boiler Works, Corinth, Miss., has been put in the hands of a receiver. Application for a receivership was made by two of the stockholders. The company was organized only a few years ago. It is expected that it will be reorganized and the plant continued in operation.

The Piedmont Auto Mfg. Company has been organized with $100,000 capital stock at Fairbairn, Ga., for the purpose of manufacturing motor cars. Robert F. Butler, W. L. Moore nd W. H. Knight are the incorporators.

The Industries Light & Power Company, Alexander City, Ala., has begun the construction of a water-power electric plant for the purpose of selling light and power to Alexander City. The company has $50,000 capital stock.

The Pea River Power Company, Troy, Ala., of which Charles M. Henderson is president, is erecting a hydroelectric plant on Pea River, in Coffee county, for the purpose of serving Troy, Dothan and other Alabama cities. The cost of the plant will be in the neighborhood of $150,000.

The Tri-State Drilling & Fishing Tool Company has been organized at Huntington, W. Va., with $15,000 capital stock by H. W. Locke, W. H. Locke and Arvilla Leidecker.

The Arkadelphia, Ark., Milling Company is planning the installation of refrigerating equipment.

Canadian capital is interested in the Georgia Railway & Power Company, which has applied for a char-

THE MACHINERY MARKETS

ter to engage in the traction and electric light and power business. The company proposes to have a capital stock of $27,000,000, and to construct electric lines in several sections of the State. Charles Magee, J. M. McWhinney, R. Mathison and George A. Kingston live in Toronto, Can., and Forest Adair, J. J. Spalding, Alex C. King and F. Marvin Underwood are Atlanta men. The articles of incorporation have been filed in the latter city.

Power equipment for the pumping station of its new waterworks system will be purchased in the near future by the city of Jessup, Ga.

The Lytton Mfg. Company, manufacturer of steam traps, Franklin, Va., is contemplating the reconstruction of its works and will be in the market for a few lathes, drill presses, etc. The company will not make any additions to its buildings. It has added to its line the manufacture of a new blow valve and a new pressure regulator.

The Kentucky Traction & Terminal Company, Lexington, Ky., has awarded a contract to Fred J. Kemp, Versailes, for the erection of a substation, 33 x 86 ft. This station will be equipped with modern electrical machinery, including a 300 kw. rotary.

The De Marco-Fulford Company, Atlanta, Ga., has been incorporated to manufacture the Peerless line of oil mill and fertilizer machinery. The company is special sales representative for the Sturtevant Mills Company, Boston, Mass. The officers of the company are F. L. de Marco, president; F. L. Sawyer, vice-president and J. H. Fulford, secretary-treasurer.

The Culloden Fertilizer Company has been incorporated with a capital stock of $10,000 at Culloden, Ga., to manufacture fertilizers. The company has commenced work on a building and expects to be ready for business in a short time. Col. H. E. Chambless is president of the company.

The Board of Aldermen, Lexington, Miss., will receive bids until October 18 for a system of sewers comprising about 5½ miles, also a system of waterworks comprising two flowing artesian well reservoirs, steel tank and tower, steam or gasoline pumps, boilers and about 6 miles of cast iron mains, hydrants, valves, etc. Address W. G. Kirkpatrick, engineer, Jackson, Miss.

The Hickman Coil Hoop Company, Hickman, Ky., has acquired the property and machinery formerly known as the Hickman Lumber & Planing Mill Company, East Hickman, and will convert it into a hoop mill. Some additional machinery will be required later on. A. J. Sides is president of the company.

The Metal Strip Glazing Company, Pelham, Ga., has been incorporated to manufacture galvanized steel strips for windows under the patents of T. E. Weaver. E. C. Ralls and J. M. Culpepper are the incorporators.

The Holt Engine Company, Burlington, N. C., is building a machine shop, 60 x 98 ft., which is to be modern in every detail. The company manufactures the Holt direct, compound and reversing rotary engines.

The William J. Oliver Mfg. Company, Knoxville, Tenn., manufacturer of contractors' equipment and plows, is contemplating the erection of several additions to its plant, including a malleable foundry and increased space for its plow factory.

The Carolina Metal Products Company, Wilmington, N. C., has had plans prepared for an addition to its plant, 50 x 200 ft., which will be installed with all necessary machinery. This addition is to take care of its sheet metal department, such as metal ceilings, sidings, metal shingles, metal tiles, etc.

The Lenoir Mfg. Company, Lenoir, N. C., has been incorpo ated with $50,000 capital stock. The company is planning the erection of a factory for the manufacture of building materials. The incorporators are O. P. Lutz, T. J. Lutz and M. L. Lutz. The company will be in the market for a second-hand re-saw in good condition.

The B. F. Board Motor Truck Company, Alexandria, Va., has been organized with a capital stock of $100,000. The purpose is to build auto trucks, ranging in carrying capacity from 1000 lb. to 10 tons, also sightseeing cars. B. F. Board is president; T. C. Smith, vice-president; W. E. Ban. treasurer; George S. Hinkins, scretary; E. K. Callahan, assistant secretary. In addition to the above, the board of directors is composed of R. B. Powell, W. R. Powell and J. U. Dellinger.

St. Louis

ST. LOUIS, MO., September 25, 1911.

September has advanced sufficiently to show strong indications that the month in the machine tool market will be an improvement over August. There has been nothing exceptional in the business done, but there has been a larger aggregate of sales and there have been more inquiries, especially in the past week. Considerable business is working into shape for taking bids in the next few weeks. Dealers for the most part express a confidence in improvement during the coming month, though most of them frankly admit that they do not anticipate any extreme activity, at least not until the political situation is cleared.

Reports from a number of manufacturing plants of St. Louis are that they are making improvements with a view of preparation to increase their mechanical equipment during the coming Fall. Their specific needs have not been listed yet.

The Cotton Belt System has placed its order for steel shapes and also for considerable equipment for its new freight terminal with the Christopher & Simpson Architectural Iron & Foundry Company, St. Louis.

A new automobile company, headed by August Mattemann, planning to construct a cheap car, has placed orders for about a dozen machine tools of varied character for a plant which it is equipping in the southern end of the city.

The Christopher & Simpson Architectural Iron & Foundry Company is making extensive additions to its plant, involving an expenditure of about $100,000, chiefly for new equipment.

The William J. Lemp Brewing Company has taken out a permit for a building for a stock house seven stories, to cost $75,000, exclusive of mechanical equipment.

The Wrought Iron Range Company has let the contracts for the new buildings which it is to construct on the western edge of the city. The cost will be $179,425, exclusive of the mechanical equipment, of machinery and heating plant. The buildings are to be fireproof.

The A. P. Bohlinger Table & Piano Stool Mfg. Company suffered a loss by fire last week but will replace its mechanical equipment at once in its present location.

The new buildings for the Rolla School of Mines, at Rolla, Mo., have been ordered constructed at a cost of $65,000, exclusive of equipment.

The Aberdeen Mining Company, Joplin, Mo., has been incorporated with $80,000 capital stock by Thomas Douglas, D. M. Henson, Joseph Young and others and will install mining equipment at once.

The Jones Razor Mfg. Company, with $75,000 capital stock, has been incorporated at Kansas City, Mo., by Floyd D. Jones, T. I. Jones and Frank G. Johnson, and will equip a plant at once.

The Holland American Tailing Mill Company, with $100,000 capital stock, has been incorporated at Joplin, Mo., by A. Van Dorser, H. A. Russell and G. C. James, and will install equipment for working mine tailings in the Joplin lead and zinc district.

The Western Steel Products Company, with $100,000 capital stock, has been incorporated at Kansas City, Mo., for the manufacture of various steel devices. The incorporators are Lyle Garrison, S. E. Gutteridge and Edward C. Marqua.

The Wright City Milling Company, with $15,000 capital stock, has been incorporated at Wright City, Mo., by P. L. Simmerman, F. A. Roennigke and W. A. Gaddis.

The Gunn Pipe Line Company, of Kansas, has been authorized to use $50,000 of its $500,000 capital stock at Nevada, Mo., for the installation of gas supply equipment.

Graham's Rockford Distillery Company, Rockford, Ill., has increased its capital stock from the nominal sum of $3,500 to $150,000, preparatory to installing equipment.

The Automatic Register Company, of Delaware, is completing arrangements for the erection of a plant at East St. Louis, Ill., for the manufacture of automatic registers for railroad and electric lines.

The International Automatic Signal Company, with $1,000,000 capital stock, has been incorporated at Kansas City, Mo., by C. H. Carson, Louis B. Leach and York Burgess, for the manufacture of automatic signaling devices.

The J. W. Boyd Mining Company, with $50,000 capi-

THE MACHINERY MARKETS

tal stock, has been incorporated at Sarsoxie, Mo., by J. W. Boyd, B. C. Burgess and Sam McFerren, and will install mining equipment at once.

The National Recorder Company, with $30,000 capital stock, has been incorporated by W. W. Kay, W. J. Kennedy and O. L. Niedringhaus, of St. Louis, for the manufacture of a register for the use of conductors of trains. A factory will be built at once.

The Christopher Electric Company, with $30,000 capital stock, has been organized at Christopher, Ill., by Thomas Horn, Albert E. Pike, H. M. Rea and T. D. Parkhill, for the installation of an electric lighting plant.

The Carthage Electric Company, Carthage, Ill., has increased its nominal capital stock of $5,000 to $50,000, preparatory to the installation of its electric plant.

The Kansas City Scales Company has increased its capital stock from $10,000 to $25,000 for the extension of its plant for the manufacture of scales.

The W. C. Mfg. Company, with $25,000 capital stock, has been incorporated at Kansas City, Mo., by Elton D. Wheeler, Burt T. Cubine and T. M. Douglas.

The Wagner Electric Mfg. Company, St. Louis, has formally increased its capital stock from $1,200,000 to $1,500,000 for the extension of its St. Louis plant and for equipment of its branch Canadian factory.

The Warren Steel Casting Company, St. Louis, with $120,000 capital stock, has been incorporated in St. Louis by John A. Warren, William A. Kammerer, Patrick Cunningham and Lorenz Wittmann, and will equip a plant for the manufacture of steel castings.

The Missouri Belting Company, St. Louis, has prepared plans for the erection of a factory at Grand avenue and La Salle street, to cost $75,000.

The American Furnace Company, St. Louis, has let contracts for the erection of a two-story steel construction factory building to be 73 x 135 ft., and to cost $42,000. The present location of this company is at 1911 Pine street, and the new building is to be erected on Morgan street, near Twenty-seventh street.

At Paragould, Ark., $30,000 is to be spent in improving the electric lighting plant.

At Gavette, Ark., a bond issue of $25,000 is proposed to provide a water works and electric light plant.

The Cushman Power Sprayer Company, now of Lincoln, Neb., will remove its offices and plant to St. Joseph, Mo., in the immediate future.

The Nebraska-Iowa Steel Tank Company, Omaha, Neb., has let contracts for the erection of a $12,000 factory building at Fourteenth and Grace streets, in that city.

The Street Railway Company, operating in Omaha, is taking bids covering the construction of an addition to its car shops, 24 x 140 ft.

At Chapman, Kan., it has been decided to issue bonds to the amount of $25,000 to provide for the construction of a city electric light plant.

Texas

AUSTIN, TEXAS, September 23, 1911.

The unusual rapidity at which cotton is being marketed is bringing about a great improvement in business conditions, due to the circulation of money that is derived from the crop. The industrial situation is very favorable in Texas and throughout the Southwest. Prospects are promising for an unusually large machinery trade in this territory during the fall and winter. As soon as the presidentiai elections in Mexico are over, which will be in October, it is expected that business conditions in that country will quickly improve and that many orders for mining and other machinery that are now held up pending the restoration of complete tranquility will be filled.

The Intermittent Vacuum Pre-cooling Company has been organized at San Benito with a capital stock of $60,000 for the purpose of installing a pre-cooling plant. The incorporators are C. B. Rodgers of Kingsville, S. A. Robertson of San Benito and J. H. Elliott of Houston.

The Fort Stockton Light & Ice Company which has been organized at Fort Stockton, with a capital stock of $35,000, will install an electric light plant and ice factory. The incorporators are Charles S. Schraff W. F. Zarback and James Rooney.

The City Council of Cameron has granted Hamilton Brothers of Chicago a franchise for the installation of an electric light plant and waterworks system.

The Hackberry Mill & Gin Company has been formed at Hackberry with a capital stock of $2,500 to install a grist mill and cotton gin. The incorporators are Jacob Lorfing, Eugene Christine and Charles Hughes.

The Vanderbilt Gin Company has been formed at Vanderbilt, with a capital stock of $2400. Incorporators are J. F. Grant, August Apree and C. C. Coleman.

The City Council of Houston Heights has under conisderation the granting of a franchise to the Houston Gas Company for the extension of its gas distributing system to that suburb.

The Business Men's Club is promoting the construction of a bridge to connect Mason with Goochtown.

The city of Baird has issued $3,500 of bonds for waterworks.

It is reported that Swift & Co., Chicago, Ill., will erect a large cold storage plant at Corpus Christi.

W. K. Durham, Atlanta, Ga., is at the head of the Olympia Cotton Mills, recently organized with a capital stock of $250,000 for the purpose of erecting a large cotton mill at San Antonio.

The Landrum Ginning Company has been organized at San Benito, with a capital stock of $6,000. The incorporators are J. L. Landrum, A. E. Chapman and Samuel Spears.

The City Board of Health of San Antonio has taken steps toward the installation of a garbage incinerator to cost about $25,000.

The Houston Gas Compay is installing an addition to its plant to cost $7,500 at Houston.

The Farmers' Gin Company has been formed at Lancaster, with a capital stock of $5,100. The incorporators are G. T. Brown, D. H. Moneyhan and C. T. Orr.

The Forney Waterworks Company, Forney, recently amended its charter to change its name to the Forney, Water, Light & Ice Company and to increase its capital stock from $10,000 to $20,000.

The Pecos Valley Southern Railway will soon begin the erection of shops and terminals at Pecos. It will also extend its line from Balmorhea to Alpine, about 75 miles.

The Kansas Ice Company, Newton, Kan., will install a 100-ton ice plant at Belen, N. M., at a cost of about $100,000.

The Adolphe Didier Distilling Company which was recently formed with a capital stock of $40,000, will install a distillery at Belen, N. M.

General Luis Terrazas, Chihuahua, Mexico, is constructing a large dam upon his ranch 30 miles north of that city. It will have a storage capacity of 350,000,000 cu. ft. of water, capable of irrigating over 4,000 acres of land. It will also supply energy for a hydro-electric plant which he will install. The power will probably be transmitted to Chihuahua and other towns of the State. M. C. Liquornik is the engineer in charge of the construction work.

Oliver B. Caldwell, Corpus Christi, has just installed a brass foundry in that city and contemplates the addition of an iron foundry in the near future.

Bonds of $20,000 have been voted for the construction of water work at Timpson.

The Mayor of Nocona will receive bids until October 2 for material and equipment for water works, pumps, engine, 75,000-gal. steel tank and tower, pipe, valves and hydrants. Specifications can be had from the Fountain-Shaw Engineering Company, 308 Andrews Building, Dallas, or from the mayor.

The Pacific Coast

SAN FRANCISCO, CAL., September 21, 1911.

Anticipations based on the improved demand for machine tools is June and July have been disappointed, the last four weeks having been about the dullest of the present year. Not only is inquiry for heavy equipment entirely lacking, but there is less demand for small tools than early in the season, and the demand for foundry supplies is extremely slow. About the only business in sight consists of additions to small shops in the interior. Officers at the Mare Island Navy Yard have prepared a list, including several large tools, but no definite action is expected for some time. Two automobile manufacturing concerns are being promoted in Oakland, but the outlook for business from this source is very uncertain. The dullness locally is partly attributed to the placing on the market of a large number of tools formerly used by the Risdon Iron Works.

A number of contracts for marine work are being completed, but a fair degree of activity in this line is

THE MACHINERY MARKETS

assured by a contract amounting to about $750,000, placed with the Union Iron Works by the Oceanic Steamship Company, for repairs and the installation of oil-burning equipment on two of its vessels. Local gas engine and pump manufacturers are well occupied, but in other departemnts the shops around San Francisco are doing comparatively little. Conferences are now being held between representatives of the employers and the union workmen, and there is some possibility of a restoration of the nine-hour day. This, it is felt, would afford some relief from the conditions which have hampered the local metal-working industry for the last year. The demand for most lines of machinery, however, is not especially active, though a few good orders are coming out for electric and steam power equipment.

Thomas M. Moore, who had charge of the machinery and power divisions of the St. Louis and Buffalo expositions, is in San Francisco on consultation concerning power for the Panama-Pacific Exposition.

It is reported that the American Safety Powder Corporation, recently organized with a capital stock of $5,000,000, will erect a large plant in Oakland.

Bids have been taken on a concrete mixing plant for use on the Humboldt jetties, the lowest being $1,560. Some new quarry equipment may be required by the Hammon Engineering Company, which is preparing to get out the rock for this work.

The San Francisco Board of Public Works will receive bids up to November 1 for 43 double-end closed steel motor cars, complete, with axles, wheels and motors, for the Geary street municipal railroad.

The Dunn Mfg. Company, Oxnard, Cal., is planning to install a crucible steel casting plant.

The Golden State & Miners' Iron Works has just completed a large clamshell dredge on which it has been working for several months.

Plans have been completed for additions to the water plant at Willows, Cal., including a large pump, gas engine and two electric motors.

The Guaranty Land & Investment Company is installing a large number of irrigation pumping units on its land near Corcoran, Cal.

The Salt River Valley Water Users' Association, Phoenix, Ariz., has taken bids on a 10-ton and a 15-ton traveling crane for its new power station.

The Humboldt Cooperage Company, Arcata, Cal., is installing a new lathe and shaper in its machine shop.

The California Wine Association is installing a 600-hp. electric motor in its plant at Winehaven, Cal.

The G. A. Baughan Valve Company is considering the erection of a factory at American Park, near San Diego, Cal.

The town of Tracy, Cal., will receive bids September 28 for a centrifugal fire pump with electric drive.

It is reported that the Diamond Match Company will install a wood-working plant at Los Molinos, Cal.

The San Francisco agency for the Whiting foundry equipment line has been taken by the Eccles & Smith Company.

B. J. Smith, associated with the Rix Compressed Air & Drill Company, expects the arrival of stock of the various lines of tools for which he has the agency within the next month. These lines will also be handled by the Los Angeles branch of the Rix Company.

Plans have been completed for an addition to the Parker Iron Works, San Bernardino, Cal., consisting of forge and pipe shops. New machinery will be installed in these departments.

J. D. Douglas, manager of a suburban railway line of Auckland, New Zealand, arrived in San Francisco last week to inspect American electric railroads. The motive power of his road is to be changed from steam to electricity, and orders for machinery will probably be placed in this country.

The Associated Oil Company is installing several auxiliary boilers and engines and a new pump in its refinery at Gaviota, Cal.

Eastern Canada

TORONTO, ONT., September 23, 1911.

The defeat of the Laurier Government at the polls on September 21 shows what the Canadian people thought of the reciprocity agreement. That pact being thus emphatically disallowed, all uncertainty in respect to it is at an end and trade will throw off any feeling of unsettlement that was caused by the political suspense. As has been said in previous reviews, such feeling has not been observable in any marked slowing down in business. It is believed, however, that it would have been very much more active had there been no elections impending, or had the issue been other than a commercial one. Since the voting, there has been a pronounced gain in public confidence, and there is now every prospect of a rousing trade for some months. There is a sense of security against depression from the United States. Already there are reports of negotiations, that were broken off after the announcement of the pact, will be resumed, for the erecting in Canada of branch plants of United States manufacturing works. Encouraging messages have been received from financial houses in London by brokers and bankers in this country as to an improved outlook for the movement of capital into Canada. It is stated that British capital can more easily be got for the establishing of American branch factories in Canada than for the enlarging of the parent plants. All the indications point to the maintenance of Canada s prosperity and the further expansion of Canada's trade.

The Canadian branch of the Flexible Conduit Company is nearly ready to install machinery in the factory building it has reconstructed for the purpose in Guelph, Ont. It will manufacture flexible conduits and flexible steel armored conductors for use in electrical installations.

The ratepayers of Norwich, Ont., have approved a by-law for the purchase by the municipality of the local electric company's plant, which the town would enlarge and improve.

The Goldfield's Company at Larder Lake, Ont., is putting in a plant to develop 2000 hp. at Raven Falls, and it will shortly install a 30-stamp mill at its mine.

At Wawaitin Falls in the Porcupine district, Ontario, the British-Canadian Power Company is building a plant for generating 5,300 hp on the Mattagaini River. Machinery is now being taken in for the equipmen of that plant and for the operation of drills, hoists and other apparatus used in construction.

The Hupmobile Company is about to begin the erection of a factory to employ from 75 to 100 men at Windsor, Ont.

The Independent Fire Company's new factory at Guelph is expected to be ready for operation before Christmas.

The Chicontimi Water & Electric Company, Chicontimi, Que., is building power works at a point 3 miles from that centre.

The bridge companies of Canada are now exceedingly busy on railroad bridges and large edifices.

A. W. Farnesworth, Consulting Engineer, London, England, is looking about in Canada for a suitable location upon which to build a steel plant to cost about $5,000,000.

Tenders are to be called for in a few weeks for the building of the superstructure of a bridge over Lachine Canal, 156 ft. single-leaf highway. The Strauss Bascule Bridge Company, Chicago, is preparing the designs.

Contracts for the electrical equipment for coal-shoots and for station heating and lighting at London, Ont., will be called for very soon by the Canadian Pacific Railway Company.

The Santz Marble Company, Buffalo, N. Y., is about to build sheds at Bridgeburg, Ont., and install a plant there for the sawing, planing and polishing of stone work.

The Riordan Paper Company, Montreal, is erecting an additional building.

A proposal has been made to the municipality of Lindsay, Ont., for the establishing of a malleable iron industry in the town by J. McComb of Toronto.

The ratepayers of Listwell, Ont., are shortly to vote upon a by-law to loan $25,000 to the Electrical Supply Company on condition that it locate its plant in the town.

J. C. Wilson & Co., Montreal, will build a warehouse and offices in a part of that city at some distance from the location of their present premises.

The Boeckh Bros. Company, Toronto, manufacturer of brushes and brooms, is building a large addition to its factory and warehouse.

The Diamond Flint Glass Co., Toronto and Hamilton, is building a factory in Hamilton to cost $65,000.

The new factory of the Canadian Yale & Towne, Ltd., St. Catherines, Ont., is to cost $125,000.

The Town Council of Port Stanley, Ont., is proposing to install a hydro-electric power and lighting plant to cost about $22,000.

THE MACHINERY MARKETS

Western Canada

WINNIPEG, MAN., September 23, 1911.

In Western Canada the elections were a cause of more hesitation on the part of business men than in the rest of the country, the belief there apparently being that in the East there was as strong a desire for the agreement as in the West. Houses in Toronto report some recent backwardness in the placing of orders by Western buyers of machinery and plant. This was owing to a belief that the increased traffic with United States that would result from reciprocity in natural products would cause an enlarged shipping of manufactured stuff from the United States into Canada. Incidentally to the trade in natural products.

The contract for the construction of the match factory at Port Arthur has been awarded to George Otto of that city.

The Universal Motor Truck Company, Warren, Ohio, has decided to establish a branch factory at Fort William, Ont.; that is, if the agreement it has just concluded with the city's Industrial Bureau is ratified by the ratepayers. The company would erect and equip a plant to cost $350,000 and the city would take $100,000 of the company's total capital stock of $1,000,000.

The Great West Coal Company, which has been floated in Glasgow, Scotland, with a capital stock of $150,000 is about to begin operations in its field of 1118 acres about five miles from Edmonton, Alberta, on the Grand Trunk Pacific. Coal cutting machinery is being brought out from Scotland.

The Western Canada Flour Mills Company, Winnipeg, has decided to build a large mill at Vancouver at a cost of about $400,000.

French's Complex Ore Reduction Company will establish in Nelson, B. C., a plant for the treatment of zinc ores in that locality.

The Canadian Pacific Railway Company is building a great irrigation dam at Bassano, Alberta.

The town of Kelowna, B. C., is planning the installation of a sewerage system, the purchasing of a large water-works pump, and the laying of a considerable extent of watermains.

The John S. Metcalf Company, Montreal, is preparing to install machinery in the extension to the Globe Elevator Company's works at Calgary, Alberta.

Large lumber mills are being planned by the Virginia & Rainy Lake Lumber Company at Fort Frances, Ont.

The Cushing Bros. Company, Calgary, Alberta, has been incorporated with a capital stock of $500,000 to carry on business as manufacturer and dealer in lumber.

The British North America Elevator Company, Ltd., will erect an elevator at Kindersley, Sask.

A. C. Stielow, a pulp manufacturer of Milwaukee, Wis., recently visited Fernie, B. C., accompanied by several directors of the Bull River Power Company, in order to place before the City Council a proposition to establish a pulp mill at that point.

The Couteau Power Company, formed some time ago by prominent men of Okanagan, B. C., for the building of an electric railroad line through that district, has sold out to McKenzie & Mann, of the Canadian Northern Railway. It is presumed that the new owners will carry out the project mentioned.

The Atlantic Refining Company, Cleveland, Ohio, is negotiating with the city of Regina, Sask., with a view to establishing a plant there.

A syndicate of Western capitalists, among whom is Colonel Walker, of Calgary, has purchased a large tract of coal lands on the eastern side of the Red Deer River, Alberta, opposite the town of Lignite, and not far from Alix. Developments of the holdings will be commenced immediately.

An English syndicate has purchased the water rights of the Paterson-Eckert Lumber Company, at Chilliwack, B. C., and it is understood that a cement plant will be erected there to cost in the neighborhood of $500,000.

The Powell River Paper Company, whose new mill has not long been in operation, is already making plans to double its capacity by the erection of a twin mill adjoining it. The company's offices are at 739 Hastings street, Vancouver.

The British Canadian Lumber Company, Vancouver, B. C., is erecting a lumber mill at Lulu Island, at a cost of $400,000. The mill will be 72 x 292 ft., exclusive of dry kilns and box factory.

The Netos Timber Company, Limited, Vancouver, B. C., has been incorporated, with a capital stock of $50,000, to carry on business in the Province of British Columbia or elsewhere as wood, timber and lumber merchants, sawmill and shingle mill proprietors, dealers in sawn timber, wood shingles, poles etc.

The Pincher Creek Mill & Elevator Company, Pincher Creek, Alta., which has an authorized capital stock of $1,000,000, is drawing up specifications for concrete buildings, tanks and power house. The company's property is situated on a stream having a natural fall of 45 ft. The flour mill will have a capacity of 1,000 to 1,200 bbls, and the oatmeal mill 200 bbls.

The Medicine Hat Milling Company will remodel and enlarge its plant at Medicine Hat, Alberta, and will build an elevator at Irvine.

A. B. Pranca, Vancouver, B. C., is preparing plans for a saw mill for the Canadian West Lumber Company, Vancouver, at Comox, B. C., at a cost of $60,000.

A by-law will be submitted to the ratepayers of Richmond, B. C. for the raising of $50,000 for the purchase, construction and maintenance of waterworks system.

Government Purchases

WASHINGTON, D. C., September 25, 1911.

The Bureau of Supplies and Accounts, Navy Department, Washington, will open bids October 14 as follows: One 21-in. turret lathe, schedule 3946; one die-sinking machine, schedule 2966; 28 electric motors, schedule 3969.

The United States engineer office, Wheeling, W. Va., will open proposals October 12 for constructing a power house and installing one 115-hp. boiler, a steam-driven air compressor, feed water heater, pumps, etc., at dam No. 19, Ohio River.

The Bureau of Yards and Docks, Navy Department, Washington, will receive bids until September 30 for a portable air compressor and accessories for the Norfolk navy yard.

Proposals for two 15-ton locomotive jib cranes, one to be delivered at the navy yard at Norfolk and one at Mare Island, will be received by the Bureau of Yards and Docks, Navy Department, Washington, until September 30.

The Isthmian Canal Commission, Washington, circular 650, calls for a list to be opened November 20 for electric towing locomotives for the canal locks.

The Paymaster General, Navy Department, Washington, will open bids October 3 under schedule 3930, class 73, for two triple plunger electric fresh-water pumps and two electric centrifugal sanitary flushing pumps, one large circular saw and one large bevel band saw for heavy ship work.

The Paymaster General, Navy Department, Washington, will open bids October 10, under schedule 3915, class 11, for one lock-seaming machine, semi-automatic, for delivery to Mare Island, Cal.

Major F. C. Boggs, purchasing agent, Washington, D. C., will receive bids until October 9 for furnishing machinery and a hydroelectric station at Gatun, Panama.

The Bureau of Supplies and Accounts, Navy Department, Washington, opened bids September 19 as follows:

Schedule 3887 class 131, five Hendey-Norton engine lathes—Bidder 82, Frevert Machinery Company, New York, $446; 86, Fairbank Company, Washington, D. C., $587 and $602; 98, Garvin Machine Company, New York, $347.40; 118, Kemp Machinery Company, Baltimore, Md., $448.50 and $471.50; 149, D. Nast Machinery Company, Philadelphia, Pa., $365; 154, Manning, Maxwell & Moore, New York, $545; 155, Niles-Bement-Pond Company, New York, $446; 174, Prentiss Tool & Supply Company, New York, $515; 199, Springfield Machine Tool Company, Springfield, Ohio, $452.50.

Schedule 3888, class 141, motor applications to belt-driven machine tools—Bidder 65, Diehl Mfg. Company, Elizabethport, N. J., $5,795 and $5,952; 101, General Electric Company, Schenectady, N. Y., $3,133; 176, Reliance Electric & Engineering Company, Cleveland, Ohio, $7,330; 222, Westinghouse Electric & Mfg. Company, Washington, D. C., $4,779.84; 244, Hendey Machine Company, Torrington, Conn., $640, part.

The Department of Justice, Washington, received bids September 18 for furnishing air receiver, air compressor, riveting hammers and hose for use at the United States Penitentiary, Leavenworth, Kan., as follows:

George S. Githens Company, Boston, Mass., $513; Corby Supply Company, St. Louis, Mo., $499; Curtis & Co. Mfg. Company, St. Louis, Mo., $494.401; Fairbanks, Morse & Co., New York, $519.30; Union Steam Pump Company, Battle Creek, Mich., $515; Independent Pneumatic Tool Company, Chicago, Ill., $491.86; Blaisdell Mfg. Company, Bradford, Pa., $413.20; Vorhees Rubber Mfg. Company, Jersey City, N. J., $57, hose only; Ingersoll-Rand Company, New York, $353.50; Reeves & Skinner Machinery Company, St. Louis, Mo., $470; Clayton Air Compressor Works, New York, $558.

Current Metal Prices.

The following quotations are for small lots, New York. Wholesale prices, at which large lots only can be bought, are given elsewhere in our weekly market report

IRON AND STEEL—

Bar Iron from Store—

Refined iron:
1 to 1⅝ in. round and square ₹ lb 1.70c
1⅛ to 4 in. x ⅜ to 1 in. ₹ lb 1.80c
1½ to 4 in. x ⅜ to 5-1 ₹ lb 1.80c
Rods ⅜ and 11-16 round and square ₹ lb 1.80c
Angles:
⅜ in. x 1½ in. and larger Cts. ₹ lb 1.90c
⅜ in. x 3-16 in. and ⅛ in. 2.00c
1⅛ to 2½ in. x ⅛ in. 2.05c
1⅛ to 2¼ in. x 5-16 in. and thicker 1.95c
1 to 1¼ in. x 5-16 in. 2.05c
1 to 1¼ x ⅛ in. 2.10c
⅝ x ⅛ in. 2.20c
¾ x ⅛ in. 2.25c
½ x ⅛ in. 2.40c
½ x 3-32 in. 2.90c
Tees:
1 in. 2.35c
1¼ in. 2.40c
1½ to 2½ x ¼ in. 2.40c
1½ to 2½ x 5-16 in. 2.10c
3 in. and larger 2.35c
Beams 1.90c
Channels, 3 in. and larger 1.90c
Bands, 1½ to 6 x 6-16 to No. 8 2.10c
Burden's "H. B. & S." iron, base price 2.85c
"Burden's Best" iron, base price 3.15c
Norway bars 3.60c

Merchant Steel from Store—

per lb
Bessemer machine 1.80c
Tire cast, tire and sleigh shoe 2.50@3.00c
Best cast steel, base price in small lots 7c

Sheets from Store—

Black	One pass, C R soft steel	R G annealed.
No. 16 ₹ lb	2.45c	2.75c
Nos. 18 to 20 ₹ lb	2.50c	2.85c
Nos. 22 and 24 ₹ lb	2.55c	2.95c
No. 26 ₹ lb	2.60c	3.05c
No. 28 ₹ lb	2.95c	3.30c

Russia, Planished, &c.

Genuine Russia, according to assortment ₹ lb 12 @14½
Perfect polished, W Dewees ₹ lb A. 10c; B, 9c net
Wood ₹ lb A. 10c; B, 9c net

Galvanized

Nos. 12 and 14 ₹ lb	2.75c
No. 24 ₹ lb	3.10c
No. 26 ₹ lb	3.30c
No. 28 ₹ lb	3.60c

No. 20 and lighter 36 inches wide, 25c higher.

Genuine Iron Sheets—

Galvanized

Nos. 22 and 24 ₹ lb	5.50c
No. 26 ₹ lb	6.00c
No. 28 ₹ lb	7.00c

Corrugated Roofing—

2½ in. corrugated	Painted	Galvd
No. 24 ₹ 100 sq ft	$3.75	$4.70
No. 26 ₹ 100 sq ft	2.55	3.90
No. 28 ₹ 100 sq ft	2.50	3.65

Tin Plates—

American Charcoal Plates (per box)

"A A A" charcoal:
IC, 14 x 20 $6.65
IX, 14 x 20 7.90
A charcoal:
IC, 14 x 20 $5.60
IX, 14 x 20 6.70

American Coke Plates—Bessemer—
IC, 14 x 20, 107 lb $4.50
IX, 14 x 20 5.50

American Terne Plates—
IC, 20 x 28 with an N lb. coating $8.70
IX, 20 x 28 with an N lb. coating 10.70

Seamless Brass Tubes—

List November 13, 1908. Base price, 18c

Brass Tubes, Iron Pipe Sizes—

List November 13, 1908. Base price, 18c

Copper Tubes—

List November 13, 1908. Base price, 21c

Brazed Brass Tubes—

List February 1, 1911 19½c ₹ lb

High Brass Rods—

List February 1, 1911 14½c ₹ lb

Roll and Sheet Brass—

List February 1, 1911 14½c ₹ lb

Brass Wire—

List February 1, 1911 14½c ₹ lb

Copper Wire—

Base price. Carload lots mill 13½c

Copper Sheets—

Sheet copper hot rolled, 16 oz. quantity lots) ₹ lb 17c
Sheet copper cold rolled, 1c ₹ lb advance over hot rolled
Sheet copper polished 20 in. wide and under, 1c ₹ square foot
Sheet copper polished over 20 in. wide, 2c ₹ square foot
Planished copper, 1c ₹ square foot more than polished.

METALS—

Tin—

Straits pig ₹ lb 44 @45 c

Copper—

Lake ingot ₹ lb 14 @14¼c
Electrolytic ₹ lb 13¾@14 c
Casting ₹ lb 13¾@14 c

Spelter—

Western ₹ lb 6¾@ 7 c

Zinc—

No. 9, base, casks ₹ lb 8½c Open ₹ lb 9c

Lead—

American pig ₹ lb 5½@5¾c
Bar ₹ lb 6¾@6¾c

Solder—

½ & ½, guaranteed ₹ lb 26½@27c
No. 1 ₹ lb 24½@25c
Refined ₹ lb 23½@24c
Prices of solder indicated by private brand vary according to composition.

Antimony—

Cookson ₹ lb. @10½c
Hallett @10 c
Other brands 9@ 9½c

Bismuth—

Per lb $2.00@$2.25

Aluminum—

No. 1 aluminum guaranteed over 99% pure, in ingots for remelting 21c and 22c
Rods and Wire Base price 31c
Sheets Base price 33c

Old Metals—

Dealers' Purchasing Prices Paid in New York.

	Cents
Copper, heavy and crucible	10.50 to 10.75
Copper, heavy and wire	10.25 to 10.50
Copper, light and bottoms	9.25 to 9.50
Brass, heavy	7.00 to 7.25
Brass, light	5.50 to 5.75
Heavy machine composition	9.00 to 9.25
Clean brass turnings	6.75 to 7.00
Composition turnings	7.50 to 7.75
Lead, heavy	3.75
Lead, tea	3.50
Zinc, scrap	4.00

NICHOLSON







We have had over forty years' experience in making Files and Rasps; we not only know what KIND of steel to use, but HOW to use it.

If NICHOLSON FILES did not hold their CUTTING edge—our order books would not hold so many CUSTOMERS.

We make over 3,000 different styles and sizes. Send for Catalog.

NICHOLSON FILE COMPANY

PROVIDENCE, R. I., U. S. A.

THE IRON AGE

Established 1855 — New York, October 5, 1911 — Vol. 88: No. 14

Published Every Thursday by the
DAVID WILLIAMS COMPANY
239 West 39th Street, New York

Entered at the New York Post Office as Second-Class Mail Matter.

Subscription Price, United States and Mexico, $5.00 per Annum; to Canada, $7.50 per Annum; to Other Foreign Countries, $10.00 per Annum. Unless receipt is requested, none will be sent. Credit for payment will be shown by extending the date on the wrapper of your paper.

W. H. Taylor, - - - - - - President and Treasurer
I. A. Mekeel, - - - - - - - First Vice-President
Harold S. Buttenheim, - - - - Second Vice-President and Secretary

Geo. W. Cope, - - - -
A. I. Findley, - - - - } Editors
W. W. Macon, - - - -

M. C. Robbins, - - - - Manager
Charles S. Baur, - - - Assistant Manager

Branch Offices

Philadelphia, Real Estate Trust Building
Pittsburgh, Park Building
Boston, Compton Building
Chicago, Fisher Building
Cleveland, American Trust Building
Cincinnati, 807 Andrews Building

CONTENTS.

Volume Better than Prices 717
The Iron Industry's Economies 718
Compulsory Safety Devices 719
The Health of Employees 719
Insurance Against Strikes 719
Labor Agitation and Railroad Machinery Purchases 720
Autogenous Welding Not for the Weakened Structure 720
The Sherman Law as It Works 720
New Publications 720
Personal 721
The Monterey Iron & Steel Company' Report 721
Obituary 721
Pig Iron Output Increases 722
Pittsburgh and Vicinity Business Notes 723
Labor Notes 723
The Iron and Metal Markets 724
Iron and Industrial Stocks 735
Trade Publications 735
The Connellsville Coke Trade 736
The Park Drop Forge Company's Improvements 736
The Block-Pollak Interests 736
Steel Works Cases Before the Commerce Commission 736
Steel Mill Illumination 737
The L. S. Starrett Company Declares "Open Shop" 739
Cambria Steel Workers' Reunion 740
The Production of Alloyed Steel in 1910 743
American Export Trade 744
The Fox 15-Inch Lathe 747
Lessons from the Swiss Metal Industries 748
Insert Chuck Jaws 750
Atlas Ore Transfer Car 751
Italian Meeting Abandoned 751
Ore Loading at El Cuero Mines 752
The Wire Specialty & Machine Works 755
The Supply and Machinery Dealers' Meeting 755
Benzol from Coke-Oven Gases 759
Matthews Baltless Guy Clamp 760
The Stockbridge Crank Motion 760
Record in Building Rolling Mill Equipment 761
Yard Installation of Cleveland Cranes 762
The Storle Brass Globe Valve 763
Russian Iron and Steel Output in 1910 763
Italy's Iron and Steel Production 763
The Worthington High Duty Pumping Engine 764
New Chilled Roll Process 766
No International Aluminum Syndicate 767
New Molder's Flask 767
The Machinery Markets 768

Volume Better than Prices

Pig Iron Statistics Reflect the Situation

Bessemer Iron at $14.65—A 40,000-Ton Contract for Line Pipe

The answer the September pig iron statistics give to the question everywhere asked as to the effect on demand of the recent disturbances in the steel trade is certainly not unfavorable. Pig iron production increased last month and is still increasing. The total September output of coke and anthracite iron was 1,977,102 gross tons, or 65,903 tons a day, against a rate of 62,150 tons a day in August. It is significant that the merchant furnaces, after seven months of steadily declining production, turned the tide last month with a gain of nearly 1200 tons a day over the August rate. It is also noteworthy that October opens with the gain in merchant pig iron production still under way, five more furnaces which make iron for the market being scheduled to blow in soon.

The active list showed a net gain of ten furnaces last month and the producing capacity was 66,468 tons a day from 213 furnaces on October 1 against 63,214 tons a day from 203 furnaces on September 1. Pig iron production is now at the rate of 24,600,000 tons a year, including charcoal iron, or 90 per cent. of the high record of 27,303,000 tons, made last year.

The pig iron market has grown more active, but the course of prices still favors the buyer. Furnaces in the East report that melters have grown more urgent about deliveries—a condition that is attracting more attention in that section. At Buffalo there has been a marked decrease in furnace stocks, and in all districts it is expected that the October figures will show reductions.

In basic iron, sales east of the Alleghenies in the past week have amounted to about 15,000 tons, divided among steel works in Connecticut, New Jersey and Eastern Pennsylvania. The basis is still close to $14.50 delivered in Eastern Pennsylvania.

In the Central West the markets for Bessemer and basic iron have grown interesting this week. After holding for months, under insignificant sales, at $15 at Valley furnace, the price of Bessemer has dropped to $14.65 on a sale of 1000 tons. A Pittsburgh buyer is reported in the market for 2000 tons. On a 2500-ton inquiry for basic iron for St. Louis, a figure equivalent to $12.50 at Valley furnace has been named, but the last reported sale was at a Pittsburgh price equivalent to $12.60 at Valley furnace.

Selling of foundry iron for 1912 has been chiefly confined to the Buffalo district. In Southern iron there are evidences that deliveries of $10 No. 2 iron have been pushed over into 1912, and for prompt delivery one or two cases of a shade below $10 Birmingham have come up. Eastern pipe works have taken a number of lots from both Northern and Southern furnaces, and apparently at low prices. In the Chi-

cago district foundry iron has sold in some cases considerably below the $14.50 level for local No. 2.

The volume of demand for finished products has held up better than has been generally credited. There was some decrease in the total of orders on the books of the steel companies in September, but it was not large. Prices have yielded in some directions to the extent that what was quoted on large and very desirable business is now applicable to smaller sales. Sales of bars have been made as low as 1.10c Pittsburgh; of plates, at 1.20c, and of sheets at 1.85c for No. 28.

One of the largest merchant pipe contracts in years has been closed by the leading producer through the United States Steel Products Company with the Western Gas, Light, Heat & Power Company, of Calgary, Canada. It calls for 40,000 tons of line pipe on which shipments will begin almost at once. A new wrought iron pipe card is in preparation showing $2 to $8 a tone reduction on galvanized, but no changes in the discounts on black iron pipe have been announced to correspond with those on steel pipe.

The Santa Fé has bought 20,000 tons of rails and 3600 tons of tie plates. In the Pittsburgh district over 24,000 tons of rails have been booked in the past week, including 5000 tons for Japan.

Car orders include 1500 for the Buffalo, Rochester & Pittsburgh and 1150 for the Pennsylvania, and the Pittsburgh & Lake Erie is in the market for 1000 hopper cars.

The water shipments of Lake Superior iron ore in September were 5,231,069 tons, and the total this season to October 1 was 24,837,137 tons, or 10,263,727 tons less than to October 1, 1910.

The Iron Industry's Economies

In the comment which is being made upon the nearness of present finished steel prices to the historic low point, sight should not be lost of the fact that since then the industry has introduced very important economies. It is observed that the average level of finished steel products outside of standard section rails, which present a case so peculiar as not to be susceptible of inclusion in the general average, is only about $4 a ton above the historic low level, made toward the close of the industrial depression of the nineties. Undoubtedly the sum total of the advances in manufacturing costs at various points is very much greater than this $4 a ton, and a portion of the gross increase is equalized by reductions in cost of manufacture at other points. The advance in wage rates paid by the iron and steel industry since the low level period of 1897-8 is undoubtedly equal to much more than $4 per ton of output. In the cost of various supplies, including coal, there has been an increase, and there has also been an increase in fuel cost through the partial failure of the natural gas supply, whereby works which formerly used gas costing practically nothing must now use coal, while those which continue the use of gas have had to make large expenditures in order to maintain the supply.

Outside of the increase in the cost of mining and transporting ore due to higher wage rates paid and higher costs of machinery and supplies, there has been a great increase in the cost of laying down at the furnace sufficient ore to make a ton of pig iron through the fact that ore must be mined at much greater depth, both in the South and in the Lake Superior region, while as to the latter there has been an important decrease in the average iron content, whereby a larger tonnage must be mined and transported in order to make a ton of pig iron. With this increased quantity of ore required, there is naturally an increase in the quantity of coke and limestone which must be produced and transported to the furnace.

These and other items make a very large aggregate increase in the cost of producing finished steel. Were there not some very large items acting to offset this gross increase, the iron and steel industry would now be losing money at a very rapid rate, for profits were very meager in 1897-8 and $4 a ton would not begin to cover the increases at various points.

Of the many economies which have been introduced relatively few have secured universal adoption, though the important economies are found at nearly all the producing works. In ore mining there are the economies due to the use of larger and better steam shovels, to more systematic methods of attack and in a few cases to the conversion of underground mines to open pits. Lake transportation has been revolutionized more than once since 1898, when the almost forgotten "whaleback" was new. Dock operations have been vastly improved, charges lessened and vessel time spent in loading and unloading much reduced. Some interests have effected economies by introducing by-product coking. A considerable portion of the blast furnace gas is now used to better advantage than formerly. Coal consumption for heating steel and producing power has been reduced by improved furnaces, the introduction of gas producers, better steam raising plant, better engines and the introduction of exhaust steam turbines. A large and important saving has been effected by the almost general use of direct metal in steel making. Bessemer plants have in many cases been supplied with open-hearth adjuncts whereby their scrap is used to good advantage. The great improvements in basic open-hearth steel practice cannot properly be included in the present category, for the reason that in 1897-8 production by that process was only one-tenth of the present tonnage, and what this process has accomplished has really been to avert what would otherwise have been a veritable famine in Bessemer ore and its products. Practically all classes of rolling mills have been greatly improved, reducing the labor cost per ton in terms of effort expended if not in terms of actual wage payment. Methods of handling raw and finished product have been entirely revolutionized, for in 1897-8 the electric crane though fairly common was very far from universal and the lifting magnet was unknown.

Despite all these and other important improvements, the actual cost of prducing a ton of finished steel is much higher at the present time than it was at the low price period to which we have been referring. An increase in cost which is not necessarily permanent but which is very prominent at the moment is that on account of the character of business passing through the mills numerous roll changes must be made and in various ways the cost of production is higher, through the diversity of specifications which must be filled from week to week, and even from day to day, than if orders were capable of being better assorted. In 1897 and 1898 there were not as large rolling units as at present, but the matter of specifications was important, and we believe that average practice involved a much more comfortable grouping

of specifications than can obtain at present. It should be recalled that in those years, and particularly in 1898, the existing mill capacity was relatively very well employed. A test of the actual capacity in existence was furnished in the great boom of 1899, when unquestionably the capacity was strained to the utmost, as witness the phenomenal rise in all prices, yet the increase in tonnage output in 1899 over 1898 was relatively small. The statistics of production furnish grounds for the inference that in 1898 more than 90 per cent. of the existing capacity was employed for the entire year.

Compulsory Safety Devices

A Wisconsin builder and user of machinery writes his approbation of a bill before his State Legislature compelling the equipment with suitable safety devices of all machinery sold in the State. He suggests that if several States would take the same stand the manufacturers of equipment would be compelled to meet the requirements, which, he maintains, would be an easy matter if the designing of apparatus should be considered with this end in view. As the practice is to-day, he says, it is sometimes a hard matter for a factory to patch up machinery to secure a really practical safety appliance. At times it happens that, after spending a considerable sum for a new machine, it must be practically rebuilt in certain parts for the purpose of securing the protection of operatives to the satisfaction of the factory inspectors.

The criticism carries much force with it. Some of the machinery people have given the subject far too little attention. It is for their interest to produce equipment which will pass the test of all local laws. Otherwise it will suffer in the regard of customers and, therefore, in competition. When a buyer is compelled to spend money in remedying conditions in a tool which he believes should have been looked after by its designers, he quite naturally bears the case in mind when again in the market.

The Health of Employees

No factor of shop management has advanced more rapidly than that which has to do with shop hygiene. The economic value of the best of working conditions is better recognized with each succeeding year, and the vastly improved environment in which the workman labors, as compared with a generation ago, is a matter of frequent comment. Not the least important work is the search for disease and other physical unfitness in industrial plants, in order that men and women may be guarded against contagion and infection. This movement had its beginning in the fight against tuberculosis, but it is now spreading rapidly to cover the general field of health.

An illuminating instance is that of the Norton Company, Worcester, Mass., which has taken up the task in an organized manner. A physician is regularly employed to inspect the individual bodily condition of employees, and spends several hours daily at the works. His task is only in its beginning, but it has progressed far enough to emphasize the value of the results. Tubercular cases, if they exist, are easily found. Inherent physical weaknesses have been discovered, especially among the older men, which in a few instances have made it advisable that they give up their employment, and other work has been given them. Evils due to excessive smoking have been unearthed with younger workmen, who have been given the opportunity to mend their ways or seek positions elsewhere. All applicants for employment are subjected to a rigorous examination. The company feels that it is too soon to place a full estimate on the system, but up to the present time the management is highly satisfied with the prospect. It is certain that in the course of time the large working force will be absolutely physically fit.

In the same general connection, the pay envelope has been adopted as a vehicle of warning in the campaign against tuberculosis which has been maintained vigorously by Rhode Island manufacturers for a number of years. The work already accomplished is enormous. To-day the presence of consumptives has been practically eliminated in a number of works, large and small. This condition has been accomplished by careful supervision and by systematic education. The pay envelope receives the careful scrutiny of the employee and is therefore used in the campaign. A sample envelope bears on it the following:

> WILL YOU HELP TO PREVENT TUBERCULOSIS?
>
> It kills 1000 people yearly in Rhode Island.
> It is spread by Careless Spitting.
> It can be cured if taken in time.
> It can be prevented in nearly all cases.
> Do not neglect a Cough. Consult a Physician.
> Sleep with the Windows Open.
> If you think you have Tuberculosis, Notify the Overseer, and the Lorraine Mfg. Company will help you.

Insurance Against Strikes

Insurance against strikes has been attempted in various countries and in several forms, but Finland is held by experts to be the first to approach the subject in a rational manner. The Finnish employers have formed a company to carry out this form of insurance with the purpose of protecting the members against losses resulting from the total or partial cessation of labor, whether the cause be strike or lockout. The insurance can be effected in two ways: First, for a sum fixed by the amount of ordinary working expenses and 6 per cent. interest per annum upon the value of stocks of raw materials, of half-finished, and, in some cases, of finished products; or, second, 6 per cent. of the calculated annual value of production. By ordinary working expenses is meant the cost necessary in operating the business, including overhead.

The compensation is calculated in accordance with the actual expenditure entailed during the period in which work is stopped. When the cessation extends beyond three days the affected member is entitled to compensation, providing that his attitude in the dispute has been sanctioned. The payment of losses is as follows: When the insurance is under the first method, compensation for total stoppage of work is paid upon the amount of the insured sum proportionate to the duration of the shutdown. For partial stoppage, compensation is in proportion to the extent and nature of the trouble. Under the second method the compensation is equal to such portion of the insurance as is represented by the reduced value of production.

The annual premium is a calculated percentage of the insured amount, and a guarantee is paid upon

joining which amounts to twice the premium. Additional guarantees may arise under certain conditions, and the members are responsible for the obligations of the company to the extent of these amounts.

Labor Agitation and Railroad Machinery Purchases

Machinery men who follow the railroads closely have been somewhat at a loss to account for the apparent indifference of the transportation companies as to their mechanical needs. In the past few months a number of instances have been noted where railroads have let contracts for freight cars when their own car-building plants have been partly idle. For some time there has been considerable unrest among the railroad shopmen, and strikes have now been called where the union position is considered strong enough. Railroad employees in all branches are closely affiliated, and a strike among the shopmen too often calls for a sympathetic walkout in other directions. The declaration has frequently been made of late by those directing the mechanical affairs of the railroads that labor unrest has tended to keep work out of the railroad shops, and it is reasonable to assume that in many cases railroads find it advisable to contract for their work rather than risk a strike that might affect their entire system. The disposition on the part of the operative heads to neglect the shops, and their action in buying large quantities of repair parts heretofore made in their own plants, would seem to give weight to the theory that the attitude of the shop unions has some influence in the matter.

Autogenous Welding Not for the Weakened Structure

The rapid growth in favor of autogenous welding leads to the inquiry whether the use of this process, with the portable plants now scattered through the country, may not be carried to excess. In the hands of operators unfamiliar with the essential characteristics of metals there is apparently the danger that the system itself will, at times, be discredited. For example, a shaft long in service, or from other causes, may have become crystalline in structure, and if this fractures at any point the welding will be likely to merely precede a break at another. Quite a feature has been made of marine repairs, and such an occurrence in the case of a broken propeller might jeopardize both life and property in the subsequent voyage. Skilled operators in a well-regulated repair plant would not, of course, be guilty of such an error, but the more generally any process is adopted the more certain it is to fall into ignorant hands, and its abuse should be guarded against, as far as practicable, by specific instructions and cautions accompanying the apparatus. This word of caution is well understood by the developers of autogenous welding. The difficulty is always to get operators who attain skill in working the apparatus and also have knowledge of metal grain structure. Fortunately the number of cases requiring grain inspection is not relatively large.

The Sherman Law as It Works

Taking as its text a statement by the New York Sun, the following delicious preachment on the Sherman law is made by Harper's Weekly:

Mr. Taft is of opinion that the trust decisions have made the meaning of the Sherman law "clear," but this view is apparently not shared either by judges, lawyers, statesmen, or business men.—*The Sun.*

No; not yet. So far as our observation and hearsays go, the Sherman act still has them all guessing, especially the lawyers and the business men. The business man goes to his lawyer and says, "Does the Sherman act permit me to do thus and so?" The lawyer studies the transaction and replies, "I guess not; but I am not sure. Crackerjack of New York is a greater lawyer than I, let us ask him." So they ask Lawyer Crackerjack, and he writes back, "I guess not. I am not sure, but I could not assure you that you will be within the law if you do it. Better not do it any more than you can help." So the business man, not wishing to risk a stay in jail, does it as little as possible, restricting his operations accordingly.

Our neighbor, the World, thinks that the law would be abundantly clarified, and the President as its sponsor would be vastly endeared to the people, "if the Administration would send half a dozen trust magnates to jail." The World must be one of those to whom the Sherman act is clear, but there is no guarantee that the act as the World sees it is identical with the act as Mr. Taft sees it, or as Mr. Bryan sees it, or as Judge Harlan saw it.

Perhaps the understanding of the Sherman law as now interpreted by the courts is spiritual, rather than merely rational and mental. It may be a thing that is finally revealed to some minds after periods of anguish and denied to others. If that is the way of it we should not wonder, perhaps, that the Sun does not understand it yet.

Mr. Wickersham seems to understand it sufficiently to prosecute, but not sufficiently to advise how to escape prosecution. When besought for a tip how the possibly guilty may cleanse themselves of even the hazard of sin and jail sentences, he says the Department of Justice cannot act as counsel for the corporations. No doubt that is true. The pity is that so much business should be in a situation where it yearns so heartily and so vainly for responsible counsel. The man up the tree inquires of the department, "If I come down, shall I be tossed by that bull?" The department replies: "We cannot advise you in advance, but the bull has been let out to toss wicked people, and if it turns out that you are wicked he will probably toss you. We cannot tell at this distance whether you are wicked or not, but the bull will know, and his behavior to you will help us and others to understand him, and the principles on which he bases his judgment."

Isn't that about it?

And Mr. Taft says: "I understand the bull; he is all right; give him his head."

And the World says:

"The only trouble about the bull is that there haven't been enough fellows shaken down for him to toss. Let him toss a few, just to encourage the rest."

And Mr. Bryan and his co-operators say: "The bull was all right before the Supreme Court sawed the tips off his horns."

New Publications

The Copper Handbook. A manual of the copper industry of the World. Compiled and published by Horace J. Stevens, Houghton, Mich. Size 5½ x 8½ in.; pages, 1902; cloth bound. For sale by the author, who will send a copy to any address, without prepayment, for inspection. Price, $5 in buckram, $7.50 in morocco.

This is Vol. X., the tenth annual edition, of the authoritative list of copper mines and copper mining companies, which Mr. Stevens has made a special effort to bring up to date. Through sickness and fire he lost six months' time in 1907 and finally, in the desire to serve subscribers, he has spent 15 months' time on the work and given it the double date of 1910-1911. The present book, in addition to the miscellaneous chapters, lists and describes no less than 8130 copper mines and copper mining companies The 24 miscellaneous chapters treat of copper from the viewpoints of history, chemistry, mineralogy, metallurgy, brands and grades, alloys and substitutes for copper. A copious glossary and a chapter of statistics ending the book contain over 40 tables, covering production, consumption, movements, prices, dividends, etc.

The Niles-Bement-Pond Company announces a change in its agency for Canada to the Canadian Fairbanks-Morse Company, Ltd.

Personal

Hugh Millikin, Cincinnati, Ohio, has accepted a position with the American Machinery & Export Company, and will sail October 7 from Seattle, Wash., for Tientsin, China, where he will be located.

H. M. Lane, president of the Lane & Bodley Company, Cincinnati, Ohio, has returned home from an Eastern trip, fully recovered from the severe shock sustained through an accident in his shop some time age that required the amputation of one of his feet.

W. A. Garrett, vice-president of the T. H. Symington Company, Baltimore, Md., has resigned to re-enter railroad service.

John J. Main, vice-president and managing director of the Polson Iron Works, Toronto, Canada, will be relieved of the active work of supervision of the company's plant through the appointment of John I. Conradi as general manager. For the past four years Mr. Conradi has been employed in the works of Vickers, Sons & Maxim, Ltd., Sheffield, England.

Milton O. Knauss has been appointed superintendent of the Topton, Pa., furnace of the Empire Steel & Iron Company. He succeeds James McKeever, who resigned to enter other business. Mr. Knauss has been for some time assistant to H. R. Hall, superintendent of the Crane Iron Works of the Empire Steel & Iron Company at Catasauqua, Pa.

Henry K. McHarg resigned as president of the Virginia Iron, Coal & Coke Company at a meeting of the directors held in New York this week. John B. Newton, who has been vice-president and general manager, was elected president and Henry K. McHarg, Jr., was elected vice-president and general manager. Mr. McHarg retires as president but is still a member of the board of directors.

Leonard Peckitt, president of the Empire Steel & Iron Company, Catasauqua, Pa., has returned from a month's absence on the Pacific coast.

Axel Sahlin, of the firm of Kennedy, Sahlin & Co., Brussels, Belgium, leaves for India this month on business connected with the starting up of the new steel plant of the Tata Iron & Steel Company near Kalimati, Bengal. The construction work has been in charge of Mr. Sahlin's firm.

The Monterey Iron & Steel Company's Report

Notwithstanding the disturbed conditions in Mexico, the annual report of the Compania Fundidora de Fierro y Acero de Monterey, S. A. (the Monterey Iron & Steel Company), Monterey, Mexico, for the year 1910 demonstrates that industrial progress may be expected to continue, and, with conditions settled by the election of a President, the country should advance in material development. This report, which covers the calendar year 1910, shows that the output of the blast furnace (which was idle for four months) was 45,095 metric tons, an amount exceeded only in the previous year, 1909, when 50,859 tons were produced.

During the year 67,944 metric tons of steel ingots were made, an increase over the preceding year of 8435 tons; 9822 tons of steel being obtained from iron melted in a cupola while the blast furnace was inactive. Finished products comprised 23,546 tons of rails weighing 85 lb. per yard; 14,159 tons of structural steel, and 14,996 tons of merchant and other steel, including spikes, bolts, reinforcing bars, etc., a total of 52,701 tons, showing a gain over 1909 of 7000 tons.

The blast furnace was supplied with 78,876 tons of ore, averaging 58 per cent. iron, of which 28,625 tons were obtained from the company's mines. Of coke, 59,970 tons were used, of which 37,090 tons were produced by the company and 22,880 tons imported. Mexican coal was employed exclusively for steam generation, 60,722 tons being used for this purpose, and 52,364 tons were fed to gas producers. The company mined 29,407 tons of limestone and 1,023 tons of native fluorspar. It also imported 639 tons of ferromanganese, 83 tons of ferrosilicon, and 737 tons of magnesite. There were 23,276 tons of iron and steel scrap used, mostly from the National Railways

The sales of the company during the year amounted to $6,206,756 Mexican, which is equivalent to $3,103,378 gold.

Obituary

JOSEPH LEON GOBEILLE, for the past three years at the head of the Gobeille-Harris Pattern Company, Niagara Falls, N. Y., died in that city September 27, after an illness of several weeks. Through most of his business career his name was identified with the Gobeille Pattern Company, Cleveland, Ohio, which he developed to large proportions. His mechanical training was obtained at Cooper Union, New York, and Rensselaer Polytechnic Institute, Troy, N. Y. After entering upon his life work at Cleveland he soon showed ability to push out in new lines, and with originality were joined capacity for organization and tireless energy. Having served an apprenticeship in patternmaking, Mr. Gobeille was acquainted with every step in that trade and was able to direct his shop operations with an attention to detail that is found in few industrial managers. While he specialized in stove patterns his shop turned out some of the largest and most intricate work called for by the leading foundries of the country. In the period from 1890 to 1900, including the years of the depression beginning in 1893, the Gobeille Pattern Works were at the height of their prominence. In his work for stove manufacturers Mr. Gobeille showed rare originality, and while he had a penchant for unique ornamentation, he was thoroughly practical in stove designing and construction and some of his best work was done in that line. He was a member of the American Society of Mechanical Engineers and in 1892 and 1893 was president of the Cleveland Engineers' Club, the affairs of that organization being highly prosperous under his administration. Mr. Gobeille had a literary bent and will be remembered for the papers he prepared for various foundrymen's and stove manufacturers' associations. He was a lover of rare books and did some work as a writer of short stories. Leaving Cleveland six or seven years ago, after a financial reverse, he was for a time connected with the Abram Cox Stove Company, Philadelphia. Later he went to Niagara Falls and organized the Gobeille-Harris Pattern Company and was in a fair way to re-establish himself in business as a proprietor when the disability developed which caused his death. An accident which befell him shortly after going to Niagara Falls was an earlier handicap, which he showed unusual courage in overcoming. He was about 55 years of age.

BYRON ALDEN BROOKS, patent expert of the Union Typewriter Company and the inventor of one of the best-known typewriters, died September 29 at his home in Brooklyn, N. Y., aged 66 years. He had been identified with the typewriter business for 40 years, and devoted his life to the improvement of writing machines. He was born at Theresa, N. Y., and was graduated from Wesleyan College in the class of 1871. He was one of the trustees of the Bedford Branch of the Young Men's Christian Association and one of the founders of the Boys' Welcome Hall, besides aiding in many of the educational and philanthropic movements of Brooklyn. He was a member of the Hardware Club and of the Lincoln Club of Brooklyn.

"Titanium Rail Tests on the B. & O. Railroad" is the title of a recent folder prepared by the Titanium Alloy Mfg. Company, Charles B. Slocum, general sales agent, Pittsburgh. Two sheets are given containing diagrams of rail sections, on each of which is indicated the line of rail wear. The results of 338 days' service show that plain open hearth rails with an average carbon content of 0.64 per cent. had an average percentage of wear of 0.277, while for titanium Bessemer rails treated with 0.15 per cent. metallic titanium and having an average carbon content of 0.47 per cent. the average wear is given as 0.177 per cent.

The Standard Welding Company, Cleveland, Ohio, has discontinued its arrangements with L. F. McClernan & Co., Chicago, for the sale of its various products and has opened an office of its own in the People's Gas Building, Chicago, which will be in charge of B. A. Quayle and A. C. Clark of its own staff. The opening of this office not only gives the company direct representation in the Central Western States, but will also provide much better service for the trade in that territory.

Pig Iron Output Increases

A Gain of Ten in Active Furnaces

Capacity in Blast October 1 Is 3250 Tons a Day More than on September 1

Pig iron production increased in September, the month showing a net gain of 10 in the number of active furnaces. The total output of coke and anthracite pig iron in the 30 days of last month was 1,977,102 gross tons, or 65,903 tons a day, as against 1,926,637 tons in August, or 62,150 tons a day, The steel works furnaces made most of the gain, but the merchant furnaces, after seven months of steadily declining production, turned the tide last month, with a gain of nearly 1200 tons a day over August.

It is significant also that October opens with the gain in production still under way, several more merchant furnaces being scheduled to blow in early this month, including one in the Buffalo district, one in the Hanging Rock district, one in Virginia, one in the Schuylkill Valley and one in the Lebanon Valley. The capacity active

The table below gives the production of all coke and anthracite furnaces in September and the four months preceding:

Monthly Pig Iron Production—Gross Tons.

	May. (31 days)	June. (30 days)	July (31 days)	August. (31 days)	S pt. (30 days)
New York	136,927	130,395	124,347	118,145	114,418
New Jersey	9,788	8,600	1,886		
Lehigh Valley	79,731	72,787	66,404	77,021	81,728
Schuylkill Valley	46,827	44,039	45,859	53,397	52,546
Lower Susquehanna and Lebanon Val.	44,179	41,751	40,085	38,741	36,687
Pittsburgh district	422,000	415,519	419,248	469,012	482,013
Shenango Valley	88,170	78,196	79,571	84,884	82,870
West Penn	61,892	60,047	73,177	96,366	98,324
Maryland, Virginia and Kentucky	53,371	48,969	52,582	46,262	44,243
Wheeling district	115,213	93,617	93,973	94,476	92,130
Mahoning Valley	187,748	188,187	184,402	189,200	213,872
Central and North. Ohio	152,809	141,973	116,953	131,850	131,020
Hocking Valley, Hanging Rock and S. W. Ohio	27,185	20,245	11,321	7,262	16,785
Mich., Minn., Mo., Wis., Col., Wash.	71,938	54,391	57,661	63,114	61,276
Chicago district	238,424	249,666	272,817	287,875	289,198
Alabama	134,386	117,015	126,200	140,879	149,238
Tenn., Georgia and Texas	28,868	27,169	27,082	28,153	25,745
Total	1,893,456	1,787,566	1,793,068	1,926,637	1,977,102

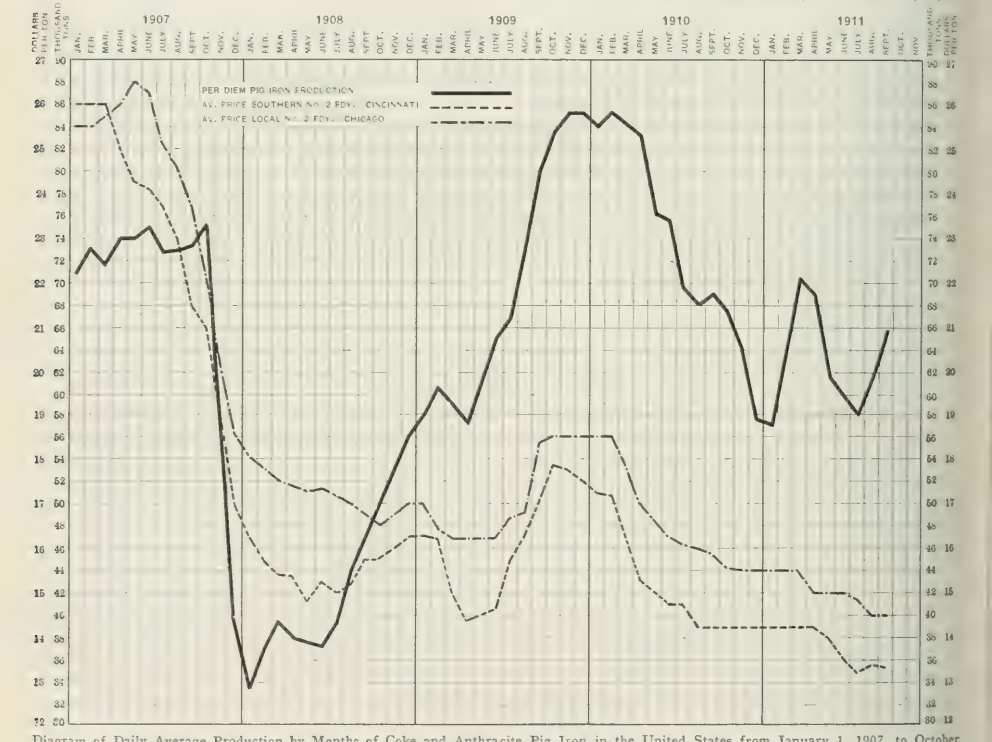


Diagram of Daily Average Production by Months of Coke and Anthracite Pig Iron in the United States from January 1, 1907, to October 1, 1911; Also of Monthly Average Prices of Southern No. 2 Foundry Iron at Cincinnati and Local No. 2 Foundry Iron at Chicago District Furnace.

on October 1 was 66,468 tons a day from 213 furnaces, against 63,214 tons a day from 203 furnaces on September 1.

Daily Rate of Production

The daily rate of production of coke and anthracite pig iron by months, beginning with September, 1910, is as follows:

Daily Rate of Pig Iron Production by Months—Gross Tons.

	Steel works.	Merchant.	Total.
September, 1910	47,067	21,536	68,842
October	45,744	21,776	67,520
November	41,427	22,232	63,659
December	35,906	21,440	57,346
January, 1911	36,401	20,351	56,752
February	42,349	21,741	64,090
March	48,970	21,066	70,036
April	47,805	21,031	68,836
May	42,570	18,809	61,079
June	42,708	16,857	59,585
July	42,472	15,369	57,841
August	47,120	15,030	62,150
September	49,696	16,207	65,903

Production of Steel Companies

Returns from all furnaces of the United States Steel Corporation and the various independent steel companies show the following totals of product month by month. Only steel making iron is included in these figures, together with ferromanganese, spiegeleisen and ferrosilicon:

Production of Steel Companies—Gross Tons.

	Pig.—Total production.			Spiegeleisen and ferromanganese.	
	1909	1910	1911	1910	1911
January	1,117,823	1,773,201	1,128,448	19,538	8,360
February	1,073,363	1,620,539	1,185,782	21,396	12,821
March	1,140,553	1,739,212	1,518,063	25,591	11,782
April	1,083,092	1,669,898	1,434,142	22,304	10,657
May	1,356,448	1,619,283	1,310,378	26,529	13,641
June	1,365,527	1,549,112	1,281,241	27,680	22,611
July	1,508,762	1,462,689	1,316,646	22,924	17,067
August	1,591,991	1,442,572	1,460,610	25,756	14,579
September	1,660,839	1,410,221	1,490,898	15,151	17,257
October	1,769,094	1,419,624		8,500	
November	1,689,994	1,242,804		9,032	
December	1,768,799	1,113,174		12,178	

Capacity in Blast October 1 and September 1

The following table shows the daily capacity of furnaces in blast October 1 and September 1:

Coke and Anthracite Furnaces in Blast.

Location of Furnaces	Total number of stacks.	Oct. 1 Number in blast.	Oct. 1 Capacity per day.	Sept. 1 Number in blast.	Sept. 1 Capacity per day.
New York:					
Buffalo	17	9	3203	6	3005
Other New York	7	3	611	3	621
New Jersey	7	0	0	0	0
Pennsylvania:					
Lehigh Valley	24	12	2557	12	2317
Spiegel	3	2	167	2	167
Schuylkill Valley	16	7	1838	6	1722
Lower Susquehanna	7	2	619	2	583
Lehanon Valley	10	4	604	4	635
Pittsburgh District	50	39	15,726	38	15,308
Spiegel	3	2	240	2	330
Schuylkill Valley	16	7	1838	6	1722
Western Pennsylvania.	27	12	3510	11	3108
Maryland	4	3	772	3	750
Wheeling District	14	9	3071	9	3051
Ohio:					
Mahoning Valley	24	18	7125	17	6750
Central and Northern.	23	11	4367	11	4285
Hocking Val., Hanging Rock & S. W. Ohio.	15	5	665	2	235
Illinois and Indiana	32	21	9532	21	9235
Spiegel	2	2	185	1	52
Mich., Wis. and Minn.	10	5	1020	5	970
Colorado, Mo. and Wash.	7	3	1022	3	1080
The South:					
Virginia	23	6	635	5	617
Kentucky	5	2	265	1	145
Alabama	46	19	4950	19	4565
Tenn. and Georgia	20	7	855	8	910
Total	416	213	66,468	203	63,214

Among furnaces blown out last month were one Edgar Thomson in the Pittsburgh district and Rockdale in Tennessee. The list of furnaces blown in included Topton in the Schuylkill Valley, one Donora and one Shoenberger in the Pittsburgh district, one Shenango in the Shenango Valley, Perry in western Pennsylvania, Covington in Virginia, Ashland No. 2 in Kentucky, No. 2 Haselton in the Mahoning Valley, Ironton, Jackson and Sarah in the Hanging Rock district and one Calumet in the Chicago district.

Chart of Pig Iron Production and Prices

The fluctuations in pig iron production from January 1907, to the present time are shown in the accompanying chart. The figures represented by the heavy line are those of daily average production, by months, of coke and anthracite iron. The two other curves on the chart represent monthly average prices of Southern No. 2 foundry pig iron at Cincinnati and of local No. 2 foundry iron at furnace at Chicago. They are based on the weekly market quotations of *The Iron Age*. The two sets of figures are as follows:

Daily Average Production of Coke and Anthracite Pig Iron in the United States by Months Since January 1, 1907.—Gross Tons.

	1907.	1908.	1909.	1910.	1911.
January	71,149	33,918	57,975	84,148	56,752
February	73,038	37,163	60,976	85,616	64,090
March	71,821	39,619	59,232	84,459	70,036
April	73,885	38,289	57,962	82,792	68,836
May	74,048	37,603	60,753	77,102	61,079
June	74,486	36,444	64,656	75,516	59,585
July	72,763	39,387	67,793	69,305	57,841
August	72,594	43,851	72,546	67,963	62,150
September	72,783	47,300	79,507	68,476	65,903
October	75,386	50,554	83,856	67,520	.....
November	60,937	51,595	84,917	63,659	.....
December	39,815	56,158	85,022	57,349	.....

Monthly Average Prices in Dollars of Southern No. 2 Foundry Iron at Cincinnati and Local No. 2 Foundry at Chicago District Furnace Since January, 1907.

	1907.		1908.		1909.		1910.		1911.	
	Sou. Cin.	Loc. No.2, Chi.	Sou. Cin.	Loc. No.2, Chi.	Sou. Cin.	Loc. No.2, Chi.	Sou. Cin.	Loc. No.2, Chi.	Sou. Cin.	Loc. No.2, Chi.
Jan.	26.00	25.00	16.15	18.10	16.26	17.00	17.25	18.50	14.25	15.00
Feb.	26.00	25.50	15.75	17.81	16.13	16.40	17.06	18.50	14.25	15.00
Mar.	26.00	25.75	15.50	17.50	16.13	16.30	17.80	18.50	14.25	15.00
Apr.	25.06	26.00	15.20	17.38	14.25	16.15	15.37	17.00	14.25	15.00
May	24.25	26.50	14.75	17.28	14.50	16.15	15.00	16.56	14.00	15.00
June	24.10	26.25	15.25	17.38	14.70	16.15	14.85	16.25	13.50	15.00
July	23.85	25.20	15.00	17.20	15.75	16.65	14.75	16.06	13.25	14.87
Aug.	23.00	24.50	15.25	17.00	16.38	16.78	14.31	16.00	13.45	14.50
Sept.	21.50	23.75	15.65	16.70	17.35	18.35	14.25	15.90	13.31	14.50
Oct.	20.95	23.13	15.75	16.50	17.88	18.50	14.25	15.56	....	....
Nov.	19.50	20.31	16.00	16.75	17.75	18.50	14.25	15.50	....	....
Dec.	17.00	18.55	16.25	17.00	17.45	18.50	14.25	15.50	....	....

The Record of Production

Production of Coke and Anthracite Pig Iron in the United States by Months Since January 1, 1907—Gross Tons.

	1907.	1908.	1909.	1910.	1911.
Jan.	2,205,607	1,045,250	1,797,560	2,608,605	1,759,326
Feb.	2,045,068	1,077,740	1,707,340	2,397,254	1,794,509
Mar.	2,226,457	1,228,204	1,832,194	2,617,949	2,171,111
Apr.	2,216,558	1,149,602	1,738,877	2,483,763	2,064,086
May	2,295,505	1,165,688	1,883,330	2,390,180	1,893,456
June	2,234,565	1,092,131	1,930,866	2,265,478	1,787,566
July	2,255,660	1,218,129	2,103,431	2,148,442	1,793,068
Aug.	2,250,410	1,359,831	2,248,930	2,106,847	1,926,637
Sept.	2,183,487	1,418,998	2,385,206	2,056,275	1,977,102
Oct.	2,336,972	1,567,198	2,599,541	2,093,121	.....
Nov.	1,828,125	1,577,854	2,547,508	1,909,780	.....
Dec.	1,234,279	1,740,912	2,635,680	1,777,817	.....

Pittsburgh and Vicinity Business Notes

The annual meeting of stockholders of the Treadwell Construction Company, builder of steel plate construction, was held at its principal offices at Midland, Pa., September 27, at which the following directors were elected: M. H. Treadwell, J. H. Killinger, H. N. Dougherty, R. M. Dorsey, W. E. Farrell, J. S. Craig and S. N. Craig. Officers were re-elected as follows: M. H. Treadwell, president; S. N. Craig, vice-president; H. N. Dougherty, treasurer, B. W. Hunsicker, secretary.

The Standard Chain Company, Pittsburgh, was the successful bidder on proposals for buoy chain, light vessel chain, shackles and swivels for the Light House Department on specifications submitted for the fiscal year 1912, bids having been opened at the department's office at Tompkinsville, N. Y., September 21. The total tonnage was 1,351,000 lb.. This is the largest contract for chain ever secured by any one manufacturer from the Light House Department.

William O'Brien & Co. are erecting an addition to their boiler-making plant on the Chartiers Valley Railroad, Pittsburgh. It is of steel, 130 x 30 ft., with a wing 24 x 30 ft.

The Buffalo Forge Company, Buffalo, N. Y., has been awarded the contract by the Westinghouse Air Brake Company for the heating and ventilating system in its new carpenter shop at Wilmerding, Pa. The building will be of brick construction, 210 ft. long.

Among recent large contracts received by the Westinghouse Electric & Mfg. Company, East Pittsburgh, was one from the city of Tacoma, Wash., for the entire switchboard and auxiliary apparatus for the power house, substation and transmission line of the 27,000-hp. hydroelectric plant which the city is erecting about seven miles away from Nisqually River. An idea of the size of the board may be gained from the fact that six tons of copper alone will be used in its construction. The amount involved in the contract, which also includes a large amount of details and supplies, is about $85,000.

Labor Notes

Car shop employees of the Union Pacific, Southern Pacific, Illinois Central and other Harriman lines numbering 30,000 went on strike September 30 in order to enforce recognition of the labor organizations as a unit. The strike affects railroad shops in 15 States, and the men involved include 10,000 machinists, 4000 boilermakers, 3000 blacksmiths, 11,000 car men, 1000 clerks and miscellaneous workmen to the number of 1000. The railroad companies are contesting the strike, and employment offices have been opened in large cities in all parts of the country.

The Board of Governors of the Building Trades Employers' Association of New York ordered a general lockout of union men last Monday in all the trades involved in the sympathetic strike on the construction of the new Vanderbilt Hotel in New York. The strike was originally called because of the employment of non-union marble workers on the building which resulted in a walkout by the members of 14 unions employed in the building trades. The retaliatory measures adopted by the Building Trades Association resulted in an end to the sympathetic strike.

A strike has been declared by pattern makers in New York and Brooklyn foundries making structural castings. The men demand an eight hour working day at the same wage rate as is now in force. The employers as a rule are resisting the demand.

The Marting Iron & Steel Company, Ironton, Ohio, blew in its furnace early this week.

The West End furnace at Roanoke, Va., will probably be blown in early this month after relining.

The Iron and Metal Markets

A Comparison of Prices

Advances Over the Previous Week in Heavy Type. Declines in Italics.

At date, one week, one month and one year previous.

	Oct. 4, 1911.	Sept. 27, 1911.	Sept. 6, 1911.	Oct. 5, 1910.
PIG IRON, Per Gross Ton:				
Foundry No. 2 standard, Philadelphia	$15.00	$15.00	$15.00	$16.00
Foundry No. 2, Valley furnace.	13.25	13.25	13.50	13.75
Foundry No. 2 Southern, Cincinnati	13.25	13.25	13.50	14.25
Foundry No. 2, Birmingham, Ala.	10.00	10.00	10.25	11.00
Foundry No. 2, at furnace, Chicago*	14.50	14.50	14.50	16.25
Basic, delivered, eastern Pa.	14.50	14.50	14.75	15.00
Basic, Valley furnace	12.60	12.60	13.00	13.50
Bessemer, Pittsburgh	*15.55*	15.90	15.90	15.90
Gray forge, Pittsburgh	13.65	13.65	13.90	14.15
Lake Superior charcoal, Chicago	16.50	16.50	16.50	18.25
COKE, CONNELLSVILLE,				
Per Net Ton, at Oven:				
Furnace coke, prompt shipment.	1.50	1.50	1.50	1.60
Furnace coke, future delivery.	1.60	1.60	1.60	1.70
Foundry coke, prompt shipment.	1.85	1.85	1.85	2.10
Foundry coke, future delivery.	2.10	2.10	2.10	2.25
BILLETS, &c., Per Gross Ton:				
Bessemer billets, Pittsburgh	20.00	20.00	21.00	24.00
Open hearth billets, Pittsburgh.	19.00	19.00	21.00	24.50
Forging billets, Pittsburgh	25.00	25.00	26.00	29.00
Open hearth billets, Philadelphia	*21.40*	22.40	23.40	26.00
Wire rods, Pittsburgh	26.00	26.00	27.00	28.50
OLD MATERIAL, Per Gross Ton:				
Iron rails, Chicago	*13.75*	14.00	14.00	16.00
Iron rails, Philadelphia	*16.50*	17.00	17.00	18.00
Car wheels, Chicago	*12.50*	12.75	13.00	14.00
Car wheels, Philadelphia	*11.75*	12.00	13.00	13.75
Heavy steel scrap, Pittsburgh	*12.25*	12.50	13.00	14.25
Heavy steel scrap, Chicago	10.00	10.00	10.50	12.25
Heavy steel scrap, Philadelphia	12.00	12.00	13.25	14.00
FINISHED IRON AND STEEL,				
Per Pound:	Cents.	Cents.	Cents.	Cents.
Bessemer rails, heavy, at mill.	1.25	1.25	1.25	1.25
Refined iron bars, Philadelphia	1.22½	1.22½	1.27½	1.40
Common iron bars, Pittsburgh	*1.20*	1.25	1.25	1.45
Common iron bars, Chicago	1.20	1.20	1.20	1.35
Steel bars, Pittsburgh	1.15	1.15	1.20	1.40
Steel bars, tidewater, New York	1.31	1.31	1.36	1.56
Tank plates, Pittsburgh	*1.20*	1.25	1.30	1.40
Tank plates, tidewater, New York	*1.36*	1.41	1.46	1.56
Beams, Pittsburgh	*1.25*	1.30	1.35	1.40
Beams, tidewater, New York	*1.41*	1.46	1.51	1.56
Angles, Pittsburgh	*1.25*	1.30	1.35	1.40
Angles, tidewater, New York	*1.41*	1.46	1.51	1.56
Skelp, grooved steel, Pittsburgh	1.15	1.15	1.20	1.40
Skelp, sheared steel, Pittsburgh	1.25	1.25	1.30	1.50
SHEETS, NAILS AND WIRE,				
Per Pound:	Cents.	Cents.	Cents.	Cents.
Sheets, black, No. 28, Pittsburgh	*1.85*	1.90	1.95	2.20
Wire nails, Pittsburgh†	1.65	1.65	1.65	1.70
Cut nails, Pittsburgh†	*1.50*	1.55	1.60	1.65
Barb wire, galv., Pittsburgh†	1.95	1.95	2.00	2.00
METALS,				
Per Pound:	Cents.	Cents.	Cents.	Cents.
Lake copper, New York	12.50	12.50	12.75	12.75
Electrolytic copper, New York	12.25	12.25	12.50	12.50
Spelter, St. Louis	5.85	5.85	5.80	5.45
Spelter, New York	6.00	6.00	6.00	5.60
Lead, St. Louis	4.32½	4.32½	4.42½	4.27½
Lead, New York	4.47½	4.47½	4.50	4.40
Tin, New York	**40.15**	38.87½	41.25	36.50
Antimony, Hallett, New York	7.70	7.70	7.75	7.87½
Tin plate, 100-lb. box, New York	$3.84	$3.84	$3.94	$3.84

*The average switching charge for delivery to foundries in the Chicago district is 50c. per ton.

†These prices are for largest lots to jobbers.

Prices of Finished Iron and Steel f.o.b. Pittsburgh

Freight rates from Pittsburgh in carloads, per 100 lb.: New York, 16c.; Philadelphia, 15c.; Boston, 18c.; Buffalo, 11c.; Cleveland, 10c.; Cincinnati, 15c.; Indianapolis, 17c.; Chicago, 18c.; St. Paul, 32c.; St. Louis, 22½c.; New Orleans, 30c.; Birmingham, Ala., 45c. Pacific coast, 80c. on plates, structural shapes and sheets No. 11 and heavier; 85c. on sheets Nos. 12 to 16; 95c. on sheets No. 16 and lighter; 65c. on wrought boiler tubes.

Plates.—Tank plates, ¼ in. thick, 6¼ in. up to 100 in. wide, 1.20c. to 1.25c., base, net cash, 30 days. Following are stipulations prescribed by manufacturers, with extras:

Rectangular plates, tank steel or conforming to manufacturers' standard specifications for structural steel dated February 6, 1903, or equivalent, ¼ in. thick and over on thinnest edge, 100 in. wide and under, down to but not including 6 in. wide, are base.

Plates up to 72 in. wide, inclusive, ordered 10.2 lb. per square foot, are considered ¼-in. plates. Plates over 72 in. wide must be ordered ¼ in. thick on edge, or not less than 11 lb. per square foot, to take base price. Plates over 72 in. wide ordered less than 11 lb. per square foot down to the weight of 3-16-in. take the price of 3-16-in.

Allowable overweight, whether plates are ordered to gauge or weight, to be governed by the standard specifications of the Association of American Steel Manufacturers.

Extras.	Cents per lb.
Gauges under ¼ in. to and including 3-16 in. on thinnest edge	.10
Gauges under 3-16 in. to and including No. 8	.15
Gauges under No. 8 to and including No. 9	.25
Gauges under No. 9 to and including No. 10	.30
Gauges under No. 10 to and including No. 12	.40
Sketches (including all straight taper plates) 3 ft. and over in length	.10
Complete circles, 3 ft. in diameter and over	.20
Boiler and flange steel	.10
"A. B. M. A." and ordinary firebox steel	.20
Still bottom steel	.30
Marine steel	.40
Locomotive firebox steel	.50
Widths over 100 in. up to 110 in., inclusive	.05
Widths over 110 in. up to 115 in., inclusive	.10
Widths over 115 in. up to 120 in., inclusive	.15
Widths over 120 in. up to 125 in., inclusive	.25
Widths over 125 in. up to 130 in., inclusive	.50
Widths over 130 in	1.00
Cutting to lengths or diameters under 3 ft. to 2 ft., inclusive	.25
Cutting to lengths or diameters under 2 ft. to 1 ft., inclusive	.50
Cutting to lengths or diameters under 1 ft.	1.55

No charge for cutting rectangular plates to lengths 3 ft. and over.

Structural Material.—I-beams, 3 to 15 in.; channels, 3 to 15 in., and angles, 3 to 6 in. on one or both legs, ¼ in. and over, 1.25c. to 1.30c. Other shapes and sizes are quoted as follows:

	Cents per lb.
I-beams over 15 in.	1.35 to 1.40
H-beams over 18 in.	1.45 to 1.50
Angles, 3 to 6 in., inclusive, ¼ in. and up	1.25 to 1.30
Angles over 6 in.	1.35 to 1.40
Angles, 3 in. on one or both legs, less than ¼ in. thick, plus full extras as per steel bar card Sept. 1, 1909	1.30 to 1.35
Tees, 3 in. and up	1.30 to 1.35
Zees, 3 in. and up	1.25 to 1.30
Angles, channels and tees, under 3 in., plus full extras as per steel bar card Sept. 1, 1909	1.30 to 1.35
Deck beams and bulb angles	1.55 to 1.60
Hand rail tees	2.45
Checkered and corrugated plates	2.45

Sheets.—Makers' prices for mill shipments on sheets of U. S. standard gauge, in carload and larger lots, on which jobbers charge the usual discounts for small lots from store, are as follows:

Blue Annealed Sheets.

	Cents per lb.
Nos. 3 to 8	1.25 to 1.30
Nos. 9 and 10	1.35 to 1.40
Nos. 11 and 12	1.40 to 1.45
Nos. 13 and 14	1.45 to 1.50
Nos. 15 and 16	1.55 to 1.60

Box Annealed Sheets, Cold Rolled.

	One Pass.	Three Pass.
Nos. 10 to 12	1.50 to 1.55	.....
Nos. 13 and 14	1.55 to 1.60	.....
Nos. 15 and 16	1.60 to 1.65	1.70 to 1.75
Nos. 17 to 21	1.65 to 1.70	1.75 to 1.80
Nos. 22, 23 and 24	1.70 to 1.75	1.80 to 1.85
Nos. 25 and 26	1.75 to 1.80	1.85 to 1.90
No. 27	1.80 to 1.85	1.90 to 1.95
No. 28	1.85 to 1.90	1.95 to 2.00
No. 29	1.90 to 1.95	2.00 to 2.05
No. 30	2.00 to 2.05	2.10 to 2.15

Galvanized Sheets, 4 Black Sheet Gauge.

Nos. 10 and 11	1.85 to 1.90
Nos. 12, 13 and 14	1.95 to 2.00
Nos. 15, 16 and 17	2.10 to 2.15
Nos. 18 to 22	2.25 to 2.30
Nos. 23 and 24	2.35 to 2.40
Nos. 25 and 26	2.55 to 2.60
No. 27	2.70 to 2.75
No. 28	2.85 to 2.90
No. 29	2.95 to 3.00
No. 30	3.15 to 3.20

All above rates on sheets are f.o.b. Pittsburgh, terms 30 days net, or 2 per cent. cash discount in 10 days from date of invoice, as also are the following base prices per square for painted and galvanized roofing sheets, with 2½-in. corrugations:

Gauge.	Painted.	Galvanized.	Gauge.	Painted.	Galvanized.
29	....	$2.30	23	$2.35	$3.45
28	$1.30	2.45	22	2.55	3.65
27	1.45	2.50	21	2.75	4.00
26	1.55	2.60	20	3.00	4.30
25	1.80	3.00	18	4.60	5.65
24	2.05	2.10	16	4.85	6.45

Wire Rods and Wire.—Bessemer, open hearth and chain rods, $26 to $26.50. Fence wire, Nos. 0 to 9 per 100 lb., terms 60 days, or 2 per cent. discount in 10 days, carload lots, to jobbers, annealed, $1.45; galvanized,

THE IRON AND METAL MARKETS

$1.75. Carload lots, to retailers, annealed, $1.50; galvanized, $1.80. Galvanized barb wire to jobbers, $1.95; painted, $1.65. Wire nails, to jobbers, $1.65.

The following table gives the price to retail merchants on wire in less than carloads, including the extras on Nos. 10 to 16, which are added to the base price:

Fence Wire, Per 100 lb.

Nos.	0 to 9	10	11	12 & 12½	13	14	15	16
Annealed	$1.65	$1.70	$1.75	$1.80	$1.90	$2.00	$2.10	$2.20
Galvanized	1.95	2.00	2.05	2.10	2.20	2.30	2.70	2.80

Market and Stove Ware in Bundles, Discount from Standing List.

Bright and Annealed:
9 and coarser 80
10 to 18 ..... 80 and 10
19 to 26 ..... 80 and 10 and 2½
27 to 36 ..... 80 and 5

Galvanized:
9 and coarser ..... 75 and 10
10 to 16 ..... 75 and 10
17 to 26 ..... 72½ and 10
27 to 36 ..... 72½

Coppered or Liquor Finished:
9 and coarser ..... 75 and 10
10 to 26 ..... 75 and 10
27 to 36 ..... 70 and 10 and 5

Tinned:
6 to 18 ..... 75 and 10 and 10

Wrought Pipe.—The following are the jobbers' carload discounts on the Pittsburgh basing card on wrought pipe, in effect from October 2, 1911:

	Steel Black.	Steel Galv.	Iron Black.	Iron Galv.
Butt Weld.				
⅛ and ¼ in.	73	53	..	..
⅜ in.	74	64	..	..
½ in.	77	67	75	65
¾ in. to 1¼ in.	80	72	75	67
2 in to 3 in.	81	74	76	69
Lap Weld.				
2 in.	77	70	72	65
2½ to 4 in.	79	72	74	67
4½ to 6 in.	78	70	73	63
7 to 12 in.	76	66	71	61
13 to 15 in.	52	..	..	..
Butt Weld, extra strong, plain ends, card weight.				
⅛, ¼, ⅜ in.	70	60	65	55
½ in.	75	69	70	64
¾ to 1¼ in.	79	73	74	68
2 to 3 in.	80	74	75	69
Lap Weld, extra strong, plain ends, card weight.				
2 in.	76	70	71	65
2½ to 4 in.	78	72	73	67
4½ to 6 in.	77	71	72	66
7 to 8 in.	70	60	65	55
9 to 12 in.	65	55	60	50
Butt Weld, double extra strong, plain ends, card weight.				
¼ in.	65	59	60	54
¾ to 1¼ in.	68	62	63	57
2 to 3 in.	70	64	65	59
Lap Weld, double extra strong, plain ends, card weight.				
2 in.	66	60	61	55
2½ to 4 in.	68	62	63	57
4½ to 6 in.	67	61	62	56
7 to 8 in.	60	50	62	56
Plugged and Reamed.				
1 to 1½, 2 to 3 in. Butt Weld	will be sold at two (2) points lower basing (higher price) than merchants' or card weight pipe. Butt or lap weld, as specified.			
1 to 1¼, 2 to 3 in. Butt Weld				

The above discounts are for "card weight," subject to the usual variation of 5 per cent. Prices for less than carloads are three (3) points lower basing (higher price) than the above discounts.

Boiler Tubes.—Discounts on lap welded steel boiler tubes to jobbers in carloads are as follows:

1¾ to 2¼ in. 65
2½ in. 67½
2¾ to 3½ in. 72½
3½ to 4 in. 75
5 to 6 in. 67½
7 to 13 in. 65
2¼ in. and smaller, over 18 ft., 10 per cent. net extra
2¾ in. and larger, over 22 ft., 10 per cent. net extra.

Less than carloads will be sold at the delivered discount for carloads, lowered by two points for lengths 22 ft. and under to destinations east of the Mississippi River; lengths over 22 ft. and all shipments going west of the Mississippi River must be sold f.o.b. mill at Pittsburgh basing discount, lowered by two points.

Pittsburgh

PITTSBURGH, October 4, 1911.—(*By Telephone.*)

Pig Iron.—The price of $15 at Valley furnace for Bessemer iron, maintained only nominally by the Valley furnaces for so long, has given way, and we note a sale of 1000 tons of standard Bessemer iron for prompt shipment made by a Valley furnace agency at $14.65 at furnace for delivery in the Cleveland, Ohio, district. On an inquiry recently sent out by a local consumer for 3000 to 4000 tons of Bessemer as low as $14.50 at furnace was quoted. There is no new inquiry for basic, foundry or gray forge iron, and the whole pig iron market is weak. We quote standard Bessemer iron at $14.65; basic, $12.60; malleable Bessemer, $13; No. 2 foundry, $13.25, and gray forge, $12.75, all at Valley furnace, the freight rate to Pittsburgh being 90c. a ton.

Steel.—There is no new inquiry for billets or sheet bars, most consumers being covered by contracts, which are coming in at only a fairly satisfactory rate. On some contracts for billets and sheet bars, of which prices are based on pig iron, consumers will pay slightly less for their steel in the last quarter than in the third quarter. We quote Bessemer billets, base sizes, at $20; Bessemer sheet and tin bars, $21; open hearth billets, $19; open hearth sheet and tin bars, $19.50 to $20, and forging billets, $25, f.o.b. Pittsburgh or Youngstown. We note a sale of 50 tons of forging billets for prompt delivery at $25, delivered at buyers' mills, Pittsburgh.

(By Mail.)

The situation is decidedly discouraging, with indications that the worst is not yet over; but in conditions like the present rumors are always prevalent of lower prices than are actually made. Confidence on the part of consumers is entirely lacking. Orders are almost wholly for such quantities of material as are absolutely needed for current requirements and on nearly everything specifications are being practically held up. On finished iron and steel products it is difficult to tell precisely what prices are ruling, but steel plates have sold at 1.20c.; structural material at 1.25c. or lower; No. 28 black sheets at 1.85c. and No. 28 galvanized sheets at 2.85c. These are the lowest prices reached on the materials named in some years. The new basing card of discounts issued by the steel pipe mills shows reductions of $2 to $4 a ton on black pipe and from $4 to $12 a ton on galvanized pipe. Boiler tubes have also been reduced $4 to $6 a ton. Heavy steel scrap loaded on cars has sold at $12 per ton, delivered in the Pittsburgh district, which is the lowest price reached for several years. Furnace and foundry coke are quiet, but prices are holding fairly firm. Reports are circulating that within a very short time labor will be asked to take material reductions on account of the present unsatisfactory conditions. However, as soon as consumers begin to believe that bottom has been reached in prices a heavy buying movement is expected to start.

Ferromanganese.—Some new inquiry has developed, and prices are now being asked on 3500 to 4000 tons for delivery to different consumers in the first half of next year. The efforts of importers to hold the market at $38.50, Baltimore, have not been successful, and we note several small sales for reasonably prompt shipment and also into the first quarter of 1912 at $36.50 to $37, Baltimore, the freight rate to Pittsburgh district being $1.95 a ton.

Ferrosilicon.—Consumers who intended to buy have withdrawn from the market and are holding off to see whether the very high prices ruling for 50 per cent. can be held. We continue to quote 50 per cent. at $58, f.o.b. Pittsburgh. Blast furnace ferrosilicon is quoted as follows: 10 per cent., $23; 11 per cent., $24, and 12 per cent., $25, f.o.b. cars, Ashland, Ky., and Jackson, Ohio, furnaces. It is considered probable that on a firm offer for reasonably prompt shipment these prices would be shaded.

Muck Bar.—The market is very dull, with no new inquiry. We quote best grades of muck bar, made from all pig iron, at $28 to $28.50, delivered at buyers' mill in the Pittsburgh district.

Skelp.—Most consumers are holding off on account of the decided weakness now existing in prices. A sale of about 500 tons of grooved steel skelp is reported at 1.15c. and 1000 tons of sheared steel skelp at 1.20c., Pittsburgh. We quote grooved steel skelp at 1.15c.; sheared steel skelp, 1.20c.; grooved iron skelp, 1.40c., and sheared iron skelp, 1.60c., all for delivery at consumers' mills in the Pittsburgh district.

Wire Rods.—Prices are weak. Specifications against contracts are not coming in at a satisfactory rate and the new demand is quiet. We quote Bessemer and open hearth and chain rods at $26 to $26.50, f.o.b. Pittsburgh.

Steel Rails.—The Carnegie Steel Company has taken no important orders for standard sections in the past week, but has received new orders and specifications for upward of 3000 tons of light rails. It is understood that a number of the leading railroads are now at work figuring their requirements of standard sections for next year, and it is believed that within the next month or so some fairly large orders for standard sections will be placed for 1912 delivery. Prices on light rails rolled from billets are being fairly well maintained and we quote as follows: 12-lb., 1.24½c.; 16, 20 and 25-lb., 1.20½c.; 30 and 35-lb., 1.19½c., and 40 and 45-lb., 1.16c. These are mill prices, plus freight, and are the minimum

THE IRON AND METAL MARKETS

of the market in carload lots, but small lots bring slightly higher prices. Standard sections are held at 1.25c. per lb., Pittsburgh, for Bessemer.

Plates.—Some car orders have been placed in the past week and others are pending. The Pennsylvania Railroad has ordered 1150 steel cars from the Cambria Steel Company, and the Buffalo, Rochester & Pittsburgh has placed 500 cars with the Pressed Steel Car Company, 500 with the Standard Steel Car Company and 500 with the Cambria Steel Company. The plates and shapes for the cars taken by the Pressed Steel Car Company and Standard Steel Car Company, amounting to about 6500 tons, will be rolled by the Carnegie Steel Company. The Pittsburgh & Lake Erie is in the market for 1000 steel cars, but nothing has yet been heard from the Missouri Pacific, which put out an inquiry some time ago for 4400 cars. A gas tank for Detroit, Mich., requiring about 1500 tons, is also in the market. The general demand from consumers is quiet. Prices are weak and while 1.25c., Pittsburgh, is generally being quoted plates have sold at 1.20c. to 1.22½c. in both narrow and wide sizes. We quote plates at 1.20c. to 1.25c., but note that 1.20c. is being done only on desirable specifications and for shipment at the convenience of the maker.

Structural Material.—It is understood that the Fort Pitt Bridge Works has taken a contract for the elevation of the Pennsylvania Lines at Cleveland, about 5000 tons, the material to be rolled by the Jones & Laughlin Steel Company. Inquiries are out for a very large amount of work, but consumers are holding off to see if prices will go any lower. We quote beams and channels up to 15 in. at 1.25c., f.o.b. Pittsburgh, but for very desirable specifications and for prompt shipment this price might be shaded.

Bars.—Little new business is being placed in steel bars. It should be remembered that with steel bars today at 1.15c. at mill, they are nearly as low as they were some years ago, when they sold at 90c. at mill, in view of the present high costs of material and labor. Specifications against contracts are only fair, and shipments by the mills in September show a falling off as compared with August. Prices on steel bars continue weak, and, while 1.15c. is generally quoted on new inquiries, on very desirable specifications for shipment at the convenience of the mill, 1.12½c. has been done. The situation in iron bars is also weaker, due to the few orders being placed, and the fact that consumers are not specifying as they should against contracts. We quote steel bars at 1.15c. and common iron bars at 1.20c. to 1.25c. at mill, Pittsburgh.

Sheets.—The volume of business in sheets is quite heavy, both in new orders and specifications against contracts, but prices are still in bad shape. As a rule the leading mills are operating to about 70 per cent. of capacity, but most of the mills are going after new business aggressively, and the low level of prices reached several weeks ago has slightly given way. Black and galvanized sheets are now being sold at prices that, with mills that buy their bars, are said to be below the cost of making them. On some desirable specifications for black sheets, recently placed for shipment at the convenience of the mill, 1.85c. has been done on No. 28 gauge, one-pass box annealed sheets, and 2.85c. on No. 28 galvanized. The range of the market on black sheets of No. 28 gauge is 1.85c. to 1.90c. and on galvanized 2.85c. to 2.90c.

Tin Plate.—The month of September was a remarkable one in this trade, specifications against contracts from leading consumers having been heavier than in any September for some years. Three or four of the leading mills report that shipments against contracts were heavier than in August, and in volume of business this has been one of the best years the tin plate trade has ever known. As a rule the leading mills are operating to from 60 to 65 per cent. of capacity, and it is probable that October will show a falling off in shipments, as many consumers have pretty well specified against old contracts and will not make new contracts until later on. The American Sheet & Tin Plate Company has recently received three or four large export orders and is making regular shipments right along to large consumers of tin plate for export, such as the Standard Oil Company and others. The market is fairly strong, and we quote 100-lb. cokes at $3.60 per base box, f.o.b. Pittsburgh.

Merchant Steel.—New orders are light and consumers are specifying for only such quantities of material as they absolutely must have. The following quotations are being more or less shaded: Iron finished tire, ¼ and ½ in. and heavier, 1.40c.; under these sizes, 1.45c.; planished tire, 1.50c.; channel tire, 1.70c. base; toe calk, 1.80c.; flat sleigh shoe, 1.45c.; concave or convex, 1.60c.; cutter shoe, tapered or bent, 2.15c.; spring steel, 1.85c.; machinery steel, smooth finish, 1.75c.

Hoops and Bands.—New orders are few but specifications against contracts are coming in at a satisfactory rate. We quote steel hoops at 1.25c. and bands at 1.15c. with extras on the latter as per the steel bar card. On desirable specifications for both hoops and bands for early shipment, these prices might be slightly shaded.

Rivets.—Specifications against contracts are dull and new orders continue light. We quote structural rivets at 1.60c. and boiler rivets at 1.70c., f.o.b. Pittsburgh, but, like everything else, on a desirable order these prices would be shaded.

Wire Products.—Wire and wire nail orders are light and are only for such quantities as are absolutely needed by retailers to fill orders or by jobbers to maintain a fair assortment of sizes in stock. The firmer tone in prices of wire and wire nails that existed a week or ten days ago seems to have pretty well disappeared and the market is weak. We quote wire nails at $1.65; cut nails, $1.55; galvanized barb wire, $1.95; painted, $1.65; annealed fence wire, $1.45, and galvanized, $1.75, all f.o.b. Pittsburgh, usual terms, full freight added to point of delivery.

Spelter.—The market is quiet. We quote prime grades of Western at 5.75c. to 5.80c. East St. Louis, equal to 5.87½c. to 5.92½c. Pittsburgh.

Shafting.—Consumers are buying only in small lots and specifications against contracts are unsatisfactory. Prices have been severely cut and we quote 60 and 5 per cent. to 60 and 10 per cent. off list in carload lots delivered in base territory.

Railroad Spikes.—The Louisville & Nashville is reported to have placed 1500 kegs. We quote railroad spikes in base sizes at $1.40 to $1.45 f.o.b. at mill, Pittsburgh.

Merchant Pipe.—The new and lower discount card issued by the steel pipe mills, effective from October 2, shows a reduction of $2 on black steel pipe, $6 to $12 a ton on galvanized steel pipe and $2 a ton on extra strong and double extra strong pipe. All the leading mills are now quoting on this new basing card, and prices have been guaranteed to December 31, so that in case another new card is issued, showing lower prices, the jobbers will be protected. A local iron pipe mill now has a new and lower card of extras on iron pipe being printed, which will show reductions of $2 to $8 on galvanized butt weld and lap weld pipe, the discounts on black iron pipe remaining the same as on the old card of October 1, 1910. It is too early as yet to know whether the lower prices will stimulate the demand, but it is believed that they will. Orders and specifications received by the mills in September showed only a slight falling off as compared with August, although the month was two business days shorter. The new discounts are printed on a previous page.

Boiler Tubes.—The lower basing card issued by the mills has not stimulated new business to any extent. It is stated that the market as based on the present card is being held.

Coke.—While trade is extremely quiet, prices on both furnace and foundry coke for spot shipment are fairly strong. There is not as much available for prompt shipment as there was some time ago, and this has firmed up prices to some extent. We quote standard makes of furnace coke on contracts for prompt shipment at $1.50 to $1.55 and on contracts for remainder of this year at $1.65 to $1.70 per net ton at oven. We quote 72-hr. foundry coke for prompt shipment at $1.85 and up to $2, and on contracts from $2.10 and as high as $2.40, the latter price being paid for some brands of coke that have a very high reputation in the trade.

Iron and Steel Scrap.—The local market seems to be pretty well demoralized as to prices, while the new demand is lifeless. Heavy steel scrap of standard grades, loaded on cars and which had to be moved, has sold in the past week as low as $12 per gross ton delivered at mills in the Pittsburgh district, the lowest price reached for several years. No large quantities of heavy steel scrap could be picked up at these prices, but it must be said that consumers are not willing to take in material at any price. The Baltimore & Ohio list now out is particularly heavy; bids are to be in by October 11, and the prices offered will no doubt

THE IRON AND METAL MARKETS

be the lowest in some months. We note a sale of 500 tons of heavy melting steel made last week at $12.50 delivered, and 500 tons at $12.25 delivered; 800 tons of bundled sheet scrap at $11.25 delivered, and 300 tons of heavy steel axle turnings at $10.25 delivered. Prices are as follows per gross ton f.o.b. Pittsburgh, unless otherwise noted:

Heavy steel scrap, Steubenville, Follansbee, Sharon, Monessen and Pittsburgh delivery	$12.25 to $12.50
No. 1 foundry cast	12.50 to 12.75
No. 2 foundry cast	12.00 to 12.25
Bundled sheet scrap, f.o.b. consumers' mill, Pittsburgh district	10.75 to 11.00
Rerolling rails, Newark and Cambridge, Ohio, Cumberland, Md., and Franklin, Pa.	13.00 to 13.25
No. 1 railroad malleable stock	11.75 to 12.00
Grate bars	9.50 to 9.75
Low phosphorus melting stock	15.50 to 15.75
Iron car axles	22.00 to 22.50
Steel car axles	16.50 to 16.75
Locomotive axles	23.00
No. 1 busheling scrap	11.50 to 11.75
No. 2 busheling scrap	8.00 to 8.25
Old car wheels	12.50 to 12.75
Sheet bar crop ends	13.75 to 14.00
*Cast iron borings	8.50
*Machine shop turnings	7.00
Old iron rails	14.50 to 14.75
No. 1 wrought scrap	13.50
Heavy steel axle turnings	9.75 to 10.00
Stove plate	9.50 to 9.75

*These prices are f.o.b. cars at consumers' mills in the Pittsburgh district.

Chicago

CHICAGO, ILL., October 3, 1911.

The disturbed conditions with reference to prices, particularly of structural shapes, prevailing in this market a week ago, are now fairly well settled on a lower basis. While no uniform price has replaced the 1.35c. Pittsburgh basis on structural shapes, the going quotation is generally accepted as $2 a ton below that figure, or 1.43c. Chicago. Plate quotations are subject to more variation, depending upon the sizes, the extreme concession of $2 a ton being obtainable only on the narrower widths. The Pittsburgh basis for steel bars is generally accepted to be 1.15c., but Western makers are conceding some of their freight advantage, and in some instances Chicago prices are reported in the neighborhood of $2 a ton above the Pittsburgh basis. The lowering of prices has apparently not brought out any great amount of new business, and the market is being sustained by specifications on contracts previously placed. The principal item of rail buying is the order of the Santa Fe for 20,000 tons of 90-lb. rails, placed with the Illinois Steel Company. Specifications for track fastenings, rail joints, and tie plates have been encouragingly heavy. The local pig iron market is experiencing one of the quietest periods in its history, and it is difficult to interest melters even at the current low quotations. Prices for old material continue to decline, and the movement is practically at a minimum. Indications as to the future of the market in all finished lines offer little encouragement in the direction of a better situation than the immediate present affords.

Pig Iron.—The present pig iron situation appears to be the cumulative result of the failure of business to come up to expectations throughout the year, combined with the lack of promise visible in the near future. As each quarter has arrived it has been necessary to carry over unused portions of tonnage contracted for, and the same situation will, doubtless, be true at the end of the year. There is little occasion, therefore, for the majority of pig iron melters being interested in additional purchases at this time. It appears to be impossible to establish an advance for first quarter iron, and, with furnaces and buyers unwilling to meet each others' views, the movement of iron is practically nil. A negotiation involving 4000 tons is reported likely to be closed but this tonnage, as compared with other current transactions, is exceptional. Both Southern and local furnaces are exhibiting an increasing interest in first quarter business, and quotations varying from $10, Birmingham, for No. 2 for delivery beginning this year and running into first quarter, to $11 for first quarter only, are encountered. Prompt shipment iron from the South is still obtainable on the basis of $10, although $10.50 is asked for certain of the standard Birmingham brands, and the Tennessee Company is out of the market on its De Bardeleben brand at $11. Local furnaces are willing to sell at $14.50 at the furnace for the remainder of the year and possibly for more extended delivery. There has been a slight reduction in stocks on hand at points selling into this market. We quote for Chicago delivery, except for local irons which are f.o.b. furnace, the following prices on prompt shipments:

Lake Superior charcoal	$16.50 to $17.00
Northern coke foundry, No. 1	15.00 to 13.50
Northern coke foundry, No. 2	14.50 to 15.00
Northern coke foundry, No. 3	14.25 to 14.50
Northern Scotch, No. 1	16.00
Southern coke, No. 1 foundry and No. 1 soft	14.85 to 15.10
Southern coke, No. 2 foundry and No. 2 soft	14.35 to 14.85
Southern coke, No. 3	14.10 to 14.35
Southern coke, No. 4	13.85 to 14.10
Southern gray forge	13.60 to 13.85
Southern mottled	13.60 to 13.85
Malleable Bessemer	14.50 to 15.00
Standard Bessemer	17.40
Basic	15.50
Jackson Co. and Kentucky Silvery, 6 per cent	17.90
Jackson Co. and Kentucky Silvery, 8 per cent	18.90
Jackson Co. and Kentucky Silvery, 10 per cent	19.90

Rails and Track Supplies.—The most important item in the week's record of new business was the order from the Santa Fé Railroad to the Illinois Steel Company for 20,000 tons of 90-lb. rails, 3600 tons of tie plates and 1000 kegs of spikes. Other standard rail business was very light in comparison. The increasing need of materials for repair and replacement is being evidenced in the railroad specifications, and shipping orders for track bolts, spikes and rail joints were above the average during the past week. An improved tonnage of light rails was also booked. We quote standard railroad spikes at 1.60c. to 1.70c., base; track bolts with square nuts, 2.05c. to 2.10c., base, all in carload lots, Chicago; standard section Bessemer rails, 1.28c.; open hearth, 1.34c.; light rails, 40 to 45 lb., 1.16c. to 1.20½c.; 30 to 35 lb., 1.19½c. to 1.24c.; 16, 20 and 25 lb., 1.20½c. to 1.25c.; 12 lb., 1.25c. to 1.30½c.; angle bars, 1.50c. to 1.60c., Chicago.

Structural Material.—The unsettled conditions of a week ago, following the advent of unrestrained aggressiveness in the pursuit of orders, has cleared somewhat with the tacit acknowledgment of 1.25c., Pittsburgh, as the ruling price for shapes. No great tonnage of new business has followed upon the naming of these lower prices, inasmuch as the continued availability of present quotations is generally anticipated. Specifications, however, are being received in well sustained volume, particularly for the material required in the recent Chicago & Alton order for 1000 cars. The aggregate of contracts for fabricated material placed during the week totaled less than 2000 tons and included 677 tons for the Boyce Building, Chicago, awarded to A. Bolter's Sons; a high school at South Bend, Ind., 313 tons, awarded to H. G. Christmen & Co.; a head frame for the Chapin mine at Iron Mountain, Mich., 220 tons, to the American Bridge Company; the Municipal Court Building, Chicago, to the Morava Construction Company, 285 tons; a truss span, 104 tons, for the Muscatine North & South Syndicate to the American Bridge Company, and a nail warehouse for the American Steel & Wire Company at De Kalb, Ill., 138 tons, to be furnished by the Illinois Steel Company. We quote for mill shipment, Chicago delivery, 1.43c., and from store, 1.75c.

Plates.—While prices of plates have not been so generally affected by the recent concessions in other lines, it is possible to obtain quotations on the narrower widths that are approximately $2 below the former regular basis. New business has been quiet, but specifications compared with the general run of orders have been quite satisfactory. Specifications were received during the week covering the material for a recent order of 1000 steel gondolas. Depending upon the character of specifications, quotations between 1.43c. and 1.53c. for mill shipment, Chicago delivery, are current, with the price out of store unchanged at 1.75c.

Sheets.—A fair tonnage in sheets continues to be received. There has been no material change in the price situation, the ordinary business going on the basis of 2.08c. to 2.13c., Chicago, for mill shipment. Maximum concessions appear to be obtainable upon galvanized rather than on black sheets. We quote Chicago prices as follows: Carload lots, from mill: No. 28 black sheets, 2.08c. to 2.13c.; No. 28 galvanized, 3.08c. to 3.13c.; No. 10 blue annealed, 1.63c. Prices from store, Chicago, are: No. 10, 1.95c. to 2.05c.; No. 12, 2c. to 2.10c.; No. 28 black, 2.45c. to 2.55c.; No. 28 galvanized, 3.45c.

Bars.—A basis of 1.15c., Pittsburgh, has been generally accepted as the ruling quotation for steel bars, although Chicago makers are making concessions from the equivalent price of 1.33c., Chicago. Some exceed

THE IRON AND METAL MARKETS

ingly low quotations are reported, but transactions are not in great tonnage, and these prices are considered less important. The asking price for bar iron is 1.20c., but the situation admits of the customer's bargaining to advantage. Specifications carrying desirable extras are reported as bringing out lower quotations. We quote as follows, f.o.b. Chicago: Soft steel bars, 1.25c. to 1.33c.; bar iron, 1.20c. to 1.25c.; hard steel bars rolled from old rails, 1.17½c. to 1.20c. From store, soft steel bars, 1.70c. to 1.80c., Chicago.

Wire Products.—The volume of trade in woven wire fence and fence wire continues heavy and ahead of expectations. The excellent demand is now expected to run well up to December 1. The general buying of barb wire, while fairly satisfactory, is not so heavy and some sections of the Northwest give evidence that the disappointing crops of the past two or three seasons have not been without their effect. Wire nail tonnage, for no apparent reason, is backward, despite the fact that stocks at distributing points are reported below the average. Jobbers' carload prices, which are quoted to manufacturing buyers, are as follows: Plain wire, No. 9 and coarser, base, 1.68c.; wire nails, 1.88c.; painted barb wire, 1.88c.; galvanized, 2.18c.; polished staples, 1.88c.; galvanized, 2.18c., all Chicago.

Cast Iron Pipe.—The weakness of the pig-iron situation has apparently discouraged some of the larger buyers of pipe from placing their orders at the present time. The principal letting of the past week was 2100 tons at Kansas City, Mo., awarded to the United States Cast Iron Pipe & Foundry Company. In the Northwest and in the Southwest a number of the smaller cities are preparing for the installation of new water works systems. We quote as follows, per net ton, Chicago: Water pipe, 4-in., $26.50; 6 to 12-in., $24.50; 16-in. and up, $24, with $1 extra for gas pipe.

Old Materials.—Prices continue to sag and buying is lighter. It is difficult to interest any of the mills in this territory in purchases of any kind. Offers of standard grade material at especially attractive prices are taken up here and there, but for the most part consumers are reducing their stocks in anticipation of a continued period of operation on the basis of strictest economy. The greater portion of railroad offerings of old material is being sold, but a number of items listed have failed to bring bids high enough to move them. The Frisco Lines are this week offering about 600 tons of scrap. We quote for delivery at buyers' works, Chicago and vicinity, all freight and transfer charges paid, per gross ton, as follows:

Old iron rails	$13.75 to $14.25
Old steel rails, rerolling	12.25 to 12.75
Old steel rails, less than 3 ft.	11.00 to 11.50
Relaying rails, standard section, subject to inspection	24.00
Old car wheels	12.50 to 12.75
Heavy melting steel scrap	10.00 to 10.50
Frogs, switches and guards, cut apart	10.00 to 10.50
Shoveling steel	9.50 to 10.00
Steel axle turnings	8.50 to 9.00

The following quotations are per net ton:

Iron angles and splice bars	$11.75 to $12.25
Iron arch bars and transoms	13.25 to 13.75
Steel angle bars	9.50 to 10.00
Iron car axles	17.25 to 17.75
Steel car axles	15.50 to 16.00
No. 1 railroad wrought	10.25 to 10.75
No. 2 railroad wrought	9.25 to 9.75
Steel knuckles and couplers	9.50 to 10.00
Steel springs	10.00 to 10.50
Locomotive tires, smooth	14.00 to 14.50
Machine shop turnings	6.00 to 6.50
Cast and mixed borings	5.25 to 5.75
No. 1 busheling	8.25 to 8.75
No. 2 busheling	6.25 to 6.75
No. 1 boilers, cut to sheets and rings	7.25 to 7.75
Boiler punchings	12.00 to 12.50
No. 1 cast scrap	10.00 to 10.50
Stove plate and light cast scrap	8.75 to 9.25
Railroad malleable	9.75 to 10.25
Agricultural malleable	8.75 to 9.25
Pipes and flues	7.25 to 7.75

Philadelphia

PHILADELPHIA, PA., October 3, 1911.

Business continues uniformly dull. Consumers are still following the established policy of buying in small lots for prompt shipment and continue their efforts to get price concessions. As competition in finished materials is sharp, quotations have been gradually softening and in instances lower figures are openly quoted, but in the majority of cases concessions are quietly made on desirable orders, while for ordinary business current quotations are obtained. Buyers are not satisfied, however, that the bottom has been reached and under the circumstances still withhold orders of any consequence. The iron market generally is quiet and with a few exceptions buying is confined to small lots for early delivery. Producers in this district still refuse to quote for next year's shipments, although the leading Virginia interest announces an advance of 25c. a ton for first quarter deliveries. Billets are easier with business light. The old material market drags, with forced sales in some grades noted at lower prices.

Iron Ore.—The situation remains quiet. Consumers are pretty well covered as to supplies for the remainder of the year and negotiations for next year's supplies have not been opened. Importations during the week included 6559 tons from Spain, 12,600 tons from Newfoundland, 6545 tons from Sweden, and 9750 tons from Cuba.

Pig Iron.—Orders are being placed against the recent inquiry of the Pennsylvania Railroad. In some grades the maximum tonnages inquired for have been placed. Owing to the fact that several of the sellers usually participating in this business are pretty well sold up for the last quarter, it is likely that there will be a wider distribution of orders to cover the full quantity inquired for than is usually the case. Sales of low grade iron continue to be made to the cast iron pipe makers, one of several thousand tons of Northern iron and another of 1000 tons of Southern iron are reported, while a reported sale of 4000 tons to one of the Delaware River interests proves to be a formal order to increase deliveries to cover a contract made some months ago. Several sales of low grade iron have also been made in odd lots ranging from 100 to 500 tons. In the higher foundry grades the movement is light, sales under 100-ton lots being in the majority, the bulk of the business being small lots for prompt shipment for which prices range from $15 to $15.25. Larger lots sell, as a rule, at the inside figure and instances are noted where sales of iron coming from outside the district have been made at a few cents concession. Eastern makers are comparatively firm at the $15 minimum, and in several cases are already pretty well sold up for fourth quarter. Consumers are still urging deliveries and making purchases on a hand-to-mouth basis, and from present indications are inclined to continue that policy until the market situation becomes more clearly defined. While inquiries for moderate lots of foundry iron for various 1912 deliveries come out, producers in this district still withhold quotations, although it is reported that the leading Virginia interest has named $12.75, furnace, for first quarter shipment, an advance of 25c. over quotations ruling for fourth quarter deliveries. Current sales of Virginia iron have been small and, while $12.50, furnace, is the usual quotation for foundry grade for shipment during the remainder of the year, several producers accept $12.25, furnace, for prompt iron. Moderate sales of Southern foundry iron for early delivery are being made at the $10, Birmingham, basis for No. 2, particularly where deliveries are favored with an advantageous freight rate. The demand for forge iron for rolling mill purposes is quiet and prices are nominally quoted at $14.25 to $14.50, delivered here. While there has been considerable talk of a further movement in basic iron, nothing definite has come out. It develops that in adition to the 3000 tons of Northern basic reported purchased by an Eastern mill last week, 2000 tons of Southern basic was taken. A delayed purchase of something over 1000 tons of off basic by another Eastern mill has come to light. One consumer is reported as being still in the market for 1000 tons of this grade for October delivery. A number of small sales of low phosphorus iron, aggregating about 1000 tons, have been made at $20, delivered in this vicinity, which flatly represents the price for standard analysis iron. Quotations range as follows for standard brands, delivered in buyers' yards in this district during the remainder of the year:

Eastern Pennsylvania No. 2 X foundry	$15.00 to $15.25
Eastern Pennsylvania No. 2 plain	14.75 to 15.00
Virginia foundry	15.00 to 15.50
Gray forge	14.25 to 14.50
Basic	14.50 to 15.00
Standard low phosphorus	20.00

Ferroalloys.—The ferromanganese market is at a standstill, buyers probably awaiting developments as to the firmness of the recent $38.50, Baltimore, quotation. A sale of several hundred tons of 50 per cent. ferrosilicon is reported at $60, delivered. Furnace ferrosilicon, 11 to 13 per cent., is quoted at $23 to $25 at

THE IRON AND METAL MARKETS

furnace, specifications within Bessemer limits as to phosphorus and sulphur.

Billets.—Consumers still place orders for small quantities only, although better prices could be had for desirable lots. Mills continue to operate on an even basis, but as orders are of a day to day character have little ahead on their books. Small sales of open-hearth rolling billets have been made at $22.40, delivered, although $21.40 can be done if any quantity for early shipment is involved. Ordinary forging billets are quoted at $26.50 to $27.40, delivered in this vicinity.

Plates.—A moderate small lot business is coming to the mills, although specifications have been a trifle irregular. Under the circumstances mill operations show some irregularity and will probably not exceed an average of 60 per cent. during September. While considerable encouragement is taken from prospective ship plate business, contracts having been made for three moderate sized vessels with one of the yards in this district, orders for plates have not yet developed. In fact there is a noticeable absence of any sizable business. Prices of plates are irregular; for ordinary miscellaneous business 1.50c., delivered here, is occasionally obtained, although 1.45c., delivered, is more generally quoted, and it is reported that concessions of $1 a ton might be had for a good sized order with desirable specifications.

Structural Material.—Bids are going in on the steel work against revised plans for the new municipal convention hall. The contract for the new bridge span for the Pennsylvania Railroad bridge across the Schuylkill River, 500 tons, has been let, as has also some smaller bridge work. Plans for the new Stock Exchange Building are approaching definite shape. Considerable business in boat shapes is being looked forward to; in fact orders for requirements of several smaller vessels are now pending. Price uncertainties are having some influence on the placing of orders and quotations are somewhat uncertain; 1.45c., delivered, represents the current quotation for plain shapes, delivered here, but there is little doubt but that 1.40c. might be done for desirable business.

Sheets.—While there has been a little better inquiry for sheets, Eastern mills report actual orders as small and practically all for prompt shipment. The aggregate volume of business keeps mills fairly active, but forward bookings are light. Business is being placed in Western sheets on a basis of 1.90c., Pittsburgh, for No. 28, although Eastern mills obtain a material advance over that price, particularly for prompt shipment.

Old Material.—Business is practically at a standstill. Consumers show little interest in the market and transactions are usually of the bargain lot class. Steel mills show practically no disposition to purchase heavy melting steel, naming $12, delivered, as their price, at which forced sales are occasionally made. There is little movement in rolling mill grades, but what buying has been done was at slightly lower prices. At the present price levels of some grades a range of 25 cents covers the full spread of the market. Quotations are, however, largely based on forced sales and buying in any quantity could hardly be done at the inside figure. The following range about represents the basis at which business could be done, for delivery in buyers' yards, eastern Pennsylvania and nearby points, taking a freight rate from Philadelphia varying from 35c. to $1.35 per gross ton, for shipment ranging from prompt to the remainder of the year:

No. 1 heavy melting steel scrap	$12.00 to $12.25
Old steel rails, rerolling (nominal)	13.50 to 14.00
Low phosphorus heavy melting steel scrap	16.75 to 17.25
Old steel axles (nominal)	18.00 to 18.50
Old iron axles (nominal)	23.50 to 24.00
Old iron rails (nominal)	16.50 to 17.00
Old car wheels	11.75 to 12.25
No. 1 railroad wrought	14.00 to 14.50
Wrought iron pipe	11.50 to 12.00
No. 1 forge fire	10.00 to 10.50
No. 2 light iron (nominal)	6.00 to 6.50
Wrought turnings	8.00 to 8.25
Cast borings	7.50 to 7.75
Machinery cast	12.50 to 13.00
Railroad malleable (nominal)	11.00 to 11.50
Grate bars, railroad	9.25 to 9.75
Stove plate	9.25 to 9.75

Bars.—The market has been quiet. Buyers hesitate to place orders for anything far beyond immediate needs, so that current business is confined to small lots, and, under the circumstances, the question of prices has not been seriously tested. For ordinary business in refined iron bars 1.22½c. to 1.27½c., delivered, is quoted, while for soft steel bars 1.35c., delivered here, is named.

Coke.—Some few contracts for foundry coke are reported, but they are usually small and the larger share of the business coming out has been in the nature of odd lots. The demand for furnace coke is principally in small and moderate prompt lots. Quotations show practically no change, the following range per net ton being named for delivery in this district:

Connellsville furnace coke	$3.80 to $4.00
Foundry coke	4.25 to 4.60
Mountain furnace coke	3.40 to 3.60
Foundry coke	3.85 to 4.20

Cleveland

CLEVELAND, OHIO, October 3, 1911.

Iron Ore.—A sale of 30,000 tons of non-Bessemer ore is reported to a furnace interest whose stack has been idle for some time but which is planned to be blown in a little later. This is the only sale of any size reported during the week. The ore movement up to October 1 was about 10,000,000 tons less than in the corresponding period a year ago. Lake shipments in September were 5,095,005 tons, not including one Marquette dock, which shipped 150,000 tons in August. Shipments fell off about 250,000 tons as compared with August. The total movement up to October 1 was approximately 24,850,000 tons. Shipments are falling off and will be very light after October. Previous estimates that the total lake movement for the season will be close to 30,000,000 tons are unchanged. We quote prices as follows: Old range Bessemer, $4.50; Mesaba Bessemer, $4.25; old range non-Bessemer, $3.70; Mesaba non-Bessemer, $3.50.

Pig Iron.—A Cleveland interest has reduced its price for Bessemer iron to $14.65, at furnace, or $15.55, Pittsburgh. Bessemer has been nominally at $15, Valley furnace, for some time, although sales have been made in small lots at concessions from that price. The same seller recently booked 1000 tons of Bessemer at $14.75. A Pittsburgh consumer is in the market for 2000 tons of Bessemer. Basic is still being quoted at $12.50, Canal Dover, or $13.50, Pittsburgh, but this price has not brought out any business during the week. A St. Louis steel company has an inquiry out for 2500 tons of basic. The foundry iron market is generally quiet. The only sales and inquiries are for small lots for delivery over the remainder of the year. Valley prices are firm at $13.25 to $13.50 for No. 2 foundry. Shipments on contracts are good. A Mansfield, Ohio, stove manufacturer is in the market for 500 tons of No. 2 Northern for delivery during the next five months. There is a moderate demand for Southern iron in lots of 300 tons and under. Furnaces are quoting No. 2 Southern at $10 to $10.50, Birmingham. For Cleveland delivery we quote as follows for prompt shipment and for the last quarter:

Bessemer	$15.65 to $15.90
Basic	13.40
Northern foundry, No. 2	13.75
Gray forge	13.00
Southern foundry, No. 2	14.35 to 14.85
Jackson Co. silvery, 8 per cent. silicon	17.30 to 17.55

Coke.—The market is very quiet, the only sales being in small lots of foundry grades. Prices are stationary. We quote standard Connellsville furnace coke at $1.50 to $1.55 per net ton, at oven, for prompt shipment, and $1.60 to $1.70 for contract. Connellsville 72-hr. foundry coke is held at $1.85 to $2.15 for prompt shipment and $2.10 to $2.40 for contract.

Finished Iron and Steel.—Stimulated by low prices, the demand in finished lines shows some improvement. Most of the selling agencies, however, report only a moderate volume of orders. With an open market the increased volume of business is being taken by mills that are quoting the bottom prices. One selling agent reports that its sales during the week were the largest of any week during the past year. Some tonnage is being held back until the market becomes more settled. Steel bars are being generally quoted at 1.15c., Pittsburgh, but this price is being shaded to 1.10c. by at least one mill to large buyers on desirable specifications. Regular quotations on plates and structural material are 1.25c. While these prices are being maintained by the most of the mills, both plates and shapes can be had at 1.20c. for desirable orders, and it is understood that considerable tonnage of structural material has been booked at 1.20c. Buying in all lines has been largely to replenish stocks that have become low. Little new structural work is coming out, work of this kind requiring round lots of material mostly being held up because of market conditions. The Hunkin-Conkey Construction Company, Cleveland, has taken the con-

THE IRON AND METAL MARKETS

tract for a grand stand for the Detroit baseball park, requiring 500 tons of steel. Because of the prevailing low prices, which they are unwilling to meet, Eastern plate and structural mills have temporarily withdrawn from this market. The demand for sheets is fairly good and Valley mills are generally firm on prices, quoting No. 28 black at 1.90c. and No. 28 galvanized at 2.90c., with a Valley base, which amounts to a concession of $1 a ton in this market. Hard steel bars are firm at 1.10c. The demand for iron bars is light. We quote iron bars at 1.20c., at mill. The Empire rolling mill, Cleveland, shut down September 30, but will probably start up again next week.

Old Material.—There is little activity in the market. Producers and dealers refuse to sell at present prices and are playing a waiting game. Inquiry is scarce, but mills are willing to buy at bargain prices. We note the sale of 1000 tons of heavy steel to a local plant and about 1500 tons of steel melting scrap in Canton. Dealers are offering $11.50 for heavy steel scrap but are able to pick up only small lots. An embargo has been declared at Monessen. The Wheeling & Lake Erie Railroad closed October 2 on a small tonnage. The Lake Shore Railroad will receive bids October 5 on an unspecified tonnage. Prices on several grades are slightly lower. Dealers' prices per gross ton, f.o.b. Cleveland, are as follows:

Old steel rails, rerolling	$12.50 to $12.75
Old steel rails	11.50 to 12.00
Steel car axles	17.50 to 18.00
Heavy melting steel	11.25 to 11.75
Old car wheels	11.25 to 11.50
Relaying rails, 50 lb. and over	23.50 to 25.50
Agricultural malleable	10.75 to 11.25
Railroad malleable	11.50 to 12.00
Light bundled sheet stock	9.50 to 10.00

The following prices are per net ton, f.o.b. Cleveland:

Iron car axles	$18.50 to $19.00
Cast borings	6.25 to 6.75
Iron and steel turnings and borings	6.75 to 7.25
Steel axle turnings	7.50 to 8.00
No. 1 busheling	9.25 to 9.75
No. 2 railroad wrought	11.50 to 11.75
No. 1 cast	11.25 to 11.75
Stove plate	9.00 to 9.25
Bundled tin scrap	11.00 to 11.50

Boston

BOSTON, MASS., October 3, 1911.

Old Material.—Owing to the completion and cancellation of old orders with mills, dealers have reduced their prices on some grades, notably heavy steel pipe, busheling scrap (skeleton and cotton ties), borings, turnings and malleable. Moderate tonnages are being moved by the smaller dealers in anticipation of snow. The prices quoted below are those offered by the large dealers to the producers and to the smaller dealers and collectors, per gross ton, carload lots, f.o.b. Boston and other New England points, taking Boston rates from eastern Pennsylvania points. In comparison with Philadelphia prices the differential for freight of $2.30 a ton is included. Mill prices are approximately 50 cents a ton more than dealers' prices.

Heavy melting steel	$9.50 to $10.00
Low phosphorus steel	11.45 to 11.95
Old steel axles	14.20 to 14.70
Old iron axles	17.70 to 18.20
Mixed shafting	12.75 to 13.25
No. 1 wrought and forge stock	11.00 to 11.25
Wrought iron pipe	8.50 to 9.00
Skeleton (bundled)	7.00 to 7.50
Cotton ties	7.00 to 7.50
No. 2 light	4.50 to 5.00
Wrought turnings	5.50 to 5.75
Cast borings	4.50 to 5.00
Machinery cast	12.50 to 13.00
Malleable	9.25 to 9.75
Grate bars	6.00 to 6.50
Stove plate	8.00 to 8.50

Cincinnati

CINCINNATI, OHIO, October 4, 1911.—(*By Telegraph.*)

Pig Iron.—There is a slightly better inquiry for prompt shipment and the volume of carload business booked runs about the same as for the past four weeks. The majority of prospective customers are asking for prices on limited tonnages for nearby delivery—an indication that speculative interests are not represented and also that many consumers are playing close to the edge so far as stocks are concerned. A local melter is expected to close this week for 300 tons of mixed foundry grades, both Northern and Southern, and there are three inquiries from Indiana totaling about 1000 tons of No. 2 foundry, the bulk of which is expected to go to Southern furnaces. The southern Ohio inquiry for a large tonnage of basic previously reported has been temporarily withdrawn. Sales include 500 tons of Northern No. 2 foundry, about equally divided between two central Ohio melters, at $13, Ironton, for last quarter movement, which figure represents the average quotation for that delivery. Numerous small sales of Southern No. 2 foundry have been made at $10, Birmingham, which now seems to be the established price for this year. Many rumors are afloat concerning 1912 quotations and while it is quite probable that both Northern and Southern iron could be contracted for, with shipments delayed so as to extend into the first quarter, there are no open prices for that delivery attractive enough to bring out any buyers in this section. Malleable is very quiet and unchanged around $13.25, Ironton. Based on freight rates of $3.25 from Birmingham and $1.20 from Ironton, we quote, f.o.b. Cincinnati, as follows, for prompt shipment:

Southern coke, No. 1 foundry and 1 soft	$14.00 to $14.25
Southern coke, No. 2 foundry and 2 soft	13.25 to 13.75
Southern coke, No. 3 foundry	12.75 to 13.25
Southern coke, No. 4 foundry	12.50 to 13.00
Southern gray forge	12.50 to 13.00
Ohio silvery, 8 per cent. silicon	16.95 to 17.20
Lake Superior coke, No. 1	14.70 to 14.95
Lake Superior coke, No. 2	14.20 to 14.45
Lake Superior coke, No. 3	13.70 to 13.95
Basic, Northern	14.20 to 14.45
Standard Southern car wheel	25.50 to 25.75
Lake Superior car wheel	19.00

(By Mail.)

Coke.—There is no new inquiry for furnace coke and that for foundry grades covers only carload lots, although shipments of both 48-hr. and 72-hr. coke, on contracts previously made, are moving along in a satisfactory manner. The production has been reduced in all three fields to conform with the present requirements of users, and as a consequence prices are reasonably firm. Connellsville furnace grades are quoted around $1.50 to $1.55 per net ton at oven and as high as $1.70 on contract business. Both Wise County and Pocahontas furnace coke are selling a few cents higher than the figures named. Foundry brands are quoted in all three districts all the way from $1.85 to $2. for prompt shipment, to $2.30 on future contract business.

Finished Material.—There is no change in the situation other than a slightly better call for structural shapes that are quoted at 1.30c., Pittsburgh, with the possibility that a desirable tonnage might be taken on at a slightly lower figure. Very little steel bar business is being transacted, although a few small lots changed hands last week at 1.20c., mill, but for carload quantities 1.15c. is the market price, and it is rumored that a desirable tonnage could be placed below this figure if the material was moved promptly. Railroad track material is dull and an inquiry for spikes or bolts generally brings out some spirited bidding from mill agencies.

Old Material.—While there is no open change in present quotations, the indifference of buyers will probably force prices to seek a lower level. Melters of scrap are merely filling urgent wants, and long time contracts are very scarce. Dealers have large quantities of scrap material on hand, some of which was taken in above the present market value, and as a consequence they are neither anxious to sell nor to take on further stocks just at the moment. The approximate prices paid by buyers, delivered in their yards in southern Ohio and Cincinnati, are as follows:

No. 1 railroad wrought, net ton	$10.00 to $10.50
Casting borings, net ton	4.50 to 5.00
Steel turnings, net ton	5.50 to 6.00
No. 1 cast scrap, net ton	9.25 to 9.75
Bound stock, net ton	6.25 to 6.75
Old iron axles, net ton	16.25 to 16.75
Bundled sheet scrap, gross ton	7.75 to 8.25
Old iron rails, gross ton	12.25 to 12.75
Relaying rails, 56 lb. and up, gross ton	20.75 to 21.50
Old car wheels, gross ton	10.00 to 10.50
Heavy melting steel scrap, gross ton	9.75 to 10.25

Birmingham

BIRMINGHAM, ALA., October 2, 1911.

Pig Iron.—No sales are yet reported at a $10 Birmingham basis, but the market is no doubt weaker, and the price named can be had on round tonnage propositions for delivery over the remainder of the year. The largest transaction for the past week, as well as for several weeks previous, involved 3000 tons of Nos. 2, 3 and 4 foundry, for shipment over the remainder of the year, but in view of the fact that this lot was exchanged for some 15,000 tons of furnace coke, the price can-

THE IRON AND METAL MARKETS

sidered is, of course, not a criterion of market values. The actual sales made since last report consisted of scattering lots of 100 to 300 tons each, with $10.25 for No. 2 foundry the consideration in the majority of cases. Such demand as has come forward was of a mandatory nature, and even the largest melters are, apparently, indisposed to contract for round tonnages at ruling prices. With the reduction of quotations on deliveries during the remainder of the year to a $10 Birmingham basis, it is believed that a $10.50 schedule would become the ruling price for shipments in the first quarter of next year. However, the market for early deliveries is in such an uncertain condition that very little interest is being manifested in forward deliveries by any parties concerned. It is noted that the rate of shipment from furnace yards has been reduced materially by the hold-ups on contracts at purchasers' request. It is not believed that the aggregate stock accumulation has been reduced to any appreciable extent this month, and the blowing out of additional furnaces is now being considered. The inquiries pending at this time are of little consequence in summarizing conditions existing, there being no tonnage in definite form actually under consideration so far as is known. We quote the market for the remainder of the year at the $10.25 basis for the grades below No. 3 foundry and with that basis, subject to 25 cents per ton shading, for No. 2 and No. 3 foundry where the tonnage offered is fairly attractive.

Cast Iron Pipe.—It is understood that the water pipe requirement for Kansas City, Mo., consisting of some 2000 tons, as last mentioned, will be furnished by a local interest, but the price is not made public. Several small lots for Southern municipalities are now under consideration, but there is still no definite announcement as to the placing of one or more large lots that have been held in abeyance for some time. In the absence of large contracts for early letting, and with the decline in the pig iron market, the competition in this market is keener. There is, however, no evidence of a decline in prices and we continue to quote nominally as follows, per gross ton, f.o.b. cars here: 4 to 6-in., $23; 8 to 12-in., $22; over 12-in., average $21, with $1 extra for gas pipe. These prices are subject to shading on large contracts.

Old Material.—This market is probably less active. Since the reduction in quotations on finished iron and steel products no new levels for old material have been made. However, a decline is generally anticipated and dealers are being governed accordingly in accumulating stocks. We continue to quote nominally as follows, per gross ton:

Old iron axles, light	$13.00 to $13.50
Old steel axles, light	12.00 to 12.50
Old steel rails, rerolling	12.00 to 12.50
No. 1 railroad wrought	10.50 to 11.00
No. 2 railroad wrought	9.00 to 9.50
No. 1 country wrought	7.00 to 7.50
No. 2 country wrought	6.50 to 7.00
No. 1 machine cast	9.00 to 9.50
No. 1 steel	8.00 to 9.00
Tram car wheels	8.00 to 8.50
Standard car wheels	9.50 to 10.00
Light cast steel plates	6.50 to 7.00

St. Louis

ST. LOUIS, MO., October 2, 1911.

The opening of the last quarter of the year finds little improvement in the situation in this territory. It develops also that the melts of pig iron in this section have not been up to expectation and that a number of consumers who were expected to be counted in the buyers' column have enough pig iron on hand to carry them until the first of the year. Business, therefore, is of the hand-to-mouth order and the general impression is that it will continue so for some time to come.

Pig Iron.—An inquiry for 2500 tons of Northern basic is the chief, indeed almost the only, feature of the market this week. Another inquiry is for 150 tons of ferrosilicon. No. 2 Southern is quotable at $10.25, Birmingham, but actual transactions might be made at concessions. There is nothing doing in malleable or other irons.

Coke.—Takings of coke continue to follow the same trend as pig iron, and practically nothing is moving except current takings on contracts or small lots for immediate requirements. There is no quotable change in prices.

Finished Iron and Steel.—Immediate delivery requirements continue to be the feature of the finished material market, and buyers are even insisting that the mills shall make deliveries in less than a week in some cases. Upon this feature chiefly rests current competition. There have been no large jobs let the past week and the tonnage being placed is for specific work in the structural steel division. In bars the conditions are about the same as with structural material, prices being unsteady. Plates are very quiet. In standard rails there have been a few small inquiries, but no business. Light rails are evidencing some little increase in interest due to the approaching winter activity in the coal mines. The lumber lines are doing nothing. Track fastenings have been in fair request at steady prices. In general buyers are not anxious to close contracts, being fully aware that they can get quick shipment on any orders that they may place.

Old Material.—There is as little sign of activity as could well be evidenced and still show any life at all. The mills are not taking anything, nor is there any active bidding from any source. The Missouri Pacific is out with a list of about 800 tons, the bids closing later in the week. The large dealers are taking material that seems worth while holding at practically their own prices and report that they see no improvement in sight. Dealers' prices per gross ton, f.o.b. St. Louis, show a few changes in the way of reductions, the quotations for the week being as follows:

Old iron rails	$12.00 to $12.50
Old steel rails, rerolling	11.50 to 12.00
Old steel rails, less than 3 ft.	10.50 to 11.00
Relaying rails, standard section, subject to inspection	22.50 to 23.00
Old car wheels	12.00 to 12.50
Heavy melting steel scrap	10.50 to 11.00
Frogs, switches and guards cut apart	10.50 to 11.00

The following prices are per net ton:

Iron fish plates	$16.50 to $17.00
Iron car axles	18.00 to 18.50
Steel car axles	16.00 to 16.50
No. 1 railroad wrought	10.50 to 11.00
No. 2 railroad wrought	9.50 to 10.00
Rails for rolling	9.25 to 9.75
Locomotive tires, smooth	13.50 to 14.00
No. 1 dealers' forge	8.50 to 9.00
Mixed borings	5.00 to 5.50
No. 1 busheling	8.50 to 9.00
No. 1 boilers cut to sheets and rings	7.00 to 7.50
No. 1 cast scrap	8.50 to 9.00
Stove plate and light cast scrap	7.00 to 7.50
Railroad malleable	7.50 to 8.00
Agricultural malleable	6.50 to 7.00
Pipes and flues	7.50 to 8.00
Railroad sheet and tank scrap	7.00 to 7.50
Railroad grate bars	6.50 to 7.00
Machine shop turnings	6.50 to 7.00

A block of $124,000 of bonds of the St. Louis Blast Furnace Company was sold under foreclosure here during the past week and was bid in by the State National Bank for $80,000. The bonds had been pledged in July, 1910, to secure a loan of $62,000. Their purchase virtually gives the bank control of the property of the company, on which the bonds are a first lien. The plant has been shut down for the past two months.

San Francisco

SAN FRANCISCO, CAL., September 26, 1911.

The closing days of September brought out a little better inquiry in the general distributive trade, though business in most lines is still of a limited nature. The situation is highly unsatisfactory to merchants, who have already suffered some loss from the weakening of primary markets, and no resumption of buying for future needs can be expected until prices are more firmly established. Except on sheets, resale prices are held on a fairly definite basis, but under present conditions business is unprofitable to many jobbers. The most encouraging feature at present is a buying movement on the part of municipalities and public service corporations, indicated by a large and increasing inquiry for cast-iron pipe and a fair movement of grooved girder rails for city use. The demand for structural material is also a little better, with inquiries coming out in the next few weeks for a very fair tonnage.

Bars.—Buying of soft steel bars by the small trade through the country is more in evidence than for some time, though the movement has been hardly normal for September, as the larger buyers are holding off from the market as much as possible. Some merchants are said to have purchased a fair tonnage for shipment by sea, but the majority regard future conditions as too uncertain to warrant any material increase of supplies. Foreign material is offered at about 1.07½c. in the harbor, to arrive, but it is difficult to arouse

THE IRON AND METAL MARKETS

any interest in such offerings. The demand for reinforcing materal continues about up to the average, and a considerable tonnage will soon be required for harbor and bridge work in various parts of the coast. Bids will probably be called for about October 1 for a large amount of concrete pier and seawall construction in this harbor. Bars from store, San Francisco, are quoted at 2c. for steel and 1.90c. for iron.

Structural Material.—Aside from a number of inquiries now in the market, or certain to come up before the end of the year, several large projects are talked of which may offer some encouragement for next year. Among these is a new wing for the St. Francis Hotel, for which plans are now being drawn. About the only new work recently let is a couple of small bridges taken by the American Bridge Company. Figures are being taken on the Pantages Theater in Oakland, about 375 tons; the German House Association building in this city, which was planned over a year ago, and will require about 800 tons, and the Downtown Realty building in this city, about 300 tons. An inquiry on the new Polytechnic High School will probably be out by the end of October. Two large jobs at Los Angeles, the new Times building and the Garland Theater, which will probably take over 2000 tons, will also be in the market in a few weeks. H. E. Huntington is having plans drawn for a 12-story office building at Main and Twelfth streets, Los Angeles, which may come up about the end of the year, and plans are under way for the Farmers' and Mechanics' Bank building at Sacramento. San Bernardino County, Cal., has just taken bids on a small steel bridge. Butte County, Cal., will receive bids October 16 for 7 steel jail cells, and several other jail jobs are expected.

Rails.—A few inquiries are still coming from logging firms, but most loggers have completed their buying for this year's work. Orders for standard sections placed with local agencies are for the most part small, and the aggregate tonnage of late has been very moderate. The principal activity at present consists of improvements to street railroads, giving rise to numerous inquiries for grooved rails. Many improvements are being made in the Oakland Traction and Key Route lines, and considerable business is expected from this source in the next few months.

Sheets.—Corrugated sheets from store are moving off in better shape than before, but there is no life to the market. Merchants are pretty well supplied, and show no inclination to buy except in a very limited way.

Plates.—Consuming trades in general are buying in rather small quantities, and while current requirements for miscellaneous work are about normal no inquiries of special interest are noted.

Merchant Pipe.—The announcement of a reduction in price of about 5 per cent, to be put in effect by the leading manufacturers October 2 has so far had no appreciable effect on local conditions. Business continues dull all over the State. Some improvement has been noted in the small distributive trade, but the revival has been less evident than usual at this time of year, and the actual requirements of consuming trades seem to be below normal. Merchants have been working off their stocks in anticipation of the decline, and if any firmness is manifest in the Eastern markets at the new level some very fair orders may be placed. A fair volume of small orders is coming from water and gas companies, but the tonnage for the oil fields is light, with no immediate prospect of improvement.

Cast Iron Pipe.—The outlook for the entire coast territory is good. A satisfactory volume of small business has come out in the last two weeks, and orders for a substantial tonnage will be placed before the middle of October, while new inquiries are steadily increasing. The town of Santa Cruz, Cal., received bids on 100 tons September 25; the Los Angeles water department opened bids on 620 tons on the 26th, and figures will be taken on 400 tons by the town of Tracy on the 28th. Long Beach, Cal., is in the market for 1700 tons, bids to be opened October 11. Extensive improvements are planned by the Salem Gas Company, Salem, Ore.

Pig Iron.—Most of the local foundries are running in a small way on stock work, with very little inquiry for castings of a special nature. The demand for pig iron is accordingly confined to narrow limits. Prices, however, are fairly well maintained. An occasional small lot might be picked up around $20, but prices on English, Continental or Chinese iron of ordinary foundry grade, to arrive, are quotable at $21 to $24. No. 2 Southern foundry iron is nominally valued at $20 to $20.50.

Old Material.—The scrap market in general is less active than at the beginning of the month. Cast iron scrap is especially quiet, and there is apparently some pressure to sell, though prices are not quotably lower. Some demand for steel melting scrap is expected in the near future, but no large purchases have been made for some time. Meanwhile, arrangements are being made to ship a considerable tonnage to the Atlantic coast. There is little demand for wrought scrap, but offerings of desirable quality are not heavy. Prices are quoted as follows: Cast iron scrap, per net ton, $16; steel melting scrap, per gross ton, $10.50 to $11; wrought scrap, per net ton, $11 to $15; rerolling rails, per net ton, $11.

Buffalo

BUFFALO, N. Y., October 2, 1911.

Pig Iron.—Inquiry for the week has been slack, but included one lot of 1000 tons foundry grades for this year's delivery from a New York State consumer and one of 500 tons from a New Jersey company. Buying has also been comparatively light and spotty in character, consisting principally of small and moderate sized lots for delivery over the remainder of the year and a few of somewhat larger proportions, taken for delivery over the remainder of 1911 and the early part of 1912. One order is noted of 500 tons of No. 2 X foundry at $13.75 at furnace and one of 500 tons of No. 2 plain at $13.50; also orders for malleable of 250 tons and 200 tons for Eastern consumers. The sale of 6000 tons of basic to a railway supply manufacturing company in this district from stored stock of an idle Buffalo district furnace is also noted. Shipments on contracts still continue very heavy and figure 40 per cent. to 50 per cent. more than current furnace production, and as a consequence stocks on furnace banks are showing rapid reduction. All of these contract shipments are apparently for immediate consumption. The indications are that furnaces are about ready to give more serious consideration to taking on 1912 business, as it is evident most consumers are practically covered for their requirements to January 1 and inquiries for 1912 delivery are increasing in number. It is difficult as yet to say what the market price will be for deliveries very far into 1912, but it is probable that in some instances current prices have been extended to cover short period delivery into next year. We quote as follows, f.o.b. Buffalo, for prompt and fourth quarter shipment:

No. 1 X foundry	$14.00 to $14.25
No. 2 X foundry	13.50 to 14.00
No. 2 plain	13.25 to 13.50
No. 3 foundry	13.00 to 13.50
Gray forge	13.00 to 13.25
Malleable	13.75 to 14.25
Basic	13.75 to 14.25
Charcoal	16.50 to 17.50

Finished Iron and Steel.—Desirable business in steel bars for good sized tonnages for shipment at convenience of the mills is reported as being taken at 1.15c., Pittsburgh, but the general run of small lot business in bars is still being quoted on the basis of 1.20c. For desirable business plates are quoted at 1.25c. and shapes at 1.30c. Orders for bar products have been received in fairly good volume during the week, the most important placements being for concrete reinforcing bars from local and Western and central New York State sources. A good many small lot orders for fabricated material are going to the warehouses on account of the mills being filled with specifications on large work. A good deal of new work in fabricated lines is about ready for figures. Plans are finished and bids will soon be taken for the Hamot Hospital at Erie, Pa., requiring 200 tons. Plans are nearing completion and will soon be figured for a school and assembly hall building for the Church of the Annunciation, Buffalo, requiring about 150 tons of steel. Bids are also to be received this week for about 600 tons of steel for the new Roman Catholic cathedral on Delaware avenue, Buffalo, for which Mosier & Summers hold the general contract. Bids are to go in this week also for the Terminal building at Syracuse, taking 1300 to 1400 tons of steel. The First Baptist Church, Syracuse, is receiving bids on revised plans requiring a considerable tonnage of steel. Plans are being drawn for the new Shea Theatre and office building, Buffalo, which will call for 400 to 500 tons of steel. George Baker Long, Akron, Ohio, was low bidder for the fabrication and erection of the steel for the St. Mary's Hospital at Niagara Falls, N. Y., 400

THE IRON AND METAL MARKETS

tons, but the contract has not been awarded, and it is stated revised plans may be drawn.

Old Material.—There has been no material change in the general situation, although there is some evidence of a slightly better feeling apparent in some quarters. A slight increase in inquiry is noted for cast scrap and railroad malleable, but no change in price is noted in any line. We quote as follows, per gross ton, f.o.b. Buffalo:

Heavy melting steel	$12.50 to $13.00
Low phosphorus steel	16.00 to 16.50
No. 1 railroad wrought	14.00 to 14.50
No. 1 railroad and machinery cast scrap	13.50 to 14.00
Old steel axles	18.50 to 19.00
Old iron axles	22.00 to 22.50
Old car wheels	13.00 to 13.50
Railroad malleable	12.75 to 13.00
Boiler plate	12.50 to 13.00
Locomotive grate bars	11.00 to 11.50
Pipe	9.25 to 9.50
Wrought iron and cast steel turnings	7.15 to 7.40
Clean cast borings	7.00 to 7.25

The German Iron Market

BERLIN, September 21, 1911

Changes in the iron market situation for the past week have been few, but the general tendency appears to be growing rather better than worse, notwithstanding the waiting attitude caused by the Morocco entanglement. According to the latest news from the west German districts the works are well employed, and as much as four to six weeks are demanded by the mills for filling new orders in some lines. Since business for the fourth quarter was opened by the Steel Works Union and several other trade combinations new orders have been coming in at a satisfactory pace. There appears thus far no tendency on the part of consumers to reduce the amount of their orders. Many individual mills have already as much work on hand as they can manage during the December quarter. While the pig-iron syndicate has not yet given out its price list for 1912 it has already begun selling at unchanged prices along the seacoast in order to forestall English competition.

The business of the Wire Rod Association has improved; shipments exceed the allotments of the mills. In August they were about 6000 tons above the July movement. The export price for rods, which had dropped a little below 100 marks in the summer, is now several marks higher. The plate market continues in good shape; heavy plates in particular are still very active, and the mills have mostly as much work as they can handle till the end of the year. Prices show a very firm tendency. Mills running on ship plates are unusually busy and can hardly take all the orders offered them; orders for very prompt delivery cannot be accommodated at all. Prices in this line are satisfactory.

The bar market has further improved; prices range between 100 and 105 marks, but the mills are refusing to take orders beyond the end of the year at these prices. In band iron the recently adopted price of 127 marks a ton has not been fully maintained, as one or more concerns in the Southwest are undercutting this price. The tube mills have work enough, but prices are still unsatisfactory, inasmuch as competition continues sharp. Better business in screws and rivets is looked for soon. The prices of some grades of screws have recently been raised 2 per cent. Locomotive and machine shops are doing a better business than in the summer. A big strike and lockout in the Sanon and Thuringian machinery and metalworking trades has been settled this week.

After the extraordinarily heavy exports of iron and steel in July the August outgo dropped back to nearly the level of previous months. The total exports reached 446,300 tons, which was 40,900 tons more than for August, 1910, but 93,000 tons less than in July, 1911. The excess of exports over imports was 395,900 tons, against 491,900 tons in July.

The stock market has shown a rather irregular tendency for iron shares for a week, but the general level of prices has probably been depressed a little, which was due more to political and money market considerations than to conditions in the iron trade. A survey of the financial prospects of iron companies for the current year indicates that most of them are making more money than last year, even in cases where their product is sold at unchanged or lower prices. Within a year economies of production have been effected to a sufficient extent to account for this result.

New York

NEW YORK, October 4, 1911.

Pig Iron.—Transactions through local offices have been of fair volume in the past week, but they represent to a considerable extent sales from Buffalo furnaces. Several sales of basic iron have been made in the East, the total for the past week or ten days running from 12,000 to 15,000 tons. Some of this was for delivery in eastern Pennsylvania and will come from Virginia furnaces. Some basic iron was sold also by a New York furnace for delivery in Connecticut, this last transaction amounting to about 3000 tons. Buffalo furnaces have made sales both for the fourth quarter and for delivery extending one, two and three months into 1912. Some of the iron for next year was sold on the basis of $13.75 for No. 2 X at furnace, but it is believed as low as $13.50, Buffalo, has been done for shipment in the early part of 1912. Eastern Pennsylvania furnaces are still unwilling to do business for 1912. It is found that melters of foundry iron in many cases are needing more than the contract shipments, and furnaces are being pressed for deliveries. One furnace has started up in the Schuylkill Valley and another in that valley is expected to blow in soon, while a furnace in the Lebanon Valley using Cornwall ore is likely to blow in in the near future. Virginia furnaces are asking $12.75 for No. 2 X for shipment in 1912, though $12.25 can still be done for this year. We quote Northern iron at tidewater as follows: No. 1 foundry, $15.50 to $15.75; No. 2 X, $15 to $15.25; No. 2 plain, $14.75 to $15. Southern iron is quoted at $15.25 to $15.50 for No. 1 foundry and at $14.75 to $15 for No. 2.

Finished Iron and Steel.—The admitted open market does not appear to have attracted much new business, and the low scale prices are firm, partly perhaps because of the lack of orders large enough to test them. It is agreed that steel bars may be obtained here on the 1.15c. Pittsburgh basis, and plates and plain structural material on the 1.20c. and 1.25c. basis, respectively, but it is believed that the ordinary run of business—that is, business not particularly attractive from a mill-operating standpoint—has been at 1.20c. and upward for bars, 1.25c. and upward for plates and 1.30c. for shapes. Bar iron is weak in sympathy with the general conditions, but the drop in demand is not so great as expected, and the price of 1.30c., New York, for best grades, is being held. The largest new development in the structural field is the building to replace the Madison Square Garden in New York. The plans comprehend a 24-story building, involving probably 25,000 tons of structural steel. Bids of general contractors go in October 7, but no time of delivery of steel is mentioned, and the immediate certainty of the construction work is questioned. Bids went in October 3 for 100 tons in two bridges for the Boston & Maine at Northville, N. H.; bids are to be taken October 6 for the 5000-ton Washington post office, and on October 9 for the 8000-ton auditorium building, Fairmount Park, Philadelphia. Among recent structural awards are: 900 tons, Normal College, Lexington avenue, to Levering & Garrigues Company; 200 tons, Scherzer bridge, New York & Long Branch Railroad, to Pennsylvania Steel Company, which also received awards for two lift bridges, 200 tons, for the Pennsylvania Railroad; 100 tons, bridges at Lynn, Mass., on Boston & Maine, to Boston Bridge Works, which also took 100 tons in bridges for the New Haven road; 100 tons, bridges at New Haven for the same road to L. F. Shoemaker & Co., which received the contract for a 100-ton bridge over the Black River for the New York Central; 300 tons in bridges for the New York Central, shared by the Phoenix Iron Company, the American Bridge Company and the Fort Pitt Bridge Company; 650 tons for the Barge office in New York, to the Passaic Steel Company, 400 tons for the Duveen loft building reported given to the McClintic-Marshall Construction Company, and 1200 tons, apartment house at Riverside Drive and 114th street, to Hinkle Iron Company, which also has a 1000-ton structure for the St. Jean Baptiste Church, Seventy-sixth street and Lexington avenue. Bids are soon to go in for the general contract on the Locomobile Company's garage involving 1700 tons and they are being taken for a Y. W. C. A. building, Fifty-second street and Lexington avenue, 1500 tons. It is understood that bids are again to be taken by the Old Dominion Line for the pier sheds at Norfolk, Va. The following are given as present quotations: Plain structural material, 1.41c. to 1.46c.; plates, 1.36c. to 1.41c.; steel bars, 1.31c. to 1.36c.; bar iron, 1.26c. to 1.31c., all New York. Plain material and plates from store, New York, 1.70c. to 1.80c.

THE IRON AND METAL MARKETS

Cast Iron Pipe.—The Providence contract for 900 tons was awarded to the United States Cast Iron Pipe & Foundry Company. It is not known so far from whom the successful contractor-bidder has purchased 8900 tons of 40-in. pipe to be furnished to the New York Board of Water Supply. No public lettings of noteworthy size are announced in this vicinity, but quite a fair business is progressing with private water and gas companies. The tonnage involved in this class of purchases is running up well, as important pipe foundries report their order books in quite encouraging shape for the greater part of the winter. Carload lots of 6-in. are still available at $21 to $22 per net ton, New York.

Old Material.—Transactions are confined to small quantities. Foundries seldom purchase more than carload lots. Steel scrap and rolling mill stock are quiet, the rolling mills especially presenting a very discouraging front to sellers. Cancellations and rejections are the experience of those dealers having contracts which they are endeavoring to fill. The railroads are putting out heavy lists, that of the Baltimore & Ohio amounting to about 21,000 tons. As dealers are carrying full stocks and consumers profess to have enough to supply their present necessities, the pressure of the railroad offerings seems likely to bring about a still lower level of values While quotations are largely nominal, dealers' prices, per gross ton, New York and vicinity, are about as follows:

Old girder and T rails for melting	$9.50 to $10.00
Heavy melting steel scrap	9.50 to 10.00
Relaying rails	20.00 to 21.00
Rerolling rails	11.50 to 12.00
Standard hammered iron car axles	20.00 to 20.50
Old steel car axles	15.00 to 15.50
No. 1 railroad wrought	11.75 to 12.00
Wrought iron track scrap	10.75 to 11.00
No. 1 yard wrought, long	10.50 to 11.00
No. 1 yard wrought, short	9.50 to 10.00
Light iron	4.00 to 4.50
Cast borings	5.00 to 5.50
Wrought turnings	5.50 to 6.00
Wrought pipe	9.00 to 9.50
Old car wheels	10.00 to 10.50
No. 1 heavy cast, broken up	10.00 to 10.50
Stove plate	8.00 to 8.50
Locomotive grate bars	8.00 to 8.50

Ferroalloys.—Ferromanganese is in fairly good demand. There are inquiries out for about 2000 tons and the usual quotation is $38.50, Baltimore. It is estimated that fully 26,000 tons of ferromanganese have been sold within the last four months and for most of this good prices were obtained. The call for ferrosilicon is quiet, with New York sellers asking $60.50, Pittsburgh. Some of them are refusing to commit themselves for delivery beyond the end of this year.

Metal Market

NEW YORK, October 4, 1911.

The Week's Prices

Cents Per Pound for Early Delivery.

	Copper, New York.			Lead		Spelter	
		Electro-		New	St.	New	St.
Sept.	Lake.	lytic	Tin.	York.	Louis.	York.	Louis.
28	12.50	12.25	38.80	4.47½	4.32½	6.00	5.85
29	12.50	12.25	39.80	4.47½	4.32½	6.00	5.85
30	12.50	12.25	.....	4.47½	4.32½	6.00	5.85
Oct.							
2	12.50	12.25	40.00	4.47½	4.32½	6.00	5.85
3	12.50	12.25	40.25	4.47½	4.32½	6.00	5.85
4	12.50	12.25	40.15	4.47½	4.32½	6.00	5.85

Pig tin has advanced on the strength of favorable statistics. Copper prices are unchanged, but the market is stronger. Lead is dull. Spelter is in so little demand that prices are largely nominal.

Copper.—While the copper market is somewhat dull on the surface, it is apparent that many of the large producers are well sold out for October, which indicates that a good consumption is going on. Some effort is being made by selling interests to dispose of their holdings for November and December delivery and there is a great deal of talk about advancing prices. There are reports of some sales of electrolytic for December delivery at 12.30c., but as there are offerings for early delivery at 12.25c. it is advisable to quote that price. Lake remains at 12.50c., but not a great deal is offered for sale for delivery this month. The exports of copper for September as reported by the New York Metal Exchange were fair. The total for the nine months of the year showed an increase of 37,545 tons as compared with the same period of last year. L. Vogelstein & Co. give the following figures of German consumption of foreign copper from January to August, 1911: Imports, 125,208 tons; exports, 5703 tons; consumption, 119,505 tons, as compared with consumption during the same period in 1910 of 108,876 tons. Of the above quantity 109,441 tons were imported from the United States. In London this morning spot copper was sold for £55 1s. 3d. and futures for £55 17s. 6d.

Copper Averages.—The Waterbury average for September was 12.50c. The average price of Lake copper in New York for the month was 12.05c. and the average price of electrolytic was 12.37½c.

Pig Tin.—The September statistics covering pig tin issued by the New York Metal Exchange are occupying the attention of the trade and their publication has given the market a favorable turn. The figures show that deliveries into consumption during the month were large, amounting to 4200 tons, and the arrivals for the month were especially heavy, totaling 5360 tons. The London syndicate has again asserted itself and bought heavily yesterday and to-day on the strength of the American statistics. This put the price up, but as consumers here seem to be pretty well supplied they did not come into the market. The stocks of available tin in this country are ample, but they are fairly well concentrated, although there is no evidence as yet of an attempt to squeeze the buyers. This morning pig tin was offered in New York at 40.15c., whereas a week ago it could be bought for 38.87½c. The London market this morning was somewhat excited over price advances and spot tin was quoted there at £183 5s. and futures at £183 7s. This is an advance of nearly £6 on spot and about £10 on futures. The syndicate is reported to be buying heavily to-day for deliveries well into the end of the year.

Tin Plates.—The domestic demand is quiet, but a great deal is being purchased for export at lower prices than domestic consumers are able to obtain. The usual quotation for delivery in this country is $3.84 for 100-lb. coke plates. The foreign tin plate market is weak at 13s. 7½d. for plates at Swansea, Wales. The fact that the price of plates at Swansea has not advanced in keeping with the pig tin market is said to be due to large sales of American tin plates for shipment abroad.

Lead.—Lead is dull but steady. An effort has been made to advance quotations in the West, but without success. The price continues at 4.33½c., St. Louis, and 4.47½c., New York. The American Smelting & Refining Company continues to hold lead at 4.50c., New York, and outside sellers are getting the bulk of the business here. The leading interest is meeting competition in the West to some extent.

Spelter.—The spelter market is somewhat unsettled, but there is so little buying that prices are largely nominal. Some heavy deliveries are being made on spelter purchased three or four weeks ago, but new inquiries are very few. The usual quotation is 6c., New York, and 5.85c., St. Louis.

Antimony.—Antimony is dull, weak and uninteresting. Reports of price cutting are current. Hallett's can be easily obtained at 7.70c.; Cookson's is offered at around 8.25c. and Chinese and Hungarian grades are offered at from 7c. to 7.10c.

Old Metals, New York.—Dealers report a quiet market, with selling prices nominally unchanged, as follows:

	Cents per lb.
Copper, heavy and crucible	10.50 to 10.75
Copper, heavy and wire	11.37½ to 11.50
Copper, light and bottoms	9.25 to 9.50
Brass, heavy	7.00 to 7.25
Brass, light	5.50 to 5.75
Heavy machine composition	9.00 to 9.25
Clean brass turnings	6.75 to 7.00
Composition turnings	7.50 to 7.75
Lead, heavy	3.75
Lead, tea	3.50
Zinc, scrap	4.00

Chicago

OCTOBER 3.—A very dull and spiritless situation has prevailed during the week in the local metal market. Prices for the leading items have declined, with the exception of tin, which has responded somewhat from the extreme low point quoted a week ago. Little encouragement is offered for a change toward more active conditions. We quote at Chicago: Casting copper, 12.50c.; Lake, 12.62½c., in carloads, for prompt shipment; small lots, ¼c. to ⅜c. higher; pig tin, carloads, 40.50c.; small lots, 43.50c.; lead, desilverized, 4.40c. to 4.45c., for 50-ton lots; corroding, 4.67½c. to 4.70c. for 50-ton lots; in carloads, 2½c. per 100 lb. higher; spelter, 5.95c. to 6c.; Cookson's antimony, 9¼c., and other grades, 8¼c. to 8¾c., in small lots; sheet zinc is $8, f.o.b. La Salle, in carloads of 600-lb. casks. On old

metals we quote for less than carload lots: Copper wire, crucible shapes, 10½c.; copper bottoms, 9¼c.; copper clips, 10⅛c.; red brass, 9⅜c.; yellow brass, 7⅜c.; lead pipe, 3⅞c.; zinc, 4¼c.; pewter, No. 1, 26c.; tinfoil, 32c.; block tin pipe, 36c.

St. Louis

OCTOBER 2.—The metal market has shown an improved tendency, the demand being better, with higher prices noted in some directions. Tin is considerably stronger at 37.65c.; Lake copper is quotable at 12.95c. and electrolytic at 12.72½c.; Cookson's antimony is quoted at 8.60c.; lead is firm at 4.35c. to 4.37½c. and spelter is well held at 5.85c. In the Joplin mining district the past week, in addition to the regular sales, about 2000 tons of zinc blende was taken for exportation to Europe, coming from surpluses in the bins which have not been regarded as on the domestic market. The week's figure for blende was $47 per ton as the top price, the 60 per cent. metallic content basis being $44 per ton. Some poor ores sold as low as $40 per ton, the general market being $1 to $3 per ton lower than last week. Calamine continued exceptionally strong at $24 to $25 per ton for 40 per cent. assay basis, while choice lots went as high as $32. The bulk of the lead ore sold at $58, with some as high as $59 per ton. Quotations on scrap metal follow: Light brass, 5c., heavy brass and light copper, 8c.; heavy copper and copper wire, 9c.; zinc, 3c.; lead, 3¼c.; pewter, 20c.; tinfoil, 28c.; tea lead, 3c.

Iron and Industrial Stocks

NEW YORK, October 4, 1911.

The stock market underwent a complete change of form on Wednesday of last week, following the publication of the statement by the United States Steel Corporation that it did not propose to dissolve voluntarily and that any suit brought by the government would be defended. All stocks advanced sharply on that day, but for a day or two following the market was feverish and excited because of other unfavorable influences affecting the general list of stocks. Since then the market has been fairly firm at a higher level of prices than noted in last week's report. The range of prices on active iron and industrial stocks from Wednesday of last week to Tuesday of this week was as follows:

Beth. Steel, com....	27 - 29⅛	Pressed Steel, pref.....	95¼
Beth. Steel, pref...	54½ - 56⅛	Railway Spring, com.....	27¼
Can. Com.....	9½ - 9⅞	Republic, com.....	21⅝ - 22⅜
Can. pref.....	81½ - 83½	Republic, pref.....	83½ - 85
Car & Fdry., com..	42⅜ - 45⅛	Sloss, com.....	35¾ - 36
Car & Fdry., pref...115 - 116½		Pipe, com.....	11⅝ - 13¾
Steel Foundries.....	27 - 30	Pipe, pref.....	43
Colorado Fuel.....	35⅛ - 37	U. S. Steel, com....	56⅛ - 62⅝
General Electric....144½-150½		U. S. Steel, com....	56⅜ - 62⅝
Gr. N. Ore Cert....	43½ - 47½	Westinghouse Elec...	60⅛ - 63¾
Int. Harv., com....100⅛-103		Am. Ship, com.....	50
Int. Harv., pref....115½-117		Chi. Pneu. Tool....	43½ - 46½
Int. Pump, com.....	27 - 30	Cambria Steel.....	42⅜ - 43½
Int. Pump, pref....	80½-82	Lake Sup. Corp....	22 - 22⅝
Locomotive, com....	34 - 35¼	Crucible Steel, com	10 - 10⅜
Locomotive, pref....	103¼	Crucible Steel, pref. 74 - 76½	
Nat. En. & St., pref. 90½ - 93¾		Hath. Wk. Ref., com	48
Pressed Steel, com..	26⅜ - 27	Hath. Wk. Ref., pref.....	98½

Dividends Declared

The E. W. Bliss Company, regular quarterly, 2 per cent. on the preferred stock, payable October 1.

The Westinghouse Electric & Mfg. Company, regular quarterly, 1¾ per cent. on the preferred stock, payable October 16.

The Chicago Pneumatic Tool Company, regular quarterly, 1 per cent., payable October 25.

The Ingersoll-Rand Company, stock dividend of 25 per cent. on common stock, payable November 1.

The Vulcan Detinning Company, quarterly, 1¾ per cent. on the preferred stock, payable October 20. Last quarterly dividend was 1¼ per cent. The stock is 7 per cent. cumulative.

The Pope Mfg. Company, regular quarterly, 1½ per cent. on the preferred stock, payable October 31.

The Thompson-Starrett Company, regular semi-annual, 4 per cent. on the preferred stock, payable November 15.

The National Fire Proofing Company, regular quarterly, 1 per cent. on the preferred stock, payable October 16.

The International Steam Pump Company, regular quarterly, 1½ per cent. on the preferred, payable November 1.

In the editorial on "The Steel Corporation and Disintegration," in *The Iron Age* of September 28, the word "discretion" appeared by an error in a sentence which should have read: "The events of the week have given telling emphasis to the need of some source of Federal *direction* for corporate business."

The Wickwire Steel Company, Buffalo, N. Y., is preparing to blow in its Harriet X furnace, which went out five weeks ago for relining.

The Holden Company, Ltd., Montreal, has been appointed general sales agent in Canada for the Chicago Pneumatic Tool Company.

The American Electric Railway Association will hold its thirtieth annual convention at Atlantic City, N. J., October 9 to 13.

Trade Publications

Wood Sawing Machinery and Gasoline Engines.—A. W. Gray's Sons, Middletown Springs, Vt. Catalogue. Treats of a line of wood sawing machines that this company has been building since 1840. It includes circular saw machines with regular, extended, long extension and swing tables; a combination drag and circular saw machine and an independent drag saw machine with friction or belt drive. The gasoline engines covered are of the four-cycle type and are made in a number of sizes ranging from 3 to 25 hp. These engines are furnished with a base or mounted on skids or wheeled trucks as may be desired.

Chain Hoists.—Wright Mfg. Company, Lisbon, Ohio. Pamphlet. Describes the Wright standard chain and screw hoists. The former is of the triplex high speed type and is made in a number of sizes ranging in capacity from ½ to 20 tons. The capacity of the screw hoist varies from ½ to 8 tons.

Lathe.—J. J. McCabe, 30 Church street, New York, N. Y. Loose leaf circular. Deals with the latest type of 2-in-1 lathe which combines in one tool a high powered triple geared 48-in. lathe with a back geared 26-in. lathe. In this way it is possible to secure a tool which can be employed for the most severe service as well as for ordinary all-round use.

Air-Lift Pumping.—Ingersoll-Rand Company, 11 Broadway, New York, N. Y. Mailing card No. 552. Relates to the air-lift system of pumping from driven wells. A typical plant consisting of a compressor, a receiver, a well and a tank is illustrated and other illustrations show the system installed for irrigating rice fields, supplying reservoirs, etc., as well as some of the standard compressors.

Lathes and Planers.—The Hamilton Machine Tool Company, Hamilton, Ohio. Loose leaf sheets. These are intended for insertion in the company's loose leaf catalogue and the tools described include an 18-in. cone pulley head lathe of the standard and quick change gear patterns, a 24-in. geared head lathe equipped with quick change gears and 24 x 24, 30 x 30, 42 x 42 and 54 x 54 in. planers. Two sheets are devoted to each tool, the specifications being printed on a thin sheet that is designed to be inserted in front of the engraving which is printed on heavier stock.

Inspection Cars.—Chicago Pneumatic Tool Company, Fisher Building, Chicago, Ill. Circular No. 87. Illustrates and describes the Rockford railroad, section and inspection gasoline motor cars. One of the special features of these cars is that the engine is directly connected to the axles like a locomotive. The various points of superiority of these cars are tersely given and a partial list of users completes the circular.

Condenser, Steam Separator and Air Washer.—The Griscom-Spencer Company, 90 West street, New York, N. Y. Two catalogues and a circular. Catalogue No. 402 calls attention to the Thompson evaporative condenser, which is said to require less than a pound of water per pound of steam condensed, and is intended to be used when water is scarce, scaly, hot or expensive. It forms a substitute for the cooling tower which, together with the Thompson evaporative condenser, is discussed, and a comparison of the cost of condensing 55,000 lb. of steam per hour at a 20-in. vacuum by both methods is given. Catalogue No. 1101 illustrates and describes the Stratton steam separator, in which the separation of water from steam is caused by the centrifugal force exerted to the mixed current of water and steam entering the apparatus. These separators are made in both vertical and horizontal types as well as in the form of a combined separator and steam receiver. They are made with either cast iron or wrought steel bodies and there are a number of line drawings showing how the separator can be changed to design to meet the demands of special piping. The circular treats of the G-S hygienic air washer, which is adapted for private residences, hotels, clubs, schools, public buildings and textile and manufacturing plants.

Gas-Electric Motor Car and Incandescent Lamp.—General Electric Company, Schenectady, N. Y. Two bulletins. The first, No. 4855, is devoted to a detailed description of the company's double truck type gas-electric car. It contains ample data of the performance of the various types of cars and the weight and seating capacities as well as plans and elevations of the various sizes. No. 4863 describes the Gem incandescent lamp, which has a metalized carbon filament. This lamp is designed to replace the carbon lamp and the bulletin compares the two styles and shows the advantages to be derived from the use of the new lamp.

The Connellsville Coke Trade

The Weekly Courier, Connellsville, Pa., of September 28, reports the condition of trade in that region as follows:

The Connellsville coke trade took a small spurt last week. Production and shipments both increased. The increase was chiefly among the merchant operators, whose output was 5 per cent better than the previous week. Shipments show a gain of about 6 per cent. Production and shipments, however, fluctuate considerably from time to time, as the following compilation testifies:

Qr.	Production. Net Tons.	Shipments. Net Tons.
1	4,242,574	4,121,706
2	3,784,349	3,899,957
3*	3,650,263	3,666,526
Total	11,677,186	11,688,189

*To September 23.

These figures show that the over-production of the first quarter was disposed of during the second. Production during the first quarter was 120,000 tons in excess of shipments, while in the second quarter shipments were 115,000 tons greater than production. The figures for the present quarter show slightly excessive shipments. There was considerable stock on the yards at the beginning of the year and there is always more or less stock, and it is always of an indeterminate character. But the figures given prove that there has been no overproduction of coke thus far this year. This fact may in a measure account for the present steadiness of prices, but there are other considerations, one of which is that prices are about as low as they can get without touching the loss line.

One factor in upholding the Connellsville coke trade has been the placing of an order for 100,000 tons of coke by British Columbia smelters. This has been divided among a number of merchant plants in this region. The Jamison Coal & Coke Company of the Greensburg-Connellsville district got some of it. The requirements as to quality are very liberal. There are no restrictions as to sulphur such as are made by furnacemen. The coke is shiped to Lorain, Ohio, and thence across Lake Erie by water to Fort Willian, Ont., thence by the Canadian Pacific to points of delivery. The freight rate is $7.95 per ton. The price is not stated, but it is understood to be in the neighborhood of $1.40. This is new business and in dull times good business. The rate is a good rate for poor coke, though not for good merchantable furnace coke.

The running time was better than the week before, the average being 5.40 days, as compared with 5.29 days. Of the entire 26,017 ovens in operation, 45 ran seven days; 10,917 ran six days; 14,421 ran five days and 634 ran four days. The number of ovens in operation in the region was increased by the firing of 20 ovens at various plants.

The Park Drop Forge Company's Improvements.—Extensive enlargement will be made to the plant of the Park Drop Forge Company, Cleveland, Ohio, a decision to this effect having been decided upon at a recent meeting of the board of directors. The main forge shop will be extended so as to provide about 50 per cent. additional floor space. A new machine shop is also planned, the first section of which will provide about 100 per cent. additional floor space. The machine shop will be of brick and steel and of the most modern design. It will include a center bay with overhead crane, and two stories in the side bays. The forge shop addition will be built as soon as possible. The company intends to install large hydraulic presses and steam hammers with the purpose of having a plant that will be unexcelled for the rapid and economical production of crank shafts for tractor engines, motor boats, stationary engines and automobiles. The company is now operating its plant overtime, and it expects that its increased capacity will be ready none too soon to care for the increased business that is looked for early in the spring.

The two blast furnaces at the North Works of the Illinois Steel Company are being dismantled. They are each 66 x 16 ft. and were built in 1870-1. No. 1 was first blown in in April, 1870, and No. 2 in April, 1871. They were last operated in 1907.

The Block-Pollak Interests

The expiration of the lease on a piece of property held in St. Louis, Mo., by the Block-Pollak Company, coincident with which certain temporary machinery was sold to the Harry Benjamin Equipment Company, which took up the lease, has given rise to an incorrect statement with reference to the affairs of the Block-Pollak Company.

In the 46 years during which the Block and Pollak interests have been associated, their business has grown both in the direction of handling raw materials and scrap and also manufacturing. The younger men of the Pollak family have been more closely connected with the development of the manufacturing plants at Cincinnati, Ohio. With the retirement of the two elder Messrs. Block, the scrap iron business of the Block-Pollak Company in the West has been under the direction of Joseph Hyman and Joseph Michaels. Without segregating the private interests of either party in the Block-Pollak Company, it has been considered desirable to place under separate corporate existence the two branches of the business in accordance with their natural division.

The plan has resulted in the organization of the Hyman-Michaels Company, of which Isaac Block is president, Joseph Hyman is vice-president and treasurer, and Joseph Michaels is vice-president and secretary, Joseph Block and P. D. Block being directors, and in the formation of the Pollak Steel Company, operating at Cincinnati, of which Emil Pollak is president. The former company will take over the entire business of the Block-Pollak Company in the West, completing its contracts and assuming its accounts. Under this new company the scrap iron business will be greatly extended and will include dealing in iron ore and pig iron.

At Cincinnati the steel axle and forging plants of the Pollak Steel Company, now in operation with a capacity of 4000 tons of axles and 2000 tons of forgings per month, will be greatly extended. New equipment for a large machine shop and hammer and forge equipment permitting the manufacture of heavy crank shaft and similar forgings will be installed in the very near future.

Steel Works Cases Before the Commerce Commission

The Interstate Commerce Commission issued an order September 30 suspending tariffs which had been put into effect by various railroads jointly with the Birmingham Southern Railroad, which is controlled by the Tennessee Coal, Iron & Railroad Company, and connects its various blast furnace plants, coal mines, coke ovens and limestone quarries in the Birmingham district. The Louisville & Nashville and other lines which were dividing their rates with the Birmingham Southern claimed that this division was in effect a rebate to the Tennessee Coal, Iron & Railroad Company. The issue just raised by the action of the commission has come up in several cases in which large manufacturing companies, including a number in the iron and steel trades, have secured the benefits of a division of through rates with a subsidiary terminal railroad company. In the case of the Birmingham Southern the rate which it jointly makes with the Louisville & Nashville and other railroads was suspended for 120 days, pending investigation.

The Wisconsin Steel Company filed a petition with the Interstate Commerce Commission at Washington, October 2, complaining of the advance on June 15 in the rates on coke from the Connellsville district in Pennsylvania to South Chicago. The old rate was $2.35 and the advance was to $2.50 a ton. It is stated that the aggregate tonnage in this traffic in the past year was 460,000 tons.

The Meaker Company, 218 North Elizabeth street, Chicago, reports that its business in 1911 has been the largest in its experience. The company is now making preparations to double its space and capacity in view of its large current business and the larger volume of the business which is in sight. Its specialty is the manufacture and installation of galvanizing plants, including equipment for electro-galvanizing.

Steel Mill Illumination

Concluding Session of the Association of Iron and Steel Electrical Engineers

Steel mill illumination was discussed from both its practical and its theoretical standpoints at the last session of the Association of Iron and Steel Electrical Engineers, held in the Hotel Imperial, New York City, Friday afternoon, September 29. Four papers in all were presented by authors calculated to approach the subject from different angles. Below are given some of the important points of the papers, together with some of the information brought out in the unusually active discussion which followed the reading of the papers. The session brought the formal meetings to a close, as many remained for excursions on Saturday. The convention proved to be a record breaker in attendance, the total registration being 155, and it was marked by a considerable number of valuable papers. The engineering contributions and the active interest is especially noteworthy for an association only five years old, and the enthusiasm of the officers on the immediate promise of the association seems to be well founded. Announcement was made on Wednesday of the officers elected for the coming year and on Friday the president announced his committees. The time and place of the next meeting were discussed and favor was shown for Milwaukee, in the third week of September, 1912. The executive committee has power in this connection.

Officers and Committees.

President, B. R. Shover, Carnegie Steel Company, Youngstown, Ohio.

First vice-president, E. W. Yearsley, Philadelphia.

Second vice-president, E. Friedlaender, Edgar Thomson Works of the Carnegie Steel Company.

Secretary-treasurer, James Farrington, LaBelle Iron Works, Steubenville, Ohio.

Safety Committee, L. R. Palmer, Jones & Laughlin Steel Company, Pittsburgh, Pa., chairman; George W. Richardson, electrical superintendent, American Bridge Company, Philadelphia; O. R. Jones, Youngstown Sheet & Tube Company, Youngstown, Ohio; H. A. Cox, American Steel & Wire Company, Donora, Pa.; E. H. Wentz, National Tube Company, Lorain, Ohio, and F. A. Wiley, Wisconsin Steel Company, South Chicago.

Committee on Membership and Board of Examiners: E. Friedlaender, chairman; James Farrington, and W. T. Snyder, National Tube Company, McKeesport, Pa.

Committee on Papers: O. R. Jones, chairman; C. W. Parkhurst, Cambria Steel Company, Johnstown, Pa., and T. E. Tynes, Lackawanna Steel Company, Buffalo.

Library Committee: James Farrington, chairman; B. F. Coombe, Carnegie Steel Company, Mingo Junction, Ohio, and B. W. Gilson.

Finance Committee: L. R. Palmer, chairman; E. W. Yearsley and James Farrington.

Editing Committee: F. W. McKee, Jones & Laughlin Steel Company, Woodlawn, Pa., chairman; H. H. Laughlin, Jones & Laughlin Steel Company, Pittsburgh, and W. T. Snyder.

Committee on Standardization: R. C. Reed, chairman; D. J. Jones, Republic Iron & Steel Company, Youngstown, Ohio; B. G. Beck, American Sheet & Tin Plate Company, Gary, Ind.; J. C. Reed, Pennsylvania Steel Company, Steelton, Pa.; F. H. Kittredge, and F. H. Woodhull, Lukens Iron & Steel Company, Coatesville, Pa.

Committee on Revision of the Constitution: W. T. Snyder, chairman; E. Friedlaender, and F. W. McKee. This committee is to report by November 1 on the question of the admission of associate members in the Association.

The Symposium on Mill Illumination

The first of the papers on illumination was read by Mr. Fortune of the Cooper-Hewitt Electric Company, on "The Light for Safety." He dwelt in part on the advantages of the monochromatic light and also on the influence of variations in intensity of light on the question of safety of operatives in factories, such as a steel plant. The second paper was submitted by H. M. Gassman, of the Tennessee Coal, Iron & Railroad Company and approached the subject of steel works illumination from a practical operating standpoint. He did not regard flame arcs as satisfactory, on the ground that they are unsteady in light quality and do not give continuous service. Four such lamps in series were always necessary and when one went out, all four failed, notwithstanding the cutouts which are provided but which rarely operated. He mentioned also the deposit on the inside of the globe, which accumulation diminished the working efficiency.

Mr. Gassman favored clusters of tungsten lamps using four 250-watt lamps and four 100-watt lamps, the latter spaced 25 ft. apart for general floor operation. He admitted the amount of energy was greater when compared with the flame arc, but when taking into consideration the loss of globes, the interruption of service in the flame arcs and the greater labor cost of maintaining and cleaning the lamps, he regarded the flame arc as having no advantage. He used clusters of tungsten lamps for outside lighting as well. For rail inspection beds he employed a row overhead in a line at right angles to the rails with the result that no troublesome shadows are developed and the quality of the light is better than he had ever enjoyed before. Another advantage he emphasized for the tungsten lighting was the chance to use independent lighting circuits, employing the 25-cycle current now common in steel works' electric power service, without depending on rotary converters where a direct-current lighting system is in use. He suggested connecting the lamps to different phases of the alternating supply as the means for eliminating the fluctuation of a light source due to the relatively low frequency.

In the discussion Mr. Shover described some experiments he is having made to discover the relative fragility of the filaments in lamps of both the high voltage and low voltage types. The result of his experiments are given for the interest they may have with the emphasis that they are not complete and in Mr. Shover's opinion are not of course conclusive owing to the fact that a sufficient number of lamps has not yet been experimented with. A board 8 in. wide and 6 ft. long arranged with a double row of lamp sockets was hinged at one end to the baseboard of the room and the other end was lifted and allowed to fall repeatedly, the operation being continued until all the lamp filaments broke. The free end was given a fall of about 23½ in. The lamps experimented with were all 40-watt new lamps of drawn wire. There were eight lamps in two lines of four each. In one was placed 50 volt lamps and in the other row 100-volt lamps. After each drop an arrangement was made to flash the current through the lamps to discover when the filament failed. The sockets may be numbered 1, 2, 3 and 4 away from the hinge joint. In the preliminary experiment the results given in the table were obtained. The table shows that the lamp in the No. 1 position of the 50-volt type did not suffer a broken filament until after 13,254 jars and that the corresponding 100-volt lamp did not fail until after 12,170 falls. The average of the 50-volt lamps is 11,505 and the average of 100-volt lamps is 3697.

	Position of Lamps.			
Voltage of lamps	1	2	3	4
50 volts	13,254	12,870	10,113	9,782
100 volts	12,170	831	1,547	241

An exhaustive paper was read on the same general subject by C. J. Mundo, of the General Electric Company, which explained at length the determination of lighting results by different methods and gave a table of the minimum satisfactory illumination intensities for different departments of a steel plant. This is reproduced in the accompanying table.

A tendency to exaggerate the value of the tungsten lamp was claimed by R. Fleming, of the Adams-Bagnall Electric Company, in discussing the paper, intimating that the tungsten lamp was now in vogue just as other types of lamps have been though now in disfavor. He felt that the flame arc had been slighted chiefly because of its past performances and offered promises that the flame arc lamp could now meet all requirements regarding regulation, cost and efficiency. The flame lamp, he said, would be the lamp for general illumination and the tungsten lamp will serve for general illumination of smaller places.

The concluding paper of the session was by Ward Harrison, of the National Electric Lamp Association, referring particularly to the non-technical features of electric illumination. Some of the points of this paper are as follows:

PAPER BY WARD HARRISON.

The light produced is in itself of no particular value to the industrial plant manager except as this light enables his men to do more work, to do it more accurately, to do it more safely. The input and output are not measured in the same units, and furthermore, since the human element cannot be eliminated from the problem, an exact determination of the most economical intensity of illumination is practically impossible. The dollar basis is the only one to which both the input and output of a lighting installation can be reduced, and up to the present time comparisons on this basis have been only the roughest approximations. To give some conception of the relative magnitude of the quantities involved, the accompanying diagram has been constructed. The curves in this figure are based upon the following assumptions:

Maximum Satisfactory Illumination Intensities for Steel Plants. Compiled by C. J. Mundy.

Service.	Intensity Recommended—Foot Candles.	Remarks and Requirements.
General office illumination.	3 to 6	For continued clerical work, it is essential that lamps be distributed so that each man obtain as good illumination as the next without shadows; light should be carefully diffused by bowl frosted lamps and using diffusing reflectors, otherwise eye strain and consequent complaint will result. Distributed illumination from ceiling units eliminating desk lamps is recommended as a clean-cut and satisfactory method.
Drafting offices.	4.00 to 8.00	To see 6H pencil line on duplex paper; to see line required to be traced. For drafting rooms very high intensities are required, and it becomes economy to concentrate this light on the table by means of the bowl frosted drop light with a reflector having a diffusing surface. Comparatively low general illumination from ceiling units is recommended in conjunction with the local table lighting.
In machine shops at tools and vises.	3.00 to 5.00	Man must watch chip taken off by cutting tool and the finish left by same; at vises to work to dimensions. It is suggested that tool and bench lights be equipped with metal reflectors. If this reflector does nothing else it keeps the glare off the lamp out of the workmen's eyes, lessening fatigue.
Mill warehouses where shipping is not active. Mill loading yards where there is no inspection. Open hearth charging floors. Soaking pits. Open hearth cast houses. Skull cracker yards. Mold yards. Ore yards.	0.15 to 0.25	For cranemen to see workmen and piles and shapes of material. It is required to see marking on material. Cranemen should be able to distinguish workmen, and the latter should be able to make out the movement of charging cars and crane. Cranemen must see to pick up ladles and cinder or slag vessels, workmen require to break up and load slag and to see movements of crane. Ore yards can conveniently be lighted from the traveling ore bridges by means of high candle-power lamps with intensive light distribution.
Loading yards where inspection is done.	0.30 to 0.50	To see flaws in surface when inspecting metal.
Blast furnaces.	0.30 to 0.50	To see tools on floor. To watch water system from floor; to see tuyere mechanism.
Cast houses. Ladle house. Boiler houses Mixing house.		To repair runways after metal has been poured. Good illumination insures cleanliness.
Machine and roll shops.	1.00 to 2.00	The labor employed is in general of high class and men should be given cheerful surroundings and good illumination for the best results. Where machine tools are spread over large areas, light should be distributed, since one man needs as much light as another, to read blue prints, safety in the operation must be considered. In such shops a man working at a tool or bench required much high intensities (3 to 5 foot) candles on the work rather than to light the whole shop to such intensities. A lamp on the tool, equipped with a good reflector to concentrate the light and to take the glare out of a man's eye, is flexible and necessary to see inside of castings. It has been found practically impossible to do away with this auxiliary, in most cases and as stated its use really results in economy.
Carpenter shops.		Same is true.
Wire drawing mills. Threading floors of pipe mills.		
Power houses		To see that machinery is working properly, that oil is feeding and to make repairs in case of accident.
Foundries.		For mold making. It is required to see by contrast in the illumination the meeting of surfaces in different planes, the finish of such surfaces, etc.
Transfer and storage bays of above shops. Pipe testing and inspection, galvanizing shops. Cold rolling mills.	0.50 to 1.0	In machine and similar shops, high bays are used to an extent for storage and the transfer of raw and finished material by means of the crane. It is possible to differentiate between the illumination employed in such bays and that used when workmen require to read prints.
Path illumination.	0.015 minimum normal foot candle	To detect obstacles or inequalities in the road. To make out forms and faces, to read a watch or make out fine print. If the minimum be taken as the illumination in a plane normal to the ray from the lamp and 4 ft. from the ground it is believed that the requirements with respect to the road surface will be taken care of.
General yard illumination.	0.015 minimum normal foot candle	To see that ties and tracks to detect a presence, in the yard. The best illuminated yard is that with the lowest maximum and the highest minimum. Therefore, when high candle-power lamps are employed they should be hung high. The efficiency of the illumination is, of course, determined by the minimum.

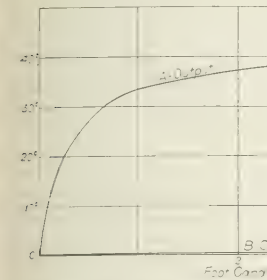
1. That one 250-watt Mazda lamp is a unit of sufficient size to illuminate to an intensity of 4-foot candles, the area which would ordinarily be occupied by two workmen. (A 250-watt lamp will illuminate an area of approximately 250 sq. ft. to this intensity.)

2. That when working under an ample intensity of daylight, the production of each man with the machines which he operates is worth 40 cents per hour to his employer.

3. That the curve of increased production with increased intensity of light is approximately of the form shown in A. (Only the ends of this curve are known; there is practically no data to substantiate the intermediate points.)

According to these assumptions it will cost approximately $0.003 per hour to supply each workman with 4-foot candles of illumination since, in a steel mill, the cost of operating a 250-watt lamp for a year of 4000 hr., including all charges, lies between $20 and $25. The cost of lighting increases almost directly in proportion to the intensity of illumination supplied, hence curve B on the diagram can be plotted as a straight line. Although the curves in the cut are based largely on assumptions, still these assumptions do not appear altogether unreasonable and the diagram, even though it may be far from correct numerically, brings out some points which are only too frequently overlooked in planning an industrial lighting installation. The most striking of these features is the relative insignificance of the cost of good illumination when compared with the value of the labor and produc-

tion totally dependent upon it. A very small increase in production will justify a large increase in the amount expended for light. If a man is worth $0.39 per hour when working under an intensity of 3 foot-candles and $0.40 per hour when working under an intensity of 4 foot-candles, it is obviously profitable to provide the latter in-



Relation of Cost of Light and Value of Operative's Output

tensity, since the cost of the change amounts only to $0.00075 per hour. In comparing different systems of illumination on a cost basis, it must be kept constantly in mind that a characteristic of any of these illuminants which may affect the production 1 per cent. is of vastly more importance than is an apparent difference of 50 per cent in operating cost per candle-power hour.

This diagram also demonstrates the futility of making definite statements as to what intensity of light is required for a given class of work with the inference that any additional intensity above this prescribed minimum is entirely wasted. As previously stated, we have as yet absolutely no data from which we may determine the most economical intensity for any given class of work, and since it seems reasonable to suppose that Curve A will, under most circumstances, continue to increase slowly out to 10 or even 15 foot-candles, it is quite possible that the most economical intensity of light is much higher than it has been the practice to supply.

The investment required for a lighting system is worthy of careful consideration. Not only must an annual charge of at least 6 per cent. be made against the installation to cover interest, taxes and insurance, but depreciation must also be taken into account. The life of a lighting system depends not so much upon the wearing out of parts as upon obsolescence. There are probably no installations in this country today that have been in use for six or seven years which are not already obsolete. In spite of the rapid progress that has been made, the best illuminants are operating at less than one-tenth of the efficiency theoretically obtainable. There is every indication that the next few years will see the greatest progress in the development of lamps and the use of light.

The L. S. Starrett Company Declares "Open Shop"

The L. S. Starrett Company, manufacturer of fine tools, Athol, Mass., has issued a statement under date of August 31 giving the reasons for its discontinuance of the use of the union label and stating that its factory would thereafter be operated on the open shop principle. The company had since March 11, 1905, conducted its factory under an agreement with the International Association of Machinists and on July 18 of this year notified the president of that association of its intention to terminate the agreement 30 days from that date. This action was not because of any disagreement with the association or of any antipathy to organized labor in general and without having in view any reduction in wages or increase in hours of labor, or discrimination in any way against any of its workmen on account of membership in any union, but, as the company says, "because after several years' experience with the closed shop we are convinced that it is not advisable to continue it and that the principle of the open shop is correct from the standpoint of justice and fairness of all concerned as well as legality."

The statement issued by the company gives details regarding letters received from various unions and individual members of unions protesting against its action and requesting the company to go on an eight-hour basis. Some of the letters urged that the termination of the agreement with the union is unfair because the company had used the union label for a number of years, had received the support of union men generally, and its business had been built up and largely increased on account of the use of the union label. To this the company states that the record of sales does not confirm the assertion that the union label has been a benefit to its business. In going over the figures of sales it found that the average percentage of the increase in sales from year to year during the period in which it used the union label was less than half the average percentage of increase during the same length of time before it adopted the label. It also states with regard to the work day that 10 years ago last spring it voluntarily went on a nine-hour basis, paying the same wages it had been paying for 10 hours and that this was made without any suggestion from any of the employees and wholly without their knowledge of the intention to do so. It was the first company in its line to adopt a nine-hour day and up to the present time is the only large concern in that line working less than 10 hours. It finds, however, that even after 10 years the nine-hour day is the exception rather than the rule in allied industries. The fact is pointed out that many of its competitors generally work 10 hours a day. It is therefore considered impossible to try to do business on a basis of 10 hours' pay for eight hours' work.

A very important part of the circular relates to the assurance given by the officers of the International Association of Machinists that under the union label agreement and the consequent closed shop not only would its sales be largely increased but shop conditions would be more stable and satisfactory. Assurance was given that there would be absolutely no attempt to curtail production and that a strike would be practically an impossibility because of the necessity under union regulations to go through so much formality and give so much chance for getting together before a strike could be declared that a great majority of cases under dispute would be adjusted without resorting to any such measures.

The company states that it found that these promises had not been fulfilled. Limitation of production has been practiced from the first, though the attention of union representatives was called to the matter repeatedly and the cost of manufacture of goods has been greater to a marked degree under the closed shop system than it was before. The company has had only one experience in the matter of a strike which occurred in May of this year when a workman was discharged by one of the company's foremen. On the same evening the local union met and voted that unless the discharged man should be reinstated by 10 o'clock the next day the members of that union would go out on a strike. The employee was not reinstated and the members struck although only a very small percentage of them knew what they were going out for. Thus the local union disregarded its own obligations and the company's rights in calling a strike over night and going out without the slightest pretence of following the methods of precedure laid down in the grand constitution of the union. No acknowledgment was made in any way by the officials of the union that the men were wrong, but those officials endeavored in every way possible to help the men maintain their position. The men were out a week, losing their wages and causing the company considerable loss and injury. The conclusion drawn by the company is well expressed as follows: "It seemed to us that if we were to play the union game under rules laid down by the unions themselves we had a perfect right to expect at least that the union would live up to their own rules. Experience has taught us that we cannot rely on this being done."

The company states that it is not now its intention to discriminate in any way against an employee because of his membership in the union. It will make no difference whether an employee belongs to a union or not. What is expected and what will be paid for is efficiency, and as long as an employee's union membership does not interfere with efficiency in his own production or that of another employee there is no more reason for any objection to his membership in a union than to his membership in a church.

Cambria Steel Workers' Reunion

Celebrating the Fortieth Anniversary of the First Blow of Bessemer Steel at Johnstown, Pa.

The fortieth anniversary of the first blow of Bessemer steel made at the Cambria Iron Works, Johnstown, Pa., was celebrated September 20 by a reunion of the survivors of those who took part in that memorable event. The first blow was made July 10, 1871, but the celebration was postponed until fall because of the intense heat of the early part of the summer. Capt. Robert W. Hunt, of Chicago, who was superintendent of the Bessemer department of the Cambria Iron Company at that time, invited the survivors and others to be his guests at dinner at the Country Club, Johnstown, on the date above named. The accompanying illustration is a reproduction of a photograph of Captain Hunt and his guests gathered at the Country Club.

Captain Hunt's Address

An important feature of the reunion was an address by Captain Hunt, which was as follows:

My Old Associates and Friends:

Words will fail me to express fully my pleasure in having you as my guests on this, the fortieth, anniversary of our making the first blow of Bessemer steel in the then Cambria Iron Company's works. As you know, the actual date was July 10, 1871; for various reasons it was thought best to postpone our celebration until now, and, compared with the 40 years which have elapsed, the additional days count as a small figure. The most important part is that so many of us who have been granted continued life are now gathered together to recall the happenings of the old days—tell of our individual experiences since then, and pay respectful, and, in many cases, loving, tributes to the memory of those who have been called to the great beyond.

I believe we have our friend, G. S. Davies (Bachan), especially to thank for the movement which has resulted in this gathering. On March 29 last he wrote me from Braddock that John Rinard and he had that day been discussing the approaching completion of the fortieth year since the first heat of steel was made at Cambria, and that it was suggested that if the fiftieth year was awaited for a celebration of the event, there might not be any of the men who helped make that heat left alive to participate in it; therefore, it would be wise to celebrate the fortieth. How little did either of them think that the grim suggestion would quickly come home to either of them. How blessed it is that such is life. Good, reliable, faithful John Rinard was but the other day called to his reward.

I replied to Mr. Davies, thanking him for calling the matter to my attention and telling him I would be more than happy to act as host on such an occasion. On July 5 he wrote me that he had just returned from Johnstown, where he had consulted with Morgan Williams and some others, and that every one was in hearty sympathy with the movement, but it was thought that a later date would be better. The happy result is that we are here, and I only wish that every one of the surviving pioneers could be here, but Oregon, California, Kansas and Colorado are far cries, and we must content ourselves by knowing that the absent ones are here in sympathy.

Historical Facts

Will you bear with me while I present a few historical facts which I think should be noted in connection with our celebration?

It is hard for those unacquainted with the history of Bessemer steel to appreciate that its commercially successful manufacture, and the revolutionary results following it, did not come without great effort and quite a long period of uncertainty.

In 1860 William Kelly came to Johnstown and made some experiments on the pneumatic refining of iron. They were conducted in the cast houses of one of the old blast furnaces on the hill. He obtained some encouraging results. Later he returned to Johnstown and had built the miniature converter which now stands in the hallway of the Cambria Steel Company's main office. This was located near the Cambria Company's foundry, and the blast for it was taken from the small blowing engines which furnished the blast to the foundry's cupolas. This



The Cambria Steel Workers of Forty Years Ago, Grouped at the Country Club, Johnstown, Pa., September 20, 1911.

was after Bessemer had read his historic paper before the Iron and Steel Institute. Bessemer secured United States letters patent on his process. Kelly afterward made application for a patent, and the United States Patent Office granted it, leaving it for the courts to decide between Bessemer and himself.

The Bessemer process has been perfected by Robert Mushet's discovery of the beneficial effects of recarbonization and the addition of metallic manganese to the decarbonized metal. This he patented in both England and this country. Bessemer later secured control of the English patent, but Mushet retained his American one. Bessemer also took out several American mechanical patents, one of which covered the rotating or tumbling converter.

Later the Cambria Company, E B. Ward, Park, Brother & Co., Lyon, Shorb & Co., and Z. S. Durfee formed a company to which Chouteau, Harrison, Valle & Co. were later admitted, which purchased William Kelly's patent and Mushet's American patent. They built an experimental plant in the casting house of one of Capt. E. B. Ward's charcoal blast furnaces located at Wyandotte, Mich.

Another organization known as Winslow, Griswold & Holley secured all of Bessemer's American patents and built an experimental plant at Troy, N. Y.

The first successful American heat of pneumatic or Bessemer steel was made in the Wyandotte plant in the fall of 1864. On February 6, 1865, the Troy plant made its first heat.

Cambria Investigates

On May 1, 1865, the Cambria Iron Company sent Jacob B. Dunlap, who had lately returned from the war as a lieutenant in the Fifty-fourth Pennsylvania Regiment of Volunteers, of which his brother-in-law, Gen. Jacob M. Campbell, had been colonel, and myself, then the chemist of the company, to Wyandotte, to work in the steel plant and learn the business, so that we might be prepared to serve them should they decide to build works of their own. We remained at Wyandotte a year, then returning to Johnstown. In the meantime much legal skirmishing had gone on between the Kelly and Bessemer interests, which finally resulted in a consolidation, the Bessemer people receiving 70 per cent. and the Kelly people 30 per cent. of the stock of the organization.

All of this took time and added to the commercial uncertainties of the business; at all events, the directors of the Cambria Company hesitated and delayed action. The Hon. Daniel J. Morrell was the general manager of the company, and he was fully convinced of the merits and importance of the process, and was very anxious to build works at once, but he was overruled. I remember hearing him say to the Cambria board of directors: "Gentlemen, if you will pay me for my Cambria stock what you know it is worth, I will not hesitate to put it all into a Bessemer plant." This was received by eloquent silence. So time went on, and, following the settlement of the patent controversy, several steel companies were organized and works built.

The Troy people erected a two 5-ton converter plant, making the first blow in it early in 1867. The third plant was that of the Pennsylvania Steel Company, its first steel being made in June, 1867. The fourth plant was that of the Freedom Iron & Steel Company, located near Lewistown, Pa. The fifth, that of the Cleveland Rolling Mill Company, Newburg, Ohio. October 15, 1868, was the date of its first blow. Cambria came sixth, with our first blow on July 10, 1871.

The converting works of the Pennsylvania Steel Company were completed some time before the rail mill, and the Pennsylvania Railroad Company was very anxious to put some American-made steel rails to actual wearing test in its tracks. The Cambria Iron Company had some years before put in a steam hammer for the purpose of hammering two puddle balls into one slab for the top of the iron rails which it made for the Pennsylvania Railroad Company. This was in the endeavor to improve the wearing quality of the rails, a point that was causing much worry and discussion and experimentation. It was not a success, and the hammer was idle. An arrangement was made by which the steel ingots cast at Steelton by the Pennsylvania Steel Company were sent to Johnstown and drawn into blooms under that hammer, and then reheated and rolled into rails for the Pennsylvania Railroad Company on the 18-in. rail train.

Up to that time hammering of ingots was the universal practice; but George Fritz, chief engineer and general superintendent of the Cambria Company, decided that the work could be more expeditiously and cheaply performed by rolling the ingots into blooms. This led to successful experiments on 8¼-in. square ingots, which were first rolled down to about 6½-in. square blooms on the 18-in. top and bottom mill, then wash-heated, and the rolling into rails completed on the 18-in. mill. From that came the blooming mill. Some of you may recall that, following my return from Wyandotte, I had the oversight of that steel rolling. The above-named work began in June, 1867, continuing until the completion of the Pennsylvania Steel Company's own rail mill in May, 1868, and the rails produced were the first rolled commercially or to order in America.

Steel Plant Began in 1870

The Cambria steel plant was begun in 1870, but not completed until July, 1871. Between May, 1865, and May, 1866, when Mr. Dunlap and I returned home from Wyandotte, several changes occurred in the Cambria mill organization. Mr. Dunlap had been a puddler before his enlistment in the army, and the company made him one of the puddle-mill foremen. The outlook for the building of the Bessemer plant was so hazy that he was glad to accept, and you will recall in those days the puddle mill was one of the most important departments of the works.

When the time came to organize the force for the Bessemer works, I received positive orders that I must not disturb any of the existing organizations by taking their skilled men. It is well known that rolling mill men are very prone to want to work in new plants, and, while there was a prevalent belief that the steel works was a doubtful proposition, nevertheless I had many applications for jobs from all over the works, and the result was the above-named order. George Fritz was very emphatic on the point, and told me to pick out bright young fellows from other than the rolling mill departments. That I selected well you are the lasting evidence. As an example, my orders were positive that I should not take Mr. Dunlap from his department. I regretted this then and have ever since, as I had formed a very high estimate of him during our year together at Wyandotte.

John Rinard was a heater in the rail mill; we had been in the army together, and he was determined to risk his fortune with the Bessemer steel business, and I guess suspected the coming order, so gave up his furnace and came to work on the construction of the steel plant as a laborer. He had been a blacksmith before a heater, so was a very handy man to have around.

George Corner was a puddler, and had also been in the same company with Rinard and me, and he did the same thing. Edward Sider, another puddler, made his peace with the powers that were in some way, and also came. I believe those three men were the only ones who came to us at first from the rolling mills.

The Fateful Day Arrives

On July 10, 1871, came the fateful day. I was the only one on the job who had ever seen a heat of Bessemer steel made. Such conditions made the work far from easy for any of us, but I can truthfully say that, from that first day until I left the company's employ in September, 1873, if ever there was a body of men who worked together with the feeling of one for all, and all for one, and everybody for the success of the work, they were the men of the Bessemer department of the Cambria Iron Company.

As I have stated, I left Cambria in September, 1873, and have ever since carried with great pride the handsome watch which my Johnstown friends presented me as a remembrance of my life among them. It was and is a good watch, and I hope to be guided by it during the remainder of my life.

You will recall that at the time of our first steel making Cambria's officers were: President, Charles R. Wood; vice-president, E. Y. Townsend; general manager, Daniel J. Morrell; assistant general manager, Powell Stackhouse; general superintendent and chief engineer, George Fritz; master mechanic and assistant to Mr. Fritz, William R. Jones; superintendent of blast furnaces, Thomas Collins; superintendent of iron mills, Alexander Hamil-

ton; assistant to him, Charles Kennedy; night superintendent, James Moore; foremen of puddle mills, Barney Ziegler and Jacob B. Dunlap; foreman of machine shops, Daniel N. Jones; foreman of foundry, Benjamin Watkins; foreman of blacksmith shops, Joseph Layton; foreman of pattern shop, Enoch Lewis; superintendent of Bessemer works, Robert W. Hunt; superintendent of blooming mill, John E. Fry.

Alas! How few of that band of able, energetic and industrious men are still alive.

The Hon. Daniel J. Morrell was a man of broad comprehension and sympathies, and filled a large part in rescuing the affairs of the old Cambria Company from utter ruin. He later made a good national legislator and did much to not only insure the holding of the Centennial Exposition, but also its great success. It is acknowledged that the lessons taught America by that exposition started us on our great path of artistic and industrial accomplishments.

E. Y. Townsend succeeded Mr. Wood as president of Cambria, and most wisely administered its affairs, and following his death Major Powell Stackhouse assumed the office and we are thankful that he still lives to ably perform the more honorable but less strenuous duties of chairman of the board of the present much larger and greater Cambria Steel Company.

Some of the Old Cambria Men

Alexander Hamilton was one of the best friends I ever had. I came to Johnstown to my first business engagement, and just as I had attained man's estate, and under circumstances that would have prejudiced a smaller man against me. He treated me as a father should a son and won my enduring respect and affection.

George Fritz was a giant among men, both in inteliect and stature. He could not merely copy any man, and, with his mechanical creative ability, was certain of being successful in his originations. This was made manifest in the design of our Bessemer plant, and, above all, in the blooming mill. That inaugurated an epoch in steel rolling and upon it has been built up the later tremendous output of American mills. His energy and capacity for work were wonderful and he always said "come," and not "go."

Do you recall that the roof of the rail mills and part of the puddle mills burned off one night not long after the plant was completed? It was a Saturday night, and on Sunday morning as soon as time enough had been given for a wash-up and breakfast for those who had been laboring all night at the fire, Mr. Fritz and the superintendents and foremen of every department of the Cambria Company met at his house. Following a presentation of the situation by him to the gathering, resolutions were adopted expressing sympathy for the Cambria Company, and requesting each and every one of its employees to contribute one day's work, to be given the next day, Monday, toward clearing away the débris and doing other things to help get the works again running. What an outpouring of earnest men and boys responded to the call! And in less than two weeks the rolling of rails was resumed.

It was a gloomy Johnstown that Saturday night and Sunday, with the expectation of months of idle mills. It was not imagined possible that so much could be accomplished in so short a time. There is no doubt that George Fritz's work and anxiety and exposure during that strenuous period did much to lay the seeds of the sickness which carried him away August 5, 1873. Will any of you forget the day of his funeral? A whole community certainly mourned and paid their affectionate and appreciative tribute.

Following Mr. Fritz's death, it was quite generally expected by the employees that Capt. William R. Jones would be given his position; but the directors of the company appointed Daniel N. Jones. Capt. Bill at once resigned, but offered to remain until he had completed the erection of the iron trussed roof which was being erected to replace the burned wooden one over the rolling mills. This was not accepted, and he soon after was engaged by William P. Shinn, president of the Edgar Thomson Steel Company, which was building works at Bessemer, Pa. The record which he later made there for both the works and himself are illustrous pages in the history of American steel making.

An Incident of Captain Jones

I desire to relate a personal incident which was strikingly typical of the man, and an example of his wholehearted and unselfish friendship. My parting with the Cambria Company came a few weeks after Captain Jones had made his arrangements with Mr. Shinn. I telegraphed the Captain that I was out and was leaving for Troy, N. Y., to interview John A. Griswold & Co. in relation to a position. After reaching that city I received a telegram from him saying, "Do nothing until you receive letter from me." The letter came, and in it he said: "When I received your message telling of your leaving, I at once went to Mr. Shinn and showed him the dispatch and said to him, 'Captain Hunt is the man you want; he has been making steel, I have not; give him charge of the works, and, if you have something else for me to do, all right; if not, all right.' Now, old man, come, and no nonsense about it. Don't think of me, for if Shinn won't give me anything I know John Fritz will. Come!"

Is it possible for me or for any one to pay in words proper tribute to friendship such as that? But there is little occasion for any one to tell the people of Johnstown of the noble qualities of William R. Jones. Following your own indescribable calamity, he gave you practical and forcible manifestations of them. Such men make us believe in humanity and thank God that he sometimes creates them. Captain Jones died September 28, 1889, from injuries received while at the post of duty.

Daniel N. Jones was not related to William R., but they had been boys together in the Lehigh Valley and remained warm friends as long as they lived. You recall that later D. N. left Johnstown, removing to Pueblo to take charge of the Colorado Steel Company's works, which position he held at the time of his death in 1889.

Previous to the building of the blooming mill, John E. Fry had been foreman of the foundry. When made superintendent of the blooming mill, Benjamin Watkins succeeded him in the foundry. Upon my leaving Johnstown Mr. Fry assumed charge of the converting department in addition to the blooming mill. Later he left the Cambria's service for other connections, and the later years of his life were passed in retirement.

At first the steel at Cambria was made entirely from Lake Superior charcoal pig iron, all of which was purchased by the Cambria Company. Later some Western pig iron made with mineral fuel was used, but a number of years passed before any home-made metal was available. Therefore, in the early days, Cambria's blast furnaces did not play any part.

As Steel Was Then Made

It is no doubt hard for the Bessemer steel men of to-day to realize or appreciate the conditions which surrounded our early work. All the pig iron was remelted in cupolas, and they could only be run for a few hours before the condition of their tuyeres necessitated the dropping of the bottom. The spiegel was melted in a reverberatory furnace, and it was a slow operation. The tuyeres in the converter bottoms were of uncertain life, and turning down the vessel and blanking them during a blow was a common occurrence. In fact, any trouble which could happen frequently did occur, and we had to fight our way through it. We did fight, and so paved the way for the easier times enjoyed by the steel makers of to-day.

We have seen the annual production in the United States of the process which we nursed in its infancy grow from practically nil to 12,275,830 tons; the number of works from five in 1871 to seventy-one in 1910.

One cannot recall old times, and those with whom we were then associated, and realize how many of those comrades have passed away without feelings of sadness—no matter how successful and happy our own lives have been; no one has escaped sorrow. It has found us in many ways, but it is blessed that time heals, and our memory of to be remembered as long as we lvie, that we are privi- joy is keener than of pain; and it is a great joy, and one to be remembered as long as we live, that we are privileged to hold this reunion. We have fought the fight some of us are still in the conflict with work yet to do, but I am certain that we all feel that in the school

of the early Cambria Bessemer days we learned lessons which have been of good service to us, and that we then formed friendships which naught but death could or can terminate.

Names of Steel Workers at the First Blow

Below is a list of steel workers who assisted in making the first blow of Bessemer steel at Johnstown:

Present at the Dinner.

Robert W. Hunt, Chicago, Ill.
Homer McGarvey, Johnstown, Pa.
Morgan L. Williams, Johnstown, Pa.
Jas. L. Cramer, Johnstown, Pa.
David Jrischo, Johnstown, Pa.
Chas. W. Andrews, Johnstown, Pa.
Sumey Wilson, Johnstown, Pa.
John Haynes, Johnstown, Pa.
Peter L. Carpenter, Johnstown, Pa.
Josh Griffith, Johnstown, Pa.
R. Emmett Lambert, Johnstown, Pa.
F. E. Jenkins, Johnstown, Pa.
Jas. M. Duncan, Johnstown, Pa.
Thomas McCoy, Johnstown, Pa.
Wm. Williams, Johnstown, Pa.
Andy Forrest, Johnstown, Pa.
John R. Sell, Johnstown, Pa.
John Hern, Johnstown, Pa.
Wm. Turner, Johnstown, Pa.
Sol Linnger, Johnstown, Pa.
John Williams, Johnstown, Pa.
F. S. Miller, Johnstown, Pa.
Frank P. Weir, Johnstown, Pa.
Wm. Rhodes, Johnstown, Pa.
Richard Bauers, Johnstown, Pa.
David Barnhart, Johnstown, Pa.
Wm. T. Dawson, Johnstown, Pa.
Amos Walls, Johnstown, Pa.
Jas. P. Griffith, Johnstown, Pa
Johnson Wagner, Johnstown, Pa.
Wm. Bittner, Johnstown, Pa.
Jas. M. Dronsfield, Johnstown, Pa.
Noah Whirkez, Johnstown, Pa.
Geo. E. Hamilton, Johnstown, Pa.
David L. Llewellyn, Johnstown, Pa.
Evan P. Lewis, Johnstown, Pa.
Jos. Burns, Johnstown, Pa.
Jno. R. Donaldson, Johnstown, Pa.
Thomas Kephart, Johnstown, Pa.
John M. Davis, Johnstown, Pa
Charles Ellis, Johnstown, Pa
A. L. Carpenter, Johnstown, Pa
George W. Gardner, Braddock, Pa.
Jonathan Lewis, Braddock, Pa
G. S. Davies, Braddock, Pa.
Benj. Mutzman, Braddock, Pa.
Mike Forrest, Wheeling, W. Va.
Frank Cramer, Pennsville, Fayette County, Pa.
George Arbaugh, Loram, Ohio.

Unable to be Present, but Sent Their Regrets.

Frank Heiner, Johnstown, Pa.
Kip Bennett, Johnstown, Pa.
Jack Williams, Johnstown, Pa.
Geo. Jordan, Johnstown, Pa.
Richard Bauers, Johnstown, Pa
Cyrus Blough, Johnstown, Pa.
Isaac Evans, Johnstown, Pa.
James W. Wilson, Johnstown, Pa.
Jos. Storme, Johnstown, Pa.
Robert Murton, Indiana Harbor, Ind.
C. Asbury Shomo, Johnstown, Pa.
Rev. P. Florain, Elizabeth, N. J.
James Stroup, Braddock, Pa.
Thomas Lowry, Braddock, Pa.
Robert Colbert, Braddock, Pa.
Joseph Abel, Eugene, Ore.
John Northcraft, Placerville, Cal.
John Stanton, Jamaica, N. Y.
Isaac Singer, Wichita, Kan.
Benj. Bair, Ohio (Loraine, Pa.
Thomas H. Edwards, Pueblo, Col.
S. C. Trawatha, Pueblo, Col.

Powell Stackhouse, chairman of the board of the Cambria Steel Company, had to send his regrets on account of his recent absence in Europe and present pressing business engagements.

Other guests present at the reunion were as follows:

David D. Lewis, Philadelphia, Pa.
Charles S. Price, president Cambria Steel Company.
H. C. Wolle, general superintendent Cambria Steel Company.
J. L. Replogle, assistant to president Cambria Steel Company.
F. E. Thompson, superintendent Bessemer department, Cambria Steel Company.
Daniel Stackhouse, assistant general superintendent Cambria Steel Company.
F. G. Parker, former superintendent Bessemer Department.
Geo. E. Thackray, special engineer, Cambria Steel Company.
H. E. Winger and G. W. Moore, Johnstown representatives of Robert W. Hunt & Co.

The meeting on factory construction and arrangement will be held by the American Society of Mechanical Engineers on Monday, October 9, at 8.15 p. m., at the Engineering Societies Building, 29 West Thirty-ninth street, New York. This represents a change of date to allow attendance of members of the National Machine Tool Builders' Association, which meets the same week in New York. Discussion will be grouped about the following topics: (a) Machine Tool Arrangement, Alex. Taylor, Westinghouse Electric & Mfg. Company; L. D. Burlingame, Brown & Sharpe Mfg. Company; Charles Day, Dodge, Day & Zimmerman. (b) Artificial Shop Lighting, C. E. Clewell, Westinghouse Electric & Mfg. Company; G. H. Stickney, General Electric Company; H. O. Stewart, Rochester Railway & Light Company; (c) Shop Floors, L. C. Wason, Aberthaw Construction Company; Henry Hess, Hess-Bright Mfg. Company; Gilbert Arnold; H. J. Lambourn, Yale & Towne Mfg. Company.

The Mount Union Silica Brick Company, Mount Union, Pa., has rounded out its plant with a number of improvements in the past year so that it now has a manufacturing capacity of 25,000,000 high-grade silica brick per annum. The storage capacity has been increased to 5,500,000 brick by the addition of a large fireproof shed. While the company has been operating its plant at full force, the present condition of the steel business will compel a slight reduction of output in the near future.

The Production of Alloyed Steel in 1910

In the October 1 Bulletin of the American Iron and Steel Association further details are given of the statistics of the production of alloyed steel ingots and castings in 1910. The first of the two tables below shows the total tonnage of ingots and castings for the various forms of alloyed steels as distributed among the steel-making processes. The second table gives by processes the production of alloyed steel castings alone.

Alloyed Steel Ingots and Castings by Processes—Gross Tons.

	Bessemer.	Basic Open-Hearth.	Acid Open-Hearth.	Crucible, Electric, and Misc.	Total.
Titanium	285,891	40,268	2	155	326,316
Nickel	73	78,103	27,293	1,238	106,707
Nickel-chrome	10	47,685	2,089	2,237	52,021
Chrome	31	15,519	6,301	1,699	23,550
Manganese	1,585	1,805	5,057	896	19,360
Vanadium	122	6,516	905	1,506	9,049
Other alloys	1,232	16,176	747	12,661	30,816
Total for 1910	296,898	206,135	44,394	20,392	567,819
Total for 1909	41,959	90,956	29,437	19,628	181,980

Alloyed Steel Castings by Processes—Gross Tons.

	Bessemer.	Basic Open-Hearth.	Acid Open-Hearth.	Crucible, Electric and Misc.	Total.
Titanium	1,524	10	2	155	1,691
Nickel	63	3,140	1,068	6	4,277
Nickel-chrome	16	448	31	50	495
Chrome	84	3,025	160	3,219
Manganese	9,511	41	7,057	614	17,223
Vanadium	108	802	208	1,118
Other alloys	1,232	29	73	1,334
Total for 1910	12,448	3,678	11,983	1,253	29,357
Total for 1909	1,646	3,107	12,148	6,101	23,002

The production by States, of alloyed steel ingots and castings in 1910, was as follows:

	Ingots.	Castings.	Total.
Massachusetts and Connecticut	809	1,384	2,193
New York and New Jersey	217,490	9,120	226,616
Pennsylvania	218,214	12,788	231,002
Del., Md. and Dist. of Col.	8,821	563	9,384
Ohio	11,582	11	11,593
Indiana and Illinois	81,530	2,898	84,428
Mich., Wis. and Minn.		923	923
Mo., Iowa, Ore. and Cal.		1,680	1,680
Total for 1910	538,446	29,357	567,819
Total for 1909	158,978	23,002	181,980

It is stated that alloyed steel ingots and castings were made in 66 plants in 17 States and the District of Columbia in 1910.

The Production of Vanadium Steel

The following communication by George E. Lees, Pittsburgh, appears in the Engineering and Mining Journal of September 30. It is difficult to understand how such a difference as Mr. Lees claims could arise, as the statistics of the American Iron and Steel Association are very carefully prepared from complete returns from all the manufacturers of steel in the United States:

"In the Journal of August 26, p. 400, the production of alloy steels in the United States for the year 1910 was given, according to the report of the American Iron and Steel Association. The total for vanadium steel is stated as 9049 tons, which, I am confident, is incorrect, as I have written to the principal manufacturers of vanadium steel, and have their replies, showing that the aggregate production of vanadium steel in the United States for 1910 was approximately 40,000 tons. I have exact statements from 21 manufacturers; several refused to disclose their figures. This total of 40,000 tons includes only vanadium steel and not the large amount of vanadium used in the manufacture of iron castings and a smaller quantity used in brass, bronze, white metal and bearing metals.

"In Engineering for May, 1911, a contributor estimates that the annual consumption of metallic vanadium in the United States is 250,000 lb. and that it is used at the rate of 5 lb. per ton of steel. On this basis the production of finished vanadium steel would have been 50,000 tons, which is certainly a closer statement of facts than the 9049 tons as given in the article that was published in the Journal. It must also be taken into consideration that the alloy steel that showed the highest total in that article represented nothing but rails, while the total given herein for vanadium steel represents a much higher class of product and includes automobile and locomotive forgings, gears, locomotive axles, piston rods, tool steel and other manufactured parts for high-duty service."

American Export Trade*

How to Build It Up and Hold It

BY WILLIAM C. REDFIELD

In the world's markets there are three great competitors—England, Germany and the United States. There are, of course, others who enter these markets, as France and Belgium, etc., but the three countries named are the leading industrial ones, and their competition especially interests us.

Let us examine briefly these three. Great Britain has in her favor vast free capital which, with her primacy in the merchant fleet of the world and the material resources of her great empire, have given her a dominating position. Her manufacturers sell in large part in markets controlled by their own power and have at their disposal a world-wide shipping and an equally widespread and strong banking system. In some parts of her empire preferential duties exist in her favor, with cheap postage and the control of telegraph lines throughout the world. From this hasty sketch we must not omit the courage and strength of the English character, nor the exceptional record of her great houses for honor and strength, nor almost 200 years of industrial and commercial experience.

The great foreign trade of Germany is of recent growth. It is backed by an almost perfect commercial organization and by the exceptional German talent for thoroughness and research. Doubtless German foreign commerce is based upon more thorough and scientific knowledge and study and preparation than that of any other people. She, too, places at the support of her exporters a widespread merchant shipping and world-wide banking power.

The United States is the youngest competitor of the three so far as relates to the world's markets. One need not go back far to find the time when our export trade in manufacture was negligible. We have not yet the enormous free wealth of Great Britain; we lack the scientific organization of Germany; we are without foreign shipping and almost without foreign banks. We have, however, as one great resource the peculiar initiative of the American, his inventiveness, that spirit which makes the progress in your shops so rapid that six months ago with many of you is ancient history, that alertness, that mechanical imagination which reaches many a result long before the German by research has sought it out or the Englishman has contemplated a change.

Great Britain's Position and German Necessity

Great Britain must export or die industrially. Perhaps 90 per cent. of all she manufactures is and must be sold abroad. She has not the domestic means of consumption. Therefore, the outlook of the English manufacturer is a world-wide one. From his earliest start at industry he has thought of things abroad. A factory in his country whose market is chiefly at home is relatively rare. By every instinct and training he is an exporter and the great system that backs him up has grown out of the necessity of his case.

In Germany a rapidly growing population in a country that cannot expand in area and which has on the whole limited natural resources must expand commercially. The German people alone cannot absorb the product of the highly trained German mind and hand. The German has a peculiar genius for organization, and, seeing his great competitor, Great Britain, established throughout the world, he has by organization and study developed that which she lacks, and has become a serious and a menacing competitor with her. The German manufacturer may because of the larger population of his land find a larger home market than Great Britain, but it is true of him also, though in lesser degree than with his English rival, that he must export the larger part of his product; hence, he, too, finds his outlook into the world's markets a normal one.

Commercial Conditions in America

Here in America the reverse is true. For a century or more we have been developing our industries with sole regard to our domestic needs. The markets of America have grown so fast both in quantity and quality of their demands that our industries have till recently had much to do to keep them supplied. But of late years a change has come. Our industries have so grown that their output when run continuously at full time is greater than our home market will take at its best, and when times are dull here there is a large surplus of unsold goods.

Out of this have grown first the wish for and then the need to obtain foreign markets. Out of this same background has grown the peculiar outlook of the American manufacturer upon the foreign field. To him it is not or has not been the chief market he seeks, but rather an incidental one. His output has been meant for home consumption first and, secondarily, for sale abroad, and it is as yet only in exceptional cases that he has come to realize the great value of the foreign markets to him and to know that they may be as valuable a part of his permanent field as are his customers at home.

Therefore we American manufacturers enter the foreign campaign with certain handicaps. Our competitors regard the foreign markets as their primary work, we as our secondary work. They must have them to survive. We want them to add to a market already very large. They strain every nerve, commercial and governmental, to secure and maintain them. We have nothing but private initiative, the alertness of mind of our manufacturers and our peculiar inventive genius and restless energy upon which to depend. Yet despite these handicaps we have become a mighty factor in the foreign field, until now, out of our total exports, manufactured products are 45 per cent.

Some of Our Elements of Strength

Our peculiar capacity for making and using mechanical devices and labor-saving apparatus of all kinds has enabled us to make our way, even against strong and established rivals. The products of American factories are selling all over the world, competing in price, or quality, or design, or all of these elements combined, with the products of Germany and England. So true is this, so well do we like the taste of that we have already had, that we cry for more.

What the American manufacturer needs to begin and develop an export trade may be classed under two heads—general requirements and special requirements, or large things and little things.

Much depends upon his own mental outlook upon the foreign field. Here many an American has come to grief. If a foreign market be regarded as an incident or a flier amid the constant pressure of a large domestic trade, to receive attention when he needs sales, and to be neglected at other times, then he had better give up thought of any serious export business. His rivals in Germany and Great Britain are on the job all the time. The American who competes in this haphazard way may through a lucky chance or the interest of an export commission house receive some orders, but if they come when domestic business is pressing and are treated at such times as of comparative unimportance, or if the details of the foreign order are considered unworthy of special notice and something other than that ordered is substituted which it is thought will do as well, then farewell to the growth of the foreign business for him.

The German will be there searching out just what that man wants, and the Englishman will be offering him goods whose standard quality will not alter for decades together.

*Extracts from an address at the banquet of the American Manufacturers' Export Association, at the Hotel Astor, New York, September 26, by Mr. Redfield, who is a Member of Congress from Brooklyn, N. Y., and also vice-president of the American Blower Company.

and no haphazard way of getting or treating foreign orders will long survive that kind of competition. An American manufacturer, to secure foreign trade, must take it seriously, must be prepared to invest in it with a view to its future development, just as he does at home, to regard it as of equal interest in due proportion to its size to his home trade, to cater to one as he does to the other and to treat the foreign trade with a patient faith in its growth if his goods and methods are right.

Some Things It Is Well to Know

Having determined that he will patiently and steadily develop a foreign trade and, so to speak, "stand the gaff" of expenditure upon it while looking and waiting for future results, he must next remember that the foreigner will not buy from him because he is an American, and that the foreigner may be quite right in saying that American designs, sizes, styles do not suit him. The American manufacturer, then, must expand his vision. Many of them only see to the three-mile limit. He must, to succeed, put himself to some degree in his customer's place, study his wants and offer him that which he wants to buy, rather than that which he, the manufacturer, wishes to sell.

Therefore the American manufacturer should go, if he can, or send to that foreign market and acquire his knowledge of it at first hands. He must, indeed, learn a good deal through others, but these others will tell him what it is to their advantage for him to know and no more, and if confined to that he will work with second-hand knowledge.

Difficulties to Be Overcome

He will speedily find that many goods are offered more cheaply than he can produce them, and at once will be forced to decide whether he will lie down or stand up. In the former case he will conclude that the poor efficiency of his labor or the high rate of wages he has to pay makes it impossible for him to compete abroad, and he will conclude that the home markets are best for him. If he is minded, however, to stand up he will enter upon a merciless course of self-criticism. He will believe that nothing in his own business is right till he has tested and proved it so.

He will be dissatisfied with his plant, methods of management, production, handling men, costs, overhead charges, everything. He will not wait for his customers to find fault with him; he will do his own fault-finding, and if he is sincere and is not imbued with that most hopeless of all industrial diseases called "knowing his own business," he will find every day for years on end something that can be bettered. His superintendent, who with an indifferent employer might continue the use of antiquated machines, will on the contrary be doing a fair second-hand trade in them, and when his old equipment has been replaced with new he will still not be satisfied.

He may have machines invented and made for him, or will so make them himself in order to meet a certain need. He will not crowd the soul and life out of his workmen, but will recognize that their prosperity and his are bound in one, and that if his product is to be brought low in cost it must be by furnishing them the very best tools and equipment and the most favorable working conditions. Because only when that is done and liberal and assured pay added to it can one get that self-discipline enforced which is the life of a high-grade modern shop, for no watchfulness of foreman or superintendent and no pressure from above can take the place of the willingness of brain, added to the zealous hand of a happy, well-paid, well-placed, well-equipped and contented workman. Physical and nervous overstrain is unprofitable in the shop or mill, as well as in the office.

Such a manufacturer will look closely and ceaselessly at his rate and quality of product and at its sure and steady flow. He will watch his wastes and his unproductive expenses, but the last thing that will worry him will be the rate of wage. If his goods come out with few or no seconds, if his ratio of repairs is small, if his waste of time and materials is kept to a low limit, if his shop is well balanced, if the spirit in his works is that of earnest, steady, quiet enthusiasm, if he is a leader of his men and not a tyrant over them, he will be content if his men earn high wages, for his cost sheets will be right.

Minor Questions

These are the great things. But some little things are important, too. We have had too much of the question, "What have we got to do with abroad?" I am afraid to speak of our lack of knowledge of common geography. One smiles when a Boston house writes to Manila on June 8 and again on June 25, saying on the latter date that they have received no answer to theirs of the 8th, and must insist upon an immediate reply. Or a New York house refers an inquiry from Panama to its agents in the Philippines; but both of these took place. I must confess to a letter from my own office not long since covering a statement of a small account, and asking the office in New York to step out and collect it, said account being in Brazil. And I remember asking a clerk where Jamaica was, to be told it was in the Pacific Ocean.

I have never found any school anywhere where they taught geography with any degree of thoroughness. It is really quite important to know in what part of the world a would-be customer is. I have seen heating apparatus recommended for Java. Akin to this is our lack of knowledge of foreign languages. This is epitomized in the old joke: "If the foreigner does not understand English, speak louder." Our own tongue is so good that it seems discourteous for a foreigner not to understand it, and we are so accustomed to feet and inches that meters and the like seem disagreeable. I have known American manufacturers abroad to realize that intelligent merchants and manufacturers could not always speak or understand English, and that the French and German and Spanish languages were really practical things in the countries where they prevail.

How Not to Get Export Business

At the Paris Exposition a large Chicago house had an exhibit. It was near mine, and after the exposition had been open a month or so the case containing the goods sent by this house was so much in my way that with my own man I opened it and set it up in the showcase belonging to my Chicago friends. There was a lot of literature with it, all in English, and all in feet and inches and dollars and cents. I suspect that such a house believes expositions are no good.

Not far away were the exhibits of some well-known manufacturers in Connecticut which they had put into the hands of a Paris house that had 50 exhibits in charge, and each of them naturally got one-fiftieth of the attention of that house. One day a fine-looking German came and looked over their case intently. He could speak but little English, but after a while came to me and made me understand that he wished to speak to the representative of that exhibit. I managed to tell him that the man came there once a day for a few minutes, and otherwise I knew him not. He went away, and ten days later returned with his bright, intelligent daughter, who spoke English well. She told me her father had sent home to Germany for her that she might talk English to the representative of the American manufacturer, for her father wanted to buy some of the American tools. To my great regret I could not even then find the representative of the American exhibitor and the couple departed, and the American lost an order.

The line of least resistance with a foreign buyer is to offer him the goods he wants described in a way he understands, and in the measures and weights with which he is familiar. The growing use of English throughout the commercial world has aided us, but ability to reach a customer in the language and the terms he understands is helpful.

Some of Our Commercial Sins

American manufacturers are charged all over the world with certain sins alleged to be almost peculiar to them—underpaid postage, bad packing, substitutions of goods, inattention to correspondence, long and unexplained delays. To these can be added one special business sin that exasperates foreign buyers and has made some drop American lines that they had taken up.

I refer to the habit of changing list prices and discounts. A foreign buyer takes an interest in a line, puts it in his circulars or catalogues, spends money to sell it, and gets it going, sends in an order. He then receives word that since the last catalogue sent him the price is changed and "we are now pleased" to quote him so and so, less so

much. Or he receives his goods together with a letter stating that the order is filled somewhat reluctantly because the price has meanwhile advanced, and future lots will carry the new price. Instantly all the expense the foreign buyer has put upon the goods is wasted.

I recall one concern, and a large one, the head of which personally supervised the detail of making up every price list, for he said those price lists were the heart of his business and they should be made with such thorough care that they never should be changed. They were not changed for 15 years. This is true, though in a lesser degree, of discounts. I have known houses abroad either angered by an increase in price in some such way as I have described, or almost equally annoyed by having a stock of goods on hand and having the manufacturer send out, without notice, a revised discount sheet in such manner that his foreign agent was obliged to sell out at a loss.

Regarding Terms

In the matter of terms, many of us group all foreigners as unsafe people to receive credit and we write rather curt letters that cash with order or against documents are our sole export terms. There are houses in almost every large city in the world a debt from whom is a sound asset. I wish more of them owed me largely. Cash against documents is preferred by many buyers as well as sellers, but it is a pity to lose valuable orders from sound houses because a provincial habit keeps us from doing what our competitors do. Within reasonable limits, why not let a sound house see or even try goods before they are asked to pay?

There are houses abroad who so frequently receive underpaid letters from America that they simply reject them. It is hopeless to correct this evil until we give up putting the cheapest office boy we have at sending out the mail in our offices. We pay perhaps $20 per week to have letters typewritten that are dictated by a man who may get several thousands a year, and we often spoil the operation by putting a $3 a week boy to inclose and mail them.

A Grist of Aggravations and Hindrances

I saw a lot of American goods in the Far East, rusted. The buyer was an American, but he had given up buying those goods in the United States. He said that he was paying 15 per cent. more for English goods, and the reason was that the Englishman packed his goods properly and the American would not. After complaint, the American manufacturer replied that he knew how to pack his goods, and would send them out well cared for in the usual way. These were the goods I saw damaged by rust, and that was the last order sent.

I saw one lot of small oil stoves from America, half of which were broken. The buyer had requested special care in packing. That was also the last order.

In one case a green label was not wanted because the natives did not like that color, but when the order was received in America and the standard label was green, the manufacturer said things about the foolishness of the natives and shipped the regular goods. In time they came back with freight charges both ways, and no orders came after that.

A shipment for Santos was sent to Rio, and months of delay ensued and much expense, complicated by the fact that the shipper kept all the bills of lading in his own desk.

Transportation Methods Abroad

An English or German manufacturer can accept a cable order to go by a definite steamer on a fixed future day. In Europe the railroads co-operate and will take the shipment from the interior to be delivered "for specific sailing." Our railroads will not receive freight on this definite basis. We lose steamers now and then, and goods lie over sometimes a month. This does not occur abroad. German and English manufacturers find at their coast line shipping companies eager to facilitate the commerce of those lands. Do we? All the way from Hong Kong by way of India to New York I saw not one American flag on a ship. One vessel bearing our flag had been in Calcutta within a year. There is no worker in the factories you represent nor a worker in any factory throughout our broad land that is not a sufferer by the absence of our own merchant ships, and you yourselves are daily losers by it.

Your goods enter, with rare exceptions, into the hands of shipping lines whose chief interest it is to develop the commerce of their own nations. They are glad to get the business flowing from our shores and must so far cater to it as not to lose it, but throughout the preference is given in their connections and management to those who are our competitors, and who are their compatriots.

Restore Our Merchant Marine

If it can be realized that all Americans, manufacturers and farmers alike, who seek export trade are constantly handicapped by having to ship their goods through the hands of our commercial antagonists, we shall be more disposed to cut short the delay in doing something serious to restore our merchant marine. We have talked subsidy and we have talked differential duties, and we have talked free ships, but in this great, practical America no men have yet arisen commanding enough to say on this vital theme: "Get together; cut out the trivial issues; forget prejudices and passion and party; let us have a conference of all concerned, pledged to some result before it adjourns."

Let us support every measure, so long as it be righteous, that even looks toward re-establishing our merchant marine. It is time to get something done.

Facts Which Must Be Reckoned With

Let us frankly, as manufacturers, face certain facts. An attitude that we are able to compete with foreign manufacturers on their own ground while unable to compete with them on our own ground cannot long be maintained. The day of special privilege for you or me is passing away, not to return. The day of self-help, of facing fearlessly the world in open competition with it is dawning. It may not come abruptly; it may come with painful processes in its readjustments. And when it comes our readjustments need not be made at the expense of the workers we employ, nor to our loss either, if we are wise and careful. To reduce wages induces waste, and such a course is a crude process. Efficiency means three things that always go together and cannot be separated: The increase in our output and its improved quality; the increase in what we pay our workers; and because of these the decrease both in the direct and indirect cost of what we make. We have got to learn to utilize the brains of our workers as we utilize their hands. The best plants anticipate and avoid waste as far as may be by designing, making, protecting, operating their machinery in accord with the laws of its being.

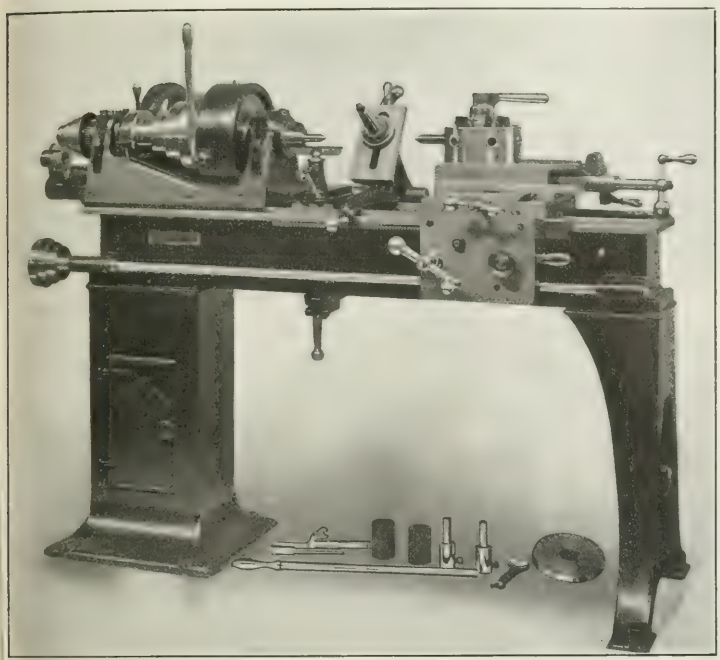
When we treat our men this way, use the best there is in each of mind and hand, fitted carefully to the work he best can do and doing it after careful instruction with the best appliances under the conditions that meet his manhood (mental and physical) best, then we shall save human waste. So long as we look first at the wage rate and past or present cost instead of at the product rate and the possible cost, we shall all be cowards. He who would export must first be fearless, then patient, and backed by fearless patience, by continued self-criticism and intelligent knowledge and a broad spirit, the most doubtful of us will come to know the fact that American manufacturers are peers to or superiors of any in the world, and able if and when they choose to meet them fearlessly in the commercial arena of the world.

The McLanahan Stone Machine Company, Hollidaysburg, Pa., has recently brought out a new single roll crusher having a capacity of about 200 tons per hour of limestone for blast furnaces.

The Parker Boiler Company, Pennsylvania Building, Fifteenth and Chestnut streets, Philadelphia, has bought a site of three acres at Lafayette Station, Pa., and has started to build a modern boiler manufacturing plant. The location is in Montgomery County, about 11 miles from the heart of Philadelphia, on the Schuylkill River, and between the Pennsylvania and the Philadelphia & Reading railroads. Room is available for shops 900 ft. long, averaging 130 ft. wide. The company reports that, although not many large orders are in sight, it has received a gratifying number of small orders from both the East and the West. The worst feature of present conditions, it observes, is the very considerable number of men who are seeking employment.

The Fox 15-Inch Lathe

A new 15-in. by 5-ft. cabinet turret lathe with friction geared head has been recently placed on the market by the Springfield Machine Tool Company, Springfield, Ohio. The special features of the tool are a type of clutch mechanism in the turret head which makes the tool capable of being handled much quicker than the old style and the ability to cut left-hand threads with right-hand leaders, thus saving the cost of a separate set of left-hand hobs and leaders.



A New 15-In. x 5-Ft. Cabinet Turret Lathe with Friction Geared Head Built by the Springfield Machine Tool Company, Springfield, Ohio

The turret is so designed that a slight backward movement of the blade loosens the former and at the same time withdraws the locking pin, while a slight forward movement indexes the turret for the next tool and at the same time locks and tightens it, the entire operation being performed in a short time with one hand. Automatic engine feed with three changes is provided for the turret, the feed being reversed by a handle which is conveniently located at the left side of the apron. The longitudinal movement of the turret is controlled by either a lever or screw. The top slide rests upon a second one having a movement at right angles to the front of the machine hand which is operated by a screw. This arrangement allows a large range for facing off work held in the chuck and when using this hand set over, the holes in the turret can be centrally located with reference to the spindle by a positive stop which can be quickly removed when the tools are to be used on the rear side of the spindle center. An additional cross movement slide is operated by a supplementary taper slide, the taper being derived from a bar between the ways of the bed. This bar is set by a graduated index and any taper up to 4 in. per foot can be secured. This arrangement obviates the necessity of setting the head stock over for taper boring or turning and with this new attachment work can be faced off square when the taper work is completed without any change being necessary. When employed for straight work, the taper side is locked to the saddle by a taper tool steel pin, having a square head for its ready removal.

The machine rests upon one cabinet and one plain leg and the former can be fitted with shelving to receive tools, chucks, etc. The drive is from the builder's improved friction counter shaft to a four-step large diameter cone pulley with back gears. Accurately ground high grade steel is used for the spindle which has a hole 1 in. in diameter through it. Phosphor bronze journals are used.

The front bearing of the chasing bar may be moved along the bed by a tongue and groove to accommodate the position of the chasing head when operating on work held in chucks or between centers. The automatic feed enables pieces of any length to be operated on within the range of the machine. When this feed is not used the saddle can be locked to bed by the gib screw at the right side of the apron. The different pitches of threads are obtained by a follower and leader device. The equipment of each machine includes one leader and follower to cut 11½ threads per inch and also one hob to cut the follower. Straight or tapering threads can be cut, the change from one to the other being quickly made. While outside taper work is being done, inside boring and tapping operations can be carried on if desired.

The following table gives the principal specifications and dimensions of the tool:

Diameter of turret, in.	7½
Length of carriage, in.	12
Movement on top slide, in.	5¼
Cross movement of top slide, in.	6¼
Number of turret holes	6
Diameter of turret holes, in.	⅞
Distance between head center and turret, in.	23
Number of cone pulley steps	4
Diameter of smallest cone pulley step, in.	3 11/16
Diameter of largest cone pulley step, in.	9½
Width of driving belt, in.	2
Back gear ratio	10 to 1
Diameter of front bearing, in.	2½
Length of front bearing, in.	4
Diameter of rear bearing, in.	2
Length of rear bearing, in.	3
Diameter of spindle nose, in.	2
Number of threads on spindle nose	6
Diameter of spindle hole, in.	1
Speed of counter shaft, r.p.m.	225
Diameter of counter shaft pulleys, in.	10
Face width of counter shaft pulleys, in.	4
Net weight, lb.	1,535
Domestic shipping weight, lb.	1,700
Foreign shipping weight, lb.	2,000

If desired a compound slide rest fitted to the V's of the bed can be furnished with this tool.

The breaking of a dam almost annihilated the towns of Austin and Costello in the northern central part of Pennsylvania, September 30. After the dam gave way the pipes conveying natural gas were broken and a conflagration followed which added greatly to the damage caused by the flood. About 100 lives were lost. The dam was owned by the Bayless Pulp & Paper Company.

The Buffalo Copper & Brass Rolling Mill announces the opening of a New York office in the Flat Iron Building, Twenty-third street and Broadway, room 1216. The establishment of such an office has become necessary owing to the company's increasing business in the vicinity of New York City. It will be in charge of James E. Barkley, who is thoroughly familiar with all details of the copper and brass business.

Lessons from the Swiss Metal Industries

Impressions of an American Visitor

BY C. A. TUPPER, MILWAUKEE, WIS.

For an American interested in the manufacture of machinery there is no part of Europe more satisfactory to visit than Switzerland. Here, within the range of short trips on steam and electric railroads, he can see more of interest and obtain suggestions more to his profit than anywhere else, either in Great Britain or on the Continent, with the possible exception of the Düsseldorf and Chemnitz districts. Coming from northern Italy the first important stop will be at Lucerne; on the route from Paris or Lyons, Geneva will be selected; while a trip through Germany lands the traveler at Zurich, the greatest center of machinery building.

The Escher-Wyss Plant

At the plant of Escher-Wyss & Cie, which is a few minutes' ride by trolley from the railroad station and principal hotels, one meets with a cordial reception and is shown freely through the works. The manager speaks English, as well as several other languages, and the chief engineer, who took the writer about, was for several years one of the company's representatives in the United

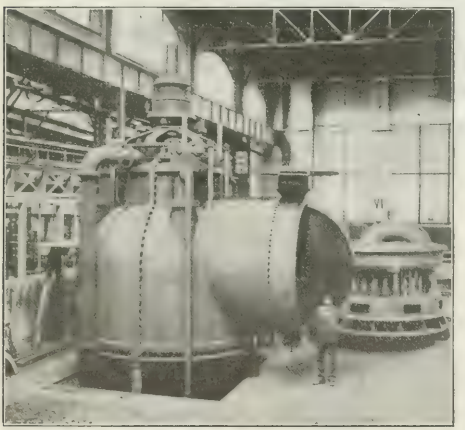


Fig. 1—Erecting Shop of Escher-Wyss & Cie, Lucerne, Switzerland.

States. In the work on the floor one sees the evidence of the widespread experience of this company, which has been more cosmopolitan than that of most American concerns engaged in similar lines. Advantage has been taken in the designing of hydraulic turbines, for example, not only of the best Swiss engineering derived from the great waterpower developments in the region of the Alps, but also of other European and American experience. In this line Escher-Wyss & Cie have been among the pioneers of the world. They designed the first turbines installed at Shawinigan Falls, from which power is transmitted to Montreal, Canada; at Niagara Falls; at Necaxa, Mexico; at San Pablo, Brazil, and for other famous plants of the American continent. While the writer was in Zurich they were about to ship large turbines to British Columbia and South America, and were completing an installation in Italy of four turbines of 6600 hp. each operating under the enormous head of 2986 ft.

They also manufacture the Zoelly steam turbine, of the impulse type, for both land and marine service, and are now furnishing a number of machines for the turbine-propelled war vessels ordered for the Italian navy. Compressors and blowers form an important line, and marine engines, particularly for steamers plying on the large Swiss lakes, have been built in their shops for many years.

In going through the shops one is impressed with the neat, orderly arrangement, the prevalence of electric drive and the up-to-date appearance of the tools, American and German types predominating. The various cutting and other small tools used on the machines are almost altogether of American manufacture, as there is a distributing house for these in Zurich and the Swiss workmen generally prefer them to any other. The strongest impression made on a visitor at the Escher-Wyss plant is the fact that they keep an open mind toward all important developments, no matter in what country these are brought out, and take pains to inform themselves concerning progress everywhere in mechanical lines. Naturally, the leading technical journals of Great Britain, France, Germany, the United States and Switzerland are regular sources of such information; and the men who travel for the company, even though sent out only on erecting work, are encouraged to look out for suggestions of value. Furthermore, their most skillful employees are engaged under long contracts, and it is made worth their while to remain with the company. The result is extraordinarily efficient service, with mistakes and miscalculations reduced to a veritable minimum. The average American manufacturer who makes a valuable investment in a draftsman, for example, to the extent of giving him one, two, five or more years' training, and then lets him go merely because work is slack, heedless of what the man is taking away in his head, might find something to ponder over in the Escher-Wyss system.

Plants at Oerlikon

The Maschinenfabrik Oerlikon, which builds a great variety of electrical machinery, is situated in Oerlikon, one of the outlying districts of Zurich. This company has a very large establishment and also does a heavy export business, including numerous sales made in Great Britain and its colonies. The Oerlikon motors are famous all through Europe, and the company's steam turbines also rank high. Its reputation has further been enhanced by the construction of electric locomotives for heavy traction service. For the new Loetschburg tunnel, pierced while the writer was in Switzerland, which ranks with the Simplon and St. Gotthard achievements, the company has been building a special type of electric locomotive which will be thoroughly tried out before the new line is in operation. This is one of the lessons to be gained in the best Swiss shops, the taking of time by the forelock. Delivery time seldom, if ever, finds them unprepared. The machine is ordinarily ready long enough ahead to enable the manufacturer to state positively that the guarantees for it will be fulfilled or bettered. To an American it seems, of course, that the enterprising character of this company is further exemplified by the large number of American machine tools to be seen in the various shops. The best English and German makers are also represented.

In the same vicinity is the plant of the Werkzeugmaschinenfabrik Oerlikon, which builds a very extensive line of machine tools, being the only important house of that kind in Switzerland. This concern advertises in Germany in technical papers, and, despite its lack of specialization in our sense of the word, appears to be making good headway there against tools of native manufacture. Italian, French and Austrian shops are also good customers. A feature is made of machines built to order for special industrial or governmental service; and in the latter case, where secrecy is involved, officials have learned that they can apply to the Oerlikon company for the execution of such contracts without any danger that the details will leak out. That is another point to be noted by the traveler as applying to Swiss plants in general. No difficulty

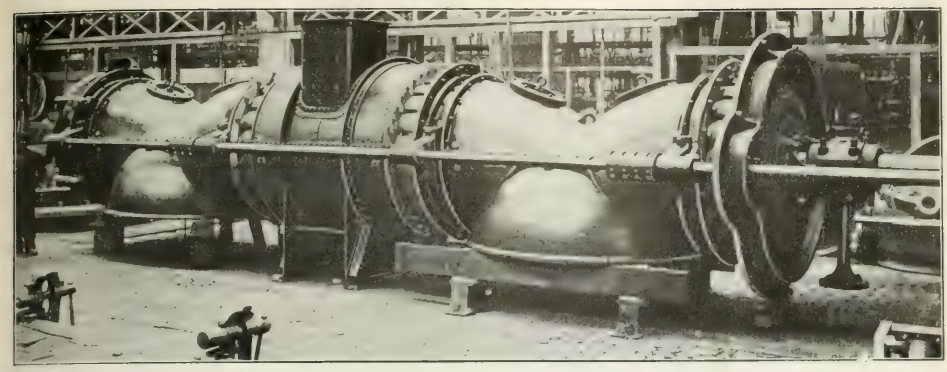


Fig. 2. A 1500-Hp. Quadruplex Hydraulic Turbine Assembled in the Shops of Escher-Wyss & Cie. Before Shipment.

is encountered in viewing the ordinary run of operations; but if any reason exists for guarding a particular fact, whether from the customer's preference or otherwise, it is as safe from outside prying or internal gossiping in such an establishment as though locked in the vaults of the Bank of England. Foreign governments, which have cultivated suspicion to a fine art, trust the Swiss manufacturers as they trust none other.

Steam Engine Building

At Winterthur, a short distance outside of Zurich to the northeast, is the plant of Sulzer Bros., who also have works at Ludwigshafen in Germany. They have established an enduring reputation in the building of steam engines, pumping machinery and related lines, as well as vessel building. More recently the construction of large oil engines has become an important specialty.

One of the principal lessons to be learned here is from the attention devoted to the chemical and physical characteristics of the materials used in the shops. A very complete laboratory service is maintained and everything is tested from pig iron, steel and alloys down to paints and lubricants.

The degree of consideration given to the foundry also amazes an American accustomed to seeing this department regarded as the Cinderella of the average metal working establishment. So much importance do Sulzer Bros. attach to that branch of the work, and rightly, that there is a special organization for it under the direct charge of one of the members of the firm. This arises in part from the fact that the works started, in the latter part of the eighteenth century, as a brass foundry, and in the present plant, dating from 1834, this department has always had a prominent place. The brass foundry is given especial attention, as Sulzer Bros. make very liberal use of brass fittings for pumps and other machinery. The entire equipment, however, is very complete, and practically nothing goes to waste that can possibly be saved. Magnetic separators are used and all scrap is recovered and briquetted to be sent back to the furnaces. For all of the lighter grades of work molding machines are used almost exclusively. The cleaning department is exceptionally well furnished and has good ventilation.

One feature of the Sulzer Bros. establishment in which they appear to take pride, but which does not appeal to an American, is the fact that they have built most of their own special tools. This was probably necessary 20 or 30 years ago, but continuance in the practice will operate to their disadvantage just as it has in similar instances in the United States.

The "scientific management" concerning which there has been so much stir in this country has, however, long been practically applied by Sulzer Bros., who keep an account for each tool and have reduced standardization,

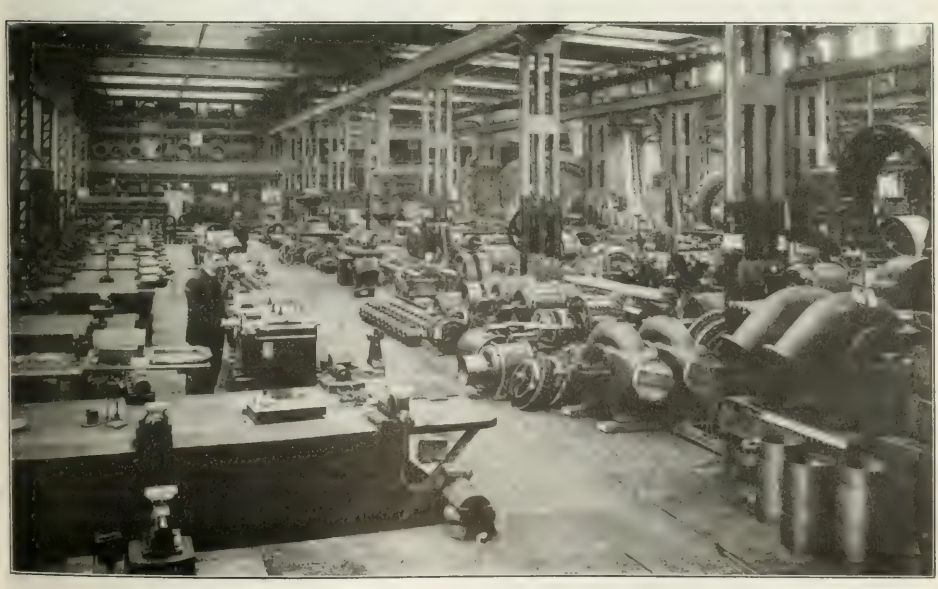


Fig. 3.—Assembling and Erecting Department of Brown, Boveri & Cie., Baden, Switzerland.

economy of movement, etc., to one of the commonplaces of their work. In all this there is a conspicuous absence of unnecessary "system" and bossing.

At Winterthur one also finds the Schweizerische Locomotiv & Maschinenfabrik, which, besides the construction of standard locomotives, makes a specialty of those intended for mountain service. Electric locomotives and haulage machines are also built. Gas and oil engines and other types of internal combustion engines form an additional line. What has been said above of Sulzer Bros. applies largely to these works and there appears to have been an interchange of ideas and experience. So far as foreign tools are used, American machines are prominent.

One of the most noteworthy features of the plant is the tool-making department, which has the reputation of being one of the best in Europe. Included with this, although in a separate building, are the arrangements for case-hardening the links, blocks and other locomotive and engine parts subject to excessive wear.

The boiler and plate shop also compares favorably with any to be found on this side of the ocean, and it forms a standing advertisement of the latest appliances, including the oxy-acetylene process of cutting out plates. There is also a very careful and apparently common-sense division between hydraulic and pneumatic tools for different classes of service, as in riveting. A peculiar feature is the use of steel belt transmission from a driving engine to shafting. In respect to electric drive this establishment is not so far advanced as the other plants mentioned, although it has been introduced in the newer part of the works.

The town of Uzwil, not far from Zurich, boasts the Vogt Benningen Maschinenfabrik; at Kriens-Luzern are Theodor Bell & Cie, famous as manufacturers of hydraulic machinery, and in Chatelaine, near Geneva, H. Cuenod Elektrizitäts Aktien Gesellschaft makes a specialty of apparatus for mechanical and electrical control. Another plant to be credited to Zurich is that of A. Schmid, manufacturer of hydraulic power and pumping machinery.

The Works of Brown, Boveri & Cie

At Baden, less than an hour's ride west of Zurich, are the works of Brown, Boveri & Cie, which have long been the Mecca of technical men from other countries seeking the best in design and workmanship, as concerns power and electrical machinery, that Europe has to offer. Here one finds, side by side with modern machine tools from England, Germany and elsewhere, the latest American automatic, semi-automatic or other high speed equipment; and there are few lost motions in the operation of these tools. The standardization of parts and percentage of work finished at one setting reminds one of the most modern shops in this country for the manufacture of automobiles, agricultural machinery, etc. For builders of electrical machinery this is a distinct achievement.

The visitor is also impressed by the care taken in the inspection and checking of all detail parts, and in the arrangements for testing. To insure accurate dimensions a special measuring machine has been provided. All tests are made in a special underground department, where the temperature, humidity, etc., are kept absolutely uniform.

This company has a record in steam turbine construction approaching 3,000,000 hp., and the Baden plant is laid out especially for building the smaller and medium sizes, those of the largest capacity being usually put through the branch works at Mannheim, Germany. The company also operates plants at Paris, London, Christiania, Rotterdam, Vienna, Buda Pesth and Milan, besides having an interest in two electrical establishments at Munich. Among their products are turbo-blowers and compressors, centrifugal pumps, generators and motors for all classes of service, electric locomotives and related apparatus.

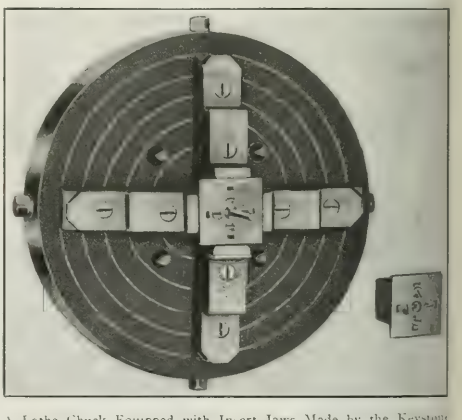
Works administration is the strongest feature of their general system; and it would be difficult to name any other company, either in the United States or Europe, where this has been reduced to more of a science. To mention this in any detail, or to describe the shops themselves, would require an extended article in itself.

In conclusion, however, it may be said that whatever has been stated of one of the above plants is more or less applicable to all of the others. Indeed, the uniform excellence of the work and the apparently free interchange of progressive ideas as they have been worked out in practical management constitutes one of the chief lessons to be drawn from a tour of Swiss shops. A parallel for it may be found in certain parts of the United States and in two or three districts of Germany, but its application here is of interest nevertheless. For a country inclosed within high mountain barriers, shut off from the seaboard and dependent upon the importation of raw material, Switzerland has taken a place in the design and manufacture of machinery which can only be ascribed to superior engineering and shop management.

Advantage has, however, also been taken of the opportunities for cheap water power. The greater part of the current needed for operating motors in the above named plants is derived from hydro-electric stations on various Alpine streams. This is another particular in which the Swiss may be emulated by Americans with considerable benefit. True, our manufacturing districts are usually remote from mountain ranges which afford the high heads so common in Switzerland; and until within recent years low-head developments were not, as a rule, commercially feasible. Now, however, water turbines are built which make the problem of low or medium heads a relatively simple one, and there are thousands of sites suitable for such plants scattered throughout the country. The future will, probably, witness their utilization on a scale hitherto undreamed. Meanwhile the other lessons to be derived from Swiss plants may be well pondered by American manufacturers in the metal-working lines, for the more their habits of breadth and thoroughness are inculcated in our systems the better it will be for the industries concerned.

Insert Chuck Jaws

To enable bolts or rods having diameters as small as ⅛ in. to be held in an ordinary lathe chuck the Keystone Mfg. Company, Clearfield, Pa., has recently placed on the market a set of insert jaws for an ordinary lathe chuck. These jaws are intended to do away with the difficulty experienced by a machinist in holding small articles in the regular lathe chuck, the jaws of which do not ordinarily come closer together than ½ or ¾ in. Pieces having



A Lathe Chuck Equipped with Insert Jaws Made by the Keystone Mfg. Company, Clearfield, Pa.

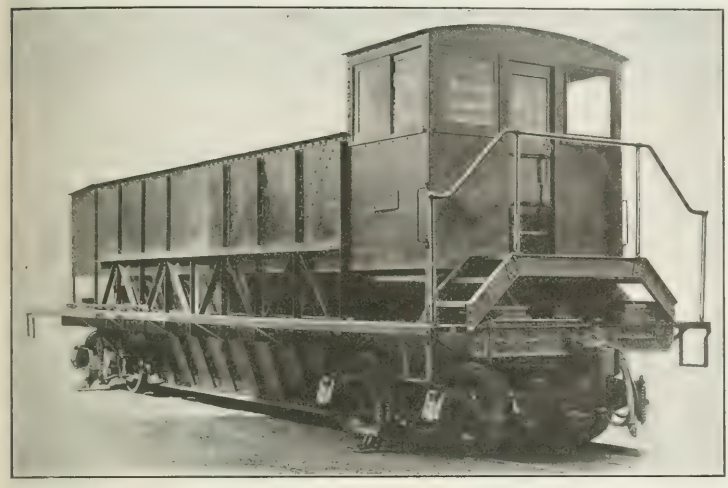
smaller diameters than this dimension had to be blocked in the chuck in order to be held, an arrangement which is sometimes difficult to accomplish.

These insert jaws, which are shown at the right of the accompanying engraving, are placed in the chuck and will hold a small bolt, rod or piece of stock firmly, thus doing away with the changing of chucks, reversing of jaws and blocking up, as well as effecting savings in time, labor and money. Three different sets of jaws are made, two with four jaws and the other with three jaws. The larger of the four-jaw sets will hold pieces ranging from ⅜ in. down to ⅛ in. and even less, and the other will accommodate pieces ranging from 11/16 to 5/16 in. in diameter. The range covered by the three-jaw set is from 11/16 to ¼ in.

The Struthers Furnace Company, Cleveland, Ohio, has increased its capital stock from $300,000 to $1,000,000.

Atlas Ore Transfer Car

Several new features both in general construction and in the electrical equipment have been embodied in the new ore transfer car recently brought out by the Atlas Car & Mfg. Company, Cleveland, Ohio. This car was designed for handling ore at the plant of an Eastern zinc company but it is said to be equally well adapted for handling all other kinds of ore.



A New Ore Transfer Car Built by the Atlas Car & Mfg. Company, Cleveland, Ohio.

Rigid steel construction is employed for the car. Box girders support the body and the sides of the car act as trusses to transfer the weight of the contents to the body bolster. The trucks are of the arch bar type and are of a very heavy design. Four doors in the bottom of the car are operated in sets of two each by compressed air and discharge the load. As the weight of the contents has a tendency to force the doors open after the toggle keeping them closed is released, only a very small amount of air is needed. A tight joint which eliminates the loss of fine ore is provided by the design of the doors and when closed they are locked positively. A stationary apron running under the car on either side prevents the scattering of the load so that the contents are dumped between the rails without loss.

The Electrical Equipment

Cabs are located at either end of the car. The one at the forward end is the operator's cab and here are located in convenient positions the air valves, the master controller and the minor operating equipment. The auxiliary cab at the rear end contains the contactor controller, the series relay, the resistances, the main line switches and the balance of the electrical equipment. The power for propelling the car is taken from a third rail through a shoe attached to the forward truck. Two 220-volt series relay type motors which are spring suspended propel the car. These motors are rated at 53 hp. based upon a 75-deg. C. temperature rise in one hour over the normal temperature of 25 deg. The electric controlling device, which was built by the Electric Controller & Mfg. Company, Cleveland, Ohio, is an important feature of the car. It consists of the various switches and relays which are mounted on slate panels and assembled into a switchboard having an angle-iron frame and sheet-iron covers inclosing all the apparatus. This equipment enables both motors to be operated either in series or in multiple in either direction, all the changes being secured magnetically. The control equipment includes a main line double-pole service switch, two double-pole magnetic switches for reversing the motors, two double-pole magnetic switches for changing the motors from series to parallel operation, individual accelerating switches, cast grid resistance, a drum-type master controller and an overhead coil or current limiting relay. This coil protects the motors and is so connected that when it operates the motors are disconnected from the line. It is reset automatically by bringing the master controller to the off position. The magnetic reversing switches are mechanically interlocked to prevent one of them from being thrown in while the other is closed, and as an additional precaution they are electrically connected so that neither of them can close if one or more of the accelerating switches is closed. In this way the motors cannot be thrown on the line unless sufficient starting resistance is inserted in the circuit to protect them from the heavy inrush of current which occurs at starting.

This equipment provides seven speeds in each direction. Four of these are with the motors arranged in series and three with the motors in multiple. All of these speed variations are controlled by the operator but if he so desires the master controller can be thrown to the full series position and the motors will be automatically accelerated by a series relay which limits the current employed to a safe amount. This arrangement can also be used in changing from full series to full parallel operation.

The following table gives the principal dimensions and specifications of the car:

Overall length, ft	36
Overall width, ft	11½
Hight from rail to top of cab, ft	13
Hight from rail to top of body, ft	10
Capacity, lb	100,000
Capacity, cu. ft	800
Diameter of wheels, in	33
Gauge of track, in	56½
Weight, lb	63,000

The equipment of the car includes an air compressor, an air brake and a pneumatic sanding device. Rolled steel wheels are used and a running board is provided on either side of the car.

Italian Meeting Abandoned.—The Council of the Iron and Steel Institute announces that due to a number of causes many members who had expected to attend the Italian meeting of the Institute at Turin in October have sent notifications that they will not be present. From about 250 the number of intending visitors fell off to 126 and the Council decided to cancel the appointment for the meeting. The political disturbances in Europe, the labor situation in Great Britain and the continuance of reports concerning the prevalence of cholera in Italy were the chief disturbing causes. A meeting of the Institute will be held in London October 5, when at least some of the papers appointed for the Turin meeting will be read and discussed.

The Ford Chain Block & Mfg. Company, 628 Race street, Philadelphia, Pa., is contemplating the increase of its present plant. It has recently brought out a patented loop chain guide for its Tribloc chain hoist for which the claim is made that it is the most important improvement to a chain hoist for 20 years. The loop guide prevents the hand chain from over-riding the wheel or becoming wedged, as is the case with other styles of blocks when the hand chain is overhauled rapidly. This guide has fixed guiding strips adjacent to the two flanges of the hand wheel conforming to the circumference of the flanges of the wheel which protect the block from shock and save the working parts from damage. The company reports an increasing demand for its hoists.

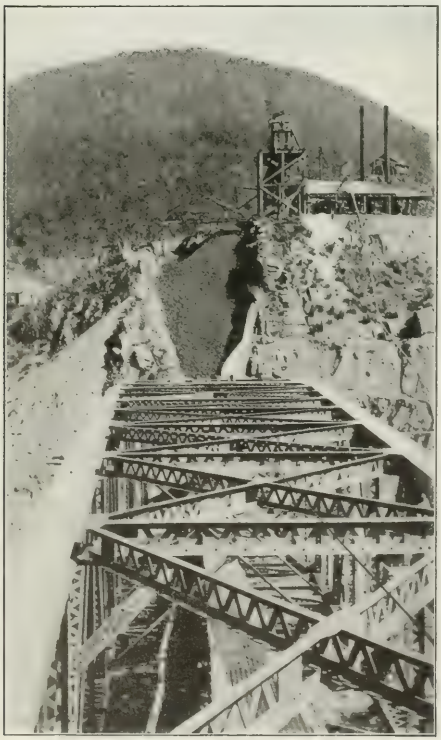


Ore Loading at El Cuero Mines

Plant Near Santiago de Cuba, with Crushed Ore Bin of Solid Rock, Wooden Tunnel Underneath, Belt Conveyor and Cantilever Loading Structure

BY JENNINGS S. COX, JR.*

The plant for loading iron ore from the Ponupo Manganese Company's El Cuero iron mines, installed at the port of Nima Nima, on the south coast of the island of Cuba, near Santiago de Cuba, possesses considerable interest for the engineer, not only because it represents a rather original combination of well-known devices, but also as illustrating the importance of the commercial side of the problems that present themselves to the engineer in the successful exploitation of ore bodies.



Open Ore Bin at Shore End of Cantilever.

The conditions encountered were, briefly, a body of 250,000 tons of iron ore of excellent quality situated close to the Caribbean Sea, but 9 miles by water and 20 miles by land from the nearest available port. In Cuba the miner finds no such railroads and docks as exist ready to his hand in the great iron mining districts of the United States; but he must provide these facilities for himself. Practically every mine that has been operated in Cuba has been obliged to build its own railroad and dock or loading device, and this heavy additional expense for installation requires a correspondingly greater amount of ore in sight to justify the opening of a new deposit.

As the ore at El Cuero, as in the other hard ore mines of Cuba, outcrops on the surface of the hillsides, and the mining is more in the nature of quarrying, the deposit being worked by a series of benches or open cuts, the problems that usually accompany underground mining are absent and the question of transportation becomes of paramount importance. Furthermore, in railroad and ocean transportation the miner has two distinct sets of conditions to consider. Whereas tonnage is of prime importance in the economical operation of a railroad, it has comparatively little effect on ocean freight, where despatch is the all-important point, rapidity in both the loading and the discharge of cargo being the *sine qua non* of cheap ocean transportation.

The most important, however, of the conditions affecting the installation about to be described is the fact that only 250,000 tons of ore were in sight when the opening of the mine was under consideration. The fact that subsequent explorations have greatly increased this tonnage does not affect the original problem presented to the engineers when the installation was planned and effected. There were no unusual difficulties to be met in the construction of the short railroad line; and a rapid, effective loading device, comparatively inexpensive in first cost and economical in operation, thus became the indispensable condition of successful operation.

Why the Cantilever Was Chosen

The nearest inclosed harbor, that of Santiago de Cuba, was so far distant from the mines as to make the cost of a railroad prohibitive. The only available shipping point was the open roadstead of Nima Nima, about three miles east of the mines, which the Treasury Department of the Republic of Cuba, at the instance of Ponupo Manganese Company, opened as a sub-port of Santiago de Cuba. This bay is protected by land to the north and east, and, to a certain extent, to the southeast, the direction of the prevailing winds. It is entirely open to the south and west. On the east side of the bay, the most protected point, there is deep water close to shore, but the bottom shows only a few inches of sand overlying the rock, and all attempts to drive piles have failed. The constant swell of the Caribbean Sea, while generally slight, was sufficient to prevent drilling holes in the bottom from a lighter or other unstable platform, and a number of plans for foundations in the sea, of sufficient rigidity and strength to withstand the occasional severe storms, were all rejected on account of the cost.

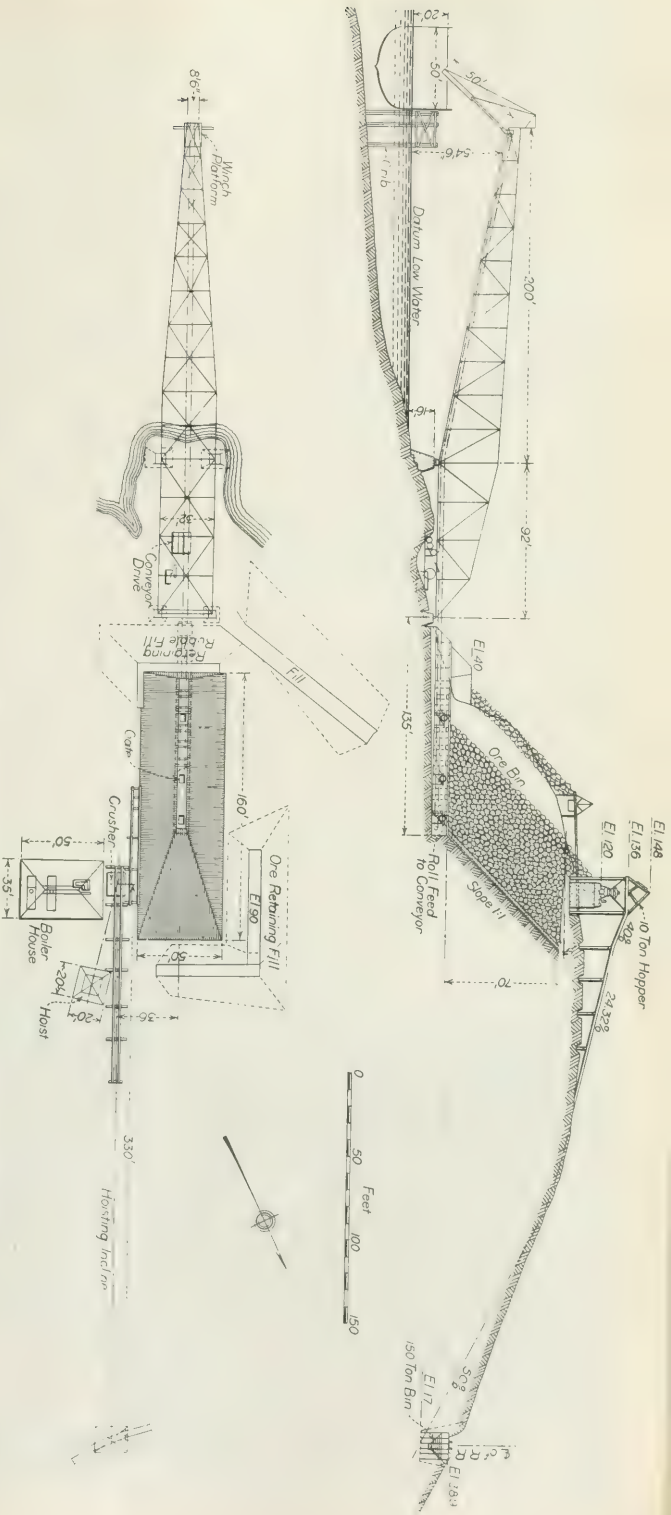
*General manager Spanish-American Iron Company and treasurer, Ponupo Manganese Company, Santiago de Cuba.

By a process of elimination a cantilever, with its foundations on the shore at the water's edge, was chosen as the only feasible plan. It is interesting to note that the general arrangement of cantilever, ore bin, crusher, etc., finally adopted was selected from more than a dozen different plans. Eight separate general arrangements all involving the use of a cantilever were prepared and estimates were made on these before a final decision was reached.

Cantilevers are used in the loading of iron ore at several places in Spain, notably at Vivero, Rivadeo and Onton. At the two last named the ore is trammed over the cantilever in small cars pushed by hand and the number of men required to load a vessel is very great. This intermittent employment of a large number of men would be out of the question in Cuba, where labor is scarce and wages are much higher than in Spain. Furthermore, only 1500 to 1800 tons are loaded in ten hours at Rivadeo, and while it is claimed that 2500 to 3000 tons can be loaded in a 10-hour day at Onton, the number of men employed is excessive. At Vivero the ore is carried over the cantilever by a Bleichert cable tramway to a vessel anchored 400 ft. from the shore. The capacity is given at 250 tons per hour; but, as this probably means when the tramway is actually running, and the time consumed shifting the vessel must be deducted, the net capacity would be no greater than at Rivadeo. Clearly some system of greater capacity and lower cost of operating labor was required at El Cuero, and the use of a continuous belt for conveying the ore seemed to meet this condition exactly.

The land at Nima Nima bay at the point selected for installing the cantilever rises abruptly from the sea to an elevation of 110 ft. and then falls off on a more gentle slope to a valley only a few feet above the level of the sea. The railroad which brings the ore from the mines to Nima Nima delivers it to a bin at the base of the inshore slope. From this bin the ore is hoisted by a 5-ton capacity skip car to the summit of the hill overlooking the cantilever loading device. Here it is tipped into a hopper which feeds directly to a No. 6 style K Gates crusher, crushing to 3 in. and under.

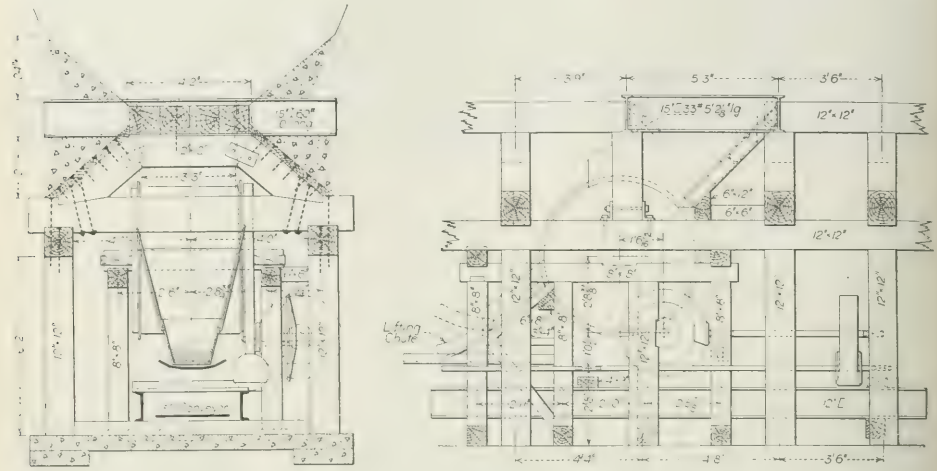
The crusher is located on the edge of a bin which has been quarried out of the solid rock and the bottom of which is 19 ft. above the sea level. The crushed ore is delivered from the crusher by a chute to the bin which has a storage capacity of 11,000 tons. If necessary, the bin can be extended inshore to double this storage capacity. The principal axis of the bin and that of



General Plan and Elevation of Ore Handling Plant of the Ponupo Manganese Company's El Cuero Mines, Nima Nima, near Santiago de Cuba.

the cantilever form a straight line. Under the center of the bin is a tunnel, and directly in front of the mouth of the tunnel is the inshore end of the anchor arm of the cantilever. A single 30-in. Robins belt conveyor runs the entire length of the tunnel and the cantilever, a distance of over 430 ft.

arches of native hardwood timber, in three pieces, also 12 x 12-in. section. The side pieces of the arch are hitched into the cap, and the center, or keystone piece carries four 12 x 12-in. pine timbers running lengthwise of the bin and forming the bottom thereof. The side pieces of the arch are covered with a 3-in. pine plank lagging, and the irregular



Elevations of One of the Three Roller Feed Gates in Tunnel Underneath Ore Bin

The Wooden Tunnel

The construction of this tunnel, to carry the great weight of crushed ore and yet not exceed the limiting cost justified by the ore then in sight, proved another interesting problem. Several plans for reinforced concrete construction were rejected on the ground of cost. The tunnel as constructed consists of 12 x 12-in. yellow pine posts, at 4-ft. centers, supporting 12 x 12-in. yellow pine stringer lengthwise of the tunnel. Caps of 12 x 12-in. pine set on this stringer directly over the posts carry flat

space between this and the sides of the excavation is filled with concrete. The arrangement was far cheaper than any other type of construction proposed, and has met all requirements, while its life should be all that the conditions exact.

Steel I beams are used where the continuity of the timber flooring is broken by the opening for the three gates, by which the ore is discharged to the belt conveyor. These gates are of the roller-feeder type, and consist of steel plate cylinders 4 ft. in diameter revolved,



The Cantilever Ore-Loading Structure, Showing Working Platform at Sea End.

through clutches, by a line shaft running the entire length of the tunnel and driven by the same engine that operates the conveyor. The cylinder is set with its axis nearer the mouth of the tunnel than the opening in the floor of the bin in such a manner that the toe of the slope of the ore in repose rests on the cylinder nearly vertically above its axis. The ore being prevented from running down the back of the cylinder by a fixed apron inclined at about the natural slope of the ore, there is no flow as long as the cylinder is at rest. As soon as the cylinder begins to revolve the angle of repose of the ore is disturbed and it follows the forward movement of the circumference of the feeder cylinder to a point where it runs down a small adjustable chute or apron to the conveyor. The angle of this chute is varied, so that the ore is delivered to the belt at a considerable velocity and in the direction of the forward motion of the belt. Although the ore is very hard and has sharp edges there is no appreciable cutting of the rubber belt, a condition that was feared when the arrangement was first designed. When the cylinder is stopped the flow of ore ceases. There is no gate to be closed.

Although there are three of these roller feeders in the bottom of the bin, but one is used at a time. When the ore is wet from rains there is a tendency to arch in the bin. As soon as this occurs that particular feeder is stopped and another started, so that there is no stoppage of the steady flow of ore into the vessel.

Vessel Loading Arrangements

The cantilever proper has its foundation on the shore at the water's edge. The overhang is 200 ft. and the inshore arm, 92 ft. in length, is securely anchored to the solid rock. The structure was built by the Pennsylvania Steel Company and was erected by the Snare & Triest Company. The outer edge of the cantilever is 60 ft. above the level of the sea, and at this point the belt conveyor delivers the ore into a telescopic chute which hangs vertically from the end of the cantilever when not in use and can be thrust out into the loading position by an elbow joint. This mechanism and the telescoping of the chute are operated by winches from a platform at the outer end of the cantilever. The foreman in charge of loading vessels stands on this platform, where he can watch the shifting of the vessel and the placing of the ore chute, and he also controls, by means of steam whistle signals, the flow of the ore and the movement of the belt conveyor.

Vessels when loading lie at the end of the cantilever, broadside on, with the bow toward the open sea, and are moored to six buoys, one each at bow and stern, and bow and stern breast buoys to port and starboard. Four heavy cribs of native timber, weighted down by 20 ft. depth of broken stone and with clumps of piles projecting above the water from each of the four corners and braced to each other longitudinally and transversely, serve to hold the vessel off from the shore even should the hawsers part; while the position of the vessel, with her bow toward the sea, makes it possible to raise anchor and put to sea, without delay or danger, in event of any sudden storm.

An 80 hp. Chandler & Taylor engine drives the conveyor and the roller feeders and a 50 hp. engine of the same make drives the crusher. Steam for these engines and for the Lidgerwood hoist, which raises the ore from the railroad bin to the crusher, is supplied by two Erie boilers, developing 125 hp. each at 100 lb. pressure. These are located on the hill just back of the crusher and are fired by wood, collected by tram lines from the neighboring hillside.

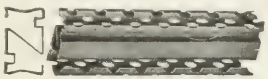
The total cost of the plant, as described, was $72,410, of which the cantilever and conveyer cost $18,500, the engine boilers, crushing machinery, etc., $10,500; freight, duties and erection on the cantilever and machinery $24,350 and the ore bin and tunnel complete $19,060. The cost of the bin quarried from the rock is noteworthy. A bin of similar capacity, built of steel, would cost considerably over $100,000, more than five times as much as the present bin.

The capacity of this plant to deliver ore to the vessels is regulated by the speed of the conveyor, which travels 650 ft. per minute, and the volume of feed to which the roller feeders are adjusted. At first it delivered 700 tons per hour, but this has now been increased to nearly 800 tons per hour by speeding up the belt. So accurately does this device run that, calculating 13 tons per minute delivered to the vessel, the estimated weight rarely varies over 1½ or 2 per cent. from the actual outturn weight at the port of discharge. The effective speed of loading depends also on the shifting of the vessel to load at different hatches. Vessels of 5,000 to 6,000 tons are loaded in a total of 12 to 13 hr. time, between 400 and 500 tons per hour. The cost of hoisting, crushing and loading ore, including operation and repairs, is less than 15 cents per ton.

The Wire Specialty & Machine Works

The Wire Specialty & Machine Works, which recently moved its plant from Chicago to South Bend, Ind., has not only increased its own equipment but is operating the plant of the Long Distance Telephone Mfg. Company. It is therefore in a very much better position not only to turn out automatic wire work, which was its exclusive business in the past, but to manufacture special machines of all sorts. The superintendent of the company, Thorvald Hansen, has had extensive experience in designing and building special machinery.

The interesting statement is made that the inventor of the studding illustrated herewith hunted in vain for four months for somebody able to build a machine to turn it out. This company designed and built such a machine and entered into a contract with the inventor to furnish him over $100,000 worth of the studding. As the demand for special machines apparently does not follow closely the demand for staples, the company's business does not seem to suffer from general depression so promptly as business in staple lines naturally would.



A Problem in Sheet Metal Forming, for Which a Special Machine was Built by the Wire Specialty & Machine Works, South Bend, Ind.

The equipment of the company's works at South Bend, Ind., consists of over 100 machine tools, including automatic wire forming machines, wire straighteners, power presses, milling machines, lathes, planers, shapers, automatic screw machines, turret lathes, annealing and tempering ovens and several special machines designed and built in the company's own factory which it is operating under contract with the machine owners.

The Supply and Machinery Dealers' Meeting

James A. Fernley, 505 Arch street, Philadelphia, Pa., secretary of the National Supply and Machinery Dealers' Association, states that more than 75 acceptances have been received for the meeting of the machinery section of that association at the Hotel Astor, New York City, October 10 and 11. Among the members who will make addresses or read papers at this meeting are the following:

J. O. Harron of Harron, Rickard & McCone, San Francisco, Cal., on "Compensation of Salesmen."

O. P. Meckel, Baird Machinery Company, Pittsburgh, Pa., on "Support to Manufacturers' Selling Policies."

C. J. O'Hara, C. C. Wormer Machinery Company, Detroit, Mich., on "Credits: Uniform Notes and Documents for Security on Deferred Payments on Engines, Boilers, Machinery and Other Equipment."

W. T. McCarthy, manager Boston branch of the Prentiss Tool & Supply Company, on "Best Methods of Handland Sales to Trade Schools and Other Similar Institutions."

Antom Vonnegut, Vonnegut Machinery Company, Indianapolis, on "Scientific Analysis of the Cost of Distributing Machine Tools."

The Davison-Hamack Foundry Company, Ballston Spa, N. Y., is installing a 50-in. boring mill and a universal miller, with the intention of entering the market for gasoline engine fly wheels furnished complete. The company will not only make the castings, but deliver them bored and machined. It would be glad to hear from engine manufacturers who are in the market for this class of castings.

Benzol from Coke-Oven Gases*

The Carl Still Type of Recovery and Rectification Plant—Trade Outlets for Refined Products of Crude Benzol

BY D. BAGLEY †

For many years it has been known that ordinary coal gas contains proportionately large percentages of benzol, in which term may be included the homologues of the benzene serie, which contribute largely to the illuminating value of the gas. The discovery of benzol in coal tar is attributed to A. W. Hoffman, about the year 1845, while its separation was entrusted to Hoffman's pupil, Charles Mansfield, who eventually carried out the process on a large scale, the principle of the separation of the various liquid hydrocarbons being the usual system of dephlegmation, previously used for the rectification of spirits of wine. The huge aniline dye industry owes its inception to the successful production of this product.

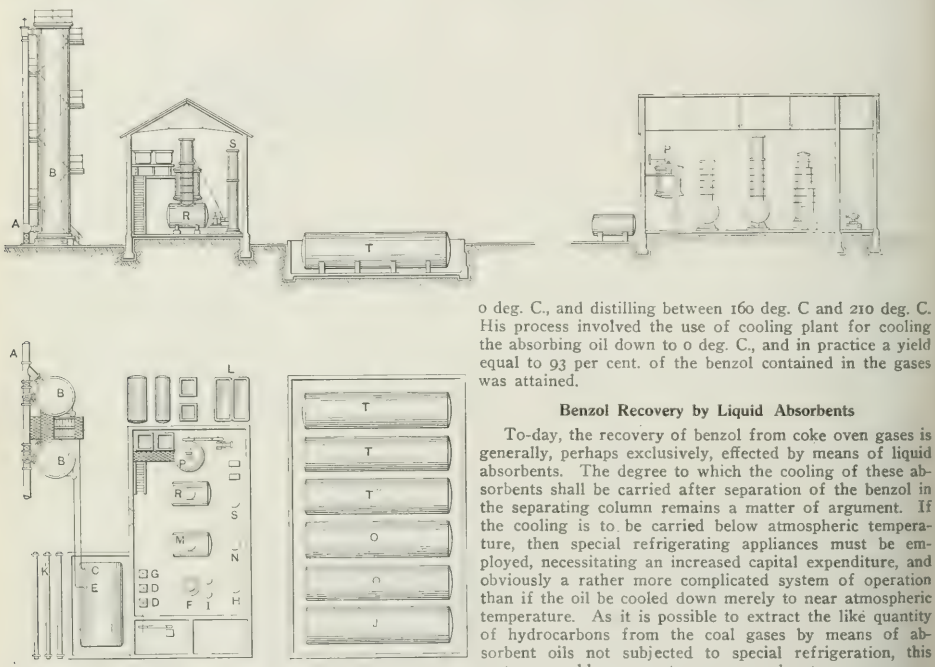


Fig. 1.—Plan and Elevation Indicating General Arrangement of a Carl Still Benzol Recovery and Rectification Plant with Washery.

The rapidly advancing demand for benzol for the aniline trades stimulated the attempts of inventors to discover means for the extraction of the benzol contained in the gases evolved in the production of furnace coke in by-product ovens. Seeing that in some cases the yield per ton of dry coal is over 2½ gal.—excluding that contained in the tars derived from the like quantity of coal, generally not exceeding 5 per cent. of the volume contained in the coal gases from the unit referred to—and that the removal of this benzol may be effected without unduly affecting the heat volume of the gases used for heating the ovens, it was natural that attempts should be made to recover this product. Various methods were suggested and tried. By cooling the coal gases to —70 deg. C., benzol will separate in the liquid form, but the obvious difficulties of employing this method on a practical scale and the high cost associated therewith preclude its adoption. Another system, that of attaining the separation by means of compression of the gases, was found to be equally impossible.

As it was well known that the heavier oils obtained from the distillation of coal tar possessed the property of absorbing benzol from coal gases, and that by this medium a simple and practical means of recovering the benzol from coke oven gases was available, the idea was made use of, and formed the subject of a patent in England in 1884 by Carves, who successfully applied the process to his own ovens. Others, notably Brunck and Huessener, worked upon the same principles, the latter using a lighter oil as his absorbent, containing no naphthalene when cooled to 0 deg. C., and distilling between 160 deg. C and 210 deg. C. His process involved the use of cooling plant for cooling the absorbing oil down to 0 deg. C., and in practice a yield equal to 93 per cent. of the benzol contained in the gases was attained.

Benzol Recovery by Liquid Absorbents

To-day, the recovery of benzol from coke oven gases is generally, perhaps exclusively, effected by means of liquid absorbents. The degree to which the cooling of these absorbents shall be carried after separation of the benzol in the separating column remains a matter of argument. If the cooling is to be carried below atmospheric temperature, then special refrigerating appliances must be employed, necessitating an increased capital expenditure, and obviously a rather more complicated system of operation than if the oil be cooled down merely to near atmospheric temperature. As it is possible to extract the like quantity of hydrocarbons from the coal gases by means of absorbent oils not subjected to special refrigeration, this system would appear to possess advantages over any system which requires refrigerating apparatus for cooling the oils prior to their use as absorbents in the gas scrubbers or other vessels.

The two most important parts of the complete apparatus for the recovery of benzol are the gas scrubbers, and the separating columns for separating the benzol from the absorbent. Obviously the former must be so proportioned and arranged as to provide the maximum of contact between absorbing oil and gas, to ensure the best results, as it must be remembered that the affinity of the oil for the benzol is considerably less than of water for ammonia. As concerns the separating column, this must be capable of continously separating the benzol and absorbent, and the separation must be complete if losses are to be avoided. The great difficulties attending the construction of this part of the plant to ensure these peremptory conditions will be better appreciated by the distiller

Until very recently, British practice—and then only on a relatively small scale—was almost entirely confined to the production of crude benzol, the buyers usually specifying that 65 per cent. should distill over at 120 deg. C. A little consideration will show that the market for this

*From the Iron and Coal Trades Review, London.
†Of Bagley, Mills & Co., London.



Fig. 2.—Exterior View of Benzol Recovery Plant.

product is an extremely narrow one, and that the producer is more or less tied to purchasers possessing the apparatus necessary for its rectification and the production of standard products having a much wider sphere of usefulness.

Further consideration discloses the fact that the producer has facilities generally very much more favorable for the production of finished products at his own works, quite apart from the above. As by this means his net results are considerably enhanced, it appears curious that so little should have been attempted in Great Britain, notwithstanding the twenty-five or more years' lead given by Germany. The answer will probably be found in the desire of most by-product coke oven owners to limit their chemical activities. A trade specification for 90 per cent., or pure, benzol, or toluol, or even solvent naphtha, is not calculated to encourage the cautious colliery agent to extend his operations into unknown fields. But, with modern plant, the advancing of crude benzol to these products and the fulfilment of the tightest specifications extant occasion no special skill, the operations being attended with less difficulty than the production of sulphate of ammonia. No one nowadays would think of disposing of crude ammoniacal liquor. The production of sulphate is a simple matter, the markets are world-wide, and the profits from the manufacturer are a prime factor in the cost of furnace coke.

The Still Type of Recovery Plant

A description is given below of a complete plant according to the system of Messrs. Carl Still, of Recklinghausen, Germany, the principal of that firm having devoted many years to the improvement and simplification of benzol recovery and rectification plant. Probably over 90 per cent. of the benzol plant in connection with coke ovens in Germany have been erected by this firm.

The ammonia-freed and cooled coke oven gases from the pressure main A, Fig. 1, ascend two of the oil scrubbers B in series. These scrubbers are provided internally with specially shaped and arranged wooden hurdles to insure the uniform distribution of the oil, fed from a number

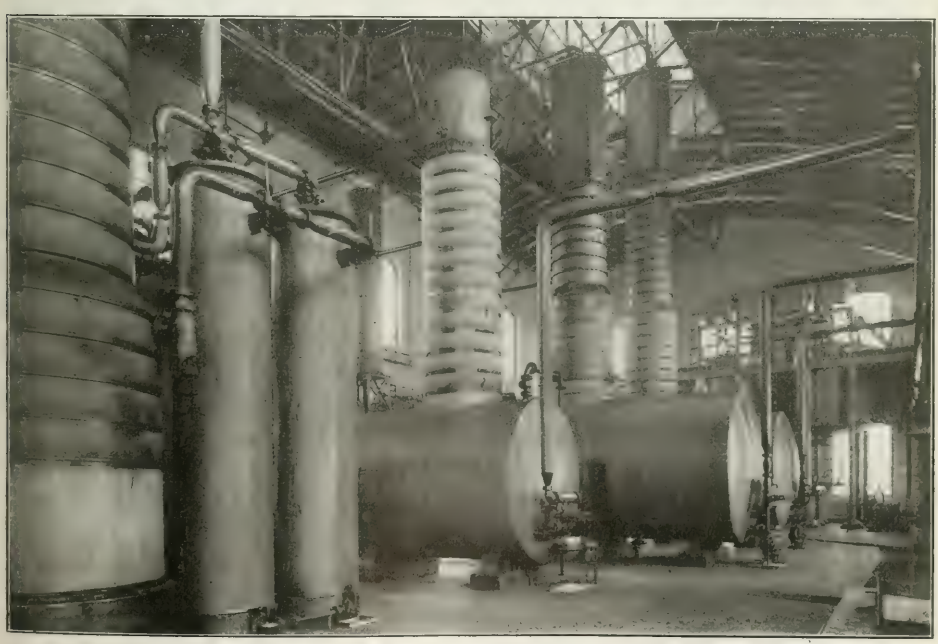


Fig. 3.—Interior View Showing Stills and Separating Columns at Benzol Plant of Gewerkschaft König Ludwig, Recklinghausen, Germany. Coke Plant Consists of 340 Ovens.

of sealed sprays situated in the top of the shell. The most intimate contact between gases and oil is a peremptory condition of operation, if the best results are to be attained. The oil flows in counter stream to the gases, and, if the scrubbers be worked in series, the partly enriched oil from the first scrubber is pumped to the second scrubber. The unsaturated and partly saturated oil is stored in the tanks C and is pumped to the scrubbers by belt-driven plunger pumps D, regulated by a by-pass. Usually one pump is provided for each scrubber, with a reserve capable of feeding any of the scrubbers. The saturated and rich oil from the scrubbers gravitates to the storage tank E. The separation of the oil and benzol is effected in the primary separating column F. This column is served by the pump G, which draws the rich oil from the storage tank E and forces it through the hot-oil coolers K, and a worm situated in the condenser H, the object being the abstraction of the useful heat from the hot oil flowing from the separating column, and the distillates. The rich oil is then forced through the pre-heaters I, provided with steam-heated worms, which bring it to the proper temperature for separation prior to entering the separating column F. Special arrangements are provided for the prevention of the frothing over of the heated rich oil in the heaters, which forms a distinctive feature of the apparatus, permitting continuous operation of the separating column. The heated rich oil flows in a downward direction through the separating column, where it is subjected to the action of live steam, finally effecting the separation of benzol and oil. The benzol vapors and steam issue from the top of the column, and are condensed in the condenser H, the lower portion of which is arranged as a separator for water and benzol. The crude benzol flows to the storage tank J, and the condensed water is returned —if needed—to the water storage tank. The now unsaturated oil passes from the separating column to the oil coolers K, a part of its useful heat being employed for raising the temperature of the rich oil, and eventually returns to the storage tank C. It will be noted that the oil is in practically continuous circulation through scrubbers, separating column, and coolers.

The product at this stage consists of crude benzol, 55 per cent. to 60 per cent. distilling over at 120 deg. C., according to the hydrocarbons of the benzene series contained in the oven gases. From the storage tank J, the crude benzol is pumped to the primary still M. This still is fitted with a special column and dephlegmator, and is heated by direct and indirect steam controlled by valves capable of extremely fine regulation. The controlling instruments of this still are so arranged that an ordinary workman can regulate the working, which divides the crude product into the desired number of fractions for producing pure 90 per cent. toluol, xylol, and solvent and heavy naphtha. Any heavier products, such as naphthalene and creosote oil, gravitate from the stil on the conclusion of the distillation to separating pans L, and are there recovered in marketable form. The fractions are condensed in the condenser N, fitted with water separators, each fraction flowing to separate storage tanks for unwashed products, O. The unwashed products are pumped separately to the washer P. This washer consists of a cylindrical vessel constructed of acid-proof material, fitted with a central agitator. The washing process has for its object the removal of impurities, the nature of which it is not proposed to describe here. First, the benzol product is treated with strong sulphuric acid, admitted to the washer from a special measuring tank fed from the acid storage tank. The acid is removed, and the product then treated with water, and afterward with a solution of caustic soda, to remove all traces of acid. For the removal of acid, water, or caustic solution, a separator is fitted underneath the washer, in order that any slight quantities of benzol or benzol product escaping with these purifying agents may be recovered and returned. A large storage tank is provided for the washed products, so that a sufficient quantity may be stored to fully charge the still, which may be working while the washing is proceeding.

From this storage tank, the final still R is charged with



Fig. 4.—Interior View Showing Stills, Separating Column and Washer at Zeche Werne, Germany.

the product to be rectified. This still is similar to the primary still M, but the dephlegmator is of a special description for producing extremely fine fractions to insure compliance with the most exacting requirements of consumers. The heating arrangements are also similar to the primary still, the same fine steam regulation being a feature for efficiently controlling the distillation. Here again, no special skill is necessary, owing to the simplicity of control. The condensates are condensed in the condensor S. At this stage a tank, divided into a number of compartments, is provided for the preliminary reception of the finished products. This provides a means of effecting any corrections prior to passing the rectified and finished products to their respective storage tanks.

The washing acid is not wasted in the Still system. After leaving the washer, the tarry acid flows to acid-proof vessels, where it is regenerated and any solid products removed. It is then quite fit for use in the ammonia house, and has no deleterious action upon the salt; indeed, its addition to the acid in the saturator is attended with beneficial results. Thus a nuisance is avoided and a source of profit created.

The consumption of steam in the entire plant is extremely low, owing to the inclusion of every available means for utilizing the waste heat in the distillates and hot oils. The power required to drive the belt-driven pumps is aproximately 15 hp. for a plant having a capacity equal to the gases from 150 ovens. It is usual to ship the bulk of the finished products in galvanized drums, each holding about 100 gal.

There are many patented and entirely novel features in the installation, to which prominence may not be given in this description. But the combined effect is to enable the whole to be controlled without trained chemists, with the minimum of labor, steam and power, and yet to produce products complying with the more arbitrary trade requirements, thus insuring a ready market. In Figs. 2, 3 and 4 are given exterior and interior views of typical plants of the Still system.

The Market for Benzol Products

Naturally, the market outlook for the various products is a matter for consideration. Fortunately an assured future for the finished products may be predicted. But as regards "crude" the maker possesses hardly one tithe of the channels for disposing of his product compared with the manufacturer of pure, washed nineties, toluol, xylol, solvent, and heavy naphtha. Some time ago attempts were made to introduce "crude" as a motor spirit. It can hardly be said to have proved a success. Containing many impurities chemically inert, its vaporization at ordinary temperatures was attended with difficulties, the deposition of carbonaceous residues on the working parts of the motor was a constant trouble, and the higher efficiency expected by increased thermal value volume for volume with petrol was hardly ever attained in practice. Now, with a properly constructed and arranged rectifying plant, the production of a motor spirit suitable for any temperature is possible, the constitutents of which may be changed at will for abnormal circumstances. To enumerate the various pure commercial products obtained from crude benzol:

Pure Benzol.—This product is largely used in the manufacture of aniline dyes, and is the base of a numerous array of such products. It is also used as a solvent and in the production of very fine varnishes.

Ninety per cent. Benzol.—The prefix "90 per cent." is used to denote the fact that 90 per cent. will distill over at a temperature of 100 deg. C. This product, likewise, is largely consumed by dye manufacturers, but its principal use would not appear to be as a motor spirit, for use in internal combustion engines. As the principal component of crude benzol, the increasing demand in this direction is one of the most favorable and promising features. Used almost exclusively in Germany, and as the preponderating constitutent of motor spirits in France, and other countries, it has found favor in Great Britain, and is likely to be in still further demand. Tests made by the writer with a specially prepared quality of benzol fully proved its superior efficiency as compared with petrol. These tests were carried out on a 40-b.h.p. four-cylinder water-cooled motor, fitted with standard apparatus for determining the power developed. The conclusion was, that by adopting proper means for carbureting the air, quite 20 per cent. less benzol was used than 0.740 petrol for a given output. These tests were further proved by practical road tests. Other uses are as a solvent, for gas enrichment, dry cleaning, etc.

Toluol.—This product, again, enters largely into the manufacture of aniline dyes, and is used in the preparation of explosives. The percentage in crude benzol varies, but the demand easily absorbs the quantities produced.

Xylol, Solvent and Heavy Naphtha.—These products may be considered together. They form a relatively small quota of the products from crude benzol, nevertheless the demand for these articles is easily sufficient for the make. Xylol and solvent naphtha are extensively used as solvents in the rubber industry, while among the uses for heavy naphtha is that of an illuminant, and for enriching certain gases.

The above brief descriptions do not pretend to denote all the uses to which the refined products from crude benzol may be put. There are a variety of other uses, and these are being periodically augmented. It suffices to show that the ability to dispose of the finished articles at remunerative prices is a real factor in the situation.

It may be argued that increased production abroad will curtail the Continental demand. This is hardly a market view. During the last nine months, with an increasing output, prices have consistently hardened, excluding solvent naphtha, which already commands a fair valuation.

As an economic factor in the production of furnace coke, the recovery and rectification of benzol plays an important part. Probably this phase of the situation appeals to the owners of coke ovens. Although no hard and fast net result per ton of coke made can be stated, owing to the differing content in the gases from various coals, from 25 cents to 35 cents per ton of coke made can be achieved, after providing for all outgoings of the usual character, so the subject from the financial side is worthy of attention. But to insure these results it may be reiterated that the plant of whatever system must be of a proven and practical description, capable of easy control with the minimum of labor. These are, and have been, the essential requirements for plants in connection with coke ovens. They will remain in force.

Results of Tests

The following results represent a number of tests at the New Barncepeth Collieries, which were recently carried out with the Still benzol plant in order to prove the guarantees given by the contractor. The results attained far exceeded the guarantees given:

(1) Pure Benol Distillation.
Charge of the still: 10.535 kg. crude benzol.
Result: 6,130 kg. pure benzol—58.1 per cent.
Test of quality: Within 0.50 deg. C., 90 per cent. distilled over. Within 0.70 deg. C., 95 per cent. distilled over.
(2) Pure Benzol Distillation.
Charge of the still: 10,377 kg. crude benzol.
Result: 7,823 kg. pure benzol—75.3 per cent.
Test of quality. Within 0.30 deg. C., 90 per cent. distilled over. Within 0.60 deg. C., 95 per cent. distilled over.
(3) Pure Benzol Distillation.
Charge of the still: 10,046 kg. crude benzol
Result: 6,781 kg. pure benzol—67.5 per cent.
Test of quality: Within 0.40 deg. C., 90 per cent. distilled over. Within 0.55 deg. C., 95 per cent. distilled over.
(4) Pure Benzol Distillation.
Charge of the still: 10,414 kg. crude benzol.
Result: 7,653 kg. pure benzol—73.4 per cent.
Test of quality: Within 0.45 deg. C. 90 per cent. distilled over. Within 0.60 deg. C., 95 per cent. distilled over.
(5) Pure Benzol Distillation.
Charge of the still: 10,297 kg. crude benzol
Result:: 8,122 kg. pure benzol—78.8 per cent.
Test of quality: Within 0.50 deg. C., 90 per cent. distilled over. Within 0.70 deg. C., 95 per cent. distilled over.
(1) Pure Toluol Distillation.
Charge of the still: 22,571 kg.
Result: 10,208 kg. pure toluol—45.2 per cent.
Test of quality: Within 0.35 deg. C., 90 per cent. distilled over. Within 0.50 deg. C., 95 per cent. distilled over.
(2) Pure Toluol Distillation.
Charge of the still: 10,911 kg.
Result: 8,184 kg. pure toluol—75 per cent.
Test of quality: Within 0.65 deg. C., 90 per cent. distilled over. Within 0.70 deg. C., 95 per cent. distilled over.

The "darkest before the dawn" period is what Franklin W. Hobbs, Brookline, Mass., president of the National Association of Cotton Manufacturers, regards the present time to be. "Such depression never has," said he, in his presidential address before the association, September 27, at Manchester, Vt., "and I believe never can long continue in our country. We now need a cessation of agitation, and then confidence will be restored and business resumed in normal proportions."

Matthews Boltless Guy Clamp

A new type of clamp for guy strands in which all bolts have been eliminated was recently patented by Claude L. Matthews and is being manufactured by W. N. Matthews & Bro., 210 North Second street, St. Louis, Mo. These clamps have been designed to do away with the use of two or more bolts, the compression of which was formerly relied upon to resist the strain put upon the guy strand. Among the advantages claimed for this clamp are ability to resist the strain put upon it, quicker application on account of the absence of the bolts and the elimination of the possibility of the strand jumping out when the clamp is drawn up to the pole on account of the spread caused by the angle. Two sizes known as the Baby and the Giant boltless guy clamps are made, the two being illustrated in Figs. 1 and 3, respectively, while Fig. 2 shows both types of clamps in use.

The Baby clamp will fit guy strands and messenger wires from 1/8 to 5/16 in. inclusive. It is designed principally for trolley span wires and all other guying where 1/4 and 5/16 in. strands are used. In installing these clamps it is simply necessary to slip the sleeve over the end of the strand before passing the latter around the pole or anchor. The end of the wire is put through the clamp again after taking the wrap around the pole or the loop through the anchor eye and the wedge is then driven toward the pole or the anchor. The clamp can also be used for taking slack out of the line. This can be easily and quickly done by first striking the wedge a light blow with a hammer and then the sleeve alternately until all the slack is out. When this has been done approximately six hard blows on the wedge with the hammer will set the clamp so tight that no further attention will be needed. The Giant clamp shown in Fig. 3 is designed for heavy strain work and will fit guy strand or messenger wire from 5/16 to 7/16 in. in diameter inclusive. This clamp, it is said, will take the place of two and in some cases three three-bolt clamps or Crosby clips, and it can be applied in approximately one-tenth the time that is necessary for putting on a three-bolt clamp.



Fig. 1.—The Baby Boltless Clamp.



Fig. 2.—The Two Types of Clamp in Use.

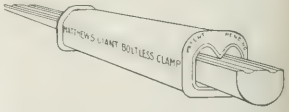


Fig. 3.—The Giant Boltless Clamp.

Two Types of Boltless Guy Clamps Made by W. N. Matthews & Bro., St. Louis, Mo.

The Stockbridge Crank Motion

Details of a Two-Piece Mechanism for Shapers

The details of the two-piece crank motion of the shaper of the Stockbridge Machine Company, Worcester, Mass., have been recently made public. The three positions of the crank at the beginning, middle and end of the cutting stroke are illustrated in Figs. 1, 2 and 3 respectively, while Fig. 4 shows the relations of the cutting stroke to the quick return together with the gear and eccentric travels and the velocity curve as computed with a 24-in. machine at the Worcester Polytechnic Institute. The straight section of the curve at the left is the cut and the loop-like curve the return.

Referring to Fig. 1, the eccentric C is mounted on and

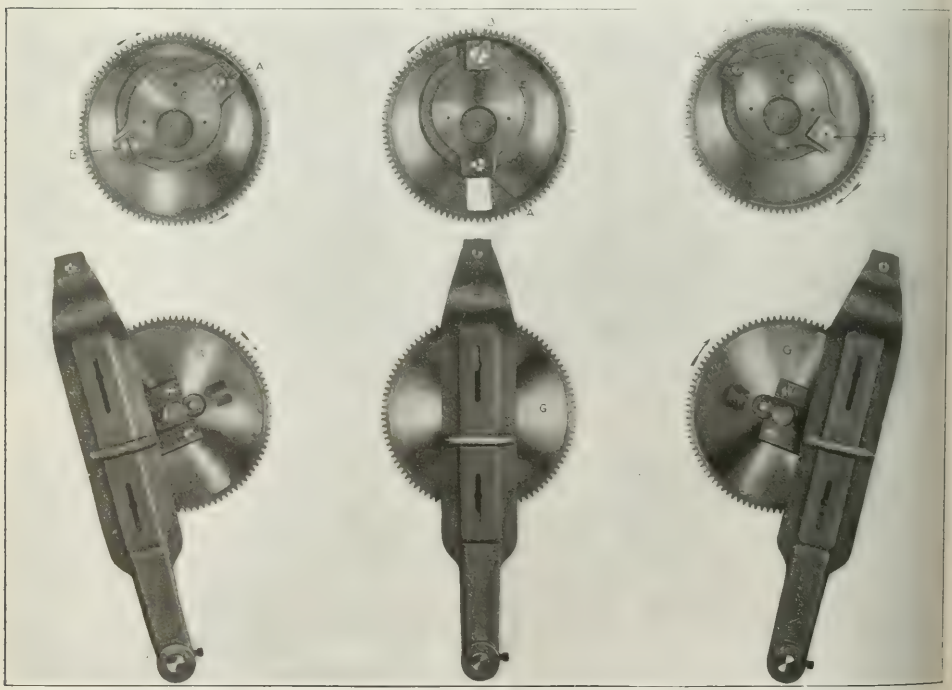


Fig. 1.—Beginning. Fig. 2.—Middle. Fig. 3.—End.

The Positions Assumed During the Cutting Stroke by the New Two-Piece Crank Motion Patented by the Stockbridge Machine Company, Worcester, Mass.

fastened to the hub of the main bearing D, which is bolted to the column. The eccentric ring E revolves on the eccentric which does not move. The gear F revolves on its own hub and transmits power to the eccentric ring through the eccentric ring gear block A, while the ring

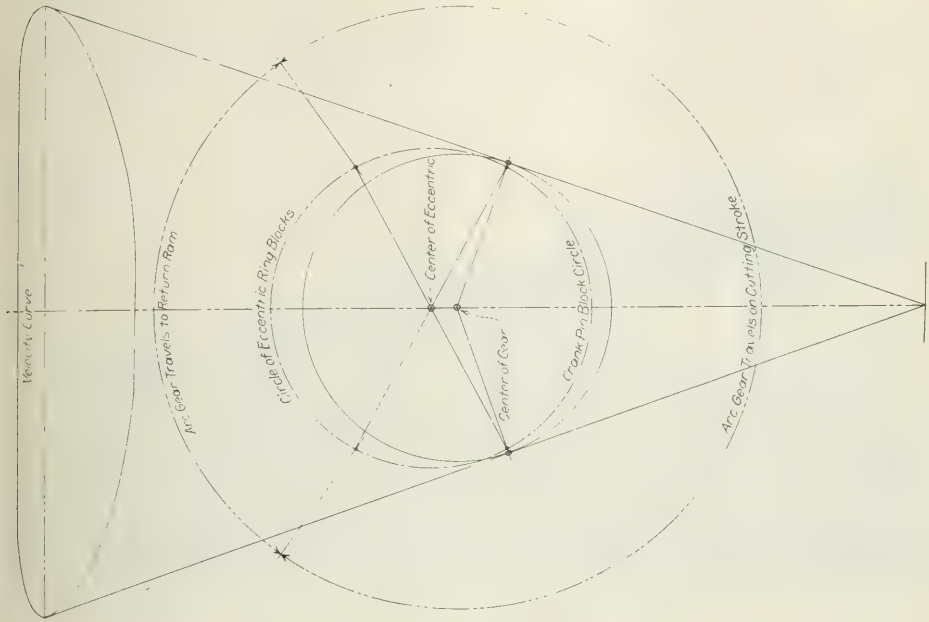


Fig. 4.—The Velocity Curve.

transmits power to the crank G, through the eccentric ring crank block B. The gear rotates at a constant speed, and this fact should be borne in mind in the following explanation of the operation of the crank motion.

In Fig. 1 the ram is about to start on the cutting stroke, while in Fig. 2 it has reached the center point. It will be noticed by comparing these two engravings that the rocker arm H is in an upright position which means that the ram has traveled one-half of the length of the cutting stroke. During this time the eccentric block A has traveled about 135 deg. It will be noticed that the eccentric ring crank block B which is diametrically opposite to the eccentric ring gear block A and connected to it by the eccentric ring E has also traveled an equal arc of its circle, and is now in a vertical position. This block, and the crank pin block I are always in the same relative position; that is the position of the rocker arm can always be determined by the position of the eccentric ring crank block or vice versa. Comparing Figs. 2 and 3 it will be noticed that the eccentric ring gear block A has moved approximately 135 deg. from its position in Fig. 2 and occupies the position corresponding to the ram at the end of the cutting stroke. This makes the total travel of the block 270 deg. during the cutting stroke while the remaining arc of the circle brings the block back to its original position.

The number of teeth in the arc which the eccentric block travels to return the ram is to the whole number of teeth in the gear, which is 96, as 3.27 is to 1. This ratio represents the actual quick return for the 24-26 in. shaper and with other sizes the ratio varies from between 3 and 4 to 1. In this way either a proportionately heavier cut can be taken or a relatively smaller amount of power consumed in taking the same cut.

Referring to Fig. 4 the circle which the eccentric ring block makes in traveling around with the gear has a radius that varies constantly from the center of the gear. This varying distance compensates for the varying speeds of the regular crank shaper ram and gives to this tool an even cutting speed throughout the entire length of cut. The speed is gradually accelerated and reaches a maximum which is retained to the end of the stroke where it drops away gradually just before reversing. The ratio on return is 3 to 1 on the full length stroke, 13 to 5 on the three-quarter stroke, 16 to 6 on the half stroke and 31 to 14 on the quarter stroke. This last ratio which is exceptionally high is maintained it is stated down to a stroke 1 in. long.

A test recently made at the Worcester Polytechnic Institute on the regular and the Stockbridge crank motions showed that 4.69 and 3.76 hp. were required by the two motions for taking a cut ¼ in. deep and 12 in. long.

Record in Building Rolling Mill Equipment

The Mesta Machine Company, Pittsburgh, Pa., which some time ago made an enviable record in building a large Corliss engine for rolling mill work in the short time of 30 days from the receipt of the order, has established a new record by building complete from the raw material to the finished product, in 24 days, one 32 x 48-in. simple Corliss engine, weighing 176,000 lb., and one 22-in. three-high puddle mill, weighing 195,000 lb., for the Sellers Mfg. Company, Chicago, Ill. There was absolutely no stock material on hand for the order, and the entire equipment was cast, forged, machined, erected complete and shipped in 24 days from the date the order was signed. This order was taken for delivery in 30 days, the principal competition in getting the order being the time of delivery. The engine is designed for heavy service, being direct connected to a mill built for rolling busheled iron for the Sellers Mfg. Company from a patented rotary busheling furnace, and it is arranged so that it can be changed to a 24-in. mill by changing the pitch of the pinions. The equipment also consists of a full complement of rolls and guides. The expedition with which this work was handled illustrates the facilities of the Mesta Machine Company for building rolling mill machinery and heavy power equipment. Its foundries, forge and machine shop are all combined in one large plant, enabling the company to put an order through its shops in regular routine.

The Mascot Stove Mfg. Company, Dalton, Ga., on November 2 will sell to the highest bidder its plant and equipment. The capacity of the plant is 250 stoves per week. The company states that satisfactory reasons will be given for selling.

Yard Installation of Cleveland Cranes

How Raw and Finished Materials Are Handled at the New Gary Plant of the American Bridge Company

The handling of material throughout the recently completed works of the American Bridge Company at Gary, Ind., is a somewhat interesting matter. A complete system of electric traveling cranes built by the Cleveland Crene & Engineering Company, Wickliffe, Ohio, has been installed. Before describing the installation a brief statement of the arrangement of the buildings, yards, etc., will assist in making the description clear. There are two main buildings 700 ft. long and 300 ft. wide which are parallel and run north and south, the shipping yard being at the former end and the receiving yard at the latter. The transfer bay, which is one of the most important parts of the plant, is located between the two main shops and connects them at their central points. The width of this bay is approximately 100 ft. and ample floor space for storage and a convenient means of communication between the shops is afforded by the bay. Fig. 1 shows the crane installation in the receiving yard, while a portion of the crane installation in the shipping yard is given in Fig. 2.

Electric driven cranes are employed for handling practically all the material in the plant. The receiving yard at the southern end of the property is 750 ft. long and 270 ft. wide. Three parallel runways each having two traveling cranes of 10-tons capacity span this yard. The arrangement of these cranes and runways is clearly shown in Fig. 1. Each of the cranes has a 90-ft. span and is equipped with two 5-ton hoists. Material is conveyed directly from the railroad tracks which run on both sides and through the center of the property to large wooden skids.

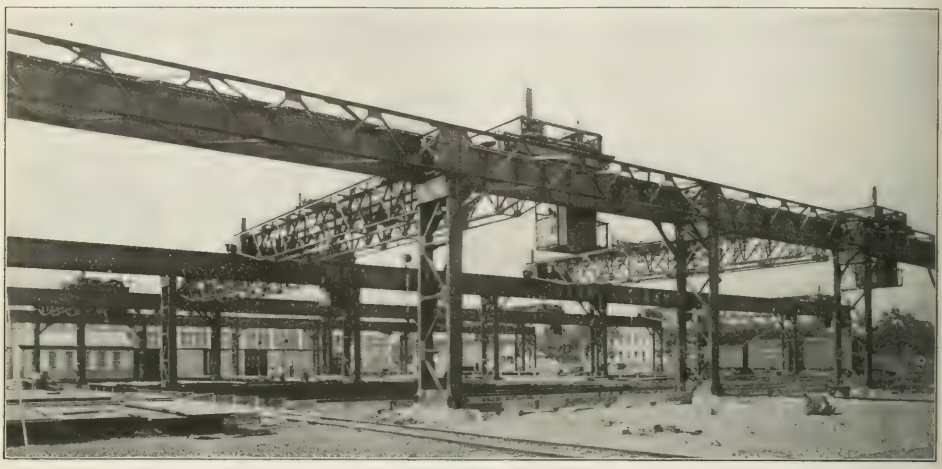


Fig. 1.—Six 10-Ton Cranes Installed in the Receiving Yard of the American Bridge Company's Gary Plant by the Cleveland Crane & Engineering Company, Wickliffe, Ohio.

The shipping yard, Fig. 2, which is at the opposite end of the plant is a trifle smaller than the receiving yard. This yard is served by four 30-ton cranes operating on 80-ft. runways and there is also a shorter runway in front of the forge and machine shops which supports a 30-ton crane of 80-ft. span. As will be noticed from the engrav-



Fig. 2.—Some of the Cranes Employed for Handling Material in the Shipping Yard.

ing this yard is provided with I-beam skids with concrete bases.

There are a number of other cranes installed throughout the plant in the rivet shop, the punch and shearing department, the finishing department, and the forge and machine shops. The installation in the rivet shop consists of a 10-ton crane having a 40-ft. span. A large receptacle is mounted on this crane and when it is filled with rivets the load is moved to the proper storage bin and discharged. In the punch and shearing department gantry cranes on 12-ft. tracks span the hydraulic riveters, those serving the 100-ton riveters having a capacity of 40 tons while those handling the output of 60-ton riveters have but 15-tons capacity. One of the special features of the crane installation is the use of a 10-ton 40-ft. span traveling crane which is intended to move machinery and a 5-ton 60-ft. traveling crane has been installed in the forge shop to take the place of the old type hand hoists. A 25-ton crane with a 60-ft. span serves the main bay of the machine shop. Working in co-operation with this large crane are 2-ton revolving traveling jib cranes which serve the machine tools. These are the only cranes in the plant which were not supplied by the Cleveland Crane & Engineering Company, and they were designed and built by the American Bridge Company itself.

The system of assembling hoists employed in the plant is worthy of special mention. These hoists operate on parallel 20-ft. runways which extend not only through the shops but also serve the transfer bay. The tracks for these hoists are located so closely that loads can reach any part of the shop or bay and a hoist can be transferred from one runway to another. In the northern end of the building there are two 40-ton 40-ft. span traveling cranes while the side bays are served by two 10-ton cranes having the same span. As an auxiliary to the crane system there is an industrial railway system of 3-ft. gauge extending throughout the entire plant. In designing this system all grades were carefully provided for and in the important departments there are four tracks.

The Storle Brass Globe Valve

The Scully Steel & Iron Company, Chicago, Ill., has recently placed on the market a new extra heavy globe valve which is known as the Storle brass globe valve. This valve

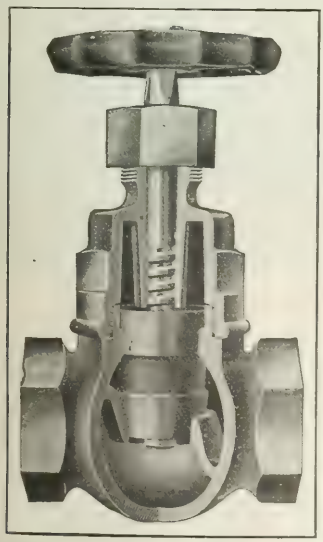


Fig. 1.—Exterior of the Storle Brass Globe Valve Made by the Scully Iron & Steel Company, Chicago, Ill.

is recommended for steam, water, oil or other liquids and exacting service conditions, and it is said to be operated more easily than the ordinary type of globe valve. An exterior view of the valve is given in Fig. 1, while Fig. 2 is a sectional view showing details of its construction.

Referring to Fig. 2 the taper plug and the two seats *a* and *b* are used in place of the single seat and disk of the old type of valve, and give an almost balanced

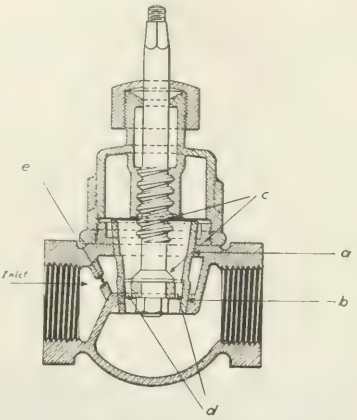


Fig. 2.—Sectional View of the Valve

valve which is easily operated under pressure. The ports *d* in the bottom of the plug allow the pressure to get to the upper seat and counteract the pressure of the lower seat, the difference between the areas of the two seats being very slight. The stem is short, which enables the valve to be used in places where a long stem would interfere with surrounding piping. The hand wheel is removable and the valve can be conveniently packed when closed and hot This packing can be done when the valve is wide open, as the two seats *c* meet and cut off the pressure in the stuffing box, which is made large enough to use ¼-in. stem packing without cramping it. The inlet is apparently opposite to that of any other valve and has an obstruction bar *e* to prevent scale from hitting the opposite side of seat *b* with full force.

Russian Iron and Steel Output in 1910.—The production of pig iron in Russia in 1910, as shown by recently published statistics, was 2,982,885 gross tons, as against 2,817,341 tons in 1909. The amount of steelmaking pig iron was 1,885,487 tons in 1910 against 1,768,306 tons in 1909. The total production of steel ingots was 3,479,153 tons in 1910; in 1909 it was 3,071,302 tons. The total of open hearth ingots was 2,835,872 tons in 1910 and 2,380,689 tons in 1909. The rail output was 482,224 tons in 1910 and 467,566 tons in 1909. Rail production is almost entirely confined to the South and the Ural districts. The production of merchant bars last year was 1,018,514 tons; of beams, 190,099 tons; of plates and sheets, 332,224 tons, and of roofing sheets, 368,386 tons. The increase in the five forms of finished material specified above was 300,000 tons over the production in 1909.

Italy's Iron and Steel Production.—The statistics of iron and steel production in Italy in 1910, as given by La Metallurgia Italiana, show the following totals, with comparisons with 1909: Iron ore, 551,259 metric tons, an increase of 46,164 tons; manganese ore, 4200 tons, a decrease of 500 tons; pig iron and blast furnace castings, 353,239 tons, an increase of 145,439 tons; steel rails, 121,370 tons, a decrease of 1920 tons.

The Lewis Institute of Chicago has issued a schedule of continuation courses which will be given evenings and Saturdays, beginning October 9. The schedule includes engineering, chemistry, physics, mathematics, drawing, languages and household arts. The mechanic arts series includes mechanical and architectural drawing, machinery drawing, machine design, lathe and milling machine work, tool and die making, pattern making, foundry and forge work. The tuition is $5 per term of 10 weeks, with $5 extra when including laboratory or shop work.

The Worthington High Duty Pumping Engine

Details of an Interesting Design Installed at Providence

BY WILLIAM SCHWANHAUSSER, NEW YORK CITY.*

On July 2, 1909, the city of Providence, R. I., issued specifications for furnishing and erecting complete at the city's water works high service pumping station, designated as Hope Station, a 10,000,000-gal. pumping engine to take the place of the Nagle pumping engine which the city had decided to remove. The new engine was to be operated with a steam pressure of 150 lb. against a discharge pressure of 65 to 75 lb. with a variable suction pressure from minus 10 lb. to plus 15 lb. The contractor was to guarantee under these conditions, absolute safety and no injury resulting from quick change of water pressure either in suction or discharge lines caused by a sudden closing of a gate or hydrant or a break in the mains.

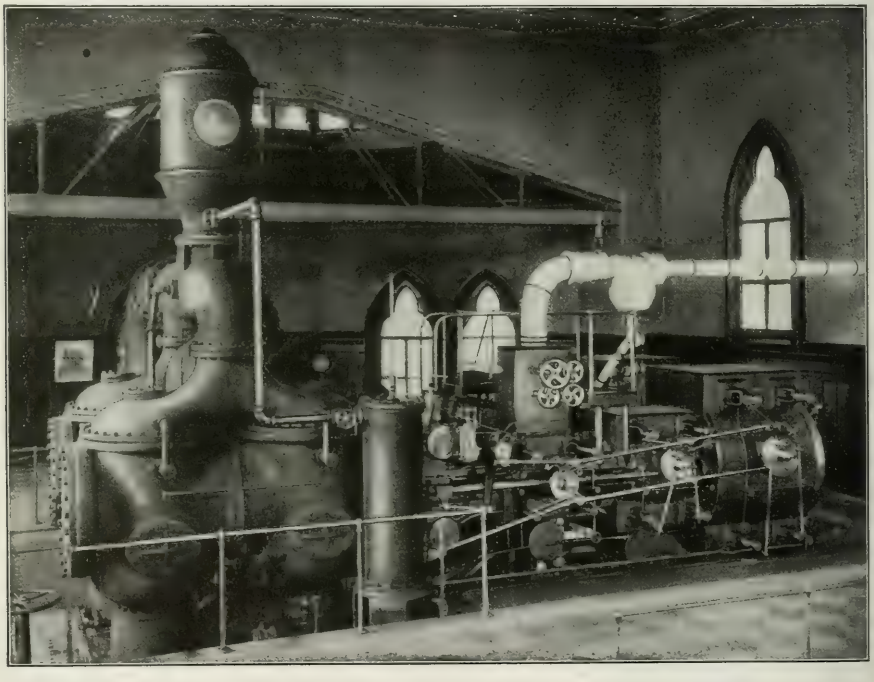


Fig. 1. The New High-Duty Pumping Engine Built for the City of Providence by Henry R. Worthington, New York City.

The bids were received on July 27, 1909, and on September 8, 1909, the city of Providence contracted with Henry R. Worthington for one Worthington horizontal high-duty triple-expansion pumping engine of a capacity of 10,000,000 gal. of water for 24 hr. against a maxmium total head not exceeding 85 lb. per square inch and a minuimum of 50 lb. per square inch. The engine was erected in the spring of 1910, and put into service in the summer of that year and has been in daily service ever since. A view of the engine is given in Fig. 1, and Fig 2 shows details of that portion of the mechanism which is employed instead of a flywheel.

As will be apparent from an examination of Fig. 1, the engine combines many features evolved for various earlier designs of the builder. The engine is of the duplex direct-acting self-contained triple-expansion high-duty type with three steam cylinders for each side arranged in tandem, each set of cylinders being directly connected to one double-acting water plunger by a special three-rod arrangement in which the plunger rod extends through the main crosshead into the high-pressure cylinder, carrying the high-pressure piston only. The low-pressure piston is connected to the main crosshead by two side rods which have the high and the low pressure cylinders between them. The low-pressure and the intermediate-pressure pistons are joined by a central piston rod, an arrangement which insures quick and easy access to each of the pistons by removing their respective cylinder heads without disturbing any other part of the engine. Both steam ends are connected to the water ends by heavy cast-iron housings, which have slides for the crossheads and journals for the oscillating cylinders of the high-duty attachment. Each of the steam cylinders has two admission valves on the top and two exhaust valves on the bottom, all of a modified Corliss type which is applicable to direct-acting pumps. The admission valves are provided with a quick-acting non-release auxiliary cut-off gear which is interposed between the wrist plate and the valve spindle cranks. The admission valves of each cylinder are thus connected to a four-arm crank fulcrumed on the wrist plate and receiving motion also from the crosshead on its own side of the engine, while the wrist plate of the main valve gear is moved from the crosshead on the opposite side in the ordinary manner of the duplex valve gear. The exhaust valves are operated directly from the wrist plate of the main valve gear as is shown in Fig. 1.

Details of the Engine

The high-duty attachment is of the standard design, each side of the engine having two oscillating cylinders the trunnions of which are carried in the bearings of the housings and containing plungers attached to the main

*Chief Engineer, International Steam Pump Company.

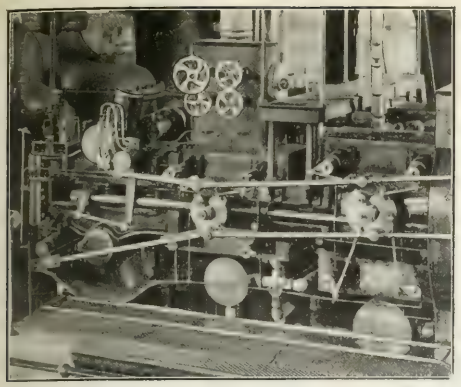


Fig. 2.—A Partial View of the Mechanism, Showing the Oscillating Cylinders Which Take the Place of a Flywheel.

crosshead. These cylinders are under constant pressure received from the discharge main of the engine and this pressure is increased to the required amount by an interposed differential accumulator. The effect of these plungers is to resist the advance of the piston rod at the beginning of the stroke and assist it at the end. By thus alternately absorbing and exerting power, due to the different angle through which the force is applied in relation to the motion of the water plungers, these compensating cylinders perform the function of a flywheel, and what is most important, the power they exert increases in almost exact ratio with the decrease of the power of the expanding steam. This arrangement is clearly illustrated in Fig. 2.

To eliminate the possibility of the engine short-stroking under variable load, a stroke-adjusting device of recent development is attached which automatically maintains a practically constant stroke of the engine. This device is so arranged as to change the back pressure of the accumulator whereby the compensating cylinder load is correspondingly increased or decreased as may be required, for the lengthening or the shortening of the stroke of the engine.

The pump ends are of the sectional plunger and ring type with suction and discharge chambers solidly bolted to the pump barrels. The latter are provided with horizontal valve decks containing multiple water valves of small diameter but sufficient area to insure quiet operation.

The condenser through which passes all of the water pumped by the engine is of the surface type and is placed in the main discharge line resting on the floor of the engine room.

The air pump is independent and of the crank and flywheel type. It is located in the basement of the station and receives its steam supply from the main steam pipe and exhausts into an auxiliary feed water heater located in the boiler room through which the feed water, after being passed through the main exhaust heater, is fed to the boilers by an independent feed pump.

The engine is equipped with two high-pressure steam cylinders each 16 in. in diameter, two intermediate steam cylinders each 25 in. in diameter, two low-pressure steam cylinders each 46 in. in diameter and two double-acting water plungers each 24 in. in diameter, all having a common stroke of 24 in.

The design represents the latest practice in pumping engines of this type. The results obtained at the official trials are given in the accompanying table which was taken from the city engineer's report.

The contract with the city of Providence specified that when pumping at the rate of 10,000,000 U. S. gal. for 24 hr. based on plunger displacement against an average water pressure of 65 lb., the engine shall perform a duty of 135,000,000 foot-pounds per 1000 lb. of dry steam, and when pumping at the rate of 7,000,000 U. S. gal. for 24 hr. against the above water pressure, it shall perform a duty of 120,000,000 foot-pounds for every 1000 lb. of dry steam consumed, the duty to be computed upon the difference of the heat units in the steam at the throttle and in the feed water returned to the boilers.

Test Results

The official duty trials were made on September 1 and 2, 1910, the city of Providence being represented by Otis F. Clapp, city engineer, and Henry R. Worthington by Noble C. Butler, Jr., of its engineering staff. The principal data and results of these trials are as follows:

Test No.	1	2	3
Dates of trials, 1910	Sept. 1	Sept. 2	Sept. 2
Duration, hr.	6	3	4
Steam pressure, lb. per sq. in.	151.4	151.2	151.9
Vacuum, in. mercury	27.45	27.67	27.75
Barometer, in. mercury	29.94	30.02	30.00
Discharge pressure, lb. per sq. in.	73.14	79.94	73.64
Suction pressure, lb. per sq. in.	5.13	5.70	6.37
Distance between gauges, ft.	1.310	1.258	1.268
Distance between gauges, lb. per sq. in.	0.57	0.84	0.55
Total pressure pumped against, lb. per sq. in.	67.54	73.70	66.72
Average stroke of engine, in.	24.55	24.68	24.77
Revolutions of engine	14,175.	4,899.	6,178.
Speed, r.p.m.	39.38	27.22	25.74
Piston speed, ft. per min.	162.4	112.0	106.3
Water pumped, million gal.	2.713	0.935	1.183
Capacity, rate per 24 hr., million gal.	10.85	7.48	7.10
Total steam used, lb.	25,429.	9,832.	11,475.
Moisture in steam, per cent.	1.71	2.38	2.38
Total dry steam used, lb.	24,987.	9,598.	11,202.
Duty per 1000 lb. steam used, million ft.-lb.	138.6	135.0	132.6
Duty per 1000 lb. dry steam, million ft.-lb.	141.0	138.3	135.8
Water horsepower	296.7	93.5	192.0
Dry steam per water horsepower per hour, lb.	14.04	14.81	14.59

As may be seen from the above table, the engine was subjected in tests Nos. 1 and 3 to conditions approximating those called for in the contract. Under full load the duty exceeded the guarantee by 4.5 per cent., while under the reduced capacity the guarantee was exceeded by 12.5 per cent. The additional credit for heat returned to the boilers as provided for in the contract is not included in the above figures. With this allowance, however, the engine is credited with a duty of 149.5 million foot-pounds per 1000 lb. of dry steam when operating under full load and with a duty of 142 million foot-pounds per 1000 lb. of dry steam when delivering 7,000,000 gal. for 24 hr. exceeding the guarantee by 10.5 and 18 per cent respectively. Test No. 2 represents the results when pumping directly into the open high service. The Fruit Hill reservoir (high service) receiving the surplus and suction being taken from the Hope reservoir on the low service. The conditions are those met in their daily service.

To demonstrate how the engine would operate under the various conditions encountered in actual service at this station, additional trials were made by pumping into the open as well as the closed high service, Fruit Hill reservoir being shut off, with suction taken from the Hope reservoir and again with suction from the street mains.

Last, but not least, the city made a test in conjunction with the fire department to ascertain how the engine would act in case of a fire. While pumping both into the open and closed service, a number of streams from street hydrants were suddenly opened and this very severe condition was safely met by the engine. During the latter trials, the engine was operated at capacities varying from 5,000,000 to 10,000,000 gal. per 24 hr. and under these capacities was subjected to fluctuations in suction pressure of from minus 8 lb. to plus 6 lb. and delivery pressures of from plus 40 to 90 lb.

The Lake Superior Iron & Chemical Company will hold a stockholders' meeting October 14, when a vote will be taken on making an issue of $1,000,000 in 6 per cent. five-year notes, to be secured by a pledge of an issue of $1,500,000 second mortgage ten-year 6 per cent. bonds also to be authorized at the meeting and to be secured by a lien on the property subject only to the lien of the first mortgage of July 1, 1910. The notes are to be sold at not less than 92½ per cent. and interest.

The Humphrey Machine Company, Keene, N. H., found its business increasing in the past year, and is now adding a new core room to its foundry in order to give the space now occupied in that way to additional molders. The company manufactures turbine water wheels, rotary fire pumps, automatic clutches and wood working machinery.

New Chilled Roll Process

A Recent Development of the National Roll & Foundry Company

Blast chilled rolls are a departure now being introduced in the Pittsburgh district by the National Roll & Foundry Company, Avonmore, Pa., which is manufacturing sheet and tin plate rolls under patents granted to J. B. Baird. This process is one of the most recent departures from the old way of making chilled rolls and it is claimed that not only is a perfectly even chill produced but a surface is given to a sheet or tin plate roll which is practically the same as that given by the water chilling process without the risk of internal stresses in the metal. Fig. 1 shows a group of sheet and tin plate rolls made in this way, while views of the mold assembled for casting a blast chilled roll and partly dismantled are given in Figs. 2 and 3, respectively. In Fig. 4 the positions of the various parts before being attached to the mold are illustrated.

The process on which Mr. Baird has secured patents employs an ordinary air blast that cools the roll fast and at the same time does not instantly cool the charcoal iron mixture. The time of cooling is absolutely within the power of the operator so that the mixture can be set rapidly to get the necessary polish for the face and then have the body cooled gradually to eliminate the casting stresses. Other advantages claimed for this process are simplicity, practicability, an even depth of chill and the absence of wave marks on the finished sheets, which is one of the objections sometimes urged against rolls.

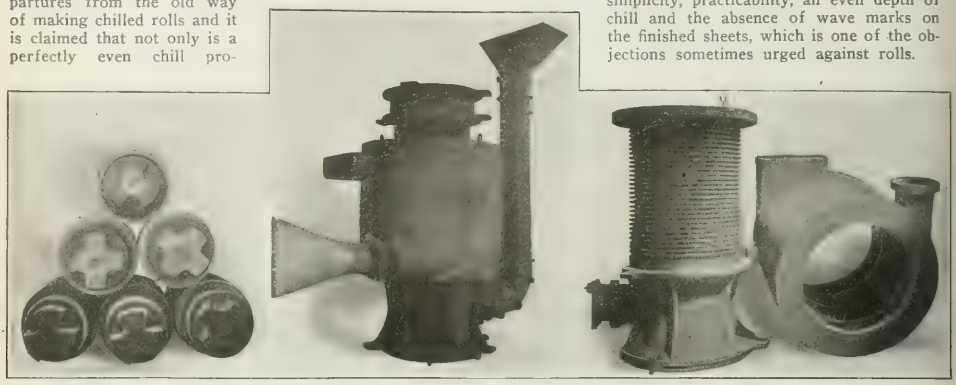
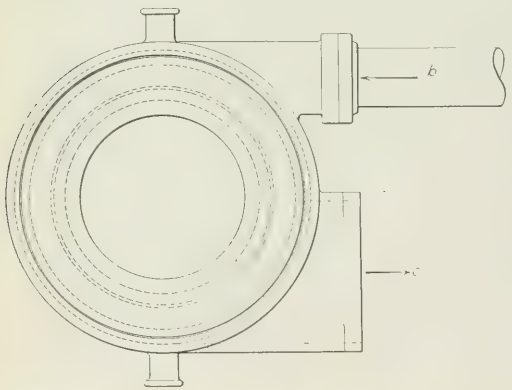


Fig. 1.—A Group of Rolls. Fig. 2.—The Mold Assembled for Casting. Fig. 3.—View of the Mold Partly Dismantled.
Views Showing the New Process for Making Chilled Rolls Patented by the National Roll & Foundry Company, Avonmore, Pa.

In making rolls by the new air blast process a mold is used which has the blast pipe connected to the chilling section of the mold as shown in Fig. 2. This pipe is connected at the outer end to a large blower capable of furnishing the blast for several molds at a pressure sufficiently high to enable the operator to control the cooling effect at will by manipulating the gate valve shown where the blast enters the mold. A thermometer is placed in the rectangular opening near the top of the chill proper to indicate the temperature of the blast at the point of egress from the mold. This temperature in conjunction with the air pressure being used for the blast gives an indication of the speed of the cooling operation.

The chilling section of the mold which is designed to enable the heat from the body of the roll casting contained in it to be radiated quickly is shown in Fig. 3. This arrangement produces and retains an even depth of chill and prevents reannealing of the chilled roll face, but does not, it is pointed out, interfere with the elimination of casting strains in the body of the roll proper. The outer casing shows the circular inlet for the blast connection and the spiral grooves in the interior through which the air must pass before reaching the rectangular opening through which the air escapes with its burden of heat into the atmosphere.



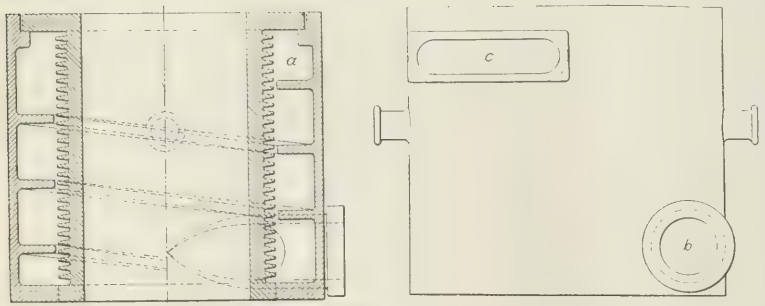


Fig. 4.—Sectional Elevation Showing the Position of the Various Parts Before Attachment to Mold.

Referring to Fig. 4 which shows the position of the various parts before attachment to the mold there is an air space, *a*, existing between the outer and inner walls through which the blast under pressure is forced continually from a blower. The temperature of the iron mold is controlled at will as the blast is increased or decreased, thus regulating the volume of air that passes through the mold.

This is secured by connecting the 10-in. blast pipe to one end of the iron mold *b*, and exhausting the heat-laden air into the atmosphere at the other end of the mold *c*, the thermometer being placed in the exhaust to show the heat that is absorbed from the mold by the air blast. In this way the temperature of the chilling mold is placed absolutely within the power of the operator by varying the amount of blast used. The even depth of chill which is thus produced is clearly illustrated in Fig. 1 which shows a group of sheet and tin plate rolls made by the blast chilled process. The photograph from which this engraving was reproduced was taken looking at the sinking head end of the roll which is the point where most of the unevenness is usually said to occur.

No International Aluminum Syndicate

The American Metal Market has the following concerning the plan for an International Aluminum Syndicate:

The negotiations which have been proceeding for some time past with the object of re-establishing an international aluminum syndicate can now be regarded, as was reported at a recent board meeting of the Neuhausen Aluminum Industry Company, as having entirely miscarried. As there appears no prospect of an understanding between the principal European producers being reached for some time, the Neuhausen Company proposes to proceed with the scheme for the raising of fresh capital, which was postponed a little time ago in view of a possible resuscitation of the International Syndicate. It is intended to make an issue through a Swiss syndicate, headed by the Swiss Credit Anstalt and the Swiss Bank Verein, of £240,000 in 4½% bonds, the proceeds being devoted to defraying the cost of erecting new plants and extinguishing the bank debt. The company already has a loan which was raised to the amount of £240,000 in 1897 and 1899, but which had been reduced to £206,000 by the end of 1910.

The consumption of aluminum in the United States in the past six years, as compared with 1900 and 1890 has been as follows:

	Pounds.		Pounds.
1890	61,000	1907	17,211,000
1900	7,150,000	1908	11,152,000
1905	11,347,000	1909	34,210,000
1906	14,910,000	1910	47,734,000

The value of the exports of aluminum and of manufactures of aluminum of domestic production for the last five years has been as follows:

1906	$364,521	1909	$567,375
1907	304,938	1910	949,215
1908	330,092		

Cloth pinions developed by the General Electric Company are made of a filler of cotton or similar material confined, at a pressure of several tons to the square inch, between steel shrouds or side plates, the whole structure being held together by means of rivets, or, in case of very small pinions, by threaded sleeves. After the teeth are cut the cloth filler is impregnated with oil. The teeth are cut to the 14½ deg. involute system according to Brown & Sharpe's standard. The teeth are stronger, it is asserted, than those of any other type of non-metallic pinion, and are sufficiently elastic to allow the meshing teeth to bear evenly across the full width of face, thereby enabling the combination to absorb shocks. Cloth pinions are particularly suitable for use on the shafts of back geared motors employed for driving lathes, planers, drill presses, shears, punches, and other machine tools.

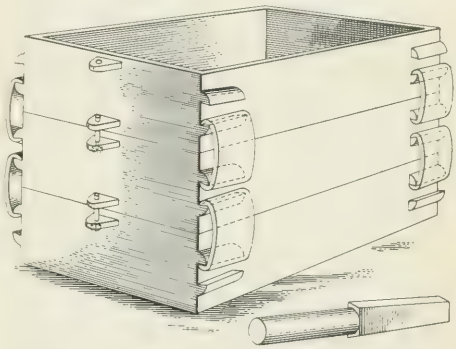
The R. W. Whitehurst Company, Norfolk, Va., manufacturer of agricultural implements and sundry specialties, is finding business this year fully 20 per cent. better than ever before up to the same time. Its factory is now running full, being very busy on cider mills and wine presses. Quite a number of orders have been received for spring delivery, while orders for earlier shipment have been coming in freely. The company has, in fact, found business so excellent that this year it put quite a quantity of new machinery in its plant.

The Charles Bond Company, 520 Arch street, Philadelphia, with works at Manheim, Pa., has recently installed a new press and other machinery to handle increased business in its line of leather belting.

New Molder's Flask

A patent has been recently granted Louis J. Kreutzberg, 147 South Ninth street, Easton, Pa., covering an improved type of molding flask. The principal feature of the new flask is the use of any number of copes which are fastened together to form practically a single unit and a novel method of fastening so that the several parts of the flask can be fastened or unfastened quickly. In addition to the use of a sectional cope a series of lugs are permanently attached to the copes and the drags of the flask to receive handles for lifting these parts or for transporting them.

The flask is provided with the usual perforated end lugs for the insertion of steel guide pins which are threaded and secured by nuts. The sections composing the flask are identical and can be assembled by clamps which engage lugs on the adjacent sides of contiguous sections. The exterior surfaces of the lugs are curved, while the internal faces are flat, inclining toward each other and tapering off toward one end. The clamps resemble a capital C in shape and have tapered clamping faces to correspond with the lugs. In this way it is possible to assemble any number of sections to give the desired depth of cope or drag. In the accompanying engraving a three-section flask is illustrated and the construction



A New Type of Molder's Flask Manufactured by L. J. Kreutzberg, Easton, Pa.

of the lugs and clamps is clearly shown. If desired the two lugs on one corner of each section can also be used as a socket in which a specially designed handle may be fitted. This handle, which is shown detached in the lower portion of the engraving, is made with faces to conform to the taper and the inclination of the lugs.

After the mold has been set up the handles may be withdrawn from the lugs, an arrangement which renders the flask less apt to be disturbed, since there are no projecting arms. Although this flask is intended to be made of either iron or steel, the principles embodied in its construction can nevertheless be applied to wood flasks advantageously. In this case the lugs on the ends and the sides, the pins, the clamps and the handles can be furnished separately. The use of the lugs on the sides enables long handles to be employed in foundries where heavy work has to be handled and cranes are lacking. The flasks are made in a number of standard sizes and can be furnished for special purposes as desired. All the portions subject to the greatest strains are reinforced with an extra thickness of metal to decrease all chance of breakage.

The Manheim Mfg. & Belting Company, Manheim, Pa., has just completed a reinforced concrete building, 140 x 170 ft., and is installing in it a large quantity of imported machinery with the expectation of being in full operation manufacturing Veelos balata belting before the end of October. This belting has enjoyed a high reputation in England and on the Continent for some years, having been manufactured extensively by Turner Brothers, Ltd., Rochdale, England. A large trade has been enjoyed in this country by the imported article, and the machinery and equipment of the Manheim Company are duplicates of those in the Turner factory.

The Machinery Markets

The export demand continues to command the attention of the machinery trade in all directions. Inquiries for equipment to both South America and Europe are heavy and sales have been large. Business is good in the New York market, and large sales have been made in Buffalo and vicinity. The export trade keeps up well in Baltimore, but the local demand is dull. Business is irregular in Philadelphia, although good sales of special machinery have been made in that market. A slight improvement is noted in New England, where machine tools are being sold to automobile manufacturers in the Middle West. Trade in Cincinnati is scattered, although a better demand has developed for boilers for heating purposes, and the export business is good. Inquiries are better in Cleveland and the call for machine tools is picking up, lathes being in the greatest demand. Metal-working machinery is selling more readily in Detroit, and some factory additions which should result in business are planned in that vicinity. An engineering firm is asking for bids on a large list of machinery in Chicago, and the Chicago, Rock Island & Pacific Railroad is in the market for a number of lathes. Boilers, motors and other power equipment are in good demand in the South, and water-power projects there promise to develop a call for some large amounts of machinery. The market is not very active on the Pacific coast excepting the demand for logging and mill equipment, which holds up well, and an increased call for motors and pumping machinery.

New York

NEW YORK, October 4, 1911.

September was an excellent month with many New York machinery houses and some of the best business done this year was placed in Buffalo, where new manufacturing enterprises continued to keep the market strong in that territory. The export demand is especially good and one New York export house has placed some large business for American machine tool builders with a railroad, whose headquarters are in Paris, France. A great deal of the machinery sold was built in Cincinnati and some New England manufacturers participated. It is understood that the engineering firm that has been inquiring for equipment for a Japanese steel plant has not yet filled its requirements. This list calls for some heavy metal working machinery. No buying has been done yet against the large South American list mentioned last week. It is now generally known that the equipment is intended for a Brazilian railroad. A firm of dealers and a firm which controls a number of machine tool manufacturing plants are bidding against each other on the general contract. The war between Italy and Turkey is not affecting the machinery trade, as some large shipments of mechanical equipment for Italian automobile plants have been made the last few days and export firms here have been informed that orders placed from Italy are to be filled as usual. It is expected that both the Mack Bros. Motor Car Company, of Allentown, Pa., and the Saurer Motor Truck Company, Plainfield, N. J., will soon buy equipment for additions. These companies have been merged under the name of the International Motor Truck Company, but their purchasing affairs will be directed as before. The Saurer Company has not yet filled its requirements, for the additions recently made to its plant and is buying machinery from time to time. The Mack Bros. Company is preparing a list to provide for an addition now under way. The Delaware, Lackawanna & Western Railroad is making up a list of machinery for some of its mining enterprises. The list is being prepared at Scranton, Pa., but the machinery will probably be purchased from the company's New York office. There are some good inquiries in this market from the South. The Holt Motor Engine Company, Franklin, N. C., is asking for bids on a few machine tools.

The Department of Public Charities, New York, will receive bids until October 13 for removing old and furnishing and installing new laundry machinery and appliances at the Kings County Hospital, Borough of Brooklyn.

The piano case factory of Joseph W. Courtade, 1130 Grand street, Hoboken, N. J., was damaged by fire September 28. The loss was confined to its power equipment, plans for the replacement of which are being made.

The Empire Tank & Pump Company, 30 Church street, New York, has been incorporated with a capital stock of $20,000 to manufacture and deal in steel tanks for the storage of paints, gasoline, etc. William M. Horne is secretary of the company.

The Binghamton Ice Cream Company, Binghamton, N. Y., has had plans prepared for an addition to its works, 60 x 85 ft. The company will be in the market soon for a steam boiler and freight elevator.

The Morris Machine Works, Baldwinsville, N. Y., has had plans prepared for an addition to its erecting shop, 50 x 175 ft., of steel and brick construction.

The contract has been awarded to John B. Dower, Ballston Spa, N. Y., for the installation of water works in the Washington County Almshouse buildings at Argyle, N. Y.

The Albany Saw Works Company, Albany, N. Y., has been incorporated with a capital stock of $50,000, to manufacture saws of all kinds. E. F. and E. L. Decker and H. H. Mills, of Albany, are the incorporators.

The Castle Lamp Company, of Amesbury, Mass., has its new factory at Elmira, N. Y., well under way and upon completion will remove its plant to the latter city.

The Northport Novelty Company has been incorporated at Northport N. Y., with a capital stock of $100,000 by A. Schroeder, of East Northport; L. Levine, Bath Beach, and J. S. Snyder, New York City, to engage in the manufacture of chemical compounds and compositions.

Wm. J. White will establish a plant for the manufacture of chewing gum at Niagara Falls, N. Y. The factory building of the defunct Niagara Folding Box Company has been taken over and will at once be equipped with the necessary machinery.

The Industrial Engineering Company, 30 Church street, New York, has received the contract from the Rochester Stamping Company, 141 Jones street, Rochester, for the erection of a four-story and basement factory building on Saratoga avenue, 60 x 109 ft.

The Luitwieler Pumping Engine Company, Rochester, has completed plans for the enlargement of its factory at 123-125 Ames street, and will at once award contracts for a wing addition 60 x 135 ft. and two stories of brick, steel and concrete construction.

The Great Northern Mfg. Company, Rochester, has been incorporated with a capital stock of $100,000 to manufacture motion picture machinery, etc., and will establish a plant for the purpose. The incorporators are G. A. and H. A. Wood and A. S. Knight, Rochester.

The Syracuse Ornamental Company, 581 South Clinton street, Syracuse, N. Y., is having plans prepared for a factory building, which it will erect early next spring. Adolph M. Holstein is president of the company.

The Parmelee Mfg. Company has been incorporated at Buffalo, N. Y., by Wm. H. Parmelee and Allen H. Hunter, with a capital stock of $25,000, to engage in the manufacture of toilet articles, drugs and medicines. Arrangements are being made for a manufacturing plant.

The Western New York Water Company, 518-520 Ellicott Square Building, Buffalo, is receiving bids for a filtration plant, which it will install in connection with its 10,000,000 gal. water works at Niagara Falls, N. Y.

The Pratt & Letchworth Company, Buffalo, has completed plans for an 80-ft. extension to its steel castings building.

Consulting Engineers Witmer & Brown, Chapin Block, Buffalo, have been engaged to design a water works system for Brockport, N. Y. The water supply may be taken from Lake Ontario, in which case the cost will be about $250,000.

The Erie Reduction Company, Erie, Pa., is completing arrangements for the rebuilding of its plant, which was recently destroyed by fire.

THE MACHINERY MARKETS

New England

BOSTON, MASS., October 3, 1911.

A slight improvement is noted in general business. The situation is not an even one; as has been the case for several years a wide variation exists as to prosperity, or the lack of it, in individual works. But the average has probably improved. The automobile builders are working at high capacity, and this influence is felt quite largely, even to the extent of considerable orders for machine tools from the Middle West. Men are talking more encouragingly, in spite of the various influences which have been creating uncertainty and unrest. More inquiries are reported by the machinery people, but orders have not increased greatly. Large quantities of machine tools are being manufactured for stock, plenty of confidence existing that the market will absorb every available machine when the tide fairly turns. It is pointed out that the period of quiet business has been so long that the latent demand has increased in a large way, and that the country's demand for machinery will be proportionately greater. The wire business of Worcester is very good, including the American Steel & Wire Company's works, and those of the independent companies, the largest of which are the Wright Wire Company, the Spencer Wire Company and the Morgan Spring Company. Many of their customers are still buying from hand to mouth, but the number of repeat orders is increasing. Taken as a whole, the New England situation is responding to some extent to the influences of the autumn.

The Billings & Spencer Company, Hartford, Conn., manufacturer of machinists' tools, drop forgings and forging machinery, will erect a brick addition, 35 x 60 ft., one story, which will be devoted to heat treating, annealing and hardening steel, and will be equipped with the most modern appliances for those purposes.

The Russell & Erwin Mfg. Company, New Britain, Conn., manufacturer of hardware, will build a factory, six stories and basement, to contain about 45,000 sq. ft. of floor space. The building will be used for manufacturing purposes only, to take care of increasing business. Work will be rushed that the building may be available for occupancy at the earliest possible date.

Fay & Scott, Dexter, Me., manufacturer of machine tools, has just completed extensive additions to its works, including a building 40 x 100 ft., two stories; another 34 x 42 ft., three stories, and a third 60 x 90 ft., one story.

The Sampo Mfg. Company has removed its factory from Gardner to Fitchburg, Mass., and will continue the manufacture of hand and power pumps, hydraulic, force and fire pumps, of types invented by the company's engineers. A new Massachusetts corporation has been formed, with authorized capital stock of $100,000. Andrew Hannula is the president; George Silpola, vice-president, and Henry Hopponen, treasurer. A specialty is a pump which can be attached to an automobile for fire purposes, with a capacity of from 500 to 600 gal. per minute. Kallie Koskinen, an expert Finnish engineer, has been made superintendent of the plant, and will have entire charge of manufacturing and developing the line.

The Ames Sword Company, Chicopee, Mass., has elected I. Homer Sweetser, Boston, its president, to succeed the late John D. Bryant, and Charles A. Bulkley, Chicopee, clerk and treasurer, to succeed the late Gamaliel Bradford. Mr. Bulkley and A. L. Howard, Boston, were elected directors. Mr. Bulkley has been the superintendent of the plant.

The Aerial Construction Company, Hartford, Conn., which was referred to last week, will establish its factory at Hartford, where the various parts will be made with the exception of the vulcanized balloon material and the 75-hp. motors. The company's engineer has not yet completed the specifications for materials for the first machine. The personnel of the company is a strong one, including F. C. Billings, vice-president of the Billings & Spencer Company, its treasurer, and F. W. Stickle, president of the Capitol Foundry Company, its vice-president. The purpose is to build a commercial airship, combining a dirigible and aeroplane, with cigar-shaped gas bag 24 x 135 ft., containing hydrogen gas, giving a lifting power of 3585 lbs., and capable of carrying seven passengers and pilot. It is proposed to erect a hangar at Hartford, where options on land have been obtained.

The Rowbottom Machine Company, Waterbury, Conn., will erect a two-story brick addition 26 x 40 ft., which will be used for general increase in floor space. No new equipment will be needed.

The Mason Regulator Company, 158 Summer street, Boston, Mass., is erecting a foundry building at its works, Dorchester, Mass., of brick, steel and cement, to be used exclusively for brass work. The furnaces will be set on a level with the main floor, so that pots may be handled easily by means of cranes, with little damage to the operator. Improved air-driven molding machines will be installed, and electric motors will be used to drive the snagging, burnishing and other machines. There will be fireproof vaults for the storage of patterns and duplicate sets of drawings.

The Scovill Mfg. Company, Waterbury, Conn., manufacturer of brass and brass goods, proposes to increase its capital stock to $5,000,000 by the issuing of 9486 shares of stock at $100. The purpose is to liquidate investments in equipment and real estate already made, and no plans for immediate extension are under discussion.

The Pope Mfg. Company, Hartford, Conn., has come under New England control by the election to the directorate of Charles E. Walker, the vice-president; Wilbur C. Walker, the secretary, and Frank A. Drury, president of the Merchants' National Bank, Worcester, Mass., succeeding New York interests who have disposed of their stock holdings. Arthur W. Pope, Boston, has been made chairman of the board of directors.

The McLagon Foundry, New Haven, Conn., is operating again after its serious fire. The main foundry building was pretty well cleaned out, but the power heating and lighting equipment, in another building, escaped with little damage. Molding and melting were resumed after only three days' stop, under a temporary roof, and it is expected that the plant will be closed in before cold weather.

The Merrick Lumber Company will erect a woodworking mill at Holyoke, Mass.

The Manufacturers' Foundry Company, Waterbury, Conn., will build an addition to its pattern shop.

Philadelphia

PHILADELPHIA, PA., October 3, 1911.

In few instances has the volume of business transacted during September shown any pronounced gain over that of the previous month, buying has, as a rule, been scattered and the demand hesitating. In occasional instances builders have been a shade more active, but not sufficiently so to materially influence plant operations. Current business continues of an irregular nature. The same hesitancy is apparent in the closing of pending negotiations, prospective buyers waiting, in many cases, more definite information as to future business before increasing their present equipment. Industrial conditions generally can scarcely be looked upon as favorable to the machine tool trade; the larger iron and steel-working plants are operating on a comparatively low rate, while industrial establishments show little improvement. Locomotive builders have but little work ahead, although the past week has brought out a few more orders for railroad cars. The shipbuilding trade looks much more promising; quite a number of inquiries for good-sized vessels are being figured on and more business is in sight. Reports from manufacturers of special machinery are more favorable than from builders of the usual standard type equipment. In instances builders of the former class of machinery have been quite busy and report order books in satisfactory condition; in other cases, however, the situation is not as favorable. Purchases come from a widely scattered territory, mostly, however, from the Western districts. Buying by consumers in this immediate territory is reported as being extremely light. There is the same lack of buying by railroads, some of the recent inquiries from roads in this vicinity still being unclosed. The engine, boiler and second-hand machinery trade continues on an irregular basis, buying has been light and widely scattered. In a few instances the foundry trade reports a somewhat better run of orders and a slightly larger melt is to be noted, consistent gains are, however, still lacking.

H. B. Underwood & Co. have been taking a fair average volume of orders for their various lines of special shop repair tools, although the demand has been of an irregular nature. Some little export business has developed and tools, including a portable boring bar, have been shipped to Japan. This concern has been quite active in its general engine and machinery

THE MACHINERY MARKETS

repair department, as a result of which its plant has been operating on a comparatively good basis.

Dodge, Day & Zimmerman, constructing and contracting engineers, report the demand for new industrial projects as being very quiet. Several small propositions are in the preliminary stage, but the larger propositions, for which negotiations have been under way for some little time, develop very slowly. No important contracts in the way of plant construction have recently been closed.

It is reported that plans have been completed by Carl P. Berger, architect, for an eight-story brick and concrete warehouse, 70 x 170 ft., to be erected in the vicinity of Fifth and Race streets, for A. Hartung. Steam heating and electric lighting systems are to be installed.

The American Pulley Company is operating its plant on a fairly even basis, at practically full capacity. The demand for its steel pulleys has been comparatively good, orders being numerous but usually small individually. The export trade continues active and shipments have recently been made to England, Sweden, Switzerland, Holland and several South American countries.

The New Engineering & Construction Company was recently chartered in Delaware with a capital stock of $100,000. The incorporators named are George G. Stiegler, George W. Dillman and B. M. Grawl, all of Wilmington, Del.

Sealed proposals will be taken until October 15 by the Building Commission of the Homeopathic State Hospital for the Insane, Hanover Township, near Allentown, Pa., for the construction of a pump house, pumping, piping, etc., for the water supply at that institution. Plans and specifications may be obtained from Philip H. Johnson, consulting engineer and architect, 1824 Land Title Building, Philadelphia.

The Hess Machine Works reports a fair inquiry for its line of file making as well as for special machinery. The foreign demand has been a trifle less active, although the domestic business continues fair. Several sets of file-making machinery have been recently shipped for export, including one set for parties in Germany.

The Machinists' Supply Company, Pittsburgh, Pa., is in the market for a number of rose bit countersinking drills for air reamers.

Baltimore

BALTIMORE, MD., October 3, 1911.

General conditions during September were rather unfavorable than otherwise in the iron, steel and machinery trades in the vicinity. In instances exceptions may be noted, but the bulk of the activity in industrial establishments came from orders already on hand rather than from any increase in current business. Consumers in practically all lines make purchases with extreme conservatism and stocks on hand are in most cases extremely light. Fabricators of iron and steel work have been somewhat better engaged, but the work is made up of numerous small propositions developing both locally and in the South. Export business has aided materially in bringing up the total volume of business in some lines. Machine tool builders as well as merchants report practically unchanged conditions, and buying of metal-working machinery of the standard type has been light, although some improvement on the demand for wood-working tools is reported. As a rule purchases continue of the small lot and single tool character. Builders of special tools and machinery continue fairly active. Municipal work, in which the trade is interested, develops but slowly. Some few small contracts for power equipment have been placed. Railroad buying of machinery, tools and equipment continue light. Proposed terminal betterments on the part of some of the local roads are, however, going forward.

There has been the usual seasonable quieting down in purchases of contractors' equipment, while considerable irregularity in the purchases of shop and mill supplies is reported. The demand for second-hand machinery and tools continues dull and reflects the general market situation. Some scattered buying of engines and boilers is reported, but installations called for are usually small. Boiler and tank makers are somewhat better engaged. Heating and ventilating engineers have considerable work on hand, which is being pushed to completion before cold weather sets in. The demand for castings is unsatisfactory, and foundry plants are operating on an irregular basis. The outlook for any general betterment in immediate business is not considered particularly encouraging; probably purchasers, being influenced by general unfavorable business conditions within as well as outside of the trade, show marked hesitancy in coming into the market for anything beyond immediate needs.

John D. Adt reports the demand for special machinery as being well maintained. Considerable business in tobacco machinery, both for export and domestic buyers, is pending, as is also a fair amount of elevator work. The plant is being operated at full time with full forces, and sufficient work is on hand to keep it so engaged for some time ahead.

Contracts are still held up for the heating and power plant to be installed in the new addition under construction for the Maryland Casualty Company. No definite date for the awarding of these contracts has been named.

The Ellicott Machine Company has recently booked a number of orders, including several for large hydraulic dredges. Its plant is now fairly busy. Inquiries are more numerous and a more encouraging view of the future business situation is reported.

Wallace Stebbins & Sons have taken several good orders recently for boilers, both for high and low-pressure service, but the demand for engines drags. Two boilers will be installed in the Women's Hospital, while one will be furnished Diffen, Langdon & Co., of this city. A fair amount of business in heating and ventilating work has been booked, while the demand for small tools and shop supplies is reported fair.

The Monumental Brewing Company has acquired additional property at 3909 to 3913 East Lombard street, and will erect a brew house 90 x 110 ft., and a garage 16 x 75 ft. on the site. The plans have been made by Otto C. Wolf, Philadelphia, Pa. Bids are now being taken for brewing and ice-making machinery, that for power purposes having been provided for.

The Aumen Machinery & Supply Company reports orders for machinery and tools as being fair, the aggregate for September showing a slight improvement over that for the previous month. Wood-working machinery and tools have been in proportionate better demand than metal-working tools. Orders have for the most part been confined to single tools, with an occasional sale covering a few medium-sized tools. No list of tools from any possible near future purchaser is reported, although a few inquiries for lots of several tools are noted. Machine shop and mill supplies are reported in moderate demand.

The Tube Bending and Polishing Machine Company, which has practically completed the installation of the equipment of its new plant at Bayard and Carrol streets, has formally organized, the following officers being elected: President, H. D. Bush; vice-president, M. C. Keith; secretary-treasurer, E. S. Hyde, and assistant treasurer, W. M. Bush. The company will manufacture tube-bending machines and polishing machines under patents of L. H. Brinkman. While the plant is now in operation some of the machinery purchased still remains to be installed. Considerable business has already been entered on the order books and the plant is expected to be placed in full operation in the near future.

The T. C. Bashor Company has taken considerable new business recently and is more actively engaged in various departments. Several good orders for boilers are reported, while some good size tank work has been taken for the Davidson Chemical Company, of this city, and the Pennsylvania Water & Power Company, McCall's Ferry, Pa. The contract for the engine and generator for the Baltimore sewage disposal plant has been awarded to this company and a Skinner engine and Fort Wayne generator will be installed. A contract has also been taken for the supervision of the erection of a plant for the Taft Fish Company and for the installation of the power plant, machinery and equipment in connection with it. The Bashor company is particularly busy with work in hand, and reports the outlook for business as considerably improved, except in the department of shop and railroad equipment supplies, the demand for which continues very quiet.

City permits have been taken out for the erection of the new ice-making plant of the American Ice Company, on Franklin street, near Pulaski street. It is said that the contract for the buildings has been awarded and that the Frick Company, Waynesboro, Pa., will furnish the ice-making machinery. The plant will comprise a manufacturing building, a storage building and a power house.

THE MACHINERY MARKETS

The Baltimore Gas Appliance & Mfg. Company, which had expected to get its new plant in operation by October 1, has been delayed by the non-arrival of some of the machinery, particularly that for its sheet metal stamping department. It is now stated by H. W. Hunter, president of the company, that the foundry department will be started about October 15, while other departments will not be operated until a later date. The whole plant, however, will be running full before the end of the year. This concern has not fully completed purchases for equipment and supplies. It is still in the market for tinners' equipment, and a number of raw materials, including pig iron, sheets, pipe, etc.

Crook, Kries & Co. have taken several good contracts, embracing power equipment and heating installations, among which is an order for three 150-hp. high-pressure return tubular boilers for the Sherwood Distillery, Cockeysville, Md., and two 100-hp. high-pressure boilers for a local institution. A contract for the heating and ventilating work for the Palais Royal, Washington, D. C., has been entered, as has also one for the heating and pipe work in connection with new buildings erected for the Maryland Tuberculosis Hospital, Sybillaville, Md. The Crook, Kries company is busy in all departments of its plant, which is being operated at full capacity.

The International Cable Railway Company, American Building, Baltimore, has been incorporated with a capital stock of $250,000, and will engage in the manufacture and construction of overhead cable railways for the transportation of ore, coal, clay, sand, timber, stone or other materials. The officers of the company are as follows: H. S. Robinson, president; H. D. Bush, vice-president; Eugene H. Ober, secretary, and N. H. Arthur, treasurer. The company has already one cable road in operation, and is considering the location of a plant in this city to manufacture the equipment.

The business of the E. J. Codd Company, 700 South Carolina street, Baltimore, builder of boilers, tanks, machinists' and millwright supplies, has been taken over by a new company organized by Thomas D. Penniman, Henry H. Wiegand and Charles Goldsborough.

Chicago

CHICAGO, ILL., October 3, 1911.

General inquiry for machine tools in this market during the past week has brought out a somewhat improved condition. Several Milwaukee concerns, including a steel foundry, are in the market for one or two tools. The Calumet Engineering Works at Harvey, Ill., is about to resume its activity, and is in the market for tools aggregating in value several thousand dollars. The inquiry of the Austin Mfg. Company, Harvey, remains unclosed, which condition is also true of the other large inquiries in the market. It is now understood that the large Chicago & Alton Railroad machinery list was sent out in advance of an appropriation being made for it. The Chicago, Rock Island & Pacific is inquiring for five lathes, including two 18-in., one 27-in., one 14-in. tool room lathe, and one 3-in. turret lathe.

The Harbeck Motors Company, Chicago, has been organized by A. T. Irwin, R. S. Hartman and Charles Bexnorz, with a capital stock of $50,000, to engage in the operation of a foundry and general machinery manufacture.

The Armitage Avenue Cabinet Company, Chicago, has taken out a permit providing for the erection of a one-story broom factory to cost $4,000.

The Wm. Foster Mfg. Company, Springfield, Ill., is increasing its capital stock from $15,000 to $50,000. This company is a manufacturer of metal ceilings, skylights and general sheet metal work. The increase in capital is intended to provide for an enlargement of the company's plant. The company was formerly known as the Wm. Foster & Sons Company.

Andrew Kopperud, Milwaukee, has purchased two acres on Thirty-ninth avenue, upon which a fireproof factory building is to be erected for the manufacture of well-drilling machinery. The building is to be 60 x 100 ft., and the project is to involve an expenditure of $20,000.

The city of Thief River Falls, Minn., recently authorized bonds to the amount of $40,000 to provide for the construction of an auxiliary steam plant for augmenting the city electric lighting station.

The city of Milwaukee, Wis., has received bids covering the construction of a power plant to utilize the waste steam generated at the garbage incinerator plant. Estimated cost of the power plant is $60,000.

The Wolf River Company, New London, Wis., has begun the construction of an addition to its chair manufacturing plant, to include one building 71 x 124 ft., and the other 96 x 128 ft. New machinery will be required.

The Kretchmer Mfg. Company, Council Bluffs, Iowa, has added to its tank manufacturing plant an addition 50 x 100 ft., one story.

The Lana Construction Company, Council Bluffs, Iowa, is contemplating a factory construction proposition to cost $20,000. The plans include increased equipment.

At Deep River, Iowa, a special election established the unanimous vote in favor of a bond issue for the purpose of installing an electric lighting plant.

O. F. Peterson, of Des Moines, Iowa, was granted a 25-year franchise providing for the erection of an electric light and heating plant at Iowa Falls.

The Green Bay Soap Company, Green Bay, Wis., has begun the construction of an addition to its plant in connection with which new machinery will be required.

The Rushville Furniture Company, Rushville, Ind., recently mentioned as having been incorporated, is now ready for some of its equipment, and will shortly let contract for boiler, feed and service pumps, piping, etc., for its heating plant.

The Prest-O-Lite Company, Indianapolis, Ind., has taken out a permit for the erection of a two-story concrete factory in that city to cost $12,000.

The American Steel & Wire Company has acquired the American Post Company, Laporte, Ind. It is the plan to move the acquired plant to the DeKalb Works.

The Specialty Mfg. Company, Anderson, Ind., has been organized with a capital stock of $20,000 by Thos. Gettle and John Winkelmeyer, of that city, to manufacture slashers and stamp machines.

Ball Bros., Muncie, Ind., are adding to their present equipment a zinc plating factory where the plating work required in their fruit jar plant will be done.

The Fort Wayne Electric Company, Fort Wayne, Ind., has in process of construction an addition to its works.

The Lafayette Safe & Lock Works, Lafayette, Ind., is completing an extensive addition to its plant.

Cincinnati

CINCINNATI, OHIO, October 3, 1911.

Business with the local machine tool builders continues rather scattering, with the export trade still holding up fairly well. A few tool makers are running on full time, but the majority still find it necessary to curtail the output of their plants.

The demand for boilers for heating purposes is good, and as the tank business is also fair, the boiler-making shops are kept busy. Second-hand machinery of all kinds is moving slowly.

The local steamfitters are out on a strike, but adjustments satisfactory to all concerned are expected to be made within a short period.

The foremen's class of the Cincinnati Continuation School will be reorganized October 6, and judging from the individual reports received by Dean J. H. Renshaw, the class this season will have probably a larger attendance than during the last season. On the same date mentioned the superintendents of the various shops in this vicinity will begin their regular visits to the school for the purpose of giving each class of apprentices a short lecture on different shop topics. The first few weeks of the opening session will be taken care of by the following superintendents: George Langen, Cincinnati Planer Company; S. E. Weir, Triumph Electric Company; W. H. Shafer, Cincinnati Bickford Tool Company, and Henry Ritter, of the Lunkenheimer Company.

The Pollak Steel Company, Cincinnati, is a new incorporation with $400,000 capital stock, to take over the business of the Block & Pollak Iron Company, and it is understood that the plant at Carthage for the manufacture of car axles and other specialties will soon be greatly enlarged. The incorporators of the new company are Emil, E. P. and B. E. Pollak, Charles Judah and E. M. Johnson. Emil Pollak will be president.

Work on the proposed $250,000 fertilizer factory for

THE MACHINERY MARKETS

the Virginia-Carolina Chemical Company to be located in a Cincinnati suburb will be commenced within a few days. The company's headquarters are in New York City.

It is reported that the Wood Shovel & Tool Company, Piqua, Ohio, has had plans prepared for a new plant of steel and concrete construction.

The new brick foundry on Buck street, Cincinnati, now under construction for the Cincinnati Steel Castings Company, is nearly completed, and will probably be in full operation before December 1.

The Blair Mfg. Company, Newark, Ohio, has been incorporated with $300,000 capital stock, and it is stated that the company intends to manufacture automobiles. Frank K. Blair is one of the principal incorporators.

The Ironton Electric Company, Ironton, Ohio, has increased its capital stock to $15,000.

The new plant of the Cincinnati Lathe & Tool Company, at Oakley, Ohio, is nearly completed, and work on installing the necessary machinery will begin before November 1.

The Allyn Engineering Company, whose incorporation was recently noted, will not erect a building for its own use at Oakley as has been reported, but is engaged solely in designing and constructing manufacturing plants in different parts of the country. Temporary offices have been opened in the Lyric Building, Cincinnati.

Devore & McGoormley, Toledo, Ohio, have prepared plans for the new factory of the McNaul Boiler & Mfg. Company, of Toledo, recently mentioned.

The Ironton Shear & Punch Works, Ironton, Ohio, has under erection a large addition to its plant, 97 x 262 ft. The Riverside Bridge Company, Martins Ferry, Ohio, is erecting the steel.

Cleveland

CLEVELAND, OHIO, October 3, 1911.

October starts out with a slightly better volume of inquiry for machine tools, and dealers are looking for a more active market this month than in September. Taken as a whole, September was a disappointing month to the dealers, although in the last two weeks the market began to show a little life. In the past week a fair volume of business in single tools was booked, some of the orders being for large tools. The demand for lathes was most active. Orders came from several sources for one or two screw machines each. The improved demand for these machines, however, appears to be local rather than general. Among new inquiries are one for five large tools and another for 12 to 15 small tools. The demand for second-hand machinery is only moderate.

A northern Ohio crane builder has recently taken some good orders for crane equipment for Canadian steel plants. Considerable other crane business is in prospect. The Youngstown Sheet & Tube Company is expected to place orders shortly for a 40-ton and a 60-ton standard crane and for ladle, soaking pit, yard and special cranes for its new open-hearth plant and finishing mills. Another recent inquiry is from the Pittsburgh Crucible Steel Company for 29 cranes for its Midland plant. Reports from manufacturers who have visited Canada recently are to the effect that business conditions are quite satisfactory there and that the outlook is promising for a good volume of Canadian business for American machinery manufacturers.

The Peerless Gear Tester Mfg. Company, Cleveland, was recently incorporated with $50,000 capital stock by Worthington Hoyt, L. H. Mesker, W. B. Hale, R. L. Matthews and A. W. Kilbourne, to manufacture a gear tester invented by R. L. Swartz, which gives a reading in thousandths of an inch in the variation in the pitch diameter, concentricity and thickness of teeth in gears, both bevel and spur gears.

The Morgan Engineering Company, Alliance, Ohio, has just shipped four cranes to the Page-Hersey Iron Tube & Lead Company, Welland, Ont., to be installed in addition to its pipe plant. The Morgan company has also recently received the following orders: One 40-ton crane, three 30-ton cranes, and an open-hearth floor charging machine for a new steel castings plant at the Longue Point works of the Steel Foundry Company, Montreal; two ladle cranes, two standard cranes, a stripper and soaking pit crane for the Algoma Steel Company, Sault Ste Marie, Ont., and a ladle crane, a soaking pit crane and a large standard crane with a span of 107 ft. 6 in. for the Minnesota Steel Company, Duluth.

The Warren Tool & Foundry Company, Warren, Ohio, has been incorporated with a capital stock of $100,000 to build a plant for the manufacture of tools and forgings. The Warren Board of Trade has contracted to furnish the company a site, the company agreeing to invest $35,000 in buildings and machinery. It is planned to start work on the plant at once and have it in January. The incorporators are James D. Robertson, O. R. Grimmesey, George Braden, Z. F. Craver and R. A. Cobb.

The National Welder Company, a new concern in Warren, Ohio, will establish a plant in the old Monarch lamp factory in that city for the manufacture of a new electric welding machine. The company has been incorporated with a capital stock of $10,000. Burt C. Taylor, the president and manager, was formerly mechanical engineer of the Winfield Mfg. Company, Warren, maker of welders. Fred P. McBerty is secretary and treasurer. The company's offices will be located at 28½ Main street, Warren.

The Buckeye Twist Drill Company, Alliance, Ohio, recently incorporated with a capital stock of $150,000, will shortly begin the erection of a plant in that city for the manufacture of twist drills and allied products. A one-story building, 60 x 175 ft., will be erected.

The Lucas Machine Tool Company, Cleveland, has awarded a contract for an extension to its machine shop, 40 x 170 ft. and one story. It will be of brick and steel construction.

The Mather & Waechter Company, Cleveland, machinist, has awarded contracts for the erection of a two-story addition to its plant, 40 x 50 ft., of steel and concrete construction. The company will probaby buy some additional machinery a little later.

The Silver Mfg. Company, Salem, Ohio, reports that its agricultural implement trade this year has broken former records and that its sales in carriage makers,' woodworkers' and blacksmiths' tools have been very good. Its foreign trade is very satisfactory. The company recently doubled the capacity of its foundry by erecting an addition, 60 x 100 ft.

Specifications have been issued for the foundry equipment for the new West Technical High School, Cleveland, for which bids will be received October 16. These include a 24-in. cupola, a tumbling barrel, a portable core oven, a brass furnace, a blower and a large quantity of small foundry tools and equipment.

The Faultless Rubber Company, Ashland, Ohio, has let a contract for the erection of a large addition to its plant.

The American Multigraph Company, Cleveland, has increased its capital stock from $1,000,000 to $2,000,000.

The Eco-thermo Stove Company has established a factory in Warren, Ohio, in a portion of the plant recently used by the Denison Mfg. Company. The company manufactures a combination stove and fireless cooker.

The Robinson & Albright Packing Company, Marysville, Ohio, has been incorporated with a capital stock of $25,000 and will erect a two-story brick packing plant.

The Alliance Brass & Bronze Company, Alliance, Ohio, will shortly move into a new plant.

The Defiance Carriage Company, Defiance, Ohio, has commenced the erection of a new plant. The building will be two stories, of brick and mill construction and wil contain 24,000 sq. ft. of floor space.

The Virden Mfg. Company, Cleveland, is now located in its new factory, 6011 to 6019 Longfellow avenue and 2166 Ashland road. It claims that this factory is the largest of its kind in this country. It makes the V. M. C. brand of brass goods.

Detroit

DETROIT, MICH., October 3, 1911.

Scarcely any changes have developed in the local machinery market. Dealers are receiving a fair number of inquiries, but a hesitancy about the closing of business which is pending is noted. Floor sales have been relatively unimportant. Metal working machinery is selling more actively than other lines at present, and the smaller classes of tools of this nature are in fairly good demand. Orders, however, are for small lots only. The automobile plants and manufacturers of auto parts and accessories are unusually busy, and although these industries have been heavy purchasers of tools and were thought to be well supplied for a considerable period, the announcement of various additions and improvements to be made in a number of plants gives rise to the opinion among local dealers that some good business may soon be expected from this source.

THE MACHINERY MARKETS

A good deal of general construction work is being done throughout the city and figures are being asked on a number of small factory additions.

The Studebaker Corporation, owner of the local E-M-F automobile plants, has decided upon extensions involving the expenditure of $1,400,000. The company has acquired a large tract of land adjoining the present Clark avenue plant and will erect thereon a large steel stamping plant, warehouses, parts factory, etc., at a cost of $1,000,000. Additions to the Piquette avenue plant and the re-equipping of the old Ford plant will involve another $400,000. Work on the improvements is to be started at once.

The United States Motor Company will soon establish a factory for the manufacture of parts for cars of past seasons' models. The plan will involve the installation of a large amount of special machinery. The location of the new plant has not been definitely decided upon as yet.

The A. E. White Machine Works, Eau Claire, Wis., has purchased a site adjoining the Hupp property and will erect a cement factory building thereon at a cost of approximately $6,000. The building will be 50 x 100 ft., and will be equipped for the manufacture of sawmill machinery. Work will be started at once.

The Crown Hat Mfg. Company has been incorporated with a capital stock of $150,000 by A. D. Mitchell, M. W. Deacon and Nathan Rittenmeier.

A new company has been incorporated under the style of the National Antiseptic Faucet Company for the manufacture of a patent faucet. The capital stock is given at $20,000, with Victor E. Schratz as the principal stockholder.

A large factory for the manufacture of fruit packages is to be erected at Berrien Springs, Mich., by Robert Totzke, of St. Joseph, Mich. The factory will have a capacity of 5,000,000 packages annually.

The Lamb Boat Works, Harbor Springs, Mich., has plans for the erection of an addition 50 x 100 ft., to take care of its rapidly increasing business.

The Havers Motor Car Company, Port Huron, Mich., is making improvements to its plant, which will practically double the floor space now utilized by the company.

The Saginaw Plate Glass Company, Saginaw, Mich., will begin work October 1 on a large addition to its plant. The new part of the factory will be 125 x 750 ft. in dimensions and of reinforced concrete construction, and it is stated that the building and equipment will cost in the neighborhood of $200,000. Extensive additions will be made to the mechanical equipment, including some special machines for the manufacture of large plates of glass.

The Belding-Hall Company, Belding, Mich., manufacturer of refrigerators, has under construction additions to its machine shop, warehouse and dry kilns.

The Cleveland-Cliffs Iron Company is constructing a hydroelectric power station near Marquette, Mich., which is to furnish power to all the company's mines and shops. The power plant will be 48 x 85 ft., and will be equipped with two units each of 4,000 hp. The transmission lines, which will distribute the power, will cover a territory of 40 miles.

The Lansing Wheelbarrow Company, Lansing, Mich., has filed notice of an increase of capital stock from $665,000 to $1,000,000. A. C. Stebbins, secretary of the company, states that no additions are to be made to the company's plant at present.

H. W. Demmon and associates are contemplating the establishment of a large canning factory at Coral, Mich.

The St. Johns Portable Building Company, St. Johns, Mich., builder of portable houses, has plans under way for an addition to its factory, 68 x 100 ft. in size.

The Industrial Works, Bay City, Mich., is purchasing a site in which a new machine shop will be erected. The new addition will be 125 x 350 ft., and with the mechanical equipment will involve an outlay of $200,000.

The Holland Gas Company, Holland, Mich., has secured a renewal of its franchise and will at once begin improvements to its plant; $50,000 will be expended.

The Iron Range Lumber & Cedar Company will erect a large saw mill at Pentoga, Mich., this fall. Separate shingle, lath and floor mills will also be built, all of fireproof construction. C. J. Huebel, of Menominee, is president of the company.

The Standard Condensed Milk Company has been organized at Deford, Mich., with a capital stock of $60,000. W. M. Neeper is president of the company. Considerable machinery will be required.

The Calumet & Hecla Mining Company has completed plans for the construction of a regrinding mill at Lake Linden, Mich. The building will be equipped with pebble mills to handle tailings.

Negotiations are being constructed for the removal of the shoe factory operated by Eady & Plant at Otsego, Mich., to Paw Paw, Mich.

The Lake Superior Iron & Chemical Company, Grand Rapids, Mich., is adding to its Newbury, Mich. plant, a new battery of retort ovens. This is one of several additions to this plant which have been completed or are in process of construction, and the expenditure involved has been estimated at $300,000.

The Jackson-Church Company, Saginaw, Mich., has plans prepared providing for the construction of a boiler shop, machine shop and foundry.

The South

LOUISVILLE, KY., October 3, 1911.

The close of the first fall month finds the machinery situation in a satisfactory condition. The volume of business handled has been just about normal, and the number of prospects in hand is sufficient to insure an average trade, at least, for the next month. Buyers have been closing more readily than they did a few weeks ago, and this has helped considerably. Boilers, motors and other power equipment are in good demand. There are numerous water-power projects being developed in the South which will require an enormous amount of equipment. The establishment of public service enterprises continues on a large scale as well.

Fairbanks, Morse & Co., who have a Louisville branch at 517 West Main street, were not damaged by the fire which destroyed a wholesale establishment two doors above. A report was erroneously printed in the daily newspapers that this concern suffered damage of $50,000.

Owing to the fact that the State of Kentucky, which purchased some power equipment from Fairbanks, Morse & Co., for installation in the Eddyville penitentiary, found it necessary to transfer the engine to Frankfort because of the break-down of the power plant there, the State Board of Control will probably purchase an additional unit for the plant at Eddyville.

The Isbell-Chapman Electric Company, Bowling Green, Ky., electrical contractor, has changed its name to the William H. Isbell Electrical Company.

It is reported that St. Louis clay products manufacturers are considering establishing a plant near Hawesville, Ky., where there is a large deposit of high-class clay.

The Moore-Young Electric Company, Lexington, Ky., has completed the installation of the equipment in the municipal lighting plant of Midway, Ky. The plant cost $4,000.

The Consolidation Coal Company, Baltimore, which is developing coal properties in Eastern Kentucky, is starting sawmills in Letcher County for the purpose of manufacturing material for the construction of an industrial town on Wright's Fork. A contract for the buildings has been let to the Nicola Building Company, Pittsburgh.

The Oman Stone Company, Bowling Green, Ky., is installing machinery for the operation of a limestone quarry.

J. B. Vardman, Elizabeth, and William Ansbrack, Louisville, are establishing a steam laundry at Elizabethtown, Ky. A building has been secured and equipment will be purchased immediately.

B. C. Baker, Burkesville, Ky., representing Eastern interests, is arranging for the installation of drilling machinery and the development of oil lands in that section of the State.

The United States Coal & Oil Company, Holden, W. Va., has purchased 25,000 acres of coal land on Blackbury Creek in eastern Kentucky and plans immediate development. Paul Hardy is general manager.

The Stony Fork Coal Company, Middlesboro, Ky., is installing new machinery. A contract has been let for a coal washer of the Tamaqua, Pa., Mfg. Company.

The Beech Creek Mining Company, Beech Creek, Ky., has been incorporated with $6,000 capital stock by A. D. Kirkpatrick, R. R. Kirkpatrick and John Sadler, Jr.

The Interstate Coal Company, Middlesboro, Ky., has purchased 800 acres of coal lands on Tye Fork, in Knox County, from the Tye Fork Coal Company for $50,000. Openings for mines will be made at once.

THE MACHINERY MARKETS

The Hicks Sheet Metal Works, Knoxville, Tenn., has taken over the machinery and stocks of G. R. Williams and will conduct its business at 1206 Grand avenue. J. C. Hicks is the proprietor.

The Southern Electrotype Company, Memphis, Tenn., will establish a foundry, it is reported. A building has already been secured.

The Nashville, Tenn., Industrial Bureau reports that it is negotiating with the following concerns with reference to establishing plants in that city: Wells-Jones Plow Company, Jackson, Tenn.; Landen-Grimsley Fire Escape Company, Monterey, Tenn.; John T. Cowley, Pittsburgh, Pa., steel cars; American Cash Register Company, Columbus, Ohio; C. D. Butterwaugh, Mishawaka, Ind., ornamental street lighting fixtures.

The Hager-Elliott Engineering Company, Nashville, Tenn., has completed the construction of a garage and plant for the manufacture of automobile parts. E. O. Elliott is general manager of the company.

H. R. Blauvelt, Knoxville, Tenn., is quoted as saying that work will begin in 90 days on the erection of a cement mill by a company to be organized with Eastern capital.

James Shingleton has been appointed superintendent of the electrical department of the Nashville Machine Company, Nashville, Tenn. The concern has secured the contract for the motor equipment to be installed at Belmont College, Nashville.

The Louisville & Nashville is building car repair shops at Etowah, Tenn. The shops will cost $20,000.

A good demand for high-grade turbines is reported by the Davis Foundry & Machine Works, Rome, Ga., which has closed contracts for installation in water works plants in a number of Southern cities.

Wakita, Okla. will issue bonds for the erection of a water plant.

Haynesville, La., is considering expending $10,000 in the construction of a system of water works.

The J. F. Weinmann Milling Company will erect a flour mill at Little Rock, Ark. The company has a capital stock of $30,000. J. F. Weinmann is president.

The York Mfg. Company, York, Pa., has been given the contract for the installation of a 100-ton ice machine in the plant of the Waycross Ice & Cold Storage Company, Waycross, Ga.

The Dunn Machine Company, Atlanta, Ga., has increased its capital stock from $25,000 to $50,000. It deals in machinery of all descriptions.

A sugar refinery costing $50,000 will be established at Opelousas, La., by the firm of Little & Lawler.

The National Computing Bin Company, Ltd., has been incorporated at Shreveport, La., with $100,000 capital stock by L. B. Thomas and R. H. Jolley.

The Georgia Power Company is planning the erection of a substation at Rome, Ga. V. E. Parons, assistant engineer, is in charge of the work.

The American Machine & Mfg. Company, Greenville, S. C., has secured a building and will concentrate its manufacturing interests in Greenville, having secured the oil mill machinery department of the C. H. Bushnell Press Company, of Thompsonville, Conn. It will manufacture machinery of this kind as well as waste-cleaning and refrigerating apparatus.

The Wheeling Mold & Foundry Company, Wheeling, W. Va., is considering increasing its capital stock from $250,000 to $750,000 and greatly enlarging its plant. C. E. Blues is president of the company.

The Humason Rail Joint Company, Shreveport, La., has been incorporated with $200,000. The purpose of the company is to manufacture a patented device. J. C. Willis is president of the company and C. P. Munday, secretary.

James G. Dickson, Little Rock, Ark., is president of a company which will establish a plant in Mississippi for the manufacture of a cotton-cleaning attachment for saw-gins.

The American Brake Lever Company, Floyd, Va., has been incorporated with $15,000 capital stock. V. M. Sowder is president and S. R. Brame is general manager.

John Martin, Clarksville, Ga., has secured a franchise for a water company and will build a plant. He is now purchasing equipment for immediate installation.

Jackson, Ga. will issue $12,000 of bonds for the improvement of its electric light and water plants.

The Savannah Electric Company, Savannah, Ga., will install two 400-hp. boilers, a 500-kw. generator and other equipment in a substation. The improvements will require an expenditure of about $100,000.

Clarksville, Ark., has the erection of an electric light plant under consideration. Winters & Dove, Ft. Smith, Ark., are drawing preliminary plans.

The Standard Oil Company, Baton Rouge, La., desires bids on dies for forging, swedging nipples under steam hammers from 2 to 12 in. in size.

The Alcus-Patterson Shade Mfg. Company has been organized at New Orleans, La., to engage in the manufacture of window shades. A new factory will be built. Richard S. Alcus is president.

Texas

AUSTIN, TEXAS, September 30, 1911.

Good showers of rain have fallen in many parts of the State the past week, tending to stimulate business but being of little benefit to the cotton crop which is now past any aid from that source. The good prices at which cotton is selling is placing a great deal of money in circulation and all lines of trade are feeling the benefits. Just now there is more demand for irrigation machinery than almost any other line and this condition promises to keep up and increase during the fall and winter.

The Bryan Pure Food & Mfg. Company, headed by L. D. Abbott, of St. Louis, Mo., will establish a factory at Bryan for the manufacture of baking powders, extracts, soda and other food products.

Haas & Sons, Sherman, will establish a factory at Bay City for the manufacture of wooden handles of various kinds.

Taxpayers of Harlingen have voted to issue $22,000 of bonds for waterworks and an electric light plant and $10,000 for street improvements. The contracts for these works will soon be let.

The City Commissioners of Waco will soon take steps toward installing a municipal electric light plant. Bonds to the amount of $250,000 have been issued for the purpose. Negotiations were pending between the city and the Waco Gas & Electric Company relative to a new light contract, but they have been broken off and it is now said that the city will put in its own plant.

The Board of Water Commissioners of Waco have under consideration the installation of additional machinery and other improvements to the waterworks plant. The proposition of submitting to a vote of the people a proposed bond issue for the contemplated improvements is also under consideration.

The Midland Land & Irrigation Company is installing an extensive shallow well pumping system near Midland. Other plants of a similar character will also be installed.

The Missouri, Kansas & Texas Railway Company has finished the survey of the site for its proposed shops and roundhouse to be located in East Waco.

Plans have been prepared by J. C. Dumont and associates for the construction of a 15-ft. dam across the Colorado River near Austin for the purpose of affording a water supply for irrigating about 10,000 acres of land. The dam will be built of reinforced concrete and will be 350 ft. long. Besides furnishing a reservoir water supply for irrigation it will give an initial power for generating 360-hp of electrical energy that will be transmitted to neighboring industrial enterprises.

Steps have been taken to install a waterworks plant at Newcastle. A reservoir will be constructed with a capacity sufficient to furnish a water supply for a city of about 30,000 inhabitants.

The Cuero Electric Light Company is installing new machinery at its electric power plant and making other improvements at Cuero.

The Beaumont Ice, Light & Refrigerating Company is extending its electric transmission system to the oil field adjacent to Guffey, and motors will be installed at the different wells and pumping done by electric power. The introduction of electricity will do away with the steam pumping plants that are now in use.

Dr. F. S. Pearson and associates have been donated a site at El Paso for their proposed paper mills and box factory, and it is reported that the work of erecting the plant will soon be started.

The Young Men's Business League, of Palestine, is promoting the erection there of a large grain elevator.

THE MACHINERY MARKETS

The Houston Construction Company has a contract for erecting 13 oil storage tanks and seven refining stills at the plant of the Texas Company at Port Arthur.

The Ricardo Gin Company has been formed at Ricardo with a capital stock of $6,000. The incorporators are H. A. Perlstein, Wm. Saenger and T. L. Cleveland.

B. E. Kern, of Deming, N. M., and associates are arranging to install a large central electric power plant, pumps and motors for the purpose of furnishing power for irrigating 32,000 acres of land near Iola, N. M. The project involves the installation of producer gas generators, gas engines, electric generators, 100 pumps of 1,000 gal. capacity each, 100 motors of 25-hp each and 50 miles of transmission lines. The total estimated cost of the improvements is $260,000. Upon each 320 acres of land in the tract a well will be put down and a pump installed.

The Chamber of Commerce, of Tucumcari, N. M., is promoting the erection of a cold storage plant and packing house.

The Virtue Mining Company will install a hydro-electric plant in Cave Creek Canyon near Rodero, N. M., and construct electric transmission lines to farms in San Simon Valley for the purpose of affording power for operating irrigation pumping plants. The water that flows over the falls in the canyon will be utilized for generating the initial power. The falls are at an altitude of about 6,000 ft. and this is lowered at a rate of about 1,000 ft. per mile, which makes the site an ideal one for a hydro-electric plant.

The City Council of Cuero, has taken steps to increase the water supply of the municipal water works system. Another artesian well will be bored and pumping machinery installed.

The City Council of Lampasas has under consideration the installation of a sanitary sewage disposal plant and a garbage crematory.

The St. Louis and San Francisco Railway Company will make improvements to its property at Beaumont at a cost of $400,000, according to the announcement of J. H. Elliott of Houston, vice-president and general manager. The terminal facilities will be enlarged, a new passenger depot erected and other improvements made.

The Temple Lumber Company is installing a water-works system for Pineland.

The City Council of Temple will install a 3,000,000-gal. pump, erect a new pumping station and lay a duplicate main from the station to Twenty-fifth street.

The City Commission of Dallas contemplates installing a large municipal water purification plant. Bonds will be issued for the purpose.

The Rex Steam Laundry Company will install a new laundry plant at Dallas at a cost of about $20,000. Gus A. Amundsen, Jr., is president and general manager.

The Hill-Henson Mfg. Company will install a plant at Palestien for the manufacture of writing ink.

The chamber of commerce of Beaumont is promoting the establishment there of a mill to manufacture syrup from sugar cane.

Dr. J. C. Chandler will establish at Beaumont a plant for the manufacture of brick.

The Cleveland Vitrified Brick Company, Humboldt, Kan., has under consideration the establishment at Taylor of a plant for the manufacture of brick.

G. A. Morris has let the contract to the Tate Nordmeyer Engineering Company, St. Louis, Mo., for the installation of an ice factory and creamery at Roswell, N. M., at a cost of $21,000.

The taxpayers of Nogales, Ariz., have voted $175,000 of bonds for the installation of a waterworks plant and distributing system and the construction of a sewer system.

Upon the installation of a fire pump recently ordered by the city of El Paso lower insurance rates will go into effect in that city. The pump that gives this additional fire protection is a 10 in. Buffalo three-stage vertical turbine pump of the submerged type. It will be placed at the bottom of a 50 ft. well and when driven by Westinghouse motors at 850 rev. per min. will deliver 3000 gal. per min. against a total head of 350 ft. This pump will be built in accordance with the requirements of the National Board of Fire Underwriters. The Buffalo Steam Pump Company, Buffalo, N. Y., has the contract.

The citizens of Brady have voted to issue $40,000 in bonds for the establishment of a waterworks system.

St. Louis

ST. LOUIS, MO., October 2, 1911.

The machinery dealers after casting up the totals for September business have reached the conclusion that, in the light of the conditions which have prevailed for the past year, they have had a very satisfactory month. The individual orders, though they have been small, have run into a very respectable total, though not as large of course as was the case before the industrial dullness set in. More personal calls are reported by dealers and more general inquiry, which they take as indicating an improvement in business. At present and for some time the takings have been by small concerns, but the larger ones are looked for in the market shortly.

The Acme Laundry Company, St. Louis, has increased its capital stock with the purpose of increasing its equipment at once.

The Acme Fireless Cooker Company has been incorporated at Quincy, Ill., with $15,000 capital stock by Sidney P. Landcraft, Joseph W. Wall, H. M. Sheer and Harry A. Snow and will establish a plant for the manufacture of fireless cookers and other household appliances.

The city of St. Louis has started a campaign for the installation of fire escapes on all buildings more than three stories and the arrests to enforce compliance with the law is cause for considerable increase in that line of business.

The Wolf Mfg. Company, with $100,000 capital stock, has been incorporated at Quincy, Ill., by Fred Wolf, Fred A. Wolf, Leo Wolf and Paul A. Wolf. A manufacturing plant will be equipped at once.

The Sanitary Wringer Mop Company, with $25,000 capital stock, has been incorporated at Kansas City, Mo., by H. and T. G. Fisher and John B. Feringer and will install equipment for the manufacture of specialties.

The National Rubber Company, St. Louis, has been incorporated with $20,000 capital stock by Louis Godlove, Charles Godlove and Eugene Schwarzwald, and will equip a plant for the manufacture of rubber specialties.

The Saxony Mills Company, St. Louis, has let the contract for a wheat elevator of 100,000 bushels capacity, which will be of fireproof construction. The contract for the mechanical equipment has not been let.

The Central Novelty Mfg. Company, St. Louis, has been incorporated by B. M. Whitmore, J. A. Rowse and S. C. Rogers and will equip a plant for the manufacture of specialties.

The R. H. Kobusch Furniture Company, St. Louis, has closed a deal for the construction of a new factory building, to which it will remove when completed, the capacity being about double that of the present plant.

The Granby Mining & Smelting Company, one of the largest in the Missouri District, received bids the past week for the construction of a new smelter on the east side of the Mississippi opposite St. Louis, but has not made public the results. The smelter, which will be for the handling of zinc ore, will be much larger than any now running in this section.

The Joplin Engraving Company, Joplin, Mo., with $50,000 capital stock, has been incorporated by R. H. Noel, V. E. Koch and H. C. Cosgrove to establish a new engraving plant at Joplin.

The Citizens Gas & Fuel Company, De Soto, Mo., with $100,000 capital stock, has been incorporated by John H. Gibbs, Albert J. Robus and Joseph Stevens, all of St. Louis. The company has a franchise to supply gas to the city of De Soto for 20 years.

The Oklahoma Iron Works, Tulsa, Okla., has been incorporated with a capital stock of $5,000 by J. W. Sloan, F. M. Iverson and F. B. Berlin, all of Tulsa

The Pacific Coast

PORTLAND, ORE., September 26, 1911.

The market for metal-working machinery shows no real life, orders for the most part being small and not especially numerous. There is no serious complaint from machine shop operators either here or on Puget Sound, but purchases of new equipment are confined pretty closely to necessary replacements. The few new shops which are being opened at various points are a very small factor in the market. Manufacturers of special logging and mill equipment throughout this territory continue to report an active business, though the general demand for wood-working ma-

THE MACHINERY MARKETS

chinery is hardly as strong as at the beginning of summer. The movement of electrical machinery continues on a fairly large scale, and aside from a number of hydroelectric projects from which inquiries are expected shortly there is a growing demand for motors, etc., in connection with industrial plants and for irrigation. Many improvements are also being planned by electric traction and lighting companies of the north coast states. There is a very fair demand for waterworks equipment, including pumping machinery as well as general supplies. The flour milling industry of this territory is something of a factor in the machinery market, and considerable new business is expected from this source. The mills are exceptionally busy, their entire output available for export being booked up to the end of the year.

The American Machine Works, Seattle, Wash., has been incorporated, with a capital stock of $100,000, by L. M. Gardner, T. V. Wilson and F. Ruttencutter.

The F. N. Livingston Engine Company, Seattle, Wash., has been incorporated by F. N. Livingston, W. H. Cooper and J. W. Baker.

J. F. Duthie & Co., operating an iron works at Seattle, Wash., have been incorporated with a capital stock of $50,000. J. Duthie and H. Mead are the principal stockholders.

The Armstrong Machinery Company, Spokane, Wash., has increased its capital stock from $45,000 to $75,000.

The town of Woodville, Ore., will receive bids September 30 for the installation of an electric lighting plant.

The A. H. Eccles Company has announced its intention to erect a large mill at Baker City, Ore.

Adolph Meier, representing Montana mining interests, is working on a project for the erection of a concentrating plant near Medford, Ore., to handle the output of mines in southern Oregon and the Rogue River district.

The equipment of the Union Cooperage Company's stave mill, Aberdeen, Wash., is being dismantled, and the plant will be converted into a shingle mill.

The Slabless Mfg. Company, recently organized at Kelso, Wash., is installing some special machinery in the sawmill of the Western Mfg. Company of that place. It is claimed that the new machines will eliminate much of the ordinary waste in cutting up logs.

The Nebaho Lumber Company, Orofino, Ida., is installing a new power plant.

The new equipment to be installed by the C. A. Smith Lumber Company, at Warshfield, Ore., will include a three-band gang saw, one single rip saw, one single band resaw and one four-side surfacer.

The United States Cashier Company, Kenton, Ore., is erecting a new factory building 42 x 160 ft, two stories, to be of fireproof concrete construction. The company manufactures computing machines. Frank Menefee is president and general manager.

The Portland Railway, Light & Power Company, Portland, is building a new car repair and construction plant. It is expected that the equipment and buildings, which include two structures, 200 x 200 ft., will require an expenditure of $500,000.

The California Malleable Iron Company has been incorporated at Riverside, Cal., with a capital stock of $500,000, by C. P. McComb, S. L. Phillips, W. A. Ramsey, J. C. Hays and C. E. Waite.

The Otis Elevator Company has taken a contract for six large elevators in the Los Angeles Investment Company's Building at Los Angeles.

The Main Stre t Iron Works, 163 Main street, this city, is replacing its temporary building with one of brick. The tools are running with little interruption during the changes, and no new machinery is to be put in.

Eastern Canada

TORONTO, ONT., September 30, 1911.

It is very plain that the elections have swept away a considerable fog of uncertainty and given new confidence to business. Whatever else may happen, it is felt that the change in government will not cause any unsettlement by tariff changes in a downward direction. There is some expectation that the steel industry will receive some additional protection. There may be an import duty placed on wire rods, and it is possible that other changes will be made for the benefit of domestic manufacturers. Mr. Borden has promised that a permanent tariff commission will be appointed, and that action by Parliament on the tariff will be on the basis of recommendations made by the commission. That the election has had an assuring effect upon business is shown by the reports from one source and another of the placing of orders that were previously held back and the completing of arrangements for starting new manufacturing enterprises. Items now frequently met with in the newspapers are those announcing the resumption of negotiations of United States works in Canada. Another noteworthy feature is the development of inquiry on behalf of British firms considering the question of locating branches in Canada. The view taken in such cases is that if United States manufacturers find it advantageous to establish branches here, it must be so for their British competitors, who have the handicap of long distance and heavy ocean freights against them. On all hands are heard expressions of faith in Canada's continued development. A great era is looked forward to for this country.

The City Council of Montreal has decided to purchase a combined chemical and hose wagon from the Pope Mfg. Company, Hartford, Conn. It will be driven by a 75-hp. gasoline engine.

The Canadian Boring Company, Toronto, has the contract to supply two 190-hp. impulse turbines to the town of Penticton, B. C., along with 3-phase generators. It will also put in a 100-hp. Diesel engine, with 3-phase generator, for the town of Wilkie, Sask., and similar equipment for the municipality of Scott, Sask.

The city engineer of Montreal will call for tenders for equiping a low-level pumping station, a 12,000,000-gal. steam pump being required.

Docithe Tendron, contractor, St. Louis de Gonzague, Que., is inquiring for prices for a steel highway bridge, 70 ft. span by 16 ft. wide, or 18 x 70 ft., delivered and erected, with 4-ft. sidewalks.

On October 16 the rate-payers of Dryden, Ont., will vote on a by-law to grant certain privileges to the Dryden Timber & Power Company, in consideration of the latter carrying out an agreement to establish pulp mills in the town.

The Muskoka Wood Mfg. Company, Huntsville, Ont., is planning an extension of its works.

The Holeproof Hosiery Company, London, Ont., is about to make some material changes in its plant and will install a lot of new machinery.

The Barcelona Traction Light & Power Company, Toronto, has been incorporated by the Dominion Government with a capital stock of $40,000,000 to develop electrical power, build reservoirs, dams, aqueducts, etc.

The Imperial Wire & Cable Company, Montreal, has received Dominion incorporation to carry on business, with a capital stock of $5,000,000.

Des Marais Machine & Drill Company, Ottawa, has been incorporated with a capital stock of $50,000.

Airozone Electric Ventilating Company, Toronto, has been incorporated with a capital stock of $350,000, to manufacture and deal in electrical apparatus.

The factory of the E. W. Gillett Company, now under construction in Toronto, is to cost $100,000.

The Ritchie & Ramsey Mfg. Company, New Toronto, Ont., will add a large extension to its plant.

On October 14 the ratepayers of St. Mary's, Ont., will vote on a by-law to raise $15,000 for electric power extensions.

The Canadian Fairbanks Company, Ltd., has been authorized to change its corporate name to the Canadian Fairbanks-Morse Company, Ltd., and to increase its capital stock from $900,000 to $2,600,000. It has also acquired the entire capital stock of the Fairbanks-Morse Canadian Mfg. Company, Ltd., which will hereafter be operated as a manufacturing department instead of as an independent corporation. These changes are made necessary by the increased volume of the business of the company and will greatly increase its facilities. It has offices at Montreal, St. John, Ottawa, Toronto, Winnipeg, Saskatoon, Calgary, Vancouver, and Victoria. Henry J. Fuller is president; Thomas McMillan and P. C. Brooks vice-presidents, and E. R. Whitehead, treasurer.

The Lowe Bros. Company Ltd., Dayton, Ohio, manufacturers of paints, colors and varnishes, have completed plans for and commenced work on its Toronto factory, which will be a five-story and basement building, 40 x 140 ft.

THE MACHINERY MARKETS

The rolling mill department of the Canadian Steel Foundries, Ltd., Welland, Ont., which has been closed for some time, is now undergoing extensive improvements. A large amount of money will be expended for these improvements and for the equipment to be installed. It is expected that the department will be in readiness for resumption of work the latter part of December.

The Bissell Company, Ltd., Elora, Ont., is in the market for a bolt heading machine to handle stock up to 1-in. and a bulldozer.

The Lautz Marble Company, Buffalo, has purchased a three-acre site at Janet street and the Michigan Central Railroad at Bridgeburg, Ont., on which it will erect an extensive plant for its Canadian branch business. An equipment of marble and onyx cutting and polishing machinery to cost about $35,000 will be installed in the new plant.

The International Register Company of Canada has been incorporated at Bridgeburg, Ont., and will manufacture cash and accounting registers. The company is remodeling the Oriental Hotel Building at Bridgeburg for factory purposes. Stanley A. Waugh is manager.

The National Cash Register Company, which is constructing a factory at 98-100 Lombard street, Toronto, Canada, is not yet in position to give details of the new machinery which will be required. The new factory, however, will be more than twice as large as the company's present Canadian plant, and in all likelihood much equipment will be required of the character ordinarily used in a machine shop. New shafting and pulleys will be needed, but it will be late next spring when the company will be ready to take up the matter.

Western Canada

WINNIPEG, MAN., September 30, 1911.

The railroad builders are continuing to spend money on a large scale. In the wake of the railroad building comes much other business, all of it more or less permanent. Manufacturers in eastern Canada are receiving good orders from the West. This part of the country was expected to have a check put on its city building progress by the closer dealing of the banks, who seize the opportunity which the fine crops give to bring many of their customers down to a better business basis. It seems likely, however, that the check will not go much farther than the land speculation fever. Money employed in that will, to some extent, be utilized in commercial business. At the present time, though banks are sparing of their accommodations, the commercial needs of the West are being very well looked after.

George White & Sons, London, Ontario, manufacturers of threshing machinery, and the Safe Lock Company are both establishing distributing centers in Brandon.

James Stewart & Co. have under contract the construction of a seven-story reinforced concrete warehouse for the Swift-Canadian Company at Edmonton, Alberta.

By-laws are to be submitted to the rate-payers of Calgary, Alberta, for the following improvements: Laying and constructing the trunk sewer, $14,000; construction and extension of conduit system, $30,000; sewer connections and sewer trenching machinery, $42,000; construction and extension of water works system, $395,000; construction and extension of municipal street railway, $375,000.

The rate-payers of Neepawa, Man., have approved a by-law to spend $100,000 on water works improvements.

By-laws will be submitted to the rate-payers of Vancouver, B. C., to raise $1,000,000 for water-main extension.

A piece of land, 620 acres in extent, has been purchased within half a mile of the Canadian Pacific Railway station at Bassano, Alberta, on which works are expected to be built by the railroad company.

Rails for a two-mile extension of the street railroad in Edmonton, Alberta, have been purchased from Gorman, Clancy & Grindley, agents for the United States Steel Corporation.

The rate-payers of Regina, Sask., will vote on by-laws for local works as follows: $400,000 for municipal street railway; $1,500,000 for water works construction; $150,000 for sewer construction and sewage disposal works.

Moore & Pethick, Victoria, B. C., have obtained the contract to build the first 18 miles of the Saanich extension of the B. C. Electric Railway. A unit of 6,000 hp. will be installed at this plant in addition to the equipment already there.

Chalmers & Williams, Milwaukee, will supply 12 tube mills for the Edmonton Portland Cement Company, Edmonton, Alberta.

Plans have been prepared for the erection of a plant at North Vancouver, B. C., to manufacture steel sleeping cars, etc.

Power development to cost $2,500,000 is being proceeded with at Saskatoon, Sask., by the Saskatoon Street Railway Company.

The Stettler Foundry Iron Works at Stettler, Alberta, have changed hands. L. Martin has purchased them and will install new machinery. The former proprietor, H. A. Underwood, will confine operations to the manufacture of circular band saws and gas engines.

The Lookout Lumber Company, Victoria, B. C., has been incorporated with a capital stock of $200,000.

The Canadian Stewart Company has begun work on the $2,000,000 coal handling plant and freight terminal for the Canadian Pacific Railway on Island Number One, Fort William, Ont.

The Canadian Northern Railway Company, Toronto, has decided to double the capacity of the Atikokan Iron Company's furnace plant at Port Arthur, Ont., and to establish there a foundry to make use of the output.

The Red Cliff Land & Lumber Company, Vancouver, B. C., has been incorporated with a capital stock of $400,000.

The people of Portage la Prairie, Manitoba, have passed a by-law to raise $110,000 to purchase the plant of the Central Electric Company in that city. It is intended to enlarge the plant considerably.

Men are at work at Sicamous, B. C., clearing the site for the new mill of the Columbia River Lumber Company, Ltd.

Arrangements are being made by a lumberman named Peder to establish a sawmill at Tete Jaune Cache, a point in British Columbia to which the Grand Trunk Pacific Railway is nearly finished.

A new sawmill of large capacity will soon be constructed at Nanoose Bay, Vancouver Island, by the Union Lumber Company.

Government Purchases

WASHINGTON, D. C., October 2, 1911.

The Bureau of Supplies and Accounts, Navy Department, Washington, will open bids October 31, under schedule 3947, for two engine lathes for delivery to Mare Island, Cal.

The Isthmian Canal Commission will receive bids until October 9, under canal circular 648, for materials for a hydroelectric plant, including water turbines, governors, head gates, penstocks, compressed air regulators, electric generators, exciters, exciter sets, lubricating system and traveling cranes.

The United States Engineer office, Dallas, Texas, will receive bids until October 18 for two sets steel lock gates and the operating gear for gates, constructing lock valves, etc.

The Lighthouse Inspector, Seventh District, Key West, Fla., opened bids August 30 for furnishing one 9-in. screw cutting lathe as follows: Seneca Falls Mfg. Company, Seneca Falls, N. Y., $268.85; Montgomery & Co., New York, $275.35.

The Bureau of Supplies and Accounts, Navy Department, Washington, opened bids September 26 for material and supplies as follows:

Schedule 3894, class 11, one trimming press—Bidder 3, E. W. Bliss Company, Brooklyn, N. Y., $3,995 and $4,100; 7, Ferracute Machine Company, Bridgeton, N. J., $4,567; 18, Toledo Machine & Tool Company, Toledo, Ohio, $2,900; 19, United Engineering & Foundry Company, Pittsburgh, Pa., $2,595; 21, Manning, Maxwell & Moore, New York, $3,994 and $4,099.

Schedule 3895, class 21, one universal double circular saw—Bidder 1, American Wood Working Machinery Company, Rochester, N. Y., $700; 2, Bentel & Margedant Company, Hamilton, Ohio, $2,533; 4, Chicago Machinery Exchange, Chicago, Ill., $578; 5, Fairbanks Company, Washington, D. C., $639; 6, J. A. Fay & Egan Company, Cincinnati, Ohio, $585; 8, Frevert Machinery Company, New York, $548; 11, Niles-Bement-Pond Company, New York, $650; 12, Oliver Machinery Company, New York, $680 and $803.

Schedule 3896, class 31, one motor-driven engine lathe—Bidder 11, Niles-Bement-Pond Company, New York, $13,160.

Schedule 3912, class 41, one water weigher—Bidder 9, Kennett Company, Chicago Heights, Ill., $1,475; 16, Schultz Patent Boiler Company, Philadelphia, Pa., $1,850.

Current Metal Prices.

The following quotations are for small lots, New York. Wholesale prices, at which large lots only can be bought, are given elsewhere in our weekly market report

IRON AND STEEL—

Bar Iron from Store—

Refined iron:
1 to 1⅞ in. round and square.... ₤ lb 1.70¢
1½ to 4 in. x ⅝ to 1 in..... ₤ lb 1.70¢
1½ to 4 in. x ¼ to 5/16 ..... ₤ lb 1.80¢
Rods—⅝ and 11-16 round and square. ₤ lb 1.80¢

	Cts. ₤ lb.
Angles:	
⅜ in. x ¼ in. and larger	1.90¢
3 in. x 3-16 in. and ⅓ in.	2.00¢
1½ to 2¾ in. x ⅛ in.	2.05¢
1½ to 2¾ in. x ¼ in. and thicker	1.95¢
1 to 1¼ in. x 3/16 in.	2.05¢
1 to 1¼ x ⅛ in.	2.10¢
⅝ x ⅛ in.	2.20¢
⅝ x ⅛ in.	2.25¢
⅝ in. x ⅛ in.	2.45¢
½ x 3/32 in.	3.90¢
Tees:	
1 in.	2.35¢
1¼ in.	2.20¢
1½ to 2¼ x ¼ in	2.00¢
1½ to 2¼ x 3/16 in.	2.10¢
3 in. and larger	2.95¢
Beams	1.90¢
Channels, 3 in. and larger	1.90¢
Bands—1¼ to 4 x 6/16 to No. 8	2.10¢
Burden's "H, B & S" iron, base price	2.95¢
"Burden's Best" iron, base price	3.15¢
Norway bars	3.60¢

Merchant Steel from Store—

	per lb
Bessemer machinery	1.80¢
Toe calk, tire and sleigh shoe	2.50@3.00¢
Best cast steel, base price in small lots	7¢

Sheets from Store—

Black	One pass, soft steel.	C.R. cleaned.	R. G.
No. 16	₤ lb	2.45¢	2.75¢
Nos. 18 to 20	₤ lb	2.50¢	2.80¢
Nos. 22 and 24	₤ lb	2.55¢	2.95¢
No. 26	₤ lb	2.60¢	3.05¢
No. 28	₤ lb	2.95¢	3.30¢

Russia, Planished, &c.

Genuine Russia, according to assortment ..... ₤ lb 12 @14½
Patent planished, W. Dewees
Wood ..... ₤ lb A. 10¢; B. 9¢ net

Galvanized

Nos. 12 and 14	₤ lb 2.75¢
No. 24	₤ lb 3.10¢
No. 26	₤ lb 3.30¢
No. 28	₤ lb 3.60¢

No 20 and lighter 36 inches wide, 25¢ higher.

Genuine Iron Sheets—

Galvanized

Nos. 22 and 24	₤ lb 5.50¢
No. 26	₤ lb 6.00¢
No. 28	₤ lb 7.00¢

Corrugated Roofing—

2½ in. corrugated.	Painted.	Galvd.
No. 24	₤ 100 sq ft $3.75	$4.70
No. 26	₤ 100 sq ft 2.85	3.90
No. 28	₤ 100 sq ft 2.50	3.65

Tin Plates—

American Charcoal Plates (per box)

"A A A" charcoal:
IC, 14 x 20 ..... $6.65
IX, 14 x 20 ..... 7.90
A. charcoal:
IC, 14 x 20 ..... $5.60
IX, 14 x 20 ..... 6.70

American Coke Plates—Bessemer—
IC, 14 x 20 ..... 107 lb $4.50
IX, 14 x 20 ..... 5.50

American Terne Plates—
IC, 20 x 28 with an 8 lb coating $8.70
IX, 20 x 28 with an 8 lb coating 10.70

Seamless Brass Tubes—
List November 13, 1908. Base price, 18¢

Brass Tubes, Iron Pipe Sizes—
List November 13, 1908. Base price, 18¢

Copper Tubes—
List November 13, 1908. Base price, 21¢

Brazed Brass Tubes—
List February 1, 1911. 19½¢ ₤ lb

High Brass Rods—
List February 1, 1911. 14⅜¢ ₤ lb

Roll and Sheet Brass—
List February 1, 1911. 14⅜¢ ₤ lb

Brass Wire—
List February 1, 1911. 14⅜¢ ₤ lb

Copper Wire—
Base price. Carload lots mill 13¾¢

Copper Sheets—
Sheet copper hot rodled, 16 oz. (quantity lots) ..... ₤ lb 17¢
Sheet copper cold rolled, 1¢ ₤ lb advance over hot rolled
Sheet copper polished 20 in. wide and under, 1¢ ₤ square foot.
Sheet copper polished over 20 in. wide, 2¢ ₤ square foot.
Planished copper, 1¢ ₤ square foot more than polished.

METALS—

Tin—

Straits pig ..... ₤ lb 43 @44 ¢

Copper—

Lake ingot ..... ₤ lb 14 @14¼¢
Electrolytic ..... ₤ lb 13¾@14 ¢
Casting ..... ₤ lb 13¾@14 ¢

Spelter—

Western ..... ₤ lb 6¾@ 7 ¢

Zinc—

No. 9, base, casks... ₤ lb 8½¢ Open... ₤ lb 9¢

Lead—

American pig ..... ₤ lb 5¼@5½¢
Bar ..... ₤ lb 6⅜@6¾¢

Solder—

½ & ½ guaranteed..... ₤ lb 25½@26¢
No. 1 ..... ₤ lb 25½@24¢
Refined ..... ₤ lb 22½@23¢
Prices of solder indicated by private brand vary according to composition.

Antimony—

Cookson ..... ₤ lb..@10¾¢
Hallets ..... @10 ¢
Other brands ..... 9@ 9½¢

Bismuth—

Per lb ..... $2.00@$2.25

Aluminum—

No. 1 aluminum (guaranteed over 99% pure), in ingots for remelting ..... 21¢ and 22¢
Rods and Wire ..... Base price 31¢
Sheets ..... Base price 33¢

Old Metals—

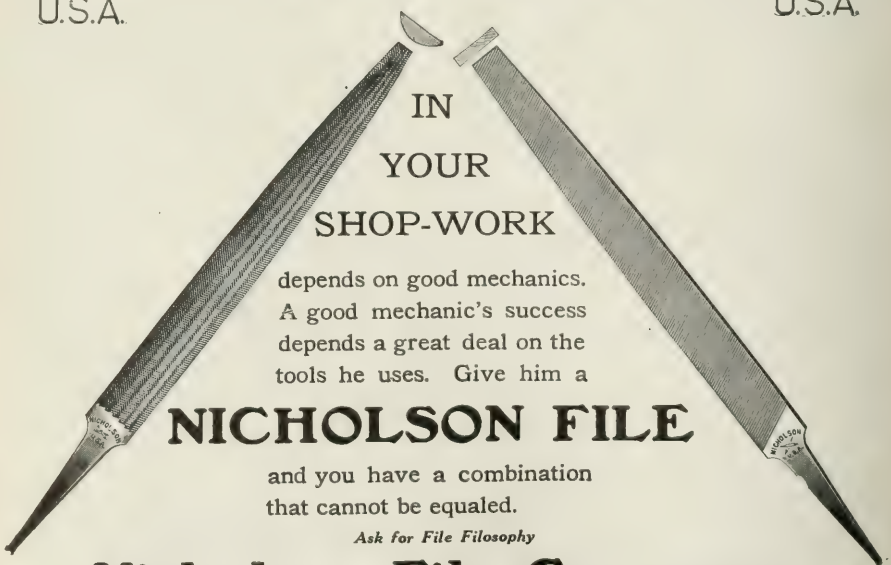
Dealers' Purchasing Prices Paid in New York.

	Cents.
Copper, heavy and crucible	10.50 to 10.75
Copper, heavy and wire	11.37½ to 11.50
Copper, light and bottoms	9.25 to 9.50
Brass, heavy	7.00 to 7.25
Brass, light	5.50 to 5.75
Heavy machine composition	9.00 to 9.25
Clean brass turnings	6.75 to 7.00
Composition turnings	7.50 to 7.75
Lead, heavy	4.75
Lead, tea	3.50
Zinc, scrap	4.00

NICHOLSON U.S.A.

SUCCESS

NICHOLSON U.S.A.



depends on good mechanics. A good mechanic's success depends a great deal on the tools he uses. Give him a

NICHOLSON FILE

and you have a combination that cannot be equaled.

Ask for File Filosophy

Nicholson File Company
PROVIDENCE, R. I.

THE IRON AGE

Established 1855 — New York, October 12, 1911 — Vol. 88: No. 15

Published Every Thursday by the

DAVID WILLIAMS COMPANY

239 West 39th Street, New York

Entered at the New York Post Office as Second-Class Mail Matter.

Subscription Price, United States and Mexico, $5.00 per Annum; to Canada, $7.50 per Annum; to Other Foreign Countries, $10.00 per Annum. Unless receipt is requested, none will be sent. Credit for payment will be shown by extending the date on the wrapper of your paper.

W. H. Taylor, - - - - - President and Treasurer
I. A. Mekeel, - - - - - - First Vice-President
Harold S. Buttenheim, - - - - Second Vice-President and Secretary

Geo. W. Cope, - - - -
A. I. Findley, - - - - } Editors
W. W. Macon, - - - -

M. C. Robbins, - - - - Manager
Charles S. Baur, - - - Assistant Manager

Branch Offices

Philadelphia, Real Estate Trust Building
Pittsburgh, Park Building
Boston, Compton Building
Chicago, Fisher Building
Cleveland, American Trust Building
Cincinnati, 807 Andrews Building

CONTENTS.

Low Prices Attract Buying 777
The Curve of Pig Iron Production 780
The Educational Value of an Export Trade 781
The Time Light in Factory Lighting 781
The Tin Plate Imports and Exports 782
The Buying of Replacement Parts 782
Correspondence 782
National Founders' Association 783
The Iron and Metal Markets 784
Sunshine in California 794
A Move to Reduce British Steel Imports 794
Personal 795
The Southern Iron & Steel Reorganization 795
September Copper Production and Stocks 795
The National Machine Tool Builders 796
The Philadelphia Foundrymen's Association 797
Pittsburgh and Vicinity Business Notes 797
The Steel Corporation's Unfilled Orders 797
Machine Tool Dealers Meet 798
Obituary 798
Factory Floors 799
The Boston Lehigh Valley Rail 800
Molten Ferromanganese for Deoxidation 801
The Deutscher Eisenhuettenleute's Meeting 802
New Repairable Plant for Windsor, Canada 802
The Osborn Drop Plate Squeezer 803
Lake Iron Ore Shipments in September 803
Electrical Iron Smelting in Sweden 804
Large Double-Acting Cam Press 805
The Sterling Air Economizer 808
August Iron and Steel Exports and Imports 809
The Jenckes Valve Gear 810
Goulds Motor-Driven Mine Pump 811
The Panama Canal Cableways 813
The Sale of French Panama Scrap Material 813
The Connellsville Coke Trade 813
The Mounting of Shafting 814
New Open-Hearth Furnace Construction 816
Decision in Gas Producer Operation 818
The New Burt Oil Filter 819
The Newark Foundrymen's Association 819
A New Internal Combustion Engine 820
A New Mount Union Fire Brick Enterprise 820
Exporters Should Fully Describe Merchandise 820
The Pittsburgh Steel Company's Report 821
New Snyder Heavy Duty Drills 821
Vulcan High Grade Steel 821
The Machinery Markets 822

Low Prices Attract Buying

Railroad and Vessel Business Pending

Heavy Pig Iron Purchases by Pipe Foundries—A Canadian Rail Inquiry

While the policy of keeping stocks at a minimum, by which consumers have been throwing all the chances of the market upon the mills, is unchanged, there are further evidences that the cheapness of steel is producing business. The railroads have been influenced by it to some extent, though it is evident, too, that purchases which they have long been classing as optional have at last become imperative.

Car orders have increased. The Missouri Pacific has bought 2400 and is expected to buy more. The New York Central has bought 1000 and is in the market for 2000. The Pennsylvania is preparing another inquiry and the Baltimore & Ohio is figuring on 5000 to 6000 cars, the need of which has for some time been apparent to its shippers. The New York Central's contract for 40 locomotives is a welcome break in the dullness in that line.

It appears, too, that the low level reached for plates and shapes has started some figuring on lake boats, in spite of the forbidding outlook for vessel owners. Capital is attracted by building enterprises, also, when fabricating companies are able to offer their product at $38. Open hearth bars are sold low enough to compete with hard bars for concrete reinforcement, and the cuts in shafting have been deep enough to induce some forward contract business.

A reduction of 84,000 tons in September in the accumulated orders of the Steel Corporation indicates a moderate falling off from the rate of new bookings in August, when orders showed a gain of 111,000 tons. It is to be considered that the daily rate of shipments from the mills was greater in September than in August and that the corporation's blast furnaces are now turning out pig iron at about the same rate as in the past three weeks.

The week has brought lower prices on some finished products, but they yield less readily at the present levels.

The Canadian Pacific is inquiring for 50,000 tons of rails, deliveries to begin in the spring of 1912. The duty of $7.84 is one obstacle to this business coming to the United States, though a Chicago district mill recently finished rolling an urgent order for 30,000 tons for this railroad. While Canadian rail mills will be crowded for some months, they will be able later to take on the business now pending and American makers are not at all sanguine of getting it. The Chesapeake & Ohio has placed a 4000-ton rail order at Gary and a Southern road has increased its original order to a western Pennsylvania mill.

Structural and plate mills are encouraged by the steel car business of the week and in the East shipyards are figuring on fully 20,000 tons. The great

Madison Square buildings in New York will require 22,000 tons. In Chicago the Field Museum steel contract, 10,000 tons, was taken by the Bethlehem Steel Company.

The Texas Company will buy 150 miles of 6-in. line pipe which is expected to go to the Republic Iron & Steel Company.

Quotations on semi-finished steel are no longer made at a uniform Pittsburgh and Youngstown price, but mills west of Pittsburgh are giving buyers farther West the freight advantage of their position. Thus open hearth billets have been sold from Ohio mill at less than the $19 Pittsburgh basis.

Buying by pipe foundries has been the feature of the pig iron market. The largest company and an Eastern company have taken together about 50,000 tons of Northern and Southern irons. The foundry iron market has broadened but little. What business has been closed for 1912 has been substantially at the prices quoted for this year. Stocks in furnace yards were reduced in all districts in September, but buyers see also the increase in the output of merchant iron.

Bessemer and basic iron are weaker in the Central West, the former being now quoted at $14.50 and the latter at $12.50 at Valley furnace. A sale of 6000 tons of basic was made by a Chicago district furnace for delivery at St. Louis.

German iron and steel markets are stronger, a record business being reported in bars and plates, in both of which advances are likely. Galvanized products are also higher abroad in view of the sharp advance in spelter.

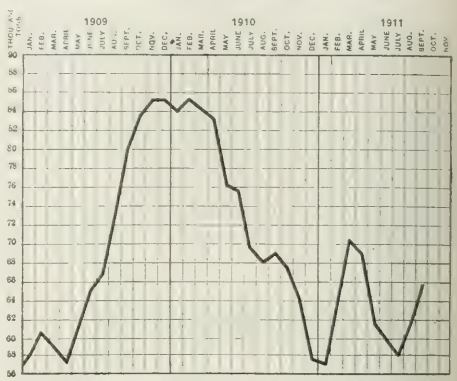
It is noteworthy that almost without exception this week's reports from the machinery markets show an improvement in inquiries and orders—confirming the tradition of October activity in that trade.

The Curve of Pig Iron Production

The fact that pig iron production is increasing when prices are at the low point for the year has caused some comment since the publication of our blast furnace statistics for September. It would seem that a net gain last month of seven in the number of merchant furnaces active is to be accounted for in part by individual conditions, as where a furnace company with a regular foundry trade has found its stocks of iron materially cut down and the call for iron continuing, while one or more furnaces were idle. But the reduction of furnace yard stocks has been general in the past month and there has been in nearly all districts enough urging forward of shipments, on the part of melters, to show that as a rule they are carrying comparatively little iron. The statistics and the known facts concerning the movement of merchant iron agree in indicating that after steadily declining for seven months, the production of merchant iron had fallen below the consumption.

So far as the steel works blast furnaces are concerned, their daily rate of production in September was the highest for more than a year and reflected the relatively large output of finished steel in that month.

The interesting question is whether the increase in steel works and merchant furnace output is to continue. A week ago a half dozen merchant furnaces were named which were to blow in in the early part of this month. This week nearly as many are known that have blown out since the month opened or will soon do so. The steel works furnaces, if the slight falling off in accumulated orders is a criterion, are not apt to increase their output greatly. However, the active furnaces at the opening of the month had a total capacity of 565 tons a day greater than the average production in September, so that some further increase is to be looked for. In this connection the accompanying diagram is instructive. It is taken from our monthly



Curve of Daily Rate of Pig Iron Production by Months, in 1909, 1910 and 1911.

blast furnace chart and shows graphically the course of pig iron production in the 33 months beginning with January, 1909. It represents strikingly how the ascent of the curve in the seven months after April, 1909, was followed by a descent in the 14 months after November, 1909. Then came a rise, followed by a corresponding decline. Another rise is now in progress, and the wavelike movement shown at the right of the diagram suggests that the upcurve produced by the August and September production will be carried somewhat farther.

The figures on which the diagram is based are given in the total or right-hand column in the table below. The first and second columns give respectively the steel works and merchant production. For 1909 and 1910 the daily averages are given by quarters, while for 1911 they are given by months:

Daily Rate of Pig Iron Production in 1909, 1910 and 1911.—Gross Tons

	Steel Works Furnaces	Merchant Furnaces	Total
1909			
First quarter	37,054	22,341	59,395
Second quarter	40,825	20,299	61,124
Third quarter	51,795	21,487	73,282
Fourth quarter	56,819	27,779	84,598
1910			
First quarter	57,063	27,678	84,741
Second quarter	53,178	25,292	78,470
Third quarter	46,908	21,696	68,604
Fourth quarter	41,043	21,767	62,810
1911			
January	36,401	20,351	56,752
February	42,349	21,741	64,090
March	48,970	21,066	70,036
April	47,805	21,031	68,836
May	42,270	18,809	61,079
June	42,708	16,877	59,585
July	42,472	15,369	57,841
August	47,120	15,030	62,150
September	49,696	16,207	65,903

Taking the pig iron figures as an index, it is plain that the decline in finished material prices this year has not resulted in any such demand as may be compared with the great restocking movement of 1909 which culminated at the end of that year. With no such impetus from stock replenishment this year or any early prospect of it, a repetition of the vaulting curve of 1909 is not imminent.

The Educational Value of an Export Trade

A feature of an export trade in connection with a manufacturing business is its educational value; and this is a contribution made by the export trade which is not as generally recognized as it should be. The educational feature of the domestic business is too common, too much a part of the business, to be recognized as a feature at all. One cannot avoid learning a great deal when conducting any kind of business; and if one could avoid learning he would find still greater difficulty in avoiding bankruptcy. This acquisition of knowledge being so intimately associated with the conduct of the business, it is easy to miss the conception that the addition of an export trade adds an educational course of its own, and that such additional course can hardly fail to be of great advantage.

In the sale of goods, each new market opened up is expected to bear its own expense and is not usually credited with contributing to the prosperity of the general business as pertaining to the supplying of the older markets. For instance, a manufacturer who has been selling his goods in a certain number of nearby states will not ordinarily decide upon carrying his selling campaign into an additional state unless the additional business promises to pay all the expenses and furnish a profit, or at least avoid a loss. Similarly he will not ordinarily add a new product to his list of manufactures unless there is reasonable assurance that in time the business in the new product will pay all the expenses involved.

There is a natural disposition to follow the same principle in canvassing the prospective advantages of an export business. Of course all manufacturers are quick to see that an export business may be conducted at a loss, when charging to it its own expenses and the proportion of the total manufacturing cost, and yet be an advantage by the additional output lowering the average cost of production on the entire output. That is a principle which has come to be well recognized and which needs no defense or exploitation at this time.

The educational value of conducting an export trade, on the other hand, is one which needs to be more generally recognized. If the profits directly accruing to the export trade, or the reductions in cost of manufacture due to larger output, are to be charged with the entire expense involved in conducting the export trade, an injustice is usually done in the accounting, for a great deal of the information which must be gathered in connection with the export trade, and much which naturally accrues in the conduct of that branch of the business, is of direct value in conducting the entire business, or the domestic branch of it.

The alert manufacturer almost always profits by coming in contact with purchasers whose wants are different from those of his old customers. He obtains ideas which sometimes he can put in practice and make his goods more salable to his old customers. He ascertains what his competitors are doing. He recognizes that without knowing what his competitors are doing he cannot hope to hold a competitive market. If the competitor is met in a foreign field, there may easily be ideas which are new in the domestic field, and once they are acquired they can sometimes be used in the domestic field, in which case the manufacturer will find himself armed with an idea which is new to his competitors, giving him an advantage over them in the domestic field. He is led to study the processes of manufacture used by the foreign competitors, their costs of production and all the features connected with their business. Such knowledge cannot fail to be of some benefit in conducting the entire business, domestic as well as foreign, thereby making a direct contribution to the success of the domestic business; although, according to the more common habit of thought, the entire expense and trouble involved in the acquisition of such knowledge would be charged to the export sales branch.

That our manufacturing industries require a large export trade is being preached everywhere, but the spirit of nearly all this preaching is simply that the country requires a larger favorable balance in the foreign trade, and the individual manufacturers require larger outlets in order to engage their productive capacity more fully. It is always intimated that we must pare our costs and learn from the competitors met in the foreign fields; but the spirit of all this is generally that the improvements we should make are called for solely through our wishing to export. The export trade does not by any means furnish the full measure of the advantages thus to be obtained. The domestic trade is directly benefited by costs being reduced, quality improved or the character of goods made more attractive to buyers.

The statement of the value of traveling as a means of broadening the mind is a truism. Precisely the same principle applies in the cultivation of foreign markets. In traveling, the ideas gained, the knowledge obtained, the mental training involved, are not of value to the possessor purely, or chiefly, because he is to travel more in his lifetime. He brings home with him certain definite assets, which are of use at home. They are assets which could not be acquired at home. Similarly the manufacturer who exports has his horizon broadened, obtains new ideas and in various ways better fits himself for the conduct of his domestic business. In estimating the rewards of an export trade the value of this educational course should not be overlooked, but should be credited as one of the offsets to the expense and trouble involved in conducting the export business.

The Lime Light on Factory Lighting

It is a singular fact that for a number of weeks associations meeting in New York City have each one given conspicuous attention to the matter of shop lighting. The fact is one of the signs of the times, emphasizing the attention being paid to the human factor in manufacturing. The question is not discussed solely from the standpoint of gaining clear vision, but from the relation of light to human endeavor. Illumination is now studied as a science, and this development owes itself to specialization in the electrical field, with the early formation of a national illuminating engineering society and the appearance in engineering circles of engineering specialists in illumination.

Recent issues of this journal have reported the general views of some of those making a special study of shop-lighting problems. It is not likely that the subject will be overdone in itself, particularly as there are so many other concomitant features of plant operation requiring attention. It is probable that the emphasis placed on the tungsten lamp as a panacea may be too great and may develop the same suspicions

that followed the enthusiasm accorded other forms of lights which had their day and were then regarded as the last word in lamps. It is worth while noting, however, that the present favored lamp has made it possible commercially to market a series of lamps of different lighting power so that almost any condition of lighting may readily be met.

The serious consideration which lighting is given, the corps of specialists in electrical companies in a position to give valuable assistance and the consulting specialists awaiting the call of the factory owner, certainly argue that the time has passed when their recommendations will be listened to and then carefully disregarded. It is pointed out that periodic attention to lighting equipment is highly beneficial and an insignificant item from the cost standpoint. Proper distribution and diffusion also are recognized of importance, particularly with reference to the human factor, a little increase in lighting cost being calculated as increasing very largely the value of the worker.

The Tin Plate Imports and Exports

One of the most interesting dev lopments in our foreign trade this year is the decline in imports and the increase in exports of tinplates. We are now exporting considerably more than we are importing. For the eight months ended with August the exports of tinplates were 36,094 gross tons, while the imports were but 12,706 tons. In the corresponding period of 1910 the exports were but 7586 tons, while the imports were 51,082 tons. The reversal of trade in this product has therefore occurred this year for the first time. In July and August the imports totaled but 533 tons, against exports of 10,517 tons. This great change is partly due to the growth of our export trade in tinplates with contiguous countries, and partly to the capture by domestic tinplate manufacturers of the very important business done by packers. They have long purchased foreign tinplates for making cans to hold their exported products, thus getting the benefit of the drawback in the tinplate duty when the cans were exported.

The Buying of Replacement Parts

Users of machinery fare best who buy repair parts directly from the manufacturer. Often they save in the cost and almost always they save time, which in many cases is the equivalent of money. The modern machine tool builder regards the replacement of parts of his machines with jealous care. Generally speaking, he desires no profit in this department of his sales. He knows that each item of repair is charged up against the individual machine, and that the higher the total of this cost the greater the handicap that his product must carry when the customer again enters the market. Wherever there is a good cost system—and the exceptions are becoming fewer every year—a record of all these details of expense is maintained, together with the idle time resulting from repairs, so that a tool has a good or indifferent or bad name as the case may be. Consequently, the machine builder resents the purchase of repair parts from a middleman, if the transaction means increased cost to the user or increased delay in delivery. The well-balanced shop is usually prepared to make immediate shipment of replacements, on the theory that every day lost in production is an argument against the efficiency of a tool.

The usual custom nowadays is to consider a question of repairs from one of several well-defined viewpoints. If a part proves defective in material or workmanship the builder cheerfully bears the expense. If the user is to blame, through the negligence or carelessness of an operator, he is charged the exact cost price. The question of responsibility may have to be adjudicated, but the principle is unchanged. If, however, a machine is of an old model and has had a useful existence covering a number of years since it left the shop of its builder, the latter may feel warranted in charging a snug profit, and the soundness of the position cannot reasonably be assailed. In this way the repair account of the machine tool manufacturer is kept within reasonable limits. But the indirect loss may be large, in the way of depreciated good-will. To minimize this is the constant aim of the well-organized sales department. Usually a point is strained in favor of the customer. In certain branches of machinery the repair part still plays an important revenue-creating part, but with the basic tools—the machines which make machines—a good name is considered an essential factor.

Correspondence

Ferrotitanium and Its Use

To the Editor: Referring to the letter by Dr. G. B. Waterhouse in *The Iron Age* issue of July 27 on the subject of ferrotitanium, I note that he says that ferrotitanium containing 5 to 8 per cent. carbon has only a very small amount of the carbon content combined with the titanium as titanium carbide, and that by far the largest part occurs as graphitic carbon in the alloy. The writer cannot agree with this as, in his opinion, only the excess of carbon crystalizes out as graphite in the production of this alloy.

Benefit of Carbon-Free Alloys

This opinion is supported by the famous French metallurgist, Moissan, in his book, "The Electric Furnace." The excess of carbon in this alloy is great, as only about 3 to 4 per cent. carbon is required for 12 to 15 per cent. titanium to form titanium carbide. On account of the carbide content, the alloy is not easily soluble, as it is a well-known fact that carbides dissolve with great difficulty in iron or steel, particularly titanium and vanadium carbide. The accuracy of this opinion is well established by practice, and there are many users of the 10 to 15 per cent. ferrotitanium with 5 to 8 per cent. carbon who have found from experience that a considerable part of the alloy does not dissolve at all but rises to the surface and is found afterward imbedded in the slag and, therefore, wasted. No case is known where this has happened with the carbon-free alloy. The user of the carbon-free alloy derives the full benefit of the titanium content, as there are no carbides at all in the alloy, neither of titanium nor iron.

Ferroalloys should be free from carbon, whether ferrochromium, ferrotungsten, ferrotitanium or ferrovanadium. No steel maker now uses ferrovanadium containing 5 to 6 per cent. carbon, as he knows only too well that the carbon is combined with the vanadium to form vanadium carbide, and this does not dissolve in iron or steel but is wasted in the slag. It is the same with titanium, and those who use both the carbon-free ferrotitanium and that containing carbon will find that the above statements are correct.

In the last paragraph of this article Dr. Waterhouse says, referring to the carbonaceous alloy, "the alloy quickly dissolves because of its low melting point." Now solubility and melting point are two entirely different things, and it is only necessary to state here a few examples where one metal will not dissolve in another, although heated far above its melting point. This is very clearly shown in the case of lead and copper. Lead has a melting point of 330 deg. C. (628 deg. F.), and copper a melting

point of 1098 deg. C. (2008 deg. F.), yet an effort to produce an alloy of copper and lead would not be successful without the aid of a flux.

On the other hand, there are many metals with high melting points which easily and quickly dissolve in others of low melting points. This is shown conclusively in the case of carbon-free manganeses, which, in spite of its melting point of 1245 deg. C. (2273 deg. F.), alloys especially easily with copper; in fact, more easily than manganese containing carbon.

The 20 to 25 per cent carbon-free ferrotitanium dissolves very easily, although its melting point is a little higher than the 10 to 15 per cent. carbonaceous ferrotitanium. This fact makes the carbon-free alloy extraordinarily suitable for use in the ladle or runner—the best way to use any deoxidizing ferroalloy.

With reference to the analysis of the carbon-free alloy given by Dr. Waterhouse, showing 7 to 8 per cent. silicon, I would like to say that this was made for a special purpose, and it is certainly not suitable for all purposes. The average silicon content of the alloy is 1.2 to 1.5 per cent. and is, therefore, lower than that of the 10 to 15 per cent. ferrotitanium in comparison with the titanium content.

High Aluminum Content

In regard to the aluminum content of the carbon-free alloy, I might say that in former years the alloy was used with a lower aluminum content, but practice has shown that the higher aluminum content gives better results, and makes the use of ferrotitanium more economical. Dr. Waterhouse's opinion that the high aluminum content might be extremely harmful is, it would appear to me, theoretical, especially when the alloy is used in the ladle. When sufficient time is allowed for the aluminum oxide to pass into the slag, no harm can possibly result. If it were harmful, why do most steel makers use aluminum as a deoxidizing agent in their steel?

The addition of aluminum to carbon-free ferrotitanium containing 25 per cent. titanium is intentional and decidedly useful. This is brought out in a letter published by Dr. Hans Goldschmidt in the October number of Metallurgical and Chemical Engineering. In this letter he states that titanic acid is well known to be very difficult of fusion and for this reason the titanic acid, which is formed by the ferrotitanium (if alone present), separates out only with difficulty. If, however, alumina is produced together and simultaneously with titanic acid, the two react together at once, forming aluminum titanate, which is more easily fusible than titanic acid, also more easily fusible than alumina.

Aluminum, used to such a large extent in the steel industry, has also the disadvantage that its oxide alone is fusible only with great difficulty and does not separate out easily. By microphotographic methods it is easy to show the small particles of alumina inclosed in steel.

Aluminum Titanate Gives a Fusible Slag

A simple experiment shows that aluminum titanate gives a much more fusible slag than either titanic acid alone or alumina alone. If one tries to melt pure alumina alone and pure titanic acid alone in a clay pot or in a small shallow crucible by means of the oxy-acetylene flame, either oxide alone will refuse to melt except if the flame be applied for a very long time and concentrated directly on the oxide, but even then it will only be possible to melt together small globules.

But if now the two oxides are mixed together, say in the ratio of three to four parts of titanic acid to one part of alumina (that is in the same proportion in which the two oxides are formed in the oxidation of carbon-free ferrotitanium, containing aluminum and made by the aluminothermic method), the two oxides together will melt in a very short time. This simple experiment shows clearly the advantages of the aluminum content of ferrotitanium.

In cases where steel contains a large proportion of oxides, which could be deoxidized much better by means of aluminum, if this were persent, the titanium has to be this deoxidizer and it is consumed uselessly as such, either in whole or in part. In order to avoid this useless and more expensive consumption of the titanium, aluminum is added simultaneously with titanium, in the case of the carbon-free ferrotitanium, so that all the impurities and oxides are first reduced by the aluminum. When this is done the titanium can manifest its own effect more strongly.

Another Advantage of Carbon-Free Alloy

Another great advantage of the carbon-free alloy lies in the fact that it is always uniform in quality and density and perfectly free from slag. This can hardly be said of the 10 to 15 per cent. ferrotitanium containing 5 to 8 per cent carbon. Judging from the material that the writer has seen being used by consumers, it is often very irregular in structure, some of it being apparently dense and undoubtedly of the specific gravity mentioned by Dr. Waterhouse, but a large percentage of it is of a porous, spongy character, which would hardly work itself through any considerable layer of slag and might even tend to float on a metal bath and thus be wasted. This porous material has a slag-like fracture and appears to contain melted titanium oxide, which would hardly be a beneficial adlition to molten steel.

There can be no doubt that with the aluminothermic process a much more complete separation of metal and slag is obtained than in the electric furnace. In the latter the metal and slag melt drop by drop, while with the thermit process the heat developed is so great that everything is melted at once and, therefore, a much more uniform metal is obtained.

The high titanium content of the carbon-free alloy is of great importance, especially if the ferrotitanium is added to the ladle. In many cases it is necessary to add from 400 to 500 lb. of ferromanganese, and where this is done it is a great advantage to add only 100 lb. of the carbon-free 20 x 25 per cent. ferrotitanium, instead of 200 lb. of the 10 to 15 per cent. alloy. For this reason many steel manufacturers prefer the higher per cent. ferrotitanium, as not nearly so much heat is required to melt it, with the result that the temperature of the steel is not reduced to the extent that it would be otherwise. The slightly higher melting point of the 20 to 25 per cent. ferrotitanium does not amount to anything in comparison with the amount of heat required for melting the double weight of alloy.

Dr. Waterhouse's opinions, as expressed in his letter, are particularly interesting, as the subject is one which is now being very generally discussed, and I trust that his further investigations may show him the correctness of my views. WILLIAM R. HULBERT.

NEW YORK, October 5, 1911.

National Founders' Association.—Announcement is made that the fifteenth annual convention of the National Founders' Association will be held at the Hotel Astor, New York, Wednesday and Thursday, November 15 and 16. The Administrative Council will hold a meeting on Tuesday, November 14, and the alumni dinner will be held Tuesday evening. Prominent speakers have been engaged for the annual banquet on Wednesday evening and committees are now arranging a programme of papers and discussions for the convention.

The Bignall & Keeler Mfg. Company, Edwardsville, Ill., manufacturer of pipe threading machines, is changing its entire line of pipe machines over to single pulley drive. The different speeds are obtained by shifting gears in the gear box and the positions of the different levers are shown by a speed plate. All gears are covered to protect workmen. The weight of practically all the machines has been increased to provide for the use of high speed steel in the dies.

The Mumford Molding Machine Company, Plainfield, N. J., announces its appointment of James T. Lee, formerly of the Hanna Engineering Works, as its Chicago representative, with address at 2059 Elston avenue, Chicago.

The annual meeting of the stockholders of the Republic Iron & Steel Company will be held in Jersey City, N. J., October 18. Four directors will be elected for three years.

The Iron and Metal Markets

A Comparison of Prices

Advances Over the Previous Week in Heavy Type, Declines in Italics.

At date, one week, one month and one year previous.

	Oct. 11, 1911.	Oct. 4, 1911.	Sept. 13, 1911.	Oct. 12, 1910.
PIG IRON, Per Gross Ton:				
Foundry No. 2 standard, Philadelphia	$15.00	$15.00	$15.00	$15.75
Foundry No. 2, Valley furnace	13.50	13.25	13.50	14.00
Foundry No. 2 Southern, Cincinnati	13.25	13.25	13.25	14.25
Foundry No. 2, Birmingham, Ala.	10.00	10.00	10.00	11.00
Foundry No. 2, at furnace, Chicago*	14.50	14.50	14.50	16.00
Basic, delivered, eastern Pa.	14.50	14.50	14.75	15.00
Basic, Valley furnace	*12.50*	12.60	13.00	13.10
Bessemer, Pittsburgh	*15.40*	15.55	15.90	15.90
Gray forge, Pittsburgh	13.65	13.65	13.90	14.15
Lake Superior charcoal, Chicago	16.50	16.50	16.50	18.25
COKE, CONNELLSVILLE, Per Net Ton, at Oven:				
Furnace coke, prompt shipment	1.50	1.50	1.50	1.60
Furnace coke, future delivery	*1.60*	1.60	1.60	1.70
Foundry coke, prompt shipment	*1.80*	1.85	1.85	2.10
Foundry coke, future delivery	*2.00*	2.10	2.10	2.25
BILLETS, &c., Per Gross Ton:				
Bessemer billets, Pittsburgh	20.00	20.00	21.00	24.00
Open hearth billets, Pittsburgh	19.00	19.00	21.00	24.50
Forging billets, Pittsburgh	25.00	25.00	26.00	29.00
Open hearth billets, Philadelphia	21.40	21.40	23.40	26.00
Wire rods, Pittsburgh	26.00	26.00	27.00	28.50
OLD MATERIAL, Per Gross Ton:				
Iron rails, Chicago	13.75	13.75	14.50	16.00
Iron rails, Philadelphia	16.50	16.50	17.00	18.00
Car wheels, Chicago	12.50	12.50	12.75	14.00
Car wheels, Philadelphia	11.75	11.75	12.75	13.75
Heavy steel scrap, Pittsburgh	*12.00*	12.25	12.75	14.25
Heavy steel scrap, Chicago	10.00	10.00	10.50	12.25
Heavy steel scrap, Philadelphia	12.00	12.00	13.00	13.75
FINISHED IRON AND STEEL, Per Pound:	Cents.	Cents.	Cents.	Cents.
Bessemer rails, heavy, at mill	1.25	1.25	1.25	1.25
Iron bars, Philadelphia	1.22½	1.22½	1.27½	1.40
Iron bars, Pittsburgh	1.20	1.20	1.25	1.45
Iron bars, Chicago	1.20	1.20	1.22½	1.35
Steel bars, Pittsburgh	1.15	1.15	1.20	1.40
Steel bars, tidewater, New York	1.31	1.31	1.36	1.56
Tank plates, Pittsburgh	1.20	1.20	1.30	1.40
Tank plates, tidewater, New York	1.36	1.36	1.46	1.56
Beams, Pittsburgh	*1.20*	1.25	1.35	1.40
Beams, tidewater, New York	*1.36*	1.41	1.51	1.56
Angles, Pittsburgh	*1.20*	1.25	1.35	1.40
Angles, tidewater, New York	*1.36*	1.41	1.51	1.56
Skelp, grooved steel, Pittsburgh	1.15	1.15	1.20	1.40
Skelp, sheared steel, Pittsburgh	1.25	1.25	1.30	1.50
SHEETS, NAILS AND WIRE, Per Pound:	Cents.	Cents.	Cents.	Cents.
Sheets, black, No. 28, Pittsburgh	1.85	1.85	1.90	2.20
Wire nails, Pittsburgh†	1.65	1.65	1.65	1.70
Cut nails, Pittsburgh†	1.50	1.50	1.60	1.65
Barb wire, galv., Pittsburgh†	1.95	1.95	1.95	2.00
METALS, Per Pound:	Cents.	Cents.	Cents.	Cents.
Lake copper, New York	12.50	12.50	12.75	12.87½
Electrolytic copper, New York	12.25	12.25	12.37½	12.75
Spelter, St. Louis	**6.00**	5.85	5.90	5.45
Spelter, New York	**6.15**	6.00	6.05	5.60
Lead, St. Louis	*4.10*	4.32½	4.40	4.27½
Lead, New York	*4.25*	4.47½	4.50	4.40
Tin, New York	**41.25**	40.15	39.75	.....
Antimony, Hallett, New York	7.70	7.70	7.75	7.87½
Tin plate, 100-lb. box, New York	$3.84	$3.84	$3.84	$3.84

*The average switching charge for delivery to foundries in the Chicago district is 50c. per ton.
†These prices are for largest lots to jobbers.

Prices of Finished Iron and Steel f.o.b. Pittsburgh

Freight rates from Pittsburgh in carloads, per 100 lb.: New York, 16c.; Philadelphia, 15c.; Boston, 18c.; Buffalo, 11c.; Cleveland, 10c.; Cincinnati, 15c.; Indianapolis, 17c.; Chicago, 18c.; St. Paul, 32c.; St. Louis, 22½c.; New Orleans, 30c.; Birmingham, Ala., 45c. Pacific coast, 80c. on plates, structural shapes and sheets No. 11 and heavier; 85c. on sheets Nos. 12 to 16; 95c. on sheets No. 16 and lighter; 65c. on wrought boiler tubes.

Plates.—Tank plates, ¼ in. thick, 6¼ in. up to 100 in. wide, 1.15c. to 1.20c., base, net cash, 30 days. Following are stipulations prescribed by manufacturers, with extras:

Rectangular plates, tank steel or conforming to manufacturers' standard specifications for structural steel dated February 6, 1903, or equivalent, ¼ in. thick and over on thinnest edge, 100 in. wide and under, down to but not including 6 in. wide, are base.

Plates up to 72 in. wide, inclusive, ordered 10.2 lb. per square foot, are considered ¼-in. plates. Plates over 72 in. wide must be ordered ¼ in. thick on edge, or not less than 11 lb. per square foot, to take base price. Plates over 72 in. wide ordered less than 11 lb. per square foot down to the weight of 3-16-in. take the price of 3-16-in.

Allowable overweight, whether plates are ordered to gauge or weight, to be governed by the standard specifications of the Association of American Steel Manufacturers.

Extras.	Cents per lb.
Gauges under ¼ in. to and including 3-16 in. on thinnest edge	.10
Gauges under 3-16 in. to and including No. 8	.15
Gauges under No. 8 to and including No. 9	.25
Gauges under No. 9 to and including No. 10	.30
Gauges under No. 10 to and including No. 12	.40
Sketches (including all straight taper plates) 3 ft. and over in length	.10
Complete circles, 3 ft. in diameter and over	.20
Boiler and flange steel	.10
"A. B. M. A." and ordinary firebox steel	.20
Still bottom steel	.30
Marine steel	.40
Locomotive firebox steel	.50
Widths over 100 in. up to 110 in., inclusive	.05
Widths over 110 in. up to 115 in., inclusive	.10
Widths over 115 in. up to 120 in., inclusive	.15
Widths over 120 in. up to 125 in., inclusive	.25
Widths over 125 in. up to 130 in., inclusive	.50
Widths over 130 in.	1.00
Cutting to lengths or diameters under 3 ft. to 2 ft., inclusive	.25
Cutting to lengths or diameters under 2 ft. to 1 ft., inclusive	.50
Cutting to lengths or diameters under 1 ft.	1.55

No charge for cutting rectangular plates to lengths 3 ft. and over.

Structural Material.—I-beams, 3 to 15 in.; channels, 3 to 15 in., and angles, 3 to 6 in. on one or both legs, ¼ in. and over, 1.20c. to 1.25c. Other shapes and sizes are quoted as follows:

	Cents per lb.
I-beams over 15 in.	1.35 to 1.40
H-beams over 18 in.	1.45 to 1.50
Angles, 3 to 6 in., inclusive, ¼ in. and up	1.25 to 1.30
Angles over 6 in.	1.35 to 1.40
Angles, 3 in. on one or both legs, less than ¼ in. thick, plus full extras as per steel bar card Sept. 1, 1909	1.30 to 1.35
Tees, 3 in. and up	1.30 to 1.35
Zees, 3 in. and up	1.25 to 1.30
Angles, channels and tees, under 3 in., plus full extras as per steel bar card Sept. 1, 1909	1.30 to 1.35
Deck beams and bulb angles	1.55 to 1.60
Hand rail tees	2.45
Checkered and corrugated plates	2.45

Sheets.—Makers' prices for mill shipments on sheets of U. S. standard gauge, in carload and larger lots, on which jobbers charge the usual discounts for small lots from store, are as follows:

Blue Annealed Sheets.

	Cents per lb.
Nos. 3 to 8	1.25 to 1.30
Nos. 9 and 10	1.35 to 1.40
Nos. 11 and 12	1.40 to 1.45
Nos. 13 and 14	1.45 to 1.50
Nos. 15 and 16	1.55 to 1.60

Box Annealed Sheets, Cold Rolled.

	One Pass.	Three Pass.
Nos. 10 to 12	1.50 to 1.55	.....
Nos. 13 and 14	1.55 to 1.60	.....
Nos. 15 and 16	1.60 to 1.65	1.70 to 1.75
Nos. 17 to 21	1.65 to 1.70	1.75 to 1.80
Nos. 22, 23 and 24	1.70 to 1.75	1.80 to 1.85
Nos. 25 and 26	1.75 to 1.80	1.85 to 1.90
No. 27	1.80 to 1.85	1.90 to 1.95
No. 28	1.85 to 1.90	1.95 to 2.00
No. 29	1.90 to 1.95	2.00 to 2.05
No. 30	2.00 to 2.05	2.10 to 2.15

Galvanized Sheets, of Black Sheet Gauge.

Nos. 10 and 11	1.85 to 1.90
Nos. 12, 13 and 14	1.95 to 2.00
Nos. 15, 16 and 17	2.10 to 2.15
Nos. 18 to 22	2.25 to 2.30
Nos. 23 and 24	2.35 to 2.40
Nos. 25 and 26	2.55 to 2.60
No. 27	2.70 to 2.75
No. 28	2.85 to 2.90
No. 29	2.95 to 3.00
No. 30	3.15 to 3.20

All above rates on sheets are f.o.b. Pittsburgh, terms 30 days net, or 2 per cent. cash discount in 10 days from date of invoice, as also are the following base prices per square for painted and galvanized roofing sheets, with 2½-in. corrugations:

Gauge.	Painted.	Galvanized.	Gauge.	Painted.	Galvanized.
29	.....	$2.30	23	$2.35	$3.45
28	$1.30	2.45	22	2.55	3.65
27	1.45	2.50	21	3.75	4.00
26	1.55	2.60	20	3.00	4.30
25	1.80	3.00	18	4.60	5.65
24	2.05	3.10	16	4.85	6.45

Wire Rods and Wire.—Bessemer, open hearth and chain rods, $26 to $26.50. Fence wire, Nos. 0 to 9 per 100 lb., terms 60 days, or 2 per cent. discount in 10 days, carload lots, to jobbers, annealed, $1.45; galvanized, $1.75. Carload lots, to retailers, annealed, $1.50; gal-

THE IRON AND METAL MARKETS

vanized, $1.80. Galvanized barb wire to jobbers, $1.95; painted, $1.65. Wire nails, to jobbers, $1.65.

The following table gives the price to retail merchants on wire in less than carloads, including the extras on Nos. 10 to 16, which are added to the base price:

Fence Wire, Per 100 lb.

Nos.	0 to 9	10	11	12 & 12½	13	14	15	16
Annealed	$1.65	$1.70	$1.75	$1.80	$1.90	$2.00	$2.10	$2.20
Galvanized	1.95	2.00	2.05	2.10	2.20	2.30	2.70	2.80

Market and Stone Ware in Bundles, Discount from Standing List.

Bright and Annealed:
9 and coarser 80
10 to 18 ..... 80 and 10
19 to 26 ..... 80 and 10 and 2½
27 to 36 ..... 80 and 5
Galvanized:
9 and coarser ..... 75 and 10
10 to 16 ..... 75 and 10
17 to 26 ..... 72½ and 10
27 to 36 ..... 72½
Coppered or Liquor Finished:
9 and coarser ..... 75 and 10
10 to 16 ..... 75 and 10
27 to 36 ..... 70 and 10 and 5
Tinned:
6 to 18 ..... 75 and 10 and 10

Wrought Pipe.—The following are the jobbers' carload discounts on the Pittsburgh basing card on wrought pipe, in effect from October 2, 1911:

	Steel Black.	Steel Galv.	Iron Black.	Iron Galv.
Butt Weld.				
⅛ and ¼ in.	73	53	68	48
⅜ in.	74	64	69	59
½ in.	77	67	75	65
¾ in. to 1½ in.	80	72	75	67
2 in. to 3 in.	81	74	76	69
Lap Weld.				
1¼ and 1½ in.	..	..	68	61
2 in.	77	70	72	65
2½ to 4 in.	79	72	74	67
4½ to 6 in.	78	70	73	65
7 to 12 in.	76	66	71	61
13 to 15 in.	52	..	47	..
Butt Weld, extra strong, plain ends, card weight.				
⅛, ¼, ⅜ in.	70	60	65	55
½ in.	75	69	70	64
¾ to 1½ in.	79	73	74	68
2 to 3 in.	80	74	75	69
Lap Weld, extra strong, plain ends, card weight.				
1½ in.	..	..	66	60
2 in.	76	70	71	65
2½ to 4 in.	78	72	73	67
4½ to 6 in.	77	71	72	66
7 to 8 in.	70	60	65	55
9 to 12 in.	65	55	60	50
Butt Weld, double extra strong, plain ends, card weight.				
½ in.	65	59	60	54
¾ to 1½ in.	68	62	63	57
2 to 3 in.	70	64	65	59
Lap Weld, double extra strong, plain ends, card weight.				
2 in.	66	60	61	55
2½ to 4 in.	68	62	63	57
4½ to 6 in.	67	61	62	56
7 to 8 in.	60	50	55	45
Plugged and Reamed.				
1 to 1½, 2 to 3 in. Butt Weld 2, 2½ to 4 in. ..... Lap Weld	will be sold at two (2) points lower basing (higher price) than merchants' or card weight pipe. Butt or lap weld, as specified.			

The above discounts are for "card weight," subject to the usual variation of 5 per cent. Prices for less than carloads are three (3) points lower basing (higher price) than the above discounts.

Pittsburgh

PITTSBURGH, October 11, 1911.—*(By Telephone.)*

Pig Iron.—We are asked to state by the Standard Sanitary Mfg. Company that reports that it is in the market for 22,000 tons of foundry and forge iron are untrue. This company has all the iron that it will need for some time to come for its Allegheny and Louisville works. The local pig iron market is very dull, the only inquiry out being one for 500 to 1000 tons of malleable Bessemer for October and November delivery. Prices are weak and not enough new business is being offered to test the market. Several Valley furnaces are offering Bessemer iron freely at $14.50 and basic at $12.50 at furnace. We quote Bessemer iron at $14.50 to $14.65; basic, $12.50 to $12.60; malleable Bessemer, $13 to $13.25; No. 2 foundry, for the remainder of the year, $13.50, and gray forge, $12.75, all at Valley furnace, the freight rate to Pittsburgh district being 90 cents a ton.

Steel.—The lower prices ruling on billets and sheet bars are causing consumers to take more interest in the market, and some inquiries are out for billets and bars for delivery over the remainder of this year and into the first quarter of next year. Specialties against contracts are coming to the mills at a fair rate. Prices are unchanged and we quote open hearth billets, $19; Bessemer billets, $20; open hearth sheet bars, $20; Bessemer sheet bars, $21, and forging billets, $25, f.o.b. at maker's mill. The steel mills are no longer quoting prices f.o.b. Pittsburgh or Youngstown, but are all quoting f.o.b. at maker's mill, adding the freight to the point of delivery. We note a sale of 1000 tons of open hearth billets of special quality at $20, delivered, equal to about $19.50 at maker's mill.

Steel Rails.—The Carnegie Steel Company has sold 1400 tons of standard section to a Western road for prompt delivery.

Merchant Pipe.—The Ohio Fuel Supply Company has bought 10 miles of 4 to 8-in. steel pipe and the Philadelphia company 5 miles of 6-in. iron pipe.

(By Mail.)

New inquiries and specifications against contracts are reported as coming in a little better, but consumers are still placing orders cautiously, taking only such quantities as are absolutely required to meet current needs. Prices have gone to a still lower level in the past week and are believed now to be very close to bottom. Plates have sold at 1.15c. to 1.20c., structural material seems to have settled down to 1.20c., and steel bars, while generally quoted at 1.15c., have sold in some cases at 1.10c., at mill. The new discounts on pipe and boiler tubes are reported to be quite well maintained and the specifications of two pipe mills up to to-day are slightly ahead of those for the same period last month. Car orders have been a little better and several good-sized inquiries are out. Some pretty heavy work is coming up, which, if it goes through, will take a good tonnage of plates.

Ferromanganese.—Sales are reported of 300 to 400 tons for delivery in last quarter at about $37, Baltimore, while for first quarter shipment most importers are asking $37.50 to $38, Baltimore. The freight rate for delivery in the Pittsburgh district is $1.95 a ton.

Ferrosilicon.—Prices on 50 per cent. are higher than last week's. We note sales of about three carloads for early shipment on the basis of $59, and we quote $59 to $60, Pittsburgh. Two blast furnaces have recently gone into the manufacture of ferrosilicon and prices are being cut to some extent. We quote 10 per cent., $22; 11 per cent., $23; and 12 per cent., $24, f.o.b. cars Ashland, Ky., or Jackson, Ohio.

Muck Bar.—While prices are not very firm, we quote best grades made from all pig iron at $28 to $28.50, delivered at buyers' mill in the Pittsburgh district.

Skelp.—The market is very quiet and a local mill that rolls both steel and iron skelp has closed down for lack of orders. A sale of 1000 tons of narrow grooved steel skelp is reported at 1.10c., at makers' mill, equal to about 1.15c., Pittsburgh. We quote grooved steel skelp at 1.15c.; sheared steel skelp, 1.20c.; grooved iron skelp, 1.40c., and sheared iron skelp, 1.60c., all for delivery at consumers' mills in the Pittsburgh district.

Wire Rods.—New inquiry is very dull, and several large makers of rods having contracts with consumers made several months ago state that specifications are coming in at a very unsatisfactory rate. We quote Bessemer, open hearth and chain rods at $26 to $26.50, f.o.b. Pittsburgh, but the market is weak.

Steel Rails.—It is reported that one of the leading roads has placed a rail order for 24,000 tons, part of which is to be rolled by the local mill. The Carnegie Steel Company has received in the past two or three weeks some very good orders for standard sections for export. New demand and specifications against contracts for light rails are fairly active, the Carnegie Steel Company having booked about 3200 tons in the past week.

Plates.—More car orders have been placed in the past week than for some time and good sized inquiries are out. In addition to the Missouri Pacific orders amounting to 2400 cars the Louisville & Nashville has placed 500 steel underframes with the Pressed Steel Car Company and 500 with the Mount Vernon Car Company. Active inquiries include 386 steel underframes for the Buffalo, Rochester & Pittsburgh, 300 steel underframe automobile cars for the Erie, 500 steel underframe furniture cars and 250 steel underframe flat cars for the Chicago, Rock Island & Pacific, 987 steel underframes for the Delaware, Lackawanna & Western, 1000 underframe box cars for the New York Central, 200 steel hoppers for the Cambria & Indiana, 40 suburban pas-

THE IRON AND METAL MARKETS

senger cars for the Long Island and 75 to 100 passenger cars for the Pennsylvania. The low prices ruling on plates are of interest to boat builders, and it is stated that several large contracts for boats for the ore trade and for freight service are under negotiation. While we quote wide and narrow plates at 1.20c., Pittsburgh, this price can be shaded on very desirable specifications and for shipment at the convenience of the mill.

Structural Material.—Bids are going in on some pier sheds at New Orleans, about 300 tons.. The American Bridge Company has taken 800 tons of bridge work for the Wabash Railroad. We quote beams and channels up to 15 in. at 1.20c., f.o.b. Pittsburgh, but on desirable specifications and for prompt shipment 1.15c. has been done in some cases.

Bars.—New orders for both iron and steel bars continue light, being mostly for small lots to cover actual needs, and consumers are specifying against contracts at only a fairly satisfactory rate. Consumers and jobbers are taking in as little as possible until conditions are more settled. The open market on steel bars is 1.15c., but on desirable specifications 1.10c. is being done. It is stated that steel bars at 1.10c. are about as low as they have ever been, taking present labor and raw material costs into account. We quote steel bars at 1.10c. to 1.15c., the lower price being made only in some cases and for desirable orders. We quote common iron bars at 1.20c. to 1.25c., f.o.b. at mill, Pittsburgh.

Sheets.—As far as new orders and specifications against contracts are concerned conditions in this trade are fairly good, most of the mills running to an average of about 70 per cent. of capacity. The leading sheet mills generally are pursuing the policy of running full for a week or two and then shutting down until enough orders accumulate to warrant starting up again full time. Some sellers report that on No. 28 black one pass, box annealed sheets, they are able to get 1.90c. on most of their orders, and it takes a very desirable specification to bring out the price of 1.85c. Galvanized sheets are possibly a little stronger, owing to the higher prices ruling for spelter. A pretty large tonnage of sheets is now being sold for export and heavy shipments have recently been made to Canada.

Tin Plate.—Between October 15 and 20 it is probable that the meat packers will come in the market to place contracts for their tin plate requirements running through the first quarter and into the first half of next year. Indications are that $3.60 per base box for 100-lb. cokes will be the basis of quotations on these contracts. Specifications against contracts have been coming in quite freely so far this month. The leading mills are operating at present to only about 60 per cent. of capacity, and it is very evident that a large productive surplus exists which must remain idle until consumption is much heavier. We quote 100-lb. cokes at $3.60 per base box, f.o.b. Pittsburgh.

Merchant Steel.—Consumers and jobbers are placing orders from hand to mouth, keeping stocks as low as possible in the belief that prices have not yet reached bottom. Quotations, which are more or less shaded, are as follows: Iron finished tire, ¼ and ½ in. and heavier, 1.40c.; under these sizes, 1.45c.; planished tire, 1.50c.; channel tire, 1.70c., base; toe calk, 1.80c.; flat sleigh shoe, 1.45c.; concave or convex, 1.60c.; cutter shoe, tapered or bent, 2.15c.; spring steel, 1.85c.; machinery steel, smooth finish, 1.75c.

Hoops and Bands.—The quotation of 1.25c. on steel hoops in this report last week was a typographical error and should have been 1.35c. New orders for both hoops and bands are light and only for small lots to cover actual needs, while specifications are not coming in at a satisfactory rate. We quote steel hoops at 1.35c. and bands at 1.15c., but on desirable orders for prompt shipment these prices would be shaded.

Rivets.—New buying is very light and specifications against contracts are unsatisfactory. We quote structural rivets at 1.55c. to 1.60c. and boiler rivets at 1.65c. to 1.70c., f.o.b. Pittsburgh.

Wire Products.—Conditions in this trade are only fairly satisfactory, new demand being only for small lots, while specifications against contracts are only for such quantities of wire and nails as jobbers or retailers require to meet current needs. The leading wire nail mills continue to bill nails at $1.70 per keg, but allow customers to deduct 5c. when remitting. We quote wire nails at $1.65; cut nails, $1.55; galvanized barb wire, $1.95; painted, $1.65; annealed fence wire, $1.45, and galvanized, $1.75, all f.o.b. Pittsburgh, usual terms, full freight added to point of delivery.

Spelter.—Prices are higher with a somewhat better demand. We note a sale of two cars, or about 50 tons, for prompt shipment at 5.95c., East St. Louis, equal to 6.07½c., Pittsburgh.

Shafting.—Prices continue at a low level, and we quote cold rolled shafting at 60 and 5 off in small lots and 60 and 10 per cent. off list in carload lots, delivered in base territory.

Railroad Spikes.—The railroads are placing only small orders to cover needs for repair work, and no large inquiries are in the market. We quote railroad spikes in base sizes at $1.40 to $1.45, f.o.b. mill, Pittsburgh.

Merchant Pipe.—The contract taken by the United States Steel Products Company from the Western Gas, Light, Heat & Power Company, Calgary, Canada, which is for a natural gas line, will be turned over to the National Tube Company to be rolled at its mills in the Pittsburgh district. The trunk line embraces about 180 miles of 16-in. line pipe, 6 miles of 6-in. screw pipe, 12 miles of 8-in. screw pipe, 12 miles of 16-in. screw pipe, and about 60 miles of 14-in. o. d. down to 6-in. i. d., while the miscellaneous lines embrace 3 miles of 12-in. o. d.; 5 miles of 10-in. o. d., 15 miles of 8-in. i. d., 15 miles of 6-in. i. d. and 50 miles of 4½-in. o. d. This is one of the largest contracts for line pipe placed in months. We also note that the Texas Company is in the market for 150 miles of 6-in. line pipe. It is probable the business will go to the Republic Iron & Steel Company, which in the past has furnished a large amount of pipe to this company. The general demand for merchant pipe is fairly active, two leading mills reporting that orders placed so far this month show a slight increase over the same period in December. It is stated that the new discounts on iron and steel pipe are being well maintained.

Boiler Tubes.—New business in both locomotive and merchant tubes is only fair and is still confined to small lots to cover actual needs. It is stated that new discounts on boiler tubes which went into effect some time ago are being maintained. These are printed on a previous page.

Coke.—Both blast furnace and foundry coke continue quiet, but prices are quite firm. Several Valley blast furnace interests continue to buy their supply of coke from month to month and we note sales of about 15,000 tons for delivery in October at $1.50 per net ton, at oven, for standard grades and also sales of about 25,000 tons of standard grade for November and December delivery at $1.65 per net ton, at oven. We quote standard makes of furnace coke on contracts for prompt shipment at $1.50 to $1.55 and on contracts for remainder of this year at $1.65 to $1.70 per net ton, at oven. We quote 72-hr. foundry coke for prompt shipment at $1.85 and up to $2, and on contracts from $2.10 and as high as $2.40.

Iron and Steel Scrap.—Conditions in this trade are very unsatisfactory, there being practically no demand. The low prices have not stimulated business and consumers are taking in as little scrap as possible. The regular monthly list of the Pennsylvania Railroad came out last week and embraced about 14,000 tons, including 5000 tons of heavy melting steel, on which bids closed on October 10. We have reduced our quotations on some lines, but hardly enough material is moving to fix a market. Prices are as follows per gross ton f.o.b. Pittsburgh, unless otherwise noted:

Heavy steel scrap, Steubenville, Follansbee, Sharon, Monessen and Pittsburgh delivery	$12.00 to	$12.25
No. 1 foundry cast	12.50 to	12.75
No. 2 foundry cast	12.00 to	12.25
Bundled sheet scrap, f.o.b. consumers' mill, Pittsburgh district	10.25 to	10.50
Rerolling rails, Newark and Cambridge, Ohio, Cumberland, Md., and Franklin, Pa.	13.00 to	13.25
No. 1 railroad malleable stock	11.75 to	12.00
Grate bars	9.50 to	9.75
Low phosphorus melting stock	15.50 to	15.75
Iron car axles	22.00 to	22.50
Steel car axles	16.50 to	16.75
Locomotive axles		23.00
No. 1 busheling scrap	11.50 to	11.75
No. 2 busheling scrap	8.00 to	8.25
Old car wheels	12.50 to	12.75
Sheet bar crop ends	13.75 to	14.00
*Cast iron borings		8.25
*Machine shop turnings		8.25
Old iron rails	14.50 to	14.75
No. 1 wrought scrap		13.50
Heavy steel axle turnings	9.75 to	10.00
Stove plate	9.50 to	9.75

*These prices are f.o.b. cars at consumers' mills in the Pittsburgh district.

THE IRON AND METAL MARKETS

Chicago

CHICAGO, ILL., October, 10, 1911.

Buyers of steel out of store found the chief item of interest during the past week to be the reduction in prices of bars, shapes, plates and sheets. The recent lowering of mill prices had established a wide spread, which has now been met by a general concession on the part of the jobbers of $2 a ton. The market situation as to prices continues to indicate that mills are using all of their local advantages, particularly of geographical location, to make attractive delivery quotations. Prices show practically no adherence to common basing points, and the market has seldom been more favorable to the buyer. From the sellers' standpoint it is therefore considered to be of unfavorable significance that consumers generally decline to take advantage of the situation beyond immediate needs. Finished steel tonnage is moving in about the same volume as for several weeks past, and the price concessions seem to have been without influence in decreasing or increasing buying. Western rail business was quiet during the week, but the awarding of the Field Museum structural steel contract, involving 10,000 tons, to the Bethlehem Steel Company, and the purchase of 2400 cars by the Missouri Pacific Railroad, requiring some 25,000 tons of plates and shapes, brought encouragement in these lines. The purchase of 4000 tons of malleable pig iron at Chicago and 6000 tons of basic at St. Louis were the exceptions in a quiet pig iron market.

Pig Iron.—Improvement in pig iron buying reported in other districts finds little parallel in the Chicago market. A sale of 4000 tons of malleable to meet the current needs of a large buyer is noted and also an inquiry for 2500 tons of foundry iron. These items stand out sharply from the balance of transactions, which seem to have been limited to quantities not exceeding 300 and 400 tons. Requests for anticipated deliveries from melters are being received in number sufficient to improve the tone of the market somewhat, and contracts upon which iron has been held up for many months are now beginning to be worked out. A tendency toward cleaning up back orders before more iron is purchased may account for both the prompt shipment demands and the lack of buying at this time. From the standpoint of price, the situation offers little to encourage the furnaces. Local iron can now be bought for $14.50 at furnace, with buyers obtaining an extension of deliveries into the first quarter. Southern iron for the remainder of the year is being sold on a basis of $10, Birmingham, for No. 2, and while the volume of sales for first quarter delivery is still quite limited, the extension of the low prices into next year seems impossible of avoidance. We quote for Chicago delivery, except for local irons which are f.o.b. furnace, the following prices on prompt shipments:

Lake Superior charcoal	$16.50 to $17.00
Northern coke foundry, No. 1	15.00 to 15.50
Northern coke foundry, No. 2	14.50 to 15.00
Northern coke foundry, No. 3	14.25 to 14.50
Northern Scotch, No. 1	16.00
Southern coke, No. 1 foundry and No. 1 soft	14.85 to 15.10
Southern coke, No. 2 foundry and No. 2 soft	14.35 to 14.85
Southern coke, No. 3	14.10 to 14.35
Southern coke, No. 4	13.85 to 14.10
Southern gray forge	13.60 to 13.85
Southern mottled	13.60 to 13.85
Malleable Bessemer	14.50 to 15.00
Standard Bessemer	17.40
Basic	15.50
Jackson Co. and Kentucky Silvery, 6 per cent	17.90
Jackson Co. and Kentucky Silvery, 8 per cent	18.90
Jackson Co. and Kentucky Silvery, 10 per cent	19.90

Rails and Track Supplies.—Buying of rails in this market during the week is without important incident. Specifications calling for track fastenings on the contrary continue to come in freely. On the long deferred Missouri Pacific Railroad car inquiry, 1900 steel coal cars were placed with the American Car & Foundry Company and 500 steel underframe box cars with the Mount Vernon Car Company. It is expected that of the remaining 2000 cars unplaced by this road a portion, at least, will be awarded in the near future. The Pullman Company and the Western Steel Car Company are each building 100 refrigerator cars for the Erie Railroad. Light rail business has been very irregular and prices are without any uniform basis. We quote standard railroad spikes at 1.60c to 1.70c., base; track bolts with square nuts, 2.05c. to 2.10c., base, all in carload lots, Chicago; standard section Bessemer rails, 1.28c.; open hearth, 1.34c.; light rails, 40 to 45 lb., 1.16c. to 1.20½c.; 30 to 35 lb., 1.19½c. to 1.24c.; 16, 20 and 25 lb., 1.20½c. to 1.25c.; 12 lb., 1.25c. to 1.30½c.; angle bars, 1.50c. to 1.60c., Chicago.

Structural Material.—Low prices for structural shapes still prevail, particularly where desirable tonnage is at stake. Some of the smaller fabricators have been encouraged to buy on mill shipment at the low prices, but the aggregate volume of orders fails to indicate any general buying in larger volume as the result of recent concessions. Bethlehem shapes were specified for the Field Museum and about 10,000 tons will be fabricated for this work by the Hansell-Elcock Company, Chicago. Other awards of steel for fabrication included 752 tons for an Illinois River bridge of the Wabash Railroad, to the American Bridge Company; 443 tons for the J. W. Jenkins Sons Company building, Kansas City, to the Kansas City Structural Steel Company; 343 tons for an office and bank building, Hutchinson, Kan., to the Modern Steel Structural Company; 114 tons for transmission line poles for the United States Reclamation Service, to B. F. Kierulff, Jr., & Co., Los Angeles, Cal. In the structural market perhaps more than elsewhere price concessions of widest range may be found. In keeping with reductions in mill quotations announcement was made of a reduction of $2 a ton on structural shapes out of store, and we now quote for mill shipment, Chicago delivery, 1.43c., and from store, 1.65c.

Plates.—Plate specifications during the week stood out more prominently than those of the other finished lines, due in large measure to requirements for the recently placed car orders. Specifications to cover this material, including shapes and plates, are now being received by the mills. Prices have followed the trend of the market and desirable business can be placed on a basis of 1.25c. Pittsburgh, although less attractive specifications have held at $1 a ton higher than these prices. In line with the jobbers' reduction on structural shapes, a similar concession is announced for plates, and we quote for Chicago delivery, mill shipment, 1.43c. to 1.48c., and out of store, 1.65c.

Sheets.—Store prices on sheets, both black and galvanized, have been reduced $1 a ton, and we have revised our quotations below. Little improvement, if any, can be noted regarding the general price situation and in many ways the market seems to be seeking its lowest level. Tonnage is still well sustained, however, though no buying for future requirements can be noted. While buyers apparently feel that at the present time there is no occasion for providing beyond immediate needs, indications show that the market is being watched very closely for a possible turn at the beginning of the year. We quote Chicago prices as follows: Carload lots, from mill: No. 28 black sheets, 2.08c. to 2.13c.; No. 28 galvanized, 3.08c. to 3.13c.; No. 10 blue annealed, 1.63c. Prices from store, Chicago, are: No. 10, 1.95c. to 2c.; No. 12, 2c. to 2.05c.; No. 28 black, 2.40c.; No. 28 galvanized, 3.35c.

Bars.—Interest in steel bars is directed more toward a search for the lowest price obtainable than toward matters of tonnage. Quotations are reported which seem too low for credence, but it cannot be doubted that Western mills are sacrificing their freight advantage to an extent which would bring the equivalent Pittsburgh basis considerably below 1.15c. Conditions apparently do not admit of obtaining more than 1.15c. Pittsburgh, and a major portion of Western business apparently has been placed between 1.25c. and 1.30c. Chicago. Steel bar tonnage is running ahead of bar iron, which latter mills in this territory are operating about 50 per cent of their capacity. Bar iron prices are approximately on a basis of 1.20c., Chicago. Hard steel bars are selling at 1.20c. We have revised store prices and quote as follows, f.o.b. Chicago: Soft steel bars, 1.25c. to 1.33c.; bar iron, 1.20c. to 1.25c.; hard steel bars rolled from old rails, 1.17½c. to 1.20c. From store, soft steel bars, 1.55c to 1.60c., Chicago.

Wire Products.—The demand for wire nails has been notably irregular, and the bookings from week to week have fluctuated between wide limits. The aggregate sales for the past month did not fall off as much, however, as had been expected. Barb wire is sharing in the very active demand for woven wire fencing and the volume in these products more than offsets any falling off in other lines. Some irregularities in price are encountered, but this may be attributed in a measure, at least, to the wide variety in types of fence. An active pursuit of business on the part of independent interests is a notable feature of the trade. Jobbers' carload prices, which are quoted to manufacturing buyers, are as follows: Plain wire, No. 9 and coarser, base,

THE IRON AND METAL MARKETS

1.68c.; wire nails, 1.88c.; painted barb wire, 1.88c.; galvanized, 2.18c.; polished staples, 1.88c.; galvanized, 2.18c., all Chicago.

Cast Iron Pipe.—At this season the municipal demand for cast iron pipe ordinarily is light, but it is expected that the low price of pig iron will lead many cities to engage pipe for spring delivery at this favorable period, particularly in view of the easy money situation. The United States Cast Iron Pipe & Foundry Company was the successful bidder for 1700 tons of pipe for Long Beach, Cal., and for 800 tons at Cincinnati. We quote as follows, per net ton, Chicago: Water pipe, 4-in., $26.50; 6 to 12-in., $24.50; 16-in. and up, $24, with $1 extra for gas pipe.

Old Materials.—The almost complete lack of interest on the part of scrap melters continues to depress the Chicago market. The tonnage changing hands is exceedingly limited and prices have suffered in consequence. Railroad offerings are not extensive and examination of the lists indicates that material previously offered has not been sold and is again offered for bids. Current lists include one from the Chicago, Milwaukee & St. Paul amounting to 1500 tons, of which the principal item is 300 tons of steel rails; 150 tons from the Soo Line, closing October 14; 800 tons from the Wabash, closing October 11, and 12,000 tons from the Baltimore & Ohio. We quote for delivery at buyers' works, Chicago and vicinity, all freight and transfer charges paid, per gross ton, as follows.

Old iron rails	$13.75 to $14.25
Old steel rails, rerolling	12.25 to 12.75
Old steel rails, less than 3 ft.	11.00 to 11.50
Relaying rails, standard section, subject to inspection	24.00
Old car wheels	12.50 to 12.75
Heavy melting steel scrap	10.00 to 10.50
Frogs, switches and guards cut apart	10.00 to 10.50
Shoveling steel	9.50 to 10.00
Steel axle turnings	8.50 to 9.00

The following quotations are per net ton:

Iron angles and splice bars	$11.75 to $12.25
Iron arch bars and transoms	13.25 to 13.75
Steel angle bars	9.00 to 9.50
Iron car axles	17.25 to 17.75
Steel car axles	15.50 to 16.00
No. 1 railroad wrought	10.25 to 10.75
No. 2 railroad wrought	9.25 to 9.75
Steel knuckles and couplers	9.50 to 10.00
Steel springs	10.00 to 10.50
Locomotive tires, smooth	14.00 to 14.50
Machine shop turnings	6.00 to 6.50
Cast and mixed borings	5.25 to 5.75
No. 1 busheling	8.00 to 8.50
No. 2 busheling	6.00 to 6.50
No. 1 boilers, cut to sheets and rings	7.00 to 7.50
Boiler punchings	12.00 to 12.50
No. 1 cast scrap	10.00 to 10.50
Stove plate and light cast scrap	8.75 to 9.25
Railroad malleable	9.75 to 10.25
Agricultural malleable	8.75 to 9.25
Pipes and flues	7.25 to 7.75

Philadelphia

PHILADELPHIA, PA., October 10, 1911.

Continued inquiry for plates and shapes from shipbuilders in this district is coming forward and the aggregate amount now being figured on both in the way of definite and prospective business totals over 20,000 tons. There has also been a larger inquiry for structural material, both for bridge and building work, but a considerable portion of the business under negotiation has a string to it. Low prices evidently have much to do with the increased inquiry, plates and shapes being now openly on a 1.40c. basis, delivered here. The pig iron market lacks any important movement.

Iron Ore.—Some little business in foreign ore for early 1912 delivery has been reported. About 50,000 tons of Spanish, for January-February delivery, has been contracted for, and negotiations are pending for other ores. The importations of Swedish ore hereafter will, it is believed, amount to about 500,000 tons a year, including the amount to be delivered on contract to the Bethlehem Steel Company. Importations during the week included 15,537 tons from Norway.

Pig Iron.—From a statistical standpoint the pig iron market in this district shows some improvement. Both the Eastern and the Virginia pig iron associations held their usual monthly meetings last week and reports showed a further decrease of pig iron stocks. A particular feature has been the urgency shown for deliveries, small lot buying and prompt shipment being pronounced. The most important development in the local market has been the practical closing of contracts for the requirements of the Pennsylvania Railroad, the maximum quantity inquired for being taken in most grades. A sale of 1000 tons of coke malleable iron for this year's shipment is reported at close to $15.75, delivered. This about cleans up all the pending negotiations for that grade. There has been the usual small lot business in the higher foundry grades, which in some instances has aggregated a very fair total. Standard brands of eastern Pennsylvania No. 2 X foundry command from $15 to $15.25, delivered, for shipments extending up to the year end, although in a few instances sellers have extended shipments into January, 1912, at current prices. For strictly first quarter shipment, for which there is more or less inquiry, sellers in this district still refuse to quote. Virginia foundry is moving in small lots, for prompt and fourth quarter delivery, at prices ranging from $12.25 to $12.50, furnace. No sales of Virginia foundry for first quarter shipment at the $12.75, furnace, basis are reported. The cast iron pipe foundries in this district are still placing contracts for low grade iron, although the demand is less aggressive. One block of 5000 tons for this year's shipment at $14.60, delivered, is reported, together with several sales of lots of a few hundred tons at irregular prices, depending on the character of the iron. Pipe makers would no doubt take on further round lots if their idea of prices, said to be about $14, delivered, would be met. Small sales of forge iron for rolling mill purposes are reported, while one inquiry for several thousand tons for early shipment is being figured on. The demand for steel making grades has again quieted down, no fresh inquiry for basic iron is reported. Small sales of standard analysis low phosphorus iron continue to be made at $20, delivered here. The following range of prices is named for standard brands, delivered in buyers' yards in this district during the remainder of the year:

Eastern Pennsylvania No. 2 X foundry	$15.00 to $15.25
Eastern Pennsylvania No. 2 plain	14.75 to 15.00
Virginia foundry	15.00 to 15.50
Gray forge	14.25 to 14.50
Basic	14.50
Standard low phosphorus	20.00

Ferroalloys.—While inquiries aggregating some 4000 to 5000 tons are reported for Western shipment, no new business in ferromanganese has developed in this district. Local sellers adhere to the recent $38.50, Baltimore, quotation, although it is reported that small lots of speculative ferro have been sold at prices under that figure. Fifty per cent. ferrosilicon is now quoted at $62, delivered, but no business of importance is pending. Furnace ferrosilicon, 11 to 13 per cent., is quiet.

Billets.—The demand still drags, consumers placing orders for small lots and showing little interest in any material quantities for forward delivery. For delivery in this territory open hearth rolling billets are quoted at $21.40 to $22.40, according to quantity and specification, while ordinary forging billets are quoted at $26.50 to $27.50, delivered.

Plates.—Makers in this district are encouraged by inquiries coming from the shipyards. Several builders have recently received orders for steel barges as well as large vessels, while inquiries are pending for a further number. It is estimated that contracts for 6000 to 8000 tons will be given for ship plates in the near future. There is also considerable business in structural plates in sight. Open quotations for ordinary heavy steel plates have settled down to 1.40c. to 1.45c., delivered, dependent upon specifications and quantity.

Structural Material.—Several good-sized propositions are being figured on, but in quite a few instances uncertainty surrounds the final closing of contracts. Considerable business in boat shapes is under negotiation. Bids are in under revised estimates for the new municipal convention hall. In this instance the quantity of structural material required has been slightly increased, 12,400 tons being required under the new plans. Considerable uncertainty surrounds the placing of the contract and it is believed that the business will be held up. The Baldwin Locomotive Works has asked for bids for the structural work for an addition to its erecting shop at Eddystone, Pa., requiring about 5000 tons, but states that it is obtaining quotations for information and is not likely to go ahead with the project at this time, although the trade believes that if prices are low enough the company may be induced to go ahead with the work. Several buildings requiring from 100 to 300 tons have been contracted for by local fabricators, while a power house for the Lehigh Valley Railroad, requiring about 2000 tons, is being figured on. Some moderate bridge orders have been placed, while one requiring 6000 tons, for a New Jersey railroad, is being estimated on. Fabricators are again reporting

THE IRON AND METAL MARKETS

easy prices and while 1.40c. is the minimum open quotation for plain shapes, delivered here, it is contended that that price is not particularly firm.

Sheets.—Eastern mills have been somewhat better fixed as far as orders are concerned and have been able to operate mills at close to full capacity this week. There is, however, little forward buying. Eastern makers obtain a material advance over the Pittsburgh basis, particularly for prompt shipment.

Bars.—While there does not appear to be a great deal of business moving, a number of the Eastern mills are somewhat better engaged. Orders, while small, aggregate a fair total. For current orders little difficulty in obtaining ruling quotations is reported, but the market has not been seriously tested for large lots, either for bar iron or steel bars, which for the ordinary run of business are quoted at 1.22½c. to 1.27½c. and 1.30c. to 1.35c., respectively, delivered in this territory.

Coke.—Occasional small lot sales comprise the bulk of the business. Few contracts are reported, and those made have been confined to the foundry grade, for which prices remain unchanged. Furnace coke is a trifle weaker, sales of prompt being reported at $1.50 at oven. The following range of prices per net ton, delivered in this territory, about represents the market:

Connellsville, furnace coke	$3.70 to $3.90
Foundry coke	4.25 to 4.60
Mountain, furnace coke	3.50 to 3.80
Foundry coke	3.85 to 4.20

Old Material.—Consumers continue to show practically no interest beyond taking on occasional bargain lots, and, for the most part, are out of the market. Railroad offerings are about the usual size and, from reports of dealers' offers, low prices will prevail. A little more interest on the part of some of the large consumers of borings is reported, but so far has not resulted in any business. Under the circumstances a narrower spread of quotations prevails in most grades, with prices largely based on forced sales and large quantities of material would not be available at current prices. The following range about represents quotations at which the ordinary current business for prompt shipment can be done, delivery in buyers' yards, eastern Pennsylvania and nearby points, taking a freight rate from Philadelphia varying from 35c. to $1.35 per gross ton, for shipment ranging from prompt to the remainder of the year:

No. 1 heavy melting steel scrap	$12.00 to $12.25
Old steel rails, rerolling (nominal)	13.00 to 13.50
Low phosphorus heavy melting steel scrap	14.25 to 14.75
Old steel axles (nominal)	18.00 to 18.50
Old iron axles (nominal)	23.50 to 24.00
Old iron rails (nominal)	16.50 to 17.00
Old car wheels	11.75 to 12.00
No. 1 railroad wrought	14.00 to 14.25
Wrought iron pipe	11.50 to 11.75
No. 1 forge fire	10.00 to 10.50
No. 2 light iron (nominal)	6.00 to 6.50
Wrought turnings	8.00 to 8.25
Cast borings	7.50 to 7.75
Machinery cast	12.50 to 13.00
Railroad malleable (nominal)	11.00 to 11.50
Grate bars, railroad	9.25 to 9.75
Stove plate	9.25 to 9.75

Matthew Addy & Co. have opened in connection with their Philadelphia office, 408, 409, 411 Real Estate Trust Company Building, a department for handling finished iron and steel products, which will be in charge of Lewis W. Lukens, for many years president and treasurer of the Longmead Iron Company.

Cincinnati

CINCINNATI, OHIO, October 11, 1911.—(*By Telegraph.*)

Pig Iron.—The market continues inactive. According to selling agencies it is practically impossible to interest consumers as the most of them have sufficient iron to tide them over until the first of the year, at which time they anticipate they will be able to meet requirements at practically the same figures as they can to-day. Consumers are taking contract shipments in a very satisfactory manner, indicating that the melt is being maintained. Order books have not been opened to any extent for next year's business, although it is intimated that several furnaces are willing to take a limited tonnage for this delivery. The situation is unchanged in the Ironton district and quotations appear to be fairly well established at $13 for this year and $13.50 for the first quarter of next. A consumer in Western territory secured 500 tons of Southern silicon, 2.25 per cent. and over, on the basis of $10, Birmingham, for this year's delivery. The local melter that was in the market last week for approximately 400 tons has secured the desired tonnage. A large consumer in Indiana is inquiring for 600 tons of Northern foundry grades for delivery covering the first quarter of next year and a southern Ohio melter wants 100 tons of high manganese for prompt delivery. Based on freight rates of $3.25 from Birmingham and $1.20 from Ironton, we quote, f.o.b. Cincinnati, as follows, for prompt shipment:

Southern coke, No. 1 foundry and 1 soft	$14.00 to $14.25
Southern coke, No. 2 foundry and 2 soft	13.25 to 13.75
Southern coke, No. 3 foundry	12.75 to 13.25
Southern coke, No. 4 foundry	12.50 to 13.00
Southern gray forge	12.50 to 13.00
Ohio silvery, 8 per cent. silicon	16.95 to 17.20
Lake Superior coke, No. 1	14.70 to 14.95
Lake Superior coke, No. 2	14.20 to 14.45
Lake Superior coke, No. 3	13.70 to 13.95
Basic, Northern	14.20 to 14.45
Standard Southern car wheel	25.50 to 25.75
Lake Superior car wheel	19.00

(By Mail.)

Coke.—Foundry coke is in a little better demand, but new business continues to be confined to carload orders for immediate use. Producers in all three districts are keeping a close watch on the situation and the curtailment of production has enabled them lately to maintain prices on a steady level. We quote 48-hr. coke in the Connellsville field around $1.50 to $1.55 per net ton at oven, for prompt shipment, and from $1.60 to $1.70 in the Wise County and Pocahontas districts, with the usual 10c. to 25c. per ton added on future contracts.

Finished Material.—The market continues to show a somewhat unsettled condition and specifications are coming in slowly. The local structural demand is light and little is being figured on at present. Prices continue to fluctuate somewhat and reports indicate some shading on desirable business. The open quotation on steel bars is said to be fairly well maintained on a 1.15c., Pittsburgh, basis, with shapes quotable at 1.25c. and plates 1.20c., Pittsburgh.

Old Material.—Railroad offerings are said to be large and the demand for scrap of all kinds is of a limited character, although an exception may be made of borings and turnings. Prices are still weak, but it is not believed that they will go any lower unless there should be an unexpected softening of pig iron quotations. The approximate prices paid by buyers, delivered in their yards in southern Ohio and Cincinnati, are as follows:

No. 1 railroad wrought, net ton	$10.00 to $10.50
Casting borings, net ton	4.50 to 5.00
Steel turnings, net ton	5.50 to 6.00
No. 1 cast scrap, net ton	9.25 to 9.75
Burnt scrap, net ton	6.25 to 6.75
Old iron axles, net ton	16.25 to 16.75
Bundled sheet scrap, gross ton	7.25 to 8.25
Old iron rails, gross ton	13.25 to 13.75
Relaying rails, 50 lb. and up, gross ton	20.75 to 21.50
Old car wheels, gross ton	10.00 to 10.50
Heavy melting steel scrap, gross ton	9.75 to 10.25

Cleveland

CLEVELAND, OHIO, October 10, 1911.

Iron Ore.—Ore firms are cleaning up their shipments on contracts rapidly. The season of lake navigation will close early and there will be little ore brought down after November 1. Lake shipments from October 1 until the close of navigation will probably not be much over 5,000,000 tons. No sales or inquiries are reported. It is too late in the season now for the shippers to expect to make any further sales of any size. We quote prices as follows: Old range Bessemer, $4.50; Mesaba Bessemer, $4.25; old range non-Bessemer, $3.70; Mesaba non-Bessemer, $3.50.

Pig Iron.—With the exception of the sale of 1000 tons to a Cleveland foundry noted last week the lower prices quoted on Bessemer iron appear to have brought out no orders or inquiries. While Bessemer is quoted at $14.65, Valley furnace, it is believed that an inquiry for a round tonnage might bring out a lower price. The local interest that bid $12.50, Valley furnace, on a St. Louis inquiry for 2500 tons of basic, the freight rate from the Valley being $3, did not get the contract. It is stated that there were three lower bidders and that the business went to the Chicago district at $15.25, delivered. The demand for foundry grades continues light, sales being mostly in small lots to small consumers. A northern Ohio furnace manufacturer has

THE IRON AND METAL MARKETS

purchased 1000 tons of No. 2 foundry. We also note the sale of 500 tons of Northern foundry and high silicon iron to an Ohio manufacturer of sanitary ware for the last quarter delivery. A local furnace has sold 200 tons of No. 2 foundry for northern Ohio shipment at $13.50, at furnace. The Mansfield, Ohio, stove manufacturer, whose inquiry for 500 tons of No. 2 Northern iron was noted last week, has increased his inquiry to 800 or 1000 tons for delivery through the last quarter and first half. There is an inquiry from Barberton, Ohio, for 600 tons of malleable iron for the last quarter delivery. For Cleveland delivery we quote as follows for prompt shipment and for the last quarter:

Bessemer	$15.55
Basic	13.40
Northern foundry, No. 2	13.75
Gray forge	13.00
Southern foundry, No. 2	$14.35 to 14.85
Jackson Co. silvery, 8 per cent. silicon	17.30 to 17.55

Coke.—The only demand is for small lots of foundry coke for prompt shipment. Prices are stationary and firm. We quote standard Connellsville furnace coke at $1.50 to $1.55 per net ton, at oven, for prompt shipment and $1.60 to $1.70 for contract. Connellsville 72-hr. foundry coke is held at $1.85 to $2.15 for prompt shipment and $2.10 to $2.40 for contract.

Finished Iron and Steel.—Mills are getting a fair volume of small orders. Further than bringing out a few good-sized stock orders, low prices have not resulted in much improvement in the demand. Consumers in most cases are buying only in small lots for their immediate requirements. The American Bridge Company has taken the contract for the Cleveland Leader Building, requiring about 4500 tons of steel. Competition was very keen and it is understood that the successful bidder quoted a price of about $38 per ton, fabricated. The erection of this building will not be started until next summer. The price situation remains unsettled and there are frequent rumors of lower quotations than the generally recognized bottom prices. Steel bars are quoted at 1.15c., Pittsburgh, but this price can be shaded to 1.10c. and perhaps slightly lower for desirable lots. Mills are waiving the usual extra for twisting soft steel bars for reinforced concrete work, making the price close to that for hard steel bars, which are firm at 1.10c. Structural material is firm at 1.20c. to 1.25c., the lower price being quoted only for desirable specifications. Prices on plates are weak and irregular. While the general quotation is 1.20c. to 1.25c., sales are reported by Ohio mills at as low as 1.16c., Pittsburgh. The demand for sheets is light. The general quotation is 1.90c. for No. 28 black, and 2.90c. for No. 28 galvanized. The demand for rivets is not active. We quote structural rivets at 1.60c., Pittsburgh, and boiler rivets at 1.70c. The latter price, however, is being shaded $1 a ton. We note the sale of a small tonnage of forging billets at $25, Pittsburgh. The demand for iron bars is light. The Empire rolling mill, Cleveland, is still shut down. We quote iron bars at 1.20c., Cleveland, this price not being shaded.

Old Material.—The market is very weak, prices being from 25c. to 50c. a ton lower on several grades. Trade is almost at a standstill. While mills are not eager to buy, some would take on scrap at particularly attractive prices. Dealers and producers, however, will sell practically nothing at present quotations. Local mills are offering $10.50 to $11 for heavy steel scrap, but have been able to pick up only a few small lots at the higher price. There is very little demand for iron making scrap. We note the sale of 800 tons of cast scrap to a local foundry. Dealers' prices, per gross ton, f.o.b. Cleveland, are as follows:

Old steel rails, rerolling	$12.25 to $12.50
Old iron rails	14.00 to 14.50
Steel car axles	17.00 to 17.50
Heavy melting steel	10.75 to 11.00
Old car wheels	11.25 to 11.50
Relaying rails, 50 lb. and over	22.50 to 23.50
Agricultural malleable	10.75 to 11.25
Railroad malleable	11.25 to 11.75
Light bundled sheet scrap	9.50 to 10.00

The following prices are per net ton, f.o.b. Cleveland:

Iron car axles	$18.50 to $19.00
Cast borings	6.00 to 6.25
Iron and steel turnings and drillings	6.75 to 7.00
Steel axle turnings	7.50 to 8.00
No. 1 busheling	9.25 to 9.50
No. 1 railroad wrought	11.50 to 11.75
No. 1 cast	11.00 to 11.50
Stove plate	9.00 to 9.25
Bundled tin scrap	11.00 to 11.50

St. Louis

ST. LOUIS, MO., October 9, 1911.

The trade here seems to have settled down to the belief that there is a long, slow and hard pull ahead, and, while prices show no demoralization in any direction, nevertheless the tendency is toward the low range. Some sizable deals were closed the past week in pig iron and coke, but in finished products and scrap there was nothing doing aside from the usual hand to mouth business which has prevailed so long.

Pig Iron.—The inquiry for 2500 tons of basic iron reported last week developed later into a 6000-ton order, the buyer being the Commonwealth Steel Company. As nearly as can be learned here the contract is on a basis of about $12.30, Valley, and the delivery is to extend over the first quarter of next year. Under an existing contract the Commonwealth company has 2000 tons per month still coming to it for the remainder of the current year. A note of improvement is the receipt of inquiries for delivery over the first quarter and first half of 1912, the largest in this line being one for 1000 tons of Southern which will probably go at about $10 for No. 2 or analysis equivalent to No. 2, Birmingham basis. The ferrosilicon previously reported has not been placed.

Coke.—There has been some interest in the market due to the placing of a contract, distributed delivery, by the St. Joseph Lead Company for 20,000 tons of 48-hr. coke. It is understood that this went close to if not actually at $1.50 per net ton at oven. Another smelter order for 3000 tons of 48-hr. coke was also placed.

Finished Iron and Steel.—The business of the week has been practically all on specifications for immediate use and the tonnage actually moved has shown somewhat of a decrease. Announcement is made of the completion of the financing of an interurban railroad connecting St. Joseph, Kansas City and Excelsior Springs, Mo., requiring about 7700 tons of rails, for which the order is expected to be placed shortly. Bars are quiet, with little demand for either the vehicle or the agricultural implement trade. Track fastenings have been in fair request at steady prices. Light rails have shown some demand from the coal mines and a little from the lumber roads, but no great total.

Old Material.—The market is almost at a standstill. The Missouri Pacific list went at fair prices, but these showed no increase in the quotations. The Wabash has out a list of 800 tons which will close on the 11th and the Southern one of 600 tons closing on the 12th. Dealers are taking advantage of the present condition of the market to buy against their sale contracts or to store for future business. Otherwise there is no feature to the local situation. Dealers' prices, per gross ton, f.o.b. St. Louis, show some changes, all slight reductions, as follows:

Old iron rails	$12.00 to $12.50
Old steel rails, rerolling	11.50 to 12.00
Old steel rails, less than 3 ft.	10.50 to 11.00
Relaying rails, standard section, subject to inspection	22.50 to 23.00
Old car wheels	12.00 to 12.50
Heavy melting steel scrap	10.50 to 11.00
Frogs, switches and guards cut apart	10.50 to 11.00

The following prices are per net ton:

Iron fish plates	$10.50 to $11.00
Iron car axles	18.00 to 18.50
Steel car axles	16.00 to 16.50
No. 1 railroad wrought	10.25 to 10.75
No. 2 railroad wrought	9.25 to 9.75
Railway springs	9.25 to 9.75
Locomotive tires, smooth	13.00 to 13.50
No. 1 dealers' forge	7.00 to 7.50
Mixed borings	8.00 to 8.50
No. 1 busheling	8.50 to 9.00
No. 1 boilers cut to sheets and rings	7.00 to 7.50
No. 1 cast scrap	8.50 to 9.00
Stove plate and light cast scrap	7.00 to 7.50
Railroad malleable	7.50 to 8.00
Agricultural malleable	6.50 to 7.00
Pipes and flues	7.50 to 8.00
Railroad sheet and tank scrap	7.00 to 7.50
Railroad grate bars	6.50 to 7.00
Machine shop turnings	6.50 to 7.00

Birmingham

BIRMINGHAM, ALA., October 9, 1911.

Pig Iron.—Nowithstanding expectations to the contrary, stocks in this State were reduced some 15,000 tons in September, as is shown by actual figures returned October 1. The quantity now on hand consists of approximately 140,000 tons of free foundry iron, 61,000 tons of warrant iron, and 18,000 tons of free basic iron, with furnace operations the same on October 1 as on September 1. A comparison of order book requirement with the present accumulation, and the prob-

THE IRON AND METAL MARKETS

able make during the remainder of the year, is not obtainable, but it is a fact that at least two of the large interests have very little iron to offer for shipment prior to January 1. The volume of business transacted the past week was considerably larger than in the week previous. The largest sale recently reported was a lot of 750 tons of No. 2 soft, for shipment within 90 days, at $10.25, Birmingham. An aggregate of 700 tons of 2 to 2.50 per cent. silicon iron was sold at $10 Birmingham, and 600 tons of a favorite brand in carloads and lots of 50 tons each, for comparatively early shipment, was sold at $10.50 Birmingham. The sale of 500 tons of high manganese iron, with silicon above 3 per cent., is reported sold at a slight concession from $12, and a smaller quantity of low silicon, high manganese iron was sold at $11. An inquiry for 10,000 tons of No. 2 foundry and 4000 tons of lower grades, received during the week through Northern offices, has not resulted in a sale so far, owing to the difference between the price offered and producers' quotations, With this exception the business pending consists of comparatively small lots for early shipment, with but little interest manifested in deliveries after January 1. The price for the delivery just mentioned is still a matter of uncertainty, but a basis of $10.50 would no doubt obtain with the majority of the producing interests for shipments over the first quarter, while a basis of $10.25 is not considered improbable where the offerings are attractive.

Old Material.—Prices are considered 50 cents per ton lower for all grades, with the demand very light and of a rather unsatisfactory nature. The most encouraging feature in the situation is the comparatively small accumulation of stock on consumers' yards. Dealers' stocks show practically no increase during the month of September, and no additions are being made except where bargain lots are offered. We revise dealers' nominal asking prices as follows, per gross ton, f.o.b. cars here:

Old iron axles (light)	$12.50 to $13.00
Old steel axles (light)	11.50 to 12.00
Old iron rails	11.50 to 12.00
No. 1 railroad wrought	10.00 to 10.50
No. 2 railroad wrought	8.50 to 9.00
No. 1 country wrought	6.50 to 7.00
No. 2 country wrought	6.00 to 6.50
No. 1 machinery, cast	8.50 to 9.00
No. 1 steel	8.00 to 8.50
Tram car wheels	7.50 to 8.00
Standard car wheels	9.00 to 9.50
Light cast and stove plates	6.00 to 6.50

Cast Iron Pipe.—The movement from local plants was very heavy during the week and a fairly attractive tonnage, in small lots, was placed for municipal requirement. Mention is not made of additional large contracts for early placing, but the outlook generally is considered favorable. Prices are unchanged and we continue to quote as follows: 4 to 6-in., $23; 8 to 12-in., $22; over 12-in., average, $21, with $1 per ton extra for gas pipe. These prices are per net ton f.o.b. cars at Birmingham district plants, and are probably subject to shading for large municipal contracts.

The blowing in of the Alabama City furnace of the Southern Iron & Steel Company has been postponed by reason of additional repairs found necessary.

Repairs to the DeBardeleben plant of the Tennessee Coal, Iron & Railroad Company, Bessemer, Ala., are under way, but no announcement has been made as to the date when either stack at that plant will be blown in.

It is understood that the rehabilitation of the former Western Steel Car & Foundry Company's plant at Anniston, Ala., is under consideration, although no definite announcement has been made in that regard.

Buffalo

BUFFALO, N. Y., October 10, 1911.

Pig Iron.—A fair amount of inquiry has been received from New York, New England and New Jersey points, principally for 1911 delivery, most buyers being rather cautious about 1912 at the present time. The week has shown a little increase in buying by foundries supplying the railroad trade and also a slight increase in general lines. Orders placed include one of 1000 and one of 500 tons of malleable, taken at $13.75 at furnace; 600 tons of No. 2 X at $13.75; 2500 tons and 400 tons of No. 3 at $13.25, all for this year's delivery. Melters are calling for prompt shipment, both on new orders and old contracts. Furnace B, of the Tonawanda Iron & Steel Company, went out of blast to-day and the entire plant is now shut down, furnace A having gone out some months ago. The depression in the pig iron business, which has forced prices below the level of the company's cost of production, was the cause of the shut down. There are 10 of the 19 furnaces in the Buffalo district now out of blast. For delivery over the remainder of 1911 we quote as below, f.o.b. Buffalo. It is likely that these prices can be obtained for the first quarter of next year, although some furnaces are holding for a little higher level for 1912 delivery:

No. 2 X foundry	$13.75 to $14.25
No. 2 X foundry	13.50 to 14.00
No. 2 plain	13.25 to 13.50
No. 3 foundry	13.00 to 13.50
Gray forge	13.00 to 13.25
Malleable	13.75 to 14.25
Basic	13.75 to 14.25
Charcoal	16.50 to 17.25

Finished Iron and Steel.—Inquiries in most lines of finished products indicate the pursuance of the hand to mouth policy in meeting consumption requirements. Consumers do not seem to be willing to buy in any large quantities on the present unsettled market. Prices for bar products are ruling at 1.15c., Pittsburgh base. For shapes 1.25c. to 1.30c. is being quoted, according to the tonnage and delivery required. Plates are ruling at 1.25c. for the regular trade. Railroads are buying a little more freely both in material for car construction and for track supplies. It is understood that the Merchants' Despatch Transportation Company has been awarded a contract for 2000 cars by the New York Central. The Canadian Government is calling for tenders for rails and track supplies for the government road to Hudson Bay, for which 30,000 tons of rails and corresponding quantities of track supplies will be required. Canadian business in other lines of finished products, which was halted to some extent by the recent election, is again coming forward in good volume. The demand for black and galvanized sheets has been fairly active in the week, apparently stimulated by the low prices now obtainable. Fence wire is held firmly at 1.45c., base, and nails at $1.65. In fabricated structural lines new inquiry has been rather slow in coming out this week, but a large number of new building projects are developing and will soon be ready for figuring. Bids will soon be received for steel for the new edifice for the First Church of Christ, Scientist, requiring 350 tons; also for the extension of the steel casting building of the Pratt & Letchworth Company plant, requiring a small tonnage of fabricated material. The Buffalo Structural Steel Company has received a contract for the addition to the Flint & Kent department store requiring about 350 tons.

Old Material.—The market continues stagnant, with no indications of new business developing in any line, although a fairly good demand is reported in outside districts. Shipments on contracts are being held up temporarily, consumers evidently having sufficient supplies on hand to cover their needs for the time. Prices are unchanged. We quote as follows, per gross ton, f.o.b. Buffalo:

Heavy melting steel	$12.50 to $13.00
Low phosphorus steel	16.00 to 16.50
No. 1 railroad wrought	14.00 to 14.50
No. 1 railroad and machinery cast scrap	13.50 to 14.00
Old steel axles	18.50 to 19.00
Old iron axles	22.00 to 22.50
Old car wheels	13.00 to 13.50
Railroad malleable	12.75 to 13.00
Boiler plate	12.50 to 13.00
Locomotive grate bars	11.00 to 11.50
Pipe	9.25 to 9.50
Wrought iron and cast steel turnings	7.15 to 7.40
Clean cast borings	7.00 to 7.25

The German Iron Market

BERLIN, September 28, 1911.

The good opinion as to the general state of trade remains unshaken, although iron shares are somewhat weaker on the stock markets. This was due partly to the less satisfactory reports from America. The Steel Works Union holds its regular monthly meeting tomorrow in Munich, and will have again to consider petitions for an increase of allotments. Several works are appealing for a 10 per cent. increase in the allotments in bars, plates and wire rods. It is reported that there is strong opposition to any increase; but, on the other hand, a dispatch of yesterday from Cologne states that there is now a very strong movement in favor of raising allotments at least in bars and plates, inasmuch as there is great activity in both lines. The demand for bars from the foreign market, it is added, continues strong and at rising prices; considerable foreign business for the first quarter of 1912 has already been

THE IRON AND METAL MARKETS

done. The price latterly has risen from 99 to 100 marks f.o.b. Antwerp. The condition of the plate trade is equally satisfactory. The statistics of class B products for August, which were given out by the union yesterday, confirm this view of the activity in bars and plates. The month's shipments of the former reached with 318,482 tons, the highest figures ever registered, while plates also scored a record at 96,356 tons. The total shipments of these two classes, together with wire rods, tubes, castings, etc., amounted to 548,333 tons, which also makes a record. It exceeds the July movement by above 50,000 tons, and that of August, 1910, by nearly 55,000 tons.

The Pig Iron Syndicate has postponed the publication of its price list till the middle of October. It is semi-officially stated that hematite and other steel-making grades will be advanced 3 to 5 marks per ton. The syndicate has already begun to sell the low-grade Luxemburg iron at seaboard points, where it is regarded necessary to meet English competition. It was announced today that the Coal Syndicate has ordered a restriction in coke production to 60 per cent. of the allotments, after a restriction of 65 per cent. had been maintained for some time. It is not clear, however, whether this action foreshadows a curtailment in pig iron production. The action was explained by the managers as due in part to an increase in allotments that goes into effect October 1, and partly to the fact that some orders were not renewed.

In connection with the organization of the pig-iron combination it is interesting to note the views of one of the furnace companies, which is operated independently of steel works and coal mines—a class of concerns having had a hard struggle with the great mixed establishments for some years. The company in question is the Bergische Gruben und Hüttenverein of Hochdahl. It says in its annual report that the new syndicate must get a very heavy export trade in order to keep its members well employed; "heavy sacrifices must be made for this purpose and the booking prices for the individual furnaces will have to be so low as to leave them but a narrow margin of profit, provided the Coal Syndicate adheres to its high coke prices."

The Aumetz-Friede Company, of Lorraine, which has become a very important concern within a few years, has just announced a dividend of 12 per cent., against 10 last year and 7 for 1908-09. The great Gelsenkirchen Company announces an increase in its capital of 24,000,000 marks, which brings it up to 180,000,000 marks. It will then stand with Krupps as the two strongest iron and coal companies in Germany. Its last previous addition to its capital was in the spring of 1909, when 26,000,000 marks was raised.

The news from the Belgian market this week indicates that prices, which had been about stationary for several weeks, have again begun to rise. An advance of basic iron by 1.50 francs was reported several days ago, then a further rise of bars for export by 1 shilling f.o.b. Antwerp, occurred; and now a Brussels dispatch of today states that heavy plates have risen from 118 to 119 shillings, plates of ⅛-in. thickness from 123 to 124 shillings, and medium and finer qualities from 124-127 to 126-129 shillings f.o.b. Antwerp.

Boston

BOSTON, MASS., October 10, 1911.

Old Material.—The only change in the scrap metal market is a slight reduction in the prices of old steel axles, old iron axles and wrought turnings. The prices quoted below are those offered by the large dealers to the producers and to the smaller dealers and collectors, per gross ton, carload lots, f.o.b. Boston and other New England points, taking Boston rates from eastern Pennsylvania points. In comparison with Philadelphia prices the differential for freight of $2.30 a ton is included. Mill prices are approximately 50 cents a ton more than dealers' prices.

Heavy melting steel	$9.50 to $10.00
Low phosphorus steel	11.45 to 11.95
Old steel rails	14.00 to 14.50
Old iron rails	17.00 to 18.00
Mixed shafting	12.75 to 13.25
No. 1 wrought iron and steel	11.00 to 11.25
Wrought steel pipe	8.75 to 9.00
Skeleton chandeliers	7.00 to 7.50
Cotton ties	7.00 to 7.50
No. 2 light	4.50 to 5.00
Wrought turnings	5.00 to 5.50
Cast borings	4.50 to 5.00
Machinery, cast	12.50 to 13.00
Malleable	9.25 to 9.75
Grate bars	6.00 to 6.50
Stove plate	8.00 to 8.50

New York

NEW YORK, October 11, 1911.

Pig Iron.—Pipe iron has made up the bulk of the transactions of the past week. One large interest has bought from 25,000 to 30,000 tons of iron, which is divided among Northern and Southern furnaces. Another buyer took several thousand tons for delivery on the Delaware River. In another case an eastern Pennsylvania pipe foundry has been in the market for a round lot, but the amount purchased is not known. There has been a fair run of business in foundry iron, including two or three lots of 1000 tons each and several of 500 tons, the most of it for delivery in the first quarter of 1912. Prices are no firmer and the present basis for this year's delivery is applying more and more to the early months of next year. The impression made among buyers by recent additions to the list of active merchant furnaces is that the supply of iron will be ample and that prices are likely to be little changed in the next two months. Virginia furnaces continue to sell at $12.25 for No. 2 X for this year, with 25c. advance asked for first quarter. Buffalo sales for first quarter have been made at $13.50 at furnace. It should be mentioned that there are some offsets to the furnaces blowing in. For example, while one Virginia furnace was blown in in September, another stack of the same company was scheduled to blow out early in October. In the Buffalo district the second Niagara furnace was blown out last week, which offsets one Wickwire, scheduled to resume after relining. In eastern Pennsylvania two furnaces are about to be blown in, while one Warwick and one Brooke will probably go out. Stocks of pig iron at furnaces reporting to the Eastern Pig Iron Association declined considerably in September, and there was a reduction also in the stocks at Virginia furnaces. We quote Northern iron at tidewater as follows: No. 1 foundry, $15.25 to $15.50; No. 2 X, $15 to $15.25; No. 2 plain, $14.50 to $14.75. Southern iron is quoted at $15 to $15.25 for No. 1 foundry and at $14.50 to $14.75 for No. 2.

Finished Iron and Steel.—Nothing sensational has developed in the finished iron and steel market, prices remaining at low level and the volume of business, of generally small orders, aggregating about the same as it has for the last few weeks. Many of the sellers maintain that both plates and plain structural material are held at the 1.30 Pittsburgh basis with plates going at an average, perhaps, of 1.27½. Plate mills are thought to be running generally at about 50 to 55 per cent. capacity. In the structural field the largest new project is the Hyde Building, 20 stories, at Twenty-fifth street and Madison avenue, involving 4900 tons of steel work. Bids are probably now all in on the 22,000-ton building to replace the Madison Square Garden. The lowest bidder for the 6000 to 8000 tons required for the two long bridges of the Central Railroad of New Jersey is understood to be the American Bridge Company. Marc Eidlitz & Son are general contractors for the 1200-ton Y. W. C. A. Building at Fifty-second street and Lexington avenue. Among structural contract awards may be mentioned: The McDonald Building, Amsterdam avenue, 800 tons, to the American Bridge Company; two bridges at Northville, N. H., for the Boston & Maine, 100 tons, to L. F. Shoemaker & Co.; a stock house for Peter Doelger, 800 tons, a large part of which is cast iron columns, to the Hinkle Iron Company. The Lackawanna Steel Company is to furnish the 5000 tons for the Filene Building, Boston. The Belmont Iron Works is to supply the 650 tons for the Barge office in New York and not the company reported last week. Quotations remain: Plain structural material, 1.41c. to 1.46c.; plates, 1.36c. to 1.41c.; steel bars, 1.31c. to 1.36c.; bar iron, 1.26c. to 1.31c., all New York. Plain material and plates from store, New York, 1.70c. to 1.80c.

Cast Iron Pipe.—It is understood that a Virginia pipe foundry has secured the contract for 8000 tons of 40-in. pipe to be furnished to the New York Board of Water Supply. The price obtained was probably a little above $20, delivered. No public lettings of importance are announced. Business in small lots is fairly active, as those who have pipe laying to do this fall are hurrying it along before the advent of cold weather. Carload lots of 6-in. are quoted at $21 to $22 per net ton, New York.

Old Material.—About the only transactions are sacrifice sales. Material on track which has to be moved is sold at the best price obtainable, irrespective

THE IRON AND METAL MARKETS

of market quotations. The outlook for heavy melting steel scrap is exceedingly discouraging, as the leading steel works in eastern Pennsylvania are buying practically nothing, some of them stating that they are sufficiently supplied either with stock on hand or material under contract to cover their needs for at least the remainder of the year. The rolling mills making bar iron appear to be doing nothing in the scrap market, evidently being well covered for their immediate wants and probably for some time ahead. The foundries are buying cast scrap but sparingly, notwithstanding the fact that its price is so much under that of pig iron. Dealers' prices, per gross ton, New York and vicinity, are about as follows:

Old girder and T rails for melting	$9.50 to $10 00
Heavy melting steel scrap	9.50 to 10.00
Relaying rails	20.00 to 21.00
Rerolling rails	11.50 to 12.00
Iron car axles	20.00 to 20.50
Old steel car axles	15.00 to 15.50
No. 1 railroad wrought	11.75 to 12.00
Wrought iron track scrap	10.75 to 11.00
No. 1 yard wrought, long	10.50 to 11.00
No. 1 yard wrought, short	9.50 to 10.00
Light iron	4.00 to 4.50
Cast borings	5.00 to 5.50
Wrought turnings	5.50 to 6.00
Wrought pipe	9.00 to 9.50
Old car wheels	10.00 to 10.50
No. 1 heavy cast, broken up	10.00 to 10.50
Stove plate	8.00 to 8.50
Locomotive grate bars	8.00 to 8.50
Malleable cast	10.00 to 10.50

Ferroalloys.—There are rumors of sales of ferromanganese at $37.50, but these are believed to be for small spot lots. For delivery over the remainder of the year the usual quotation here is $38.50, Baltimore. Some sales of carload lots of ferrosilicon have been made this week at $60, Pittsburgh, and several inquiries for delivery over the remainder of the year are out. New York sellers are firm in the belief that ferrosilicon will go higher and are now asking $62, Pittsburgh, for the remainder of the year and are reluctant to quote figures for next year's delivery.

Metal Market

NEW YORK, October 11, 1911.

The Week's Prices

Cents Per Pound for Early Delivery.

	Copper. New York.			Lead		Spelter	
Oct.	Lake.	Electrolytic.	Tin, New York.	New York.	St. Louis.	New York.	St. Louis.
5	12.50	12.25	40.10	4.47½	4.32½	6.00	5.85
6	12.50	12.25	40.25	4.35	4.20	6.05	5.90
7	12.50	12.25		4.35	4.20	6.10	5.95
9	12.50	12.25	41.50	4.25	4.10	6.15	6.00
10	12.50	12.25	41.25	4.25	4.10	6.15	6.00
11	12.50	12.25	41.25	4.25	4.10	6.15	6.00

Spot tin is scarce and has advanced. Copper is unchanged. Lead is down. Spelter has advanced.

Copper.—The report of the Copper Producers' Association seems to have had little effect on the copper situation. From all accounts there is a good consumption of copper just now and consumers are buying steadily. Recent attempts to advance the market on Lake copper met with little success as many sellers seem to be satisfied to take 12.50c. Electrolytic continues to be held at 12.25c. In London this morning spot copper was sold for £54 6s. 3d. and futures at £55 3s. 6d. The market was dull. The exports of copper so far this month have not been heavy, amounting in all to 5073 tons.

Waterbury Average.—Through an unfortunate error the Waterbury average for September was misstated in *The Iron Age* of last week. The average was 12.62½c.

Pig Tin.—Spot tin is scarce, and although there is no attempt to corner the immediate supply in this country, prices have advanced on the strength of a good demand. The London syndicate has entered the list again and heavy purchases of futures were made in that market during the week. Consumers in this country seem to be fairly well supplied with tin for their immediate needs and consequently the demand is light. This morning pig tin was sold for 41.25c. and the offerings at that price were few. In London to-day spot tin was sold for £188 5s. and futures for £187. The arrivals of tin in this country so far this month have been 975 tons, and 1,172 tons are afloat.

Tin Plates.—The domestic demand for tin plates is quiet but the export market continues especially good. The market in foreign tin plates is unchanged and the price at Swansea, Wales, remains at 13s. 7½d. The usual quotation here for 100-lb. coke plates is $3.84, but it is understood that some concession is being made on this price.

Lead.—Two sharp reductions were made in lead in the New York market within a week. The cuts were made by the principal producer to meet reductions made by others. On Wednesday it reduced its price from 4.50c. to 4.35c. and on Monday a further reduction of 10 points was made. As a result that interest is again taking considerable business which would have gone to outside sellers who have not as yet met its price of 4.25c., New York. The market in St. Louis is now 4.15c.

Spelter.—The spelter market is very firm and has advanced during the week to 6.15c., New York. The advance was influenced in a measure by the good buying movement. It appeared early in the week that a number of consumers were short of stock as they came in and bought freely on a rising market. The St. Louis market is very firm at 6c.

Antimony.—Antimony continues dull and very weak. Cookson's has been reduced to around 8.15c., but buyers do not seem to want to take hold. Hallett's is offered at 7.65c. to 7.70c., and Chinese and Hungarian grades are selling from 7c. up.

Old Metals, New York.—Dealers report business dull, with selling prices nominally unchanged, as follows, buying prices having been given in error last week:

	Cents per lb.
Copper, heavy and crucible	11.75 to 12.00
Copper, heavy and wire	11.37½ to 11.50
Copper, light and bottoms	10.50 to 10.75
Brass, heavy	8.00 to 8.25
Brass, light	6.50 to 6.75
Heavy machine composition	10.25 to 10.50
Clean brass turnings	7.75 to 8.00
Composition turnings	8.50 to 9.00
Lead, heavy	4.15
Lead, tea	3.90
Zinc, scrap	4.50

Chicago

OCTOBER 10.—A somewhat improved tone was noted in the local metal market during the week, in connection with which will be active buying. Prices have remained practically unchanged, with the exception of a slight increase in casting copper and a decrease in the price of tin. We quote at Chicago: Casting copper, 12.37½; Lake, 12.62½c., in carloads, for prompt shipment; small lots, ¼c. to ⅜c. higher; pig tin, carloads, 41.50c; small lots, 43.50c; lead, desilverized, 4.35c. to 4.40c., for 50-ton lots; corroding, 4.60c. to 4.65c., for 50-ton lots; in carloads, 2½c. per 100 lb. higher; spelter, 5.95c. to 6c.; Cookson's antimony, 9¼c., and other grades, 8¼c. to 8¾c., in small lots; sheet zinc is $8, f.o.b. La Salle, in carloads of 600-lb. casks. On old metals we quote for less than carload lots: Copper wire, crucible shapes, 10½c.; copper bottoms, 9¼c.; copper clips, 10⅛c.; red brass, 9⅜c.; yellow brass, 7⅜c.; lead pipe, 7⅞c.; zinc, 4c.; pewter, No. 1, 26c.; tinfoil, 32c.; block tin pipe, 36c.

St. Louis

OCTOBER 9.—Lead shows a weakening tendency, while spelter is on the up grade. For the former the quotation is 4.20c., and for the latter the figure is 6c., with a good demand. Tin is decisively higher at 40.65c. Lake copper is quoted at 12.80c. and electrolytic at 12.72½c. Cookson's antimony is held at 8.47½c. In the Joplin market zinc sulphide is quotable at $47 per ton for the top, while the assay basis for the past week for 60 per cent. metallic content ranged from $44 down to $40 per ton. In calamine prices are relatively much stronger than for the blende, the price the past week being $32 per ton for choice lots. The assay basis price ranged from $23 to $25 per ton. Lead ore is weaker at $56 to $59 per ton. Scrap metal prices are: Light brass, 4c.; heavy brass and light copper, 8c.; heavy copper and copper wire, 9c.; zinc, 3c.; lead, 3½c.; pewter, 20c.; tinfoil, 29c.; tea lead, 3c.

Iron and Industrial Stocks

NEW YORK, October 11, 1911.

The stock market on the whole has been fairly steady. The chief incident of note was a sharp decline in Allis-Chalmers stocks and bonds. The common stock fell from 6 to 2, the preferred from 16½ to 10¾ and the bonds from 66¼ to 58. The sharp decline has brought out a statement from Vice-President Nichols, who says that while the volume of new business with the Allis-Chalmers Company has been unsatisfactory it has cur-

rent assets greatly in excess of its current liabilities. The company's product consists of heavy machinery, power plants, etc., and as new enterprises are now being held in abeyance a market must be found among going concerns who themselves are now operating far below capacity with consequently little incentive or courage to increase their capital expenditures. Securities of equipment companies have been well held, Car & Foundry common showing a somewhat significant advance. The range of prices on active iron and industrial stocks from Wednesday of last week to Tuesday of this week was as follows:

Allis Chalm., com...	2 - 4	Pressed Steel, pref..	95 - 95¼
Allis-Chalm., pref...	12½ - 16	Railway Spring, com.	27½ - 27⅝
Beth. Steel, pref....	55½ - 57¼	Republic, com.....	22½
Can. com.....	98¾ - 103¼	Republic, pref.....	83 - 84
Can. pref.....	82½ - 85¼	Sloss, com.....	37 - 38
Car & Fdry., com. ..	45½ - 48	Pipe, com.....	11¼ - 11⅝
Car & Fdry, pref.....	114	Pipe, pref.....	43¼
Steel Foundries.....	30 - 33	U. S. Steel, com....	57⅝ - 60½
Colorado Fuel.....	27	U. S. Steel, pref....	108½ - 109½
General Electric...	147 - 150	Westinghouse Elec..	61¼ - 62¾
Gr. N. Ore Cert.....	46½ - 49¾	Am. Ship, com.....	49 - 50
Int. Harvester, com.	102 - 104⅛	Chic. Pneu. Tool....	45½ - 46
Int. Pump, com.....	25⅝ - 28	Cambria Steel.....	43 - 43½
Int. Pump, pref.....	80 - 81¾	Lake Sup. Corp.....	22½ - 25
Locomotive, com.....	34¾ - 35½	Warwick	10
Locomotive, pref.....	105	Crucible Steel, com..	10⅛ - 10⅝
Nat. En. & St., com.....	15	Crucible Steel, pref.	75¾ - 76¼
Nat. En. & St., pref.	92 - 93	Harb. Wk. Ref., pref.....	89
Pressed Steel, com..	28¾ - 29		

A New York banking house has underwritten $3,500,000 first mortgage 20-year 5 per cent. purchase money bonds of the Railway Steel Spring Company. The new bonds, which are dated October 1, 1911, are to cover the cost of the Interocean Steel Company's plant at Chicago. They are subject to redemption at 105 and accrued interest and a sinking fund of $125,000 has been provided to start in 1914 to buy them in.

Dividends Declared

The corporation of J. G. White & Co., regular quarterly, 1½ per cent. on the preferred stock, payable November 1.

The Pittsburgh Coal Company, regular quarterly, 1¼ per cent. on the preferred stock, payable October 25.

The Harbison-Walker Refractories Company, regular quarterly, 1½ per cent. on the preferred stock, payable October 20.

The American Nut & Bolt Fastener Company, Pittsburgh, regular quarterly, 2 per cent.

The Standard Underground Cable Company, Pittsburgh, regular quarterly, 3 per cent.

Sunshine in California

It is encouraging, says the Bache Review, issued by J. S. Bache & Co., bankers, New York, to receive from the Pacific coast evidences that material well-being is prevalent there. The monthly financial letter of the American National Bank of San Francisco details a condition of prosperity in California and the adjoining States of the Pacific coast and facts in support of this are tabulated from the crop records, price quotations of leading products, gains in bank deposits and clearings, in traffic reports and in building construction figures. Gains over a year ago in capital and surplus, in individual deposits and in loans of the banks throughout the State are marked. Bank clearings for the eight months of 1911 show percentage in gains in all the leading cities of the State. The letter asserts that the sane optimism of the Pacific population is tempered only by apprehension as to what may develop in the East or in Europe.

An illustration of the prevailing thrift is pointed to in the record of the opening day at the Postal Savings Bank in San Francisco. The total first day's deposits were $8,645, more than double the amount received at Chicago on the first day and about four times the Boston record. This is considered remarkable from the fact that San Francisco is well provided with regularly established savings banks, some of them dating back more than 50 years and having combined deposits of more than $160,000,000. California's principal grain crop, barley, while not large, is of such exceptionally fine quality that prices have risen to unexpected levels. Hops, sugar, beets, walnuts and olives will all make big crops. The citrus fruit shipments for the year have been 40 per cent. higher than last year. The prune crop is estimated at 140,000,000 lb. against 80,000,000 lb. last year, with prices ranging higher. Raisins yield 100,000,000 lb. against 125,000,000 lb. last year, but prices are up fully 20 per cent., so that monetary returns will be about the same.

An event of national importance will be the formal commencement of work on the Panama Exposition on October 14, when President Taft will be in San Francisco, the terminus of his long tour, and will break ground for the first construction work of the exposition buildings. New steamship lines are being organized to take care of the great traffic between Pacific and Atlantic ports and it is said that five great European steamship companies are planning to establish regular sailings between San Francisco and their home ports. The outlook is for wonderful growth throughout the Pacific country.

A Move to Reduce British Steel Imports

A step has been taken in the British steel trade which is designed to reduce the amount of structural steel imported into Great Britain. The Scottish Steel Makers' Association recently sent a circular to shipbuilders, bridgebuilders and other consumers of plates and shapes announcing that the association would pay them a rebate of 5 shillings a ton on all steel bought and received by them after July 1, 1911, which had been manufactured at any of the mills of the associated steelmakers, whether such steel had been bought direct from the mills or otherwise. It was stated that the rebate would be computed for twelve months and be payable six months afterward, "but only to those consumers who have up to that date and since confined their purchases and use of steel (the class or classes manufactured by the associated makers) to that manufactured by such associated makers." While the plan originated with the Scottish branch of the industry, it could not be made effective without the cooperation of the English steelmakers, consequently a conference was held in London last week at which the North East of England Steel Makers' Association was represented. No details of the action taken at this meeting are available beyond the statement that the English manufacturers are in general in sympathy with the proposal, though they desired some modification in the details at first submitted by the Scottish steelmakers.

A statement compiled by the London Iron and Coal Trades Review shows that the imports of bars, angles, shapes and plates into Great Britain in the first eight months of 1911 were 152,695 tons, against 93,519 tons in the corresponding period of 1910. The British manufacturers had some reason, therefore, for concern over the growing use of foreign steel. As might be anticipated consumers are not altogether pleased with the new proposal. British shipbuilders consider that any restriction on their opportunity to secure low priced steel would interfere with their ability to compete in the shipbuilding trade. The question is raised also whether, after the new arrangement becomes effective, prices might not be advanced more than enough to counterbalance the 5 shillings rebate offered by the manufacturers to those buying their products exclusively.

The F. B. Shuster Company, New Haven, Conn., learns that the impression is now being conveyed in some quarters that it is to go out of business by reason of the death of President F. B. Shuster last August. Any report to that effect is incorrect, as the business will be continued on the same lines and under practically the same management as before. The question of selling out or closing up the business has never been considered. In spite of the general depression throughout the summer, the company has continued to run its plant full time, with a full force of men, and has turned out some very large orders. It now has a large amount of business on hand, in its regular lines of automatic wire straighteners and cutters and rotary riveting machines and in its special lines, with bright prospects for a good business through the fall and winter.

The new ore boat, J. M. Schoonmaker, named in honor of the vice-president of the Pittsburgh & Lake Erie Railroad, and built for the Shenango Furnace Company, Pittsburgh, was launched at the Ecorse yard of the Great Lakes Engineering Works, Detroit, Mich., October 8. This is the largest ore boat on the Lakes, and when the new lock gates at the Soo are completed it is expected to carry 15,000 tons or more. The length of the boat between perpendiculars is 617 ft., breadth of beam, 64 ft. and molded depth of hold 33 ft.

Personal

Harold S. Buttenheim, for the last two years manager of Iron Age-Hardware, has resigned as secretary and director of the David Williams Company. With his brother, Edgar J. (formerly circulation manager of the David Williams Company), Mr. Buttenheim purchased, recently, The American City, a monthly journal devoted to municipal problems and civic betterment, and published at 93 Nassau street, New York. This is a field of work in which Mr. Buttenheim has felt a deep interest for years. It is his belief that a journal devoted to the good government of cities, and the work of boards of trade and civic associations, can be made a substantial success. It will be his aim to make The American City such a paper, and for his success in this undertaking he has the best wishes of his former associates. Hr. Buttenheim's place as manager of Iron Age-Hardware will be taken by Roy F. Soule, already well known to the hardware fraternity.

Richard W. McKay has been appointed superintendent of blast furnaces of the Pennsylvania Steel Company at Steelton, Pa., succeeding John Reese, who resigned.

E. N. Zern, formerly with the H. C. Frick Coke Company and Jamison Coal & Coke Company, Pittsburgh, has been appointed assistant professor of coal mining in the University of Pittsburgh.

Frank Cunningham, for several years superintendent of the Mahoning Works of the Republic Iron & Steel Company at Youngstown, Ohio, has been appointed superintendent of the company's new tube mills. He is succeeded at the Mahoning Works by H. Steindreder, formerly of the company's works at Chicago. Mr. Cunningham was presented with a cut glass punch bowl, a silver tea service and gold watch and charm by officials and employees of the Mahoning Works.

J. L. Brierton, assistant to the vice-president of the Central Iron & Coal Company, Holt, Ala., has resigned.

W. C. McKee, formerly in the blast furnace department of the Algoma Steel Company, Sault Ste. Marie, Ont., has been appointed assistant superintendent in the blast furnace department of the Inland Steel Company, Indiana Harbor Ind.

Raymond Lewis, formerly superintendent of blast furnaces at Sault Ste. Marie, Ont., sailed for India October 3 to take the position of assistant superintendent of blast furnaces of the Tata Iron & Steel Company. R. H. Sanborn, formerly of the "Soo" plant, goes with him as foreman.

E. Steytler, who for some years has been assistant general manager of sales of the Pittsburgh Steel Company, has been appointed general manager of sales, succeeding F. H. Forman, who, owing to ill health and the necessity for a change of climate, requested to be released from the duties of the position. Mr. Forman will be located in Los Angeles, Cal., assuming there entire charge of the business of the same company on the Pacific coast.

Halsted Little, for many years associated with the sales department of Manning, Maxwell & Moore, has been appointed Eastern sales agent for the Detroit Twist Drill Company, with office at 30 Church street, room 604, New York City.

George Ritchie, the new works manager of Bolckow, Vaughan & Co., Middlesbrough, England, arrived in New York in the past week and will visit the important steel-making districts in the United States and Canada.

Felix A. Vogel, general manager Florence Iron Company, of Wisconsin, miner of iron ore, has returned from Europe after an absence of four months.

C. E. Pettee, who has been connected with the Herman Pneumatic Machine Company, Zelienople, Pa., for the past three years as works manager and salesman, resigned October 1.

B. S. Harrison, of London, representing Sota & Aznar, dealers in Spanish iron ore, who has been in this country on business for several weeks, sailed for England October 10.

Harry E. Zaring, assistant secretary of the Crucible Steel Company of America, Pittsburgh, has been elected secretary of the Crucible Coal Company, one of the subsidiary companies of the Crucible Steel Company, and will assist J. C. Neff, general manager of the Coal Company, in connection with the development and operation of the property near Rice's Landing, Greene County, Pa. Mr. Zaring's headquarters will be in the Empire Building, Pittsburgh. P. C. Williams, formerly assistant secretary of the Pittsburgh Chamber of Commerce, has been elected assistant secretary of the Crucible Steel Company of America, to take the place of Mr. Zaring.

W. P. Snyder, president of the Shenango Furnace Company, Pittsburgh, has returned from a two months' trip to Europe.

E. W. Pargny, president of the American Sheet & Tin Plate Company, Pittsburgh, has returned from Europe.

Edward Worcester, vice-president of the National Tube Company, has returned to Pittsburgh from a business trip to California.

George L. Brown, treasurer of the Marshall Foundry Company, Pittsburgh, has gone to California for the winter.

W. H. Wonfor, advertising and export manager of the William Powell Company, Cincinnati, Ohio, is on a business visit to Cuba.

C. L. F. Robinson, president of the Colt's Patent Firearms Mfg. Company, Hartford, Conn., is in England on a two months' business trip.

The Southern Iron & Steel Reorganization

Plans have been completed for the reorganization of the Southern Iron & Steel Company and its consolidation with the Alabama Consolidated Coal & Iron Company A new company will acquire the properties of these companies, subject to about $2,000,000 of underlying bonds on each property. For this purpose and for raising $4,130,000 additional cash capital the new company will issue $5,000,000 6 per cent. bonds, $12,000,000 6 per cent. cumulative preferred stock and $12,500,000 common stock, or $30,000,000 new securities in all.

These new securities will be distributed on the following basis: Holders of the first refunding bonds of the Southern Iron & Steel Company will receive 80 per cent. in new preferred stock and 20 per cent. in new common stock; debenture holders, 60 per cent. in new preferred stock and 40 per cent. in new common stock; one year note holders, 100 per cent. in new bonds, 25 per cent. in new preferred stock and 100 per cent. in new common stock; preferred stockholders, 20 per cent. in new common stock, and common stockholders 5 per cent. in new common stock. Preferred stockholders of the Alabama Consolidated Coal & Iron Company will receive 150 per cent. in new preferred stock; common stockholders 122 per cent. in new preferred and 115 per cent. in new common stock.

There will be offered for subscription, for the aggregate sum of $4,130,000 in cash, $4,130,000 new bonds, $1,032,500 new preferred stock and $4,130,000 new common stock. Of this amount the allotment to the Southern Company's preferred stockholders is $1,180,000 and the common stockholders $950,000. The common stockholders of the Alabama Company may subscribe for the remaining $2,000,000 of the merged company's bonds.

The depositary will be the Bankers' Trust Company of New York, and it is expected that a voting trust for the new securities will be formed.

September Copper Production and Stocks

The Copper Producers' Association has issued its statement for the month of September, as follows:

	Pounds
Stock of marketable copper of all kinds on hand at all points in the United States, September 1	133,441,501
Production of marketable copper in the United States from all domestic and foreign sources during September	115,588,950
Deliveries of marketable copper during September:	
For domestic consumption 57,311,584	
For export 50,824,011	
Total	108,135,595
Stock of marketable copper of all kinds on hand at all points in the United States, October 1	140,894,856

An increase in stocks of 7,453,355 lb. is thus shown. This is due to a heavy decline in exports in September, attributed to the unsettlement of business in Germany, caused by the dispute with France relative to Morocco.

The National Machine Tool Builders

The Annual Convention Largely Attended—A Group of Interesting Papers

The National Machine Tool Builders' Association held its annual meeting at Hotel Astor, New York City, October 11 and 12, with the largest attendance in its history, due partly to an increased membership, which has practically doubled in two years, and partly to the constantly growing interest in the work. The convention of the National Supply and Machinery Dealers' Association progressing simultaneously and to an extent jointly under the same roof had an important influence on the occasion. Tuesday night Machinery had its "inning" in the ball room of the hotel, with an elaborate vaudeville show and other entertainment, while Wednesday night the American Machinist gave a large theater party.

A feature of the convention was the "heart to heart talks" on trade conditions, in executive session, where manufacturers and dealers expressed their views.

The convention opened Tuesday morning with the largest attendance for the first day in the history of the organization. President Fred A. Geier was in the chair. After some preliminary routine business the officers made brief reports, that of Treasurer A. E. Newton showing the financial condition to be exceedingly prosperous. In the course of his remarks, Secretary Charles E. Hildreth read a characteristic communication from Charles L. Hilker, Hamilton Machine Tool Company, Hamilton, Ohio, entitled the "Spirit of Optimism and its Effect Upon Trade." In simple idiom Mr. Hilker struck at a present day tendency to exaggerate the more unsatisfactory of business conditions. He said:

Optimism and Its Effect on Trade

The other day Smith got on the street car. He was a little manufacturer, but was feeling pretty well satisfied with the way things were going and had decided upon adding two or three new tools to his equipment. At the next corner on got Jones, the big manufacturer. "Oh, hello; good morning, Mr. Jones," said the erstwhile cheerful and optimistic Mr. Smith. "How's business?"

"Nothing doing at all," answered Jones, pulling a long face and feeling at his chin. "Never saw business any worse; don't seem like it ever would pick up either. I don't see what we are going to do if things keep on this way."

Smith's optimism first became pale and then took on deeper tints of indigo. By the time he had reached his shop commercial shivers were chasing themselves up and down his spine and he was ruminating. "If a big man like Jones is worrying about the future and thinks things are all going to pot, it's time for me to take another think. I need those tools and could use them, too, but if there isn't going to be any business, why——"

Smith didn't buy any new equipment, and Jones lost just the amount of business that Smith's little optimistic push would have started down the line. Now, there are a whole lot of cheerful little Smiths and a whole lot of pessimistic big Joneses. And which policy works out the best? The old quotation, "laugh and the world laughs with you," is dead wrong in comparative value with the weep end of it when it comes to studying the business pulse. One little lament from the big Joneses is going to scare more confidence out of the little Smiths than you can squeeze back in a year. They draw back in their shells like so many turtles and wait "to be shown" before so much as sticking out a nose.

Now you, Mr. Big Manufacturer, may not be having things all your own way. You increased your plant and put in new machinery to meet an inflated demand. Perhaps there is an overhead expense of power, belting and pulleys that are not productive. Perhaps even some of the banks become peevish occasionally. But——

Is this an excuse for telling some one else?

Do you gain anything by scaring all the commercial confidence out of the little man who wanted to give you an order and was only cautious enough to feel you out before doing so?

Does it get you anything to talk to the general public as though you were in the last stages of dyspepsia and trying to get an extension on your paper from an obdurate banker? You know it does not. What do we care if Wall Street is suffering from an in-growing grouch?

What difference does it make to us if the railroads prefer utilizing their scrap-pile machinery? Or, if the steamship purchasing agents give you the impression of a group of pall-bearers? Their orders count, of course, but they are far from being the only grain in the sand pile. And it is our foolish lamentations over the procrastination of these sometime big buyers that causes us to spill the ice water down the collar of the cheerful and hopeful little man.

It's the little things that count in life—the little men whose cheerful optimism makes them bigger men to-morrow and real personages to be reckoned with the day after, that we have to take into consideration. And if by handing out the glad hand of present and future prosperity we can foster and encourage this growth, we can, so far as railroads, Wall Street and Congress are concerned, trot blithely on our way.

So what's the use of rehearsing, "just before 1907 we were doing etc., etc." That's ancient history and there's no use in going into post-mortems. We've got to live now.

The new constitution committee, A. E. Tuechter, chairman, was excused from further service with a vote of thanks.

The first paper was that of Henry L. Gantt, consulting engineer, New York, on "Task Work as a Basis of Proper Management." He discussed the premium and bonus systems in very great detail, going deep into the elemental work which must be done in every shop in the establishment of this method of wages. The paper was listened to with great interest and was followed by a spirited discussion, among those participating being William Lodge, E. P. Bullard, Jr., Carl G. Barth, each of whom gave valuable information as to certain phases of the system in his own works.

New Members

New members were elected as follows:

Watson-Stillman Company, New York City.
Beaudry & Co., Inc., Boston, Mass.
Lennox Machine Company, Chicago, Ill.
Ferracute Machine Company, Bridgeton, N. J.
Standard Machinery Company, Providence, R. I.
National Machinery Company, Tiffin, Ohio.
Smith & Mills Company, Cincinnati, Ohio.
New Britain Machine Company, New Britain, Conn.
J. N. Lapointe Company, Marlboro, Mass.

Tuesday Afternoon Session

The paper on "Shop Hygiene as a Factor of Efficiency," by Winthrop Talbot, M.D., of Human Engineering, Cleveland, Ohio, was listened to with much interest.

Dr. Talbot was followed by Dr. W. J. Clark, physician for the Norton Company, Worcester, Mass., who went into details as to the system employed by his company, which embraced the physical examination of all employees when first hired. He pointed out that this frequently prevented the employment of workmen afflicted with tuberculosis or other contagious diseases. A card showing the record of each employee is kept and occasionally it has been a very valuable document in defending damage suits for accidents. Dr. Clark fully explained that once each month different foremen were brought together and given "first aid" instruction. One expert dresser of wounds is retained, who is notified immediately after an accident and he meets the patient at the company's hospital, taking care of him until the doctor arrives.

L. P. Alford, editor of the American Machinist, presented an exhaustive paper on "Standardization of Machine Tools for the Benefit of the User," which he illustrated copiously with lantern slides, In general he stated that there are six important principles in standardization, which he has formulated as follows:

1. Standardize corresponding designations and capacities and establish a method of power rating.
2. Standardize devices for holding cutting tools.
3. Standardize devices for holding work and fixtures.
4. Standardize operating movements.
5. Standardize parts concerned in the setting up of machines with reference to the permanent shop equipment.
6. Accept the geometric progression as a fundamental requisite in designing feeds and speeds.

The application of none of these principles will introduce a radical change in design, for, on the contrary, either through action by this association or through a process of natural development, uniform features can be pointed out substantiating the importance and setting a precedent for the application of each principle.

The Philadelphia Foundrymen's Association

The Philadelphia Foundrymen's Association held its regular meeting at the Manufacturers' Club on the evening of October 4, with President Thomas Devlin in the chair. There was a large attendance of both local and out of town foundrymen.

Charles James, general manager of the Kuebler Foundries, Inc., Easton, Pa., and C. F. Grimes, Standard Roller Bearing Company, Philadelphia, were appointed delegates to attend the Atlantic Deeper Waterways convention at Richmond, Va., October 17 to 20. George C. Davis, official chemist of the association, directed the attention of the members to the work of the committees of the American Foundrymen's Association and the American Brass Founders' Association, who are endeavoring to establish a uniform report card dealing with laboratory reports in connection with the analysis of iron, steel and other metals, as well as ores, coal and coke. At the present time there is a wide diversity in the manner of making these reports, which sometimes results in considerable confusion. W. P. Putnam, of the Detroit Testing Laboratory, Detroit, Mich., is chairman, and Mr. Davis, who is also a member of the American Foundrymen's Association committee, asked that the members of the association forward to him copies of the forms used, so that the committee will be able to better formulate and recommend a uniform card which will fully cover the various requirements. The name of the Standard Roller Bearing Company, Philadelphia, Pa., was presented for membership and favorably acted upon.

The paper for the evening, on "Titanium as a Scavenger versus Titanium as an Element of Value in Metals," by W. A. Pollock Davis, was read, in the writer's absence, by A. A. Miller, but as expected lantern slides for illustrating the paper were delayed it was suggested that the writer deliver the address personally at a later meeting of the association.

Richard L. Moldenke, secretary of the American Foundrymen's Association, addressed the meeting, supporting the remarks of Mr. Davis in regard to the work of standardizing the form of laboratory report blanks. He stated that this would be the banner year for the association in connection with its publications and that the transactions this year would include between 700 and 800 pages of printed matter. He also stated that the 1912 convention of the association would be held in Buffalo, N. Y., and that the committee of the association had recently viewed the facilities offered both for convention and exhibition purposes and found them exceptionally favorable. Dr. Moldenke then, upon request, made an address on general cupola practice, giving his views particularly in connection with the methods of charging, carelessness in which, he said, was a frequent cause of unsatisfactory melting and a bad condition of the iron when tapped. Discussion in this connection was briefly entered into by Dr. E. E. Brown, Alexander E. Outerbridge, Jr., and Charles James.

Pittsburgh and Vicinity Business Notes

The Oil City Trust Company has been appointed receiver for the Holbeck-Riverside Gas Power Company, Oil City, Pa. The company was recently organized, being a consolidation of the Holbeck and Riverside gas engine companies, and was engaged in the manufacture of gas engines.

The Elkins Foundry & Machine Company, Elkins, W. Va., has awarded the contract for the construction of a building which will contain a foundry, 32 x 60 ft.; a machine shop, 32 x 60 ft.; a pattern shop, 42 x 50 ft., office, store rooms, etc.

The Pittsburgh Motor Car Company, 1109 Empire Building, Pittsburgh, expects shortly to secure a suitable site on which to erect a new plant. It is the intention of the company to build a brick and stone structure, 95 x 238 ft., one story.

The Frontier Decorating Machine Company, East Liverpool, Ohio, has been incorporated with a capitalization of $10,000 by A. O. C. Ahrendt and others.

It is announced that the Penn 30 Auto Company, which has been negotiating for the location of a plant in Warren, Ohio, and other cities, has finally decided to locate in New Castle, Pa.

No. 1 stack of the Shenango Furnace Company, Sharpsville, Pa., which was blown in September 20 on basic iron, started last week to make Bessemer.

The puddling mills of the Sligo Iron & Steel Company at South Connellsville, Pa., which have been idle for some time, started last week. The company is turning out an order for high-grade quality muck bar to be used by a leading chain company in furnishing chain to the United States navy.

Reports that the H. C. Frick Coke Company will build a large block of bee-hive coke ovens in Washington County, Pa., are untrue. It is not the company's intention to build any more bee-hive ovens, and the coking coal from properties recently bought will probably be shipped to the Gary district to be used in by-product ovens.

Sales managers of the Republic Iron & Steel Company in the various cities met in Youngstown, Ohio, on Wednesday and Thursday last week to discuss plans for the coming year.

The Pittsburgh Tack & Nail Company, recently incorporated with a capital stock of $100,000, is considering plans for the building of a plant at Rochester, Pa.

The Steel Corporation's Unfilled Orders

The statement of the United States Steel Corporation published October 10 showed that the unfilled orders on the books of its subsidiaries on September 30, apart from inter-company business, amounted to 3,611,317 tons, a decrease of 84,668 tons from the total on the books August 31. The statements of the three preceding months had shown an increase. Low point was touched at 2,674,757 tons on December 31, 1910. The amounts reported for the various months of this year are as below, in tons:

Sept. 30, 1911	3,611,317	April 30, 1911	3,218,704
Aug. 31, 1911	3,695,985	Mar. 31, 1911	3,447,301
July 31, 1911	3,584,085	Feb. 28, 1911	3,400,543
June 30, 1911	3,361,058	Jan. 31, 1911	3,110,919
May 31, 1911	3,113,187		

At the end of September, 1910, the total of unfilled orders was 3,158,106 tons. The totals at the close of the various years have been as follows: 1902, 5,347,523 tons; 1903, 3,215,123 tons; 1904, 4,696,203 tons; 1905, 7,605,086 tons; 1906, 8,489,719 tons (the high record); 1907, 4,624,552 tons; 1908, 3,603,527 tons; 1909, 5,927,031 tons.

Under the title "Ganschow on Gears" the William Ganschow Company, Chicago, has compiled for the trade interesting information on gears. This company has equipped its shop with unusual completeness in the matter of gear cutting, generating and hobbing machinery and in this book the facilities afforded thereby are fully catalogued. Many suggestions of value to the user of gears, with illustrated diagrams, are presented. Very complete gear tables, giving the circular pitch and corresponding pitch diameters and vice versa of a wide range of sizes, are included among a number of engineering tables of useful information. Attention is given individually to the presentation of specifications for spur gears, bevel, worm and wheel; rack and pinion, rawhide pinion, spiral and special gearing. The book comprises 228 pages, 8 by 5 in. in size. It is printed in colors and tastefully bound in green cloth with gold lettering.

A dispatch from Seattle, Wash., states that application has been made for the appointment of a receiver for the Western Steel Corporation. The company was incorporated in Washington October 2, 1909. The authorized capital stock is $15,000,000 common and $5,000,000 6 per cent. non-cumulative preferred stock. It also has $2,000,000 of bonds. Its steel plant has a daily capacity of 200 tons of merchant bars and light shapes. Action on the appointment of a receiver has been deferred by the court at the request of creditors and stockholders, who will endeavor in the meantime to adjust the company's affairs in a satisfactory manner.

The Garwood Electric Company, Garwood, N. J., for which Charles N. Fowler, Jr., Elizabeth, N. J., has been appointed receiver in chancery, is not only completing its unfilled orders but is also taking new business. The assets of the company are largely in excess of its liabilities. All of the branch offices of the company are soliciting business, as usual, and reorganization plans are now being considered.

Machine Tool Dealers Meet

First Annual Session of the Machinery Section of the National Supply and Machinery Dealers

The Machinery Section of the National Supply and Machinery Dealers' Association held its first annual meeting as a separate body at the Hotel Astor, New York, October 10 and 11. Most of the 85 delegates in attendance were dealers who specialize in the sale of machine tools and metal working equipment, and a large part of the time given over to the business sessions was used in the discussion of matters pertaining to the selling of metal working machinery. W. L. Rogers, president of the association, presided over the meeting and on Tuesday morning he opened the session by outlining the scope of the convention and referred briefly to matters which were to come up for discussion. Following the roll call Henry Prentiss, of the Prentiss Tool & Supply Company, New York, who is first vice-president of the association, spoke on the benefits to be derived from the meeting. He said in part:

The Benefits of Trade Associations

Doubtless some of our members are asking themselves this question: Why should we employ our time and energies in attending these meetings when they are so much needed to further business interests in the home field. This is a pertinent query which should be satisfactorily answered. Permit me to outline a few of the reasons why we should look upon these meetings with distinct favor.

One of the strong affirmative factors in reaching this conclusion is the benefit of personal acquaintance. Heretofore we have been inclined to look upon our competitor with disfavor, as one who was an unwelcome obstacle in the way of business prosperity. Perhaps we felt that we were justified in using his supposedly doubtful methods to checkmate him. Now, as a result of our coming together our feeling toward our competitor has completely changed. We learn that he had the same misconception of our methods that we entertained of his methods, and that it is his desire and intent to conduct an honorable business, to employ clean and just methods and to treat his competitor fairly. We find that he is facing the same problems that confront us. It has been made plain to us that we have common aims and difficulties which we can work out together to our mutual advantage. Ways and means of conducting business to insure greater returns are an outcome of this intercourse.

Our members are beginning to realize the importance of the expense account; the literature which our secretary-treasurer has sent to members from time to time illustrates what an association can do to focus our attention upon this, one of the controlling factors in business success. We find that the increase of our earning capacity is largely dependent upon the volume of business; that many of our manufacturers are, as yet, unconvinced of the necessity of an increased selling commission. The increased volume, however, is not sufficient to cover the enlarged expense account, hence this problem is becoming daily more perplexing; associated together we are in better position to solve this problem and to accomplish reforms which as individuals we could not successfully cope with.

During these meetings we shall learn from the reports of our secretary-treasurer and committees what has been accomplished during the past year of advantage to our membership. We are to consider the following important subjects: Confidence and co-operation; compensation of salesmen; credits; uniform notes and documents for security on deferred payments; manufacturers' selling policies, which includes close co-operation with the Machine Tool Builders' Association to promote the best interests of the machinery trade, to make it not only more profitable, but to establish more cordial relations with our manufacturers; best methods of handling sales to trade schools and other similar institutions; cost of doing business; service rendered to appraisal companies in connection with the appraisal of machine tools and other equipment; uniform proposal blank with non-cancellation clause.

In this connection I wish to emphasize the importance of reaching a fair understanding among our members handling business in what is termed "open territory," which calls for rigid maintenance of the manufacturers' resale prices, resulting in the fair competition which we employ and enjoy in closed territory. Such an understanding will help materially in the net results of the year's business.

Another association which is holding its meetings in this hotel to-day is a forceful object lesson of the benefits derived from membership in a strong and active association. A few years ago this association was comparatively weak and had little influence; it has now grown to be strong and representative and is helpful in many ways to its members. Shall we not profit by this example and through intelligent, persistent and united effort win for our association its rightful place as the representative of an important business industry? The higher thought, *i. e.*, that we only truly receive as we give out, is taking its rightful place in human consciousness. One of the channels through which this thought is manifested is in association work in which individual co-operation, growing out of an understanding of our common needs, brings harmonious action, whose fruitage is an abounding success.

Thomas A. Fernley, secretary-treasurer of the association, presented an interesting report of the organization's affairs and took occasion to point out that the business outlook among machinery men is better at present than it has been in some time.

Edgar E. Strong, of the Strong, Carlisle & Hammond Company, Cleveland, Ohio, presented a paper on "Confidence and Co-operation," the discussion of which brought the morning's session to a close. He said in part:

Confidence and Co-operation

As an instance of the benefit of co-operation which necessarily calls for confidence, I wish to go into a little ancient history. Many years ago the supply business in certain lines was badly demoralized in Cleveland. Certain staples were sold at a nominal profit of one and a half to five per cent., which we now know meant an absolute loss, and not a trifling one at that. Some wise man of sufficient standing to make the matter respectable conceived the idea of getting together and taking action to remedy this condition. The plan found favor and all the larger dealers co-operated and established prices on these money losers which brought them on the right side of the ledger, and for years that class of goods paid liberal profit in our local market, while in other surrounding cities they continued to be marketed at the loss. This was before the days of the Sherman law or our own Ohio Valentine law, and of course we do not now agree upon prices, but the lesson learned then has not been forgotten and we each feel that the other knows an unprofitable job when he sees it and is not out for that kind of business.

Of course some of you are not interested in the supply business, but tell me if you can why the principles of the machine-tool business are any more difficult to harmonize than those of the supply. If there is a difference, is it not easier to adjust in your particular line than in the supply line. Is it not true that most of the high-grade tool builders establish prices at which their tools are sold? Some of them I know do, and are very rigid in their requirements in that direction.

It seems proper to ask whether this association by itself or co-operating with other associations cannot start a campaign of education to bring pressure to bear upon the Congress to so amend the Sherman law act that reasonable regulation of prices, terms, etc., shall be lawful. Under the present law, no one seems to be certain just what it is lawful to do. Recent decisions are construed to prohibit the establishment of prices fixed by the seller on the ground that when a thing is sold the previous owner has no further rights in it and no right to dictate in any way concerning it. The court seems to overlook the fact that real estate, the basis and origin of all wealth, has been sold with restrictions for centuries and continues to be sold.

Tuesday afternoon the dealers listened to a report of the machinery committee presented by O. P. Meckel, Baird Machine Company, Pittsburgh, Pa., in which was outlined the work done by the Machinery Section of the association during the year. J. O. Harron, of Harron, Rickard & McCone, San Francisco, opened a discussion on "Compensation of Salesmen," in which the matter of paying salesmen by salary alone or salary and commission was gone over. The rest of the afternoon was given over to talks on credits and the question of securing payment on material purchased on notes.

The muck bar and merchant iron mills at Canton, Md., of the Canton Iron & Steel Company, Baltimore, have been closed down. When they are likely to resume has not been learned.

Factory Floors

Factory construction, factory arrangement, factory lighting and factory floors were made the special subject of the October meeting of the American Society of Mechanical Engineers, held on the evening of October 9, in the Engineering Societies Building, New York. The general subject was introduced by a formal paper by L. P. Alford and H. C. Farrell, describing the arrangement and construction of the reinforced concrete factory buildings of the United Shoe Machinery Company, at Beverly, Mass. The paper may be obtained in full in the October Journal of the society.

Discussion was prearranged with a grouping under the heads enumerated. The question of machinery arrangement was taken up in part by Alexander Taylor, manager of works, of the Westinghouse Electric & Mfg. Company, East Pittsburgh, and L. D. Burlingame, of the Brown & Sharp Mfg. Company, Providence. Contributions on shop lighting were made by G. H. Stickney, of the General Electric Company, and by C. E. Clewell, of the Westinghouse Electrical & Mfg. Company. In general the pronouncements regarding lighting followed the lines brought out in the recent meeting of the Association of Iron and Steel Electrical Engineers, printed in part in the issue of October 5.

The subject of factory floors was taken up in detail by H. M. Lambourn, of the Yale & Towne Mfg. Company, Stamford, Conn. He expressed decided favor for a wood-wearing surface and reported satisfactory experience with Southern pine and also with maple, the latter wearing smoothly and being favorable from a price consideration. He showed a number of pictures of floors thirty years and older of common cut Southern pine. Lantern photographs were also shown to exhibit the advantage of floors laid with the boards brought tightly together by means of jacks. He emphasized the desirability of having the floor boards laid in the direction of maximum travel, such an arrangement facilitating the removal of such boards as suffer excessive wear. He admitted that the objections to the concrete floor are the amount of abrasive dust which develops and the absorption of body heat. Such a floor is inadvisable where the processes of manufacture entail an expenditure of nervous energy on the part of the operators. The concrete floor was attractive at first, but was subject to wear, and, particularly with a poor foundation, developed cracks which become holes.

Cast iron plates he admitted were good for foundry floors, but he appeared to favor a brick floor. It had the advantage that it was easy to replace. Where rooms had an acid atmosphere or there is necessity for having maximum water resistance asphalt floors were good. He did not dwell on composition floors, but expressed interest in the experiences being gained at the Grand Central Station of the New York Central railroad with different forms of composition floors.

Henry Hess, president of the Hess-Bright Mfg. Company, Philadelphia, described at some length, with the aid of lantern photographs, wood block floors in use in the German Niles works. The foundation consists of sand and solid concrete 8 to 14 in. thick, and the wearing surface of blocks of about the size of the average brick, creosoted and set in tar in the lower part. The cracks between abutting blocks were filled with sand. They were set in uniform straight lines, making it possible to run an electrical conductor, for example, under the floor by removing a line of blocks, and protecting the conductor with a wood channel before replacing the blocks. He showed also some samples of a German composition flooring, of sawdust, preferably of hard wood, in a magnesia compound colored or mottled like marble to suit the desire. This material is ¾ to ½ in. in thickness on a base of about ½ in., comprising a cinder concrete with magnesia and having a porous structure. He has found that material does not warp and may be used for foundry patterns although it is somewhat hard on wood-working tools. He regarded the floor lying between wood and concrete so far as the comfort of the operators is concerned. Cracks do not develop in it and it may be rounded at the walls like tile floors in hospitals.

Obituary

JOHN HARTWELL HILLMAN, Pittsburgh, senior member of the firm of John H. Hillman & Son, died suddenly of heart failure at his residence October 10, aged 70 years. He was born in Montgomery County, Tenn., served in the Confederate army under General Forrest, and subsequently with his father and brother, under the firm name of Daniel Hillman & Sons, operated charcoal blast furnaces and rolling mills in Tennessee and Kentucky for a number of years. Mr. Hillman moved to Pittsburgh in 1886 and engaged in the iron, coal and coke business. He was one of the pioneers in the development of what is known as the Lower Connellsville coke region, engaged in the manufacture of coke in that district and continued in this business up to the time of his death.

GEORGE WEBBER, who was one of the pioneer steam elevator builders in this country, died at Boonton, N. J., October 5, aged 88 years. He established a factory in 1870 at 181 Pennsylvania avenue, Newark, N. J., which is now operated by his sons, George A. and Charles Webber, he having retired several years ago.

THOMAS P. KELLY, president of the foundry supply firm of T. P. Kelly & Co., 534 West Twenty-second street, New York, died September 22 of paralysis after a brief illness, aged 60 years. He was born in Dublin, Ireland, and was graduated from the Waterford College. He came to this country when 21 years of age and immediately entered the foundry supply business as a salesman. In 1885 he established the business of T. P. Kelly & Co., and since that time and until his death was in active charge of the company's affairs. Mr. Kelly was a member of the Foundry and Manufacturers' Supply Association, which was later incorporated as the Foundry & Machine Exhibition Company, and of the Newark Foundrymen's Association, the Philadelphia Foundrymen's Association, the Machinery Club of New York, the New York Municipal Art Society, the Irish Historical Society and other prominent organizations. The business of T. P. Kelly & Co. will be continued as an incorporation by P. A. Kirby, Walter F. Kaine and M. F. Kirby.

HENRY L. BRADLEY, secretary, treasurer and manager of the Atlas Mfg. Company, New Haven, Conn., died September 2. He organized the business in 1891, having invented the shelf brackets, coat and hat hooks and ceiling hooks now manufactured by the company; also all the automatic machinery used in producing those products, as well as a new line which the company is about to put on the market.

H. R. IVES, Montreal, Canada, died suddenly last week at the age of 78 years. He was born in Plainville, Conn., and went to Montreal in 1859, where he founded the firm of Ives & Allan, manufacturers of bedsteads, ornamental iron and steel and brass goods. He retired from business some years ago, and in 1908 became connected with the Canada Foundry Company as Quebec representative. He was a member of the Canadian Society of Civil Engineers, the Engineers' Club, the St. James Club, the Canadian Club and several other organizations.

W. M. JONES, assistant treasurer of the Sheffield Coal & Iron Company, Sheffield, Ala., died October 7, following an operation for appendicitis.

Correction.—In the review of the Bucyrus Handbook which appeared in *The Iron Age*, September 28, on page 695, the name of the company making the report upon which the handbook is based was inadvertently given as the Destruction Service Company. The name of the company making the report should have been the Construction Service Company, 15 William street, New York City. This company makes a specialty of building up work that has broken down or that is in danger of doing so, and it will be readily seen that the incorrect title might create a misapprehension of its functions.

Attorney-General Wickersham, who arrived in Washington October 8, authorized the statement that there was no truth in the publication made in New York the same day that a bill in equity had been prepared at Washington and was awaiting him, the purpose of which was to begin suit to dissolve the United States Steel Corporation as a combination in violation of the Sherman law.

The Broken Lehigh Valley Rail

A Discussion of Piping and of a Peculiar Separation in the Steel at the Point of Fracture

The investigation into the causes of the rail failure which was responsible for the wreck on the Lehigh Valley Railroad near Manchester, N. Y., August 25, is still in progress. As it involves no small amount of laboratory work, the results will probably not be available for publication for some time. Considerable interesting detail was brought out, however, in the coroner's inquiry held immediately after the accident, particularly in the testimony of Robert Job, chemist of the Lehigh Valley Railroad, who is vice-president of the Milton Hersey Company of Montreal, Canada. The examination of Mr. Job took a wide range, the object of the questions being to bring out facts as to the practice of rail mills, the specifications of the railroads and the causes of various defects in rails in service. Mr. Job, in referring to the requirements of the Lehigh Valley Railroad and the practice of the mills making rails for that road, said:

A 20 Per Cent Discard

In our practice 20 per cent of the entire weight of the ingot is cut off as discard. Our inspector measures that carefully, because we pay an additional premium for that 20 per cent. In the ordinary mill practice 9 per cent only is discarded, but we prefer to pay for the additional amount in order that we may have better and smoother rails. After the 20 per cent has been discarded the first rail coming immediately below that point is taken for the drop test, and a piece, approximately between 5 and 6 ft. long, is cut off. The next rail coming from the point just after this drop test is stamped with the letter A; the next one is stamped B; the next one C, and the next one D, and so on; and then the cropping that has been previously explained is taken from the bottom of the ingot so as to render sure that it is free from any visible defect.

Q. What per cent is cropped off from the bottom?

A. That depends a great deal upon the character of the steel. If it is bad the cropping is kept on further and further up until the steel appears to be good.

Q. Is the cropping taken ever as bad as that from the top?

A. Well, that is pretty hard to state. They sometimes at the very bottom it is porous, and just as porous at the bottom sometimes as at the top. There is a great tendency for a pipe to form at the top, and on that account special attention is given to that, although equally great care is given to the cropping at the bottom in order to be certain that the steel there is free from any impurities.

Q. The last question is an A rail, is it not?

A. Yes.

Asked whether the A rail in any heat is considered the weakest, Mr. Job said: "I consider the A rail, after 20 per cent of cropping has been performed, to be as safe as any rail in the ingot. It would be stronger than, or as strong probably as, a rail from the bottom of the ingot." Asked how 20 per cent was arrived at as the proper amount to be cropped, he said: "We find as a general practice that when 15 per cent is removed there is very little tendency to pipes or other defects in the steel."

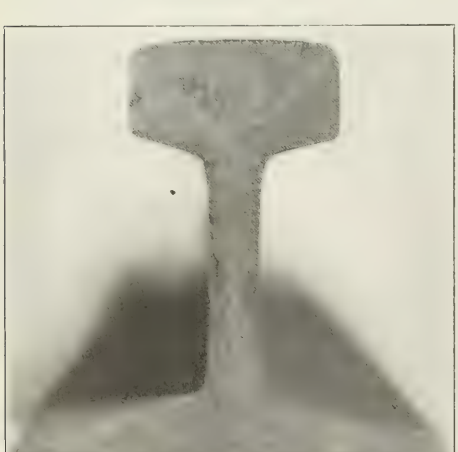


FIG. 1.—INCHES. End of 31 Inch Piece of the Rail that Failed. In the Head is the "Dark Spot" and the Area of "Separated" Metal Shown on the Left Side of the Head, Extending Almost to the Bottom of the Web on the Left Side.

Defective Metal and Piping

It was brought out that the rail which had broken in several pieces when the train passed over it on August 25 was of open-hearth steel, rolled at South Bethlehem, Pa., and weighed 90 lb. to the yard. The specifications called for phosphorus under 0.04 per cent. manganese from 0.80 to 1.00 per cent and carbon between 0.70 and 0.80 per cent. An end piece of the rail 31 in. long was produced and shown to Mr. Job. Both ends of this piece were photographed and reproductions appear in Figs. 1 and 2. Referring to what he called Exhibit B, shown in Fig. 1, which is the broken end of the piece, the coroner's questioner called attention to the dark spot which appears in the head of the rail and asked what it indicated. Mr. Job replied that it indicated a decidedly defective mill practice; that something in connection with the manufacture of the rail caused a depression of the metal at that point. He could not tell precisely how the defect had been produced, but, he added, "there is a separation of the metal immediately under the surface of that spot extending two-thirds of the distance across the entire head of the rail."

His attention was then called to the seam which appeared in the center of the web, and of this he said: "That is technically known as a pipe. It is due to the formation of a cavity which occurs through the cooling of the metal, extending to a point below that at which the cropping was made. In other words, it is a defect of mill practice. Perhaps I ought to say that the seam line is formed as a result of that defect, owing to the fact that when the billet is rolled out into a rail the surfaces come in contact but do not adhere to one another. . . . When a pipe is present in the web it weakens it very little. Where it extends to the top of the head or near the top of the head, there is, of course, a tendency for the steel to smash down, so that ordinarily a rail containing a defect of that kind can be readily seen by the track man. When the defect is in the web, as in this case, a very little weakness results from such a defect, because it is so far below the top of the head that the load is evenly distributed."

Q. From your experience would you say that the test rail which was taken from that heat contained a pipe?

A. It might, or it might not. We know this much, that the rail taken from the top of that heat did not break when subjected to the intense force of 2,000 lb. falling from a distance of 18 ft. upon the rail between the supports. That very rail might, however, have been piped, for I have known personally of rails which have stood four and perhaps more blows under the drop test which have been badly piped.

The Cause of the Break

To the question which of the two defects shown in the broken end of the rail was the more serious, Mr. Job replied: "There is another kind of crack extending three-quarters of the distance across the entire metal in the head which weakens the steel so much that there would be no comparison between its weakening effect and that of a small pipe in the web of the rail."

Asked whether there was any test which would bring to light the defect shown by the dark colored spot, Mr. Job said that it would be disclosed by the drop test. Such a defect could not be seen on the rail even on very close examination, but under the drop test a rail with such a defect would be broken in pieces. It was suggested by the examiner that the rail might have been given a blow when it was laid that would show a defect like that of the dark spot. Mr. Job replied that this was very unlikely, since rails are treated very carefully in laying and are not subjected to any undue shock. "It would be very unwise to make a test of that kind, since the integrity of the rail might be weakened. A heavy blow might start some crack in perfectly sound metal and when once a crack starts it is likely to extend, just like tearing a piece of paper."

Q. What in your opinion, from the examination of the rail and the surroundings, caused that rail to break?

A. I believe that it was some blow from the moving train which was sufficient to extend the crack in the top of the rail clear across—in other words, to break the one-quarter of the metal remaining in the head and thus cause the fracture of the entire rail.

Q. Now, this spot shown on the end of the rail was on which side of the rail with reference to the car wheel?

A. It was on the running edge.

Q. Do you think that the piping would have any effect in the break of the rail?

A. No, sir, I think not. I believe that the original fracture came as the result of the weakness in the head, as I have said, from the fact that only one-fourth or so of the steel remained unbroken at that point. After the first fracture, of course, the impact would naturally break up the rail into a great many pieces.

Q. Can you tell from your examination of the rail how far the defect indicated by this black spot extends lengthwise in the rail?

A. My impression is that it does not extend beyond the immediate surface. I take that from the general appearance of the break, from the fact that it has a comparatively smooth surface, giving an indication that there has been a slight movement between the different portions of the steel. . . . . .

Q. Have you noticed any such a defect as this in any of the other portions of the rail?

A. Yes.

Q. In how many?

A. I haven't counted the exact number, but from memory I should say in three or four pieces, possibly more.

Q. Were they, as you call it, on the running side of the rail?

A. Yes.

The Cutting of the Rail as a Possible Cause

It developed in the examination that the broken rail was first laid in track in October, 1910, and that it was relaid in April, 1911. At that time a piece was cut off the end, so that the new end of the rail was as shown in Fig. 2. Referring to the cutting off of the end in April, 1911, the examiner asked:

Q. Would the fact that that rail was cut, using a hammer and chisel, one man holding the chisel, and the other man using the hammer, on the base of the rail, and then dropping it, have any tendency to crack the rail at the place where this spot indicates a defect?

A. No, sir. I think not. I think there would be no chance at all of that.

Q. Would it be possible, in your opinion, to break that rail at that point, in the laying of it, in any way, striking it?

A. No, sir. I may say that one reason why I am quite certain that the crack does not extend is that the color of the fracture is practically the same at one point as at another. If there had been several fractures there would be different degrees of oxidation, and consequently different degrees of color, so that one portion, which we will say was broken originally at the mill, might extend one-half of the distance, and then the next fracture, when it was broken by some heavy blow, would extend the rest of the distance, and we would have a different color, because it would be less oxidized. So that from that appearance I am satisfied that that fracture was originally made at the mill and did not extend after that time. There is every indication of that from the face of the rail. . . . .

Q. Do you consider piping in a rail a serious defect?

A. My experience has been that the tendency of piping is to cause a crushing of the rail, a crushing of the steel, which can be plainly seen by the track man, and that, of course, when the pipe extends beyond the web of the rail and pretty well up into the head. Under those conditions, the metal above that point is so small that it is unable to support the load of the trains, and consequently this crushing occurs, and in that case the defect is very readily apparent to anyone walking the track. Generally the head of the rail spreads apart so that it can be very easily seen.

Q. Do you consider piping in the web alone a serious defect of a rail?

A. I might answer in this way, that I have known a rail which contained a pipe in the web to stand 34 years of hard service. It depends, of course, upon the location of the pipe, and the condition of the steel.

Q. In the one which you refer to, where was the pipe located?

A. In just about the same location that this is. From a point just above the base to a point at about the beginning of the head.

The Condition of the Cut End

The cut end of the 31-in. piece (Fig. 2) was then shown and Mr. Job's attention was called to the pipe which starts just above the base and extends into the head. He was asked whether this pipe was more serious than the one in the broken end of the piece (Fig. 1). He replied that the former would be considered more objectionable from the fact that such a rail would be more likely to mash down in the service, though in the particular rail in question so much solid metal would remain above the pipe that there would probably be but slight tendency to mash. The question was then asked whether the piping in Fig. 2 was visible on April 20, 1911, when the rail was cut off at that point.

A. It would be impossible to state whether or not it was. It might have been in that condition just as it is now, or it might have been in a condition in which no sign of the piping occurred. In breaking off a rail, very often thin portions may adhere, which, in the course of subsequent handling, rubbing against the next rail or by the light and jar of service, may have been knocked off from it; so that I am satisfied that in a case of this kind a line such as this had might not have been at all visible. It may have been covered up by some portion of the steel which, in the jolting of a number of months has dropped down and gradually exposed the crack; or, of course, it is possible that there may have been a slight tendency to crawl here and open up the defect, particularly since this would be at the very end of the rail, where it would receive the hard hammer blows of every wheel which passed over it.

Q. Do I understand you to go on record as saying that where there is piping it cannot be discovered by cutting the rail?

A. I should say that in almost all cases, or in the majority of cases it could be discovered perfectly well, depending, of course, upon the condition of the pipe. In some rails on cutting the entire rail splits apart; and in some places, of course, a knife cannot be used just as soon as the steel is opened. In other cases the piping is less apparent; and, in fact, in many cases which I have seen, the two surfaces are in intimate contact, so that there is simply a fine line of demarkation to show; and provided the break comes evenly, as it very often does, it is quite difficult to know that a pipe is present at that point.

Q. Can it be discovered on close inspection?

A. It could be discovered by taking a brush and polishing it and



Fig. 2.—Cut End of 31-Inch Piece, Showing Pipe.

etching it; then the line, and in fact any slight defects which might be present, could be seen by the opening of the line.

Q. Is that difficult to do?

A. It could not be done in track. Ordinarily it is a laboratory experiment.

Mr. Job suggested that a sliver of metal may have covered the upper part of the pipe shown in Fig. 2 when the rail was cut, also that the metal may have been bent over the crack somewhat, so that the pipe was not seen by those who cut the rail. Asked whether the cutting of the rail with a chisel and a hammer would have a tendency to open up the pipe, he said that a good deal would depend upon the conditions under which the rail was broken. "I have seen cases in which it would open decidedly by cutting and I have seen others in which there was no opening of the metal at all."

Molten Ferromanganese for Deoxidation

A Successful Practice in a German Steel Plant

In Stahl und Eisen for August 24, 1911, Messrs. Bronn and Schemann discuss the use of molten ferromanganese for deoxidizing purposes. It is well known that there are marked advantages in adding this alloy in the molten state rather than in lumps, but the disadvantages of the cupola, open-hearth furnace or arc-electric furnace are so great that in the melting this value is fully counterbalanced.

As far back as 1906 the Rombacher Works melted its ferromanganese and by tilting the molten metal into the ladle coincident with the converter product assurance was had that the entire amount of the alloy actually reacted with the steel. When lumps of the alloy are simply thrown into the converter at the proper time there is no telling how much manganese gets into the slag. With molten alloy a series of tests has shown conclusively that there is no noticeable difference between the steel of the first and last of the charge. Moreover, in this way very quiet teeming is possible, charges being as high as 23 tons. This was noted with 1000 charges of basic Bessemer steel, where not a single one gave trouble in pouring. Evidently the liquid alloy was so nicely distributed and the deoxidation so thorough that the results were actually surprising. Even with manganese in the steel as low as 0.22 to 0.25, rolling was satisfactory and the crop ends lost very light. The result was that less alloy was used, while the powder usually sticking to the slag was saved.

While the results were so good, it was not easy to get the melting of the alloy itself satisfactory, the ordinary methods with the cupola, etc., oxidizing too much of the manganese. Manganese volatilizes too readily, the boiling point being 3450 degs. F., while iron boils at 4425 degs. F., for the arc electric furnaces. Moreover, in half an hour after starting the manganese smoke was so irritating that tests had to be stopped. The elegant Girod electric furnace, with the hearth electrode of heavy iron bodies, failed completely, as the molten ferromanganese penetrated

into the iron, even when the current was introduced through water-cooled electrodes of heavy and of light sections. In no case could the electrodes be used over three days. In the case of the water-cooled article this was found to have changed to high percentage manganese iron, which allowed water to pass through. It was also difficult to keep the hearth intact, as not only must the alloy be simply melted but it must be highly overheated. As the bath was thinly liquid, the alloy easily penetrated into the cracks of the brickwork and gave trouble. Finally a special composition for the brick overcame this.

As the advantages of liquid ferromanganese were too great to abandon, further researches were made and finally an arc with a potential difference far below the usual one of 45 to 75 volts between electrode and bath was secured. Perfect success was the result. In the case of a six-day campaign, the capacity of the furnace being 1.5 tons, at the end, there was not the slightest trace of an iron increase in the alloy, which would have been the case had any manganese volatilized. Using so small a voltage difference requires close work between electrode and bath surface. In spite of this the wear on the electrodes was not excessive at all (1 cm per working hour), and it is confidently expected that this will be decreased.

The average saving in manganese, which is 35 per cent. by using the alloy in the molten state, amounts to more than double the melting expense and in the works in question often allows the substitution of the basic Bessemer steel thus produced in place of the open-hearth quality.—

R. M.

The Deutscher Eisenhuettenleute's Meeting

Important Papers Presented

BERLIN, September 28, 1911. At the autumn meeting of the Deutscher Eisenhuettenleute's, held last week in Breslau, an interesting paper was read by Dr. I. Puppe, of Berlin, on American rolling mills. He spent ten weeks in America last spring, and the paper embodied the results of his observations. After describing various American rolling mills and comparing them with German mills the speaker referred to the extraordinary capacity of American mills. The producing capacity of rolling mills, he said, has been developed to an extraordinary degree in America. He referred as an example to the new rail mill at Gary, which can turn out 4,000 tons of finished rails in 24 hours. He concluded that such results were accomplished by building rolls specially adapted for producing the particular line of product desired. In general he found that the American mills are built for producing the largest possible quantities with less regard to quality than in Germany. In view of the excellent results of this system of production there the speaker recommended that German engineers give more attention also to specializing on rolls, so that special rolls be devoted to turning out each single line of product. In this way, he thought, the Germans would be better able to meet American competition in the world's markets. Finally the speaker referred to the claim of the Americans that their machine-tool and power-developing machinery are superior to the German product, and he compared the figures given him in America with what is being done with German machinery to prove that the American claim is unfounded.

One of the most interesting and important papers read at this meeting was that of Prof. Simmersbach, of Breslau, on the use of coke-oven gas in open-hearth furnaces. Referring to the interest created by the application of gas for power development at iron mills, he said that a new value can now be attached to gas as a means of heating the Siemens-Martin furnace. Ten years ago furnace gas, free of sulphur, was regarded as best for furnaces; but now coke-oven gas is gaining the preference owing to its higher heating value. The first successful experiments in applying coke-oven gas in a Siemens-Martin furnace were made so recently as 1907 in Upper Silesia at the Hubertushütte by Director Amende, who mixed it to the extent of 70 per cent. with generator gas for producing steel. In 1909 the Societé John Cockerill, of Seraing, Belgium, began to use coke-oven gas for making steel, and in the same year Director Wiertz at Mühlheim used it with a mixture of blast-furnace gas.

The speaker then showed a series of comprehensive tables showing the heating capacity of coke-oven gas, pure and in mixtures with other gases, together with temperature comparisons within the open hearth furnaces during the process of making steel with such fuel, to show that the temperature in the hearth is considerably higher with coke-oven gas than with the generator gas hitherto in use. Where the maximum flame temperature obtainable with generator gas was 1780 to 1788 deg. C., a temperature of 1850 deg. and higher was easily obtained with coke gas. In this way the producing capacity of the Siemens-Martin furnace is considerably increased; a gain of 15 to 20 per cent. can be relied upon. This means a considerable gain in the saving of heat through radiation, since radiation will be relatively less with a furnace of large production than one of small production. He recommended that the gas be conveyed directly into the furnace without a previous heating, as this would damage its quality, and to use hot air as blast. This would mean a further saving in construction cost, owing to the fact that gas chambers are dispensed with; and hence the furnace roofs can be built much more durably. The durability of the furnaces is precisely the same in using coke-oven gas as in using generator gas.

The transition from generator gas to coke-oven gas can be rather simply effected by mixing blast-furnace gas with coke-oven gas in such proportions that the mixture shall have only a somewhat greater heating value than generator gas. The method of work then remains the same, and the workmen need to learn nothing new; on the contrary, they have easier work, for they will always have a high temperature at their disposal toward the end of a charge. The mixing of the two gases can be made in a simple and effective manner by using gasometers and maintaining the proper pressure. By employing coke-oven gas in the Siemens-Martin furnace it becomes possible to use only coking coal at iron works. Such works can now use with advantage coke-oven gas alone, or mixed with blast-furnace gas, as found desirable. The technical process at iron works is today already at a point of transformation, for the use of gas from coke ovens in the open hearth will reduce the cost of producing open-hearth steel to a considerable extent.

New Hupmobile Plant for Windsor, Canada

The Hupp Motor Car Company, Detroit, Mich., has completed its plans and purchased a site for the erection in Windsor, Ontario, of a plant for the complete manufacture of automobiles for its large and rapidly growing Canadian trade. The factory will be located at the corner of McDougall avenue and Gibbs street, on the Windsor Terminal Railway. The site comprises 3½ acres, and ground was broken October 5.

The factory will be modern in every particular, with a present capacity of 3000 cars per year, but so constructed as to add sections and increase the capacity as required. The main building will house the offices, stock rooms and the various assembling and painting departments, together with the inspection, shipping and mail order departments. Another building, separated from the main building, will accommodate the power and heating plant, motor-test department and rough-test department. The buildings will be erected after the most approved construction, consisting of heavy piers to carry the floors and roof, and the space between the piers practically all glass, thus securing the greatest possible amount of light. Full provisions are being made to care for the comfort of the workmen, and everything necessary in the way of equipment will be installed to insure economical operation and the turning out of the very highest grade of work. The company expects to push the construction of the new plant so as to be ready for occupancy January 1.

The Lake Superior Corporation, at its recent annual meeting, elected the following directors: R. L. Austin, of Philadelphia; Herbert Coppell, of New York; Joseph S. Dale, of New York; T. J. Drummond, of Montreal; Thomas Gibson, of Toronto; J. Tatnall Lea, of Philadelphia; D. C. O. Newton, of Montreal; Frederick McOwen, of Philadelphia; Herbert M. Price, of Quebec; J. Frater Taylor, of Sault Ste. Marie; John T. Terry, Jr., of New York, and Walter K. Whigham, of London. The officers elected are: President, T. J. Drummond; vice-presidents, J. Tatnall Lea, Walter K. Whigham and J. Frater Taylor; secretary and treasurer, Thomas Gibson.

The Osborn Drop-Plate Squeezer

The Osborn Mfg. Company, Cleveland, Ohio, has recently placed on the market a new type of drop-plate squeezer molding machine. This machine is said to be the only drop-plate machine made with the squeezer attachment so that it can be used in three different ways and practically combines the advantages of three machines in one. In the case of many jobs the necessity of using expensive individual stripping plates for each pattern is obviated, while on the other hand the machine is so constructed that it is adapted for use with stripping plates when they are required. Two styles of machines are built, one with a plain base and the other with a wheel base, which is the type illustrated. Fig. 1 is a view of the machine, while in Fig. 2 the pattern is being drawn.

This machine consists of a molding machine with a strong squeezer attachment and is similar in type and construction to the builder's adjustable flask strippers. These machines have a uniform maximum pattern draw of 6 in., which is accomplished, as shown in Fig. 2, by a half turn of the handle, accuracy being assured by the guides to the pattern carrier. The patterns are mounted on plates which drop directly from the flask, drawing both pattern and pins in one operation.

The squeezer attachment is simple, strong and efficient. Sufficient pressure is secured by a powerful leverage combined with a folding toggle which brings the head directly down upon the flask with but little effort on the part of the operator. The springs shown in the lower portion of both engravings operate to hold the squeezer attachment out of the way when the flask is being filled and also act as a counterbalance for the head when it is moved forward and back.



Fig. 1.—A New Drop Plate Squeezer Molding Machine Built by the Osborn Mfg. Company, Cleveland, Ohio.

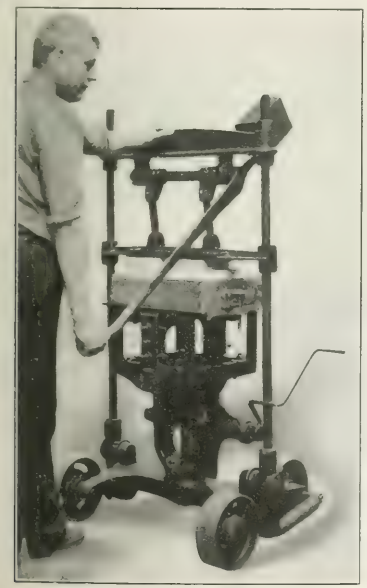


Fig. 2.—Drawing the Pattern.

These machines are made with a plain base or a wheel base, as illustrated. The latter type of machine should be found very convenient in foundries since it enables the squeezer to be moved readily from place to place. The wheels are made with extra wide rims so as to avoid the cutting of the foundry floor, while the bearings, which are a special inclosed type, keep out sand and grit. Two sizes of machines are built which can be furnished in either style. The larger size takes flasks ranging from 13 to 16 in. in width, while the smaller one accommodates those ranging from 9 to 12 in. The maximum length handled is 21 in. inside and 27 in. outside for both machines. The adjustment for varying sizes of flasks can be easily made.

Lake Iron Ore Shipments in September

The statement of iron ore shipments from upper lake docks in September shows a total of 5,231,069 gross tons against 6,273,832 tons in September, 1910, a falling off of 1,042,763 tons, or 16.62 per cent. The total of shipments to October 1 this year was 24,837,137 tons against 35,100,864 tons to October 1, 1910. The falling off is thus 10,263,727 tons, or 29.24 per cent. The shipments by ports for the two years, in gross tons, were as follows:

	Sept., 1911.	Sept., 1910.	—to October 1— 1911.	1910.
Escanaba	668,595	705,801	3,986,847	3,868,072
Marquette	367,964	439,142	1,568,711	2,689,219
Ashland	368,945	557,858	1,878,786	3,436,820
Superior	1,563,836	1,256,665	7,946,109	6,484,352
Duluth	1,131,747	2,041,908	5,501,364	11,865,552
Two Harbors	1,130,482	1,272,158	4,855,320	6,756,840
Total	5,231,069	6,273,832	24,837,137	35,100,864

Water shipments in 1910 after October 1 were 7,510,327 tons. A similar October and November movement this year would bring the total for the season well above 32,000,000 tons. The probabilities are, however, that this year's total of lake shipments will fall between 30,000,000 and 31,000,000 tons, as shippers expect to move comparatively little ore in November.

At the regular monthly meeting of the Cleveland Engineering Society October 10 an interesting paper on "Profitable Sharing versus Profit Sharing" was read by E. P. Roberts, of Roberts & Abbott, engineers, Cleveland. Owing to the general interest taken in this subject the meeting was an open one. At a special meeting of the society October 24 Charles S. Gingrich of the Cincinnati Milling Machine Company will give an illustrated talk on "Modern Machine Shop Milling Processes."

Electrical Iron Smelting in Sweden*

Design, Performance and Product of a 2500-hp. Furnace at Trollhättan

BY THOMAS DUNCAN ROBERTSON.

The Jernkontoret, an association of Swedish ironmasters founded over 180 years ago, determined to build at Trollhättan an electric shaft furnace of 2500-hp. capacity for smelting iron. They voted a sum of $90,000 to put up the plant and to further develop the process. The Swedish government, to assist in the undertaking, decided to furnish power at a nominal figure from its Trollhättan station.

In the construction of the furnace two separate portions are to be distinguished, viz.: the shaft and the crucible or hearth. [It is along the lines of the 700-hp. furnace at Domnarfvet, illustrated in *The Iron Age*, September 16, 1909.] The shaft is simply a shell of steel plate lined with firebrick. At the top it is riveted to an octagonal channel iron ring, which bears on two built up beams, these being in turn supported by the walls of the building. At the top of the shaft is a Tholander charging bell, a type of bell peculiar to Sweden which is specially

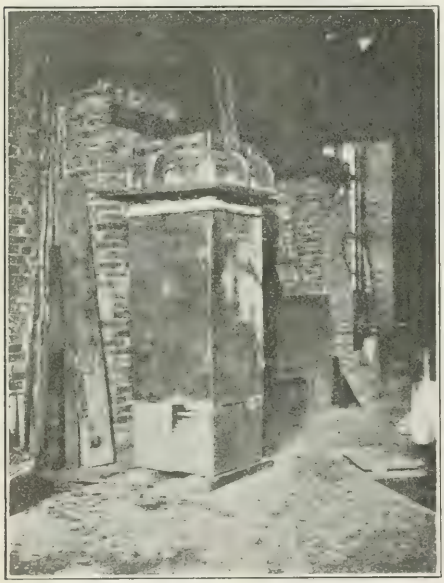


Fig. 1.—New Electrode with Iron Sheath and Contact Frame.

designed to deliver the ore round the sides of the shaft and the charcoal in the center. A 2½-hp. reversible 3-phase motor raises and lowers the bell.

The crucible rests on a concrete foundation. It also has a steel shell, next to which is a lining of firebrick, with an inner lining of magnesite brick, while the bowl-shaped bottom is formed by ramming in a mixture of magnesite and tar. The arched roof is built of firebrick and has four openings to admit the electrodes. Thes project through the roof at an angle of 65 deg. to the horizontal. At the opening in the roof each electrode is surrounded by a copper water jacket, provided with asbestos packing to prevent the leakage of gas. The electrical contact pieces are wedged between the upper end of the electrodes and a holder of cast steel which is supported in a frame that can be raised or lowered between two guides, one on either side of the electrode.

An important feature of the furnace is the provision made for the circulation of the gases produced by the reduction of the iron ore. The gas is drawn from the cool upper part of the furnace by means of a fan, and blown under the hot roof of the crucible, serving the double purpose of prolonging the life of the roof, and at the same time giving up its heat to, and helping in the reduction of, the charge. The four tuyeres through which the gas is blown are midway between the electrodes. The tap holes, runners and pig iron are those of ordinary Swedish blast furnace practice, the pigs are flat and rectangular and are cast in cast-iron molds. During a large portion of the time the charge has been high in iron and the quantity of slag correspondingly small, so that the iron and slag have been tapped out together, and by means of a small dam the slag has been allowed to run off down a sand trench.

The transformers, electrodes, the tap hole arch and the walls of the hearth are water cooled. The water is pumped from the adjoining canal to a tank on the furnace top, about 100 gal. per minute being used. The electric current is taken through an automatic oil switch to the furnace transformers. These are two in number each of 1100-kva. capacity, oil insulated, with water cooling. By means of Scott connections they transform the three-phase 10,000-volt supply to a two-phase current, the tension of which by altering the number of primary windings can be regulated between 50 and 90 volts. This alteration is carried out while the furnace is working by simply turning a handle, and the arrangements are such that the two phases can work at different tensions.

An elaborate system of pyrometers is installed with holes distributed vertically along the shaft for the thermo-elements. Ordinary water manometers are permanently connected to the furnace top, the discharge side of the fan and to a hole in the roof of the hearth. A Mono apparatus constantly records the percentage of CO_2 in the gas from the fan. The laboratory is fitted with gas analysis apparatus, and is well equipped for the analysis of the works materials and products.

Proportions of the Furnace

The design of the furnace was based on the experience of the inventors at Domnarfvet. The calculations assumed a production of 7500 tons of pig iron per year of eleven working months, or 23 tons per 24 hours. A cubic yard of charcoal was taken as weighing 250 lb., 3 lb. of pig iron being obtained from 1 lb. charcoal. In deciding on the correct volume for the furnace it was assumed that half the ore would be contained in the interstices of the charcoal and that the other half would require extra space, and also that the ratio of the volume of charge per day to the furnace volume is equal to 1.55. It was then found that 23 tons of pig iron correspond to a volume of 66.7 cu. yd. of charcoal and an extra space of 10.3 cu. yd. for the ore, making a total of 77 cu. yd. Therefore the volume of the furnace should be $77 \div 1.55 = 49.5$ cu. yd.

The diameter of the neck was the first dimension to be decided upon and this was fixed at 47 in. It appeared desirable to make it larger but this would have necessitated a larger hearth to make room for the electrodes. The shape and depth of the hearth were based on the Domnarfvet experience. A high and narrow shaft would give a good gas reduction efficiency, but would mean a large back pressure against the gas, and a higher cost of constructon. A medium was struck at 45 ft. from the ground level to the furnace top.

At the time the furnace was designed carbon electrodes in one piece of the necessary dimensions could not be obtained, so that electrodes were built up of four pieces, 6½ ft. long and 13 in. square. Before being bound together the sides forming the joints were planed true by hand and the joint was made with a thick paste of graphite and molasses. The upper part of the electrode is covered with asbestos millboard and thin sheet iron, to prevent loss of heat.

*From a paper presented at the meeting of the American Electrochemical Society, in Toronto, Canada, September 21-23.

The furnace was thoroughly dried out with wood and charcoal fires, and heated up electrically by filling the hearth with coke and turning on the current. Charging was commenced on November 15, 1910. The furnace began to produce iron regularly and without difficulty, the first few tappings being rather high in sulphur from the large quantity of coke in the hearth.

The various iron works of Sweden sent their ores to be electrically smelted. In order to gain as much information as possible, the burden of the furnace was constantly altered to vary the grade of iron produced. Such treatment involving the frequent alternation of acid and basic slags was not good for the furnace hearth, and it must be admitted that it was something of an achievement for this to stand six months of this treatment without needing any serious repairs.

Operating Results of Electric Iron Smelting Furnace.

Periods of operation	2	3	4	5
Per cent. iron in ore	65.57	65.06	49.50	57.—
Per cent. iron in charge	62.1	62.56	—.—	53.—
Slag per ton (2,000 lb.) of iron, lb.	410	448	1,840	940
Material charged per hectolitre of charcoal, lb.	146.3	156.5	148.7	153.7
Time consumed in working, hr	2,010	184.5	639.3	506.5
Time consumed in interruptions, hr.	145.6	5	1	21.—
Average load, kw.	1,319	1,694	1,917	1,735
Kw.-hr. per ton of iron	2,987	1,953	2,884	2,468
Iron per kw.-yr., tons	4.2	4.49	3.67	3.64
Electric consumption, per ton of iron, lb.	22.48	21.68	18.38	14.—

Period No. 1 covers the firing up of furnace, to Nov. 15, 1910. Per cent. of iron in ore, 54.92; per cent. of iron in charge, 50.8; slag per ton of iron, 780 lb.; time consumed, 7 hr. 30 min.; average load, 1,121 kw.; kw.-hr. per ton of iron, 3,454; iron per kw.-yr., 2.54 tons.

Results of Operation

In the accompanying table is given a summary of working results for the period November 15, 1910, to April 9, 1911. As might be expected the output per kilowatt-year is proportional to the percentage of iron in the ore, but with ores producing a greater quantity of slag the electrode consumption is smaller. The thermal efficiency of the furnace was carefully worked out, when it had been running for five months, after which time the lining had worn rather thin, so that radiation losses were probably higher than normal. However, 80 per cent. (the figure obtained) compares favorably with 82 per cent. for the efficiency of the Swedish charcoal blast furnace, and with the 70 per cent. of the English blast furnace.

As the volume of the furnace and gas piping is constant an excess of gas is being continually produced, proportional to the amount of ore reduced. This gas is allowed to burn into the air at present at Trollhättan, but in the newer plants arrangements are to be made for

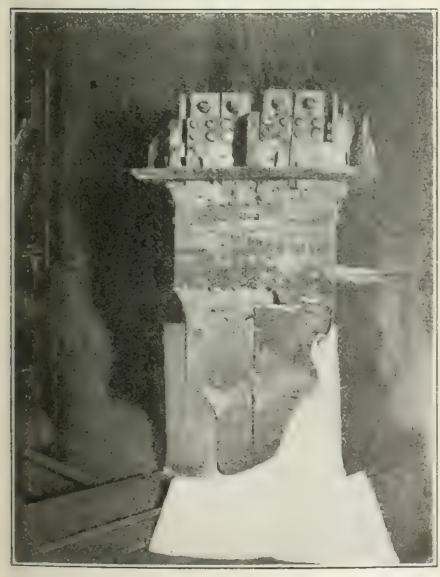


Fig. 2.—Half Consumed Electrode Showing Line of Surface of Charge.

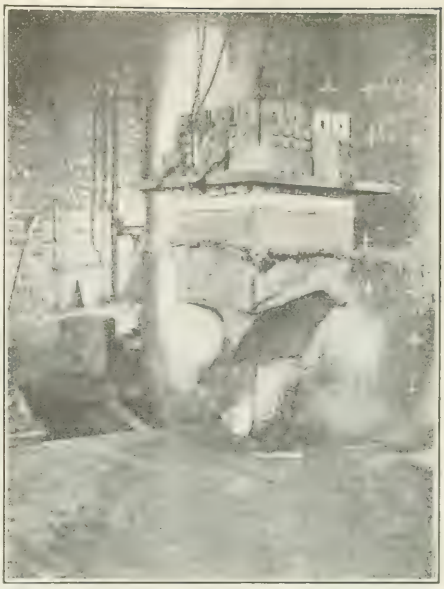


Fig. 3. Stump End of Electrode Used as Long as Possible

using it for calcining purposes. About 19,400 cu. yd. of gas are produced per ton of pig iron, and each cubic foot will develop 240 to 285 B.t.u., as the gas averages about 80 per cent. combustible.

When calculating the various charges the quantity of charcoal is kept constant at 6½ hectolitres and the amounts of ore and limestone are varied to produce the desired grade of iron, a typical charge at the time when the author was present at the furnace being:

Magnetite 700 kg. (1,585 lb.)
Concentrates 133 kg. (293 lb.) } 419 kg. (923 lb.)
Mill Cinder 11 kg. (24 lb.)
Limestone 32 kg. (70 lb.)
Charcoal 6½ hectolitres or 100 kg. (220 lb.)

This is dropped into the furnace at one raising of the bell and tappings are made every 18 charges, or about once every six hours.

The conditions governing the grade of iron produced are similar to those in the ordinary blast furnace, except that the irregular influence of the air blast is absent. The furnace gives the maximum output when making white iron, as the making of grey iron requires a rather higher temperature and consequently a greater power consumption. By increasing the amount of ore in the charge when the furnace is making white iron, a low carbon iron with very little silicon is produced, a typical analysis of which is as follows:

	C.	Si.	Mn.	S.	P.
Percentages	2.60	0.10	0.11	0.2—	—.—

This iron naturally is full of holes, but instead of these having colored oxidized surfaces, they are silvery white; the absence of oxygen from the furnace atmosphere accounting for the production of this grade of iron free from oxides. The results of making steel from this iron are given later.

The tension employed varies greatly and depends mainly on the resistance of the charge. This broadly speaking increases with the amount of slag produced and with the wear of the electrodes but decreases as the amount of charcoal in the charge becomes greater. The maximum power allowed is 1900 kw. and to avoid overheating the electrodes the current must not exceed 17,000 amp., so that the voltage has to be regulated accordingly.

The wearing of the electrodes has given rise to some curious and interesting results. In Fig. 1 is shown a new electrode with its iron sheath and contact frame. When this is placed in the furnace, the bottom end projects into the actual charge and is gradually abraided and consumed. Between the stock line and the roof is a space filled with

furnace gases which contain about 15 per cent. CO_2 so that the portion of the electrode exposed to them is very gradually oxidized. The result of this is shown in Fig. 2 where the half-consumed electrode was removed for inspection, the line of the surface of the charge being clearly visible. Fig. 3 shows the stump end of an electrode which had been lowered as far as possible into the furnace and kept there until unfit for further use. It will be seen that two of the four carbons which compose it have been burnt through to the center. About three weeks is taken to burn through an electrode above the stock line, so that in practice each electrode is lowered once every two weeks, to ensure regular working without risk of fracture, which



Fig. 4.—Effect of Stream of Carbon Dioxide on an Electrode.

would result in a lump of electrode being left in the charge. With the object of cooling the roof immediately behind the electrodes gas was blown in beneath the water jackets during a portion of the time. The effect is shown in Fig. 4, the CO_2 in the stream of gas having burnt a hole in the electrode, causing this practice to be discontinued.

Field of Application of the Furnace

A point of interest is the success met with in smelting magnetic concentrates at Trollhättan. The design of shaft in this particular case is not considered suitable for the purpose, being too narrow, but in spite of this, 65 per cent. of finely divided concentrates caused no inconvenience in working. The inventors of the furnace are of the opinion that, with a specially designed shaft, charges of all fine concentrates could be smelted. Canada is rich in deposits of iron sands and lean magnetites, which are easily concentrated, but which are expensive to nodulize or briquette into a form suitable for blast-furnace smelting, so that where these are within easy reach of water powers, there seems to be a good field open for electric smelting.

Dr. Haanel, in his report on the experiments made at Sault Ste. Marie, mentions that no difficulty was experienced in smelting titaniferous ores electrically, and it is interesting that the Swedish experience bears out this point, although no ores were used with more than 0.8 per cent. TiO_2. The electric smelting of ores with high sulphur content is another interesting problem. Dr. Haanel was successful in producing low sulphur iron from sulphurous ores, but in Sweden there are practically none of these ores mined, so that this point was not confirmed on a large scale at Trollhättan; however, there can be little doubt that the electric furnace, with its reducing atmosphere and basic lining of the hearth, permitting as it does of the use of a slag very rich in lime, offers the best method of producing sulphur-free pig iron from ores containing that unwelcome element.

The pig iron produced by the furnace was sent to various Swedish iron works for conversion into steel in open-hearth furnaces. The characteristic feature of electric pig iron is its freedom from oxides; and in consequence electric pig of normal silicon content (say, 1 per cent. and over) takes a longer time and more ore to convert into steel than ordinary blast-furnace grey iron. Low-carbon electric pig iron, however, is found to give surprising results, charges made up of 50 per cent. of this iron and 50 per cent. of scrap producing hot fluid steel with considerable saving of time over ordinary practice. As was to be expected, the open-hearth furnace managers looked somewhat askance at this iron at first, as they knew the disastrous effect of using low-carbon iron full of holes from the blast furnace; however, after giving it a trial the workmen asked for more, as they said that the furnace worked better and more rapidly with the new pig iron. Fortunately for the electric furnace in Sweden, it is more economical to make the white iron that the steelmakers prefer than to make high-silicon grey iron. Thus it may be maintained, on the strength of the experience gained, that for the open-hearth process, high-silicon contents are detrimental rather than advantageous, while in the blast furnace pig iron a certain quantity is necessary to neutralize the defects of a reduction process less perfect and ideal than that employed in the electric furnace.

Changes Induced by the Tests

The Trollhättan furnace was shut down at the end of May of this year in order to make certain alterations suggested by the results of its six months' campaign. Two of these deserve mention.

1. Since the furnace was designed, the manufacture of large carbon electrodes, of high conductivity, has made great progress. It is now possible to obtain cylindrical electrodes of 23½ in. diameter, fitted with screw joints. These have recently been installed at Trollhättan, and result in two considerable improvements, the first one being that the loss due to stump ends is done away with, as when an electrode becomes too short a new one can be screwed on above it. The second one is that the electrical contact can be made at the point where the electrode enters the roof, in this way saving about 40 kw., which with the old arrangement was lost, due to the resistance of the whole length of the electrode through which the current had to pass. This new arrangement will permit of the furnace taking 3000 hp. instead of 2500 hp.

2. The other important alteration is in the gas-circulating arrangement. The old dust-catcher was not very effective, as only very fine dust is expelled from the furnace. The result was that the dust collected in the centrifugal fan, and had it not been that this was kept fairly clear by a jet of water, would have choked up the blades in a few hours; as it was the fan had to be stopped and cleaned every week. Now a water-scrubber takes the place of the dust-catcher, and a fan on the ground floor blows the cleaned gas into the furnace, an extra fan being held in reserve.

At the present time the following "Electrometall' furnaces are either working or in course of erection:

Sweden—Trollhattan, one furnace	3,000	hp
Domnarfvet, one furnace	4,000	"
Hagfors, two furnaces (3,000 hp. each)	6,000	"
Norway—Tyssedahl (Hardanger), two furnaces (3,500 hp. each)	7,000	"
Arendal, two furnaces (2,500 hp. each)	5,000	"
	25,000	"

In these newer furnaces three-phase current is used, and by means of three single-phase transformers, low tension current is furnished to six carbon electrodes. Owing to the recent improevments in electrode manufacture and furnace design, it is now possible to construct units up to 6000 hp., which it is expected will work for two years without serious repairs to the hearth. Rather more than three metric tons of pig iron are produced by the electric furnace per electrical horsepower-year, using one ton of charcoal for the reduction of the ore. The blast furnace uses about three times this amount of fuel per ton of iron, so that in Sweden, where, owing to the demand of wood for the pulp industry, the price of charcoal is yearly advancing, there is a great field open for electrical smelting on account of the saving in fuel. The furnaces in Norway have a somewhat different form of shaft, as coke is the

fuel employed for smelting. The volume of the shaft is smaller, but its diameter is greater than the corresponding shaft of a charcoal furnace. The coke in the charge gives a greater conductivity, so that a lower tension has to be used.

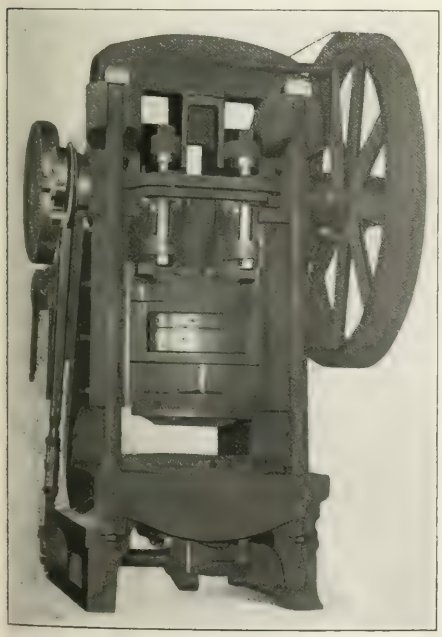
The comparative costs of electric and blast furnace smelting depend in general on the cost of suitable fuel and electrical energy, as the electric furnace simply substitutes one electrical horsepower-year for two metric tons of blast furnace fuel.

Large Double-Acting Cam Press

What is said to be the largest double-acting cam and crank press now built in the United States was purchased by the H. A. Matthews Mfg. Company, Seymour, Conn., from the Waterbury Farrel Foundry & Machine Company, Waterbury, Conn. This press is used for cutting and forming heavy steel parts, and will cut and draw cups having a minimum diameter of 16 in. from metal ⅜ in. thick and heavier. It enables certain classes of large work to be turned out in one operation instead of two, as was previously the case, on account of there not being presses sufficiently large to handle this work. The installation of this press has resulted in the production of work of at least half the former cost in many cases.

The arrangement of the slides is such that the cutting slide comes down, cuts the blank and remains at the bottom of its stroke while the center slide comes down and performs its operation. After this slide has risen a short distance, the cutting gate begins to rise also. On account of the massive construction of the press and the heavy work handled by it two 4½-in tie rods are attached to the front of the press to avoid any spring in the frame. The frame, the cutting and the drawing slides and the cutting slide ring nuts are of cast iron. Steel castings are used for the upper and lower yokes and the cams and the cam rolls are hardened and ground tool steel. Bronze bushings are provided for the cam rolls.

The press is double back geared. The cast-iron gear on the crank shaft is driven by the steel casting pinion on the back shaft, and the cast-iron gear on this shaft is driven by a machine steel pinion on the driving shaft. This last shaft has a 42-in. flywheel with a 6-in. face and a 36 x 10 in. Falls friction clutch pulley. The friction clutch is rated at 22.8 hp. at 100 r.p.m., and is intended for moving the slides slowly in setting the tools. The shipper lever at the side of the press controls the engagement and disengagement of the friction clutch.



An Exceptionally Large Double-Acting Cam Press, Built by the Waterbury Farrel Foundry & Machine Company, Waterbury, Conn.

The knockout consists of a pin in the bed operated by a lever from a horizontal shaft that receives its motion from an arm and side connection operated by a cam on the crank shaft. The hub of the knockout cam has teeth cut in it which mesh with others in a disk on the crank shaft, an arrangement which enables the knockout to be timed easily. The upper and the lower halves of the knockout connection are steel castings and machinery steel is used for the turnbuckle. The press is equipped with a three-key clutch with springs attached to levers pivoted on the frame for pulling on the levers and throwing off all three keys into slots in the wheel hub when the treadle is depressed by the operator.

The equipment of the press includes a cast-iron bolster plate 4 in. thick with T slots for receiving the tools. A cast-iron punch plate is also furnished. The following table gives the principal dimensions and specifications of the press:

Diameter of crankshaft at journals, in.	7
Distance from bed to center of crankshaft, in.	7½
Distance from bed to bottom of cutting slide, when down, in.	17
Distance from bed to bottom of drawing slide, when down, in.	22
Stroke of cutting slide, in.	12
Stroke of drawing slide, in.	10
Distance from top of bed to bottom of ways, in.	17
Distance between ways, in.	38½
Diameter of cutting slide, bottom, in.	34
Diameter of drawing slide, bottom, in.	16½
Distance between uprights at bed, in.	39½
Distance between slide center and back of bed, in.	10
Distance between slide center and front of bed, in.	25½
Width of bed, in.	63½
Diameter of opening through bed, in.	17
Thickness of bolster plate, in.	4
Diameter of hole in bolster plate, in.	10
Diameter of tie rods, in.	4½
Stroke of knock out, in.	4½
Ratio of gearing	25 to 1
Diameter of flywheel, in.	42
Face width of flywheel, in.	6
Weight of flywheel, lb.	980
Diameter of friction pulley, in.	36
Diameter of counter-shaft, in.	2 7/10
Length of countershaft, in.	72
Diameter of tight and loose pulleys, in.	24
Face width of tight and loose pulleys, in.	8½
Diameter of driving pulleys, in.	42
Face width of driving pulleys, in.	8½
Speed of countershaft, r. p. m.	320
Weight of countershaft, lb.	920
Over-all height, in.	116
Floor space, in.	116 x 108
Weight of press, including bolster and knockout, lb.	62,320

This press was set up for testing at the builder's factory and was then taken down and shipped in sections, two complete cars being used.

The New Era Gas Engine Company, Dayton, Ohio, on account of its surrounding conditions, has been compelled to seek a more suitable location, and after giving the question several months' thought and study has decided to locate in Portsmouth, Ohio. Its new plant, now about completed, will consist of a machine shop, pattern shop, erecting shop, forge shop and foundry, all thoroughly equipped with the most modern machinery. With these improved facilities the company will be able to produce, in the shortest possible time and in the very best manner, a complete line of gas and gasoline engines as follows: Little Giant single-cylinder horizontal engines, 8 to 20 hp.; New Era single-cylinder horizontal engines, 8 to 70 hp.; Improved New Era throttling engines, 25 to 80 hp.; improved 2, 3 and 4-cylinder vertical engines, 60 to 250 hp., throttling type. A. M. Sullivan will continue to give the business his personal attention. The company's address is now Portsmouth.

The Stephenson Charcoal Iron Company, Wells, Mich., has placed the following contracts for work in connection with its new blast furnace plant: Plate work, structural work and boilers, Muskegon Boiler Works, Muskegon, Mich.; hot blast stoves, Lake Shore Engine Works, Marquette, Mich.; blowing engine, Weimer Machine Works Company, Lebanon, Pa.; pumping machinery, Henry R Worthington, Philadelphia office; hoist equipment, Otis Elevator Company, Pittsburgh office. The foundations for the plant are nearing completion and the construction of the buildings is well under way. Frank C. Roberts & Co., Philadelphia, are the engineers for the company.

The Sterling Air Economizer

A New Device for Overcoming Lost Pressure and Eliminating Condensation in Compressed Air Lines

In the operation of a compressed air system where air-driven tools are in service at a considerable distance from the compressor plant and long lines are necessary it is not uncommon to expand the air with some heating arrangement near the end of the line and thus restore some of the pressure dropped. This heating also removes a large portion of the moisture in the air, thus obviating the condensation at the tool. A new device for this purpose and one admitting of automatic regulation has been developed by the Sterling Equipment Company, Peoples Gas Building, Chicago, Ill., and is known as the Sterling air economizer. The object of the device is to maintain any predetermined temperature in a compressed air line under

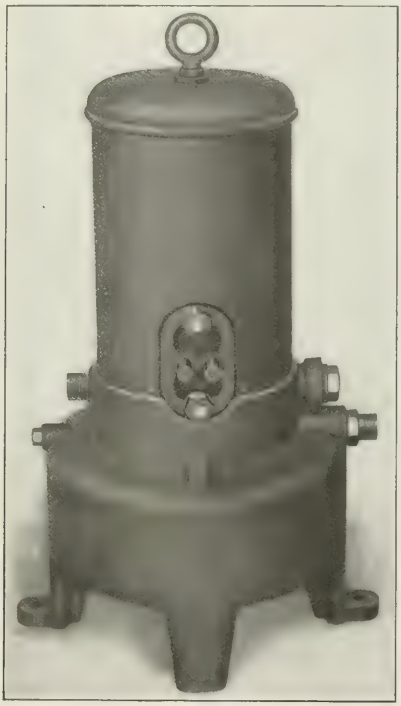


Fig. 1.—The Stationary Type of Air Economizer Built by the Sterling Equipment Company, Chicago, Ill.

accurate regulation by a continuous ignition internal combustion of vaporized liquid fuel.

The claims made for the Sterling air economizer are based on the following analysis: The temperature required to increase the volume of compressed air from 30 to 50 per cent. ranges between 300 and 500 deg. F., which temperatures are practicable and easily maintained in this apparatus. Assuming an absolute temperature of air on the line at 511 deg., corresponding to 50 deg. F., to be increased 300 deg., or to an absolute temperature of 811 deg., it follows in accordance with the law of gases under heat treatment that the volume of the air is increased $(811 - 511) \div 511 = 0.587$, or 58.7 per cent., which represents an actual saving of 37 per cent. with reference to the entire volume of air. It is further claimed that this addition of 37 per cent. to the tool capacity for a given compressor output is obtained with a much lower expenditure of heat than is required for the production of an equivalent amount of mechanically compressed air. In support of this contention it is stated that to produce 1 cu. ft. of air at 100-lb. pressure in an ordinary steam-actuated compressor approximately 2 cu. ft. of steam at the same pressure are required, which work involves the expenditure of 620 heat units. In comparison, an equal expansion of air is obtained through the air economizer with expenditure of only 63 B.t.u.

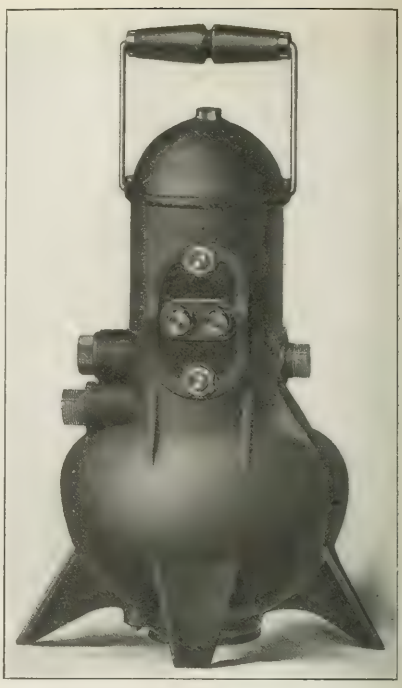


Fig. 2.—The Portable Type of Economizer

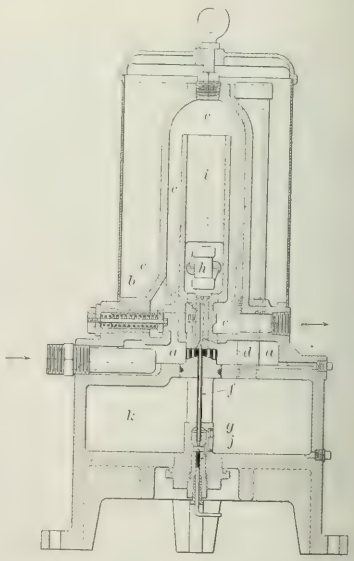


Fig. 3.—Sectional Elevation Showing Constructional Details.

The accompanying illustrations, Figs. 1 and 2, show the economizer in both the stationary and portable types. The latter can be made in capacities up to 250 cu. ft. of free air

per minute. Its operation is controlled by the flow of air and combustion can only begin with the passage of the air through the economizer and ceases when the throttle valve of the air tool is closed. Any increase in temperature desired is controlled from one valve. As a result there is no waste fuel and no overheating of the air while the tool is not operating. The device operates equally well on gasoline, kerosene or any high grade distillate of crude oil and the heated air is maintained free from smoke by completely surrounding the combustible mixture of vaporized fuel oil in the combustion chamber by an excess of air. Ignition is effected by means of a small electric resistance coil, using either 110 or 220 volt alternating or direct current, or by a hot tube.

From the cross-sectional elevation, Fig. 3, it may be seen that when the tool is started the air enters the space *a*, and about 05 per cent. passes through the valve *b* into

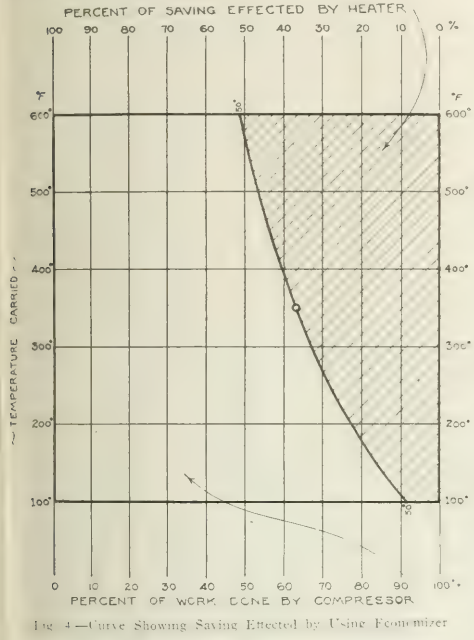


Fig. 4—Curve Showing Saving Effected by Using Economizer

the space *c*. The rest of the air passes through the inspirator opening *d* and mixing tube *e* and forms a combustible mixture with the fuel oil drawn from the tube *f* at the point *d* when the needle valve is opened about a quarter turn, thus admitting fuel oil through the screen *g*. This mixture is ignited by contact with the resistance coil *h* and is burned in the combustion zone *i* at a very high temperature. It then mixes with the air in the space *c* and uniformly heats the entire volume to the desired temperature, the increase being controlled by the fuel needle valve *j*. The pressure of the air in the compartments *a* and *k* is kept the same by a balancer pipe and is a fraction of a pound more than that in the inspirator opening due to the floating deflector *b*, the difference in pressure being sufficient to raise the fuel oil through the tube *f* to the nozzle. The instant the air commences to pass through the heater combustion begins and ceases when the tool is shut off. The needle valve *j* is the only adjustment on the heater, and when this valve is once set the action of the heater is uniform and a constant temperature is maintained. The only attention required by the heater is the renewal of the fuel supply. Approximately 2½ gal. of gasoline or kerosine will heat 100 cu. ft .of free air per minute from 50 to 350 deg. for a 10-hr. continuous run.

The blast furnace of the Thomas Furnace Company, Milwaukee, Wis., is now undergoing repairs. The company has just completed the building of two T. F. Thomas patent stoves 18 x 90 ft.

August Iron and Steel Exports and Imports

The report of the Bureau of Statistics of the Department of Commerce and Labor for August shows an increase in both the exports and imports of iron and steel as compared with the figures for July. The total value of the exports of iron and steel and manufactures thereof, not including iron ore, was $20,704,454 in August as compared with $18,052,337 in July, while the value of similar imports in August was $2,282,490 against $2,015,692 in July.

The exports of commodities for which quantities are given totaled 170,280 gross tons in August, against 192,282 tons in July. The August exports were exceeded by those of March and April, those of March having been 215,067 tons and of April 227,832 tons. The details of the exports of such commodities for August and for eight months of the fiscal year ended with August, compared with the corresponding periods of the previous year, are as follows:

Commodities.	1911. Gross Tons.	1910. Gross Tons.	1911. Gross Tons.	1910. Gross Tons.
	—August—		—Eight months—	
Pig iron	[illegible]	11,025	[illegible]	79,866
Scrap	6,185	[illegible]	57,300	14,985
Bar iron	[illegible]	12,067	[illegible]	17,307
Axle tools	1,186	1,111	[illegible]	13,333
Steel bars	1,261	10,167	82,757	65,535
Billets, ingots	[illegible]	[illegible]	[illegible]	[illegible]
Steel rails	41,879	24,726	311,732	243,244
Iron sheets and plates	[illegible]	1,250	[illegible]	[illegible]
Steel sheets and plates	[illegible]	[illegible]	[illegible]	[illegible]
Tinplate and terne plates	[illegible]	[illegible]	[illegible]	[illegible]
Structural iron and steel	16,508	15,177	142,173	104,219
Barb wire	[illegible]	6,391	[illegible]	[illegible]
All other wire	11,058	6,295	85,353	60,949
Wire rods	[illegible]	[illegible]	[illegible]	[illegible]
Cut nails	[illegible]	[illegible]	[illegible]	[illegible]
All other cut, including forgings	[illegible]	[illegible]	[illegible]	[illegible]
Pipe and fittings	18,392	16,580	130,176	105,140
Total	[illegible]	[illegible]	[illegible]	[illegible]

The imports of commodities for which quantities are given totaled 19,685 gross tons in August, as compared with 15,252 tons in July and 30,870 tons in August, 1910. The details of such imports for August and for eight months of the fiscal year ended with August, as compared with corresponding periods of the previous year, are as follows:

Commodities.	1911. Gross Tons.	1910. Gross Tons.	1911. Gross Tons.	1910. Gross Tons.
	—August—		—Eight months—	
Pig iron	10,447	20,029	107,999	159,947
Scrap	851	1,882	13,423	62,271
Bar iron	2,698	3,769	19,195	28,655
Billets, bars and steel forms, n.e.s.	3,971	4,513	21,366	32,108
Sheets and plates	138	689	1,549	4,761
Tin and terne plates	298	4,072	12,706	51,082
Wire rods	[illegible]	[illegible]	[illegible]	[illegible]
Total	19,685	30,870	187,521	353,347

The heavy decline in tinplate imports is noteworthy. The imports of iron ore in August were 175,183 gross tons against 200,845 tons in July and 282,949 tons in the month of August, 1910. The total importations of iron ore for eight months of the fiscal year ended with August were 1,177,896 gross tons, against 1,791,025 tons in the corresponding period of 1910. Of the August imports of iron ore 114,505 tons came from Cuba, 37,800 tons from Newfoundland, 11,704 tons from Canada, 10,596 tons from Sweden and 518 tons from other countries.

The total value of the exports of iron and steel and manufactures thereof, not including iron ore, for eight months of the fiscal years ended with August was $164,608,574 against $130,148,124 in the corresponding period of 1910. The total value of the imports of iron and steel and manufactures thereof, exclusive of ore, for eight months of the fiscal year ended with August was $20,226,510 against $27,759,334 in the similar period of 1910.

Last week the steel steamer Grayson was launched at the Ecorse yard of the Great Lakes Engineering Works at Detroit. The Grayson is the first launched of four package freight steamers to be built for trade on the Atlantic coast. She will be enrolled at Wilmington, Del. It is proposed to send her to the coast before the close of navigation. The Grayson is of Welland Canal size and in many ways differs in construction and equipment from vessels turned out for the lake trade. One point of difference will be in the placing of her machinery amidship instead of aft.

The Jenckes Valve Gear

A Corliss Type for Gas Engines

Under patents recently granted, J. M. Jenckes, 41 Pratt street, Providence, R. I., has placed on the market a new type of valve gear for gas engines. Among the special advantages claimed for this gear are reliability in operation comparable to that secured with the steam engines of the same size, positive closing of the valves, elimination of gears in the direct drive of the valves, the doing away with the long cam shaft and ease of making repairs. Fig. 1 is a view of the gear and Fig. 2 shows its application to a gas engine.

This gear can be applied to an engine already constructed, although it is also incorporated in a new type of engine which the inventor has designed. The bed is of the side crank quarter box type and is of heavy construction, the section through the crosshead guides being square. The connecting rod, the crank disk and the crosshead in general follow high grade steam engine practice except that they are heavier. The cylinders, which are simple in construction, are cast in one piece. The exhaust

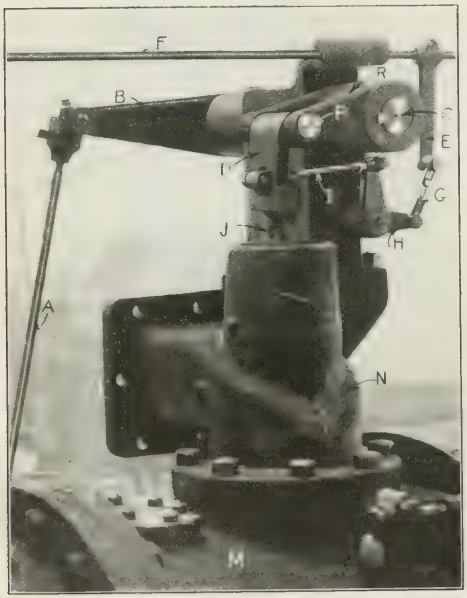


Fig. 1.—The New Gas Engine Inlet Valve Gear, Patented by J. M. Jenckes, Providence, R. I.

valve housing is bolted to the side of the cylinder and has a water jacket, an arrangement which permits the valve stem to stand vertical, thus giving good water circulation in the valve. The valve is partly balanced, which makes it easier to open and it can be readily removed for inspection. The pistons are two in number, each mounted in the middle of a hollow piston rod. The rods are joined between the cylinders and there is a sliding support at each end and in the center at the point where the rods join, thus relieving the cylinders of all wear from the pistons. The cooling water enters at the center and has a separate circulation path to each piston and discharges into the bed at one end and into the tail-rod support at the other. The connections on the piston rod are constructed in such a way that the rod can turn without affecting the sliding supports or breaking the water connections. If desired the piston and the piston rods can be removed at the center between the cylinders.

Details of the Gear

Referring to Fig. 1, which shows the valve gear applied to a trial engine in the shops of the National Transit Company, Oil City, Pa., the rod A is connected to a wrist plate which is driven from the main shaft by an eccentric in the same way as is the case with an ordinary steam engine. This

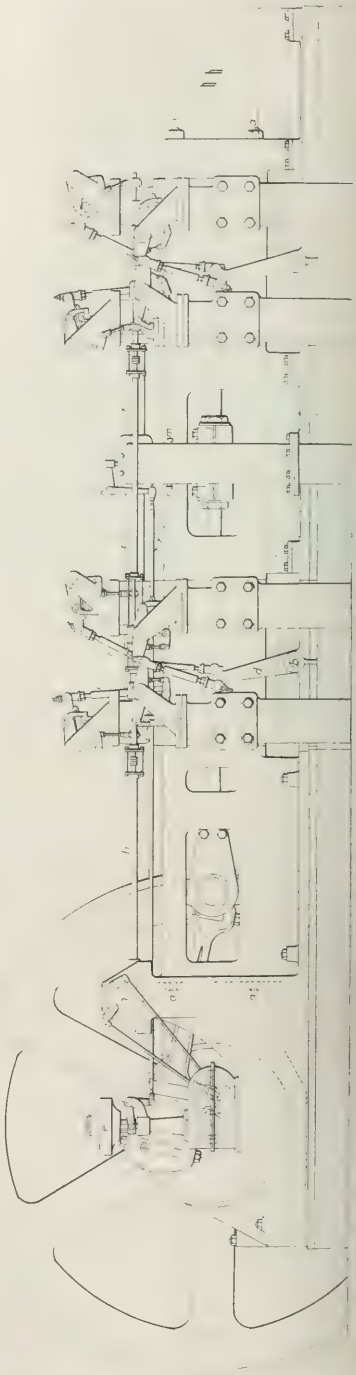


Fig. 2.—Details of the Application of the Gear to a Gas Engine.

rod is connected by a pin to the arm B, which is rigidly keyed to the shaft C. This shaft is rigidly keyed to the lever R, which has the hood D attached to it by the pin P, upon

which the hood D swings. The head of the valve stem J is rigidly connected to the valve, the valve spring being inclosed in the valve casing N. The timing rod F moves one stroke for each complete revolution of the crankshaft and is driven by a set of spur gears having a ratio of two to one. These gears have only to overcome friction so that they need not be large even on big engines. The timing rod F is connected to the hook D through the arm E, the link G, the bell crank H and the link I. The first two members of this train combine to exert a wrist plate action and cause the bell crank to dwell when the valve is being opened, thus preventing any slippage between the hook D and the valve-stem head J. On one end of the stroke of the timing rod F the hook is disengaged from the head of the stem so that the valve opens every other stroke. The engagement of the hook with the head of the valve stem is such that if the valve should tend to stick open it will be forced shut or nearly so, which causes the valve to close positively. In case temporary repairs have to be made it is claimed that all parts of the valve gear can be replaced overnight in a blacksmith shop and an ordinary drill press.

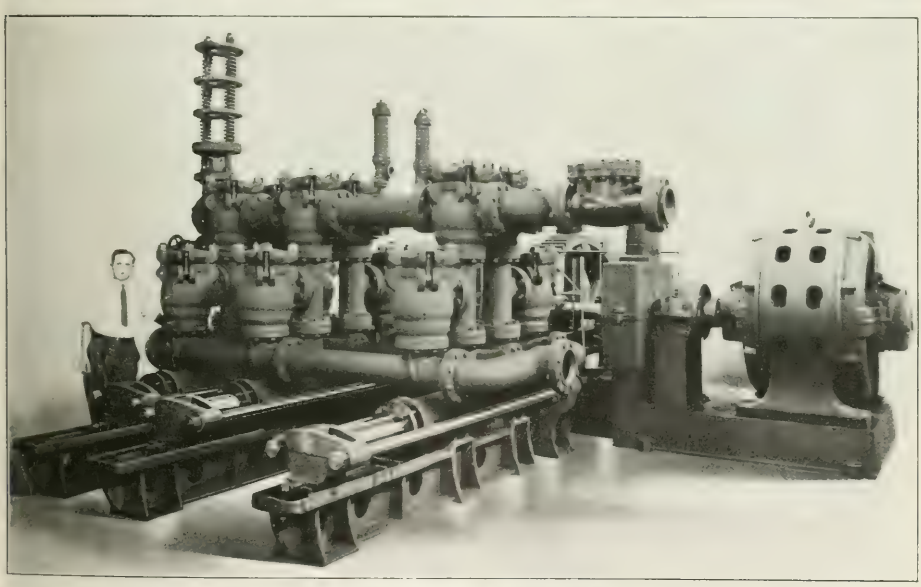
Referring to Fig. 2, which shows the application of the valve gear to an engine, a bearing on the foundation is secured for the engine throughout its entire length and breadth. The four tie bars terminating in nuts *a* pass through the entire engine and when they are set up all the cast iron parts are placed in compression, which gives a rigid engine and one which is said to be very stiff for its weight. The reverse side of the engine is plain except for the valve gear. There are two eccentrics on the main shaft which connect with rocker arms to line up with rods from wrist plates mounted on the shaft *b*. The inlet valve links are connected to a wrist plate mounted loosely on this shaft. The exhaust wrist plate *d* is attached firmly to the shaft and is driven by a lever on the opposite side of the engine. A shaft having a connection with the main crank pin drives the governor *e* through bevel gears and also drives the timing eccentric *f* at half the speed of the engine. The box *g* incloses an arrangement of levers which drive the timing rods *h* in a reciprocating manner. The rear cylinder operates like the crank cylinder and the wrist plates are connected with a rod. The gas and the air forming the explosive mixture which furnishes the motive power are conducted separately in the divided pipe *o*, the amounts being controlled by the valves *m* and *n*. The gas and the air are mixed at the throttle valve *l*, which has a balance control from the governor through the lever *k* and the rod *x*. After leaving the throttle valve the mixture is conducted to the cylinders through the pipe *z*, which is rectangular in cross section. The ignition is of the make and break type, the spark being furnished by an 80-volt electric current. Compressed air is used for starting the engine and auxiliary equipment is furnished to supply it.

As a result of the tests previously mentioned, the National Transit Company, Oil City, Pa., is building a 26 x 30 in. double-acting, tandem gas engine directly connected to a 500-kw. generator to be equipped with this gear. This engine is to be used to drive the machinery in the shops of this company, which builds the engines and pumps used by the Standard Oil Company throughout the country.

Goulds Motor-Driven Mine Pump

What is said to be one of the largest motor-driven pumping equipments ever built for unwatering a mine was recently furnished by the Goulds Mfg. Company, Seneca Falls, N. Y., to the El Oro Mining & Railway Company, El Oro, Mexico. This installation affords an excellent illustration of the advantages of the electric-driven pump for mine service, since the flexibility of this equipment enables it to be installed and operated in any desired location regardless of the capacity required.

The construction of the pump is such that it can readily be dismantled and lowered down an ordinary mine shaft and when assembled it requires very little headroom. The pump is installed in the bottom of the mine and will pump against the head of 1300 ft. The cylinders are 6 in. in diameter and 20 in. long and the capacity of the equipment is 500 gal. per minute. The driving motor is a 200-hp three-phase 50-cycle 440-volt constant



One of the Largest Motor-Driven Pumping Equipments for Unwatering a Mine Built by the Goulds Mfg. Company, Seneca Falls, N. Y.

speed motor built by the Westinghouse Electric & Mfg. Company, East Pittsburgh, Pa. The normal speed of the motor armature is 485 r.p.m. and power is transmitted through a double reduction gear to the pump crank shaft, which operates at a speed of 35 r.p.m.

The Corrugated Bar Company announces that its headquarters will be removed October 14 from St. Louis, Mo., to Buffalo, N. Y., where it will occupy the third and fourth floors of the Mutual Life Building. The change in headquarters has been decided upon as the company's stock, warehouse and fabricating plants are located near Buffalo, and customers can thus be given better and more prompt service in the handling of orders. District offices will be maintained in the National Bank of Commerce Building at St. Louis, as well as in New York and Chicago.

The Panama Canal Cableways

An Interesting Study in the Efficiency of This Type of Machinery

The specifications for the cableways used in the construction of the Gatun locks and at other places of the Panama Canal called for the high speed of 1800 ft. per minute, which was about twice the speed obtainable from the carriers on the market at the time these specifications were issued. Together with this high speed it was imperative that the machines should work at the maximum efficiency with the smallest possible percentage of breakdowns, since on work involving the moving of so much material even the slightest delay is serious. It has been estimated, for example, that on the Gatun locks where the greatest number of cableways are installed the loss per minute for the time the cableways are out of service during working hours for repairs amounts to $1.50. If each cableway were out of service 10 min. per day in a year of 300 working days, the total loss for the eight cableways installed at that point would amount to $36,000. This includes the losses for labor, depreciation, interest and overhead charges.

The contract for the 13 cableways to be used on the canal was awarded to the Lidgerwood Mfg. Company, 96 Liberty street, New York, N. Y. These machines have been in operation for approximately two years and have fulfilled the requirements as to speed with a high efficiency as regards breakdowns. In order to do this a new type of carrier had to be designed that involved a number of detail changes all tending both to increase the speed and to decrease the wear and breakage. A view of the Gatun lock showing these cableways in use for transmitting material is given in Fig. 1, while Fig. 4 illustrates the new type of carriage designed for the high speed cableways installed on the Isthmus. The construction of the buttons is shown in Fig. 2, while Fig. 3 is a section through the button after being installed on the cable.



Fig. 1.—The Cableways Installed at the Gatun Locks for Transporting Material by the Lidgerwood Mfg. Company, New York, N. Y.

The standard design of Lidgerwood cableway had a fall-rope carrier in which the carriage ran on a main cable and was moved in either direction by haul ropes. The fall was operated by a fall rope which was kept approximately parallel to the main cable by a series of carriers that were spaced on a button-rope cable and were picked off the main carriage by buttons fastened at intervals along this rope. Formerly these carriers hung on a horn at one end of the carriage and were provided at the upper end with slots of graded sizes corresponding to the dimension of the buttons so that each button would pass through every carrier except the one that was intended to be pulled off the horn. In this way the carriage ran all along the cable, the fall rope was kept from the natural sagging that would prevent the operation of the fall and as the carriage returned toward the engine the carriers were picked up successively by the horn on its way back.

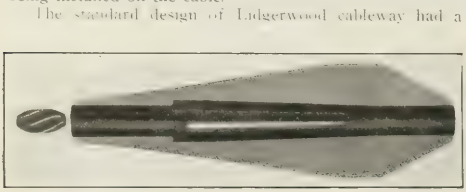


Fig. 2.—Section Through the Button

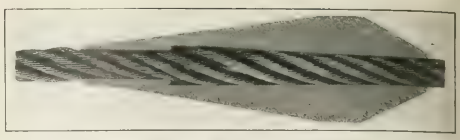


Fig. 3.—Section Through the Button on the Cable

These machines worked fairly well up to a speed of 800 ft. per minute, but above that the repair losses were very great. The form of the button, the manner in which it was held in place on the button rope, and the shape of the carrier heads which collided with the buttons all seemed to contribute to this difficulty. The buttons entered wedge-like into an opening in the carrier heads which were slotted in forged steel, but no matter how heavy the heads were made the impact effect seemed to increase in proportion to the weight, and the wedge-like action of the buttons split the heads. The impact on the buttons was also destructive to the button ropes, which had to be renewed frequently. This type of button was made in halves, divided lengthwise and screwed together. It inclosed a pair of spreaders put into the rope and a babbitt metal bulge cast around the rope within the button. The surface of the rope which received the shock was so small that the wire was soon cut and the ropes destroyed.

Improvements in the New Cableways

The capacities specified for the cableways for the canal necessitated load carriage speeds of 1800 ft. per minute and this made improvements in the old type imperative. In designing these cableways improvements were made in the buttons, the fall rope carrier and the carriage itself. Instead of making the button in two pieces as formerly, it is now a single steel forging bored out with a long tapering recess, as illustrated in Fig. 2. To make the rope fit this recess for its entire length a tapered steel pin which is shown in the recess in the middle of the button is inserted instead of the hemp center. In this way a bearing of ample area is secured to receive the shock from the carrier and eliminates the tendency to cut the rope. A follower which is shown at the left end of the button fits into the open end and serves to finish its contour. A small spreader shown detached at the extreme left is inserted in the rope back of this follower as shown in Fig. 3 and holds the button in place. This type of button and the rope

carrying it have withstood a series of tests extending over a number of months at the company's testing station where the carriage speeds have been as high as 3000 ft. per minute for a considerable length of time.

The form of the fall rope carrier head, Fig. 4, was the next point to receive attention. Its design was changed from a slotted head to the form of a steel eye which, as it comes into contact with the end of the button around almost the entire circumference instead of at two points only, eliminates the tendency of the button to split. Another advantage of this arrangement is that, since the eye weighs but about one-tenth as much as the slotted head, a considerable saving in the weight is secured. Another arrangement which absorbed a considerable part of the shock which formerly took place was the hanging of the eye in the carrier so that it was free to swing when it was picked off the carriage. The introduction of a second joint in the carrier head below the eye resulted in such a thorough absorption of the shock that even at speeds as high as 2000 ft. per minute no destructive effect was said to have been apparent.

The last improvement of importance was made in the carriage and followed and was incidental to the other two

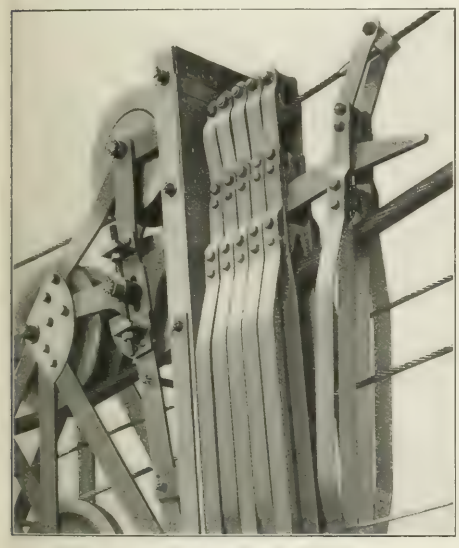


Fig. 4.—The New Cableway Carriage.

changes. As will be noticed by referring to Fig. 4 the horn which carries the fall rope carriers out to the buttons and picks them up again upon the return trip of the carriage is mounted separately on the main cable and has a wheel which is entirely independent of those holding the carriage. A pivoted connection joins the horn mounting to the carriage in such a way that the horn and the cable are always parallel regardless of what the curve of the latter may be. In this way, it is pointed out, the carriers are picked up positively and with very little shock as the horn enters them at the same point each time. There are three bearing wheels on the main cable for the carriage proper, and two of these are mounted in a pivoted bearing so that they can adjust themselves to the varying curves of the cable. In this way the weight and the wear are distributed equally between these two wheels, an arrangement which contributes, it is said, very materially to the life of the main cable. The increase in the economical speeds of the load carriage from 800 or 900 ft. per minute to 1600 or 1800 ft. has approximately doubled the capacity of the cableways.

Reports received from the canal state that the eight cableways used placing concrete in the locks have been out of service for repairs of all kinds but 1 per cent. of the total working time for nearly a year's continuous use. This is based on a working day of 10½ hr. and a loss of 7½ min. per day. An interesting contrast between the efficiency of the old and new types of cableways is afforded by comparing the performance of the machines installed on the Chicago Drainage Canal, which was the largest single operation where cableways were employed. In this installation the 20 old-style cableways for the first few months showed an average loss for repairs during working hours of approximately 45 min. per 10-hr. day each, but this was later somewhat reduced. On the basis of the Panama report this would give a difference in efficiency of 6½ per cent. in favor of the Panama cableways, or, reduced to dollars and cents, the cableways at the Isthmus have an actual earning capacity of $20,250 a year apiece over those used for the drainage canal

The Sale of French Panama Scrap Material

Referring to the sale to the Chicago House Wrecking Company, for $215,000, of all French equipment and scrap metal in the Canal Zone that has not been taken into stock for use, or is not already in use, the Canal Record says:

The successful bidder agrees to pay an arbitrary rate of $8 a ton on the issuance of bills of lading until the total price is paid. Included in the material sold are a number of old locomotives, dredges, excavators, dump cars, boilers, cranes, cylinders, 30 and 35-lb. steel rails, scrap iron, copper and brass. It must be taken by the contractor from the places where it has been collected, or where it was abandoned by the French, and transported to the seaboard at his expense. A rate of $2.25 per net ton will be given by the Panama Railroad for transportation to either Colon or Balboa. Most of the material that was in the Gatun Lake region has been removed, but there still remain some excavators at Tabernilla and some miscellaneous equipment at Bohio, which must be removed by the contractor before the water covers it, or be a loss. None of this material is in the canal prism.

A statement of the net value of the French scrap sold up to July 1, 1911, is in preparation in the office of the examiner of accounts, and, until that is available, the exact value to the government cannot be given. Approximately, one million dollars' worth of the material has been applied in canal construction, however, and there have been sold in the States as scrap 17,537.23 gross tons at an average price of $11.86 per ton.

The Connellsville Coke Trade

The Weekly Courier, Connellsville, Pa., reports conditions in the region as follows:

The Connellsville coke trade last week did not maintain its record of the week before, showing a loss in both production and shipments of close to 3,500 tons. With all contracting for furnace coke for this year practically closed, and no expectation that the furnace capacity will be increased in the near future, indications are that there will be little change in the operation of the furnace ovens for the remainder of the year.

While the foundries are taking full shipments on contract coke, the demand for prompt foundry is light, and on account of some cutting by dissatisfied and presumably needy producers, prices have suffered a shade. As a consequence, good grades of foundry coke are now quoted at from $1.80 to $1.90 per net ton at oven, as compared with the former quotation of $1.85 to $2.

Production last week was 313,652 tons, as against 317,055 tons. The loss was entirely with the furnace ovens, their total being 176,676 tons as compared with 180,066 tons, a decrease of 3,390 tons. The total number of ovens in operation was 26,034, being increased by the firing of 10 ovens at Acme, 20 at Mt. Hope and two scattering, and decreased by the blowing out of 15 at the Semet-Solvay plant, making a net increase of 17 ovens.

The total number of ovens in the region was increased by the addition of 30 ovens at various plants.

The light-hearted manner in which dissolution suits are planned against large manufacturing concerns, says the Wall Street Journal, displays the popular attitude toward our foreign trade. Brag of the exports, but curse the exporters.

The Aligning of Shafting*

Methods and Results in Reducing Friction Losses in Machinery Drives

BY GEORGE W. TOGAN

A very careful investigation and numerous tests establish that the average loss of power due to friction in shafting is about 35 per cent., a startling fact. It is a very common experience to find in these plants friction loads of 40 to 42 per cent. The friction is not altogether due to the shafting, that is, the pressure at the boxes, but is also due to the tension of the belts.

A few up-to-date plants use a transit or architect's level instead of the spirit level to obtain their leveling line. It is a fact conclusively proved that no line over 50 ft. in length can be accurately adjusted by this method. Where this method has been used on lines 150 ft. or over a variation of 1¼ in. in level and alignment has been found, and a variation of ½ in. is very common. This is not due to the carelessness of the mechanic or millwright, as one might quickly suppose, for with this method the cleverest millwright living could not do a perfect job. The very smallest variation found out of hundreds of tests on long lines has been ⅛ in., and this is considered a real good job.

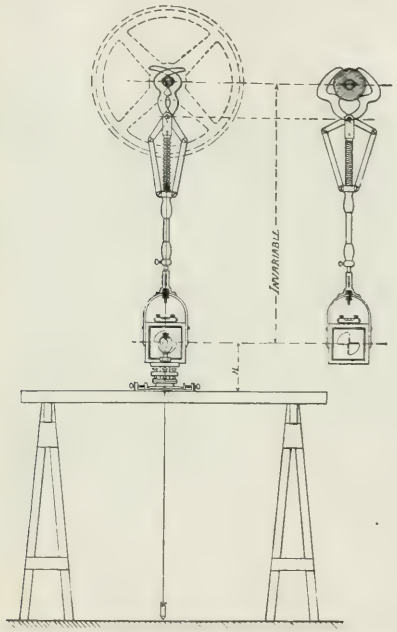


Fig. 1. Portable Target for Shafting of Different Sizes.

The fault is not with the millwright, but with the tool; a perfect job is an impossibility under this method. This explains clearly why the standard of friction—that of 35 per cent. quoted above—is accepted to-day, and this is really an excellent average. A very great majority of mills will exceed this average. Where this average is maintained good work has been done by the millwrights.

To align and level shafting with such perfect accuracy that what was considered a fair friction load, namely, 35 per cent., is now considered extremely excessive. Using the device here described the new standard calls for a friction load of not over 20 per cent. This is a safe and conservative figure, for we could claim a standard of 15 per cent. and maintain it. This low standard, however, involves not only close to ideal conditions in the plant, but such an arrangement of machines, pulleys and belting, together with such personal supervision, as perhaps it would be unreasonable to expect. With this device any shafting of whatever length and of varying sizes irrespective of the location of the shaft and the obstructions under or around it can be so adjusted that the boxes will bear perfect relation to

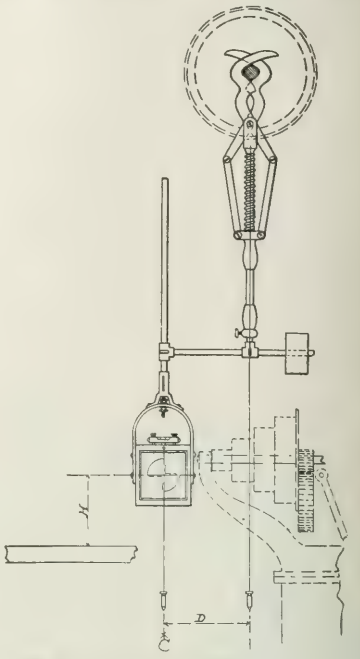


Fig. 2. Use of Portable Target with Offset.

each other, all pressure on the shafting being removed and the only cause of friction being the weight of the shaft in the box and the pull of the belt.

The New Device

The device includes a special architect's level built particularly for indoor and shafting work, a self-centering target, which is hung from the shafting by an ingenious

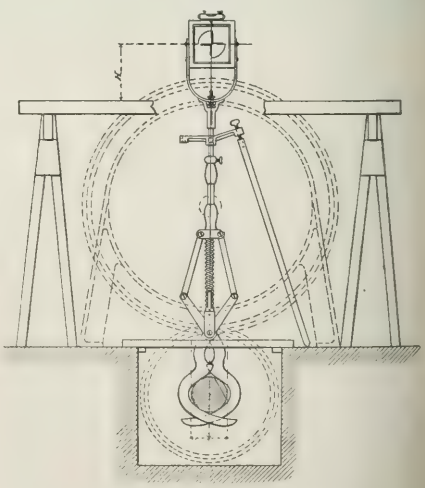


Fig. 3. Portable Target Over Pit Shafting.

jaw clamp so constructed that it not only invariably finds the center of the shafting but remains invariable irrespective of the change in size of the shafting and variations

*From a paper read before the National Association of Cotton Manufacturers, Manchester, Vt., September 27-28.

due to change in diameter (Fig. 1) and a fixed or stationary target used as a check to insure uniform readings. The portable or moving target is capable of such arrangements and adjustments as to enable the operator to work on any of the various kinds and positions of shafting. The portable target and the back target are both transparent. A magnifying lamp is used for night work, making it unnecessary to light up the factory.

Fig. 2 shows the fundamental principle of using the target with offset for the purpose of getting around an obstruction, whether a machine or belt. Various arrangements of this offset feature will enable the operator to overcome any condition or obstruction he may find. Fig. 3 shows the method of adjusting the target on shafting which is in a pit or on the floor. Fig. 4 shows a very common arrangement where the shafting runs under tables or benches. It is really a simple offset arrangement.

The merit of this system is based upon the portable target and its centering features because of its invariable relation to the line of the shaft. Each reading presents the actual condition of the hanger, both as regards the alignment and level, at one operation. The crosshairs of the architect's level showing on the face of the target indicate the true position, whether the shafting is high or low or out of alignment. The boxes can be adjusted to 0.01 in. if desired and a reading of any length shafting can be made. All arrangements of the targets provide for the accurate locating of the engineer's level in positions convenient to the operator. The method is simple, absolutely accurate and economical; so simple that any ordinary millwright can use it, so accurate as to insure the reducing of an ordinary friction load anywhere from 10 to 50 per cent., and so economical as to enable two men to do in an hour's time, whether night or day, more actual work than four men can do in four hours' time under the old method.

Another interesting and unique feature of the outfit is that with it shafting in motion can be aligned accurately. In one case of shafting at a speed of 185 r.p.m. neither the architect's level nor portable target was affected in the least by vibration or the running of the shafting, and an absolutely perfect reading was secured. While it is advisable at all times to align shafting when not in motion, it is nevertheless true that a perfect operation can be secured even though the shafting is in use. The only thing that will affect the reading would be the vibration from the floor or ceiling, which would make it difficult to get an absolute reading of the architect's level.

Results of Shaft Aligning*

In a plant in Worcester, Mass., is a main line shaft 226 ft. long in the basement. The main drive was on one end, the shafting passing through four brick walls. It was impossible to align it from end to end by any other method than that employed. Setting up the instruments a reading was taken, showing a sag of 2¼ in. in about 25 ft. Investigation showed the fact that about eight months previous there had been an accident to the building, when temporary repairs had been made, but inaccessibility and a pressure of business furnished the excuse for setting up the shaft temporarily in what proved to be a dangerous position.

In a factory in New Bedford, Mass., a main line ran over cross-beams of trusses 22 ft. from the floor. The shafting also went through one brick wall. An engine indicator card revealed a very decided increase in friction, which ultimately resulted in the blowing out of a cylinder. The line was 250 ft. long, ranging from 2 3-16 in. to 6 3-16 in. in diameter, and had not been aligned for several years. A reading was taken in two hours, showing a variation of 2¾ in. What would ordinarily have been at least a two days' job under any other method—and a most imperfect one on account of conditions—was accomplished on a Saturday with entirely satisfactory results and a decided decrease in friction.

A shaft 120 ft. long, running in roller-bearer hangers driven by motor, was aligned and leveled in two hours' time, and a second reading immediately taken on the motor showed a yearly saving figured by the superintendent as about $20. The result was that every shaft in this plant was immediately gone over—some 5000 ft. in all—and a saving of approximately $900 per year was shown. The incident also revealed to the superintendent the mistake in the placing of the machines and the necessity of a counter-shaft. In this, as in every other case, a reading of the shafting was taken before actual work was done, and in this particular plant, instructions were given the millwright

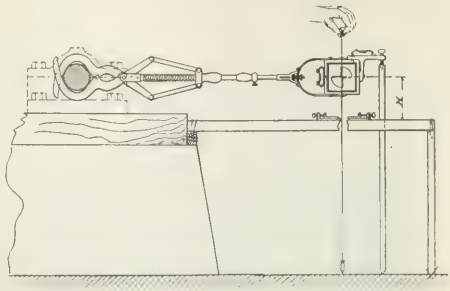


Fig. 4. Target Used with Shafting Under Benches.

that readings of the various shafts were to be placed in the superintendent's hands monthly, which ultimately resulted in the shafting being gone over every three months.

In another case 2510 ft. of shafting of 23 different lengths, the shortest length being 32 ft. and the longest 360 ft., were aligned and leveled in 52 hr., working evenings, and for the first time in the history of this plant it was not necessary to shut down a department or lose a minute's running time. Never more than three men worked on the job, and most evenings but two. Before the work of aligning was done, the total load was 307 hp., of which 113 hp. was charged to friction, showing a friction load of 36.8 per cent., 1.8 per cent. above what was consilered normal. Within 5 hr. after the work was completed, a second reading was taken to determine the saving, if any, and at this time the friction load showed 93 hp., which was 25.5 per cent. of the total load, a saving on the 2510 ft. of shafting of 20 hp. Since this chart was taken in this particular case a further saving has been shown. It was admitted that the saving in power would amount to about $1100 a year.

In Waterbury, Conn., a test was made on a 3 15/16-in. shafting, 85 ft. long. A reading showed consumption of 10 hp. Competent millwrights aligned the shaft, using the old method of a silk string and spirit level, and a second reading showed improved alignment and a reduction of 2½ hp., the shaft consuming 7½ hp. The shaft was immediately aligned and leveled with our device and left in an absolutely perfect condition. The third reading showed the shaft consuming 4 hp., a saving of 3½ hp. over the old method. The shaft had been lined up about a year earlier.

It is a common policy that belts should be removed when shafting is aligned. It has been clearly proved that this is an error; that all shafts should be aligned and leveled with the belts in place. A tight belt would very naturally pull a shafting over, and the removing of that belt causes a natural rebound in the shaft. Were the shaft aligned with the belts removed the alignment would immediately be thrown out by the putting on of the belts, whereas if the shafting was surveyed with all belts on an adjustment would be secured as near as was possible to secure it, to the running line.

If I were asked to state in concrete, simple terms what the difference in friction is between a scientific accurate surveying of shafting and the method ordinarily used, I should say it is at least 1 hp. to every 100 ft. of shafting. The day is coming—if it has not already arrived—and it has arrived to a good many—when this question of friction and vibration is to receive a great deal more thought and attention than it has heretofore, for we are beginning to realize the tremendous waste due to friction on shafting and machines, which friction can be very largely removed

*Abstracted from a considerable number offered by the author, accompanied with diagrams of the shafting arrangement.

The American Railway Association's latest bulletin gives the total number of idle cars in the United States and Canada on September 27 as 50,038, which represents a decrease of 14,245 in the preceding two weeks. The decrease in the number of idle box cars was 10,200

New Open-Hearth Furnace Construction

One Opening in the End Wall, That for Gas, While Air Enters Steeply Through the Roof

In Stahl und Eisen, Vol. 31, No. 28, is an interesting article on new developments in open-hearth furnace construction, well illustrated, and written by Chief Engineer F. Bernhardt of Königshütte. The changes he describes

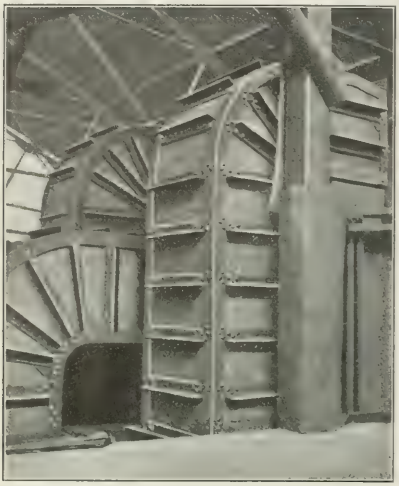


Fig. 1.—Arrangement of 17-Ton Open Hearth Furnace for Admitting Air Through Openings in Air Box and Roof.

have already been tested practically. The new construction removes entirely the so-called furnace head of the old construction. The chief characteristic is that the air is brought up over the end wall to an air box that rests, independent of the furnace, on the steel framework. The air enters the furnace through openings in the air box and the roof. The air box can be so arranged as to admit the air at any inclination downwards, even vertically.

The gas and air flues are built independently of each other and the end wall, and suitable provisions are made to allow of expansion and contraction. Air box, gas flue and air flues are easily changeable, and consist of an angle iron framework and one thickness of brick. Through their separate construction they are accessible on all sides and well cooled by the outside air. Also the whole end wall of the furnace is free, so that it is air cooled, and any necessary repairs can be readily made. The chief advantage of this arrangement is that the troublesome tongue between the air and gas ports, an essential part of the old construction, is entirely done away with. This part soon burns back and changes the meeting point of the gas and air. The coal consumption increases, the efficiency of the gas is decreased, and the charge takes a longer time. The length of flame is shortened and the furnace roof is attacked. The air port becomes larger and the gas port smaller, so that the proportion of air to gas becomes too great, and this has an important influence on the quality of the steel.

Drawbacks of the Ordinary Construction

It is a common occurrence in the ordinary style of furnace that only after making a number of heats is the normal time per heat reached; and on the other hand many times the first heat is the best, and the furnace gets gradually worse as the ports burn back. Mr. Bernhardt's experience with the old construction was that, with a furnace making 450 to 500 heats, after about 300 heats the best grades of very soft steel could not be made. The product was red short.

In the new construction the end wall has only one opening, that for the gas, and the air enters very steeply through the roof. In this way the gas and air meet always at the same place. A very intimate mixture of gas and air takes place near the end wall; the flame covers the whole width of the bath and flows along it whole length. In this way the charge is melted and refined noticeably quicker than in the old style furnace, where the gas and air often do not thoroughly mix until half way across. This, of course, means very ununiform heating, the steel at the incoming end often being cooled down.

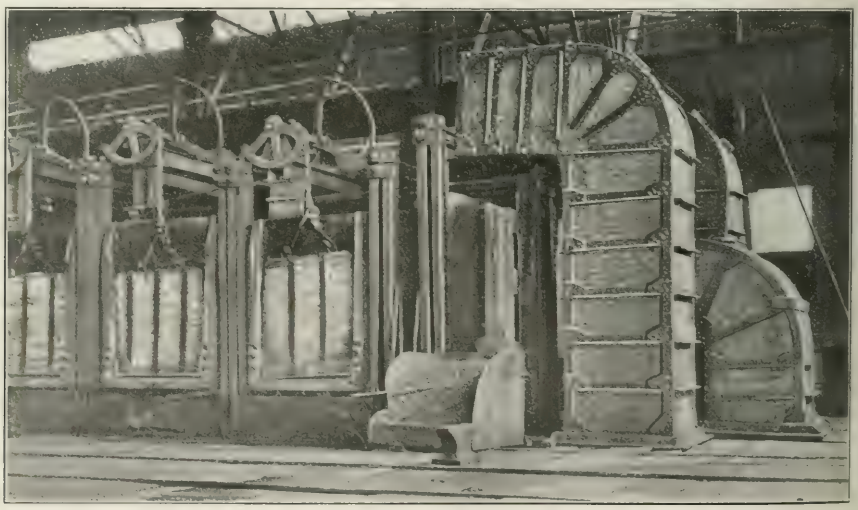


Fig. 2.—The New Arrangement as Applied to a 40-Ton Furnace.

When the end wall is burnt back in a funnel shape the proportions of gas and air with the new construction are hardly changed. The chemical influence of the flame

on the bath remains, therefore, always the same. Through the thorough mixing near the end the gas burns almost completely in the furnace, and not, as in the old construction, mostly against the outgoing ports. The end walls and roof are therefore much less exposed to destructive influences.

great deal of refractory material. The tearing down of the furnace can be begun immediately after tapping. The air box, gas and air flues can be removed by the crane, the flues from the checkers, coming to the working floor, being covered with a plate to prevent loss of heat. In a large plant the number of reserve furnaces can be reduced

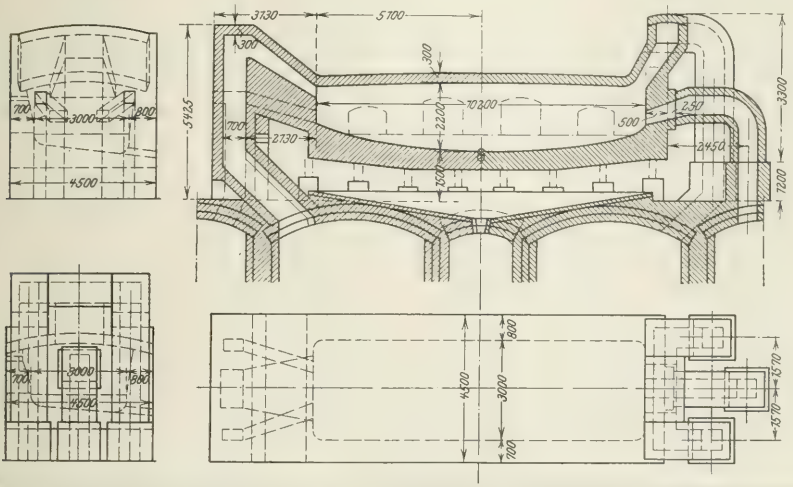


Fig. 3.—Plan and Section of 40-Ton Open Hearth Furnace. The New Arrangement is Shown on the Right-Hand Side of the Furnace and the Old Arrangement on the Left. Dimensions in Millimeters.

The inside of the end walls with its perfectly flat surface and only one opening offers very few points of attack and suffers less in consequence. Because of their thinness and free exposure the end walls are also very efficiently air cooled. Further advantages of the new construction lie in the simple construction of the whole furnace. Through the separate nature of the gas and air flues, the real body of the furnace is considerably shortened. Also because of the very effective flame production it may be further shortened and widened and still have the same or even

The First Experimental Furnace

The new construction has been tried for a considerable time at Königshütte on three furnaces and the results were better than expected. The first experiment was made on a 17-ton furnace. On the right side the old ports were left in and on the other the new construction was built, to observe the different effect. The appearance of the new construction is shown in Fig. 1. The air box extends the whole width of the furnace and is supported on brackets resting on the steel framework. The air and gas flues and

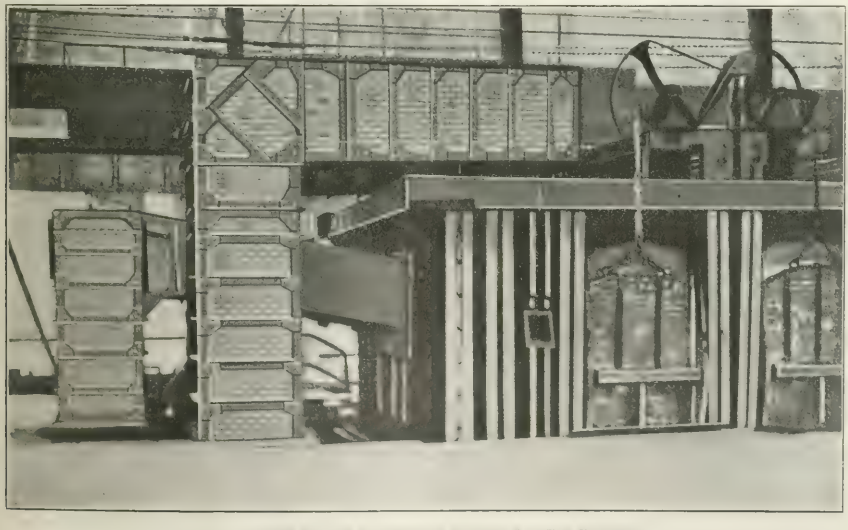


Fig. 4.—The Air Box as Applied to the Second 40-Ton Furnace

greater capacity. The steel framework will be lighter and simpler, and the roof will have greater durability.

Repairs and the tearing down of such a furnace can be done in a very short time. The air box is easily changeable, and the rebuilding of the thin end walls and the short simple roof ought to take only a few days and not use a

the air box are of one brick thickness. The air enters the furnace at an angle of 62 deg.

The furnace was put in use August 23, 1910. After 130 heats the right end wall needed repairing. After 360 heats, on November 29, 1910, the furnace was stopped and rebuilt because the right furnace head was badly burnt.

opportunity was taken to thoroughly rebuild the right half of the furnace, and slight repairs were made to the air box on the left side.

On January 2, 1911, the furnace was again put in use and on April 13, 1911, after 324 heats, a total of 630 heats.

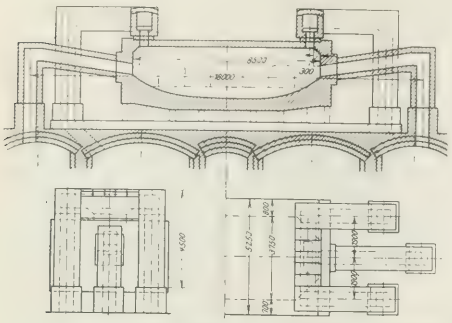


Fig. 5.—Section and Plan Showing New Arrangement of Second 40-Ton Furnace

was shut down. The left side could easily have stood two or three weeks more, but on the right side the checker work was filled with slag. The usual end wall repairs on the right side were not necessary until March 9, 1911, after 244 heats, which was exceptional. This was a proof of the complete combustion of the gas and air entering from the left side.

After putting in use, the furnace took about a week to give the best results; then it was noticed that the left side was superior to the right side, for the charge was melted at least 30 minutes earlier on that side. This influence extended fully two-thirds of the length of the furnace. The furnace men made use of this by placing the charge at the left side of the furnace as much as possible. After a certain time the right side improved, but the left side remained superior and constant. Corresponding to these results the time per charge was 6 hours at the beginning, then for a time 5½ hours, and at the end of the run again 6 hours.

A Change in the Air Box

The second test was made on a 40-ton furnace. When both ends of the furnace were built alike. The arrangement is shown in Figs. 2 and 3. The left side of Fig. 3 shows the old construction, and the right side the new one. The chief departure in this arrangement from that for the 17-ton furnace was that the part of the air box between the two air flues was made simpler and easier to change. This is the part that was attacked the most strongly. The air enters the furnace at 52 deg. The cross section of the gas and air ports remains carefully the same as in the old construction. The furnace has been constantly in use since January 10, 1911, and had made up to the time of the article 346 heats. After 282 heats, on April 10, the first Sunday repairing was done. It consisted of repairs to the roof over the end walls and to the air box. This repair work was rather troublesome, because the rather poor choice of reinforcement for the air box prevented proper air cooling, and led to its destruction. Maintaining the same areas for the gas and air, as in the old construction, made such an active flame that the furnace got too hot, and the brickwork was attacked more or less. The weekly output increased from 24 to 27 heats. When the furnace is torn down the areas will be reduced, and it will also be possible to reduce the dimensions of the checkers.

Angular Instead of Curved Flues

The third test is also being made on a 40-ton furnace. It is illustrated in Figs. 4 and 5. The difference from the second installation are that the gas and air flues are angular instead of curved, and the air enters the furnace vertically. The hearth is made shorter and wider. As may be seen in the drawing the end wall springs in an arch for twelve in. (300 m.m.) before it is cut by the air entrance. The object of this is to gain data for the best position of the air entrance. The furnace had only been in use for a few days, so that no conclusions could be given. The flame formation is good, but 90 deg. appears to be too steep an angle, because too many of the waste gases go through the gas entrance.

From the tests made so far, it is estimated that the gas and air flues will stand 1500 to 1800 heats. The end walls and air box will stand from 280 to 330 heats, and the life of the roof is increased at least 50 per cent. This leads in Germany to a direct saving of 19 cents per ton of steel, and does not take into consideration the simple furnace construction, as well as the favorable influence on the quality of the steel. With further development this figure ought to be increased. From the tests it may be concluded that the air box extending the whole width of the furnace is the most practical.

The remainder of the paper takes up various proposed modifications, and the application of this principle to tilting furnaces and mixers. It concludes with the description of a proposed slag pocket, the floor of which is level with the working floor and into which a suitable car may be placed for catching the slag. C. B. W.

Decision on Gas Producer Operation

Doherty Process and Apparatus for Prevention of Clinkering and for Fuel Saving Upheld

A decision on gas producer operation has been handed down by Judge Brown, of the United States Circuit Court of Massachusetts in favor of the complainant in the case of the Combustion Utilities Corporation versus the Worcester Gas Light Company, Worcester, Mass. About three years ago it was claimed that the Doherty patents were infringed by a prominent builder of gas benches for the Worcester Gas Light Company. Suit was brought against the gas company by the Combustion Utilities Corporation as owner of the Doherty patents.

Mr. Doherty's invention does away with the use of water and steam for regulating the temperature of combustion and preventing clinkers and consists of a process of employing a decombustible gas, preferably carbon dioxide, mixed with air. It has for its object not only the regulation of combustion and prevention of clinkers, but also a considerable reduction in the amount of fuel required to obtain a given result. The mixture of carbon dioxide and oxygen should be introduced to the fuel bed at such a temperature and the proportions of carbon dioxide, free oxygen and free nitrogen should be such that the fuel bed is kept below the temperature at which clinkers occur, heat being given up to the gases from the fuel bed.

Among the citations as set forth by the defense as indicating anticipation in the prior art were United States and foreign patents covering the return of part of the products of combustion to the producer for the purpose of utilizing what would otherwise be waste heat; also processes for smokeless operation of furnaces by burning the free carbon in the waste gases to colorless carbon dioxide; also a process for the production of a long rolling flame suitable for lime-kiln operation by returning a portion of the waste products of combustion to the space beneath the grate bars of a furnace. The court held, however, that these patents had for their object something entirely distinct and different from the fundamental bases of the Doherty patents, which were the regulation and control of combustion.

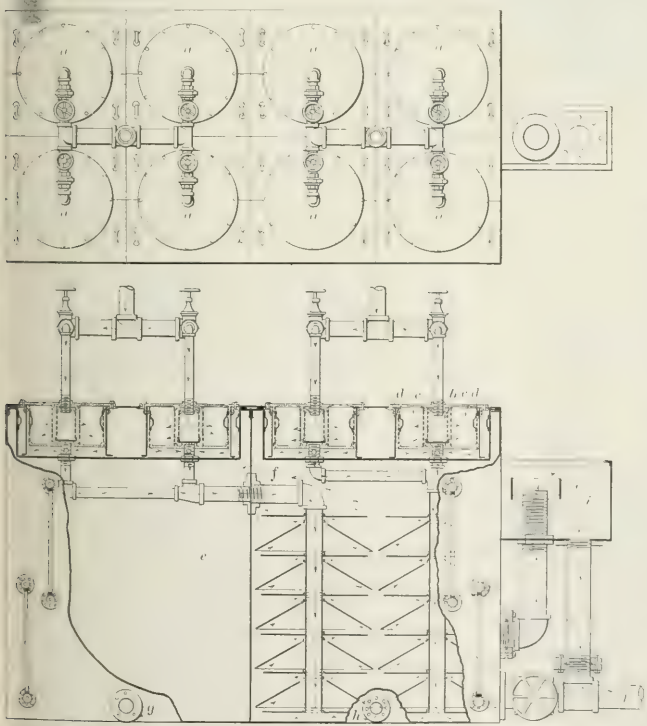
The Doherty apparatus patent was also held by the court as having been infringed. The patent has to do with the means and methods employed to regulate the mixture of air and diluent gases.

The Linton Trust Company, Linton, Ind., has been appointed receiver for the Indiana Steel & Iron Company, on petition of the Linton Rolling Mill Company. The rolling mill had been idle for about two years, when, early this year, a stranger from Pittsburgh induced the leading business men of Linton to raise $10,000 to start the mill in operation again, he to put in $30,000. A new corporation was formed and the property of the old one conveyed to it. The promoter left for Pittsburgh and did not return. The court is now asked to declare the conveyance void and to transfer the property back to the rolling mill company.

The New Burt Oil Filter

Size is the especially interesting feature of a new pressure oil filter which has recently been developed by the Burt Mfg. Company, Akron, Ohio. The capacity of this new filter, which is designed for use in street railway power houses and other large power plants, is 100 gal per minute, and in addition to filtering the oil, space is provided for storing 500 gal. of purified oil. A plan view and an elevation of the filter are given in the accompanying engraving.

In use the dirty oil is first collected in a settling tank and pumped from there under pressure to the filter. It is delivered through pipes to a battery of eight filtering cylinders. Upon entering one of these filtering cylinders, *a*, the oil passes into a fine screen cylinder having a removable sediment pan, *b*, at the base, to facilitate cleaning. From there passes through a cylinder, *c*, filled with animal bone black and then through a ply of filtering cloth, *d*. Upon leaving the filtering cylinder the oil flows down one of the tubes to the bottom of the filter and into the washing and cooling compartment. It bubbles up through the water in this compartment, passing around baffle plates that make the distance the oil travels by the time it reaches the top 10 ft., and when it has completed its course, which is clearly indicated by arrows, it has become thoroughly washed and cooled. When the oil reaches the top of the cooling compartment it is discharged directly into the pure oil reservoir *e* through the overflow *f*. From this reservoir the oil is pumped through a 2½-in. outlet, *g*, either directly into the system or to an overhead oil reservoir having a capacity of 500 gals., from which it flows back to the bearings and the same filtering operation is performed over and over. Each filtering cylinder is independent of the others and one or more can be cleaned



An Improved Type of Pressure Oil Filter for Large Power Plants Made by the Burt Mfg. Company, Akron, Ohio

at any time without interfering with the oiling system by simply closing the valves corresponding to the cylinders which are to be put out of commission.

The water for cooling the oil is supplied to the filter constantly through a 2-in. outlet, *h*, at the bottom and is discharged through the automatic water separator *i*. The water separator is lower than the discharge into the pure oil reservoir, and thus it carries off the water which runs through a 4-in. pipe, *j*, into the sewer. If for any reason it is desired to economize in the amount of water used, it can be run into a cooling tank and pumped from there back into the filter. Any water that is brought to the filter by the used lubricant is automatically removed by the water separator. The quantity of cold water that is allowed to pass into the filter regulates the temperature of the oil, while if it is desired to heat the lubricant, heating coils can be placed in the filter for that purpose.

The top, the shell and the water separator are made of No. 10 galvanized sheet metal, reinforced by 2 x 2 in. angles, the remainder of the filter being No. 18 galvanized Toncan metal. The overall dimensions of the filter, exclusive of the water separator section, are length, 8 ft.; width, 4 ft., and hight, 5 ft. As the oil is pumped into the filter it can be located in a convenient place in the engine room, and it is not necessary to place it in the basement as is the case with the ordinary gravity oiling system.

The Newark Foundrymen's Association

At a meeting of the Newark Foundrymen's Association held at Newark, N. J., on the evening of October 4, the members enjoyed an interesting exhibition of moving pictures which was given by the Goldschmidt Thermit Company, 90 West street, New York, illustrating some rapid welding operations by the thermit process. The pictures were explained by W. R. Hulbert, sales manager of the Goldschmidt Thermit Company. A striking series of illustrations showed the simultaneous welding of two serious fractures in a locomotive frame. The breaks were in two parallel sections of the frame and they were welded in a period of two hours. The pictures gave the most important details of the work. Illustrations of the process of continuous joint welding were given and views were shown of important welding operations on heavy shafts, flywheels, etc. Mr. Hulbert conducted a number of interesting experiments to illustrate the thermit process. He welded a butt to a metal plate within a few minutes and illustrated the heat of thermit material by dropping a quantity of it into a glass receptacle filled with water. The thermit descended through the water and burned a hole through a disk of metal at the bottom of the receptacle. After the exhibition Dr. E. A. Beck, who is a metallurgical expert with the Goldschmidt Thermit Company, answered questions regarding the use of the process.

A dinner preceded the business meeting. The following were elected to membership in the association: The Debevoise-Anderson Company, Rogers, Brown & Co., Goldschmidt Thermit Company, all of New York, and Samuel L. Moore & Sons, Elizabethport, N. J.

The charter of the Lansing Wheelbarrow Company, Lansing, Mich., having expired September 21, the company has reorganized, changing its name to Lansing Company. It is doing this for the reason that its old name was not comprehensive enough to embrace the entire line of goods it manufactures. It makes not only a complete line of wheelbarrows and warehouse trucks, but an extensive line of steel scrapers, concrete and mortar mixers, automobile turntables, cast iron, rubber and fibre wheels and casters, etc.

A New Internal Combustion Engine

A new type of four-cylinder, four-cycle, water-cooled gasoline motor designed by R. C. Mitchell has been built by the Webster & Perks Tool Company, Springfield, Ohio. A feature of the motor is the location provided for the magneto on a bracket attached to the end of the rear cylinder. Fig. 1 is a view of the engine taken from the rear or flywheel end, while Fig. 2 shows the engine from

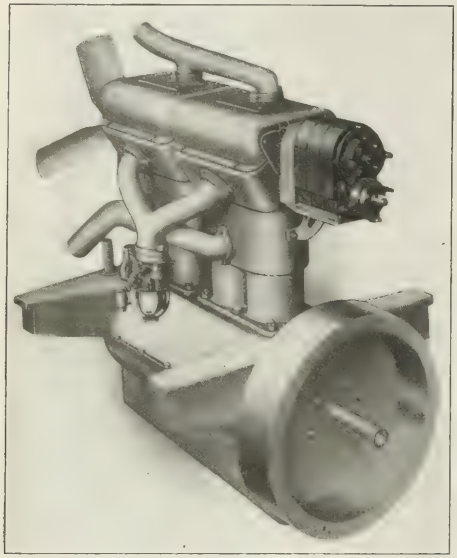


Fig. 1.—A New Four-Cylinder Four-Cycle Water-Cooled Gasoline Engine Designed by R. C. Mitchell, Springfield, Ohio.

the opposite end, while a portion of the casing has been broken away to show some of the interior mechanism.

The valves are located in cylinder heads, the inlet on one side and the exhaust valve on the other, both being inclined at an angle of 30 deg. to the center line. As is customary the valves are mounted in cages which facilitate the removal of the cage and the valve for regrinding and this removal is accomplished by loosening one screw. The valves seat against the cages instead of the cylinder casting and are actuated by four barrel cams each operating the valves for one cylinder. It is claimed for these cams that in addition to opening both valves they also close them positively, thus insuring a uniform charge in the cylinders at all speeds.

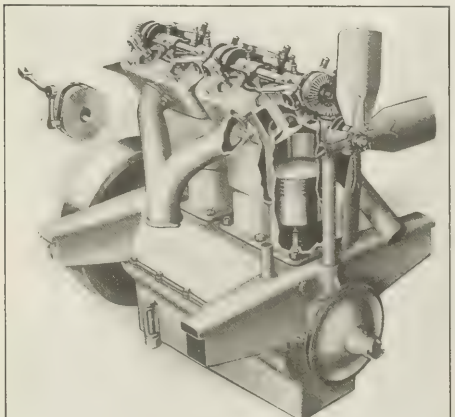


Fig. 2.—View of the Motor with the Casing Partly Broken Away to Show Details of Valve Mechanism.

The camshaft is located on top of the cylinders and is driven by a vertical shaft which receives its power from the crankshaft by bevel gears. The construction of the cams and their location on this shaft, it is explained, insures the valves always being in time and does away with the heavy springs usually employed for closing the valves. Lubrication of the camshaft is accomplished by wick-oiling bearings with an ample reservoir. All moving parts of the engine, the camshaft and the cams are encased in dust-proof hoods which can be quickly and easily removed for inspection.

The novel location of the magneto is calculated to keep the magneto free from dirt and grease and as the generator extends through the dash, an adjustment can be made without leaving the seat and is readily accessible. A small spur gear at the end of the camshaft is employed to drive the magneto.

The lubricating system employs a pump located in the crank case, from which oil is delivered to a manifold or reservoir in the upper portion of this chamber. Small brass tubing conveys the lubricant from the reservoir to all of the bearings, thus insuring a constant flow of oil where it is needed. Before being placed on the market one of these motors with a cylinder of 4 3/16-in. bore and a 5-in. stroke was given a test in a seven-passenger touring car weighing approximately 3000 lb.

A New Mount Union Fire Brick Enterprise

The Mount Union Refractories Company, Mount Union, Pa., received a Pennsylvania charter September 12. The capital stock of the company is $300,000, and the directors are as follows: R. P. M. Davis, president and general manager; F. D. Halstead, secretary and treasurer; C. V. Hackman, superintendent; Wilson Kistler and P. P. Griffin. Messrs. Davis and Hackman have been connected with the Harbison-Walker Refractories Company, Mr. Davis as works manager and Mr. Hackman as superintendent of the company's Mount Union plant. Mr. Halstead was formerly secretary, treasurer and general manager of the Queen's Run Fire Brick Company.

The new company owns large quantities of ganister rock near Mount Union and has begun the erection of a plant for the manufacture of silica and magnesite brick. The purity of the ganister rock is what has made Mount Union silica brick famous, and the new company has an immense supply of such material. The construction of the entire plant, including stock sheds, will be of brick and steel, with concrete foundations. Its capacity will be 80,000 brick per day.

Exporters Should Fully Describe Merchandise

The Bureau of Statistics, Department of Commerce and Labor, Washington, D. C., has issued a circular calling the attention of exporters to the importance of extreme care in properly and fully describing merchandise offered for exportation. This necessity is especially apparent in the case of merchandise forwarded from interior points to the exporting ports to be there "manifested" (or described for exportation) by the export agent, transportation company or steamship line to which it is consigned. Such merchandise is often so insufficiently described by the owners or consignors as to prevent its proper description by those presenting it for exportation. Persons forwarding merchandise for exportation should realize that all articles not fully and properly described are liable to encounter serious delay at the export port, as the customs authorities are required to insist upon a proper description, including quantity and value of the various articles, in the form of an export manifest, before a clearance shall be granted to the vessel on which the merchandise is to be exported. The circular quotes extracts from the laws and customs regulations, issued by the Treasury Department, indicating the manner in which merchandise for exportation must be described and manifested. Copies of the circular may be obtained by addressing Bureau of Statistics, Department of Commerce and Labor, Washington, D. C.

The Pittsburgh Steel Company's Report

The Pittsburgh Steel Company has issued its report for the year ended June 30, 1911. The income amount compares as follows:

	1911.	1910.		Changes.
Sales receipts	$11,774,356	$11,670,918	Inc.	$103,438
Expenses*	10,507,104	10,415,106	Inc.	91,998
Net earnings	$1,267,252	$1,255,812	Inc.	$11,440
Other income	5,924	28,782	Dec.	22,858
Total income	$1,273,176	$1,284,594	Dec.	$11,418
Charges	191,669	369,672	Dec.	178,003
Surplus	1,081,506	914,922	Inc.	$166,584
Dividends	741,899	479,520	Inc.	262,379
Surplus	$339,608	$435,402	Dec.	$95,794

*Materials used and cost of operations (including repairs and maintenance of plants), selling and general expenses.

The general balance sheet as of June 30, 1911, compares with that of December 31, 1910, as follows:

Assets.	June 30, '11.	Dec. 31, '10.
*Real estate, plant and equipment	$13,336,519	$13,251,195
Stocks of subsidiary companies	330,000	330,000
Cash	905,938	886,576
Notes receivable	79,259	105,948
Accounts receivable	1,458,509	1,554,483
Loan and advances	864,166	843,706
Materials and supplies	2,123,579	2,485,526
Prepaid charges	6,913	41,097
Total	$19,105,386	$19,498,531

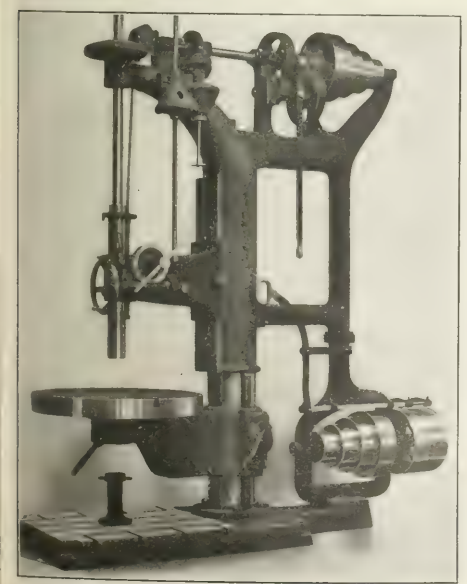
*Patent rights are not valued.

Liabilities.		
Preferred stock	$7,000,000	$7,000,000
Common stock	6,000,000	6,000,000
Subscription receipts on common	484,270	294,460
Real estate bonds and mortgages	30,000	30,000
Time and demand loans	950,000	1,511,197
Accounts payable	1,028,866	1,338,524
Dividends payable January 1	129,660	119,880
Profit and loss surplus	3,482,589	3,204,470
Total	$19,105,386	$19,498,531

All of the first and general mortgage bonds have since been retired.

New Snyder Heavy Duty Drills

J. E. Snyder & Son, Dewey and Parker streets, Worcester, Mass., have recently brought out a new heavy pattern 44 and 46 in. standard upright drill, the latter being the size illustrated. The main column, which is 11 in. in diameter, is strongly braced, weighs 1100 lb. and possesses sufficient strength to do the heaviest work the tool is called upon to handle. The base has a number of internal reinforcing ribs and is planed on both the top and bottom surfaces. The head has an ample bearing on the column and is exceptionally rigid. Crucible steel is employed for the spindle which has a 2½-in. bearing in the sleeve and a 2¼-in. bearing in the large bevel gear at the top. The hole in the spindle is bored to conform to the No. 5 Morse standard taper and the spindle nose which is 4 in. in diameter is furnished with a ball bearing. The table supporting arm has a bearing on the main column 11 in. diameter and 15 in. deep, while the table is strongly braced underneath and has an ample bearing on the arm.



The 46-in. Heavy Duty Drill Press Built by J. E. Snyder & Son, Worcester, Mass.

The drive is from the countershaft at the base to the overhead countershaft, four speed changes being rendered available by the use of a four-step cone pulley. The belt shifter is controlled by the pull handle, which projects to a point just above the lower column brace, and the back gears, which have a ratio of 7¼ to 1, are controlled by friction.

The following table gives the principal dimensions and specifications of the 46-in. drill:

Over-all hight, in.	118
Maximum distance spindle to base, in.	89
Maximum distance spindle to table, in.	37½
Length of head on column, in.	18
Length of table arm on column, in.	15
Diameter of column, in.	11
Diameter of driving pulleys, in.	16
Face width of driving pulleys, in.	5
Width of main driving belt, in.	5
Number of cone pulley steps	4
Diameter of smallest cone pulley step, in.	7½
Diameter of largest cone pulley step, in.	16
Face width of cone pulley steps, in.	4½
Width of cone pulley driving belt, in.	4¼
Diameter of table, in.	37
Diameter of spindle in sleeve, in.	2½
Diameter of spindle in bevel gear, in.	2¼
Morse taper, spindle	No. 5
Diameter of spindle nose, in.	4
Vertical feed of spindle, in.	18
Diameter of crown gear, in.	13
Diameter of bevel pinion, in.	6
Length of base, in.	84
Width of base, in.	34½
Depth of base, in.	15½
Width of face on column, in.	10
Traverse of head on column, in.	25½
Traverse of table arm on column,	14
Ratio of bevel gears	2 1/6 to 1
Ratio of back gears	7 1
Speed of lower countershaft, r.p.m.	235
Minimum spindle speed, back gears engaged, r.p.m.	7
Maximum spindle speed, back gears engaged, r.p.m.	31
Minimum spindle speed, back gears disengaged, r.p.m.	50
Maximum spindle speed, back gears disengaged, r.p.m.	230
Number of feed changes	5
Minimum feed per revolution of spindle, in.	0.007
Maximum feed per revolution of spindle, in.	0.052
Power required, hp.	5
Floor space, in.	34½ x 107
Domestic shipping weight, lb.	6,400
Foreign shipping weight, lb.	6,800
Contents of cases, cu. ft.	348

If desired, the drill can be supplied with a tapping attachment at a slight excess cost. All of the gears of this drill are provided with guards to protect the operator from possible chance of accident.

Vulcan High Grade Steel.—The Vulcan Crucible Steel Company, Aliquippa, Pa., has issued a brochure calling attention to the high character of its products. Both the crucible and open-hearth furnaces used by this company are operated with natural gas which, on account of its freedom from sulphur, is an ideal fuel for the melting of steel. The acid open-hearth steel which it makes does not contain more than 0.030 phosphorus and sulphur. The ingots are bloomed under a forging hammer and are rigidly inspected for any defects before finishing. The company manufactures chrome vanadium steel for all purposes requiring great strength and endurance, especially for automobile parts. Hecla vanadium steel is made for case hardening, for oil-hardened gears and for tools. The brand known as Wolfram high-speed steel contains a high percentage of vanadium and is carried in all sizes, annealed and unannealed. The brand known as Vulcan special vanadium steel contains a definite percentage of vanadium and is designed for all purposes where the finest grades of carbon steel are used, and is carried in all sizes, annealed. In addition to these classes of steel, the company manufactures tungsten magnet steels.

Some manufacturing plants, especially among the older works, lose themselves through a lack of signs indicating their whereabouts to the visitor. Industrial neighborhoods often prove a maze of streets and alleyways to the stranger, who welcomes the conspicuously lettered building and the well designated office. To him they are a saving of time and effort. It is worth while to use a building for its full advertising value, conveying to the world the name of the occupant and the product.

The Machinery Markets

An improvement is noticed in the machinery trade in several markets. There is an inquiry out in Chicago for bids on a small list of machine tools, and a list is expected from the Hyde Park High School. Trade is scattered in Cleveland, but the volume of buying is better. In Cincinnati business is not as good as it was this time last year, but a good number of inquiries are out for single tools, and the call for the smaller sizes of electric units is excellent. Inquiries have increased in Detroit, and an improved demand exists there for saw-mill equipment. Business that has been pending for some time has been closed out in St. Louis and the general tone of the market there is better. The Philadelphia trade is bidding on a fair-sized list of machine tools, and some good power business is coming forward. There are many signs of improving business in New England, where inquiries and orders are being placed in better volume. Drop forging manufacturers in the New England market are busy in supplying the automobile trade. New York dealers are expecting an additional list from the Delaware, Lackawanna & Western Railroad. Wood-working equipment is selling well on the Pacific coast, and electrical machinery is in good demand. In Texas good sales are being made of machinery for irrigation projects, and the Mexican market is opening up. The trade is busy again in the South, and new prospects are plentiful, the demand being principally for power-plant equipment, quarrying machinery, general contractors' equipment and refrigerating machinery.

New York

NEW YORK, October 11, 1911.

The Delaware, Lackawanna & Western Railroad, which has a list out calling for about $8,000 worth of machinery, is preparing an additional list to cover shop needs at Scranton, East Buffalo, Elmira and perhaps the shops at Kingsland, N. J. From all accounts the company is planning to spend fully $25,000 in the immediate future, most of which will be expended for metal-working equipment. This is the most important matter of machinery interest before New York dealers at present. Inquiries from other directions are good, but they come from widely scattered sources, and as a rule they cover only small lots of needed equipment. Machinery houses are still bidding on the requirements of the Frick Company, Waynesboro, Pa., which intends to spend $25,000 or more. The Columbia Gray Iron Casting Company, Columbia, Pa., is also making inquiries in this market for foundry equipment and a small amount of machinery to replace that damaged by a recent fire at the company's plant. The export demand continues especially good.

A number of New York machinery houses have inquiries from the Harlan Hollingsworth Corporation, Wilmington, Del. This company, which builds vessels and railroad cars, has let contract for the construction of a machine shop, 100 x 150 ft. in size. It will be remembered that some time ago the same company sent out a machinery list which called for about $40,000 worth of mechanical equipment. The list was cut down and only about one-third of the material asked for was purchased. It is probable that the company will buy the rest of the machinery listed for the machine shop now under construction.

The Otis Elevator Company, 17 Battery place, New York, has this week awarded a contract to the Thompson-Starrett Company, 49 Wall street, for an office and factory building to replace its works at Twenty-sixth street and Eleventh avenue. The building will be seven stories, 100 x 200 ft., and is designed to house the company's office, storage and repair shops. Pursuing this policy of centralizing its executive and mechanical departments the company also has plans by Burnham & Co. for an eight-story building to be erected at Jackson boulevard and Jefferson street, Chicago, Ill. These real estate operations will be in the hands of a company about to be organized which will be known as the Otis Realty Company.

Fire at the plant of the Robert Reiner Importing Company, Weehawken, N. J., October 2, damaged the building and a large amount of Swiss embroidery machinery stored there. The company is the American agent for Swiss embroidery machines and manufactures parts for the machinery. No plans for rebuilding have been prepared as yet.

The Luitwieler Pumping Engine Company, Rochester, N. Y., is in the market for a 10-ton crane, electric or steam, for its new plant now under construction.

The Commercial Motor Truck Construction Company, 828 Broad street, Newark, N. J., has been incorporated with $125,000 capital stock to manufacture motor vehicles. The company is having experimental trucks constructed and intends to erect a factory 50 x 100 ft. The incorporators are William Dimond, John True and W. Eugene Turton, all of Newark.

The Hay Foundry & Iron Works, Newark, N. J., are in the market for a planer, electrically driven, with about a 7-ft. opening.

The Positive Clutch & Pulley Works, Buffalo, N. Y., now located at 24-32 Lansing street, has purchased five acres of land on the Niagara Falls division of the New York Central Railroad at Toisul street, in the new manufacturing district at North Buffalo, and is having plans prepared for a foundry building and extensive machine shops which it will build early next spring. The business of the company in the manufacture of pulleys, clutches, reversible glass and transmission machinery has grown very rapidly since the incorporation of the company, the forepart of the present year, and commencement of manufacturing operations necessitating the immediate enlargement of its facilities. S. A. Benedict is general manager and treasurer.

The Buffalo Forge Company has been awarded the contract by the Westinghouse Air Brake Company for the heating and ventilating system to be installed in the new shops which the latter company is erecting at Wilmerding, Pa.

The Flexume Sign Company, Buffalo, is building a one-story steel factory building at 1453 Niagara street.

The Grimm Mfg. Company, Buffalo, maker of combination sawing, planing, boring and mortising machines for carpenter contractors' use, is building a two-story concrete block addition to its factory at Keystone street and Walden avenue.

The factory of the Chadakoin Boat Company, at Celeron, N. Y., on Lake Chautauqua, near Jamestown, was destroyed by fire October 4. The loss on the building and contents was $35,000. The factory is to be rebuilt at once.

The Mayfield Glove Company, Mayfield, N. Y., has been incorporated to manufacture gloves, mittens, etc., with a capital stock of $100,000. The incorporators are S. W. Hallenbeck, E. D. Heacock and E. M. Brown, Gloversville, N. Y.

Joseph A. Morrow, Albion, N. Y., is having plans prepared for a large addition to be made to his machine shop on Orchard street. The new building will be 75 x 200 ft., three stories.

The Heater Muffler Company, Elmira, N. Y., has been incorporated to manufacture appliances for motors, engines, automobiles, etc., with a capital stock of $50,000. W. Kinzie, L. D. Curran and A. G. Ingram, of Elmira, are the incorporators.

Revised plans are being prepared for the factory building which the Central Casket Company, 45 Niagara street, Buffalo, contemplates erecting at Manitoba street and the Erie Railroad, that city.

Plans have been prepared by J. N. Chester, engineer, for the installation of a 20,000,000-gal. pump at the water works station, Erie, Pa.

New England

BOSTON, MASS., October 10, 1911.

A good many signs of improving business conditions are in evidence. In the machine tool trade inquiries are much more numerous and some of the manufacturers report an increasing demand in the form of actual orders. With a few shops September was a really good month, and October opens as promisingly. For example one large builder of grinding machinery finds the works running so full that it would take little additional improvement to reach the full capacity mark. A greater number of orders, covering a larger variety of material, indicates a change for the better to the mill supply people. Some of the

THE MACHINERY MARKETS

machinery dealers feel somewhat encouraged by recent developments of their business, while others have experienced little improvement. The drop forging manufacturers are exceedingly busy, largely for the automobile trade. In Connecticut the hardware factories appear to be at least normally active. New Britain is making no complaint, and the large additions planned by the Russell & Erwin Mfg. Company and now completing for Landers, Frary & Clark bespeak a belief in the immediate future of their trade. In the Naugatuck Valley the manufacturers who cut up brass are doing a very good volume of business, but the brass mills are not running full, though the condition of their business could not be called dull. The general experience of traveling salesmen is more cheerful than it has been.

The New York, New Haven & Hartford Railroad will soon issue a small list of machine tools for the new roundhouse at New Haven. The Thomas Laughlin Company, Portland, Me., is completing a new building for which some machinery will be required.

Few manufacturers anticipate a boom in business until after the Presidential election, but they believe that conditions will improve somewhat, which would mean a good, average business and a profitable one. Many observers would prefer a continued fair market to the more short-lived boom, and would be well contented with an improvement of rather moderate scope.

The Norton Grinding Company, Worcester, Mass., is contemplating equipping a complete pattern shop in the new building now nearing completion. At the present time patterns are made by outside parties. No definite decision has been made in the matter.

The large works of the Holtzer-Cabot Company, Brookline, Mass., manufacturer of electric motors and other electrical equipment, were burned October 6, with a loss estimated at higher than $200,000. The plant was practically wiped out. While no announcement has been made the trade presumes that the factory will be re-established as soon as possible, for the business is a well known and profitable one. A large amount of machinery will be required when the time to purchase equipment arrives.

Frank E. Seeley has been made vice-president and assistant treasurer of the Standard Mfg. Company, Bridgeport, Conn., manufacturer of gear cutting machines and other machine tools and specialties, and will devote himself to the sales end of the business. C. E. Bilton is the president and treasurer. Mr. Seeley has been the assistant general superintendent of the Bryant Electric Company for the past six years, and previous to that time was for six years with the New York Central Railroad as supervisor of shops at West Albany. He is a Yale man, taking his degree at Sheffield in 1890.

The business of the Waterbury Welding Works, Waterbury, Conn., has been incorporated with a Connecticut charter as the Waterbury Welding Company. E. S. Ross continues as the manager. The company does a large business in welding by the Davis-Bournonville oxy-acetylene process.

The Winter Bros. Company, Wrentham, Mass., manufacturer of taps and dies, contemplates increasing its equipment to some extent, though no additions to the factory are planned. The company states that its factory has been particularly busy for some weeks.

The F. & M. Brush Company, 14 Greendale avenue, Worcester, Mass., has begun the manufacture of a new wire brush for use in foundries and other manufacturing plants which require this class of equipment.

The Standard Mfg. Company, Bridgeport, Conn., has brought out a rack cutting machine which is an adaptation of the company's automatic gear cutter. The machine has a capacity to cut racks up to 8 in. wide and 22½ in. in length, automatically feeding and indexing, and longer lengths with resetting of feed.

The Spencer Wire Company, Worcester, Mass., will erect two additional buildings immediately. One will be 60 x 120 ft., two stories, and will be used for general manufacturing purposes. A galvanizing building will be 24 x 80 ft., one story.

Additions to general manufacturing plants in New England include the following: Avery Chemical Company, 88 Broad street, Boston, plant at Lowell, Mass., 50 x 50 ft., three stories, with three wings, to cost $150,000; Oliver M. Dean, Worcester, Mass., brooms, factory 48 x 72 ft., two stories; Alden Spear Company, Cambridge, Mass., two-story concrete factory; E. T. Wright & Co., Rockland, Mass., shoes, four-story wing, 50 x 70 ft.; E. A. McMillin & Co., North Adams, Mass., two-story addition, 50 x 50 ft.; the Russell Company, South Farms, Conn., three-story building, 52 x 78 ft.

The published plans of the Gilbert & Barker Mfg. Company, Springfield, Mass., manufacturer of gas appliances, call for eight buildings. The main structure will be 93 x 105 ft., two stories; sheet metal building, 100 x 250 ft., one story; furnace building, 83 x 120 ft., one story; power house, 52 x 90 ft.; while there will be an office building, storehouses, testing house and minor structures.

Philadelphia

PHILADELPHIA, PA., October 10, 1911.

There is still a lack of anything definite in sight which the trade might consider particularly encouraging, at least as far as near future buying is concerned. But one list of any size—that of the Frick Company, Waynesboro, Pa., covering, it is said, some 15 tools, is before the trade that shows any indication of early closing. In fact, there is very little business under negotiation in this district beyond single tool propositions. Usually some minor shop equipment for small plants is being figured on, but recently there has been less business of that character offered. Transactions during the week have been comparatively unimportant; merchants report sales light, while manufacturers have been taking on but little new business, with orders of a diversified nature and coming from varied sections of the country. Special tool makers have taken a little better volume of business, but this varies according to the class of equipment built.

The general state of unrest as to future business conditions keeps buying of new equipment down to a minimum as well as retarding the development of new industries, which would become purchasers of machinery and tools, particularly those for metal-working purposes. Under the circumstances purchases are made only when new equipment is actually needed, and then the matter of immediate delivery is a factor. Railroad buying is practically at a standstill in this district. Little business is moving in second-hand machinery, purchases being varied and the demand irregular. Some fair business in power equipment is pending, but in this field developments are slow. Manufacturers of power transmission equipment doing an established business abroad report a slight improvement in that demand. The foundry trade is irregular, in the aggregate, however, the volume of business is slightly larger.

The Pennsylvania Equipment Company, West End Trust Building, is in the market for two and probably four second-hand standard-gauge locomotive cranes, of five tons' capacity. These must be in good order and subject to immediate shipment.

Estimates are being taken under revised plans for the proposed plant of the Lanston Monotype Company, to be erected at Twenty-fourth and Locust streets. The building is to be 170 x 268 ft., six stories, of concrete construction.

The Hub Machine, Welding & Contracting Company reports business in its line of Acme saw tables to have been comparatively good, extensive sales of both direct-connected electric and belt-driven machines having been made. In its welding department it has been quite actively engaged. A fair volume of business in general machine work is noted, although the plant is not being operated at its full capacity.

The Eynon-Evans Mfg. Company has recently completed extensive improvements to its brass foundry. This concern is quite busy in its pattern shop department and fairly busy in its machine shop. The general demand for brass and bronze castings has, however, not been very active.

The Iron City Foundry Company, Lebanon, Pa., is planning to build a new foundry plant on a plot of ground at Third and Willow streets, in that city, purchased by it some time ago. The main foundry building will be 40 x 1220 ft., and several other buildings are to be erected. While all the plans are completed, the work of erecting the new plant will not be started until next spring.

The Chester Steel Castings Company, Chester, Pa., is enlarging and remodeling its chipping shop in order to obtain increased capacity and additional lighting facilities.

The Baldwin Locomotive Works is shipping by the steamship Livingstonia 20 locomotives to Victoria, Australia for the Victorian Government Railway. The de-

THE MACHINERY MARKETS

mand for locomotives is usually confined to small lots. A recent order for five ten-wheel engines was received from the Norfolk & Southern Railroad. The Baldwin Works is taking preliminary estimates on the construction of an extensive addition to its erecting shop at Eddystone, for which it is said that in the neighborhood of 5000 tons of structural material will be required, although the prospects are that building will not be started in the near future.

E. T. & F. E. Mathewson, well known in the machine tool trade, have opened an office at 929 Real Estate Trust Building, and will engage in the general engineering business and the sale of special engineering equipment. They will be the direct representatives, in this territory, for the Toledo Bridge & Crane Company and Baker Brothers, both of Toledo, Ohio, the latter firm making high-speed drilling machines and cylinder boring machines; the Modern Tool Company, universal grinder and similar tools, and the Merrill Mfg. Company, pipe-cutting and threading machinery. Several contracts for the various lines of equipment represented by them have recently been closed.

Chicago

CHICAGO, ILL., October 10, 1911.

The past week has witnessed a material improvement in the inquiry for machine tools in this market and also in sales from the floor, in which most of the local dealers have participated. The very irregular course of business during the past several months has, however, destroyed confidence in the continuity of active business from week to week. Several of the inquiries mentioned in this report within the past fortnight are still unclosed. New inquiries include requests for prices on a 72-in. boring mill and a 36-in. lathe for the Chicago Water Works Department. A local manufacturer is in the market for tools aggregating in value about $2,500. The list of specifications for the machine equipment to be placed in the new Hyde Park High School is expected in the near future and dealers are also interested in the prospects for extended equipments in connection with the proposed Nicholas Senn and Pullman schools. The Rumely-Wachs Machinery Company, which recently took over the assets of the McDowell, Stocker Company, has been rounding out its line of machine tools and now announces that it is handling the Becker Milling Machine Company millers, both vertical and horizontal; John B. Morris Machine Tool Company lathes and drills, Whitcomb-Blaisdell Machine Tool Company planers and the R. K. LeBlond heavy lathes.

The plant of the Home Stove Works, Chicago, was heavily damaged by fire last week. The loss was to the buildings and machinery.

The Midget Refrigerator Machine Company, Chicago, has been organized for manufacturing purposes by Morton L. Hamlet, John M. Spellman and John R. Lefevere, with a capital stock of $100,000.

A new power and manufacturing building is to be erected in Chicago at the corner of St. Clair and East Erie streets by Frederick M. Bowes, of the Bowes Realty Company. The building is to cost $150,000.

The Automatic Register Company, Chicago, has been incorporated with a capital stock of $25,000 to manufacture and deal in recording machinery by Asa G. Adams, Dwight F. Bobb and James B. Westcott.

The Calumet Car Company, East Chicago, has been organized with a capital stock of $75,000 to build railway cars. The following directors have been elected: A. A. McCalla, P. C. McCalla, D. W. Rogers, G. W. Lytton, W. L. Lytton, P. H. McCalla and A. H. Eroe.

The Ross Machine Company Lafayette, Ind., has been incorporated with a capital stock of $15,000 to manufacture automobile parts.

The Hammond Steel Barrel Company, Hammond, Ind., has been organized with a capital stock of $100,000. The following directors have been elected: J. H. LaFaye, N. A. Cunningham, C. F. Knowlton, F. H. Fox and W. A. Hill.

Smith & Holtern, Clinton, Wis., have arranged to move their plant to Janesville, Wis., where an additional building will be erected.

The Wisconsin & Michigan Railway, with offices at Marinette, Wis., is to rebuild its Peshtigo, Mich., car shops.

The Blake Specialty Company, Davenport, Iowa, has under construction a new plant, including a foundry building 30 x 100 ft. and a machine shop 75 x 80 ft.

The Wm. Galoway Company, Waterloo, Iowa, has just financed a bond issue, a part of the proceeds of which will be used for an addition to its plant.

The Elgin Canning Company, Elgin, Iowa, at a meeting of its stockholders decided to erect a new fireproof factory building to cost not less than $25,000.

A portion of the plant of the Hay Tool Mfg. Company, Council Bluffs, Iowa, was destroyed recently by fire, involving the loss of some machinery which will require replacing.

The Hawkeye Carriage & Auto Company has been formed at Cedar Rapids, Iowa, to engage in the manufacture of wagons and auto trucks, and a contract has been let for the erection of a one-story factory building.

The Waterloo Gasoline Engine Company, Waterloo, Iowa, is building an addition to its machine shop to be 120 x 400 ft. The extension of the factory is occasioned by the branching of this concern into the manufacture of light farm tractors and motor trucks.

The plant of the National Wood Works, Sioux City, Iowa, was recently damaged by fire to the extent of $30,000. A rebuilding of the plant and the replacing of the damaged machinery is planned.

The Emporia Railway & Light Company, Emporia, Kan., is expending about $35,000 for new machinery to enlarge its capacity.

The St. Joseph Plow Company, St. Joseph, Mo., has been reorganized coincident with the absorption of the Swanson Mfg. Company, under the name of the Swanson St. Joseph Plow Company, and has increased its capital stock to $200,000.

Plans have been prepared by the Churchhill Automatic Electric Clock Company for the erection of a new factory at Pueblo, Col.

The Midland Valley Railway has let the contract for a four-stall round house to be erected at Wichita, Kan., by the Hammond Construction Company of that city.

The Chicago Scrap Iron Company, First National Bank Building, Chicago, expects to purchase shortly three or four large shears for shearing scrap iron, and may also install a traveling crane for the purpose of handling scrap in its new yards on the Belt Railroad, Chicago.

Cleveland

CLEVELAND, OHIO, October 10, 1911.

The local machine tool market shows quite an improvement. A fair volume of business in small orders, mostly for single tools, was placed during the week. Buying is scattered among manufacturers of various lines. A fair proportion of the business was in good-sized tools. While inquiries are not numerous they are better than they have been for some time. The demand for second-hand machinery is moderate. Machine tool builders still find business light, but orders with some are more plentiful than they were a few weeks ago. The demand for heavy handling machinery is not active.

Encouraging reports can now be made regarding the general manufacturing situation in metal-working lines in this city, which appeared to remain about stationary for several months. That a better volume of orders is coming in is indicated by an increase of the number of men employed, small additions to the working forces in a number of the shops having recently been made. Automobile plants continue to run about full and makers of automobile parts and accessories are generally busy.

Proposals for pumps for the high-pressure fire-service pumping station in Cleveland will be received by the Director of Public Service October 24. The specifications provide for four horizontal multi-stage centrifugal pumps, each of a capacity of 2500 gal. per minute, to pump against a pressure on the discharge end of the pumps of 270 lb. per sq. in. The pumps will be electrically driven. Bids will be received at the same time for four motors, to be direct connected. The specifications provide for three-phase, 60-cycle, 440-volt induction motors. The electrical equipment will include transformers, regulating devices, current breakers, switchboards, switches, etc.

Bids have been received for the new plant to be erected by the Ohio Wire & Steel Company, Warren, Ohio, plans for which have been prepared by Henry & Murphy, architects, Akron, Ohio. The main building will be 80 x 475 ft., one section 375 ft. long to be

THE MACHINERY MARKETS

two stories. The building will be of brick and steel construction with steel window sash. There will be eight annealing furnaces, one baking furnace and complete equipment for drawing light and coarse wire.

The Thompson Electric Company, Cleveland, has been incorporated with a capital stock of $10,000 to manufacture the Thompson automatic cut-out hanger for electric lamps, now made by the Thompson Hanger Works, 337 Superior avenue, N. W. The company has been organized by the election of Allison J. Thompson as president and treasurer, and Jay E. Thompson, secretary.

The plant of the Morton Engineering Company, now located in Fresno, Cal., will be established in Galion, Ohio, provided citizens subscribe to $30,000 in stock. The matter is in the hands of the Commercial Club in that city. The company will make gas engines and tractors.

Sealed bids will be received by the Director of Public Service, Cleveland, October 16, for transformers for the municipal electric-light plant.

The Toledo Fiber Package Company, Toledo, Ohio, has secured a site for a large new plant, having purchased an acre of land in Auburndale.

The Electric Signal & Engineering Company, Alliance, Ohio, has been incorporated with a capital stock of $20,000 by D. C. Schultz and others.

Cincinnati

CINCINNATI, OHIO, October 10, 1911.

The machine tool business is not as good as it was last year at this time, although the inquiry just now, especially for single tools, is particularly encouraging. A large number of local tool builders are attending the National Machine Tool Builders' Association in New York this week, and it is understood that the majority of them will stay over a few days to look after their steadily increasing export trade.

The smaller units of electrical power equipment are in excellent demand, and one local firm reports the sale of over 500 motors during the past few months, solely for operating moving picture outfits.

The local steamfitters' strike has not yet been settled, and is causing some delay in the installation of heating and other equipment in both manufacturing establishments and residences.

The Cincinnati branch of the National Metal Trades Association will hold a business meeting October 17 in the Ohio Mechanics' Institute's new building. The apprenticeship committee will make a report recommending the abolition of the uniform rate paid apprentices and of the written contract. In lieu thereof it will be suggested that each company shall issue to its apprentices a written statement specifying the wages to be paid, length of service, work to be done in the various departments, and that instead of a bonus of $100 being paid the apprentice at the end of four years he shall receive each year a certificate for $25, bearing interest at 4 per cent., which is payable at the end of his four year's service.

The Favorite Stove & Range Company, Piqua, Ohio, is just completing a manufacturing building that is said to be one of the best of its kind in the Central West. The new structure is of reinforced concrete construction, 140 x 300 ft., with concrete floor and monitor type roof. Not all of the necessary equipment has yet been purchased.

The Cincinnati Veneer Company is reconstructing its plant at 1285 West Sixth avenue, recently destroyed by fire. It is understood that some woodworking machinery and other equipment is yet to be purchased.

It is rumored that the G. J. Brethaur Planing Mill Company, Cincinnati, is having plans prepared for a large addition to its plant in the western section of the city.

Some power plant equipment will be required by the Ohio Agricultural Experiment Station, at Wooster, Ohio, to be installed in a proposed addition to its power house. Proposals for the building will be received until October 27 by Charles E. Thorn, director.

The Southern Engineering Company has been incorporated at Bluefields, W. Va., with $10,000 capital stock, to handle mining and other machinery. J. E. B. Stewart, formerly sales agent at Bluefields for the Westinghouse Electric & Mfg. Company, is president of the new company.

The Hamilton Molding Sand Company, Hamilton, Ohio, has been incorporated with $3,000 capital stock. William B. Mayo is one of the principal incorporators.

The Kenton Electric Lighting Company, Kenton, Ohio, is reported to have plans under way for a new electric lighting plant.

The Crystal Ice Company, Newport, Ky., has been incorporated with $100,000 capital stock, and will probably soon commence work on a large ice plant. The incorporators are Joseph Adams, Ben. A. Adams and William Schmid.

The O. Armleder Company, Cincinnati, states that the current reports as to a proposed addition to its factory is incorrect, and that it has no intention of enlarging its facilities for manufacturing auto trucks just now.

The Kingery Mfg. Company, Cincinnati, has leased the factory buildings at 220-226 Pearl street, formerly occupied by the Incandescent Light & Stove Company, and will fit them up for the manufacture of ice cream freezers and other specialties.

The Taylor Heat & Light Company is a new incorporation at Columbia, Ohio, with $30,000 capital stock. The new company's plans have not yet been given out. W. A. Chambers and C. S. Lehman are named among the incorporators.

The Dean Mfg. Company, Newport, Ky., jobbing founder and manufacturer of internal combustion engines, has increased its capital stock from $100,000 to $150,000. The only contemplated addition to its plant is an erecting room, for which no equipment will be required. The company is incorporated under the Ohio laws.

The Mercantile Company, Dayton, Ohio, manufacturing stationer, is having plans prepared for a four-story addition to its plant. Frank H. Smith, Dayton, is consulting engineer.

The Allyn Engineering Company, Lyric Building, Cincinnati, announces that the contract for the new large factory at Winston-Salem, N. C., for the Mengel Box Company, Louisville, Ky., has been let to Howard Morse, Newport News, Va.

Detroit

DETROIT, MICH., October 10, 1911.

While no changes of marked importance have appeared in the local machinery market, dealers generally report an increased number of inquiries and the demand for machine tools and general shop supplies is being well sustained. The demand for engines and boilers is light. Some sawmill equipment is being purchased in small lots and continued activity is expected in this line owing to the number of mills which have suffered fire losses recently. Michigan railroads are planning numerous improvements, work on which will be started before the new year, but so far very little buying has been done by the roads. There is a widely scattered demand for second-hand equipment in single pieces both of standard and special nature. Plants engaged in the metal trades are quite busy and the demand for both iron and steel castings is fairly good. Factory building operations are reported to be more quiet than those of last month but a considerable amount of miscellaneous work is under way.

The Lake Superior Iron & Chemical Company has set aside $1,000,000 to be expended in improvements to its various plants and properties in northern Michigan. Of this amount $300,000 will be spent in the enlargement of the plant at Newberry, Mich., the additions to which will include a retort plant 70 x 400 ft. for the conversion of wood into charcoal, a central power house and a large saw mill, the latter being already completed. The headquarters of the company are at 432 Penobscot Building, this city.

The Detroit United Railway, owner of the city's electric railroad system, has purchased a site of 15 acres in the western part of the city with the view, it is understood, of erecting extensive car houses and a branch power plant.

Edmunds & Jones, manufacturers of automobile lamps, are constructing a two-story brick addition to their present factory. In common with other automobile accessory plants, the company is finding it necessary to increase the capacity of its factory.

The Ross & Young Machine Company, conducting a general machine shop, is increasing its facilities by the erection of a new factory building on Center street.

The Superior Cigar Mfg. Company has awarded the contract for the erection of a large new factory building, which will allow the company to greatly increase its output.

THE MACHINERY MARKETS

The National Iron Works has filed notice of an increase of capital stock from $5,000 to $25,000.

The Smith & Baldbridge Machine Company has increased its capital stock from $50,000 to $90,000.

The Miller Car Company, which recently organized to engage in the manufacture of automobiles, has purchased a site in the northeastern part of the city with a view of erecting a factory in the near future. Theodore Miller is president of the company.

Two Detroit companies have announced plans for enlarging their branch plants in Windsor, Detroit's Canadian suburb. The E-M-F Automobile Company will erect a three-story addition to its present factory, giving it 40,000 sq. ft. additional floor space, and the Dominion Stamping Company has had plans prepared for an addition, two stories, 80 x 150 ft.

The Solvay Process Company, operating soda, ash and coke plants at Detroit and Solvay, N. Y., has increased its capital stock from $8,000,000 to $10,000,000.

The State Railroad Commission has approved the articles of incorporation of the Michigan & Indiana Traction Company, which has been organized with a capital stock of $750,000 for the purpose of building an interurban railroad south from Battle Creek, Mich. to Indiana points. P. A. Hines of Chicago and H. P. Loveridge of Coldwater, Mich., are president and secretary, respectively, of the company.

Considerable improvements are to be made to the municipal electric light plant at Union City, Mich., including the purchase of a new generator and engine.

The Spring Valley Mining Company, which operates an iron mine near Iron River, Mich., has under construction an engine and boiler house 50 x 103 ft. and a dry house 24 x 100 ft. and will install a hoist engine, air compressor, generator and two 150-hp. boilers in the new buildings.

The Calumet & Hecla Mining Company will soon award its semi-annual contract for steel and machinery supplies and reports from Hancock, Mich. are to the effect that a number of steel manufacturing companies have sent representatives to Hancock as a result.

The Cogswell Motor Car Company, Grand Rapids, Mich., has filed articles of incorporation giving its capital stock at $10,000. The company will manufacture both automobiles and auto parts.

Fire which destroyed the stave and hoop mill of the T. E. Jackson Company at Pellston, Mich., caused a loss of $25,000. It is expected that the company will soon take steps to rebuild

A receiver has been appointed to take over the affairs of the Van-L. Motor Car Company, Grand Rapids, Mich. The company was only recently organized and had done little in a manufacturing way.

Frank Burt, president of the Kalamazoo Mfg. Company, is organizing a company for the manufacture of suction street cleaners. The cleaner is an invention of Mr. Burt and will be constructed along entirely new lines.

The Standard Flaked Food Company of Owosso has accepted plans for the construction of a new factory and the building will be immediately erected. H. P. Davies is president of the company.

Jacob C. Fetter has purchased a half interest in the Burridge Shear Company, Sturgis, Mich. The company reports an excellent volume of business, including a considerable export trade.

The E-Z Suction Cleaner Company has been organized at Saginaw, Mich., with a capital stock of $50,000 and will engage in the manufacture of vacuum cleaners

The city of Baraga, Mich. will receive bids until October 16 for the construction of a waterworks system and electric light plant at an estimated cost of $30,000. The Oscar Clausen Engineering Company is the engineer in charge

Indianapolis

INDIANAPOLIS, IND., October 10, 1911.

The Hackedorn Construction Company, Indianapolis, has increased its capital stock from $20,000 to $50,000.

The Sanitary Mfg. Company, Indianapolis, has been incorporated with $25,000 capital stock to manufacture sanitary devices. The directors are L. D. Shearer, Frederick Grumme and George Urscel.

The Eckart Carriage Company, Auburn, Ind., has increased its capital stock from $100,000 to $200,000.

The Hydro-Electric Light & Power Company has been incorporated at Connersville Ind., with a capital stock of $100,000 to furnish light and power The directors are E. D. Johnson, L. R. Johnson and W. E Lowe.

The Indiana Limestone Company, Bedford, Ind., has been incorporated with $250,000 capital stock to quarry stone. The directors are Arthur Schwarzenbach, C. C. Ingalls and Alva Seyboldt.

The M. D. Moore Mfg. Company has been organized at Waveland, Ind., to manufacture can openers The directors are M. D. Moore, J. W. Robertson and J. K. Sharp.

The Ft. Wayne Auto Motor Company, Ft. Wayne, Ind., has increased its capital stock from $50,000 to $100,000

The Forse Mfg. Company, Pendleton, Ind., manufacturer of automobile parts, has increased its capital stock from $25,000 to $40,000.

The Malleable Steel Range Company, South Bend, Ind., has been sold by Harry A. Engeman, Jr., Joseph D. Oliver and Lewis C. Matthews to W. L. Kiser and Jacob Woolverton.

The Indiana & Michigan Electric Company, South Bend, Ind., is rebuilding its large power plant here at a cost of about $500,000.

The Hoosier Refrigerator Company has elected the following officers: C. W. Reed, president; J. C. Taler, Galesburg, Ill., vice-president: Harry Ader, Peru, secretary, and W. S. Pond, Peru, treasurer.

The Rifle Mfg. Company has been organized at Valparaiso, Ind., and incorporated with a capital stock of $100,000 to manufacture washing machinery. The directors are W. W. Rifle, Kempton Ellis and H. B. McCoy.

The Indiana Rolling Mill Company, New Castle, Ind., by action of its directors, has decided to rebuild its shovel plant destroyed by fire a few months ago

The South

LOUISVILLE, KY., October 10, 1911.

The outlook, as the result of increasing business during the past week or ten days, is much more cheerful from the standpoint of local machinery manufacturers and dealers. A good deal of business is being closed, and plenty of prospects are in the market. A good many orders for power plant equipment are being received from going concerns, indicating that dealers and manufacturers are not being compelled to depend entirely upon new enterprises for their sales. Boilers, quarrying equipment, refrigerating machinery and contractors' outfits are leading items in the machinery market at present. There is also a good demand for woodworking machinery.

Local steel and iron men who attended the recent convention of carriage builders at Atlantic City, N. J., have returned with reports of optimistic feeling among the carriage interests. They are consuming more axles and other material now than ever before, and as many of the manufacturers have gone into automobile making and others have emphasized their popular-priced vehicles there has not only not been a loss as a result of the encroachment of motor cars, but an actual gain in business following it.

The Louisville Soap Company has been making some additions to its power plant, installing three boilers made by the Henry Vogt Machine Company, Louisville. E. D. Morton & Co., Louisville, installed three Williams improved safety feed-water regulators on these boilers.

The Louisville Railway Company is installing some additional coal bins at its power house and has purchased the necessary conveying machinery. D. X Murphy & Bro. are the architects.

Attention is being given a project of Mayor Head, of Louisville, to build a power canal from a point on the Ohio River east of Louisville, to a point on the river below the city, which would give a fall of 27 ft. A member of the city engineering department has been detailed to look into the feasibility of the project, and the Engineers' and Architects' Club of Louisville is to discuss it.

The O. K. Laundry, Louisville, of which William Beha is manager, is in the market for a 100-hp. boiler

J. J. Blocker, of the Owensboro, Ky., Steam Laundry, is installing a power plant of considerable dimensions for the purpose not only of operating his laundry but serving other interests as well.

The Roberts & Schaefer Company, Chicago, has been given the contract to design and build the new

THE MACHINERY MARKETS

locomotive coal-handling plant of the Kentucky & Indiana Terminal Railroad Company, Louisville. It will have a capacity of 500 tons.

The Norman Woodworking Company, Louisville, has let a contract to the Berlin Machine Works, Beloit, Wis., for the full equipment of saws, planers, etc., which it will require.

By reason of the installation of a large amount of machinery in its Louisville factory, the Henry Vogt Machine Company has equipped a complete forging plant, has doubled the capacity of its ice can department and also doubled the capacity of its machinery erecting department. Business with the company is reported to be excellent.

The Kentucky Electric Company, Louisville, has applied for a franchise to manufacture and distribute steam for heating in the central district of the city, and the ordinance is now pending in the General Council. The company is now completing the construction of an addition to its power plant, but if it succeeds in getting the franchise it will erect another stack and install additional boilers. A large amount of wrought iron piping will also go underground in serving the prospective patrons of the plant. The company has let contracts to the Robins Belt Conveying Company, Cleveland, and the Orten-Steinbrenner Company, Chicago, for the conveyor and crusher, respectively, which are to be installed in the coal handling section of its plant.

The Martin's Fork Coal Company, Pineville, Ky., has been incorporated with $40,000 capital stock by W. G. Cheif, Ben F. Unthunk and H. H. Tuson. This is one of the coal development projects in the southeastern Kentucky district.

The Kentucky Traction & Terminal Company, Lexington, Ky., is to build for the Lexington Utilities Company, a subsidiary concern, an ice plant in connection with its own power house, for the construction of which contracts have been let. The ice factory will have a capacity of 150 tons.

It is reported that the plant of the Maysville, Ky., Foundry & Engineering Company, which has been idle for several months, will be purchased by a company which is being organized for the purpose of manufacturing steam and hot water heating plants. New York interests are to put up $45,000 of the proposed $75,000 capital stock, and Maysville business men will subscribe the remainder. Among those interested are George Longnecker, W. W. Ball, Horace Cochran and John M. Hunt.

The Planters' Warehouse Company, Maysville, Ky., will erect a rehandling tobacco warehouse. The equipment of the plant will consist of hydraulic presses and other machinery.

The Hillman Sand Company, Limestone, Ky., will install a rock crushing outfit with a capacity of 200 tons a day. The company was recently organized with $10,000 capital stock. C. W. Hillman is president and general manager.

R. A. Babcock has purchased the machine shop of W. I. Garrett at Providence, Ky. The concern will be continued along the same lines as heretofore, manufacturing cars for use in coal mines and smoke stacks, and doing repair work. Mr. Babcock has been connected with the Providence Mining Company.

Orangeburg, Ky., near Maysville, is considering the erection of a small electric light plant. Arrangements may be made to secure connections with some other plant.

The Prestonsburg Electric Light Company, Prestonsburg, Ky., has filed amended articles of incorporation increasing its capital stock from $6,000 to $10,000.

McKenzie R. Todd, state inspector and examiner has reported on the Kentucky State University at Lexington, recommending the construction of a plant to supply power, heat and light for the buildings. The recommendations will be submitted to the Legislature at its session in January. Henry S. Barker is president of the university.

P. P. Mitchell, Edmonton, Ky., is constructing a flour mill.

The new plant of the Vulcan Steam Shovel Company, Evansville, Ind., is to be completed by December 1, it is reported.

B. W. Chapman, Alamo, Tenn., will erect an electric lighting and power plant.

D. F. White, J. D. Stoltz and associates, Adams, Tenn., are organizing a company for the establishment of an electric light plant.

The foundry of the Harriman Mfg. Company, Harriman, Tenn., was destroyed by fire with a loss of $7,000. It is to be rebuilt immediately.

The Wheland Machine Works, Chattanooga, Tenn., and the Chattanooga Machinery Company, Chattanooga, Tenn., have been consolidated, effective November 1, under the name of the Wheland Company, which will have a capital stock of $1,000,000, according to an official announcement. The company will be one of the most important manufacturers of sawmill equipment in the world. The Wheland Machine Works has been in operation for 15 years, and the Chattanooga Machinery Company has been in existence for 25 years. Plans for improving the present plants are now under way. New equipment will be added and the arrangement of the plants thoroughly modernized. In addition to the line of standard machines which the company will market, it will make a feature of special woodworking equipment. The two new plants cover a total of 23 acres.

Arthur C. O'Connor, Detroit, is reported to be planning a plant in Memphis, Tenn., for the purpose of utilizing the wood ashes which are now the waste of sawmills which use dust and scraps for fuel. It is intended to manufacture certain chemicals with the ashes.

It is reported from Chattanooga, Tenn., where the General Electric Company is opening branch sales offices, that the corporation has in view ultimately establishing a factory there for the manufacture of goods sold in Southern territory.

An abbatoir is to be built at Vicksburg, Miss., according to plans which have been outlined by leading business men. Power and refrigerating equipment will be required.

The Gulfport & Mississippi Coast Traction Company, Gulfport, Miss., has announced that additional shops will be erected at Gulfport. The cost of the machinery will be $5,000.

A contract has been let for the erection of the building of the Farmers' Cotton Oil & Fertilizer Company, Huntsville, Ala. Machinery is now being purchased.

Smith's Ideal Range Corporation, Lawrenceville, Va., has been incorporated with $50,000 capital stock. B. W. Smith, LaCrosse, Va., is president, and H. C. Wesson, Lawrenceville, is vice-president. A plant for the manufacture of stoves will be erected at once.

John Martin, Robert McMillan and others have secured a waterworks franchise at Clarksville, Ga., and will probably build a plant.

The city of Jellico, Tenn., will receive bids until November 1, through Walter G. Kirkpatrick, engineer, Jackson, Miss., for furnishing machinery and materials and for the construction of a system of waterworks, comprising 12½ miles of mains with hydrants.

The Virginia Railway & Power Company, Richmond, Va., will erect a new power house with an initial capacity of 12,000 hp., but additional units will be installed later. Other improvements will be made.

Auburndale, Fla. will construct a plant for the manufacture of electric light and power. A system of waterworks will also be built.

Scottsboro, Ala. contemplates constructing a water plant. H. B. McCrary & Co., Atlanta, Ga., are the engineers in charge.

Jacksonville, Fla. is planning the expenditure of $40,000 for the installation of a pump and making other improvements in its waterworks system. The municipality has also voted a bond issue for improving and enlarging the electric light plant.

St. Louis

ST. LOUIS, Mo., October 7, 1911.

The month of October opened with some encouragement in the machine tool market as a result of the placing of some very fair orders during the past week on deals that have been pending for some time. No new business of especial moment has come out since the last report, but it is assured that some good inquiries are to come soon from sources not yet prepared to give out the specifications. Generally the dealers in the market see improvement in conditions, but expect the upturn in business to be gradual.

The Huttig Sash & Door Company, which was burned out some months ago and is now rebuilding, has out a list of some 20 wood-working machines for the equipment of the new plant. This deal is expected

THE MACHINERY MARKETS

to be acted on during the coming week. At present the Huttig company is operating the Frye plant which it bought after the fire and filling orders for both concerns from that source.

The Sanitary Washing Machine Company has its new factory building about completed, and will be in the market very soon for several wood-working machines.

The Fulton Iron Works this week placed its order for a heavy 10-ft. reversing motor planer, which is the first tool ordered for the big new plant being built for the company in the western suburbs of the city.

The Mathews-Davis Boring Tool Company has its new plant well under way, and has made selection of most of its new tools, which are all special manufacturing machines. No standard tools of any consequence will be needed.

The Board of Public Improvements of St. Louis the past week let heating-equipment contracts aggregating $18,221 for public buildings to the John B. Hughes Heating Company and to Edwin P. Ambler.

The Central Mill & Elevator Company, Bloomington, Ill., has increased its capital stock from $17,000 to $25,000 for the purpose of enlarging its equipment.

Webster Groves, an incorporated suburb of St. Louis, will vote October 28 on a bond issue of $75,000 for the enlargement of the water-works system of the city.

The Racine Mining Company, Joplin, Mo., has been incorporated with $18,000 capital stock by Clyde H. Scott, H. W. Dale and Frank W. Dale, and will install mining equipment on its property.

The Edwardsville Gas Company, which is to install a city gas plant at Edwardsville, Ill., across the Mississippi from St. Louis, has been incorporated with $100,000 capital stock at Evansville, Ind., where the owners reside. They are P. J. Scheller, Henry Dannettell and H. I. Peckinpaugh.

The smelter at Nevada, Mo., operated by the late A. B. Cockerill, which has been closed about four years, is to be overhauled, new equipment added and operations resumed, capitalists of the Webb City, Mo., zinc district furnishing the money.

Work has been begun on the addition to the plant of the Dorris Motor Car Company. It consists of a building 200 x 200 ft., three stories, adjoining the original factory. It will be fireproof and will cost $100,000 exclusive of the mechanical equipment, which will treble the capacity of the present plant.

The Busch-Sulzer Bros.-Diesel Engine Company, controlling the Diesel crude-oil motor patents for the United States, has optioned land for a plant in St. Louis. The company has a capital stock of $2,100,000, and succeeds the American Diesel Engine Company. It is controlled by the Busch brewing interests. Construction of the plant will begin with the closing of the land deal. It will provide work for 600 employees when completed.

The Alvey Bros. Machinery Company, with $12,000 capital stock, has been incorporated in St. Louis to do a general machinery business. The stockholders are John A. Alvey, Philip C. Alvey, William F. Alvey and Hugh H. Alvey.

The Wrought Iron Range Company, St. Louis, Mo., has had permits issued covering the building of its new plant comprising a two-story factory, 313 x 304 ft., cost $163,000; a one-story blacksmith shop, 60 x 134 ft., cost $10,000; a one-story boiler house, 43 x 68 ft., $5,000, and other buildings.

The American Zinc, Lead & Smelting Company, Carthage, Mo., has plans prepared for the erection of a 500-ton mill near Carterville.

The American Aviation Company, Louis Mitchell, president, has contracted to locate a plant to build monoplanes at Little Rock, Ark.

Texas

AUSTIN, TEXAS, October 7, 1911.

Improved conditions are noted in the machinery trade in Texas and the Southwest. Many good orders are being placed for various lines of machinery, particularly for irrigation projects and mines. There is also a stimulus in the demand for machinery for manufacturing plants. The situation in Mexico is improving now that the recent elections passed off quietly. It is believed that there will be a great demand for American-made machinery in that country during the next several months.

Capt. J. G. Smyth is installing a pumping plant to irrigate 400 acres of land near Uvalde.

The Commissioners Court of Chambers County has ordered an election to be held October 21 to determine whether the proposed Trinity River irrigation district shall be organized. The district is to comprise 75,000 acres of land.

The recent election on the proposition of forming an irrigation district in Cameron county, to comprise 85,000 acres of land resulted favorably. The district has power to levy taxes and issue bonds for the purpose of constructing the canal and ditches. Bonds will be issued on the proposed improvement as soon as the surveys are finished. The Board of Directors of the district are A. T. Woodhous, James La Gro, W. A. Boss, A. M. Deyo and J. C. Van Kirk of Brownsville.

S. E. Parsely and W. F. Payne have formed the Parsely-Payne Mfg. Company to manufacture a newly patented cotton chopping machine at Crockett. They have also purchased the wood-working and machine shops of H. A. Yeager.

Joe S. Lewis will install a large irrigating pumping plant near Gonzales to provide water for 500 acres of land.

The Commissioners Court of Cameron county has called an election for October 21 to vote on the proposition of organizing a drainage district in the San Benito section to embrace 100,000 acres. The estimated cost of the proposed drainage system is $475,000, the surveys having already been made.

Applications have been made to the Commissioners' Court of Brazoria county for the creation of a drainage district in the Blessings section to embrace about 50,000 acres of land. An election will be called to vote on the proposition of issuing bonds for making the proposed improvements. A. R. Leckie is the engineer in charge of the survey.

The City Commission of Dallas has let the contract to the Harris Air Pump Company to equip three wells in Oak Cliff with pumping machinery.

At Archer City a bond issue of $12,000 has been authorized for the purpose of installing a waterworks system.

The City Council of Cleburne has under consideration the issuing of bonds to install a new waterworks plant.

The City Council of Artesia, N. M., has under consideration the construction of a sewer system.

The Alamogordo Improvement Company, Alamogordo, N. M., will construct a reservoir in La Luz canyon sufficient to irrigate 18,000 acres of land.

The Pecos Valley Water & Irrigation Company has been formed at Arno, with a capital stock of $50,000. The incorporators are R. G. Werner, R. S. Johnson and F. E. Knaup.

The city of Austin has just finished a complete survey for a proposed extensive sewer system and the proposition of issuing bonds for the proposed improvement will be voted on at a date not yet fixed.

The Rio Grande Wax Company, with a capital stock of $25,000, will install a large plant near Sanderson, for the manufacture of wax from the candelilla weed. The incorporators are J. G. Griner of San Antonio, Oscar Pacius of Sanderson and Dr. F. W. Reeve of Sanderson.

Clarke & Burge of Chicago, will install a modern electric light plant and waterworks system at Menard.

W. E. Schell & Co. will soon begin the installation of a complete system of waterworks at Port Lavaca. It will develop an artesian supply of water for the purpose.

New machinery, including a 200 k. w. direct-connected generator and a 300-hp. engine, will be installed in the municipal light and power station of Denton, at a cost of 10,000.

The city of Mexia will install a new engine and dynamo in its light and power plant.

The Port Lavaca Light & Power Company of Port Lavaca, will install a new 125-hp. engine and make other extensive improvements to its plant.

The Atlas Metal Works, Dallas, has sold its present plant and contemplates the erection of a new and larger factory.

The San Benito Cotton Gin Company, San Benito, has been incorporated by W. B. Alexander, T. J. Christa and Otto Ebeling, with $30,000 and will install a ginning equipment at once.

The Roswell Light & Gas Company, Roswell, N. M., will enlarge its plant to 1500 hp. It will install

THE MACHINERY MARKETS

two new 750-hp. producer gas engines, and the new plant will be so constructed that a second unit of similar size may be easily installed.

The Santa Gertrudes Mining Company, Pachuca, Mexico, will install two more tube mills at its property at San Guillermo.

The Veta Colorado Mining & Smelting Company, Minas Nuevas, state of Chihuahua, Mexico, will enlarge its mill at Minas Nuevas from 350 tons to about 600 tons daily capacity. Firman Smith of Knoxville, Tenn., is at the head of the company.

The Shattuck Mining Company of Bisbee, Ariz., will erect large reduction works at Douglas, Ariz.

The Globe Western Copper Company will erect a 100-ton mill at its mine near Miami, Ariz.

The Big Pine Mining Company will install a 100-ton cyanide plant at its mine 10 miles south of Prescott, Ariz.

Noah Allen, of Brownsville, is promoting the organization of an irrigation district near Cotulla, with the view of reclaiming about 60,000 acres of land. The work will involve the erection of a dam across the Nueces River and the construction of a large system of canals.

The Pacific Coast

SAN FRANCISCO, CAL., October 3, 1911.

The outcome of the municipal primary election is regarded with great satisfaction by commercial and industrial interests, and is considered a ground for some encouragement by local machine shop operators. Merchants and agents handling machine tools still report a rather quiet market, though a fair volume of business has been closed the past week. Few of the orders recently booked include more than two or three tools of ordinary stock design, and new inquiries coming up are of little importance.

Woodworking equipment has not been especially active of late, but small purchases are being made by a number of logging interests, in preparation for next season's work. Electrical machinery of all descriptions is in demand, and a few large orders have recently been placed. Plans which have been practically completed for extensions of electric traction lines in many parts of the state assure an active market in this department for the coming year. Aside from a fair demand for small hoists, pumps and air compressors, there is not much movement of mining machinery, and quarry equipment is also rather quiet.

Tools have been purchased for two new automobile factories. The California Motor Car Company of Oakland has ordered three lathes, two drills, a shaper, two grinders and a small portable crane. The Lewis Motor Truck Company, Gustave Brenner president and Chas. B. Lewis manager, has secured a location in San Francisco and made arrangements for its equipment, though the list of tools purchased is not made public. Several tools have also been purchased by the International Excavator Company, which is starting a factory for automatic excavators at Hayward, Cal.

A number of tools formerly used by the Risdon Iron Works are said to have been sold to the Government for use at the Mare Island Navy Yard. A new cupola has also been purchased for the Navy Yard.

The Pacific Coast Steel Company has completed its plant at South San Francisco, but has not yet started operations, owing to delay in the delivery of its first shipment of Chinese pig iron.

The United Properties Company, which controls some of the leading public service enterprises of Oakland, Cal., has placed orders for electrical equipment said to amount to about $2,000,000, though nothing is given out as to the nature of the material ordered. It is known, however, that important extensions are to be built shortly to the San Francisco, Oakland & San Jose Railroad, an allied concern.

The city of Los Angeles, Cal., is preparing to install a number of cranes on the wharves in Los Angeles harbor.

A contract has been let for an electric light and power plant at Fort Miley, Cal.

The San Francisco Automatic Machinery Company has been incorporated in San Francisco, with a capital stock of $100,000, by J. G. Rapp, G. L. Bender and T. J. O'Brien.

The California Pipe Line Machine Company has been incorporated in San Francisco, with a capital stock of $20,000, by W. L. Norris, J. J. and P. H Mahoney.

The Santa Ana Co-operative Sugar Company, Santa Ana, Cal., has placed a contract for beet sugar machinery, amounting to $512,000, with the Dyer Company of Cleveland, O.

The town of San Mateo, Cal., has placed an order for a municipal pumping plant with the United Iron Works.

Figures have just been received for a municipal pumping plant for the town of Dorris, Cal. Figures were taken on both electric and gasoline pumps.

Sloan & Robson, engineers, San Francisco, will receive bids until October 18 for the construction of a municipal waterworks system for the town of Exeter, Cal., which will consist of a 100,000-gal. steel tank and tower, motor driven centrifugal pumps, water mains, etc. The cost is estimated at $40,000.

A rock crushing plant is to be installed at the East Side Jail, Los Angeles.

The Illinois-Pacific Glass Company, San Francisco, has placed an order with the Geo. E. Dow Pumping Engine Company for a lot of air compressing equipment to be used in connection with glass blowing machines.

The Oliver Continuous Filter Company, San Francisco, has received orders from Mexican mining firms for two large filtering machines.

The California Glass Insulator Company has purchased a site near Long Beach, Cal., and expects to install a manufacturing plant shortly.

Bids have been called for on a lot of pumping machinery for the town of Whittier, Cal.

The Enterprise Foundry Company, San Francisco, has purchased a 20-acre tract at Richmond, Cal.

The Dempsey Concrete Machinery Company has been incorporated at Phoenix, Ariz., with a capital stock of $50,000, by J. T. Dempsey, P. W. Carey and others.

The Coin Controlled Lock Company, organized to handle a lock invented by W. S. Farnsworth, Petaluma, Cal., is planning to install a factory in San Francisco.

It is reported that the Dry Creek Gold Mining Company will build a gold dredge near Cottonwood, Cal.

The Livermore Fire Brick Company, Livermore, Cal., is preparing to install a repress.

C. H. Mitchell, California representative of the Berlin Machine Works, has moved from the old Henshaw-Bulkley quarters to 155 Fremont street, where a full stock of Berlin woodworking machines will be carried.

The Great Western Power Company is setting up a rock crushing plant, including a No. 8 Gates crusher, at its Big Meadows dam site. The equipment was purchased about two years ago, but has never been used.

Ford & Malott are preparing to install a gravel cleaning plant near Niles, Cal.

The California Malleable Iron Company, recently organized to take over the plant of the Pacific Malleable Company at Riverside, Cal., is contemplating an extensive addition.

The Savage Tire Company is about to erect a factory for the manufacture of steel automobile tires at San Diego, Cal. This company was recently incorporated with a capital stock of $1,000,000 and a tract of land was acquired on which a plant 145 x 600 ft. will be built.

The Berlin Machine Works, Beloit, Wis., has let contracts for the initial construction work for its new plant at Portland, Ore.

Western Canada

WINNIPEG, MAN., October 7, 1911.

The announcement was made recently that L. B. de Laitte, the French inventor, would proceed at once with the erection of a factory for the manufacture of so-called automatic gas in Vancouver. A plant to cost $500,000 to manufacture the machinery required is proposed and it is estimated this will give employment to 300 workmen. It is claimed that by the automatic process gas can be produced nearly one-third cheaper than at present.

E. W. Davies, Calgary, Alberta, is considering the idea of starting a nail factory in Medicine Hat, Alberta.

Harry Twill and N. H. Martin, both of Medicine Hat, Alberta, are negotiating with that municipality

THE MACHINERY MARKETS

with the object of establishing there a plant to manufacture gas-well drilling machinery, and heavy forgings.

The International Harvester Company of America is considering a proposal to erect a warehouse at North Battleford, Sask.

The Wallace Shipyards Company, North Vancouver, B. C., has taken out a permit for an extension to its machine shops.

The McLaughlin Carriage Company, Oshama, Ont., is preparing to extend its garage at Winnipeg, Man.

The Crescent Creamery Company has plans under way for a new building in Winnipeg to cost $280,000.

The Canadian Pacific Railway's Western shops are to be located at Calgary, Alberta.

Sealed tenders marked Tender for Power Station will be received by G. W. Robinson, secretary-treasurer of the city of Lethbridge, Alberta, up to and including November 24, 1911, for the supply, delivery and erection of equipment for the Power Station Extension, including boilers and accessories, mechanical draft and economizers, steam turbo-generator set and condensing equipment, steam engine driven exciter, sub-station equipment. Plans and specifications can be obtained from Arthur Reid, superintendent engineer, city of Lethbridge.

The Brandon Electric Light Company, Brandon, Man., plans the erection of a one-story addition, brick and steel, concrete foundation, steam heating, electric lighting, cement work, structural iron. Structural alterations are being made preparatory to the installation of large new dynamo. J. E. Mooring is superintendent.

The Alberta Sewer Pipe Company, Calgary, Alberta, has started manufacturing operations.

The Cram Lumber & Trading Company, Vancouver, B. C., is about to start another mill, Lapperton being the point selected.

It is the intention of the Power Committee of the Portage la Prairie, Manitoba, Council to waste no time in the erection to the addition to the municipal power plant which the city recently took over from the Central Electric & Gas Company. The work will be superintended by Alderman W. P. Ritchie, who erected the present plant.

The Saskatchewan River is being tested at Saskatoon as to its power possibilities in connection with the projected new dam. Mr. Richardson, of New York, consulting engineer, is supervising the test.

Cecil B. Smith, consulting engineer of the Winnipeg power construction department, has in hand plans for the erection of a $250,000 power plant at Prince Albert, Saskatchewan.

The Life Saver Lock Company of Minneapolis has purchased a site in Winnipeg, and will establish a branch factory here.

The Hurst Engineering & Construction Company, Ltd., Winnipeg, has incorporated with a capital stock of $20,000. Ralph B. Pratt, architect; Harold Edwards and D. A. Ross, civil engineer, all of Winnipeg, are among the incorporators.

A bylaw has been passed by the rate-payers of Davidson, Saskatchewan, to raise 10,000 for the purchase and installation of an electric light system. A. J. Robertson is secretary-treasurer of the town.

A bylaw will be submitted on October 16 in Dryden, western Ontario, to authorize the town to enter into an agreement with the Dryden Timber & Power Company to sell Dryden Park to the said company, to exempt it from taxation for ten years and to fix the rate of assessment at $60,000 for that term, in return for which pulp and paper mills will be erected.

Eastern Canada

TORONTO, ONT., October 7, 1911.

The state of trade continues to reflect the very favorable underlying conditions. The wealth produced by the natural industries, the settlement of the tariff laws, the confidence of British investors and the general satisfaction of banking interests with the outlook are all on the side of continued healthy activity in trade and industry. There seems to be no cloud on the Canadian horizon. The bent toward speculation is being corrected by the influence of bankers and the chief dispensers of mercantile credit. Undoubtedly the speculative tendency was a source of danger, and, had the crops of the west not been unusually good, there might have been serious trouble on account of the commitments of business men to ventures in fields outside of that to which their enterprise properly belonged. Competition is likely to be keener in the next twelve months than it was in the last. Every important contract for new equipment now brings tenders from manufacturers outside of the country. Contracts which a few years ago would not have been looked upon by American companies as worth troubling about are now drawing bids from the other side of the line. British houses, too, are increasing their interest and extending their business here. The work done by the British Trade Commissioner established at Montreal, with correspondents in the other important centers of the country, is proving fruitful in two ways. First, it is stirring up the interest of British exporters, and it is causing many of them to establish agencies here. Second, it is leading to the establishment of British branch factories. There has been a marked renewal of inquiries by American manufacturers who are considering the locating of branches in Canada. There is evidently an idea that the tariff will not be lord. Assuredly the steady importation of British capital is encouraging American manufacturers to plant branches here.

A contra-flow condenser manufactured by Richardson & Westgarth, Hartlepool, England, has been installed for the Nova Scotia Steel & Coal Company, North Sydney, N. S., by Peacock Bros., Montreal.

It is expected that in the January elections by-laws will be submitted to the ratepayers of Toronto for the construction of a tube railway system to cost about $5,000,000 and for a viaduct to cost $1,500,000.

The St. Catharines Broom & Brush Company, St. Catharines, Ont., is proposing to establish a factory in Calgary, Alberta.

A proposal to erect a plant for assembling automobile parts is before the Town Council of Lindsay, Ont. Parties representing the Ohio Automobile Company are said to be identified with the project.

The Automatic Wood Turning Company, St. Romuald, Que., is preparing to double its manufacturing capacity.

Canada Steel Foundries, Welland, Ont., is planning large additions to its plant.

The plant the John Deere Plow Company, Moline, Ill., proposes to erect in Welland, Ont., is to cost $1,000,000.

J. Kiplin, local manager of the Imperial Oil Company of Canada, states that his company will immediately extend its refining plant at Sarnia to an extent involving the expenditure of at least $500,000.

The MacIntyre Mining Company, Porcupine, Ont., will install a 40-stamp mill, spending altogether about $250,000 on the plant.

At a meeting of the directors of the Porcupine Gold Mines, Porcupine, Ont., it was decided to erect a 100-ton mill south of the Hollinger.

The Porcupine Mohawk Company at Porcupine, Ont., one of the newer companies, is planning the installation of a shot drill on its property.

A. Wallberg, of the British-Canadian Power Company, started work that will eventually result in completion of the power plant at Wawaitin Falls on the Mattagami River, northern Ontario, and the supplying of power to the Porcupine mines. Twenty-five men have commenced the building of camps that will later accommodate the force of 250 men who will build the big dam and install the machinery for a plant that will develop 10,000 hp. Supt. McNabb will, after the construction of the camps, build a canal 900 ft. long.

The A. E. White Machine Works, Eau Claire, Wis., which is erecting a branch factory at Windsor, Ont., will probably be in the market about January 1 for equipment for this plant, including a 14- or 16-in. x 8 ft. engine lathe, complete with quick change gear, hollow spindle, draw back bar and collets up to ⅞-in.; one drill press about 22-in., with power feed reverse motion and tapping attachment; one Yankee drill grinder to grind up to 1¼ in.; one double end emery grinder to carry 12-in. wheels; one buffing and polishing head to carry 12-in. wheels; one plain milling machine with table travel of 24-in.; one heating and tempering oven; one forge with a capacity to handle steel 3½-in. to 4-in. diameter, and also some transmission equipment. This equipment may be new or second-hand but must be of improved patterns.

THE MACHINERY MARKETS

Government Purchases

WASHINGTON, D. C., October 9, 1911

The United States Engineer office, San Francisco, Cal., will open bids December 27 for the construction and equipment of two steel 20-in. pump dredges.

The United States Engineer office, Washington, will open bids October 23 for furnishing one 30-hp. 5-drum hoisting engine.

The office of the Supervising Architect, Treasury Department, Washington, will open bids October 25 for one gas engine and electric generator for the United States post office, London, Ky.

The Paymaster General, Navy Department, Washington, will open bids October 13, under schedule 3947, for two engine lathes, and on October 24, schedule 3946, one 21-in. turret lathe; schedule 3966, one die sinking machine, one anchor windlass with engine complete, one direct current motor, two hoisting and rotating equipment and five 3-hp. motors; schedule 3082, one double-back geared lathe, one pipe-threading machine, four ash-hoisting machines and two 50-kw. turbo-generating sets.

The Commissioners of the District of Columbia, Washington, opened bids September 28 for furnishing and installing one steam engine and one electric generator in the Armstrong Manual Training School, Washington, as follows:

Item 1, engine, Harrisburg Foundry & Machine Works, Harrisburg, Pa., $1,394; National Electrical Supply Company, Washington, D. C., $1,710; Thomas E. Bashor, Baltimore, Md., $1,473; Buffalo Forge Company, Buffalo, N. Y., $1,575; Carroll Electric Company, Washington, D. C., $1,662; A. D. Granger & Co., New York, $1,823 and $1,750; Ames Iron Works, Baltimore, Md., $1,147; Ball Engine Company, Philadelphia, Pa., $1,358; Ridgway Dynamo & Engine Company, Ridgway, Pa., $1,450; John D. Adt, Baltimore, Md., $1,389; McCay Engineering Company, Baltimore, Md., $1,420; American Engine Company, Bound Brook, N. J., $1,709.

Item 2, one electric generator—McCay Engineering Company, Baltimore, Md., $1,100; National Electrical Supply Company, Washington, D. C., $1,035; Thomas E. Bashor, Baltimore, Md., $893; General Electric Company, Baltimore, Md., $997; Carroll Electric Company, Washington, D. C., $1,028; Western Electric Company, New York, $973.50; A. D. Granger & Co., New York, $1,200; Burke Electric Company, Erie, Pa., $1,045; Sprague Electric Works, New York, $1,010; Ridgway Dynamo & Engine Company, Ridgway, Pa., $1,100; John D. Adt, Baltimore, Md., $1,244.

Item 3, engine and generator complete—Walker & Keppler, Philadelphia, Pa., $2,676.50; Ridgway Dynamo & Engine Company, Ridgway, Pa., $2,450; McCay Engineering Company, Baltimore, Md., $2,470.

The Commissioners of the District of Columbia, Washington, opened bids October 2 for furnishing one 16-in. heavy back-geared motor-driven crank shaper, as follows:

Yumen Machine & Supply Company, Baltimore, Md., $666.55; Fairbanks Company, Washington, D. C., $620; Kemp Machinery Company, Baltimore, Md., $729 and $597, alternate; Manning, Maxwell & Moore, New York, $690 and $700, alternate; National Electrical Supply Company, Washington, $650 and $800, alternate; Queen City Machine & Tool Supply Company, Cincinnati, Ohio, $635; Thomas Summerville Company, Washington, $750.

Baltimore Industrial Notes

The Western Maryland Railroad has awarded the contract for the regrading and extension of its yard facilities at Port Covington to the Carter Construction Company, Cumberland, Md. Trackage facilities for 1000 additional cars will be provided. Plans for improvements in the vicinity of its Hillen Station in Baltimore have not been fully decided upon.

Local contractors have been estimating on the construction of a large warehouse to be erected in Hagerstown, Md., for the Fidelity Storage & Warehouse Company. The plans call for a four-story concrete structure, about 60 x 100 ft.

Baltimore contractors have been invited to bid on the construction of a 10-story fireproof hotel to be built in Macon, Ga., from plans by W. L. Stoddart, architect, New York. The building is to be of steel, with terra cotta and limestone trimmings.

The H. J. West Construction Company has been awarded a contract to erect a five-story warehouse at 211-213 West Pratt street for the trustees of the Johns Hopkins Hospital. The building is to be of reinforced concrete and fireproof throughout. The floors are to be concrete and steel. It is stated that the John Deere Plow Company will occupy the building when completed.

Municipal contracts in which the trade is interested have been slow in development. Changes in the municipal organization have interrupted departmental work to a considerable extent, and until the various changes are completed the plans for various municipal projects under consideration will probably be delayed.

Dietrich Brothers are very busy on erection work in connection with contracts for the Baltimore Bargain House, which is now about three-fourths erected, and on the Maryland Casualty Company's new addition, the structural work for which is now beginning to go up. New business the past month has not been very heavy, but orders have been taken for a number of small jobs, including a new Odd Fellows' Hall in Westminster, Md. Some fairly good work is in sight.

The Chesapeake Iron Works reports a moderate increase in the demand for both structural and ornamental iron work, particularly of the small and medium size. A fair share of the demand is from local interests, although some good business has developed in the South. Orders recently taken include one for the structural work for the new building of the Atlantic Trust & Banking Company, Wilmington, N. C., requiring several hundred tons; a church building in Norfolk, Va., taking upward of 100 tons, and the structural work for the new plant of the American Ice Company, Baltimore. The estimating department is fully engaged, but the plant is still operating considerably under normal capacity.

The Municipal Factory Site Commission, A. S. Goldsborough, secretary, reports negotiations under way for a number of factory sites for new industries, of which at least four are considered as very promising, and one, that for the International Cable Railway Company, practically assured. As several of the propositions under consideration are of considerable size and importance, developments move slowly.

The Baltimore Bridge Company is very busy with work in hand, its capacity being pretty well covered for the next three or four months. A good share is for the export trade, although some little additional domestic work has recently been taken, including the general contract for the superstructure of pier 6 for the Baltimore & Ohio Railroad at its Staten Island terminus. In addition to the structural work, which will require about 300 tons of material, the sheet-metal work will also be furnished. An order for the steel work for a 100-ft. radius crane has also been received from the J. M. Dodge Company, which is to be erected at Shady Side, N. J. The Baltimore Bridge Company is making extensive shipments on export business, principally bridge work to Costa Rica.

Among the many large orders recently received by the railroad department of the General Electric Company, Schenectady, N. Y., are the following: Metropolitan West Side Electric Railway Company, Chicago, Ill., two 2000-kw., 600-volt rotaries, six 700-kw., 9000-430 transformers, two 20,000-cu. ft. blower sets and switchboard; Fairmont & Clarksburg Traction Company, Fairmont, W. Va., for Clarksburg, three 300-kw., 1200-600 rotary converters, nine 110-kva. transformers and switchboard; City & County Contract Company, New York City, for New York, Westchester & Boston Railway Company, one gasoline-electric equipment for construction car and control equipment; Lewiston, Augusta & Waterville Street Railway Company, Lewiston, Maine, one 300-kw, two-unit motor generator set and switchboard; Waldameer Construction Company, Erie, Pa., for Erie & Suburban Railway Company, one GE-205 four-motor car equipment; Pacific Electric Railway Company, Los Angeles, Cal., one motor generator set, one 17-kw., 500-125-volt exciter, three WC-50-450-15,000/13,500 1250-volt core type transformers; Delaware & Hudson Company, Albany, N. Y., one gas-electric motor car.

The Rateau Steam Regenerator Company, 140 Cedar street, New York, has been awarded a repeat order by the American Sheet & Tin Plate Company for a steam regenerator for its plant at Vandergrift, Pa. This regenerator will receive an intermittent flux of steam from reversing mill engines and will deliver a constant flux of steam to two mixed flow steam turbines of 500 kw. each. It has also been awarded a contract by the Atlanta Steel Company, Atlanta, Ga., for a steam regenerator, which will receive steam from reversing engines and also from a three-high mill engine. The steam is to be delivered by the regenerator to two mixed flow turbines of 500 kw. each. In both instances the mixed flow steam turbines are equipped with the Rateau patent mixed flow governor.

Current Metal Prices.

The following quotations are for small lots, New York. Wholesale prices, at which large lots only can be bought, are given elsewhere in our weekly market report

IRON AND STEEL—

Bar Iron from Store—

Refined iron.
1 to 1½ in. round and square ..... ₤ lb 1.70c
1½ to 4 in. x ⅜ to 4 in. ..... ₤ lb 1.70c
1½ to 4 in. x ¼ to 4 in. ..... ₤ lb 1.80c
Rods, ⅜ and 11-16 in. and square ₤ lb 1.80c

Angles,	Cts. ₤ lb.
⅜ in. x ¾ in. and larger	1.90c
⅜ in. x 5-16 in. and ⅛ in.	2.00c
1½ to 2½ in. x ⅛ in.	2.05c
1½ to 2½ in. x ¼ in. and thicker	1.95c
1 to 1½ in. x 5-16 in.	2.05c
1 to 1½ in. x ⅜ in.	2.10c
⅝ x ⅝ in.	2.20c
⅝ x ¼ in.	2.25c
⅝ in. x ⅛ in.	2.45c
⅜ x 3-32 in.	3.90c

Tees,	
1 in.	2.35c
1¼ in.	2.20c
1½ to 2½ x ¼ in.	2.00c
1½ to 2½ x 5-16 in.	2.10c
⅜ in. and larger	2.05c

Beams	1.90c
Channels, 3 in. and larger	1.90c
Bands, 1½ to 6 x 6-16 to No. 8	2.10c
Burden's "H. B. & S." iron, base price	2.95c
Burden's "Best" iron, base price	3.15c
Norway bars	3.60c

Merchant Steel from Store—

per lb.

Bessemer machinery	1.80c
Toe calk, fire and sleigh shoe	2.50@2.60c
Best cast steel, base price in small lots	7c

Sheets from Store—

Black	One pass, C.R soft steel	R. G. cleaned.
No. 16	₤ lb 2.45c	2.75c
Nos. 18 to 20	₤ lb 2.50c	2.85c
Nos. 22 and 24	₤ lb 2.55c	2.95c
No. 26	₤ lb 2.60c	3.05c
No. 28	₤ lb 2.95c	3.30c

Russia, Planished, &c.

Genuine Russia, according to assortment ..... ₤ lb 12 @14½
Patent planished, W. Dewees Wood ..... ₤ lb A, 10c; B, 9c net

Galvanized

Nos. 12 and 14	₤ lb 2.75c
No. 24	₤ lb 3.10c
No. 26	₤ lb 3.20c
No. 28	₤ lb 3.60c

No. 20 and lighter 36 inches wide, 25c higher

Genuine Iron Sheets—

Galvanized

Nos. 22 and 24	₤ lb 5.50c
No. 26	₤ lb 6.00c
No. 28	₤ lb 7.00c

Corrugated Roofing—

2½ in. corrugated.	Painted	Galvd.
No. 24	₤ 100 sq. ft... $3.75	$4.70
No. 26	₤ 100 sq. ft... 2.85	3.90
No. 28	₤ 100 sq. ft... 2.50	3.65

Tin Plates—

American Charcoal Plates (per box)

"A A A" charcoal:	
IC. 14 x 20	$6.65
IX. 14 x 20	7.90
A charcoal:	
IC. 14 x 20	5.40
IX. 14 x 20	5.70

American Coke Plates—Bessemer—

IC. 14 x 20 ..... 107 lb	$4.50
IX. 14 x 20	5.50

American Terne Plates—

IC. 20 x 28 with an 8 lb coating	$8.70
IX. 20 x 28 with an 8 lb coating	10.70

Seamless Brass Tubes—
List November 13, 1908. Base price, 18c

Brass Tubes, Iron Pipe Sizes—
List November 13, 1908. Base price, 18c

Copper Tubes—
List November 13, 1908. Base price, 21c

Brazed Brass Tubes—
List February 1, 1911: 19½c ₤ lb

High Brass Rods—
List February 1, 1911 14½c ₤ lb

Roll and Sheet Brass—
List February 1, 1911 14½c ₤ lb

Brass Wire—
List February 1, 1911. 14½c ₤ lb

Copper Wire—
Base price. Carload lots mill 13¾ ¢

Copper Sheets—
Sheet copper hot rolled, 16 oz. quantity lots ..... ₤ lb 17c
Sheet copper cold rolled, 1c ₤ lb advance over hot rolled
Sheet copper polished 20 in. wide and under, 1c ₤ square foot.
Sheet copper polished over 20 in. wide, 2c ₤ square foot
Planished copper, 1c ₤ square foot more than polished

METALS—

Tin—

Straits pig ..... ₤ lb 44 @45 c

Copper—

Lake ingot ..... ₤ lb 14 @14¼ c
Electrolytic ..... ₤ lb 13¾@14 c
Casting ..... ₤ lb 13¾@14 c

Spelter—

Western ..... ₤ lb 6¾@ 7 c

Zinc—

No. 9, base, casks... ₤ lb 8½c Open... ₤ lb 9c

Lead—

American pig ..... ₤ lb 5½@5½c
Bar ..... ₤ lb 6⅝@6¾c

Solder—

½ & ½, guaranteed ..... ₤ lb 25½@26c
No. 1 ..... ₤ lb 23½@24c
Refined ..... ₤ lb 22½@23c
Grades of solder indicated by private brand vary according to composition.

Antimony—

Cookson ..... ₤ lb..@16½c
Hallett ..... @16 ¢
Other brands ..... 5@ 8½c

Bismuth—

Per lb $2.00@$2.25

Aluminum—

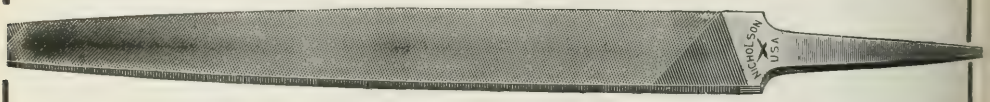
No. 1 aluminum (guaranteed over 99% pure), in ingots for remelting ..... 21c and 22c
Rods and Wire ..... Base price 31c
Sheets ..... Base price 33c

Old Metals—

Dealers' Purchasing Prices Paid in New York.

	Cents.
Copper, heavy and crucible	10.50 to 10.75
Copper, heavy and wire	11.375 to 11.50
Copper, light and bottoms	9.25 to 9.50
Brass, heavy	7.00 to 7.25
Brass, light	5.50 to 5.75
Heavy machine composition	9.00 to 9.25
Clean brass turnings	6.75 to 7.00
Composition turnings	7.50 to 7.75
Lead, heavy	4.25
Lead, tea	3.50
Zinc, scrap	4.00

NICHOLSON U.S.A. **Honesty Is The Best Policy Even In a FILE** NICHOLSON U.S.A.



YOU WILL ALWAYS FIND THE ***NICHOLSON*** *HONEST ALL THROUGH. IT HAS WON ITS FAMOUS REPUTATION BECAUSE OF ITS KEEN, SHARP BITE AND LASTING QUALITIES*

ASK FOR FILE FILOSOPHY

Nicholson File Company, Providence, R. I.

THE IRON AGE

Established 1855 — New York, October 19, 1911 — Vol. 88: No. 16

Published Every Thursday by the

DAVID WILLIAMS COMPANY

239 West 39th Street, New York

Entered at the New York Post Office as Second-Class Mail Matter.

Subscription Price, United States and Mexico, $5.00 per Annum; to Canada, $7.50 per Annum; to Other Foreign Countries, $10.00 per Annum. Unless receipt is requested, none will be sent. Credit for payment will be shown by extending the date on the wrapper of your paper.

W. H. Taylor, - - - - - - President and Treasurer
I. A. Mekeel, - - - - - - - First Vice-President
Harold S. Butterheim, - - - - Second Vice-President and Secretary

Geo. W. Cope, - - - - - }
A. I. Findley, - - - - - } Editors
W. W. Macon, - - - - - }

M. C. Robbins, - - - - Manager
Charles S. Baur, - - - Assistant Manager

Branch Offices

Philadelphia, Real Estate Trust Building
Pittsburgh, Park Building
Boston, Compton Building
Chicago, Fisher Building
Cleveland, American Trust Building
Cincinnati, 807 Andrews Building

CONTENTS.

Competition Growing Sharper 833
Steel Makers Move for Lower Freights 834
The Trend of Railroad Revenues 834
Overhead Expense and Cost Systems 835
Correspondence 836
What the Sherman Law Forbids 837
Armor Plate Decision 837
The Iron and Metal Markets 838
Pittsburgh and Vicinity Industrial Notes 848
Rail Branding and Heat Number Stamping 849
The Ashland Steel Company's New Officers 849
Personal 850
Obituary 850
The Connellsville Coke Trade 851
National Implement and Vehicle Association 851
The Lackawanna Steel Company's Earnings 851
New Vessels for Panama and Pacific Trade 852
The New York Electrical Exposition 852
Western Steel Corporation Receivership 852
Steel Works Labor Conditions 853
The Frontier Iron Works Adds New Lines 853
The Great Northern Iron Ore Lease 854
The Machine Tool Dealers' Meeting 857
The National Machine Tool Builders 857
Hagan Sheet and Pair Furnace Contracts 857
Bretaud Steel Converter Installations 857
The Lake Superior Iron & Chemical Company 858
The American Shipbuilding Company's Report 858
Dodge Bearings in Long Service 858
The Storage Battery for the Steel Mill 859
New Shuster Raveter 859
Lamp Hangers for Mill Lights 860
The Electric Lamp Combination Dissolved 860
The Michigan Steel Company 860
The American Steel Foundries' Earnings 860
Factory Illumination 861
August H. Tuechter on European Conditions 861
American Iron and Steel Institute 861
The Besly Disk Grinder 862
The Foundry Drying Oven 864
The Philadelphia Foundry Foremen 864
Canada's Titaniferous Ores Used in the United States 865
The American Supply and Machinery Manufacturers' Association 865
Ellwood City, Pa., Gets a New Industry 865
Berger Steel Storage Bin 865
Safety Can for Gasoline 866
Portable Electric Bench Drill 866
The McGowan Duplex Pump 867
Wire Twisting Machine 867
Little Giant Serial Tap 868
The Tisco Manganese Steel Chain 868
Aerial Camera 869
The Louisville Steel & Iron Company 869
The Testing Society's Year Book 869
Crucible Steel Company of America 870
The Caldwell Air Compressor 871
The Cino Iron Body Gate Valve 871
Judicial Decisions of Interest to Manufacturers 872
Trade Publications 873
The Machinery Markets ..... 874 to 881
New Tools and Appliances 881

Competition Growing Sharper

Further Decline in Prices of Finished Products, Though Volume Keeps Up—Reduction in Tin Plates

Active competition is steadily crowding prices of finished steel closer to the cost line. Any satisfaction manufacturers get from the sustained volume of current business is tempered by concern over diminishing profits.

An important development of these conditions is that steel manufacturers in the Central West are asking the railroads which haul their raw materials to adjust freight rates on these to bring them more in line with existing prices for finished products. The movement is of far-reaching import. It involves the long established rates on ore from Lake Superior mines to upper lake docks; but what is of even more significance is its bearing upon the relative competitive ability of mills in the Pittsburgh, Valley and Wheeling districts, on the one hand, as against those in the Chicago, Buffalo and other districts. It brings up also the question of the relative advantages of the Steel Corporation, with its ore-carrying roads leading to upper lake and from lower lake ports, and the independent steel manufacturers who pay existing freight rates.

It would seem that this question of freight reduction is just now given precedence with a number of steel companies over that of wage reduction, which only recently was being seriously considered. Wage readjustments seem less imminent than was the case a few weeks ago, when the market, so far as prices are concerned, was in better condition than it is today. The scarcity of labor in the coke regions is well known. There are signs in some iron and steel works districts that much of the surplus labor of a few months ago has been absorbed.

The large number of vessels placed with Eastern shipyards is in part due to low prices for steel. The Maryland Steel Company in contracting this week to build four steamers for the American-Hawaiian Steamship Company has filled its ways for nearly eighteen months. One and possibly two other vessels are planned by the same company for the Panama Canal. The New York Shipbuilding Company has taken three large steamers for the oil trade, and two vessels for the coastwise trade are pending. Pittsburgh mills have carried off nearly all the plates and shapes for the recent vessel lettings in the East.

Steel for Section 12 of the Lexington avenue extension of the New York Subway, 5000 tons, was placed this week. That for Section 15 will follow at once, while four sections remain to be let. The two bridges let by the Central Railroad of New Jersey, 4700 tons, show to what depth prices have gone, the successful bidder naming 2.05c. erected.

Several railroads, including the Pennsylvania and

the B. & O., are figuring on rail requirements for 1912, which are now expected to be somewhat less than for this year. No change from the $28 basis for Bessemer rails is looked for. More railroad bridge work is projected and considerable steel car business is being figured on under the inducement of very low prices. The New York Central is taking bids on 1200 frogs, an unusually large single contract.

Even at 1.10c. at Pittsburgh for steel bars, forward contracting is not heavy. Leading buyers are covered to July, 1912, and as the market declines these contract prices are readjusted in monthly settlements.

The chief formal reduction in prices this week was that in tin plates from $3.60 to $3.40 per base box. This is $9 a ton lower than the 1907 level, which is in line with reductions in other products. Meat packers and other important consumers are expected to contract soon for the first half of next year.

Pig iron markets have made no response in prices to the favorable statement concerning stock reductions in September. In the Central West, where stocks declined very considerably, the weakness has been most pronounced. Southern No. 2 iron has sold at $9.75, Birmingham, for early shipment, and iron for the first quarter can be had at $10. Northern furnaces are more aggressive and lower prices have been made by Buffalo and northern Ohio furnaces.

In steel making pig iron the largest pending business is 6000 tons of basic for eastern Pennsylvania delivery in the first quarter of 1912. Bessemer iron is weaker to the extent that at $14.50, the recent price for the last quarter, iron can now be had for the first half of 1912.

Steel Makers Move for Lower Freights

Manufacturers of iron and steel in the Pittsburgh, Mahoning and Shenango Valley and Wheeling districts are taking up with the railroads which haul their raw materials the question of adjusting freight rates on these so that they shall be more in line with existing prices for finished products. It would probably be more accurate to say that the movement is also as much concerned with bringing the rates on iron ore, coal and coke in the districts named into line with rates on the same materials shipped to other districts and, in some cases, from districts other than those which supply the iron and steel manufacturers of the Central West with their raw materials. It is stated that conferences have been held by important independent steel manufacturers and that the result of their deliberations will now be brought to the attention of railroad officers. The railroads chiefly interested are the Baltimore & Ohio, the Pennsylvania, the Lake Shore, the Pittsburgh & Lake Erie, the Bessemer & Lake Erie and the ore carrying roads of Minnesota, Wisconsin and Michigan.

The data gathered in support of the contention of the steel manufacturers show a considerable inequality in existing rates on iron ore, coal and coke. Comparisons have been made between the rate per ton per mile on iron ore between Lake Erie ports and the Valley, Pittsburgh and Wheeling districts, and the rates on iron ore from Lake Erie to more remote producing districts. Other comparisons have been made between the ton-mile rate on Pennsylvania coal and coke to furnaces in eastern Ohio and western Pennsylvania and the rates on Pennsylvania coal and coke to the Buffalo district, and on West Virginia and Virginia coal and coke to the Chicago district. These show, it is stated, that as against 8 mills per ton per mile for assembling ore and fuel at some plants in the Valley, Pittsburgh and Wheeling districts, other districts have rates as low as 4½ mills per ton-mile.

The movement referred to is like that which pig iron manufacturers in the South have recently undertaken for the lowering of freight rates on pig iron from Southern furnaces to Northern districts, in being immediately prompted by the low levels to which prices have fallen. For some time, also, as already referred to in these columns, steel manufacturers in the Central West have been considering seriously the necessity of a readjustment of labor costs. Thus far, however, no wage reductions have been made either at the blast furnaces or the steel works of the Central West. The indications are, moreover, that such reductions are even less likely to be made now than was the case a few weeks ago, when prices of finished steel products were from $1 to several dollars a ton higher than they are to-day. Every effort has been made by works managers to increase the efficiency of present operating forces, and some slight reductions in numbers have been made, particularly in the various mechanical lines having to do with maintenance. So far as the main bodies of workmen at the various steel plants are concerned, however, they are at present quite well employed and no marked surplus of labor exists in the chief iron and steel manufacturing centers. The attention of manufacturers has thus shifted rather toward freight readjustment than to labor readjustment.

In view of the important interests involved and the intricacy of the problem of rate making, as well as the long history of existing conditions, it is a question whether the readjustment sought will come in the near future. It involves a new relation between raw-material rates in the various districts which, once established, would extend considerably beyond the life of present prices for finished product. It is stated that what is sought is a voluntary rearrangement of rates by the railroad companies, and that at present there is no plan for taking the matter before the Interstate Commerce Commission.

The Trend of Railroad Revenues

The Bureau of Railway Economics, maintained at Washington by the railroads, has issued its bulletin of railroad earnings for the month of July. Its reports are compiled from the same data as those of the Interstate Commerce Commission, but for a given month its report is made somewhat earlier than that of the Commission, probably because it does not wait for reports from some minor roads. The showing of rail operations per mile of road, the only fair basis of comparison of railroad operations, is as follows, with the difference from the preceding July indicated:

	July, 1911.	Change.
Total operating revenue....	$988	—$22
Total operating expenses....	671	— 17
Net operating revenue.....	$317	— $5

A comparison with July, 1909, is not possible, as when figures for that month were compiled the Bureau's practice was to include roads over 500 miles long, whereas now it includes roads over 50 miles long, and on the latter basis the general averages are slightly decreased, because the short roads ordinarily have lighter operations than the average.

The July comparison is a favorable one from the viewpoint of railroad economy, as there is a greater relative decrease in operating expenses than in total operating revenue. The total revenue decreased $22, or 0.218 per cent., while the operating expenses decreased $17, or 0.248 per cent., which left a decrease in net operating revenue of $5, or 0.155 per cent. Normally it is expected that expenses will decrease less rapidly than total revenue.

Since January revenues per mile have been falling behind those of a year earlier; but the maximum loss was in March, each month since then showing a narrowing of the gap, until for July the loss from the previous July is very small in total revenue and almost negligible in net revenue. The year 1910, however, with which these comparisons are being made, compared very favorably with 1909 as regards total revenue but unfavorably as regards expenses; total revenues increased greatly, but operating expenses almost as much, so that the gain in net revenue was trifling. In general, then, the showing just made for July last indicates that the new fiscal year is running substantially as well as the average of the two preceding fiscal years.

Taking the reports of the Interstate Commerce Commission, which antedate those of the Bureau of Railway Economics, comparisons can be made as far back as July 1, 1907, when the uniform accounting system went into effect. Last July does not compare altogether favorably with July, 1907, but the decline in total operating revenue is only $24, and the loss in net only $17. Compared with July, 1908, last July's showing is very good indeed. Making a general comparison of last July with the average monthly results in four preceding years, there is a very substantial gain in total revenue and also a very substantial gain in net revenue.

The favorable showings just made mean more than the bare figures indicate, particularly from the iron trade's viewpoint of regarding the railroads as a customer rather than as a public servant. These comparisons are all per mile of line, which makes the railroad viewpoint, but comparisons of total operations must show very substantial gains, because each year the total railroad mileage of the country increases. The Interstate Commerce Commission's report for July, 1907, covered operations of 210,158 miles of road; that for June, 1911, covered 243,732 miles, the increase in four years, less one month, being 15 per cent. Even did the record of operations per mile of line remain stationary in that period, the total of railroad operations would increase; more traffic would be handled, more train miles would be run and more rails would wear out.

It may be added that statistics of the total freight ton-mileage compiled over a long period of years show that continuous growth in traffic is the almost invariable rule. In the period of 29 years from 1882 to 1910, fiscal years, inclusive, there were only four years, 1894, 1895, 1908 and 1909, in which all previous records for freight movement were not broken. The total increase in ton-mileage in the 29 years was 553 per cent., which represented an average gain, one year over the preceding, of 6.9 per cent., or an average of one doubling in every period of between 10 and 11 years. The iron trade now fully realizes that railroad consumption of iron and steel through the wearing out of material is much larger than formerly, while consumption for new erection is less important than it was in the boom periods in which there was heavy building of new road; and it may be regarded as certain that with very slight backsets the wearing out of railroad material will continue to grow, through almost constant increase in the total volume of traffic.

Overhead Expense and Cost Systems

The theory on which the accepted cost systems of to-day are based has for its backbone the attempt to recover through the selling price the expenses entailed in manufacture plus a legitimate profit. To accomplish this, there is added to the known cost of labor and material a certain arbitrary amount supposed to represent the overhead expense involved in the handling of the class of goods manufactured. The sum of these three quantities is accepted as the cost of production. This increment to cover overhead expense bears a varying ratio to the labor and material cost, being in some branches of trade equal in amount to the sum of the labor and material. Evidently, then, it is an item of cost well worthy of consideration, being as important in any manufacturing establishment as any of the other things for which trained executives are paid large salaries.

It is not the intention, however, to suggest that the general expense account is being neglected in the ledgers, for such is not the case. Nevertheless, strong grounds exist for the conviction that the widely accepted method of recovering this general expense by a level pro rata apportionment on all goods manufactured works a serious disadvantage and makes subtle inroads on the year's profits. Without doubt this procedure is one of the direct causes for astonishment to the board of directors when the auditor's statement shows less than the expected profit. Without doubt, too, it is a potent factor in a firm's losing to a competitor a class of business which had gone through the works steadily for so many years as to be considered standard.

No one at all familiar with manufacturing will for a moment defend the principle of charging the overhead or general expense against all articles by a set rule regardless of actual conditions. Yet that very thing is done every day in many factories practically unchallenged. A class of goods which is easily handled and on which little trouble arises, which, perhaps, calls for almost no expense for tool work or for power, is loaded with what is in its case an abnormal overhead expense burden. And whenever it is necessary to make a new contract there may be great hesitancy in making a slightly lower price, because the margin is so small between the selling price and the figured cost of production, as calculated by the prevailing system. Really good profitable business is known to have been turned away because of a negative margin showing up from this same comparison of quoted price and calculated cost.

One of the largest manufacturing establishments in this country does a business of which one-half is for standard apparatus and the remainder for special. Each year the proportion changes, the standard work giving way to the special. At the yearly meetings of the sales department the greatest pressure is put upon the salesmen to sell more standard product. The reply has always been that competitors continually underbid, that the factory cannot build the standard apparatus cheaply enough. There follows at once each

year an investigation as to design and productive labor cost. The material cost is reduced and a few cents are cut off the labor items here and there although the engineering and the shop force feel in their very bones that the design is as good as any on the market and that the labor cost is as low as can be expected to secure good workmanship. Moreover, going through in such large quantities, the best conditions for cheap manufacture exist. But when the revised figures have passed through to the selling department the whole thing has been "killed" by the addition of an overhead which, though figured strictly to rule, is entirely out of proportion. Small wonder, then, that every one throws up his hands and that the profitable standard business slips away, a big slice this year, another next year.

Nor is there any good excuse for continuing in this error, nor reason why a more equitable scheme cannot be worked out. The present method, it must be admitted, is far in advance of the old "flat rate" system. Yet the practice of apportioning overhead expense on the basis of productive labor is to-day as obsolete, or should be, as the hand-loom. The cry for actual costs never was so loud as it is to-day, the need never so urgent. Still, although a man will grow sick at heart if he inadvertently omits from his labor cost an item of 10 or 15 cents per 1000 pieces, he will cheerfully add to his labor total an overhead which may be twice that too high.

We have fallen into this habit principally to simplify our accounting, and partly because it was a satisfaction to get away from the previous crude calculations. We have come to a time now, however, when by a very simple change in our cost accounting system we can let sound judgment dictate our selling prices, instead of weakly accepting as final the results of a calculation full of assumptions and averages. And that the industrial engineer of the morrow will solve the question we have strong belief. It is almost in our power to take only the business in which there is a profit; we shall soon be cured of the myopia which prevents us from recognizing a good paying proposition from one that is not.

Correspondence

The Production of Vanadium Steel in 1910

To the Editor: My attention has been called to a communication from George E. Lees, of Pittsburgh, which appeared in *The Iron Age* for October 5, and which originally appeared in the Engineering and Mining Journal of September 30, in relation to the production in the United States in 1910 of vanadium steel. I have had the reports which we received from the steel makers gone over very carefully and give below the tonnage reported to us of all alloyed steel in which vanadium was used alone or in conjunction with other alloys.

Alloyed Vanadium Steel:	Gross Tons.
Vanadium steel ingots and castings	9,049
Chrome-vanadium steel ingots and castings	7,535
Nickel-chrome-vanadium steel ingots and castings	8,971
Nickel-vanadium and nickel-molybdenum vanadium steel ingots and castings	489
Total	25,844

If Mr. Lees had read carefully the text under the first table in the article which appeared in the Bulletin of the American Iron and Steel Association for October 1, he would have noticed that the figures given for chrome-vanadium and nickel-chrome-vanadium steel, the production of both of which was included in the total of 30,816 tons given for "other alloys," related to the production of chrome-vanadium and nickel-chrome-vanadium steel by the *basic open-hearth process only*. In addition, a small tonnage of chrome-vanadium and nickel-chrome-vanadium ingots and castings was made in 1910 by the acid open-hearth, crucible and electric processes.

I have no knowledge of the production of vanadium in this country in 1910 or in any other year. My impression is that the production is not annually collected. Nor do I know how much vanadium is annually consumed by our steel manufacturers and by gray iron and malleable founders. But, as already stated, the figures given in the above statement cover fully, so far as reported to us by the manufacturers, the production of vanadium steel ingots and castings in 1910, when vanadium was used alone as an alloy or in conjunction with other alloys.

I may add that in addition to the alloyed steel enumerated above and in the table which appeared in the Bulletin, the steel manufacturers also reported to us the production of tungsten, nickel-tungsten, tungsten-chrome, aluminum, and various other alloyed steel ingots and castings, the production of which is included in the dragnet phrase "other alloys" in the Bulletin tables.

JAMES M SWANK.

PHILADELPHIA, October 16, 1911.

The Production of Alloyed Steels

To the Editor: In your issue of October 5 you give the statistics of alloyed steel production as made public by the American Iron and Steel Association for the year 1910. To the average reader I believe these statistics will be misleading, and I would like to make the following criticisms in the hope that they will clarify the subject.

It is admitted by metallurgists and manufacturers in general that the so-called titanium steel is not an alloy steel. It may therefore be eliminated from the report, bringing the total production of alloyed steel for 1910 down to 241,503 gross tons.

The figures given for nickel-chrome steel include 8760 tons of nickel-chrome-vanadium steel, and the total for chrome steel includes 6903 tons of chrome-vanadium steel. The report of the association is therefore misleading in both these items, and the production of vanadium alloys on this basis becomes:

	Tons.
Straight vanadium steel	9,049
Nickel-chrome-vanadium steel	8,760
Chrome-vanadium steel	6,903
Total vanadium alloys	24,712

Eliminating titanium steel for the reasons given above, the total alloyed steel production for 1910 was 241,503 gross tons, while the various types of vanadium steel aggregated 24,712 gross tons, or more than 10 per cent. of the reported total. This does not seem to be a bad showing for a type of steel that is relatively new, especially when it is considered that the nickel-chrome steel, according to the report, is largely composed of a natural alloy steel made from ores containing both nickel and chromium, and that this steel is not, from the metallurgical standpoint, anything like the nickel-chrome steel that is built up in the furnace by deliberate additions of nickel and chromium. It is produced as an expedient and frequently sold without any mention of its chemical analysis.

Even on the above interpretation of the report, the total production of vanadium steel, accepted at 24,712 gross tons, must leave a very notable amount of vanadium unaccounted for. A contribution to London Engineering in May, 1911, gives the consumption of metallic vanadium in the United States during the year 1910 as 250,000 lb., a figure we have no reason to doubt. On the average consumption of 5 lb. of vanadium to the ton, this would bring the total vanadium steel to 50,000 tons. Exaggerating the case, and assuming that all this vanadium had been used in tool steel, where the consumption would be about 20 lb. to the ton, the production would have been 12,500 tons, while, according to the report, vanadium steel, as such, is given as only 9040 tons.

The writer has been in communication with all the large steel producers in the United States, and is in possession of data bringing the total vanadium steel production in ingots and castings to a conservative figure of 40,000 net tons. When it is remembered that vanadium steel at present is too expensive to be employed for rails and structural material, it will be seen that even 10 per cent. of the total alloyed steel production represents a very generous

consumption of vanadium steel as well as a very rapid growth in its employment, considering the recent date at which it was introduced as a commercial alloy.

Tendencies must be considered quite as much as facts, and the point that should be brought out in a comment of this kind is the rate of increase in the other alloy steels, compared with the rate of increase in the use of vanadium steels. On this basis I think it is certain that vanadium steels take the first place, as it is only within the last few years that the element vanadium has been procurable at a price and in quantities that have made its commercial application possible. Its production and use, therefore, depend far more upon the availability of ferrovanadium than upon the competition of some other alloy.

G. E. LEES,
Advertising Manager Vanadium Sales Company of America.
PITTSBURGH, PA., October 9, 1911.

Speculation by Makers of Scrap

To the Editor: Why is it that so many concerns working in iron and steel speculate in scrap? Is it a contagion from the scrap dealer? I have seen staid conservative business men who are producers of scrap and who refuse to speculate in the raw materials which they consume, buying only a little in advance of their needs or to cover contracts which they have taken, but who will almost invariably speculate in scrap. They cannot be as well informed on conditions in the old material market as a scrap dealer, whose business it is to be posted on that market every day. Nevertheless, I have seen such manufacturers hold their scrap through declines of several dollars a ton. Meantime it is exposed to the weather, which through disintegration causes a loss of 5 to 10 per cent., while the material which remains deteriorates in value by a considerable amount. The scrap pile also occupies space which should be valuable in regular manufacturing operations; and finally capital is tied up which should be worth 6 per cent. a year.

OLD MATERIAL.

What the Sherman Law Forbids

Not Restraint of Competition Without Resulting Restraint of Trade

Interesting and doubtless to many readers surprising statements concerning the Sherman law are made by Albert H. Walker, attorney, of New York, in a communication to the New York Sun. Mr. Walker is the author of the book, "The History of the Sherman Law," and on his long study of that statute and of the literature relating to its enactment, as well as of all the decisions of the courts relating to it, he bases six conclusions, which are reproduced below from his article. They serve to clear up some questions which much of the comment from high official quarters has only tended to befog:

1. The first section of the Sherman law prohibits restraint of interstate or international trade or commerce, but it does not expressly prohibit restraint of competition and it does not impliedly prohibit restraint of competition, except where restraint of competition results in restraint of trade or commerce, which is far from always being the case. For example, Section 1 of the Sherman law does not prohibit the formation of partnerships or corporations or the consolidation of corporations, or the sale of the good will of any business coupled with a contract to refrain from competing with the business thus sold. In short, if anybody will present to me any case in which a combination of men or corporations operates fairly and ethically I will undertake to show that that combination does not violate the Sherman law, and back up my showing by statements and arguments which nobody can overthrow.

2. Section 2 of the Sherman law, in prohibiting monopolizing and attempts to monopolize, is not violated by any person or corporation which does not work by the aid of impediments placed in the paths of competitors, even if that person or corporation does acquire by means of superior skill or superior facilities more than half or even the whole of a particular part of interstate or international commerce.

3. There is no difference between that limitation which Chief Justice White sought to insert in the Sherman law by means of the word "unreasonable" in his dissenting opinion in the Trans-Missouri case in 1897 and the limitation which he sought to introduce into that statute by the word "undue" in his obiter dicta in 1911 in the Standard Oil case and the American Tobacco case. Those words, if they had been really inserted in the statute, would introduce confusion instead of clarification. But the attempt of Chief Justice White to insert the word "undue" into the statute by his obiter dicta in the Standard Oil case and the American Tobacco case was no more effective than his attempt to insert the word "unreasonable" into the statute by his dissenting opinion in the Trans-Missouri case, for obiter dicta are like dissenting opinions in having no binding force on anybody.

4. President Taft was not speaking accurately when he said in his recent Detroit speech that the decisions of the Supreme Court in the Standard Oil case and the American Tobacco case mean "that they find that any contract made for the purpose of excluding competition, controlling prices or of maintaining a monopoly in part or in whole is contrary to the statute," for nobody can deduce from either of those decisions the proposition that every combination which "excludes competition" operates "in restraint of trade" and therefore violates the Sherman law.

5. The Sherman law originated with Senator Sherman, but it was put by Senator Edmunds into the exact shape in which it was enacted by Congress; and being put into that shape it was unanimously approved by the nine members of the Senate Judiciary Committee in 1890 and by every member of the House of Representatives and by every Senator except Senator Blodgett of New Jersey. In the eye of the law of construction of statutes it is the clearest and most complete and accurate of all the multitudinous statutes which I during my long life as a lawyer and law author ever read. The "confusion worse confounded" which has been made to surround that statute for more than twenty-one years never had the slightest real necessity. Quite otherwise than this, it has been artificially worked up by the lawyers employed by violators of the statute and by numerous statesmen and other politicians who wanted to confuse the matter in order that they might avoid displeasing the people at the same time that they avoided displeasing the violators of the law, and by able editors of newspapers who discussed the matter in good faith but without time enough to separate the chaff of the lawyers and statesmen from the wheat of the statute itself.

6. Any really able lawyer who will impartially study the language of the Sherman law and then impartially study all of the one hundred decisions which have been rendered by the courts relevant to that law can reliably advise any person or corporation whether the business in which that person or corporation is engaged or concerned does or does not violate the Sherman law. But no such advice can be given by any lawyer whose mind is confused and distorted by the hundreds of unfounded and conflicting statements which can be collected out of the obiter dicta of courts or out of the speeches of lawyers or statesmen.

Armor Plate Decision.—A decision of importance was handed down by the United States Circuit Court of Appeals at Philadelphia October 11, when it dismissed four suits brought by the Fried. Krupp Aktien Gesellschaft of Germany against the Midvale Steel Company of Philadelphia to restrain the Pennsylvania corporation from infringing on patents for a process of manufacturing armor plate. The decision was given by Judge Joseph Buffington and sustains the opinion of the Circuit Court, which had decreed that the evidence produced before the lower court was "not sufficiently satisfactory either in quality or amount" to establish infringement. The appellate court goes a step further and declares that two certain claims in two of the Krupp patents are invalid and that, therefore, there could not be an infringement.

To take care of its growing business in the Philadelphia territory the MacArthur Concrete Pile & Foundation Company, 11 Pine street, New York, N. Y., has appointed Louis E. Welsh district manager for New Jersey, Pennsylvania, Delaware, Maryland and the District of Columbia, his office being located in the Perry Building, Philadelphia, Pa.

The Iron and Metal Markets

A Comparison of Prices

Advances Over the Previous Week in Heavy Type, Declines in Italics.

At date, one week, one month and one year previous.

	Oct. 18, 1911.	Oct. 11, 1911.	Sept. 20, 1911.	Oct. 19, 1910.
PIG IRON, Per Gross Ton:				
Foundry No. 2 standard, Philadelphia	$15.00	$15.00	$15.00	$15.75
Foundry No. 2, Valley furnace	13.50	13.50	13.50	14.00
Foundry No. 2 Southern, Cincinnati	13.25	13.25	13.25	14.25
Foundry No. 2, Birmingham, Ala.	10.00	10.00	10.00	11.00
Foundry No. 2, at furnace, Chicago*	14.50	14.50	14.50	16.00
Basic, delivered, eastern Pa.	14.50	14.50	14.75	15.00
Basic, Valley furnace	12.50	12.50	12.60	13.00
Bessemer, Pittsburgh	15.40	15.40	15.90	15.90
Gray forge, Pittsburgh	13.65	13.65	13.90	14.15
Lake Superior charcoal, Chicago	16.50	16.50	16.50	18.00
COKE, CONNELLSVILLE, Per Net Ton, at Oven:				
Furnace coke, prompt shipment.	1.50	1.50	1.50	1.60
Furnace coke, future delivery..	*1.55*	1.60	1.60	1.70
Foundry coke, prompt shipment	1.80	1.80	1.85	2.10
Foundry coke, future delivery..	2.00	2.00	2.10	2.25
BILLETS, &c., Per Gross Ton:				
Bessemer billets, Pittsburgh	20.00	20.00	21.00	23.50
Open hearth billets, Pittsburgh	19.00	19.00	21.00	24.00
Forging billets, Pittsburgh	*24.00*	25.00	26.00	29.00
Open hearth billets, Philadelphia	21.40	21.40	22.40	26.00
Wire rods, Pittsburgh	26.00	26.00	27.00	28.50
OLD MATERIAL, Per Gross Ton:				
Iron rails, Chicago	*13.50*	13.75	14.50	16.00
Iron rails, Philadelphia	16.50	16.50	17.00	18.00
Car wheels, Chicago	12.50	12.50	12.75	14.00
Car wheels, Philadelphia	11.75	11.75	12.50	13.75
Heavy steel scrap, Pittsburgh	12.00	12.00	12.75	14.25
Heavy steel scrap, Chicago	*9.75*	10.00	10.50	12.25
Heavy steel scrap, Philadelphia	12.00	12.00	12.50	13.75
FINISHED IRON AND STEEL, Per Pound:	Cents.	Cents.	Cents.	Cents.
Bessemer rails, heavy, at mill	1.25	1.25	1.25	1.25
Iron bars, Philadelphia	*1.22*	1.22½	1.22½	1.40
Iron bars, Pittsburgh	1.20	1.20	1.25	1.45
Iron bars, Chicago	*1.17½*	1.20	1.22½	1.35
Steel bars, Pittsburgh	*1.10*	1.15	1.20	1.40
Steel bars, tidewater, New York	*1.26*	1.31	1.36	1.56
Tank plates, Pittsburgh	*1.15*	1.20	1.30	1.40
Tank plates, tidewater, New York	*1.31*	1.36	1.46	1.56
Beams, Pittsburgh	1.20	1.20	1.35	1.40
Beams, tidewater, New York	1.36	1.36	1.51	1.56
Angles, Pittsburgh	1.20	1.20	1.35	1.40
Angles, tidewater, New York	1.36	1.36	1.51	1.56
Skelp, grooved steel, Pittsburgh	1.15	1.15	1.20	1.30
Skelp, sheared steel, Pittsburgh	1.25	1.25	1.30	1.40
SHEETS, NAILS AND WIRE, Per Pound:	Cents.	Cents.	Cents.	Cents.
Sheets, black, No. 28, Pittsburgh	1.85	1.85	1.90	2.20
Wire nails, Pittsburgh†	1.65	1.65	1.65	1.70
Cut nails, Pittsburgh†	1.50	1.50	1.55	1.65
Barb wire, galv., Pittsburgh†	1.95	1.95	1.95	2.00
METALS, Per Pound:	Cents.	Cents.	Cents.	Cents.
Lake copper, New York	12.50	12.50	12.60	12.87½
Electrolytic copper, New York	12.25	12.25	12.37½	12.80
Spelter, St. Louis	**6.10**	6.00	5.90	5.45
Spelter, New York	**6.30**	6.15	6.05	5.60
Lead, St. Louis	**4.15**	4.10	4.35	4.27½
Lead, New York	4.25	4.25	4.50	4.40
Tin, New York	**41.45**	41.25	38.87½	37.62½
Antimony, Hallett, New York	7.70	7.70	7.75	7.75
Tin plate, 100-lb. box, New York	*$3.64*	$3.84	$3.84	$3.84

*The average switching charge for delivery to foundries in the Chicago district is 50c. per ton.

†These prices are for largest lots to jobbers.

Prices of Finished Iron and Steel f.o.b. Pittsburgh

Freight rates from Pittsburgh in carloads, per 100 lb.: New York, 16c.; Philadelphia, 15c.; Boston, 18c.; Buffalo, 11c.; Cleveland, 10c.; Cincinnati, 15c.; Indianapolis, 17c.; Chicago, 18c.; St. Paul, 32c.; St. Louis, 22½c.; New Orleans, 30c.; Birmingham, Ala., 45c. Pacific coast, 80c. on plates, structural shapes and sheets No. 11 and heavier; 85c. on sheets Nos. 12 to 16; 95c. on sheets No. 16 and lighter; 65c. on wrought pipe and boiler tubes.

Plates.—Tank plates, ¼ in. thick, 6¼ in. up to 100 in. wide, 1.15c., base, net cash, 30 days. Following are stipulations prescribed by manufacturers, with extras:

Rectangular plates, tank steel or conforming to manufacturers' standard specifications for structural steel dated February 6, 1903, or equivalent, ¼ in. thick and over on thinnest edge, 100 in. wide and under, down to but not including 6 in. wide, are base.

Plates up to 72 in. wide, inclusive, ordered 10.2 lb. per square foot, are considered ¼-in. plates. Plates over 72 in. wide must be ordered ¼ in. thick on edge, or not less than 11 lb. per square foot, to take base price. Plates over 72 in. wide ordered less than 11 lb. per square foot down to the weight of 3-16-in. take the price of 3-16-in.

Allowable overweight, whether plates are ordered to gauge or weight, to be governed by the standard specifications of the Association of American Steel Manufacturers.

Extras.	Cents per lb.
Gauges under ¼ in. to and including 3-16 in. on thinnest edge	.10
Gauges under 3-16 in. to and including No. 8	.15
Gauges under No. 8 to and including No. 9	.25
Gauges under No. 9 to and including No. 10	.30
Gauges under No. 10 to and including No. 12	.40
Sketches (including all straight taper plates) 3 ft. and over in length	.10
Complete circles, 3 ft. in diameter and over	.20
Boiler and flange steel	.10
"A. B. M. A." and ordinary firebox steel	.20
Still bottom steel	.30
Marine steel	.40
Locomotive firebox steel	.50
Widths over 100 in. up to 110 in., inclusive	.05
Widths over 110 in. up to 115 in., inclusive	.10
Widths over 115 in. up to 120 in., inclusive	.15
Widths over 120 in. up to 125 in., inclusive	.25
Widths over 125 in. up to 130 in., inclusive	.50
Widths over 130 in	1.00
Cutting to lengths or diameters under 3 ft. to 2 ft., inclusive	.25
Cutting to lengths or diameters under 2 ft. to 1 ft., inclusive	.50
Cutting to lengths or diameters under 1 ft.	1.55

No charge for cutting rectangular plates to lengths 3 ft. and over.

Structural Material.—I-beams, 3 to 15 in.; channels, 3 to 15 in., and angles, 3 to 6 in. on one or both legs, ¼ in. and over, 1.20c. Other shapes and sizes are quoted as follows:

	Cents per lb.
I-beams over 15 in.	1.30 to 1.35
H-beams over 18 in.	1.40 to 1.45
Angles, 3 to 6 in., inclusive, ¼ in. and up	1.20 to 1.25
Angles over 6 in.	1.30 to 1.35
Angles, 3 in. on one or both legs, less than ¼ in. thick, plus full extras as per steel bar card Sept. 1, 1909	1.25 to 1.30
Tees, 3 in. and up	1.25 to 1.30
Zees, 3 in. and up	1.20 to 1.25
Angles, channels and tees, under 3 in., plus full extras as per steel bar card Sept. 1, 1909	1.25 to 1.30
Deck beams and bulb angles	1.50 to 1.55
Hand rail tees	2.45
Checkered and corrugated plates	2.45

Sheets.—Makers' prices for mill shipments on sheets of U. S. standard gauge, in carload and larger lots, on which jobbers charge the usual discounts for small lots from store, are as follows:

Blue Annealed Sheets.

	Cents per lb.
Nos. 3 to 8	1.25 to 1.30
Nos. 9 and 10	1.35 to 1.40
Nos. 11 and 12	1.40 to 1.45
Nos. 13 and 14	1.45 to 1.50
Nos. 15 and 16	1.55 to 1.60

Box Annealed Sheets, Cold Rolled.

	One Pass.	Three Pass.
Nos. 10 to 12	1.50 to 1.55	.....
Nos. 13 and 14	1.55 to 1.60	.....
Nos. 15 and 16	1.60 to 1.65	1.70 to 1.75
Nos. 17 to 21	1.65 to 1.70	1.75 to 1.80
Nos. 22, 23 and 24	1.70 to 1.75	1.80 to 1.85
Nos. 25 and 26	1.75 to 1.80	1.85 to 1.90
No. 27	1.80 to 1.85	1.90 to 1.95
No. 28	1.85 to 1.90	1.95 to 2.00
No. 29	1.90 to 1.95	2.00 to 2.05
No. 30	2.00 to 2.05	2.10 to 2.15

Galvanized Sheets, of Black Sheet Gauge.

Nos. 10 and 11	1.85 to 1.90
Nos. 12, 13 and 14	1.95 to 2.00
Nos. 15, 16 and 17	2.10 to 2.15
Nos. 18 to 22	2.25 to 2.30
Nos. 23 and 24	2.35 to 2.40
Nos. 25 and 26	2.55 to 2.60
No. 27	2.70 to 2.75
No. 28	2.85 to 2.90
No. 29	2.95 to 3.00
No. 30	3.15 to 3.20

All above rates on sheets are f.o.b. Pittsburgh, terms 30 days net, or 2 per cent. cash discount in 10 days from date of invoice, as also are the following base prices per square for painted and galvanized roofing sheets, with 2½-in. corrugations:

Gauge.	Painted.	Galvanized.	Gauge.	Painted.	Galvanized.
29	.....	$2.30	23	$2.35	$3.45
28	$1.30	2.45	22	2.55	3.65
27	1.45	2.50	21	2.75	4.00
26	1.55	2.60	20	3.00	4.30
25	1.80	3.00	18	4.60	5.65
24	2.05	3.10	16	4.85	6.45

Wire Rods and Wire.—Bessemer, open hearth and chain rods, $26 to $26.50. Fence wire, Nos. 0 to 9 per 100 lb., terms 60 days, or 2 per cent. discount in 10 days, carload lots, to jobbers, annealed, $1.45; galvanized, $1.75. Carload lots, to retailers, annealed, $1.50; gal-

THE IRON AND METAL MARKETS

vanized, $1.80. Galvanized barb wire to jobbers, $1.95; painted, $1.65. Wire nails, to jobbers, $1.65.

The following table gives the price to retail merchants on wire in less than carloads, including the extras on Nos. 10 to 16, which are added to the base price:

Fence Wire. Per 100 lb.

Nos.	0 to 9	10	11	12 & 12½	13	14	15	16
Annealed	$1.65	$1.70	$1.75	$1.80	$1.90	$2.00	$2.10	$2.20
Galvanized	1.95	2.00	2.05	2.10	2.20	2.30	2.70	2.80

Wrought Pipe.—The following are the jobbers' carload discounts on the Pittsburgh basing card on wrought pipe, in effect from October 2, 1911:

	Steel Black.	Steel Galv.	Iron Black.	Iron Galv.
Butt Weld.				
⅛ and ¼ in.	73	53	68	48
⅜ in.	74	64	69	59
½ in.	77	67	75	65
¾ in. to 1¼ in.	80	72	75	67
2 in. to 3 in.	81	74	76	69
Lap Weld.				
1¼ and 1½ in.	..	..	68	61
2 in.	77	70	72	65
2½ to 4 in.	79	72	74	67
4½ to 6 in.	78	70	73	65
7 to 12 in.	76	66	71	61
13 to 15 in.	52	..	47	..
Butt Weld, extra strong, plain ends, card weight.				
⅛, ¼, ⅜ in.	70	60	65	55
½ in.	75	69	70	64
¾ to 1½ in.	79	73	74	68
2 to 3 in.	80	74	75	69
Lap Weld, extra strong, plain ends, card weight.				
1¼ in.	..	..	66	60
2 in.	76	70	71	65
2½ to 4 in.	78	72	73	67
4½ to 6 in.	77	71	72	66
7 to 8 in.	70	60	65	55
9 to 12 in.	65	55	60	50
Butt Weld, double extra strong, plain ends, card weight.				
¼ in.	65	59	60	54
⅜ to 1½ in.	68	62	63	57
2 to 3 in.	70	64	65	59
Lap Weld, double extra strong, plain ends, card weight.				
2 in.	66	60	61	55
2½ to 4 in.	68	62	63	57
4½ to 6 in.	67	61	62	56
7 to 8 in.	60	50	55	45

Plugged and Reamed.

1 to 1¼, 2 to 3 in. Butt Weld
2, 2½ to 4 in. ..... Lap Weld

} will be sold at two (2) points lower basing (higher price) than merchants' or card weight pipe. Butt or lap weld, as specified.

The above discounts are for "card weight," subject to the usual variation of 5 per cent. Prices for less than carloads are three (3) points lower basing (higher price) than the above discounts.

Boiler Tubes.—Discounts on lap welded steel and charcoal iron boiler tubes to jobbers in carloads are as follows:

Steel.		Charcoal Iron.	
1¼ in.	65	1½ in.	48
2 in.	67½	1½ to 2¼ in.	50
2¼ to 3¼ in.	72½	2½ in.	55
3½ to 4 in.	75	2¾ to 3 in.	60
5 to 6 in.	67½		
7 to 13 in.	65		

2¼ in. and smaller, over 18 ft., 10 per cent. net extra.
2¾ in. and larger, over 22 ft., 10 per cent. net extra.
Less than carloads will be sold at the delivered discount for carloads, lowered by two points for lengths 22 ft. and under to destinations east of the Mississippi River; lengths over 22 ft. and all shipments going west of the Mississippi River must be sold f.o.b. mill at Pittsburgh basing discount, lowered by two points.

Pittsburgh

PITTSBURGH, October 18, 1911.—*(By Telephone.)*

Pig Iron.—No large inquiries are out. Consumers of iron are pretty well covered for the remainder of the year and do not seem disposed at this time to contract into next year, owing to the uncertainty as to whether or not prices have touched bottom. We note a sale of 500 tons of basic iron for November and December at $12.50, Valley furnace; also a sale of 1000 tons of malleable Bessemer iron to the Pennsylvania Malleable Company at a price reported under $13, Valley furnace, and 2000 to 3000 tons of Bessemer iron for forward delivery at $14.50, Valley furnace. We note also sales of small lots of Northern No. 2 foundry for prompt delivery at $13.50, Valley furnace. We quote Bessemer iron at $14.50; basic, $12.50; No. 2 foundry, $13.50; malleable Bessemer, nominally, $13; and gray forge, $12.75, all at Valley furnace, the freight rate to the Pittsburgh district being 90c. a ton.

Steel.—Occasional inquiry has come into the market for small lots of billets and sheet bars, but consumers are covered by sliding scale contracts against which specifications are coming in at only a fairly satisfactory rate. Prices are unchanged and we quote open hearth billets, $19; Bessemer billets, $20; open hearth sheet bars, $20; Bessemer sheet bars, $21, and forging billets, $24, f.o.b. at maker's mill.

Steel Rails.—The Carnegie Steel Company has received an order from a Western road for 2000 tons of standard sections for prompt shipment, and has also taken a fair tonnage from other roads made up of small orders. Several of the leading railroads, among them the Baltimore & Ohio, Pennsylvania, Norfolk & Western and others, have their specifications for next year about ready, and the rail mills anticipate the placing of orders in the very near future. New demand and specifications for light rails are quite active, the Carnegie Steel Company having shipped the past week close to 2000 tons. Prices on light rails are lower, due to keener competition among the mills, and particularly from the light rail mills that reroll from old rails. We quote light rails as follows: 8 and 10-lb. sections, 1.295c.; 12 and 14-lb., 1.205c.; 16, 20 and 25-lb., 1.16c.; 30 and 35-lb., 1.15c.; 40 and 45-lb., 1.105c.

(By Mail.)

The event of the week is the reduction of 20c. per base box on tin plate, or from $3.60 to $3.40 for 100-lb. cokes. The reduction is a little larger than had been expected. The best that can be said for the iron market this week is that the low prices ruling on pig iron, steel and finished material are bringing out a larger volume of new business. Prices seem to be seeking a still lower level, but certainly cannot go down much further. Plates seem to have settled down to 1.15c.; structural material to about 1.20c.; steel bars to 1.10c., and No. 28 black sheets to 1.85c., at mill. A feature of the market on pig iron is that Bessemer iron has sold for delivery through the first half of next year at $14.50, Valley furnace. There is very little doing in the other grades. The new demand for furnace and foundry coke is better, but with no improvement in prices. The scrap trade is absolutely neglected.

Ferromanganese.—Prices are being asked on 5000 tons or more, part of it for delivery this year, but most of it for the first half of 1912. Importers still continue to ask $38 to $38.50 for first half, but we note sales of about 600 tons for the remainder of this year and first quarter of next year at $37, Baltimore. We quote 80 per cent. for the remainder of this year at about $37 and for first half of next year $37.50 to $38, Baltimore, the freight rate to Pittsburgh being $1.95 a ton.

Ferrosilicon.—Sales of 75 to 100 tons of 50 per cent. have been made at $60, Pittsburgh, the highest price reached in some months. Indications are that the price will go higher. We quote 10 per cent., $22; 11 per cent., $23, and 12 per cent., $24, f.o.b. cars Ashland, Ky., or Jackson, Ohio.

Muck Bar.—A sale of about 500 tons of high grade muck bar is reported at about $28, Pittsburgh. We quote best grades, made from all pig iron, at $28 to $28.50, delivered at buyer's mill, Pittsburgh district.

Skelp.—The market continues very dull. We quote grooved steel skelp at 1.15c.; sheared steel skelp, 1.20c.; grooved iron skelp, 1.40c., and sheared iron skelp, 1.60c., all for delivery at consumers' mills in the Pittsburgh district.

Wire Rods.—New inquiry for wire rods is light, and prices are weak. Consumers are not specifying at a satisfactory rate against contracts, and in some cases shipments are being held up. We quote Bessemer, open hearth and chain rods at $26, f.o.b. Pittsburgh.

Plates.—While the actual inquiry has not been received by local steel car builders it is understood that the Baltimore & Ohio Railroad is in the market for 5000 steel freight cars. The Union Tank Line, owned by the Standard Oil Company, is inquiring for 500 tank cars, and the Union Pacific Railroad for 25 steel cars. The Buffalo, Rochester & Pittsburgh is expected to place a contract in a few days for 1086 steel underframe cars. The Woodward Iron Company is inquiring for 50 to 100 coke cars and the Pittsburgh Coal Company for 1200 steel coal cars. Some projects are up for ore boats that if they go through will require a very heavy tonnage. We quote wide and narrow plates at 1.15c. to 1.20c., Pittsburgh, the lower price being for desirable specifications and prompt shipments.

Structural Material.—The American Bridge Company has taken 2200 tons of bridge work for a Western railroad and 6000 to 8000 tons for an Eastern road. Bids will soon be asked on a bridge at McKees Rocks

THE IRON AND METAL MARKETS

requiring 2500 to 3000 tons. We quote beams and channels up to 15 in. at 1.20c., Pittsburgh, but in some cases 1.15c. is being done on desirable specifications.

Bars.—There is not much new buying in either iron or steel bars and specifications against contracts are coming in only fairly well. With steel bars ruling from 1.10c. to 1.15c., it would seem that the bottom of the market has been reached, even with the keen competition that is existing among the mills at present. Consumers are taking in only such quantities of iron bars as are absolutely needed to meet current requirements. We quote steel bars at 1.10c. for very desirable specifications and 1.15c. in small lots, while iron bars are ruling at 1.20c. to 1.25c., f.o.b. Pittsburgh.

Sheets.—New orders and specifications against contracts show a slight falling off, but shipments by the mills are fairly heavy. In spite of the very low prices ruling on black, galvanized and roofing sheets, the trade is buying cautiously for absolute needs, while jobbers are not inclined to increase their stocks at present. Unless there should be further reductions in prices of sheet bars it is not believed that sheets can go much lower, as for some mills that buy their steel, the present prices of sheets are at cost or lower. On the usual run of orders No. 28 black sheets are ruling at 1.90c., but on desirable specifications 1.85c. is being done, while on No. 28 galvanized 2.85c. to 2.90c. represents the market. Several local mills report that they are taking some nice orders for sheets for export.

Tin Plate.—Effective on Monday, October 16, the manufacturers announced a reduction of 20c., or from $3.60 to $3.40 per base box, 14 x 20, coke plates. The reduction was not unexpected, but was somewhat heavier than had been looked for. It is simply in line with the lower prices ruling on all other forms of finished iron and steel. Looking back at the most depressed period in the past, on January 6, 1899, the price of tin plate was $3 per base box, but pig tin was then about 21c. per pound and sheet bars $17.50 per gross ton. On January 26 of the same year tin plate was advanced 25c. per box and the price steadily rose until August 6, 1899, when 14 x 20 coke plates were selling at $4.65. It is claimed that with present costs of raw material the price of tin plate is relatively as low as it has been at any time in the last 10 years. There has been little new buying for some time, but it is expected that meat packers and other heavy consumers will shortly commence to place contracts for the first half of next year. The mills as a rule are operating at present to about 60 to 65 per cent. of capacity. We quote 100-lb. cokes, 14 x 20, at $3.40 per base box, f.o.b. Pittsburgh.

Merchant Steel.—The low prices ruling are stimulating demand to some extent and mills report that more orders have been received so far this month than in the same period in September. Prices continue weak. Quotations, which are more or less shaded, are as follows: Iron finished tire, ¼ and ½ in. and heavier, 1.40c.; under these sizes, 1.45c.; planished tire, 1.50c.; channel tire, 1.70c., base; toe calk, 1.80c.; flat sleigh shoe, 1.45c.; concave or convex, 1.60c.; cutter shoe, tapered or bent, 2.15c.; spring steel, 1.85c.; machinery steel, smooth finish, 1.75c.

Hoops and Bands.—Mills report slightly better specifications against contracts on hoops, but the new demand is quiet and only for small lots to cover actual needs. The new demand for bands is also dull and specifications against contracts are unsatisfactory. We quote steel hoops at 1.35c. and bands at 1.15c., extras on the latter as per the steel bar card, but on some recent orders for prompt shipment for both hoops and bands these prices have been shaded $1 per ton.

Rivets.—The new demand is reported a little better, probably due to the lower prices ruling. We quote structural rivets at 1.50c. to 1.55c. and boiler rivets at 1.60c. to 1.65c., f.o.b. Pittsburgh.

Wire Products.—The new demand for wire and wire nails is only for small lots to meet actual needs, while buyers are specifying against contracts only for such quantities as they must have. The leading wire nail mills continue to bill nails at $1.70 per keg, but allow customers to deduct 5c. when remitting. We quote wire nails at $1.65; cut nails, $1.55; galvanized barb wire, $1.95; painted, $1.65; annealed fence wire, $1.45, and galvanized, $1.75, all f.o.b. Pittsburgh, usual terms, full freight added to point of delivery.

Spelter.—The market has further advanced and we quote prime grades of Western at 6.15c., East St. Louis, equal to 6.27½c., Pittsburgh. Still higher prices are predicted.

Shafting.—The new demand is dull and specifications against contracts are not satisfactory. We quote cold rolled shafting at 60 and 5 per cent. off in small lots and 60 and 10 per cent. off list in carload and larger lots, delivered in base territory.

Railroad Spikes.—No contracts are being placed, the railroads buying only such quantities as are needed for repair work. We quote railroad spikes in base sizes at $1.40 to $1.45, f.o.b. Pittsburgh.

Merchant Pipe.—Last week the fact was noted that the Texas Company was in the market for 150 miles of 6-in. pipe, and that the business would probably go to the Republic Iron & Steel Company. This has proved to be the case. The order has been so placed and the pipe will be rolled at the Republic Company's tube mills at Youngstown, Ohio. The new demand for merchant pipe is fairly heavy but not quite so large so far this month as in the same period in September. It is stated that the lower discounts adopted two weeks ago are being maintained.

Boiler Tubes.—A fair amount of new business is being placed in locomotive tubes, but new demand for merchant tubes is quiet and is only for small lots to cover actual needs. Jobbers are still carrying as light stocks as possible. We are advised that the new discounts are being fairly well maintained.

Coke.—A better inquiry for both furnace and foundry coke is reported and some fairly large sales have been made. A number of blast furnace companies have been sending out inquiries for coke for the first half or through all of 1912. One is in the market for 5000 tons per month for all of 1912, another for 2500 tons a month for the first half of next year and a Cleveland furnace interest is in the market for 300 tons of coke per day for the remainder of this year. The Bessemer Coke Company is starting this week its Humphries Works at Hecla, Pa., in the Connellsville region, which has 100 ovens and has been shut down for some time. This company is making large shipments of furnace and foundry coke to Canada. As yet there is no betterment in prices, high grade furnace coke for prompt shipment being available at $1.50 per net ton at oven, and for the remainder of the year at about $1.55 to $1.60. A sale of 5000 tons of furnace coke for November and December has been made at $1.60. Efforts are being made by the operators to more closely regulate the output to the consumption, so that stocks of coke in yards and on cars are less than for some time. We quote 72-hr. foundry coke for prompt shipment at $1.85 up to $2 and on contracts from $2.10 up to $2.40 per net ton at oven, the higher prices being for makes of foundry coke that have a most excellent reputation among consumers.

Iron and Steel Scrap.—Consumers are refraining from buying, and an embargo now exists on scrap routed for Monessen, Pa., which is making the situation worse. Bids on the Pennsylvania Railroad scrap which closed October 10 were much lower than have been made on the lists of this road for some months. We note sales of 2000 tons of heavy steel scrap at about $12, 300 tons of cast iron borings at $8.15 and about 800 tons of machine shop turnings at $8.60, all delivered in the Pittsburgh district. Prices are as follows per gross ton f.o.b. Pittsburgh, unless otherwise noted:

Heavy steel scrap, Steubenville, Follansbee, Sharon, Monessen and Pittsburgh delivery	$12.00 to $12.25
No. 1 foundry cast	12.50 to 12.75
No. 2 foundry cast	12.00 to 12.25
Bundled sheet scrap, f.o.b. consumers' mill, Pittsburgh district	10.25 to 10.50
Rerolling rails, Newark and Cambridge, Ohio, Cumberland, Md., and Franklin, Pa.	13.00 to 13.25
No. 1 railroad malleable stock	11.75 to 12.00
Grate bars	9.50 to 9.75
Low phosphorus melting stock	15.50 to 15.75
Iron car axles	22.00 to 22.50
Steel car axles	16.50 to 16.75
Locomotive axles	23.00
No. 1 busheling scrap	11.50 to 11.75
No. 2 busheling scrap	8.00 to 8.25
Old car wheels	12.50 to 12.75
Sheet bar crop ends	13.75 to 14.00
*Cast iron borings	8.25
*Machine shop turnings	8.75
Old iron rails	14.50 to 14.75
No. 1 wrought scrap	13.50
Heavy steel axle turnings	9.75 to 10.00
Stove plate	9.50 to 9.75

*These prices are f.o.b. cars at consumers' mills in the Pittsburgh district.

THE IRON AND METAL MARKETS

Chicago

CHICAGO, ILL., October 17, 1911.

The finished steel tonnage in new business placed on the books as the result of sales in this territory the past week has been small, being limited to miscellaneous buying in lots of a few hundred tons. In a great measure the extremely low prices have been responsible for the orders taken. Specifications have been in somewhat better volume and the recently placed car business has brought to the mills a fair rolling of structural shapes and plates. Prices have reached the lowest levels thus far recorded in this period of depression. The pig iron situation offers little to dispel the general weakness, and the scrap market is experiencing the most unsatisfactory conditions in many years.

Pig Iron.—Indications point very strongly to the selling of local Northern iron under the quotation of $14.50, f.o.b. furnace, which has been maintained for some time. The open quotation, however, continues unchanged and is offered as the minimum quotation for some of the furnaces. For Southern iron the $10 basis, Birmingham, for No. 2 prompt shipment continues in force and the business available seems insufficient to warrant any departure from that schedule. The buying for delivery in 1912 continues to be restricted within narrow limits and some uneasiness is being felt by the furnaces because of the continued deferring of such purchases. We quote for Chicago delivery, except for local irons, which are f.o.b. furnace, the following prices on prompt shipments:

Lake Superior charcoal	$16.50 to $17.00
Northern coke foundry, No. 1	15.00 to 15.50
Northern coke foundry, No. 2	14.50 to 15.00
Northern coke foundry, No. 3	14.25 to 14.50
Northern Scotch, No. 1	16.00
Southern coke, No. 1 foundry and No. 1 soft	14.85 to 15.10
Southern coke, No. 2 foundry and No. 2 soft	14.35 to 14.85
Southern coke, No. 3	14.10 to 14.35
Southern coke, No. 4	13.85 to 14.10
Southern gray forge	13.60 to 13.85
Southern mottled	13.60 to 13.85
Malleable Bessemer	14.50 to 15.00
Standard Bessemer	17.40
Basic	15.50
Jackson Co. and Kentucky silvery, 6 per cent	17.90
Jackson Co. and Kentucky silvery, 8 per cent	18.90
Jackson Co. and Kentucky silvery, 10 per cent	19.90

Rails and Track Supplies.—Further buying of cars by Western roads failed to materialize during the week, although the Western car shops which are not busy with new work are repairing a large number of old cars. No rail orders of consequence are reported, and the sale of 4000 tons to the Chesapeake & Ohio, which was given currency in some quarters during the week, has been recognized as a transaction now some weeks old. Reports covering the condition of railroad rolling stock indicate with increasing force the necessity for replacements, but as yet no very general interest in new equipment has been displayed. We quote standard railroad spikes at 1.60c. to 1.70c., base; track bolts with square nuts, 2.05c. to 2.10c., base, all in carload lots, Chicago; standard section Bessemer rails, 1.28c.; open hearth, 1.34c.; light rails, 40 to 45 lb., 1.16c. to 1.20½c.; 30 to 35 lb., 1.19½c. to 1.24c.; 16, 20 and 25 lb., 1.20½c. to 1.25c.; 12 lb., 1.25c. to 1.30½c.; angle bars, 1.50c. to 1.60c., Chicago.

Structural Material.—The week was particularly barren of contracts for fabricated steel, the aggregate placed being 1148 tons, and the only work upon which figures are being taken is the McClurg apartment building, for which 1000 tons will be required. The Worden-Allen Company, Milwaukee, will fabricate 400 tons for a shaft house at the Allouez copper mine, Allouez, Mich. For a Sacramento, Cal., power house, 348 tons will be furnished by the American Bridge Company, and for a Chicago, Milwaukee & St. Paul viaduct the Morava Construction Company, Chicago, will furnish 400 tons. Prices of structural shapes for mill shipment are now pretty generally on the basis of 1.20c., Pittsburgh, or 1.38c., Chicago. The price from store continues at 1.65c.

Plates.—Plate specifications have held up in fairly good tonnage, but new business in this line has shown the same scarcity as that prevailing in other directions. Further concessions in prices are reported, and we quote for Chicago delivery, mill shipment, 1.38c. to 1.43c., and out of store, 1.65c.

Sheets.—A fair volume of sheet business continues to be received, but as in other lines, despite this reasonably good tonnage, strength seems not to be added to the situation. Our quotations represent prices for offerings of average desirability. We quote Chicago prices as follows: Carload lots, from mill, No. 28 black sheets, 2.08c. to 2.13c.; No. 28 galvanized, 3.08c. to 3.13c.; No. 10 blue annealed, 1.63c. Prices from store, Chicago, are: No. 10, 1.95c. to 2c.; No. 12, 2c. to 2.05c.; No. 28 black, 2.40c.; No. 28, galvanized, 3.35c.

Bars.—The week brought out a noticeable increase in the buying of bars and likewise a further unsettling of prices. For prompt shipment specifications, prices equivalent to a 1.10c., Pittsburgh, basis are not uncommon. It is generally accepted that contracts are placed at about $1 a ton higher. Bar iron business shows little improvement and the mills seem willing to accept bookings on the basis of 1.17½c. We quote as follows, f.o.b. Chicago: Soft steel bars, 1.25c. to 1.33c.; bar iron, 1.17½c. to 1.20c.; hard steel bars rolled from old rails, 1.17½c. to 1.20c. From store, soft steel bars, 1.55c. to 1.60c., Chicago.

Wire Products.—The generally unsettled situation regarding prices in other lines has added difficulty to the sustaining of a firm position regarding wire products. The demand for fencing, both barb wire and woven wire, is a strong feature of this trade. Jobbers' carload prices, which are also quoted to manufacturing buyers, are as follows, per 100 lb.; Plain wire, No. 9 and coarser, base, $1.68; wire nails, $1.88; painted barb wire, $1.88; galvanized, $2.18; polished staples, $1.88; galvanized, $2.18, all Chicago.

Cast Iron Pipe.—At Chicago bids on 500 tons of 8-in. are to be received on the 18th, and at Woodstock, Ill., prices are being asked on 250 tons. The award at Los Angeles, Cal., is still pending. The general demand for pipe has fallen off somewhat, as is customary at this season, but it is expected that an opportunity to buy advantageously will bring out a number of inquiries before the close of the year. We quote as follows, per net ton, Chicago: Water pipe, 4-in., $26.50; 6 to 12-in., $24.50; 16-in. and up, $24, with $1 extra for gas pipe.

Old Material.—The local market for old material is making a low record for itself and the immediate future holds out little encouragement. Comparatively few sales are being made, although most of the mills are willing to take limited quantities at the minimum prices. The fact that dealers and brokers can move material at this level only at a loss for the most part is restricting trading. The only important railroad offering in scrap consists of 1700 tons of rails by the Baltimore & Ohio Chicago Terminal. On recent lists a number of items submitted by the railroads for prices have been withheld from sale because of the low quotations made. We quote for delivery at buyers' works, Chicago and vicinity, all freight and transfer charges paid, per gross ton, as follows:

Old iron rails	$13.50 to $14.00
Old steel rails, rerolling	12.25 to 12.75
Old steel rails, less than 3 ft.	11.00 to 11.50
Relaying rails, standard section, subject to inspection	24.00
Old car wheels	12.50 to 12.75
Heavy melting steel scrap	9.75 to 10.00
Frogs, switches and guards, cut apart	10.00 to 10.50
Shoveling steel	9.50 to 10.00
Steel axle turnings	8.50 to 9.00

The following quotations are per net ton:

Iron angles and splice bars	$11.75 to $12.25
Iron arch bars and transoms	13.25 to 13.75
Steel angle bars	9.00 to 9.50
Iron car axles	17.25 to 17.75
Steel car axles	15.50 to 16.00
No. 1 railroad wrought	10.25 to 10.75
No. 2 railroad wrought	9.25 to 9.75
Steel knuckles and couplers	9.50 to 10.00
Steel springs	10.00 to 10.50
Locomotive tires, smooth	14.00 to 14.50
Machine shop turnings	6.00 to 6.50
Cast and mixed borings	5.25 to 5.75
No. 1 busheling	8.00 to 8.50
No. 2 busheling	6.00 to 6.50
No. 1 boilers, cut to sheets and rings	7.00 to 7.50
Boiler punchings	12.00 to 12.50
No. 1 cast scrap	10.00 to 10.50
Stove plate and light cast scrap	8.75 to 9.25
Railroad malleable	9.75 to 10.25
Agricultural malleable	8.75 to 9.25
Pipes and flues	7.00 to 7.50

Philadelphia

PHILADELPHIA, PA., October 17, 1911.

Keen competition for plates and shapes for boat building is said to have brought out some sharp cutting in prices. Desirable business in the general line of finished products has been placed at lower figures than recently quoted openly and some buying for stock is reported. The demand for fabricated structural material, however, is less pronounced. Billets are a shade more active, but open hearth rolling billets are now flatly on a $21.40, delivered, basis. Steel bars are not particularly strong, although iron bars are on a com-

THE IRON AND METAL MARKETS

paratively even basis. The pig iron market has been extremely quiet. Coke is dull, while the old material market is practically at a standstill.

Iron Ore.—Consumers will not use all the ore contracted for this year, and will carry over a considerable amount for delivery in the first quarter of next year. Under the circumstances purchases are confined to small lots to piece out furnace mixtures. Importations during the week included 4720 tons from Sweden and 6200 tons from Cuba. Total importations at this port in September aggregated 95,482 tons.

Pig Iron.—New business generally has been quieter. Consumers are still following the hand-to-mouth policy of making purchases, and as stocks in consumers' yards are usually light the question of prompt delivery is an important one. In some few cases furnaces are behind in their deliveries on foundry grades, a condition which under ordinary circumstances would mean the blowing in of idle stacks, but under present conditions, with prices unremunerative, the disposition is to defer such action if at all possible. Sales of foundry grades are being made to regular customers, on which deliveries run through the next five and six months, at the present market prices, $15 to $15.25, delivered, for No. 2 X foundry iron. No producer in this district, however, is yet willing to name a flat quotation for strictly first quarter shipment. A sale of 1000 tons of coke malleable was, however, sold for second quarter shipment at a price reported to be $16.55, delivered. Odd lots of low grade iron continue to be taken by cast iron pipe makers, but a difference in views as to prices continues to hold up large transactions. Sales of Virginia foundry irons for prompt and last quarter delivery, in lots up to 100 tons, are made at $12.25 to $12.50, furnace, but no sales for strictly 1912 shipment are reported. Definite inquiries for foundry grades for both early and forward shipment have been light. Small lots of rolling mill forge are reported sold at $14.50, delivered, while negotiations are still pending on the inquiry for several thousand tons reported last week. An inquiry is noted for 6000 tons of basic iron, for shipment in the first quarter of next year, from a central Pennsylvania consumer, while an Eastern melter is again feeling around for a moderate quantity. Small sales of low phosphorus iron are reported, although not for consumption in this immediate vicinity, at equal to $20, delivered here. The following range of prices is named for shipments ranging from prompt to the next three months, delivered in buyers' yards in this district:

Eastern Pennsylvania No. 2 X foundry	$15.00 to $15.25
Eastern Pennsylvania No. 2 plain	14.75 to 15.00
Virginia foundry	15.00 to 15.50
Gray forge	14.25 to 14.50
Basic	14.50
Standard low phosphorus	20.00

Ferroalloys.—Inquiries for ferromanganese from consumers in the West are still unclosed, buyers and sellers being apart on the question of prices. The majority of the Eastern sellers maintain the $38.50, Baltimore, quotation for 80 per cent. ferro, although no business is done at that figure. Fifty per cent. ferrosilicon is comparatively firm at $62, delivered, but no business is moving in this or the usual 11 to 13 per cent. furnace grade.

Billets.—A trifle better demand for open-hearth rolling billets is reported. Orders are more numerous and consumers are showing more interest in buying for future delivery. Producers are more encouraged with the outlook. Open-hearth rolling billets for this year's shipment are quoted at $21.40, delivered here, with forging billets at $26.50 to $27.50, according to specification.

Plates.—Price concessions have resulted in a somewhat larger volume of business coming to the mills. Orders for several thousand tons of boat plates have been placed and some 14,000 tons is pending for four vessels for which contracts have been placed with Eastern ship builders. Some very low prices have been named for this business and the bulk of the orders have gone to Western mills. Bridge plates have been in pretty active demand and a better run of business in tank and boiler plates is reported. Open quotations for heavy plates, delivered in this territory, range from 1.35c. to 1.45c., the inside price being available for particularly desirable orders.

Structural Material.—Developments in connection with pending propositions, particularly those of any size, as the municipal convention hall, the addition to the Baldwin Locomotive Works erecting shop and a comparatively large apartment house job, are still held up. Fresh inquiries have been less plentiful, although several buildings are in sight. Railroad bridge orders are not so numerous, although considerable business of this character is pending. Open quotations for plain shapes are lower, 1.35c., delivered here, representing the minimum applying on desirable business, although 1.40c. still rules for small current orders.

Sheets.—About an even volume of business is coming to Eastern mills, which have been again able to average close to full capacity during the week. While there is a little more sizable lot buying, the bulk of the business is in small lots. Prices show little change, Eastern mills readily obtaining a material advance over quotations named by Western mills for delivery in this district.

Bars.—A better volume of business in iron bars is noted, in some instances orders being for larger quantities and for delivery over more extended periods. Mills in this vicinity are fairly well engaged and prices for iron bars range from 1.22c. to 1.27c., delivered here. A moderate business in steel bars is going and, while 1.30c., delivered, is an open quotation, it is reported that even this price has been shaded on desirable specifications.

Coke.—Occasional transactions in foundry coke for early delivery are reported, but there is little snap to the demand. Sales of prompt furnace coke continue to be made at $1.50 at oven, with $1.60 asked for deliveries during the remainder of the year and $1.75 to $1.85 quoted for first quarter shipment. The following range of prices, per net ton, is named for early deliveries in buyers' yards in this district.

Connellsville furnace coke	$3.70 to $3.90
Foundry coke	4.25 to 4.60
Mountain furnace coke	3.30 to 3.50
Foundry coke	3.85 to 4.20

Old Material.—The market has been extremely quiet. Railroad lists closed recently went at prices close to current quotations. The largest quantities evidently went to consumers, although small lots were distributed among other bidders, who paid from $12.15 to $12.25 for heavy melting steel. It is understood that No. 1 wrought scrap on railroad lists did not, in instances, bring over $13.75. There has not been enough business moving in any grade to establish quotations. Sellers make few offers under present conditions and unless forced to sell aim to hold what stocks they have, awaiting better conditions. The following range about represents quotations at which the ordinary current business for prompt shipment can be done, delivery in buyers' yards, eastern Pennsylvania and nearby points, taking a freight rate from Philadelphia varying from 35c. to $1.35 per gross ton, for shipment ranging from prompt to the remainder of the year:

No. 1 heavy melting steel scrap	$12.00 to $12.25
Old steel rails, rerolling (nominal)	13.00 to 13.50
Low phosphorus heavy melting steel scrap	16.25 to 16.75
Old steel axles (nominal)	18.00 to 18.50
Old iron axles (nominal)	23.50 to 24.00
Old iron rails (nominal)	16.50 to 17.00
Old car wheels	11.75 to 12.00
No. 1 railroad wrought	14.00 to 14.25
Wrought iron pipe	11.50 to 11.75
No. 1 forge fire	10.00 to 10.50
No. 2 light iron (nominal)	6.00 to 6.50
Wrought turnings	8.00 to 8.25
Cast borings	7.50 to 7.75
Machinery cast	12.50 to 13.00
Railroad malleable (nominal)	11.00 to 11.50
Grate bars, railroad	9.25 to 9.75
Stove plate	9.25 to 9.75

Cincinnati

CINCINNATI, OHIO, October 18, 1911.—*(By Telegraph.)*

Pig Iron.—The largest inquiry before the trade here is for 1200 tons each of Northern and Southern foundry iron to be shipped to a central Indiana consumer during the first half of next year. There is a fair run of inquiries for small tonnages that are well scattered. Business booked is usually confined to carloads, although two sales of No. 2 Northern foundry totaling 500 tons were closed last week at $13, Ironton, for this year's delivery. A few 100-ton lots of No. 2 Southern foundry were also taken by nearby melters at $10, Birmingham, mostly for prompt shipment. A number of Southern furnaces are willing to take on first quarter business at $10, and it is also rumored that several producers in the Hanging Rock district have solicited orders from old customers at $13, Ironton, for the same delivery. The absence of speculative buying and the excellent shipments now being made on old contracts are considered two encouraging features that in a

THE IRON AND METAL MARKETS

measure offset the pessimistic feeling engendered by the low prices now prevailing. Malleable is unchanged at $13.25, Ironton, but very little demand for it is reported. A local firm is asking for 500 tons of ferromanganese for shipment over the next six months. It is rumored that local agencies will soon be working on a large inquiry for basic, but no definite information is yet available as to the tonnage or delivery wanted. Based on freight rates of $3.25 from Birmingham and $1.20 from Ironton, we quote, f.o.b. Cincinnati, as follows, for prompt shipment:

Southern coke, No. 1 foundry and 1 soft	$14.00 to $14.25
Southern coke, No. 2 foundry and 2 soft	13.25 to 13.75
Southern coke, No. 3 foundry	12.75 to 13.25
Southern coke, No. 4 foundry	12.50 to 13.00
Southern gray forge	12.50 to 13.00
Ohio silvery, 8 per cent. silicon	16.95 to 17.20
Lake Superior coke, No. 1	14.70 to 14.95
Lake Superior coke, No. 2	14.20 to 14.45
Lake Superior coke, No. 3	13.70 to 13.95
Basic, Northern	14.20 to 14.45
Standard Southern car wheel	25.50 to 25.75
Lake Superior car wheel	19.00

(By Mail.)

Coke.—Prices continue firm on both foundry and furnace grades, although the spurt of activity reported last week in the foundry coke demand has eased off and there is now practically no new inquiry. Shipments on contracts continue moving satisfactorily. Connellsville 48-hr. coke is selling around $1.50 to $1.55 per net ton at oven for nearby shipment, but in the Wise County and Pocahontas districts the asking price ranges from $1.60 to $1.70 for prompt movement. Contract business in all three fields brings out quotations from 10c. to 20c. above the foregoing prices. Foundry coke is quoted in the different districts all the way from $1.85 to $2 for prompt shipment and between $2.10 and $2.25 for future delivery.

Finished Material.—It is reported that the small order business for steel bars is better than dealers themselves realize, and structural shapes are also in fair demand. The Pittsburgh mill price on steel bars is 1.15c. and the local warehouse quotation is around 1.60c. Beams and channels, cut to lengths if desired, are being sold on a basis of 1.70c., Cincinnati warehouse delivery. Hoops and bands are very quiet.

Old Material.—It is hard to size up the present situation, although it cannot be denied that a further weakening in prices is threatened. It is reported that several railroad systems have unloaded a large tonnage of scrap lately, and it is quite probable that our maximum buyers' prices quoted below would about represent the minimum sellers' quotations obtainable. The approximate prices paid by buyers, delivered in their yards in southern Ohio and Cincinnati, are as follows:

No. 1 railroad wrought, net ton	$10.00 to $10.50
Casting borings, net ton	4.50 to 5.00
Steel turnings, net ton	5.50 to 6.00
No. 1 cast scrap, net ton	9.25 to 9.75
Burnt scrap, net ton	6.25 to 6.75
Old iron axles, net ton	16.25 to 16.75
Bundled sheet scrap, gross ton	7.25 to 8.25
Old iron rails, gross ton	13.25 to 13.75
Relaying rails, 50 lb. and up, gross ton	20.75 to 21.50
Old car wheels, gross ton	10.00 to 10.50
Heavy melting steel scrap, gross ton	9.75 to 10.25

Cleveland

CLEVELAND, OHIO, October 17, 1911.

Iron Ore.—Shipments are decreasing and very little wild vessel room will be required from now on. The October movement will show considerable falling off from that of a year ago. No sales or inquiries are reported. Ore firms do not expect any further sales this season, except possibly a few small lots. We quote prices as follows: Old range Bessemer, $4.50; Mesaba Bessemer, $4.25; old range non-Bessemer, $3.70; Mesaba non-Bessemer, $3.50.

Pig Iron.—A Cleveland interest has sold 1500 tons of Bessemer iron to a Pittsburgh consumer at $14.50, Valley furnace, for delivery through the first quarter of next year. Bessemer iron is being quite generally quoted at $14.50 and basic at $12.50, Valley furnace, but these prices have brought out no additional sales or inquiries. The foundry iron market is dull, the business reported being in small lots. The only local inquiry of any size is from a Cleveland manufacturer for 1000 tons of No. 2 foundry for the last quarter and first quarter delivery. A western Michigan stove manufacturer is reported in the market for a large amount of foundry iron. Foundries in this territory are nearly all under contract for their requirements for this year and are taking no interest in the market for delivery after January 1, although some contracts have been placed for the first quarter. Foundries have not bought in excess of their requirements and stocks are generally low. Some Southern foundry iron is being sold in small lots for the last quarter delivery at $10 to $10.25, Birmingham. Competition in Ohio silvery iron is keen and has resulted in lower prices. In some cases $15.50, at furnace, is being shaded for 8 per cent. silicon. For Cleveland delivery we quote as follows for prompt shipment and for the last quarter:

Bessemer	$15.40
Basic	13.40
Northern foundry, No. 2	13.75
Gray forge	13.00
Southern foundry, No. 2	$14.35 to 14.60
Jackson County silvery, 8 per cent. silicon	17.05

Coke.—The market is quiet. Prices are stationary and firm. The only sales reported are small lots of foundry coke. We quote standard Connellsville furnace coke at $1.50 to $1.55 per net ton, at oven, for prompt shipment and $1.60 to $1.70 for contract. Connellsville 72-hr. foundry coke is held at $1.85 to $2.15 for prompt shipment and $2.10 to $2.40 for contract.

Finished Iron and Steel.—While the demand in finished lines is somewhat more active than before the recent cuts, lower prices are bringing out only a moderate volume of business. Mills are getting a good volume of orders, but they are nearly all for small tonnages. It seems still to be the policy of nearly all consumers to buy only in small lots for their immediate requirements. The price situation appears somewhat more settled. Sellers are not inclined to shade recent low quotations, but some appear willing to take bottom prices for smaller lots than they would book at these levels a week or two ago. Steel bars are selling at 1.10c. to 1.15c., Pittsburgh, and efforts of buyers to secure a price lower than 1.10c. appear to be generally unsuccessful. Structural material is sold at 1.20c. to 1.25c., the former price being only for the most desirable orders. The same quotations are being made on plates, but they are not so firm and there are reports of shading of 1.20c. While mills are not eager to take on tonnage for delivery after the first of the year some steel bar contracts at 1.15c. and plate and shape contracts at 1.25c. have been taken in the local market for delivery through the first quarter. The structural market is quiet. Low prices on steel do not as yet appear to have stimulated building activity. The demand for sheets is moderate and prices are fairly firm. While some concessions are reported some of the mills are declining to shade the regular quotations of 1.90c. for No. 28 black and 2.90c. for No. 28 galvanized. The demand for iron bars is not active. Prices are firm at 1.20c., Cleveland mill. The Empire rolling mill, which has been idle for two weeks, started up this week.

Old Material.—The market is very dull and prices on some grades show a further decline. There is practically no inquiry from the mills, although some will take on small lots that are offered at very low prices. A local mill has contracted for 500 tons of heavy steel scrap at $11. Dealers are unwilling to sell stocks at present, as they cannot do so without taking a loss. Producers are also generally holding their accumulations of scrap for a better market. Mills are taking a moderate volume of material on contracts. Dealers' prices, per gross ton, f.o.b. Cleveland, are as follows:

Old steel rails, rerolling	$12.25 to $12.50
Old iron rails	14.00 to 14.50
Steel car axles	17.00 to 17.50
Heavy melting steel	10.75 to 11.00
Old car wheels	11.25 to 11.50
Relaying rails, 50 lb. and over	22.50 to 23.50
Agricultural malleable	10.50 to 11.00
Railroad malleable	11.00 to 11.25
Light bundled sheet scrap	9.50 to 10.00

The following prices are per net ton, f.o.b. Cleveland:

Iron car axles	$18.50 to $19.00
Cast borings	6.00 to 6.25
Iron and steel turnings and drillings	6.50 to 7.00
Steel axle turnings	7.50 to 8.00
No. 1 busheling	9.00 to 9.50
No. 1 railroad wrought	11.25 to 11.75
No. 1 cast	11.00 to 11.50
Stove plate	9.00 to 9.25
Bundled tin scrap	11.00 to 11.50

Birmingham

BIRMINGHAM, ALA., October 16, 1911.

Pig Iron.—One producing interest reports the sale of an aggregate of 4500 tons in the past week; another reports 1750 tons, with 850 tons and 700 tons respectively as the aggregate sold by two other concerns. This tonnage does not include any part of the

THE IRON AND METAL MARKETS

large order understood to have been placed with Southern producers by the leading pipe interest through Eastern offices, but, with the exception of one lot of 1000 tons for Northern consumption, consists of lots of 500 to 750 tons each, of which 600 tons only is for delivery in the first quarter. Prices recently received vary from a basis of $10 to $10.50, Birmingham. The higher price named was obtained for first quarter shipments and for carload lots for prompt delivery. A lot of 1000 tons for prompt shipment was sold at $10, Birmingham, but the majority of sales effected involved a basis 25c. per ton higher, which is the price being adhered to by the majority of producers for deliveries during the remainder of the year into strictly Southern territory. The schedule of $10.50, Birmingham, for delivery in the first quarter of next year has been adopted by one producing interest only so far; however, such figures are no doubt acceptable to the majority of producers. More interest is being manifested in advanced deliveries by the trade, although a comparatively small tonnage for such requirement is now being considered in definite form. An inquiry recently made in this market for 3000 tons of mill iron for shipment extending into the first quarter has not resulted in a sale. It is understood that in this particular case the lowest figures quoted were $9.25 for gray forge and $9 for mottled, while the price offered for those grades was $9 and $8.50 respectively. A lot of 100 tons of high silicon iron has just been sold at $11, Birmingham, and several inquiries for small lots of silvery gray are pending. This last grade, as well as the low grades, or mill iron, continues very scarce.

Cast Iron Pipe.—Approximately 1700 tons of water pipe has just been placed with Southern producers for requirement at Long Beach, Cal., and some addition has been made to a contract placed for requirement at Kansas City, Mo. The city of Lexington, Miss., will award some 1000 tons of water pipe during this week, which is the largest single tonnage actually in sight for early placing. Notwithstanding adverse conditions, the price for both water and gas pipe is being fully maintained as far as the Southern producing interests are concerned. The concessions that have been made by the Northern and Eastern producers have not affected the prices asked by local concerns, which is accounted for by the tonnage now on order books. It is pointed out that the local production has so far this year been short the output of two large plants, while the business placed that has of necessity come to Southern plants is practically equal to that placed when all plants were in operation. The local pipe interests have not figured largely in the pig iron market for some months, but such conditions are due to previous purchases rather than to a smaller consumption at the plants in operation. Producers' asking prices for water pipe are as follows, per net ton, f.o.b. cars here: 4 to 6-in., $23; 8 to 12-in., $22; over 12-in., average, $21, with $1 per ton extra for gas pipe.

Old Material.—The demand is still very scattering and prices received are considerably at variance. Sales of the past week involved light cast and stove plate, with small lots of wrought and steel grades. We quote as follows, per gross ton, f.o.b. cars here:

Old iron axles (light)	$12 50 to $13.00
Old steel axles (light)	11.50 to 12.00
Old iron rails	11.50 to 12.00
No. 1 railroad wrought	10.00 to 10.50
No. 2 railroad wrought	8.50 to 9.00
No. 1 country wrought	6.50 to 7.00
No. 2 country wrought	6.00 to 6.50
No. 1 machinery, cast	8.50 to 9.00
No. 1 steel	8.00 to 8.50
Tram car wheels	7.50 to 8.00
Standard car wheels	9.00 to 9.50
Light cast and stove plates	6.00 to 6.50

St. Louis

ST. LOUIS, MO., October 16, 1911.

The market is unreservedly in the doldrums. Conditions have apparently settled down to the hand-to-mouth principle for some time to come. Pig iron, coke, finished iron and steel and even old material are going at prices which the sellers are unwilling to quote, and buyers keep them a secret in the hope of pushing them farther down next time.

Pig Iron.—A sale of 600 tons of foundry and an inquiry for 600 tons of soft from another source constitute the chief items of the week. The former consisted of 500 tons of No. 2 Southern and 100 tons of No. 4. It is pretty well settled that the No. 2 went at $9.75, Birmingham. The delivery is for November and December. The inquiry noted is for first quarter. No. 4 is almost out of the market here and is commanding within 50c. of No. 2 price.

Coke.—The smelter sale of 3000 tons of 48-hr. coke reported last week has swelled to 6000 tons, and the price is said to have been above the market, due to special conditions. Most of the business now is in carload orders for prompt shipment. The quotations nominally stand now at $1.50 at oven for 48-hr. coke, $1.90 to $2.15 for prompt shipment 72-hr. Connellsville and Stonega, and $2.10 to $2.25 for first quarter delivery.

Finished Iron and Steel.—Practically all the business moving is for prompt shipment, but an interesting feature is the fact that collections are good and discount customers are taking their discounts regularly without urging. In structural steel very little is being taken for stock, despite the attractive prices that are available. There is, however, a fair business in small orders, running into an interesting total. An example of the insistence of the buyers is shown in an order placed to-day, on which the conditions were for shipment Wednesday of this week. In standard rails the inquiries are few, and for small quantities not enough to have any bearing on the market. Light rails are in increased request, due to the growing activity of the coal mines. Track fastenings have been in only fair demand. Bars show little movement and the same is true of plates, in spite of the fact that prices are practically at buyers' disposition.

Old Material.—Conditions in the scrap market are such as to leave the dealers with little hope for the immediate future and practically nothing by which to get a line on possibilities. There continues to be some buying to apply on contracts and a little to hold against better prices, if they come. No new lists came out during the week and in the present state of the market those which have been expected may be withheld. Dealers' prices, per gross ton, f.o.b. St. Louis, are as follows:

Old iron rails	$12.00 to $12.50
Old steel rails, rerolling	11.50 to 12.00
Old steel rails, less than 3 ft.	10.50 to 11.00
Relaying rails, standard section, subject to inspection	22.50 to 23.00
Old car wheels	12.00 to 12.50
Heavy melting steel scrap	10.50 to 11.00
Frogs, switches and guards cut apart	10.50 to 11.00

The following prices are per net ton:

Iron fish plates	$10.50 to $11.00
Iron car axles	18.00 to 18.50
Steel car axles	16.00 to 16.50
No. 1 railroad wrought	10.25 to 10.75
No. 2 railroad wrought	9.25 to 9.75
Railroad springs	9.25 to 9.75
Locomotive tires, smooth	13.00 to 13.50
No. 1 dealers' forge	7.00 to 7.50
Mixed borings	5.00 to 5.50
No. 1 busheling	8.50 to 9.00
No. 1 boilers cut to sheets and rings	7.00 to 7.50
No. 1 cast scrap	8.50 to 9.00
Stove plate and light cast scrap	7.00 to 7.50
Railroad malleable	7.50 to 8.00
Agricultural malleable	6.50 to 7.00
Pipes and flues	7.50 to 8.00
Railroad sheet and tank scrap	7.00 to 7.50
Railroad grate bars	6.50 to 7.00
Machine shop turnings	6.50 to 7.00

San Francisco

SAN FRANCISCO, CAL., October 10, 1911.

The movement of finished products continues on about the same limited scale as last month. While the local trade does not anticipate any further reduction of values in the primary markets, the recent decline has failed to bring out any active buying interest. Although some of the larger merchants are keeping their stocks in good shape others are letting their supplies run low, and speculative buying is entirely lacking. Judging by the present attitude of buyers it is not likely that any number of contracts for extended delivery will be placed until there is some indication of an advance at the mills. Some apprehension still exists in the jobbing trade regarding the action of the United States Steel Products Company, though recent private advices concerning conditions in Eastern distributive markets are of a reassuring nature. Local resale prices on merchant pipe have been reduced, but values in other lines show little change.

Bars.—The larger consumers of soft steel bars continue to buy in a small way for immediate needs only, and while the aggregate movement from store is slightly larger than a month or two ago the tonnage is below the average for this time of year. The reduction of mill prices has had no perceptible effect

THE IRON AND METAL MARKETS

on the volume of orders. Merchants are buying according to current needs, but appear unwilling to make any provision for the future. No very large orders for reinforcing material have come out of late, but the total tonnage is fair, and numerous small inquiries are coming up. Bars from store, San Francisco, are quoted at 2c. for steel and 1.90c. for iron. Even at the reduced mill quotations these figures leave little room for profit to the jobber.

Structural Material.—Notwithstanding some encouraging features in the outlook, actual business continues rather slow, the letting of large contracts being delayed for various reasons. The valuation of building permits last month was $1,634,048, a decrease of about $600,000 from the August record, though the valuation for September, 1910, was still lower. Building is quiet at Portland, Ore., but Los Angeles has taken a very fair tonnage of late, and several new inquiries are about due. The principal contract closed here is the German House Association building, requiring between 800 and 900 tons, which went to the Western Iron Works. A few small country bridge jobs have been placed, and a small contract has been let on the Westinghouse Air Brake Company's warehouse in Oakland, though the greater part of this building will be of reinforced concrete. Plans for the Polytechnic High School will be out in about two weeks and bids on the Los Angeles Times building will be received October 12. Figures are being received on the Failing building at Portland, Ore., about 200 tons. Nothing further has been heard of the St. Francis Hotel addition or the Standard Oil building, though the latter is pretty certain to be let during the fall. Plans are nearly complete for the Sharon estate building at New Montgomery and Jessie streets, but it is not certain that the job will be carried out.

Rails.—Light rails remain dull, but orders for standard sections are coming out in fairly good shape. Most individual inquiries are for small or moderate lots, but quite a number of the interurban lines of California are coming into the market and continued activity is expected for the remainder of the month. Orders are also coming out freely for grooved rails. Construction has been authorized on the Clear Lake Railroad of Lake County, Cal. It is announced that work will be rushed on the Southern Pacific extension from Eugene, Ore., to Coos Bay. Surveys are being made for a new branch in the oil field district.

Sheets.—The movement in a small jobbing way is about up to that of last month, but there is little buying except for actual needs. Most of the jobbers are keeping out of the market and show no disposition to take on any surplus until more firmness is exhibited in the East.

Plates.—Interest in ship plates has fallen off for the present, and the decline in prices appears to have checked the demand for tank plates, though actual requirements are smaller than a few months ago. A good many small tanks are being ordered for waterworks projects through the country, but there is no heavy demand from the oil fields. Independent oil interests have formed a storage plan which may lead to considerable business.

Merchant Pipe.—The reduction of prices by manufacturers was followed immediately by a corresponding drop in local jobbing prices. The tonnage booked by manufacturers' agents is less than last month. Merchants report no demand of any consequence and are themselves buying practically nothing. Some additional stock may be taken on later in the month, but there is no disposition to place contracts for extended delivery. Business in the oil fields is also about at a standstill, as the production of oil is in excess of transportation facilities, and capital appears to be lacking for the construction of new pipe lines. Bids were received October 9 by H. Floyd, Victoria, B. C., for 24 miles of steel pipe, 4 to 12 in.

Cast Iron Pipe.—There has been considerable delay in the laying of pipe for the San Francisco auxiliary system, 4000 tons of this material being still in the yards of the United States Cast Iron Pipe & Foundry Company awaiting delivery. The present movement along the coast is satisfactory, though the principal tonnage for some time has been for southern California. The 8000 tons for San Diego is being shipped in trainloads of 1000 tons. The Los Angeles order for 620 tons was placed with the Glamorgan Pipe Company. The United States Pipe Company has taken a small order for Hollywood, Cal. The town of Dorris, Cal., is taking bids on a lot of waterworks supplies, and Orland and Watsonville, Cal., will be in the market shortly for a lot of pipe. The town of Oxnard, Cal., is figuring on a water system to cost about $150,000, and will be in the market in about three months. There is a good sized inquiry from Honolulu, T. H., for which no order has been placed.

Pig Iron.—The general foundry trade remains extremely quiet. Some local steel interests have recently placed contracts with Chinese furnaces for a heavy tonnage for extended delivery at prices amounting to about $18 in this harbor, but ordinary shipments are quoted at $20 to $24 for foundry grades of Chinese, English or Continental iron. The ship Irby has just arrived with 700 tons of English iron, besides a lot of coke and fire brick. No. 2 Southern foundry iron for delivery at San Francisco is quotable at $20.50 to $21, but is not moving in any quantity.

Old Material.—Conditions show little change, aside from a feeling of weakness in all lines. There is some movement in steel melting scrap, but only in a small way, and the movement of the surplus to the East will probably commence shortly. Cast iron scrap is almost entirely neglected. Rerolling rails are still being delivered on old contracts. Prices are quoted as follows: Cast iron scrap, per net ton, $16; steel melting scrap, per gross ton, $10.50 to $11; wrought scrap, per net ton, $11 to $15; rerolling rails, per net ton, $11.

The Pacific Hardware & Steel Company, San Francisco, has loaded the ship Edward Sewall, 5500 tons, with a full cargo for this port, including wire products, plates, sheets and pipe. The vessel was dispatched from Philadelphia for the voyage via Cape Horn, October 4. This is the first time that a local hardware house has taken an entire cargo of steel products from the Atlantic coast.

Local merchants are greatly concerned over the possibility of a general advance in westbound rail rates, which is expected to occur November 15. The effect of this advance would be to divert almost the entire tonnage of steel for this territory to the sea route. The tonnage via Panama and Tehuantepec has been steadily increasing for some time, and shipments are now brought by sea almost as quickly as by rail. The change would operate greatly to the disadvantage of inland plants and may cut off the coast market almost entirely from some manufacturers.

Buffalo

BUFFALO, N. Y., October 17, 1911.

Pig Iron.—The market is quiet. Apparently there are not many consumers who have not covered their present and immediate future requirements, and inquiry is slack. Little of the recent pipe works purchasing came to this district. Such orders as have been placed have covered principally the general run of foundry grades in small amounts and at prices substantially the same as reported last week. Shipments on contracts to cover fourth quarter requirements of melters continue heavy. Quotations show quite a wide range, determined according to the specifications of the purchaser and the furnace necessities as regards being sold up on grades specified. So far as ascertained, no premium is now being asked for the first quarter of 1912 over the present quarter. The quotations below approximate the situation as closely as possible for the present quarter and delivery extending over the first quarter and possibly the first half of 1912, f.o.b. Buffalo:

No. 1 X foundry	$13.75 to $14.00
No. 2 X foundry	13.25 to 13.75
No. 2 plain	13.00 to 13.50
No. 3 foundry	13.00 to 13.25
Gray forge	13.00
Malleable	13.75 to 14.25
Basic	13.75 to 14.25
Charcoal	16.50 to 17.25

Finished Iron and Steel.—The lower prices have brought out considerably increased tonnages of new business in bars, plates and shapes, particularly for bar material, more orders having been placed than for some weeks. The price at which the larger proportion of the bar business was taken was 1.15c., Pittsburgh, for carload lots and 1.20c. for less than carload lots. In a few instances covering large tonnages it is reported that 1.15c. has been shaded slightly. Fence wire and wire nails are steady at $1.65, nail base, for carload lots to jobbers. Considerable Canadian export business in barb wire, fence wire, etc., is noted, including two orders of 100 tons each. Shipping specifications on bar contracts for the remainder of the year are heavy in volume. In fabricated structural lines the situation shows improvement over last week. The feeling is bet-

THE IRON AND METAL MARKETS

ter and consumers are evidently becoming convinced that now is a good time to buy. Henry Schenck & Son, Erie, Pa., have received the general contract for the Lawrence Hotel and the Hamot Hospital nurses' home in that city, the former requiring about 900 tons and the latter about 200 tons of steel. The Charles F. Ernst Sons Iron Works, Buffalo, has received the contract for the steel for the Casino building to be built by the city of Buffalo in Cazenovia Park, about 100 tons. Driscoll Bros., Ithaca, were low bidders for the Prudence Risley Hall, Cornell University, taking about 200 tons, but plans may be revised and new bids called for. Plans are being prepared for a six-story annex to the J. N. Adams Company's department store, Buffalo, requiring 450 tons, and for a seven-story department store at Rochester for E. W. Edwards & Son, requiring 800 tons.

Old Material.—An exceedingly limited demand is experienced for any line. Consumers are taking material on contract even less freely than last week, at which time such shipments were quite light. Users' requirements for the remainder of the year are evidently well supplied. There are no indications of a revival of demand, but prices are unchanged, dealers preferring to hold their stocks rather than to lower the present schedule. We quote as follows, per gross ton, f.o.b. Buffalo:

Heavy melting steel	$12.50 to $13.00
Low phosphorus steel	16.00 to 16.50
No. 1 railroad wrought	14.00 to 14.50
No. 1 railroad and machinery cast scrap	13.50 to 14.00
Old steel axles	18.50 to 19.00
Old iron axles	22.00 to 22.50
Old car wheels	13.00 to 13.50
Railroad malleable	12.75 to 13.00
Boiler plate	12.50 to 13.00
Locomotive grate bars	11.00 to 11.50
Pipe	9.25 to 9.50
Wrought iron and cast steel turnings	7.15 to 7.40
Clean cast borings	7.00 to 7.25

Boston

BOSTON, MASS., October 17, 1911.

Old Material.—Prices have not changed in the week. The market is featureless and dull. The prices quoted below are those offered by the large dealers to the producers and to the smaller dealers and collectors, per gross ton, carload lots, f.o.b. Boston, and other New England points, taking Boston rates from eastern Pennsylvania points. In comparison with Philadelphia prices the differential for freight of $2.30 a ton is included. Mill prices are approximately 50 cents a ton more than dealers' prices.

Heavy melting steel	$9.50 to $10.00
Low phosphorus steel	11.45 to 11.95
Old steel axles	14.00 to 14.50
Old iron axles	17.00 to 18.00
Mixed shafting	12.75 to 13.25
No. 1 wrought and soft steel	11.00 to 11.25
Wrought iron pipe	8.75 to 9.00
Skeleton (bundled)	7.00 to 7.50
Cotton ties	7.00 to 7.50
No. 2 light	4.50 to 5.00
Wrought turnings	5.00 to 5.50
Cast borings	4.50 to 5.00
Machinery, cast	12.50 to 13.00
Malleable	9.25 to 9.75
Grate bars	6.00 to 6.50
Stove plate	8.00 to 8.50

The German Iron Market

BERLIN, October 5, 1911.

Conditions in the iron market are improving. The works are having an unusually heavy run of orders. According to some of the trade reports they have never been busier than now, and most of them are demanding six to eight weeks for filling new orders. The foreign market continues to call for large quantities of steel, and the outbreak of the war in the Mediterranean appears to have had no effect in restricting the foreign demand. The prices on foreign orders are firm, and improvements have been reported in some cases; but home prices show less strength than those for export.

Pig iron continues to be turned out at about the previous rate, and consumers are regularly taking shipments on contracts. The market, however, shows the same waiting tendency previously reported. It now appears that the new syndicate has good grounds for its repeated postponements in giving out its price list; it has not yet reached an understanding with a group of dealers, and there appear also to be some troubles still inside the new organization. According to later information the Luxemburg-Lorraine furnaces joined the syndicate in a rather experimental sort of way till the end of 1912, whereas the other furnaces went in for four years; hence it is possible that this southwestern group may give notice of quitting before a year has elapsed. Meanwhile the furnaces are demanding somewhat higher prices for supplementary orders of iron for this year delivery.

In semimanufactured steel products business continues very good. The usual monthly report given out by the Union several days ago says that the amounts contracted for during September warrant the conclusion that consuming works are well employed; also that calls for delivery on foreign orders have continued satisfactory, and that business with England has improved. In heavy steel rails business continues very good, says the Union, and further large orders have been taken. Grooved rails are quieter, corresponding to the season, but some good home and foreign orders are about to be placed. Rails for mines are also quieter. Sales of structural shapes for the last quarter of the year have been made in satisfactory quantities, and specifications have been coming in at a brisk pace.

Bars are more active, and prices are firm. Many of the mills have an unusually large supply of orders on hand, and some of them are stipulating six to eight weeks to deliver on new orders. Home business for the quarter has mostly been contracted for, and few new orders are coming out; but foreign business is quite active. The bottom prices for home delivery are now about 103 to 105 marks, while some establishments demand still more. Bars of open hearth steel command as high as 110 marks. It is reported that the mills show no disposition to take orders for next year's delivery at these prices. Prices for bars for export have risen to 97.50-100 marks in sympathy with recent advances in Belgium. The Union last week rejected the application for an increase of allotments in bars; and this occurred also in respect to plates, wire rods and tubes.

The market for plates of all qualities, but particularly for the heaviest grades, continues very active, and this tendency is further stimulated by a strong foreign demand. Ship plates are in such heavy demand that some foreign orders with short periods of delivery had to be rejected. German shipyards are offering so many orders that it is difficult to place them. The demand for plates by construction shops is also very heavy, but boiler plates are not in quite such heavy demand as the foregoing. The demand for plates of medium thicknesses has increased, and mills have much work to do.

Band steel has improved within the past few weeks, although the price situation is unfavorably influenced by the competition of several south German works. The mills have mostly sold out their output to the end of the year. The foreign demand is quite good, but prices for export are very low owing to English and Belgian competition. English competition is also felt in cold-rolled bands, in which a rather quiet tone prevails.

Wire rods are rather more active. The requirements of consumers have been about provided for till the end of the year. The demand for wire and wire nails, both from the home and the foreign trade, has become considerably more active; but prices are very unsatisfactory. Another unsatisfactory section of the trade is that of pipes, for which prices also remain much too low to suit makers; but considerable ordering is reported.

Some further company reports have been issued this week. The Deutsch-Luxemburg Company, now one of the biggest concerns of the country since it annexed the old Dortmund Union last year and advanced its capital to 100,000,000 marks—again distributes 11 per cent., but this is on 90,000,000 marks, against 55,000,000 marks last year. The gross profits amounted to 19,955,000 marks, against 13,807,000 marks last year. The Laurahütte of the Silesian district also leaves its dividend unchanged—at 4 per cent.—but it, too, had larger earnings, namely, 6,747,000 marks, against 5,345,000 marks last year. Finally, the Düsseldorfer Eisen und Draht-Industrie, one of the leading wire producers of the country, distributes only 8 per cent., as compared with 10 per cent. last year.

The Robesonia Iron Company, Ltd., Robesonia, Pa., has started up its blast furnace, the torch having been applied on the evening of October 12, and it is now running nicely. S. B. Patterson is superintendent.

THE IRON AND METAL MARKETS

New York

NEW YORK, October 18, 1911.

Pig Iron.—Inquiry for pig iron in the New York district has increased in the past week and several lots of 500 to 1000 tons of foundry iron are under negotiation, in addition to one of 500 tons of malleable pig iron for Newark, N. J. Several other New Jersey concerns are in the market, including one prominent manufacturer of stove plate castings which bought a round lot two or three weeks ago. A number of inquiries have come from New England foundries and for this business there is keen competition between furnaces at Buffalo and Virginia furnaces, in case the buyer is located so as to receive shipments entirely by water. Virginia sellers are still quoting $12.25 at furnace for No. 2X iron. Transactions in Eastern Pennsylvania indicate that some Lehigh and Schuylkill valley furnaces are selling quite a little below $14.50 at furnace for No. 2 iron. Sales have been made below the basis of $15 at Jersey City for No. 2X, while certain Buffalo furnaces are selling at $13.25 for delivery over the remainder of this year, and in some cases through the first quarter of 1912. Most of the business of the past week and that now under negotiation is for the first quarter of next year, and buyers have no difficulty in getting bids on the same basis as for deliveries in November and December. In spite of an improved statistical position the recent yielding of prices on steelmaking pig iron in the Central West has had an unfavorable effect on the general market. The low prices named in some foundry iron sales are not made by all furnaces, and some of the figures reported are found to apply to iron of lower silicon than strictly No. 2X. Recent purchases of pipe iron are now said to have aggregated less than was at first reported, though there was a general acceptance of offers of odd lots of low grades coming from a considerable number of Northern and Southern furnaces. Our quotations are as follows for Northern iron at tidewater: No. 1 foundry, $15.25 to $15.50; No. 2X, $15 to $15.25; No. 2 plain, $14.50 to $14.75. For Southern iron we quote $15 to $15.25 for No. 1 foundry and $14.50 to $14.75 for No. 2 foundry.

Finished Iron and Steel.—The low level of prices does not seem to have attracted additional business in structural material, and the attitude is that buyers have been made overcautious and slow to settle projects because there has been so much advertising in the local market of assertions that the territory is overbuilt and that prices are weak. It is still maintained that plates and shapes are held at a price corresponding to 1.25c., Pittsburgh, and too little business of the large sort has been placed to prove anything to the contrary. Similarly steel bars remain at the 1.15c., Pittsburgh, basis except for attractive orders. Some 500 tons of plates cut circular were closed last week at the 1.25c. rate with the usual extra—one transaction which does not show great weakness; and there is a brightening in the possibilities of additional steel boat building, including 4000 tons in contemplation for coasting steamers—a condition calculated ordinarily to stiffen the market. Withal, a fair run of business is reported, keeping up at the rate of recent weeks, as the list of awards in structural lines given below will show. Improvement is reported in bar iron, but the volume of business is still below normal. Two of the larger awards in structural work went to the American Bridge Company, 5000 tons for section 12 of the New York subway and 4700 tons for the two bridges of the Central Railroad of New Jersey. Other railroad work includes: 500 tons, New York Central terminal work in New York, to L. F. Shoemaker & Co., and 200 tons, bridge work, Seaboard Air Line, to Virginia Bridge Company. Recent awards for buildings include 1200 tons, Y. W. C. A. building, New York, to A. E. Norton Company; 600 tons, commercial art galleries on East Fortieth street, New York, to Hay Foundry & Iron Works; 450 tons, hotel in Savannah, Ga., to Lauer & Harper, Washington; 500 tons, First National Bank building, Boston, to New England Structural Company; 300 tons for branch building, Anheuser-Busch brewery, to Milliken Brothers; 200 tons for the plant of the Gilbert & Barker Mfg. Company, West Springfield, to Berlin Construction Company; 1200 tons, pavilions, Bellevue Hospital, to McClintic-Marshall Construction Company; 900 tons, St. Anthony's Hospital, Woodhaven, N. Y., to John Pirkl Iron Works, and 400 tons, Goelet building, Fourth avenue and Thirty-first street, to Bethlehem Steel Company. The steel work has not yet been placed for the Otis Elevator Company's new building in New York, involving about 1500 tons. In a few weeks bids will be wanted for the building structure for the Eagle Silk Company, Fourth avenue and Twentieth street, requiring perhaps 3000 tons. Bids are being taken for the Monahan Express building, Eighteenth street, 1000 tons. Added consideration to the approach work of the New York Connecting Railroad bridge brings back at least momentarily the promise of early settlement of this large project. No award has yet been made of the 1500 tons for the Seaman's Institute building, Coenties Slip. Quotations are: Plain structural material and plates, 1.36c. to 1.46c.; steel bars, 1.31c. to 1.36c.; bar iron, 1.25c. to 1.30c., all New York. Plain material and plates from store, New York, 1.70c. to 1.80c.

Cast Iron Pipe.—The New York Board of Water Supply will open bids October 31 from contractors for furnishing and laying about 7000 net tons of 48-in. pipe in the Bay Ridge section of Brooklyn. No other lettings of importance are announced for the near future. A fair demand is experienced for small lots for prompt shipment. Carload lots of 6-in. continue to be quoted at $21 to $22 per net ton, tidewater.

Old Material.—Consumers continue to purchase cautiously. Transactions are therefore confined to small lots and are usually of a bargain character. This applies as well to buyers of cast scrap as to consumers of heavy melting steel scrap. The general conditions are as unsatisfactory as at any time in the recent past. Dealers making shipments on contracts still encounter difficulty in having their deliveries accepted, but they are now being asked to make less of a concession than some time ago. The consumer will generally take any rejected scrap at a concession of 50 cents per ton. Dealers are chary about entering into commitments for future delivery because of the uncertainty of being able to buy enough low-priced material to average up with what they are holding at prices prevailing a month or so ago. They are receiving complaints from shippers that it does not pay to load old material at prevailing prices and consequently it is permitted to lie. The dealer and broker generally are unable to meet the views of mill operators, who of course are anxious to buy at lower prices so as to be able to make a profit out of their low-priced sales of finished products. A condition of this kind is not likely to last for any great length of time unless consumption should decrease considerably. Dealers' prices per gross ton, New York and vicinity, are about as follows:

Old girder and T rails for melting	$9.25 to $9.75
Heavy melting steel scrap	9.25 to 9.75
Relaying rails	20.00 to 21.00
Rerolling rails	11.25 to 11.75
Iron car axles	20.00 to 20.50
Old steel car axles	15.00 to 15.50
No. 1 railroad wrought	11.50 to 12.00
Wrought iron track scrap	10.50 to 11.00
No. 1 yard wrought, long	10.75 to 10.75
No. 1 yard wrought, short	9.25 to 9.75
Light iron	3.75 to 4.25
Cast borings	4.75 to 5.25
Wrought turnings	5.25 to 5.75
Wrought pipe	8.75 to 9.25
Old car wheels	9.75 to 10.25
No. 1 heavy cast, broken up	9.75 to 10.25
Stove plate	7.75 to 8.25
Locomotive grate bars	7.75 to 8.25
Malleable cast	9.75 to 10.25

Metal Market

NEW YORK, October 18, 1911.

The Week's Prices

Cents Per Pound for Early Delivery.

	Copper, New York.			Lead		Spelter	
Oct.	Lake.	Electrolytic.	Tin, New York.	New York.	St. Louis.	New York.	St. Louis.
12*	....	....	....	....	....	....	....
13	12.50	12.25	41.45	4.25	4.10	6.15	6.05
14	12.50	12.25	....	4.25	4.10	6.20	6.10
16	12.50	12.25	41.50	4.25	4.15	6.25	6.10
17	12.50	12.25	41.35	4.25	4.15	6.30	6.10
18	12.50	12.25	41.45	4.25	4.15	6.30	6.10

*Holiday.

Spot tin is a little higher. Copper is quiet and unchanged. Lead is somewhat firmer in the West. Spelter has advanced.

Copper.—There is a good steady buying of copper, although sellers would like to see more business. Reports are current that in some cases concessions have been made to induce trading, but no direct price cuts have been made and the average quotations remain un-

THE IRON AND METAL MARKETS

changed with Lake copper at 12.50c. and electrolytic at 12.25c. In London to-day the copper market was firm and spot copper was sold at £55 7s. 6d. and futures at £56 3s. 0d.

Pig Tin.—The pig tin market is more quiet than it has been in some time. Prices have been fairly steady during the week, and although stocks are none too plentiful those who have tin to sell show no desire to squeeze the consumers. On the other hand, consumers seem to be very well supplied and they are taking the metal only in small quantities. Pig tin was offered in New York to-day at 41.45c. In London to-day the market was firm with spot tin quoted at £189 and futures at £188 12s. 6d.

Tin Plates.—The market in tin plates is seasonably dull. There is a good export movement on, but the buying in that direction has been induced by generous concessions. A reduction has been made in the domestic price of tin plates and the market for 100-lb. coke plates is now at $3.64.

Lead.—Recent reductions in the price of lead have induced considerable trading. It appears that many consumers are very short of stocks and they have come into the market and bought generously during the last week. The result is that the price has been raised five points in St. Louis. In New York the price remains unchanged from last week at 4.25c., but the leading interest is getting its price and outside dealers are apparently letting the market alone.

Spelter.—Regardless of the weakness in other nonferrous metals, spelter steadily advances and grows stronger. There are a number of large inquiries out and consumers are finding considerable difficulty in getting metal for early delivery. Many producers claim to be sold up, and while the claim is made that the market is being manipulated the fact remains that spelter is very strong and decidedly scarce for spot delivery. This morning spelter could not be had in New York for less than 6.30c. and the St. Louis price was 6.10c. It looks as though the market will advance further.

Antimony.—Antimony is very uninteresting. Cookson's can be had for 8.15c. and Hallett's for 7.65c. Chinese and Hungarian grades are offered at from 7c. up. Buyers are taking absolutely no interest in the situation.

Old Metals, New York.—Business continues very dull, with dealers' selling prices nominally unchanged, as follows:

	Cents per lb.
Copper, heavy and crucible	11.75 to 12.00
Copper, heavy and wire	11.37½ to 11.50
Copper, light and bottoms	10.50 to 10.75
Brass, heavy	8.00 to 8.25
Brass, light	6.50 to 6.75
Heavy machine composition	10.25 to 10.50
Clean brass turnings	7.75 to 8.00
Composition turnings	8.50 to 9.00
Lead, heavy	4.15
Lead, tea	3.90
Zinc, scrap	4.50

Chicago

OCTOBER 17.—For immediate shipment, buying week has been fairly active. In contrast, the interest in futures is at a minimum. The price of tin has fluctuated considerably during the week but has regained more than was lost and is now moving in higher levels. Lead is slightly lower, but a sharp increase in the price of spelter is noted with very light offerings. We quote at Chicago: Casting copper, 12.37½c.; Lake, 12.62½c., in carloads, for prompt shipment; small lots, ¼c. to ⅜c. higher; pig tin carloads, 42.50c.; small lots, 44.50c.; lead, desilverized, 4.25c. to 4.30c., for 50-ton lots; corroding, 4.50c. to 4.55c. for 50-ton lots; in carloads, 2½c. per 100 lb. higher; spelter, 6.25c. to 6.30c; Cookson's antimony, 9.25c., and other grades, 8.25c. to 8.75c., in small lots; sheet zinc is $8, f.o.b. La Salle, in carloads of 600-lb. casks. On old metals we quote for less than carload lots: Copper wire, crucible shapes, 10.50c.; copper bottoms, 9.25c.; copper clips, 10.12½c.; red brass, 9.37½c.; yellow brass, 7.37½c.; lead pipe, 7.87½c.; zinc, 4c.; pewter, No. 1, 26c.; tinfoil, 32c.; block tin pipe, 36c.

St. Louis

OCTOBER 16.—The weakening tendency in lead continues, with the quotations to-day at 4.10c. to 4.12½c. Spelter's strength is greater every day, and the market to-day is firm at 6.25c. and sellers inclined to hold at that. Tin is a shade higher than last week at 40.85c. Lake copper has fallen off to 12.72½c., and so has electrolytic to 12.60c. Cookson's antimony remains unchanged at 8.47½c. In the Joplin market the past week the top price was $47 per ton for zinc sulphide on an assay basis of $44 per ton for grades carrying 60 per cent. of metallic content. From this figure the basis ranged down as low as $38 per ton for the poorer grades. Prices for calamine continued exceptionally strong at $23 to $25 per ton, assay basis of 40 per cent. metallic contents, with the top price running to $32 for choice lots. Lead ore was weaker, the best paid being $57 per ton and the bulk going at $54 to $55 per ton. Old metals are quoted as follows: Light brass, 4c.; heavy brass and light copper, 8c.; heavy copper and copper wire, 9c.; zinc, 3c.; lead, 3.25c.; pewter, 20c.; tinfoil, 29c.; tea lead, 3c.

Iron and Industrial Stocks

NEW YORK, October 18, 1911.

Transactions in stocks have not been large and prices have been comparatively steady. The range of prices on active iron and industrial stocks from Wednesday of last week to Tuesday of this week was as follows:

Allis-Chalm., com...	2½ - 3¼	Pressed Steel, com..	28¾ - 29
Allis-Chalm., pref...	9⅞ - 12½	Pressed Steel, pref.....	95
Beth. Steel, com...	28¼ - 28½	Railway Spring, com.	27½ - 28½
Beth. Steel, pref...	56 - 56⅝	Republic, com.....	22⅜ - 23¼
Can. com.....	10 - 10¾	Republic, pref.....	84⅞ - 85
Can, pref.....	85½ - 87	Sloss, com.....	40
Car & Fdry., com...	48 - 51	Pipe, com.....	11⅝ - 13
Car & Fdry., pref.....	115	Pipe, pref.....	44½ - 45
Steel Foundries ...	31 - 32¾	U. S. Steel, com...	58¾ - 61⅜
Colorado Fuel	26⅞ - 27	U. S. Steel, pref...	108¾ - 109⅛
General Electric ...	149 - 152	Westg. Elec.	61⅜ - 66
Gr. N. Ore Cert...	49⅝ - 52	Va. I. C. & Co.....	60
Int. Harv., com....	103 - 104¾	Am. Ship, com.....	49 - 50
Int. Harv., pref.....	116	Chic. Pneu. Tool...	46½ - 47
Int. Pump, com....	26 - 27½	Cambria Steel	43 - 44
Int. Pump, pref.....	81½	Lake Sup. Corp....	24¼ - 28
Locomotive, com....	34¾ - 35⅝	Warwick	10¼
Locomotive, pref...	104 - 105	Crucible Steel, com.	10⅜ - 10¾
Nat. En. & St., com.....	15	Crucible Steel, pref.	75½ - 76⅜
Nat. En. & St., pref.....	94		

According to the printed plan of the merger of the Alabama Consolidated Coal & Iron Company and the Southern Iron & Steel Company, the dividends on the preferred stock of the new company shall be cumulative at the rate of 6 per cent. per annum on and after July 1, 1912.

Kuhn, Loeb & Co., New York, have purchased $5,000,000 five-year 5 per cent. secured gold notes of the Associated Simmons Hardware Company, which controls the Simmons Hardware Company, of St. Louis, established in 1874, and allied companies. These notes have been sold to provide money for funding existing obligations and additional working capital.

Dividends Declared

The J. G. Brill Company, regular quarterly, 1¾ per cent. on the preferred stock, payable November 1.

The Warwick Iron & Steel Company, regular semi-annual, 4 per cent., payable November 15.

Pittsburgh and Vicinity Industrial Notes

Mackintosh, Hemphill & Co., Pittsburgh, have received a contract from the Algoma Steel Company, Sault Ste. Marie, Ontario, Canada, for a pair of 55 x 60-in. direct-connected reversing blooming-mill engines. It has also received a contract from the Pittsburgh Crucible Steel Company, controlled by the Crucible Steel Company of America, for a 44 and 70 x 60-in. twin tandem compound direct-connected reversing engine for driving a new 40-in. blooming mill at its new steel works at Midland, Pa. The contract for the blooming mill will probably be given out within 10 days. The engine to be furnished by Mackintosh, Hemphill & Co. is very similar to the engine they built for the Duquesne Works of the Carnegie Steel Company and for the Aliquippa Works of the Jones & Laughlin Steel Company, both of which have made splendid records.

The Ellwood City Forge Company, Ellwood City, Pa., is about to install another cold saw and some special machinery. This company manufactures steam hammer forgings, such as engine crank shafts and other heavy work. It is a comparatively new concern, but is desirous of keeping its manufacturing facilities even with the demands made on it when business is normal.

The Keystone Bronze Company, operating two plants in Pittsburgh and another at New Brighton, Pa., has just

installed some new machinery in its machine shop at the Thirty-eighth street, Pittsburgh, plant, consisting of a 54-in. Colburn boring mill, Cincinnati shaper, bolt and nut tapping machine, screw cutting machine, etc., all of which are motor driven. The company makes brass, copper, bronze and aluminum castings, such as blast furnace tuyeres, bosh plates, locomotive and car bearings, babbitt metals, etc. The new machinery is to finish a line of castings up to 10,000 lbs. in weight, the intention being to specialize in heavy machinery castings, mill work and large special work to specifications.

The Bessemer Gas Engine Company, Grove City, Pa., manufacturer of gas engines, pumping outfits, gasoline producing plants, etc., has recently sold the following engines: Herman Pneumatic Machine Company, Zelienople, Pa., one 65-hp.; Beard-Stephen Company, Columbiana, Ohio, one 20-hp., for its new machine shop; Kelso Grain Company, Cherokee, Kan., one 40-hp.

The Jamison Coal & Coke Company, Oliver Building, Pittsburgh, operating mines and coke ovens near Greensburg, Pa., and Barracksville, W. Va., reports that many manufacturers are specifying for larger tonnages of Jamison foundry coke than ordinarily, and that this condition enables the company to maintain its production on about as good an average as in the past.

The Isaac C. Dakin Company, West Newton, Pa., is manufacturing an automatic bridge wall for three types of boilers, such as cylinder, tubular and flue, which it claims maintains a pressure at a more uniform stage and on a lower fuel consumption. The company has installed several of these bridge walls and has tables showing the efficiency and saving in fuel, which will be sent on request to interested manufacturers.

The Borough of South Connellsville, Pa., has made a proposition to the American Sheet & Tin Plate Company that it will exempt the company from all taxes for a period of years if it will start up its Humbert Tin Plate Works there, which have been closed down for a long time.

The Titanium-Alloy Mfg. Company, Charles V. Slocum, general sales agent, 1225-1226 Oliver Building, Pittsburgh, is sending out a card, on which is shown that during 1910 the quantity of rails treated with titanium was 326,316 gross tons, which was more than 300 per cent. greater than the tonnage treated with nickel and 84,813 gross tons more than the output of all the other alloyed steels combined.

The Morgantown Board of Trade, Morgantown, W. Va., recently raised $250,000 in seven days to be used in a campaign for exploiting local advantages as a manufacturing center. It is proposed to increase the fund to $400,000.

The Republic Rubber Company, Youngstown, Ohio, will issue $1,000,000 in preferred stock, half of it to be used in additions to the plant to be made at once, and the other half to be kept in the treasury for improvements to be made later. The company has more orders than it can fill, in spite of the fact that not long ago its plant was considerably enlarged.

The Independent High Grade Oil Company, Pittsburgh, has placed an order for 20 tank cars with the Warren Foundry Company, Warren, Pa. It is also figuring on the erection of three 50,000-gal. storage tanks in the Pittsburgh district.

Max Solomon, dealer in iron and steel scrap, Oliver Building, Pittsburgh, has bought the long idle plant of the Shenango Iron & Steel Company in Wheatland, Pa., with 15 acres of ground, for $34,075. He has not decided as yet whether he will operate the plant, which comprises puddling furnaces, muck bar mills and finishing mills for making iron bars.

Reports that A. M. Byers & Co., Inc., Pittsburgh, would build 50 more puddling furnaces at Girard, Ohio, are officially denied. The company has 86 puddling furnaces at Girard, and does not contemplate any additions in the near future.

The Corry Metal Furniture Company, Corry, Pa., has increased its capital from $50,000 to $100,000.

Clinton furnace, of the Clinton Iron & Steel Company, Pittsburgh, which is now idle, is expected to blow in about November 1. It has recently been relined and repaired and will run on foundry iron.

Rail Branding and Heat Number Stamping

Robert W. Hunt & Co., inspection of rails and fastenings, 1121 The Rookery, Chicago, have issued a wall card which is of special interest to railroad men connected with the maintenance of way departments. The card gives details of the methods adopted by the steel rail manufacturers of the United States, Canada and Mexico in the branding and heat number stamping of steel rails. Each company has its own method of branding and stamping, and therefore each is taken up specifically, thus giving the practice employed at every mill.

The card states that the brand on rails gives the name of the manufacturer, a number or abbreviation by which the rail section is designated, the month and year of manufacture and, if the metal is open hearth steel, the letters O.H. are also added. Some times the letters F.T. are added to signify ferrotitanium steel. Square block letters and figures about an inch high are commonly used, and as these are cut into one of the rolls of the last pass the brand will always appear slightly raised at regular intervals on the web of the rail. The month is generally shown by Roman numerals, as VII for July and sometimes by a series of I's, as IIIII for May. The number representing the heat, blow or melt of steel and the letter to indicate the position of the rail in the ingot are stamped on the web of the rail with dies while it is still red hot, but after it has been completely rolled and sawed to length. It is to be remembered that the brand always appears in raised letters and that the heat number and letter are stamped on.

The Ashland Steel Company's New Officers.—The directors of the Ashland Steel Company, Ashland, Ky., have reorganized by electing the following officers: President, B. H. Burr, of Ironton; vice-president, T. M. Adams; secretary, Oscar Richey, of Ironton; treasurer and general manager, L. R. Putnam. This reorganization was necessary on account of the vacancy caused by the death of Ironton A. Kelly, who held the position of president and general manager. Mr. Burr, the former secretary, is promoted to the presidency, and Mr. Putnam, who was treasurer, is given the additional important position of general manager. No change will be made in the policy of the company, which will continue to be conducted as in the past.

Large bronze castings, thought to constitute the largest bronze group ever cast and erected in America, are on exhibition this week at the Roman Bronze Works, 275 Greene street, Brooklyn, N. Y. They form an artillery group, incidentally of remarkable realism and spirited action, for the General Grant monument in Washington, D. C. All told they weigh 28,600 lb. and the dimensions of the group are: Length, 28 ft.; width, 10 ft.; height, 11 ft. The castings were made in molds of a special composition regularly used by the company and are of what is termed standard United States bronze. The molds were formed around an aggregate of cast wax patterns, which are melted and absorbed in the heat treatment or baking of the molds. These are inclosed in brick retorts or heating chambers, containing the baking fires and built up around the green mold. After baking, the molds are placed in concrete casting pits where sand can be tamped around the molds. Henry Merwin Shrady is the sculptor and Edward Pearce Casey is the architect.

The Vulcan Supply Company has established its office at 1 Madison avenue, New York City. It is the intention of the company to purchase complete equipment for contractors, engineers and builders. Connections have been made with a number of mills, by which materials can be offered at attractive prices. A. G. Sivori, president of the company, has been the New York representative of the Orenstein-Arthur Koppel Company for a number of years. E. P. McDonald, vice-president, is also well known among the contractors in New York. The company is obtaining prices and catalogues on contractors' materials and would also consider the agency for the sale of any first-class article that would be interesting to contractors or engineers.

Personal

Charles U. Carpenter, formerly president of the Herring-Hall-Marvin Safe Company, Hamilton, Ohio, has been elected president of the Fire-Proof Furniture & Construction Company, Miamisburg, Ohio, and vice-president of the Republic Motor Car Company, Hamilton, Ohio.

O. P. Hood, head of the departments of mechanical and electrical engineering of the Michigan College of Mines, Houghton, Mich., has accepted an appointment as chief mechanical engineer of the United States Bureau of Mines, and will make his headquarters in Pittsburgh, Pa.

Manning E. Rupp has accepted a position as mechanical engineer with Stanley G. Flagg & Co., Philadelphia, Pa. He was formerly in the department of construction and engineering of the Isthmian Canal Commission, at Panama, and later associated with John W. King, consulting engineer, New York.

Charles E. Torrance, formerly instructor of experimental engineering, Sibley College, Cornell University, Ithaca, N. Y., has become associated with the Northampton Emery Wheel Company, Leeds, Mass.

R. G. McAuley, president of the McAuley Steam Trap Company, Pittsburgh, has resigned. New officers have been elected as follows: A. F. Cobey, president; H. W. Braden, vice-president; C. F. Cobey, secretary and treasurer.

Lucien Arbel, of the Establishment Arbel, Paris, France, which manufactures car wheels, has been visiting in this country inspecting a number of American car wheel plants.

Dr. Schuchardt, of Thyssen & Co., Melheim, Germany, who is connected with the gas engine department of that company, is visiting American manufacturers.

Otto G. Kaiser and Wilhelm Jung, of Röchling Bros., Ludwigshafen-on-the-Rhine, Germany, are spending several months in this country with a view to establishing a branch here for handling Röchling's electric steel.

H. Seaver Jones, formerly superintendent of the Empire Steel & Iron Company's blast furnace plant at Oxford, N. J., is now with the T. A. Gillespie and East Jersey pipe companies at 50 Church street, New York City.

Crispin Oglebay and D. R. Wilson, the former president of the Ferro Machine & Foundry Company, Cleveland, and the latter manager of sales of the foundry and machine shop of that company, sailed last week for a three months' business and pleasure trip abroad. During their absence they will visit the automobile shows in London and Paris.

H. F. J. Porter, 1 Madison avenue, New York, has been engaged as expert on fire prevention by the commission created by the New York Assembly to inquire into the conditions under which manufacture is carried on in the first and second class cities of the State. This commission, whose appointment was due largely to the Washington Place fire in New York City last spring, is expected to suggest such legislation as will eliminate existing peril to the life and health of operatives. It held the first of its public hearings in New York City last week.

Gano Dunn has just returned from abroad, where as a representative of the United States Government, and as president of the American Institute of Electrical Engineers, he has been attending the International Electrical Congress at Turin and the meeting of the International Electro-Technical Commission, the body that has been organized to bring about international uniformity of standards and practice in the electrical industry. Mr. Dunn, who for many years was first vice-president and chief engineer of the Crocker-Wheeler Company, and is a past president of the New York Electrical Society, has been elected a director and a vice-president of J. G. White & Co., Inc., New York.

Harry S. Brady, who for eight years was connected with the Youghiogheny & Ohio Coal Company interests at Cleveland, and who for the past two years has been general manager of Ohio for the Pittsburgh Plate Glass Company's coal interests, known as the Charleroi Coal Works, has left the latter company to become associated with the Moreland Coke Company of Pittsburgh's Cleveland office in the Rockefeller Building, where he and W. J. Houston, manager of Ohio, will take care of the Moreland Company's business at that point. He will give particular attention to the sale of the company's Star Youghiogheny thin vein gas coal, the output of which is extremely large.

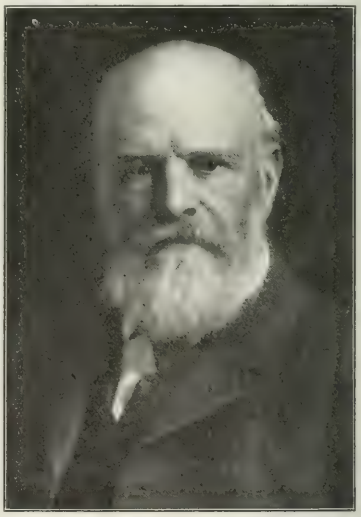
C. J. Nash, who has been with the Westinghouse Air Brake Company, as special representative in the draft gear department, has resigned to engage in the railroad supply business and will make a specialty of draft gear attachments. His headquarters will be in Pittsburgh.

Edward Bailey Cook, manager of the Warwick Iron & Steel Company, Pottstown, Pa., sailed last week for a six weeks' trip abroad, during which he will visit the Spanish iron ore mines of Sota & Aznar.

Obituary

J. H. Hillman, Sr.

JOHN HARTWELL HILLMAN, SR., who died suddenly of heart failure on October 10 at his home in Pittsburgh, belonged to the old school of iron manufacturers. He made charcoal pig iron before the Civil War in the old 3 to 7-ton cold blast charcoal furnaces of the type that existed in Ohio, Pennsylvania, Kentucky, Tennessee and Alabama, afterwards puddling this iron and selling it in the form of charcoal blooms and boiler plate. He was the fourth generation of his family that had been in this business, his father having manufactured iron in Kentucky, Ohio and Tennessee, and his grandfather and great-grandfather in New Jersey and Pennsylvania. Mr. Hillman's grandfather manufactured charcoal iron during the Revolutionary War and made cannon and cannon balls. J. H. Hillman, Sr., manufactured charcoal iron for cannon and cannon balls during the Civil War. He was



J. H. HILLMAN, SR.

on the Confederate side and fought under General Forrest, although his father was a Union man. After his father's death he continued in the manufacture of charcoal iron and boiler plate until the advent of steel boiler plate. In the South in the old days it was his custom to trade with the Pittsburgh machinery manufacturers, and the exchanges then were made by water, the machinery being sent south by boat, on the rises, to the furnaces and rolling mills located on the Cumberland River, and payment being made in pig iron. These exchanges took place in the days when machinery was worth 8 cents to 12 cents a pound, and the pig iron from $50 to $65 a ton.

Mr. Hillman moved to Pittsburgh in 1886 and started the brokerage firm of J. H. Hillman & Co., which later became J. H. Hillman & Son. Mr. Hillman was first to

bring Southern coke pig iron into Pittsburgh, shipment being made by river on coal barges returning from Southern trade. This was almost 25 years ago. About 1893 he became interested in Connellsville coking coal and was one of the pioneers in the opening up of the lower Connellsville or Klondike district, in which by far the greater percentage of Connellsville coke is manufactured to-day. He later became interested in the manufacture of the coke himself and continued in this business up to the time of his death. He was a member of the Sons of American Revolution, the Duquesne Club, and a number of other societies and clubs in the Pittsburgh district.

ZACHARY TAYLOR HALL, senior member of the firm of Hall & Carpenter, metal merchants, Philadelphia, Pa., died at Atlantic City, N. J., October 9, aged 60 years. He had been in poor health for several years and had not been giving close attention to business for some time. He was born in Philadelphia, and while still a young man became identified with his father's business. On the death of his father, August R. Hall, in 1893, he became the senior member of the firm. He was a member of the Union League, past president of the Metal Club of Philadelphia, and was also prominently identified with the Credit Bureau of the Philadelphia Tin Plate Jobbers' Association. He leaves a widow and three sons, E. Roberts, Haslet G. and Zachary T. Hall, Jr. Resolutions paying a high tribute to his memory were passed at a special meeting of the Metal Club of Philadelphia.

JOHN MCLAREN, president of the Phillips & McLaren Company, operating foundry and machine shops in Pittsburgh, died suddenly at Braddock, Pa., October 14, aged 61 years. He was waiting for a train to take him to Pittsburgh. He leaves a widow and six children.

WASHINGTON HASTINGS, formerly of the Seidel & Hastings Company, Wilmington, Del., died in that city October 9, after a brief illness, aged 74 years. He was born in the vicinity of Wilmington, and when a young man entered the hardware business, remaining until he was 21 years of age, when he entered the employ of the Wilmington Plate Iron Works, which later became the Seidel & Hastings Company, manufacturer of iron and steel plates, in which he became the dominant factor. This company went out of existence about ten years ago. He was deeply interested in the civic affairs of Wilmington, and was for a time a member of the Board of Water Commissioners. At the time of his death he served as one of the minor judiciary of the city. He leaves a widow.

JOSEPH WATSON SIMS, who for the last 12 years was connected with Henry R. Worthington, Inc., at its Harrison, N. J., plant, and latterly manager of the meter department, died October 15 at his home in Orange, N. J., aged 44 years. He was a native of Cincinnati, where he received his technical training.

THOMAS NEELY, secretary and treasurer of the Neely Nut & Bolt Company, South Side, Pittsburgh, died suddenly at his home October 11.

AUGUSTINE R. TREADWAY, until last July president of the Peck, Stow & Wilcox Company, died at his home in Cleveland, Ohio, October 16, from heart failure, aged 75 years.

The Connellsville Coke Trade

The Weekly Courier, Connellsville, Pa., reviews the coke trade of the past week as follows:

The Connellsville coke trade is running along at an even gait. Production and shipments were practically the same as the previous week, save that slight gains are reported. The merchant operators of the region are putting forth a very successful effort to regulate production to consumption. Their yards are pretty free of stock coke and the furnace interest is also making a thorough clean-up. Coke that has lain on the yards of the Morgan Valley plants for more than a year is being loaded up and shipped. The coke region clean up will clear the trade atmosphere considerably, and if the iron and steel business increases, which is probable, there will be an increase in coke production. The business just now is in a renovating and waiting stage.

In production there was a gain of 691 tons as compared with the week before, the total being 314,343 tons as against 313,652 tons. To the furnace ovens belongs the credit for the gain, with an increase of 2490 tons. The merchant ovens, on the other hand, fell off 1799 tons.

The number of active ovens in the region was increased by the firing of 20 ovens at Oliver No. 2, 15 at Semet-Solvay, 50 at Martin and 10 at Mt. Hope, and decreased by the blowing out of 70 at Brier Hill, making a net gain of 25 ovens.

The prompt furnace coke market has continued strong, but has not been active. A sale of about 50 cars was made at $1.50, and a few other lots are understood to have gone at the same figure. There is practically no demurrage coke coming out these days. A number of the producers quote $1.50 for prompt furnace coke, but such quotations usually cover relatively small lots, there being no large offerings. The demand for prompt coke has been limited for several weeks, the furnaces all getting good deliveries on their contracts.

Foundry coke is being well taken on contract, but fresh demand is light, consumers having already made contracts covering their usual periods. A few contracts expire at the end of this year, but in general the foundry coke contracts run to July 1 or Aug. 1.

National Implement and Vehicle Association

The initial meeting of the consolidated agricultural implement, vehicle and other allied manufacturers' associations in one convention as the National Implement and Vehicle Association opened at the Congress Hotel, Chicago, Tuesday morning with an enthusiastic gathering of 300 members. The Tuesday and Wednesday morning sessions were devoted to the organization of the convention, the reading of reports from officers and standing committees and the appointment of the temporary convention committees. The session of particular importance was that of Wednesday afternoon, at which time a sales managers' meeting was held for a general discussion of their problems, followed by a discussion as to the costs of doing business, directed by Harry Mead, Wichita, Kan., and C. M. Johnson, Rush City, Minn. The entertainment of the convention included a theater party on Tuesday evening, a reception and ball on Wednesday evening and the annual banquet on Thursday evening.

The Lackawanna Steel Company's Earnings.—The combined earnings of the company and subsidiaries for the three and nine months ended September 30, 1911, were as follows:

	Total income.	Int. on bds. and notes.	S. F. and exhaustion.	Depreciation, etc.	Balance, surplus.
	Three Months.				
1911..	$749,936	$437,500	$86,867	$235,499	$40,070
1910..	1,440,150	437,500	101,656	308,638	592,356
	Nine Months.				
1911..	$2,406,297	$1,312,500	$201,059	$745,094	$147,644
1910..	4,888,493	1,292,083	293,270	1,016,804	2,286,335

The unfilled orders September 30, 1911, were 189,898 gross tons, against 261,931 in 1910. The company also reports balances on October 1 as follows: Accounts receivable, $4,086,937; cash on hand, $4,385,970; current liabilities, $864,392.

The American Locomotive Company, 30 Church street, New York, received the following orders last week for steam shovels and locomotives: Chickamauga Quarry Construction Company, Chattanooga, Tenn., one class 25-11-1¼ steam shovel; Western Pacific Railway Company, one rotary snow plow, scoop wheel type, 18 x 26-in. cylinders, 12-ft. cut. Its Montreal Locomotive Works booked the following: Roger Miller & Son, Toronto, two four-wheel saddle tank locomotives (040-T type), cylinders 11 x 16 in., driving wheels 33 in. and total weight in working order 39,000 lb.; P. Lyall & Sons, Ltd., Montreal, one four-wheel saddle tank locomotive (040-T type), cylinders 13 x 18 in., driving wheels 36 in. and total weight in working order 56,000 lb.

The Kelly Reamer Company, 1555-57 Columbus road, Cleveland, Ohio, has recently opened offices at 96 and 98 Reade street, New York; 170 Oliver street, Boston, Mass.; 112 Queen Victoria street, London, England. The company reports an unusual demand for its product, with indications of continued increase during the winter months.

The New York Electrical Exposition

In addition to the features of popular interest, such as Government exhibits showing methods of planting submarine mines, signal corps work, electrical agricultural appliances and the household goods exhibits, at the Electrical Exposition, which opened October 11 and will continue until October 21 at the New Grand Central Palace in New York, there are many exhibits calculated to attract the attention of the industrial world. Among these are numerous electrically propelled commercial vehicles and exhibits of underground conduit systems carrying electrical cables.

One of the largest displays of industrial equipment is that of the General Electric Company which shows motors, arc lamps, air compressors and heating devices. The Westinghouse Companies also have a large section devoted to the exhibition of factory lighting systems, direct current motors, electric meters, etc. The Crane Company, Chicago, is exhibiting automatic cut-out valves, stop check valves, etc. The Electrical Controller & Mfg. Company, Cleveland, Ohio, exhibits automatic motor starters and controllers in operation. The Electrical Testing Laboratories, New York, has a display of testing equipment. The Habirshaw Wire Company, Yonkers, N. Y., shows rubber covered wires. The Fred Lee Company, New York, exhibits steel reflectors and lamps for lighting systems. Other exhibitors are the National Electric Lamp Association, a 3000-watt cluster of lamps, carbon lamps, etc.; the New York Edison Company, window lighting systems and electrical goods of popular interest; Otis Elevator Company, motor-operated passenger car; the Revolute Machine Company and Topping Bros., New York, complete drafting room equipment; Rider-Ericsson Engine Company, New York, electrically operated water supply system; Watson-Stillman Company, New York, turbine pumps; L. J. Wing Mfg. Company, New York, positive pressure blowers, disk fans and turbine blowers; Eimer & Amend, New York, electric laboratory appliances; Multiple Unit Electric Company, New York, electric muffler furnaces, crucible furnaces and combustion furnaces.

The exposition was formally launched at a luncheon given on the evening of the 11th in the same building by the New York Edison Company to Thomas A. Edison, attended by many notables in the electrical world. The producers and consumers of copper seized the occasion as a fit one on which to present the inventor with a gift that would express their appreciation of the part his inventions have played in the continuous stimulation of the copper industry. Their gift was a cubic foot of copper, cast with the greatest difficulty after six unsuccessful attempts. It weighs 486 lb., and rests upon a stout pedestal. "Edison" is the simple inscription on the top of the cube. One face bore this lettering:

Edison's First Invention
Oct. 13, 1868
Output of Copper, 377,664,000 Pounds
October 13, 1910
Output of Copper, 1,910,608,000 Pounds.

The tables at the luncheon were arranged to form a giant E, with Mr. Edison sitting on the right of the toastmaster, John W. Lieb, Jr. The speakers were President Charles Kirchhoff, of the American Institute of Mining Engineers; Editor Price, of the Electrical Review, and George B. Cortelyou, president of the Consolidated Gas Company. T. Commerford Martin, secretary of the National Electric Light Association, presented the cube.

Western Steel Corporation Receivership

At Seattle, Wash., receivers were appointed by the United States District Court on October 13 for the Western Steel Corporation. The petitioner was the Metropolitan Trust Company, of New York, which, it is stated, holds the notes of the corporation for $600,000. The receivers will serve only until the creditors select a trustee. It was announced some weeks ago that the stockholders of the company had authorized a bond issue and that the president, James A. Moore, of Seattle, had made arrangements for placing the bonds.

The Western Steel Corporation was incorporated in the State of Washington August 2, 1901, acquiring $2,768,000 out of the $3,000,000 capital stock of the Western Coal & Iron Corporation, Ltd., a Canadian company, with mineral claims in British Columbia, Nevada and Washington. The corporation's plant is at Irondale, 38 miles north of Seattle, and consists of a blast furnace with a capacity of 75 tons a day, three open-hearth steel furnaces and blooming and merchant mills. The authorized capital is $15,000,000 common, $5,000,000 6 per cent. noncumulative preferred stock and $2,000,000 first mortgage bonds. The directors are for the most part residents of Seattle and Tacoma, Wash.; Vancouver, B. C., and San Francisco. Some Boston and Worcester, Mass., capital is also represented. President Moore is also at the head of the Irondale Realty Company, which it is stated disposed of about $500,000 worth of property in the vicinity of the steel plant. The corporation had a number of iron ore leases and it was announced last year had made a 15-year contract for the importation of Chinese iron ore and pig iron from the Han-Yeh-Ping Iron & Coal Company, Ltd., operating the Hanyang Iron Works near Hankow on the Yangtse River. A number of shipments of both ore and pig iron were made under this contract. Bars were among the products of the company and a horseshoe plant and a nut and bolt works were projected.

New Vessels for Panama and Pacific Trade

The American Hawaiian Steamship Company, whose plans for four 9000-ton freighters to engage in trade between the Atlantic and Pacific coasts were announced some time ago, has let the contracts for these boats to the Maryland Steel Company. While this addition to the company's capacity has been spoken of as due to the approaching completion of the Panama Canal, it is expected that a portion of the tonnage will be available for trade on the present lines a year or two before the canal is opened. The contract calls for final delivery in the summer of 1913. The company expects to reduce its time from New York to Pacific ports to 21 days when the canal is open, and hopes to put the new schedule into effect by the beginning of 1914.

Reference has already been made in these columns to the incorporation in New Jersey of the Atlantic & Pacific Transport Company, of Baltimore, with a capital of $15,000,000. It is headed by B. N. Baker, formerly president of the Atlantic Transport Company. The plans of the new incorporation contemplate the construction by 1913 of 15 steamers to engage in mail service between New York and Colon, New Orleans and Colon, San Francisco and Panama, with fortnightly service between Seattle and Panama.

The Ingersoll-Rand Company has issued a statement of earnings to the New York Stock Exchange for the six months ended June 30, 1911, as follows:

Earnings of properties		$624,587
Provision for depreciation		231,148
Net earnings		393,438
Interest on bonds	$50,000	
Dividend on preferred stock	75,759	
Special reserve in respect of patents	5,000	
		130,759
Net addition to surplus		262,679

The general balance sheet as of June 30, 1911, shows depreciation reserve, $1,539,773; patent and license reserve, $640,000; additional patent and license reserve, $5,000; special inventory reserve, $800,000; profit and loss surplus, $1,777,029.

A. J. Goss, 6506 Perry avenue, Chicago, has been appointed sales manager of the E. Killing's Molding Machine Works, Davenport, Iowa, for Pennsylvania, Ohio, West Virginia, Kentucky, Indiana, Illinois, Missouri, Michigan, Wisconsin and Minnesota. Buffalo, N. Y., and towns within a radius of 100 miles of that city are reserved to the Buffalo Foundry Supply Company, which has the selling agency of the Killing machines for that territory.

The Wm. Cramp & Sons Ship & Engine Building Company, Philadelphia, Pa., on October 10 launched two vessels for the Cuban Government, one a cruiser, the Cuba, the other a naval training ship, the Patria. The former vessel is a twin screw vessel 260 ft. long, with a displacement of 2055 tons, while the latter is 185 ft. long and has a displacement of 1200 tons.

Steel Works Labor Conditions

An Inquiry Covering the Lackawanna and Other Independent Companies

The Survey, the weekly journal published under the Charities Publication Committee of the New York Charity Organization Society, has an article in its issue of October 7 dealing with the town of Lackawanna, N. Y., and the living conditions of the employees of the Lackawanna Steel Company, whose families chiefly make up its population. The writer is John A. Fitch, the member of the staff of the Pittsburgh Survey especially charged with the investigation of steel works conditions, and the article is one of a series having the general title "The Human Side of Large Outputs—Steel and Steel Workers in Six American States." In its editorial referring to this series, the Survey says that Mr. Fitch's investigations were made possible by the gift of Charles M. Cabot, of Boston, a stockholder in the United States Steel Corporation who has been active in drawing public attention to labor conditions in the steel works of the country and living conditions in steel works towns. Mr. Fitch's inquiry covered the large independent steel mills in Pennsylvania and those at Lackawanna, Gary, South Chicago, Pueblo and Birmingham. It appears that these investigations have all been made and that what remains is the publication of the articles.

Commenting on the statement made by Charles M. Schwab that the conditions at the Bethlehem Steel Company's plant, which the government investigated last year, were not worse than those at other steel plants, the Survey says:

> What we find is that Mr. Schwab is, in the main, correct. Everywhere we have found long hours, overtime, Sunday work, and low wages. Striking advances we have found in the protection of employees from personal injuries. The Steel Corporation has devised a safety organization of remarkable scope and effectiveness—one with inspection which puts to shame the factory inspection of any of our State governments. In its relief plan, it has gone a long way beyond the demands of statute and common law in the States in which its plants are located. A movement away from the seven-day week is discernible, and at the same time open advocacy of the twelve-hour day. When the American Iron and Steel Institute this spring appointed a Welfare Committee, the members, according to President Clarke of the Lackawanna Steel Company, were fairly staggered by the size of the problem before them. This note of sincerity no less than breadth of outlook has characterized the statements given out as to the work which the committee has set for itself.

The article on the town of Lackawanna, N. Y., and the living and employment conditions of Lackawanna Steel Company workers takes up 16 pages of the Survey and is illustrated. The author grants that some of the undesirable conditions he describes are due to the natural crudeness of a young and rapidly built city. The thing in the whole article which calls for severest criticism is that prominence is given on every page to conditions of which complaint is made, while the efforts the steel companies are making to remedy these conditions, which should be the strongly emphasized feature of such articles, are relegated to the fine type of a footnote. The author might well have displayed at the outset of his article this paragraph which we find in insignificant type at the bottom of a page. It tells of the changes the Lackawanna Steel Company has made so as to give one rest day in seven to its workmen.

"In the spring of 1911 important changes took place. The blast furnace crews were organized on such a basis as to give each man one day of rest in seven. An attempt was made to do the same in the coke ovens, but the men objected on account of dissatisfaction with the day of rest allotted, so the plan was abandoned. The men do take off about three days in each month. In addition to these changes, which give a weekly rest day to 1300 or 1400 men, the working day for the common labor force has been reduced from twelve to ten hours."

Elsewhere it is stated that the Lackawanna Steel Company had offered slag free to the city for filling the swamp in the boarding house district to which the article particularly objects, and that the South Buffalo Railway Company, a subsidiary of the steel company, offered to haul the slag free and dump it at convenient points. The steel company has recently interested itself in social work, employing James Bronson Reynolds to make a thorough investigation of social conditions. It is admitted that "a number of interesting and hopeful things have resulted directly and indirectly from Mr. Reynold's report, the first of its kind submitted to the officials of a large employing steel corporation by a man of independent standing as an economist and social worker." Of these "interesting and hopeful things" Mr. Fitch's article enumerates the following:

> One of the first things was the organization of a sociological department. So far it has not been determined just what lines of activities are to be taken up by this department, but a way is being found out for it in an interesting manner. About a year ago a settlement, in which several Buffalo people were interested, was started in Lackawanna by Miss Emma Kaan, an artist of Hungarian descent. A committee has been organized of which George D. Sawyer, of Buffalo, is chairman, and with which General Manager C. H. McCullough, of the steel plant, is co-operating. This committee has assumed charge of the settlement and of social work in general in the community. One year ago there was practically no social work in Lackawanna. Now, in addition to the settlement itself, there is a model lodging-house conducted by the settlement; two visiting nurses are at work; a Y. M. C. A. worker, who last winter conducted evening classes for men, spent the summer in charge of a boys' camp in the country near Lackawanna; a trained Charity Organization Society worker has been in the field since March; a playground has been opened and a director secured; a modified milk station and a dispensary have been established. Of the expense attendant upon these enterprises five-sixths is borne by the steel company.
>
> During the past month Elizabeth S. Williams, long headworker of the College Settlement on Rivington Street, New York, has taken up residence in Lackawanna. Miss Williams takes temporary charge of the settlement to develop its activities; and during her stay she will study the needs of the community and help organize further efforts at improvement. The sociological department of the steel company will undoubtedly keep closely in touch with this outside work and thus rather remarkable co-operative relationships for improvement in mill and town will be instituted. The application of the experienced judgment and democratic standards of neighborhood workers, who have had their training in the tenement life of the great cities, to such an outlying self-contained industrial community as Lackawanna is in itself an experiment which will be watched with interest.

The Frontier Iron Works Adds New Lines

The Frontier Iron Works, Buffalo, N. Y., has acquired a controlling interest in the Buffalo Aluminum & Bronze Company. The transfer of the property of the latter company has already taken place and the following directors or stockholders of the Frontier Works have been elected officers of the Aluminum & Bronze Company: Walter M. Semon, president and treasurer; Timothy M. Light, vice-president; James W. Murphy, secretary. The Aluminum & Bronze Company operates a foundry for making aluminum and bronze castings, largely for the automobile and motor trade, and also conducts a department for aluminum hollow ware.

By adding its new connection, the Frontier Iron Works is now able to supply a complete line of castings to its various customers. It has for many years made a specialty of cylinder castings for the automobile and motor trade and has also operated an extensive plant for the manufacture of machine tools, in which its principal products have been a patented tilting table drill press and the well-known Royal power hack saws. A new line will also be added, consisting of motors for aeroplanes on which the company has made experiments for more than a year and has now brought out a very successful design of an aeroplane engine. The company has doubled its capital stock to take care of the extensive additions to the plant which are necessary for the manufacture of these motors. The offices of the Frontier Iron Works are located at the corner of Grant and Letchworth streets and the newly acquired plant of the Buffalo Aluminum & Bronze Company is situated on Letchworth street, directly opposite.

Recent foundation contracts awarded to the MacArthur Concrete Pile & Foundation Company, 11 Pine street, New York, N. Y., include those for the inbound and outbound freight houses of the Père Marquette Railroad at Saginaw, Mich., a large machine shop for the Westinghouse Electric & Mfg. Company, East Pittsburgh, Pa., and the Fulton County Court House, Atlanta, Ga. The last contract calls for over 1200 piles to support the building, which is to be a 9-story reinforced concrete structure costing about $750,000.

The testing of thermometers forms the subject matter of Circular No. 8 of the Bureau of Standards, issued by the Department of Commerce and Labor, Washington, D. C. Besides methods of testing and calibration of thermometers, methods are given for using precision thermometers. The pamphlet is a cyclopedic treatment of thermometry.

The Great Northern Iron Ore Lease

Some Stipulations of the Hill Deal with the Steel Corporation That Have Been Lost Sight Of—Royalties May Reach High Figures, but Are Not Increased by 3.4 Cents as a Regular Factor

Based upon a brief penciled memorandum made in 1906 and subscribed with the initials "E. H. G." and "J. J. H.," there were issued that year by the Great Northern Railway 1,500,000 "ore trust certificates" representing control of or ownership in certain lands on and adjacent to the Mesaba iron ore district of Minnesota. Readers of *The Iron Age* are so thoroughly conversant with the wonderful history of that mining district that it is useless to repeat here what the control of large tracts of lands on the range means to a steel-making company. This memorandum was turned over to the legal representatives of the United States Steel Corporation at Duluth, to be elaborated into legal shape, and nearly a year later the formal lease of the Great Northern lands on the Mesaba to the Steel Corporation was ready for delivery to the principals. The lease comprises a printed book of more than 1000 pages, and a sufficient number of copies was issued for delivery to the principals only; the instrument was never placed on record.

In connection with this lease is another document running from the Great Northern Railway Company to the Ore Trustees, transferring all its interests in these lands to the trust, under certain conditions, and minutely specifying lands, powers, salaries, etc., of the trustees, their manner of perpetuation, the interest of certificate holders, etc. Great secrecy surrounded both these documents; this one also has been kept from the records.

These ore certificates are based chiefly upon mining leases of lands on or near the Mesaba range, between certain subsidiary companies of the Great Northern Railway and other parties, on the one hand, as lessors and various mining companies, on the other hand, as lessees. What is commonly known as the "Hill Ore Lands Deal" with the Steel Corporation is the most important of the various leases of lands controlled by the railroad company. This is true, not only from the fact that it doubtless covers a greater tonnage of iron ore than any lease by the Great Northern to other concerns, but because of the fact that it is based on a higher rate of royalty than was ever known in that district for any large tonnage, and a rate that annually increases, is on a basis of enormous annual output, and because it has emphasized the large control of ore supply by the Steel Corporation, to which attention was drawn in the report of Herbert Knox Smith, commissioner of corporations.

Limits of the Mesaba Formation

The iron-bearing formation known as the Mesaba range lies in a generally east-northeast and west-southwest trend, commencing in Township 59-14 and ending near the Mississippi river, in Township 55-25, an approximate length along its course of about 75 miles. East of 59-14 merchantable ore has not yet been found in any considerable quantity, and west of the Mississippi river the region is thickly covered by drift, and the strike of the formation is not definitely assured, while what ore has been discovered is generally of quite low grade. By exploration carried on continuously during the past 20 years the northern limit of this productive region has been quite thoroughly determined and it is useless to expect to find iron ores of the Mesaba type in the sedimentary and eruptive rocks to the north. A quartzite rock lies under and close to the ore-bearing rock in most cases, and beneath it are eruptive rocks of great age. But exploration has not yet determined with absolute precision all points on the southerly line of the productive formation. There is a possibility that an occasional minor discrepancy may be found between what is now recognized as the general contact between the ore formation and the south slates and the true contact, as it may ultimately be found to lie. That such discrepancies, if they exist at all, will be slight and of trifling importance, so far as general results are concerned, may be assumed as certain. In accord with the universal geological theory as to the origin of the commercially valuable ores of the Mesaba, it will be impossible for ore to extend for any material distance to the south of the edge of these slates or beneath them; therefore they may be assumed to limit the possible southerly extension of ore bodies of the district.

The Great Northern Lands and Leases

Great Northern Railway lands are bounded quite closely on the north by the north line of the productive formation, with but comparatively few tracts on lands that are assuredly unproductive and in the quartzite or eruptives; but there is a considerable proportion of the acreage too far to the south to be classed as probably valuable for ore, unless the formation is much wider than exploration has proved it or than geologists have reason to suspect. Most of these latter lands, probably worthless for iron ore, are held under fee title, and are therefore of but trifling carrying cost; but a few of the tracts held under lease on this south side of the formation have been abandoned by the sublessee after exploration or examination.

The various lessors in interest are the West Missabe, Wright, Davis, Wells and Stone land companies; the Wabigon, Minosin, Niniwa, Nibiwa and Wenona iron companies; the Leonard, Arthur, Fillmore, Harrison, Jackson, Tyler, Polk and Van Buren iron-mining companies. These concerns are subsidiaries to the Great Northern Railway and hold lands under fee titles, in whole or in part; have various leases from the school lands of the State of Minnesota and from corporations and individuals; on all of these they receive all or a certain part of the royalties paid on ores taken therefrom by the Great Western Mining Company, which is the holding department of the United States Steel Corporation for the Hill ore lands.

Of lands covered by the lease to the Great Western Mining Company there are 39,280 acres, more or less; of this the Great Northern holds in fee about 19,700 acres, has a half interest in some 15,400 acres more, owns other fee interests than half in some 360 acres and has under lease from other fee owners at royalty rates that permit it a profit in the Steel Corporation transaction 3800 acres more. All these figures are necessarily triflingly approximate. The Great Northern also holds in fee the title to some 1420 acres that had been leased to other operators than the United States Steel Corporation prior to the date of the execution of the Great Western instrument and before the Great Northern had commenced negotiations with the corporation. One of these leases had descended to the Great Northern from the earlier proprietors of the land; that being to the Mahoning Ore & Steel Company, covering 150,000,000 or more tons.

Additional to all these lands, there is a considerable acreage in the Great Western lease in which ore certificate holders have no interest, as the lands are leased to the Great Northern at the same rate of royalty as the Great Northern receives from the Steel Corporation. As to these lands the Great Northern Railway is beneficiary, so the ore taken therefrom must be shipped to Lake Superior over that line, which secures what is commonly supposed to be a very large profit thereon. These tracts include parcels owned by the Northwestern Improvement Company (Northern Pacific Railway Company) and also lands owned by Longyear & Bennett and others. Many of the tracts included in the main instrument, and in which the Great Northern road has a half interest in fee, are owned, as to the other half, by Longyear & Bennett, and are included as a whole, but the entire royalty derived from one half the ore goes to Longyear & Bennett and not to the Great Northern. In these cases the Great Northern Railway benefits as above.

In what are known as "Walker lands," lying near the Mississippi river and included in the Steel Corporation lease, the Great Northern owns an undivided one half the

title. The remaining half is the property, in fee, of the Lorain Iron Company, a subsidiary of the Steel Corporation, and on half the ores mined from these Walker lands the Great Northern Railway is not entitled to the freightage. This is the only exception to the rule of the lease that this road shall receive the freights paid on all ore taken from lands included in the Great Western leasehold.

The Scale of Prices

The lease to the Steel Corporation provides for the mining and shipment of at least 750,000 tons of iron ore during the year 1907, this minimum amount to be increased by 750,000 tons a year until it shall have reached the annual total of 8,250,000 tons in the year 1917. From that time until the exhaustion of the ore bodies in this land, the annual minimum shall be the vast amount of 8,250,000 tons. Royalties are to be paid based upon the quality of the ore, in units of iron only and without regard to phosphorus or other deleterious elements. Ore containing 59 per cent. of iron, dried, which is probably about 52 per cent. natural, as Mesaba ores average high in moisture, is the base on which all royalties are computed. For the year 1907 such an ore was to pay a combined royalty and freight to Lake Superior of $1.65, of which 80 cents is freight. This latter sum is fixed for the period of the lease on ores of whatever grade. Of the entire amount received, this is the proportion that goes to the Great Northern Railway itself, and inures to the benefit of stockholders of that company alone. Should freights decrease, the royalty portion rises similarly. Annually, after 1907, the proportion of the amount that is paid as royalty is to be increased by a sum equal to 4 per cent. interest on the original royalty, or 3.4 cents a ton on the 85-cent basic ore. Thus in 1908 the royalty portion of the payment was 88.4 cents a ton, in 1911 it is 98.6 cents and in 1915 it will be $1.122, to all of which must be added the further sum of 80 cents a ton to get the actual cost of delivery of a ton of that ore to Lake Superior in those years.

Beginning with the base of 59 per cent., dried, the royalty rises or falls 4.82 cents for each per cent. of iron in the analysis. In other words, a 60 per cent. iron ore was costing in 1907 for royalty only 89.82 cents, and a 55 per cent. ore 65.72 cents. For the year 1911 these two grades cost $1.0419 and 76.24 cents respectively, and for the year 1915 they will cost $1.1855 and 86.75 cents respectively. The year 1915 is especially referred to, as it is at this time that the Great Western Mining Company has its sole option of withdrawing from the lease.

The impression is general that the sliding scale of royalties is based on the definite factor of 3.4 cents per annum, added to the price of 1907; but this idea is not in accord with the terms of the lease, which is distinct as to the advance of 4 per cent. on the original prices, which are as follows:

Ore at	Royalty	Ore at	Royalty
59 per cent.	$0.85	58 per cent.	$0.8018
60 per cent.	.8982	57 per cent.	.7536
61 per cent.	.9464	56 per cent.	.7054
62 per cent.	.9946	55 per cent.	.6572
63 per cent.	1.0428	54 per cent.	.6090
64 per cent.	1.0912	53 per cent.	.5608
65 per cent.	1.1392	52 per cent.	.5126
66 per cent.	1.1874	51 per cent.	.4644
		50 per cent.	.4162
		49 per cent.	.3680

Other Stipulations of the Lease

Ore containing 49 per cent. metallic iron, dried, is fixed as the minimum merchantable standard that the lessor can require to be mined; should the lessee desire to extract any ores of lower grade he is to pay therefor a flat rate of $1.10 a ton, royalty and freight combined, or 30 cents a ton for the ore itself. This provision is continuous.

At present rail freight and dockage charges from all Mesaba range points to Lake Superior ports amount to 80 cents a ton; but in case there is any change in these rates at any time during the term of the lease, whatever amount is taken from the freight shall be added to the royalty, making the sum of the two continuous. It is more than probable that in a reasonable time, and long before the exhaustion of this lease, there will be some change that will reduce the freight charge on Mesaba ores from 20 to 25 per cent. or more. In that case a larger portion of the total receipts will be received by the ore certificates, and less by the railroad company, the cost to the Steel Corporation remaining as fixed under the original agreement.

Payments of royalties are to be made quarterly to the trustees at their office in St. Paul, Minn., for all ore delivered in the preceding quarter, and on January 20 of each year any deficiency in the shipments of the preceding year must be settled for, as though mined, and on the assumption that this ore was of the standard of the lease, namely, 59 per cent. iron. These deficiency payments do not, however, include freight or dockage charges, which are paid as the ore is actually shipped.

All general and special taxes, all liens and claims of every nature, are paid by the lessee, insuring to the Great Northern full payment of the minimum royalties each year.

The lease carries provision for full exploration of the lands, and more than the required number of drills has been continuously at work since the beginning of the term. As high as 92 drills have been employed at one time on these lands by the lessee corporation. At present the lands are almost completely explored and the number of drills employed is fewer, but is still above the minimum requirement.

Lease May Terminate January 1, 1915

If the lessee wishes he may surrender the lands, but at one specified date only, namely, upon January 1, 1915, and then upon wrttten notice given by him to the trustees two years prior to that day. If not so surrendered, the lease continues until all merchantable ore, of 49 per cent. and over, has been shipped from fee lands, and as long thereafter as the annual minimum shall be paid. As to lands held by the Great Northern under leases, the Great Western lease terminates 90 days prior to the day upon which expire the leases under which they are controlled. Most of these latter instruments are of 50 years' duration, though some are less. That of the Leonard Iron Mining Company expires on January 1, 1920.

Most of the lands that the Great Northern holds under lease from other fee owners and has re-leased to the Great Western Mining Company are the property in fee of the State of Minnesota; and on these the State derives an income of 25 cents a ton on all ore mined, without regard to quality or date of mining. The difference between this 25 cents a ton and the price paid by the Great Western to the Great Northern represents the profits to ore certificate holders on this class of ore. Some of these leased lands are from corporations and individuals, and on these the rate of royalty varies; but it is universally on a flat basis, whatever the grade or time of extraction. These royalties, too, may be said to average about 25 cents a ton. There are some 30 or more of these leases, which it is unnecessary to enumerate.

New Mines Opened by the Steel Corporation

Since the execution of its lease and in carrying out the provisions thereof, the Oliver Iron Mining Company, acting for the Steel Corporation, whose mine operating department it is, has opened the Dale, Harold, Hill, Mace, Mississippi, Uno, South Uno and Walker mines, and has taken over the Leonard, that had been previously operated. To the close of 1910 the aggregate of annual minimum shipping requirements under the lease had reached a total of 7,500,000 tons, as follows:

In the year 1907	750,000 tons.
In the year 1908	1,500,000 tons.
In the year 1909	2,250,000 tons.
In the year 1910	3,000,000 tons.

During that period there had been shipped by the lessee from mines opened under the lease the total of 2,217,353 tons of iron ore, leaving an apparent deficiency of 5,282,647 tons, on which the Steel Corporation has paid the royalty (at the rate of 85 cents a ton for 1907, with the requisite increased sums for subsequent years), but which it has not yet been able to mine. The ore thus paid for in advance is to the extent of the payments an asset of the corporation, for it can be mined subsequently without additional payments except for the freight charge to Lake Superior. However, certain Great Northern interests have attempted to read into the contract a meaning that whenever the Oliver Iron Mining Company is able to take out these deficiencies of previous years it shall be obliged to pay not only the rate of the year in deficiency, but the added rate of the year in which the deficiency is wiped

out. That is, should the Oliver Company make up for the losses of 1907-8-9 in the season of 1910, it shall pay in addition to the price of those years a price increased by the interest up to the time of actual shipment. But the contract does not appear to warrant that contention.

Royalties on Deficiencies

But the apparent deficiency is not the same as the actual. Two of the mines mentioned above are situated on what is known as Walker land, and an undivided half interest in these lands is owned in fee by the Steel Corporation through its Lorain Iron Company. Therefore but one half the shipments from these mines can be credited under the lease. One of these is the Hill mine, and this had produced 801,088 tons prior to 1911, thus reducing the actual shipments under the lease to 1,816,809 tons, a deficiency on January 1, 1911, amounting to 5,683,191 tons. This can be best expressed as follows:

	1907	1908	1909	1910
Royalty rate	$0.85	$0.884	$0.918	$0.952
Mine shipped:				
Dale	....	....	....	....
Harold	....	....	....	27,711
Hill	....	....	....	861,088
Leonard	....	....	6,857	687,910
Mace	....	....	....	15,267
Mississippi	....	....	....	36,581
Vale	....	....	....	341,939
Deduct one-half Hill				400,544
			6,857	1,809,952
Requirements	750,000	1,500,000	2,250,000	3,000,000
Deficit	750,000	1,500,000	2,243,143	1,190,048
Total deficit				5,683,191
Advances on ore not produced	$637,500	$1,326,000	$2,059,205.27	$1,132,925.70
Total advances to January 1, 1911				5,155,630.97

The minimum to be produced in 1911 amounts to 3,750,000 tons, at a royalty rate of 98.6 cents a ton. The royalties to be paid in January, 1912, will therefore amount to $3,697,500, providing the Steel Corporation is unable to make settlement on the basis of the actual grade of ore shipped under the entire contract to that time. This it can do only providing it shall then have completed the shipment of all deficiencies to that time. As this will mean the shipment during 1911 of the enormous amount of 9,433,191 tons, it is most improbable that any settlement can then be made.

Indeed, in order to reach the accrued minimums up to the close of 1912 the Steel Corporation will have to take about 7,000,000 tons for each of the two years, and it is quite safe to say that the minimums will not have been met before the end of next year. Whenever that time arrives, there will be a return to the Steel Corporation of a sum based on the difference between the grades of ore paid for and those actually shipped. How much this may be is utterly impossible of determination now. But the assumption may be made that the average grade of ore shipped for these years will not be up to 59 per cent. and that the average grade to be shipped during the term of the lease will not exceed 54 per cent. But present shipments are from portions of the range where the ores run well up in iron, and may average nearly 59 per cent.

The purpose of this article is to discuss the Great Northern Railway's iron ore lands in their connection with the United States Steel Corporation, and without reference to the possible value of these ore certificates. Therefore any consideration of other leases by the railroad company is unnecessary and to be avoided. Nothing will be said, consequently, concerning other lessees than the Steel Corporation, of whom there are four.

About 300,000,000 Tons of Hill Ore

Estimates of the tonnage developed on the lands included in the Steel Corporation lease have varied widely, as is but natural. One estimator may consider mainly the possibilities of the situation, taking a broad view based on the prior development of the central portions of the Mesaba district and placing his belief on an optimistic base. Another may take what figures a mining engineer would consider safe, and estimate from the actual developed ore. At the time the lease was made, Mr. Hill was quoted as saying that there were 500,000,000 tons in the lands, but whether he referred to the lands covered by this lease or to the entire holdings of the Great Northern road was never made plain so far as the writer knows. But these figures were not meant to be taken as most people took them—as meaning that such a tonnage was developed. In conversation one day with the writer while sitting in the office of the president of the Great Northern, President Hill explained that these estimates were based upon occasional holes that showed ore but were some distance apart, and that he had assumed the conditions observed at the holes would be found reasonably continuous throughout the intervening distance. But he recognized that these holes were much too far apart to permit such an estimate from the standpoint of a mining engineer. At that time an engineer, figuring on the basis that Mesaba practice had proved reasonable and conservative, would have cut that estimate down to about 175,000,000 tons. Indeed, about this figure was what the Duluth offices of the Steel Corporation then reported to New York as the tonnage developed on the lands under negotiation.

If Mr. Hill's estimate at that time was based on his expectation of the total tonnage on Great Northern lands that have been developed up to the present day, it was not far out of the way; and assuming this to have been his meaning, the remarkable foresight with which he has so often been credited is once more vindicated.

Since then exploration on the Steel Corporation lands has been continuous. At times the Oliver Iron Mining Company had from 90 to 100 drills on the property, more than double requirements, and it has now come pretty close to a complete exploration. There are now developed on these lands, as a mining engineer would measure ore, about 300,000,000 tons, and this amount is unlikely to be materially increased, except by reason of some considerable lowering of the minimum merchantable grade. Should there be such a demand for ore—and such prices for steel as to permit it—as to cause a material drop in ore-buyers' and furnace standards, this total would be indefinitely augmented.

Of the 300,000,000 tons a part is held by the Great Northern in fee; in another part a 50 per cent. fee interest is held; in still another there are various undivided fee interests; a part is held by underlying leases that average about 25 cents a ton, and a part is held in leases from parties who benefit to the full extent of the royalty paid by the corporation. These latter passed their lands through the Great Northern trust simply for the purpose of sharing in the benefits of a deal far more advantageous than they would have been able to make for themselves.

A Table of Royalties

With a gross tonnage as above stated the lease will expire by exhaustion of its ore in 1946, on the basis of a minimum annual output and a minimum of merchantable iron constant at 49 per cent. In this connection there is here presented a table showing the amounts of royalties per ton to be paid each year up to 1947 on three grades of ore—namely, 59 per cent., 54 per cent. and 49 per cent. The first is the standard of the lease, the second a probable average of shipments for a term of years and the third the lowest merchantable ore, as defined in the instrument of lease:

Year	Ore of 59%	Ore of 54%	Ore of 49%
1907	$0.8500	$0.60900	$0.36800
1911	.9860	.70644	.42688
1912	1.0200	.73080	.44150
1913	1.0540	.75516	.45632
1914	1.0880	.77952	.47104
1915	1.1220	.80388	.48562
1916	1.1560	.82824	.50048
1917	1.1900	.85260	.51520
1918	1.2240	.87696	.52992
1919	1.2580	.90132	.54464
1920	1.2920	.92568	.55936
1921	1.3260	.95004	.57408
1922	1.3600	.97440	.58880
1923	1.3940	.99876	.60852
1924	1.4280	1.02312	.61824
1925	1.4620	1.04748	.63296
1926	1.4960	1.07184	.64768
1927	1.5300	1.09620	.66240
1928	1.5640	1.12056	.67712
1929	1.5980	1.14492	.69184
1930	1.6320	1.16928	.70656
1931	1.6660	1.19364	.72128
1932	1.7000	1.21800	.73600
1933	1.7340	1.24236	.75072
1934	1.7680	1.26672	.76544
1935	1.8020	1.29108	.78016
1936	1.8360	1.31544	.79488
1937	1.8700	1.33980	.80960
1938	1.9040	1.36416	.82432
1939	1.9380	1.38852	.83904
1940	1.9720	1.41288	.85376
1941	2.0060	1.43624	.86848
1942	2.0400	1.46160	.88320
1943	2.0740	1.48596	.89792
1944	2.1080	1.51032	.91264
1945	2.1420	1.53466	.92736
1946	2.1760	1.55903	.94208

At this last date the mines of the main lease will have become exhausted, providing no great additions are made to them by explorations yet to be carried out, and such additions are rather unlikely. If leaner ores shall become

merchantable there will be a large addition, impossible now to calculate.

As shown here the Steel Corporation in 1946 would be paying a rate of royalty amounting to $2.176 per ton on a 59 per cent ore, and correspondingly on other grades. If, in the interim, the freight rate on ore from Mesaba points to Lake Superior ports is reduced to, say, 50 cents a ton, the royalty will be $2.467. This is a royalty charge of a trifle more than $5 per ton on steel made from this ore.

The Machine Tool Dealers' Meeting

Conclusion of the Proceedings

In *The Iron Age* of last week a report was given of the proceedings of the Machinery Section of the National Supply and Machinery Dealers' Association at its meeting at the Hotel Astor, New York City, on Tuesday, October 10. The fourth executive session was opened Wednesday afternoon with an address by W. M. Pattison, president of the W. M. Pattison Supply Company, Cleveland, Ohio, on the subject of "Service Rendered to Appraisal Companies in Connection with Appraisal of Machine Tools and Other Equipment." It was the general opinion of the members that the appraisal companies should not be furnished data free of charge as is now the custom.

Percy M. Brotherhood, of Manning, Maxwell & Moore, Inc., New York, opened a discussion on the "Uniform Proposal Blank" question, which was thoroughly gone into and the following form was adopted:

Uniform Proposal Blank

We propose to furnish you machinery as per schedule attached hereto and forming part hereof at prices set opposite the respective items.

Delivery.—F. o. b. our works, as specified.

Time of Shipment.—To be as specified.

Terms of Payment.—Net cash 30 days after date of shipment.

The time of delivery named herein is the approximate date of shipment from our works, and this corporation shall not be responsible for delays occasioned by strikes, fire or other causes beyond its reasonable control.

The acceptance of the machinery when delivered shall constitute a waiver of all claims for damages caused by any delay.

If there be several deliveries hereunder, settlement shall be promptly made for each invoice in accordance with above terms.

All previous communications between the parties hereto, either verbal or written, with reference to the subject of this proposal, are hereby abrogated and withdrawn, and this proposal, when duly accepted and approved, shall constitute an agreement between the parties hereto, and no modification of such agreements shall be binding upon the parties, or either of them, unless such modification shall be in writing, duly accepted by the purchaser and approved by an executive officer of this corporation.

Cancellation Clause—Please note that all our proposals, quotations and acceptances of orders are made with the mutual understanding that orders are not subject to cancellation provided shipment is made within the time promised, and machines of special design, embodying special measurements, also motor driven, are not subject to cancellation, unless specially arranged for.

The foregoing proposal is subject to the approval of an executive officer of this corporation, and shall not be binding upon this corporation until so approved, nor unless accepted by the purchaser within thirty days from the date hereof.

There are no understandings or agreements outside of this written proposal.

Upon the close of the executive session the meeting adjourned.

Convention Notes

On Tuesday evening members of the National Machine Tool Builders' Association and of the Machinery Section of the National Supply and Machinery Dealers' Association enjoyed an entertainment as guests of Alex. Luchars, publisher of Machinery. The affair was held in the grand ball room of the Hotel Astor and a pleasing programme replete with amusing hits on machinery men was given. Supper was served, and during the evening a loving cup was voted to Henry Prentiss, of the Prentiss Tool & Supply Company, as the most popular machinery man. On Wednesday night the convention delegates were guests of the American Machinist at a theater party at the Hippodrome.

The Hyatt Roller Bearing Company, Newark, N. J., had an interesting exhibit of its line of roller bearings at the Hotel Astor on October 10, 11 and 12 in a room adjacent to the halls occupied by the Machine Tool Builders' and Machinery Dealers' conventions.

The National Machine Tool Builders

At the final session of the annual convention of the National Machine Tool Builders' Association, at Hotel Astor, New York, October 11, officers were elected as follows:

President, E. P. Bullard, Jr., Bullard Machine Tool Company, Bridgeport, Conn.
First vice-president, Fred A. Geier, Cincinnati Milling Machine Company, Cincinnati, Ohio.
Second vice-president, A. T. Barnes, W. F. & John Barnes Company, Rockford, Ill.
Treasurer, Albert E. Newton, Prentice Bros. Company, Worcester, Mass.
Secretary, Charles E. Hildreth, Whitcomb-Blaisdell Machine Tool Company, Worcester, Mass.

The sense of the meeting was that discounts to State and municipal institutions be eliminated, and a committee was appointed consisting of Wood Walter, Cincinnati Milling Machine Company, Cincinnati, Ohio; Murray Shipley, Lodge & Shipley Machine Tool Company, Cincinnati, and A. E. Newton, Worcester, to confer with a committee of the National Supply and Machinery Dealers' Association. This latter body comprises W. M. Pattison, W. M. Pattison Supply Company, Cleveland, Ohio; J. O. Harron, Harron, Rickard & McCone, San Francisco; Alfred Marshall, Marshall & Huschart Machinery Company, Chicago; R. J. Lynd, Chandler & Farquhar Company, Boston, Mass., and A. Schen, J. M. Wright & Co., St. Louis, Mo.

It was voted to employ a permanent secretary, the selection being left to the executive committee.

A motion was carried that hereafter the annual meeting shall continue for three days, and the semiannual meetings two or three days at the option of the executive committee. Atlantic City was determined upon as the place of the semiannual meeting next spring.

Hagan Sheet and Pair Furnace Contracts

George J. Hagan, Peoples Bank Building, Pittsburgh, has secured a contract from the Washington Tin Plate Company, Washington, Pa., for six sheet and pair furnaces of the same type that were designed and erected by him for the McKeesport Tin Plate Company, Port Vue, Pa., and two double annealing furnaces, stoker fired. In addition he has the contracts for bricking in and setting all of the Babcock & Wilcox and Heine water-tube boilers, aggregating about 2000 hp.; also setting in tin house machinery. Among other contracts which he has recently taken are the following: The Inland Steel Company, Indiana Harbor, Ind., four independent stoker-fired sheet and pair furnaces, being exact duplicates of those designed and erected for the Canton Sheet Steel Company, Canton, Ohio; Portsmouth Steel Company, Portsmouth, Ohio, six sheet and pair furnaces, also to be duplicates of the Canton installation, and six stoker-fired annealing furnaces; Allegheny Steel Company, Brackenridge, Pa., one stoker-fired continuous sheet steel box annealing furnace, which has a capacity for holding 15 boxes and is continuous in operation, similar to those operated by manufacturers in Germany and England.

Bretaud Steel Converter Installations.—J. V. Bretaud, foundry engineer and manufacturer of steel converters, Muskegon, Mich., recently completed the installation of a converter in the Dayton Steel Foundry Company's plant, Dayton, Ohio. This converter is of the Bretaud type, with a removable top and has a capacity of two tons. It has been in successful operation since the first blow, and, although most of the castings made consist of automobile parts, the metal is so fluid that no difficulty is experienced in pouring off entire heats with bull ladles filled from the converter. The company formerly made steel by the crucible process. A Bretaud converter is also being installed in the plant of the Muskegon Steel Casting Company, Muskegon, Mich. This converter has a capacity of one ton.

At Noblesville, Ind., October 14 an application for the appointment of a receiver for the Atlanta Tin Plate & Sheet Mill was filed in the Circuit Court. Henderson Coppock and nine other persons are plantiffs. The plaintiffs allege that owing to mismanagement, the result of employing incompetent men, the operation of the plant has resulted in a large loss.

The Lake Superior Iron & Chemical Company

Directors and Officers Visit the Company's Plants

The Lake Superior Iron & Chemical Company, whose main office is in Detroit, Mich., operates a number of charcoal blast furnaces in Michigan and Wisconsin. The following article, reproduced from the Marquette Mining Journal of October 9, gives an account of the visit made to the company's plants that week by directors, officers and others interested:

The party left Chicago, which was its assembling point, Wednesday evening, and spent Thursday at Ashland, Wis., inspecting the company's plant there and enjoying the hospitality of Manager and Mrs. Johnson at a charming luncheon. Among the directors and officers of the company who made the trip a close personal inspection tour were W. M. McLeod, T. G. Scott and E. R. Peacock, of London, Eng.; E. R. Wood, president of the Dominion Securities Company and of the Canadian Bank of Commerce; J. M. McWhinney, president of the Union Trust Company, of Toronto; M. Cochran Armour, of Rogers, Brown & Co., Chicago; Frank W. Blair, president, and Charles R. Dunn treasurer of the Union Trust Company of Detroit; E. C. Norsworth, of Montreal, and W. H. Matthews, vice-president and general manager of the Lake Superior Iron & Chemical Company.

With these gentlemen were a number of others representing several financial interests who were desirous of making a general survey of the upper peninsula. They were Charles H. Moore, of Chicago; G. W. Lindsay and C. B. Neel, of New York; J. F. O'Hara, of Detroit, and Clarence H. Leonard, financial editor of the Detroit Journal.

The party spent Friday morning inspecting the Manistique plant, where a large amount of new construction work has been in progress. The Lake Superior Iron & Chemical Company is developing an 1800-acre farm on some of its cut-over lands in Luce County, a part of which is set aside for stock raising. All of Saturday was spent in Newberry, whence the party proceeded southward to East Jordan.

A vast amount of plant improvement and extension work has been completed by the company since the new organization took hold of the properties, and much more similar work at the several plants is in contemplation. Under the supervision of H. W. Dow, of Marquette, the company's mechanical engineer, there have been installed at Manistique a new central power plant and a new chemical plant for the manufacture of methyl alcohol and calcium acetate. The blast furnace has been overhauled and provided with a steel hoist tower, a cross compound blowing engine and a new lining. In addition to this, the kilns, smoke mains, condensers and fan houses have been largely rebuilt, and a 6,000,000-gal. pumping plant installed.

At Newberry, where, it is said, is to be found the most modern and completely equipped plant in the northern peninsula, there have been installed a 1500-hp. central steam power plant, an electrically driven saw mill for lumbering and the better preparation of cordwood for the retorts, a retort plant consisting of 20 retorts, with a capacity for carbonizing 160 cords of wood per day, a chemical plant for the manufacture of methyl alcohol and calcium acetate, and an extensive group of machine, blacksmith, locomotive and car repairing shops. The blast furnace is being remodeled and enlarged. Here, as in Manistique, there is being installed a new cross compound blowing engine. In addition to these improvements there have been over two miles of high and low pressure water lines laid and a new pumping station built. The pumping equipment consists of two motor-driven, two stage centrifugal pumps, having a capacity for delivering 7,000,000 gals. of water per 24 hours. All of the new construction work designed by Mr. Dow is of a substantial nature, the buildings being constructed almost entirely of steel, brick and concrete.

At the other properties very little new construction has been undertaken so far, aside from the relining of the stacks at the Boyne City and Elk Rapids furnaces and the building of ore thawing sheds at Ashland.

The American Shipbuilding Company's Report

The American Shipbuilding Company has issued its annual report for the year ended June 30, 1911. The income account compares as follows:

	1911.	1910.
Net earnings	*$954,862	$1,980,654
Depreciation, maintenance, etc	317,644	272,032
Balance	$ 637,218	$1,708,622
Preferred dividend	553,000	553,000
Balance	84,218	1,155,622
Additions	.....	271,300
Surplus	$84,218	$884,322

*Includes $100,000 contingent earnings on unfinished construction, year ended June 30, 1910.

The general balance sheet as of June 30, 1911, compares as follows:

Assets.

	1911.	1910.
Plant and property	$18,531,958	$17,904,086
Material on hand	540,389	510,287
Stocks and bonds	968,500	884,400
Uncompleted contracts	807,288	821,791
Cash	1,073,616	902,045
Accounts and notes receivable	3,198,992	3,907,006
Total	$25,120,744	$24,929,615

Liabilities.

Preferred stock	$7,900,000	$7,900,000
Common stock	7,600,000	7,600,000
Accounts and notes payable	2,088,466	1,166,519
Reserve fund	1,052,085	1,259,121
Profit and loss surplus	6,480,193	7,003,975
Total	$25,120,744	$24,929,615

In addition to the foregoing, there exists a contingent liability from the guarantee of first mortgage bonds on steamships built by the company, aggregating $1,214,000, and carrying interest.

President James C. Wallace says: "All of the properties of the company have been kept fully up to the standard of condition. During the year there have been completed and placed in operation a 700-ft. dry dock, steel punch shop, building berth and boiler shop at Port Arthur, Canada. Since the opening of the dry dock in the early part of April it has been filled almost continuously with repair work, with favorable prospects of a fair business. The company has built and completed 22 vessels during its fiscal year, and now has under contract eight vessels, one of which is the largest side-wheel passenger steamer ever built. The general conditions prevailing in iron and steel throughout the country and in the business on the Great Lakes have caused the volume of our business to decline in proportion to other industries, and the outlook for the coming year is not favorable for any improving conditions, as the present carrying capacity of our lake marine exceeds the probable tonnage to be freighted, and this is likely to continue until there is a material increase in the demand for iron ore and kindred products."

Dodge Bearings in Long Service.—The Dodge Mfg. Company, Mishawaka, Ind., has received the following interesting letter from Ernest Jackson, engineer, London, Eng., testifying to the lasting service of Dodge capillary self-oiling bearings: "Exactly ten years ago I completed the equipment of a large factory in North London. The whole of the main line shafting and counter-shafting in this factory was fitted with Dodge ball and socket adjustable hangers, with bearings of the capillary self-oiling type. I felt great confidence in these bearings at that time, and the result after ten years' service has only been to increase it. I find that not a single bearing has had to be replaced, neither has a bearing at any time run hot during the whole of the ten years' working. The other day I examined a bearing which has been in use for the whole period and which still shows no appreciable signs of wear."

The Bureau of Navigation of the Department of Commerce and Labor reports that shipbuilding returns for the quarter ended September 30 show a falling off when compared with the corresponding period of 1910. There were 350 sail and steam vessels of 56,217 tons constructed in the United States during the quarter just ended. Last year the number was 376, of 95,137 tons. Of the 350 vessels built in the last quarter 131 were constructed on the Atlantic and Gulf coasts, while 92 were built on the shores of the Great Lakes. The Pacific coast built 70.

The Storage Battery for the Steel Mill

The storage battery in the steel mill to take heavy power fluctuations, leaving the generators to carry approximately the average load and relieving them of the heavy surges common in steel mill work, was described in a paper read before the Association of Iron and Steel Electrical Engineers, at its convention in New York during the week of September 25, by F. H. Woodhull, of the Lukens Iron & Steel Company. In July, 1906, the battery, of 120 cells, made by the Electrical Storage Battery Company, Philadelphia, was installed. After a few months' operation the battery was increased to give it a 1600 amp.-hr. capacity. It has been in almost continual operation, 24 hr. a day for over five years and is still doing good work. It has never been necessary to run the engine to carry the load of the mill on Sundays, the battery taking care of the load from daylight Sunday morning until the time the generators are started up Sunday night. The battery has cost not more than $700 to maintain; $40 of this amount, or an average of $8 per year, was spent for repairs and labor on switchboard, and the remainder, $132 per year, was expended on the battery.

New Shuster Riveter

A new size of elastic rotary blow riveting machine has been recently placed on the market by the F. B. Shuster Company, New Haven, Conn. The machine has been built in a number of sizes for some time, but this particular one, which was furnished to a chain manufacturer for heading both ends of the rivets used in chains simultaneously, is the first of the 3/4-in. size built with the lower revolving fixture. This double heading operation is performed in the same length of time as was formerly required for heading one end of a rivet. Fig. 1 illustrates the new machine, while in Fig. 2 a view is given showing the contrast between this new type and the smallest size built by the company which is designed to head rivets 1-16 in. in diameter and smaller.

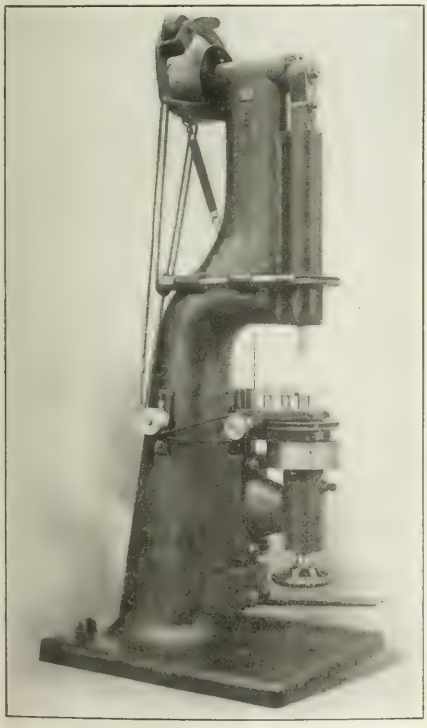


Fig. 1.—The New Elastic Blow Riveting Machine with Lower Revolving Fixture Built by the F. B. Shuster Company, New Haven, Conn.

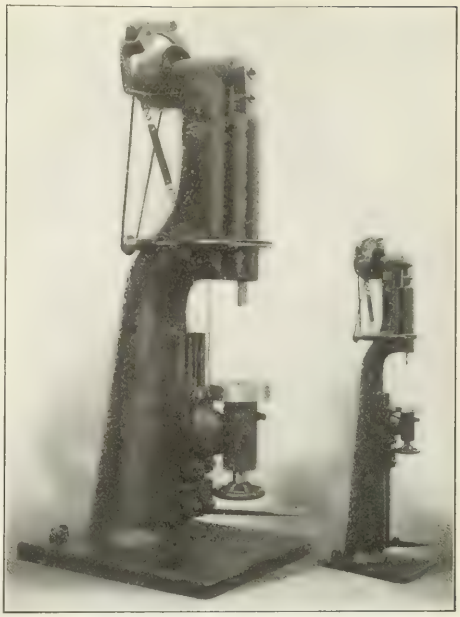


Fig. 2.—View Showing the Contrast Between the New Machine and the Smallest One Built by This Company.

The rivets are headed by the reciprocating hammer and also by the rotating hammer, which is restrained from moving longitudinally by an anvil carrier bolted to the table, the articles to be riveted being held between the hammers. The most important feature of the machine is the combination and working of the cylinder and hammer rod with the lower revolving attachment. The direct and central application of the power together with the positive rotary motion of the hammer causes a regularly applied breaking down action so that the rivets are turned down evenly on all sides and perfect heads are secured. The lower revolving fixture can be removed if desired and the machine used for heading one end of a rivet. In either way the riveter is adapted for a large variety of work. The machine has few parts, which minimize the chances of its getting out of order.

The contrast between the different sizes of riveters built by this company is clearly brought out in Fig. 2, which illustrates the new machine without the lower fixture and the smallest size of riveting machine built also with the revolving fixture removed. This latter machine is designed to head rivets having a maximum diameter of 1-16 in. The contrast in these two machines is further emphasized by comparing the weights, which are 3000 lb. for the new 3/4-in. riveter and about 300 lb. for the smallest size.

The Oeking Company, of New York, has been incorporated to sell the punching and shearing machines manufactured by the Stahlwerk Oeking, of Düsseldorf, Germany, and has opened offices at 50 Church street, New York City. A large stock of machines will be shortly on hand for prompt deliveries in Jersey City, where spacious warehouse facilities have been provided. The management of the Oeking Company is in the hands of the Wiener Machinery Company, which has made a specialty of importing similar machines. The Oeking Works does not depend for its steel upon outside steel foundries, but has a capacity of about 15,000 tons annually of steel castings for its machinery department. All standard sizes are manufactured in series and it is the aim to deliver any machine at once from stock. The Oeking Company will shortly issue an illustrated catalogue which will give a detailed description of the works and of the machines and accessories it makes.

Lamp Hangers for Mill Lights

When mill work, or a great portion of it, must be stopped so that a huge crane requiring great power to operate it can be used to enable the trimmer to get to his lamps, the lighting cost mounts up to an extremely high figure. The lamp trimmer usually ranks with the lowest-priced labor in the mill, so that it is not his time, but the loss of time to the crane, that becomes the basis of the argument against the flaming arc lamp.

The answer to this argument will be found in a thoroughly practical automatic cut-out hanger, which will permit the lamps to be cut out from the electric circuit and lowered to the ground where they can be trimmed in safety and convenience and where this work can be done in such a manner as to increase greatly the life and efficiency of the lamp, regardless of its type or the frequency with which it must be trimmed. If it should become necessary for a crane to pass while a lamp is being trimmed, providing the cut-out hanger is suitably designed, the lamp can be quickly and easily raised, and then lowered again to permit the trimmer to complete his work after the crane has passed.

The foregoing is taken from a paper read before the recent meeting in New York of the Association of Iron and Steel Electrical Engineers by J. E. Thompson, of the Thompson Electric Company, Cleveland, Ohio, maker of lamp hangers. The author showed lantern photographs of the arc lamp hanger made by his company, described in these columns in the issue of August 17. His idea of the proper kind of hanger is one having the line or conductor wires extending straight out from the pole or wall to binding posts in the upper member of the hanger; two pulley wheels so that the strain on the lamp cord is reduced by one-half and so that the cord may be much lighter than is customarily used, although that now in use may be accommodated; and an arrangement so that a short, light pull on the lamp-cord gives an instant release (something in the nature of the snapping of a whip lash), disconnecting the two members of the hanger. The lamp accompanied by the lower member descends. When the lamp is again raised until the two members of the hanger come together they are automatically, both physically and electrically, re-connected. The physical connection is absolutely secure, it is emphasized, so that unless the lamp-cord is given that quick elastic snapping release described, the two members af the hanger will not be disconnected. The hanger is fitted with a top bale which is suitable for attachment to a pipe bracket, truss, cable, ceiling or any other horizontal support.

The Electric Lamp Combination Dissolved

The United States District Court for the Northern District of Ohio has rendered a decree in favor of the Government in the case brought under the Sherman anti-trust law against the General Electric Company and about 35 subsidiaries. In effect the decree orders the company to conduct its business under its own name and directs the dissolution of the National Electric Lamp Company and about 35 subsidiary corporations. The petition was dismissed as to the Kentucky Electrical Company. As the decree was acquiesced in by the companies there will be no appeal.

The General Electric Company must conduct any business in the manufacture or sale of electric lamps in its own name. The practice of fixing a resale price on lamps, whether patented or unpatented, is forbidden and once a lamp has been manufactured by the owner of a patent or his licensee and sold to a wholesale or retail dealer, the price at which the dealer sells to another or to the public is open to free competition. Another provision will make it possible for independent manufacturers of electric lamps to secure the parts necessary for such manufacture without such restraints as heretofore existed.

The defendants get 90 days in which to comply with the general terms of the decree. The General Electric Company is given six months to take over the National Electric Lamp Company of Cleveland.

The General Electric Company through this lamp pool held control of 95 per cent. of the lamp business of the country. It sounds like an oppressive monopoly, and yet it has been one that has made possible the wonderful development in electric lighting. There was chaos in the lamp business 20 years ago. The lamp pool restored the industry to a commercial basis and this led to wonderful inventions, so that for 16 cents the consumer gets a lamp 50 per cent. more powerful and efficient than the lamp for which he paid 85 cents in 1890.

The Michigan Steel Company

The Michigan Steel Company is being organized with a capital stock of $1,500,000, to build an open-hearth steel plant in Detroit. Detroit men are back of the project, but it is understood that M. A. Hanna & Co., Cleveland, owners of the Detroit Iron & Steel Company, will be largely interested. On excellent authority it may be stated that the project has reached a point where the building of the plant is practically assured.

The proposed site is a 50-acre tract on the River Rogue near the two stacks of the Detroit Iron & Steel Company on Zug Island. The plan is for the Hanna blast furnaces to furnish metal for the steel plant. The following appeared in the Detroit Free Press last week in regard to the proposed enterprise:

The company will issue $1,500,000 of stock, and will sell $1,000,000 of bonds. Arrangements have been completed by which the Union Trust Company of this city and Peabody, Houghteling & Co. of Chicago will jointly underwrite the bonds. The site for the plant has been secured, the plans and specifications for the buildings have been drawn, and bids for the construction of the buildings are about to be opened. It is estimated that it will take about a year to get the plant in complete running order, but all that remains to be done in connection with the preliminaries is to perfect the organization by the placing of the stock and the election of directors and officers.

This work is in the hands of Charles W. Baird, secretary and treasurer of the Detroit Iron & Steel Company, the representative in Detroit of the Hanna interests and the man who has worked up the new project from the start. The stock is not being offered for sale to the general public. It is being placed with a good deal of care and discretion among the capitalists who control the manufacturing plants in the city that are consumers of the grade of steel that the new plant will turn out. The purpose of this is to secure a sure market for the output. It is estimated that Detroit with the territory immediately tributary to it consumes annually between 200,000 and 300,000 tons of steel of the kind that the new plant will manufacture, and it is proposed to turn out at the start about 100,000 tons anunally, or something less than 50 per cent. of what the local market calls for.

The American Steel Foundries' Earnings

A financial statement of the American Steel Foundries and its subsidiary companies for the eleven months ended June 30, 1911, has been given out, as follows:

Earnings from operations of plants and net income of subsidiary companies		$618,613
Other income:		
Interest, discount and exchange	$36,028	
Income from investments and loans	432	
Sinking fund profits	4,526	
Miscellaneous	6,743	
		$47,729
Total income		$666,342
Deduct:		
Interest on debentures	$126,016	
Interest on bonds:		
Outstanding	159,234	
In sinking fund	53,708	
Bond sinking fund installment and profits	100,776	
Depreciation of buildings, plant and equipment (all properties)	224,814	
		$664,548
Balance, net income		$1,794

Although there has been no marked improvement in business, the company now has more orders on hand than 60 days ago, September having been a particularly good month. Operations are at about 40 per cent of capacity.

The Administrative Council of the National Metal Trades Association held its semi-annual meeting at the Hotel Astor, New York City, October 12. The councilors passed on Commissioner Robert Wuest's report outlining the work done by the association during the year.

Factory Illumination

Reflectors and Their Upkeep

Factory illumination with special reference to cotton mills was made the subject of a paper by J. M. Smith, Cleveland, Ohio, read before the National Association of Cotton Manufacturers, Manchester, Vt., September 29. The following extracts having a general application to shop lighting have been made:

The number of machines lighted by any one unit is somewhat a matter of choice. Large units are more economical as regards cost of wiring, renewals and labor for maintenance. Smaller units are preferable because of a more uniform distribution of light, absence of shadows and more accurate location with reference to the operator's needs. A further advantage of the smaller units is the relatively small inconvenience resulting from the failure of a lamp. If a single lamp illuminates four or eight machines its extinguishment means the idleness and loss of time of many operators and machines. With small units the desired illumination can be obtained with a lower height of suspension than with large ones. This is an important advantage in rooms with low ceilings.

Where tungsten filament incandescent lamps are used, the 60 and 40-watt sizes equipped with intensive reflectors are very popular. Proper light distribution can be obtained from either steel or glass reflectors so that the deciding factors will be considerations of a more commercial nature. In the matter of first cost, the steel enameled reflector will be found somewhat lower. The depreciation due to dust should not be greatly different for the two types. The replacement of glass reflectors in a large factory is found to amount to 3 or 4 per cent. of the total maintenance cost. It is possible to determine easily when a glass reflector has been properly cleaned, whereas the efficiency of a metal type may be considerably impaired without this being easily detected by inspection. Reflectors with a smooth enamel finish can be very easily cleaned in place with a damp cloth. One of the points which has brought glassware into favor is the fact that a very appreciable amount of light passes through the reflectors, lighting the ceiling and walls, giving a more cheerful appearance to the room. In cotton mills, however, there is so much reflection from the brightly lighted goods that a well diffused light is found in the upper part of the room, sufficient to enable repairs to be made on shafting.

Maintenance and Care

The largest item in the upkeep of a system using incandescent lamps is the cost of the lamps themselves. In one large industrial plant this amount is 75 per cent. of the direct maintenance charges. The average effective life of a Mazda lamp depends upon the efficiency at which it operates. The manufacturers rate the lamps at three different operating efficiencies corresponding to the life figures of 1,000, 1,300 and 1,700 hr. The choice of the efficiency depends upon the price paid for power. Where this is purchased at a moderately high rate, it pays to run the lamp at high efficiency, thereby obtaining the most light for the current consumed. Even when the mill has its own lighting plant and energy is cheap, the high efficiency lamps are desirable on account of the better quality of the light.

In order that the illumination will not be materially reduced after the plant has been in operation for some time, the lamps and reflectors should be thoroughly cleaned at proper intervals. A recent investigation in a weave room where dust made conditions as bad as will be found in practice, showed a loss of light of about 10 per cent. per month with both glass and steel reflectors. If by thorough cleaning we eliminate the loss due to dust we can keep the amount of light obtained within a few per cent. of that given by the new installations, the lamp itself maintaining its candle power so well during its rated life that the average will be well above 90 per cent. of the initial value.

The cleaning of the lamps may be done in the most obvious way by providing one worker with necessary step ladder and washing material and taking down each unit, cleaning and replacing it. This, however, is not an economical arrangement, as two trips up and down the step ladder are required for each reflector, and the man doing the work performs several different operations in succession which wastes time as compared with doing only one thing. Some factories have a man with a ladder put up a clean reflector at the same time he is taking down a dirty one; the latter he hands down to a helper who washes it ready to be placed clean on the next fixture. If the washing takes relatively more time than the removing and replacing of the unit, two persons may be employed at washing. Another arrangement very desirable in a large factory, is to provide a truck holding an extra stock of clean reflectors. These may be put up as the dirty ones are removed to be taken from the room for cleaning.

August H. Tuechter on European Conditions

August H. Tuechter, president of the Cincinnati Bickford Tool Company, Oakley, Cincinnati, Ohio, who recently returned from an extended European trip, on being interviewed by our Cincinnati representative, Charles L. Smith, gave his views of the foreign situation in regard to machine tools as follows:

"The condition of the machine tool business in Germany and throughout Europe, except possibly in one or two countries, is comparatively speaking good. It is not booming, but solid. Undoubtedly the best results are obtained by personal visits to these countries, and a knowledge of the various languages is very beneficial.

"American machine tools are very extensively copied, and with more favorable prices of material and labor the European manufacturers make the competition for the American manufacturers exceedingly keen. Patents in Europe, especially in Germany, afford considerable protection. The smaller trade centers often offer better opportunities than the larger cities, as it is natural that the competition in the larger cities becomes much sharper than in the outlying districts.

"Whether or not many American machine tools are purchased by the European merchants and reshipped to other countries—such as the various colonies, South America and Africa—is hard to say, but undoubtedly there is some business of this kind done. Terms of payment in Europe are about the same as in America, being in some cases very prompt, in others extended over a certain length of time

"It does appear as if, in view of the immense revival of the machine tool interests in Europe, it will become, and even is already, much more difficult for the American manufacturer to find a market for his product, and this condition will undoubtedly increase and develop strongly as time goes on."

American Iron and Steel Institute

Secretary James T. McCleary has given notice of a special meeting of the members of the American Iron and Steel Institute on October 26 at 30 Church street, New York, for the purpose of voting upon a proposition that the number of its directors be changed from 15 to 21 and a proposition that Section 4 of the Constitution of the Institute be amended to read as follows:

"Section 4.—The Institute shall be managed and controlled by a Board of Directors consisting of 21 members in the manner and subject to the provisions of the constitution and by-laws of the Institute; the directors to be elected as provided in the by-laws, and, if so provided in the by-laws, to be divided into separate classes."

A safeguard for an industrial railroad car is illustrated in the October issue of the Journal of Industrial Safety, published by the Industrial Safety Association, 29 West Thirty-ninth street, New York City. It comprises a flat steel bar extending immediately outside the wheels of the car at a point slightly above rail level so that a workman's foot cannot accidentally get under the wheels. The bar is riveted to drop pieces from the frame of the car and each end is bent to an obtuse angle calculated to shove the foot from a rail and to keep it from the rail once the front wheel has passed the point of danger. Where pressure for aisle space is great and the platforms of cars cannot be made appreciably greater than the wheel base of the car, the protection mentioned becomes more important.

The Besly Disk Grinder

Details of a Machine Recently Developed for Pattern Makers' Use

For grinding flat surfaces on wood, Charles H. Besly & Co., 118 North Clinton street, Chicago, Ill., have placed on the market a new pattern makers' disk grinder. In addition this tool can also be used for jointing, beveling, mitering and finishing woodwork where fine finish, exact angles and accurate dimensions are required, as well as for cylindrical grinding and metal pattern work. It is claimed that with the flat steel disk wheel, the adjustable work table and the various attachments supplied, high grade work can be mechanically produced at a great saving in time as compared with the method formerly employed. It is also possible to use cheaper pattern lumber, as hard and soft wood, cross grains, straight grains, knots, shakes, sap and even nails or screws which may protrude to the ground surface can be removed equally well. A large amount of work which has heretofore been classed as trimmer work can be done on this grinder, it is pointed out, while it also does much of the turning and smaller machine planing, as well as a large portion of the sanding, planing, cornering and general hand fitting and finishing work.

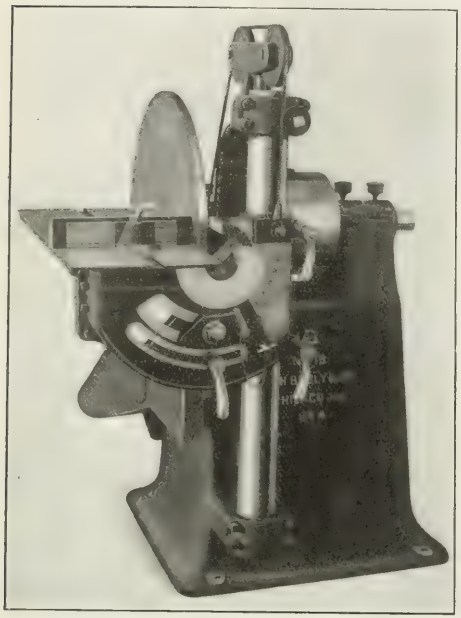


Fig. 1.—The No. 15-30-A Pattern Makers' Disk Grinder Built by Charles H. Besly & Co., Chicago, Ill.

Fig. 1 shows one of these grinders equipped with a 30-in. wheel, while the different adjustments of the work table are illustrated in Figs. 2, 3 and 4, the table being locked in the horizontal position in the first, swung out of the way in the second and locked at an angle of 45 deg. from the horizontal in the last. Four attachments are furnished with each machine, namely, the sliding bevel gauge, the sizing circle gauge, the sizing bevel gauge and the angle plate, all of which are illustrated in Figs. 5, 6, 7 and 8 respectively. Fig. 9 shows a typical pattern produced by employing the sliding bevel gauge and tilting the work table.

The Machine in Detail

The grinding is done by sheets of garnet or other abrasive paper, called circles, which are cemented to the faces of steel disk wheels that are generally 30 or 40 in. in diameter and ⅞ in. thick. As the circles become worn they are torn from the wheel and new ones cemented on. Wrought steel, specially treated to eliminate strains in the metal, is used for the disk wheel. This is machined so as to be practically flat and of uniform thickness throughout within a limit of 0.001 in. The spindle, which is 2½ in. in diameter, runs in bearings having a total length of 16 in. All the wearing parts of these bearings are renewable, and they have inserted bushings of cast iron lined with bearing metal. The bushings are ground on the outer surface and are fitted in bored and reamed holes in the main bed casting. In this way new spindle bearings can be inserted and the original alignment of the spindle preserved, a feature which is important when the finely graduated work table and the attachments used on this machine are taken into consideration, since a slight wear in the bearings would destroy the accuracy of the grinder. Phosphor bronze collars ground all over take care of the end thrust, while the spindle end play is taken up on a single bearing bushing.

The work is supported on an adjustable work table, which is 14 in. wide and 40 in. long, and is brought into contact with the grinding wheel in the correct position. The work table may be tilted and locked at any angle from 75 to 135 deg. from the plane of the grinding disk, large distinct graduations being provided to govern this angular adjustment. The table can be locked instantly at 90 deg. without referring to the graduations. An adjustable circular gibbed bearing located so that its center always remains 1-32 in. from the face of the grinding disk accomplishes the tilting movement. The working edge of the table is on this center and remains near the grinding disk regardless of the angular position of the table top. The work table has a vertical adjustment of 25 in. and may be swung away from the grinding disk for convenience in resetting the wheel or facing off large patterns as shown in Fig. 3. A view of the table locked at an angle of 45 deg. from the horizontal is given in Fig. 4. In resetting the disk wheel it is not necessary to remove the wheel from the machine, the table being simply swung out of the way as shown in Fig. 3. A telescoping dust hood which can be piped to the exhauster for withdrawing the dust made by the grinding process is included in the equipment of the machine. The work table is counterweighted and each adjustment is locked with a single handle nut, thus insuring easy and quick manipulation.

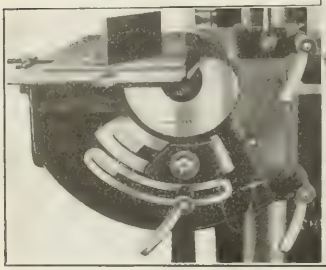


Fig. 2.—Locked in Horizontal Position.

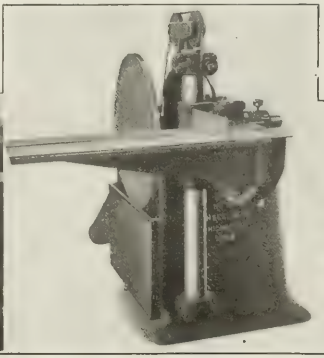


Fig. 3.—Swung Out of the Way.

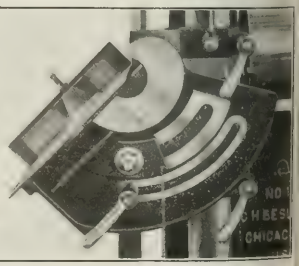


Fig. 4.—Locked at 45 Deg. From Horizontal.

Three Views Showing Adjustments of Work Table.

Work Table Attachments

Four attachments are regularly supplied with each machine and are used in a groove in the top of the work table, which runs parallel to the face of the grinding disk. The sliding bevel gauge illustrated in Fig. 5 is mounted on a bar which slides in the groove in the top of the work table. This gauge is graduated from 0 to 45 deg. on either side of the center and can be instantly adjusted by either right or left hand work. The base of this gauge is a blade having a sliding attachment toward and away from the disk wheel, which enables work to be supported all the way to the grinding disk, regardless of the angular position of the blade. The graduations of this gauge when employed in combination with those governing the tilting movement of the table enable ground surfaces having double angles to be produced at one setting, a typical piece of this nature being illustrated in Fig. 9. The sizing circle gauge, Fig. 6, has sliding movement in both directions on the work table and is drilled to receive center screw plugs on which the work may be rotated to grind cylindrical or conical surfaces. An adjustable stop screw limits the transverse movement so that circular work can be ground to any desired radius and accurately duplicated as many times as may be desired. The holes in the bar are spaced ½ in. apart on centers and are marked with the approximate radius each will generate. The sliding bar is graduated in thirty-seconds so it is a very simple matter for the workman to see what radius the gauge will generate before beginning the grinding operation. The adjustable stop screw has a fine adjustment and can be used in connection with the graduations on the sliding bar to give any desired radius.

The sizing bevel gauge which is shown in Fig. 7 has both longitudinal and transverse sliding movements on the work table. Like the sliding bevel gauge, it is graduated in degrees from 0 to 45 on either side of the center and can be used for right or left hand work, the adjustment being made instantly. The transverse movement like that of the sizing circle gauge is limited by an adjustable stop screw which enables work to be ground to size accurately and duplicated. The angle plate, Fig. 8, is intended to be used where thin work is to be cornered freehand. In this way it is possible for the workman to support his work at right angles with the table top while rounding corners freehand.

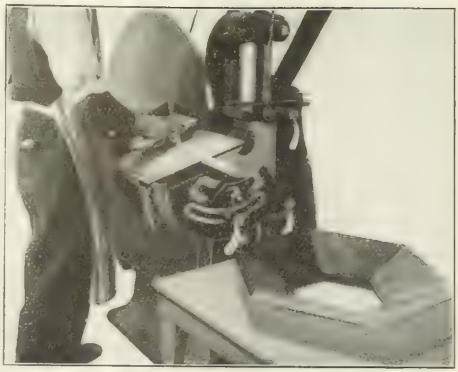


Fig. 9.—Typical Pattern Produced by Employing the Sliding Bevel Gauge and Tilting the Work Table.

The grinder can be driven from either an overhead countershaft or from one located below the floor or from an electric motor suspended from the ceiling of the story beneath. The bed casting is slotted so that the belt can pass through where the underneath drive is used and caps are supplied for closing the slots when an overhead countershaft is employed.

A Typical Pattern

The concave hexagonal ring shown in Fig. 9 was made on the grinder in 15 min. This time does not include the work of rough sawing and assembling the different pieces. In the engraving the operator is shown grinding a segment similar to those used in the ring. In producing this piece the work table and the sliding bevel gauge were clamped in the angular positions necessary to grind each surface to the required double angle at one setting. In addition to this piece, it is possible to make numerous other irregular shaped patterns by tilting the work table and using the different attachments supplied with the machine.

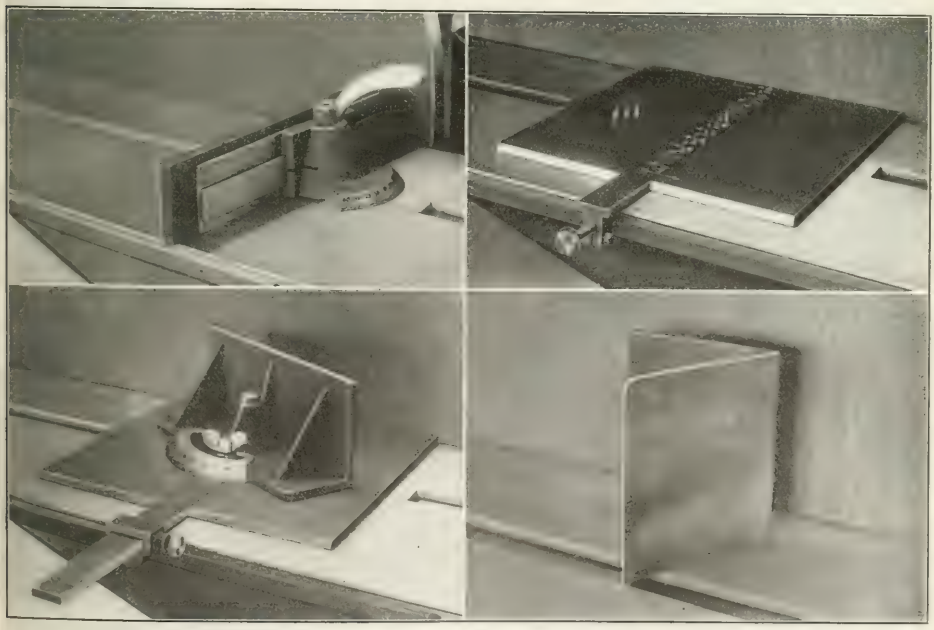


Fig. 5.—Sliding Bevel Gauge.
Fig. 7.—Sizing Bevel Gauge.
Fig. 6.—Sizing Circle Gauge.
Fig. 8.—The Angle Plate.

The Different Attachments Furnished.

The Foundry Drying Oven

Temperature and Rapidity of Operation Are Important Questions

Prof. B. Osann in Stahl und Eisen, Vol. 31, No. 30, p. 1219, describes the processes taking place in the foundry drying oven. Only a small portion of the heat actually gets to the objects to be dried by direct contact, most of it being radiated upon them from the walls and roof of the oven. As the gases pass through the oven from the firebox, heat is imparted to the cores and molds therein, as well as to the walls, roof and floor of the oven itself. Naturally the surfaces of an oven will acquire a higher temperature than its contents, for they have no water to evaporate and also have retained the heat of previous firings. So long as there is a difference in the temperatures of the oven and the objects placed therein, radiation of heat to the latter takes places.

There is also a radiation of heat from the incandescent fuel used for firing; and if this is in such a position that it can act directly upon the molds and cores, the action is too sharp, and cracks as well as disintegration of material will result. It is therefore either necessary to interpose a protecting shield of brickwork or sheet iron, or, still better, to bring the heat into the oven by means of a flue.

Water evaporating from the masses of damp sand is taken up by the dry air or gases surrounding them and is carried off. The more readily this can be accomplished the better the drying. The question of temperature is all-important here, for the hotter the air or gases the more water can be taken up, even if the air passed through the grates was saturated in the first place. Drying with air, instead of the gases of combustion, is always more satisfactory, for the firing gases already have a high degree of saturation by moisture. Temperatures required are about as follows: Cores for radiators, 300 deg. F.; loam molds and heavy dry sand work, 575 to 650 deg. F.; cores for malleable casting work, 350 deg. F.; steel molds, 575 to 925 deg. F.

Temperature and Draft

To select the proper temperature for a given object, much judgment should be exercised. Every variety of mold and every thickness has its normal temperature of drying, taking into consideration the time available. Practically a trial is necessary, upon which subsequent lines of procedure can be based. The lower the temperature can be set the les the fuel expenditure as well as danger to the work in hand. Naturally this means extending the time. As this has a limit, it will be necessary to subject heavy molds to a higher temperature than small and thin section ones. Where it is possible to vary the time of drying the temperatures can be kept more uniform. For instance, heavy dry sand or loam molds require from 18 to 36 hours to dry properly, with normal oven temperatures. Pipe cores require only 2 to 3 hours, while for steel molds the custom is to give an hour for every inch of thickness of the mold, with temperatures of about 750 deg. F.

As it is possible to work with strong and with light draft in the drying ovens, it is well to remember the following: The more rapid the change in the air or gases in the oven the quicker the moisture is taken up and removed. The water is first removed from the skin, and capillary action draws the water from the interior to the surface for continuous removal. Now, it is often forgotten that this capillary action cannot take place faster than at a certain rate, and hence it is useless to fire up so strongly that the surface of a mold or core is ruined while the interior is still wet. It is therefore wise to have a very slow action in the case of heavy work, while for pipe cores the more rapidly the atmosphere of the oven is changed the better.

As stated above, practical trials alone will give the desired information. To accomplish this while measuring the temperatures the heated drying oven is provided with an excess of air by regulation of the dampers, and the drying action can thus be noted. The fuel on the grates can also be gradually diminished and thus an excess of air allowed to pass through the bed. Where gas firing is resorted to, the question is still easier, for here there is a choice of two methods: high temperature with changes in volume which are comparatively small and low temperatures with rapid changes in the oven.

The Effect of Moisture

The question of the time between drying and pouring off also cuts a considerable figure. Where a core is used at once, a damp interior is not so serious a thing; but where it is allowed to stand for a long time any moisture still existing within is drawn to the surface by capillary action and trouble results when molten iron comes into contact with it. This is usually attributed to "drawing moisture from the air," whereas in reality the dry surface of a core or mold is as eager to suck water from the wet interior as would be the case in a dry sponge.

The importance of using a comparatively light facing of loam or green sand in a mold, venting with plenty of coke pieces and backing with dry old sand will be seen from the above. Even sand that is more open is better than a close material, where it is important to dry well.

Tests should be made to note whether a fast drying in the beginning with subsequent slow drying is not preferable to get the best results for a given class of material and work. The whole subject on close study shows how complicated it is and how by intelligent application much money can be saved. R. M.

The Philadelphia Foundry Foremen

The regular monthly meeting of the Associated Foundry Foremen of Philadelphia, the first since the summer recess, was held at the Manufacturers' Club on the evening of October 10, with Vice-President James Whitehead in the chair. E. F. Lovell, of J. Jacob Shannon & Co.; H. A. White, Stein, Hirsch & Co.; J. I. Fasy, Philadelphia Chaplet Company; M. S. Hare, Harbison & Walker Refractories Company, and R. R. Rutlinger, Davis Collieries Company, all of Philadelphia, were elected to membership. Nominations for officers followed. C. R. Brown, of E. E. Brown & Co., and Thomas G. Smith, Midvale Steel Company, were nominated for president; James Whitehead, Abram Cox Stove Company, and William Butterworth, Penn Steel Casting & Machine Company, Chester, Pa., were nominated for vice-president; M. S. Hare, Harbison & Walker Refractories Company, and D. M. Kittenger, Pencoyd Iron Works, were nominated for secretary-treasurer, and C. J. Krayer, Union Foundry & Machine Company, was nominated for trustee, to serve for three years. An auditing committee composed of Thomas G. Smith, H. Bing and A. A. Miller was appointed to audit the accounts of the committee having charge of the recent outing of the association, while the president appointed a committee consisting of Thomas G. Smith, H. A. White, John Alexander, A. A. Miller, James Whitehead, H. B. Taylor, Jr., George W. Moore and J. I. Fasy, to devise plans for the broadening of the scope of the association's meetings and to report at the next meeting.

The Independent Pneumatic Tool Company, Chicago, manufacturer of Thor air tools, has opened a branch office at 1052-3 Chandler Building, Atlanta, Ga., so as to be better prepared to take care of its increased business in the South. J. J. Keefe, who has been connected with the company several years as Southern traveling representative, has been appointed manager of the Atlanta office. A complete line of Thor tools and parts will be carried in stock for the convenience of customers.

The Henry Souther Engineering Company, 11 Laurel street, Hartford, Conn., has issued a card which gives a table of Brinell hardness numerals in handy reference form for the laboratory, inspection room, superintendent's office or engineer's office. The card is 8½ x 11 in. Copies will be furnished on request, provided that those who apply will state their line of business.

The Goulds Mfg. Company, Seneca Falls, N. Y., reports that its business now is running at only a slightly lower rate than last year, which was the biggest in the history of the company. Its business in hand pumps and small machinery is the biggest it has ever had, but in large power pumps and heavy machinery is slightly lower than last year. As has been the case for several years, its export trade is good and showing a steady increase.

Canada's Titaniferous Ores Used in the United States

The Mines Branch, Province of Quebec, has issued a report on mining operations in that province in 1910. The production of titaniferous iron ore in 1910 is referred to as marking the opening of a new era in the exploitation of these deposits. The opinion is expressed that an important industry will yet be developed. The shipments of titaniferous iron ore from Baie St. Paul last year were 3596 tons. The ore was mined from the extensive deposits of St. Urbain which were worked in the early eighteen-seventies, but in the past 35 years had shipped very little. A part of the ore mined in 1910 went to the General Electric Company's works at Lynn, Mass., where it entered into the manufacture of electrodes for arc lights. This ore, according to the General Electric Company's analyses, has the following general composition:

	Per cent.
Metallic iron	30 to 35
Titanic acid	45 to 50
Impurities	20

The remaining shipments of the ore mined at St. Urbain went to the Titanium Alloy Mfg. Company at Niagara Falls, N. Y., where it was used in the production of ferrotitanium in the electric furnace.

In the portion of the report relating to iron ore reference is made to the Canada Iron Furnace Company, which operated two blast furnaces, one at Drummondville and the other at Radnor. The ore used is mainly bog iron ore, produced in the vicinity of the furnaces, but a certain porportion of American and Ontario ores is also added. The charges at these furnaces last year consisted of 5987 tons of bog ore, 1615 tons of foreign ore, 3860 tons of charcoal and 839 tons of limestone. The production of pig iron amounted to 3237 tons, valued at $85,255. Some prospecting for iron ore was carried on at various places in Quebec last year, including work at the Bristol mine and the Spaulding Township iron deposits, and that done on the iron sands of Batiscan. The Bristol mine was first opened in 1872 on lots 21 and 22, range 2, Township of Bristol. After a thorough magnetic survey of these deposits in 1909, E. Lindeman, of the Federal Mines Branch, concluded that very important ore bodies exist on lots 21 and 22. Some extensive diamond drill operations were carried on by Ennis & Co., of Philadelphia, and it is believed the results were satisfactory. Of the Batiscan iron sands deposits, on which work was done by W. J. Chapman, of Toronto, it is stated that the intention is to concentrate the sands. Analyses show that they are much less titaniferous than those of the lower St. Lawrence. The Megantic Iron Ore Company has done some stripping and trenching on its property in Spaulding Township, Beauce County, 12 miles distant from Megantic, and six miles from the main line of the Canadian Pacific Railway. The ore is a hematite mixed with jasper bands.

The American Supply and Machinery Manufacturers' Association

A campaign to increase its membership from 200 to 400 by January 1 has been inaugurated by the American Supply and Machinery Manufacturers' Association. In carrying out its efforts to double the membership the association has divided the country into five territories. A chairman or captain has been appointed for each territory, and under each captain there will be a large number of lieutenants, enlisted from prominent manufacturing concerns that are already members. The campaign is in charge of the bureau of general service of the association, which is under the direction of W. M. Chamberlain, 71 Griswold street, Detroit, Mich.

The association is planning to extend its scope and to make the organization more valuable for its members. Its object and work will be set forth fully in a circular letter that has been prepared and which will shortly be sent out to members and prospective members. "We co-operate for mutual benefit" is a slogan that has been adopted. This slogan will be incorporated into a neat design, which will bear the name of the association and the names of the National Supply and Machinery Dealers' Association and of the Southern Supply and Machinery Dealers' Association, with which the manufacturers' association is closely affiliated. The emblem will be gotten out in artistic form and will be sent to members for use on their letterheads.

In announcing its plans for making the organization more valuable, the association states that it aims to make the tie between the dealers and the manufacturers stronger, this applying both to the manufacturers that sell direct as well as to those that sell through dealers. The association also aims to encourage greater sympathy on the part of the manufacturers with the problems involving the dealers, and to develop a more generally satisfactory relation between the manufacturers and their dealers. Field committees are being appointed in each locality where the association is active, for the consideration of and action upon problems in which both the manufacturers and dealers are involved. This is practically the grouping of a number of small associations within the parent body.

The present membership has been divided up and classified under 20 heads. Trade committees are being appointed representing each of these separate lines of manufacture to conduct work incidental thereto and to make reports in writing at the annual conventions. A bureau of general service will be maintained to furnish statistics and other information of benefit to members

Ellwood City, Pa., Gets a New Industry

The Pittsburgh Company, of Ellwood City, Pa., which has been conducting an aggressive campaign for locating new manufacturing plants, has just closed for one new industry and is consummating arrangements for another. S. A. Roelofs, president of the Pittsburgh Company, last week signed the contract under which the Matthews Gravity Carrier Company, of St. Paul, Minn., moves its plant to Ellwood City. The site secured is 200x500 ft., approximating over two acres, with an option on additional land, all of which is located at Tenth street, having connections with the New York Central and Baltimore & Ohio railroads. The new plant will have double the capacity of the old one at St. Paul, being on the two unit plan, while provisions have been made for the third. Plans and specifications are being prepared for the main building, to contain about 20,000 sq. ft. of floor surface, to be of concrete and steel or brick and steel construction. Other buildings will be about 30x80 ft., 40x50 ft., etc.

The Matthews Company manufactures a complete line of automatic elevators, gravity brick carriers, friction chutes, box and shingle carriers, etc., and, besides the American plant, has factories in Toronto, Canada, London, England, and Australia. Much of the material used in its machinery is produced in Pittsburgh and the East, and this with an attractive proposition made by the Pittsburgh Company influenced it to locate where it has. Additional new machinery will be required, all of which will be motor driven, the power being furnished by the Pennsylvania Power Company, an identified interest of the Pittsburgh Company. Work on the new plant will be commenced as soon as possible, and arrangements have been entered into to have it ready for operation in February of next year. The officers of the Matthews Company are: H. L. Jenkins, president; O. C. Sylvester, secretary, and F. E. Moore, treasurer and manager. Mr. Moore will have charge of the Ellwood City plant, and the St. Paul factory will be dismantled. All of the land offered to manufacturers by the Pittsburgh Company has natural gas and water.

Berger Steel Storage Bins.—The Berger Mfg. Company, Canton, Ohio, is manufacturing steel storage bins designed for use in factories, wholesale and retail stores and jobbing houses. Made in the form of a cabinet, the size of the various compartments is adjustable to special needs. The shelves are so arranged that partitions can be adjusted as desired, being easily inserted and bolted in place. The various parts are tied together by means of stove bolts. The bin can be erected with ordinary labor, the only tool necessary being a screw-driver to tighten up the stove bolts. Tests have been made to prove the strength and utility of these bins. One test was the placing of heavy loads in the various compartments of a section, slabs of spelter, averaging 63 lb. each, being used. The total weight of the spelter was more than 7½ tons, and there was no apparent deflection at any point.

Safety Can for Gasoline

A new device designed to prevent the explosion of gasoline, benzine and similar liquids, was demonstrated Wednesday afternoon, September 27, at the Berlin Chemical Laboratory, 558 West 171st street, New York. It is the invention of a German engineer named Langrehr and is intended to be applied to cans and other receptacles employed in the storage or handling of inflammable liquids. Among the various fields in which this can be used are chemical and stove plants, tank cars, automobiles, motor boats, aeroplanes, ships and various types of manufacturing plants where gasoline, benzine, kerosene, alcohol, ether and other inflammable liquids are used. At the present time the Fire Underwriters regulations require that cans or tanks containing liquids of this nature shall be placed outside of buildings, and as an additional precaution buried in the ground. If receptacles fitted with the Langrehr device are employed it is stated that such precautions are not necessary. The device itself is illustrated in Fig. 1, while a view of two different types of cans equipped with it is given in Fig. 2.

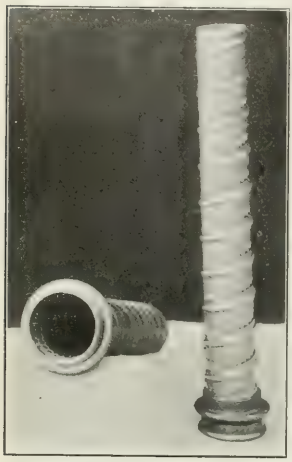


Fig. 1.—The Langrehr Safety Device for Receptacles Containing Inflammable Liquids.

The Langrehr device is an extension of the principle of the Davy mining lamp, the wire gauze giving way to a metal tube, which is fastened to the opening of the can and provides a channel through which the gasoline or other liquid passes in and out of the container. This tube, as will be noticed, by referring to Fig. 1, is of corrugated metal, wound spirally and perforated, so that the liquid stands at the same level both in the tube and in the can. In the Davy lamp if gas flows through the meshes of the wire gauze surrounding the light there is an explosion, but this is confined within the cage, the gas outside failing to ignite because the wire gauze takes up the heat. In the Langrehr device when the flame is applied to the gasoline can, causing the vapor to ignite, the flame, it is claimed, is not communicated to the can since the tube absorbs the heat and prevents the bulk of the gasoline from becoming ignited.

The efficiency of this device, it is pointed out, is due to the fact that narrow passages are formed by the massive metal strips, by which the burning gases are cooled to such an extent that the transmission of the flame into the vessel containing the combustible liquid is impossible. The top of each tube has a screw cap of soft solder, and it is stated that if a fire should reach a storehouse containing cans or tanks of gasoline fitted with these devices, the tops would melt away before the vessels were greatly heated, thus exposing the gasoline in tubes to the flames. This liquid would burn until t were empty, but the bulk of it in each can would tected and its vapors would not explode.

One of the experiments performed at the demor tion was the ignition of gasoline in a round can similar to that shown at the right of Fig. 2 at the center opening. A rubber hose was attached to the spout and an effort made to produce a flare-back, but this was not successful. Another experiment consisted of pouring benzine which had been previously ignited into a second can with the result that no explosion took place.

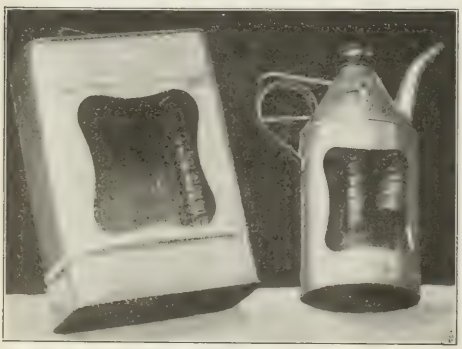
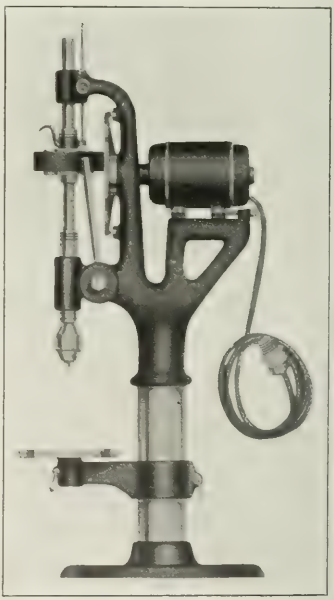


Fig. 2.—Two Types of Cans Equipped with the Langrehr Device.

Portable Electric Bench Drill

Rapid and accurate small tapping operations are specially claimed for a new portable electric sensitive bench drill being placed on the market by the Hisey-Wolf Machine Company, Cincinnati, Ohio. Emphasis is also placed on the sensitiveness of the tool which tends to reduce the breakage of twist drills to a minimum.

The spindle is of high grade steel and is counterbalanced by an inclosed spring and has ball thrust bearings. It is regularly fitted with a ½-in. chuck, but a No. 1 Morse taper socket can be furnished if desired. The column and all the working parts have a ground finish. The spindle drive is by a small friction disk which can be easily shifted across the center of the driving disk by a lever. This special arrangement it is pointed out makes the tool very handy for small-tapping since the spindle is reversed instantly. Automatic compensation for wear is also said to be secured by the friction disk drive and a uniform speed varying from 400 to 975 r.p.m. is maintained at any position of the spindle.



A New Type of Portable Electric Sensitive Bench Drill Built by the Hisey-Wolf Machine Company, Cincinnati, Ohio.

The table which is 12 in. in diameter is adjustable for angle drilling, and can be easily detached from the supporting arm that can be adjusted vertically on the column. The total hight of the drill is 35 in.; the maximum distance between the spindle and the table, 12 in.; the spindle travel, 9 in., and the total weight 120 lb.

The tool is made for alternating and direct current and the driving power can be obtained from an ordinary lamp socket.

The McGowan Duplex Pump

With a view to increasing the efficiency and reducing the cost of maintenance, the John H. McGowan Company, Cincinnati, Ohio, has recently made several improvements in its line of duplex pumps. In doing this new patterns of boiler feed and tank pumps were brought out. Among the advantages claimed for the new design are the ability of the pumps to operate at full stroke with ease and quietness at the highest speeds required by this class of machinery, as well as a special type of crosshead, rocker arm, packing box and adjustable water piston. Exterior and sectional elevations of the pump are given in Figs. 1 and 2 respectively, while Fig. 3 illustrates the spool type of crosshead used.

Referring to Figs. 1 and 2 it will be noticed that the frame connecting the steam and the pump ends is of a straight three-section pattern which is open at the bottom, a feature which gives an enlarged working space for gland adjustment. The pump cylinders are brass lined and the pistons are of the adjustable head and follower type, packed with square fibrous packing. Brass valve seats

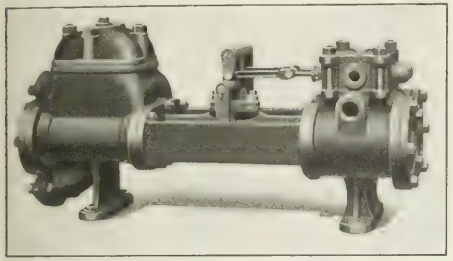


Fig. 1.—The New Duplex Boiler Feed Pump Built by the John H. McGowan Company, Cincinnati, Ohio.

of standard form are used and are secured in place by a fine thread. The valves are held in place by bronze stems and springs and were designed with special reference to the service to which the pump is to be subjected. The steam cylinders are bored to uniform size and the steam valve piston and all parts throughout are made to a standard to ensure duplication of parts.

Cast brass is used for the packing boxes on both the piston and the valve rods, and these are screwed in place by fine threads. The boxes for the pump and piston rods are screwed into the forward head of the cylinder which dispenses with a gasket between the frames and the pump body. Another advantage of this packing box is the doing away with the use of sheet packing and the use of packing box studs and nuts. Cast brass nuts highly finished and fitted with swivel glands are used for the piston and valve rod packing boxes. The outer end of the swivel gland is spun within a recess of the packing nut, so that it can be adjusted or withdrawn from the packing box by the movement of the nut without disturbing the packing. One of the special features claimed for this arrangement is that binding of the piston rod is eliminated.

The crosshead, which is illustrated in Fig. 3, together with the rocker arm, is of the spool form which permits a complete rotary motion of the piston and eliminates to a large degree the uneven wear within the cylinders

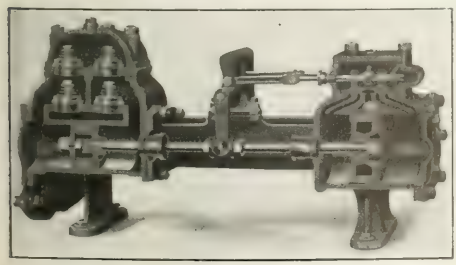


Fig. 2—Sectional View.

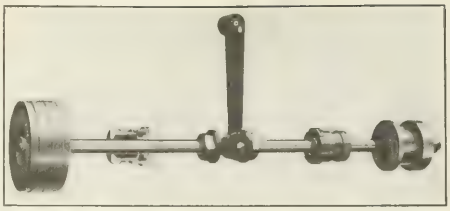


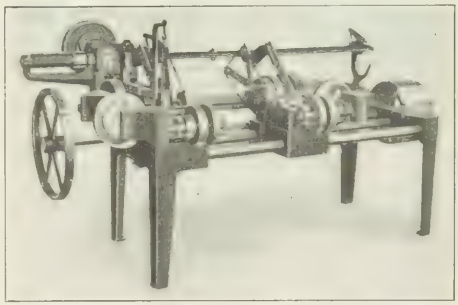
Fig. 3—The Spool Type of Rotary Crosshead Used.

caused primarily by the lack of movement in the square or fixed crosshead. Renewable crosshead wipers are provided for the rocker arms which avoid the expense replacing or refitting the rocker arms.

The boiler feed pumps are designed for pressure up to 200 lb. per square inch and are made in a number of different sizes. These pumps when operated at the proper speed will feed boilers ranging from 50 to 2400 hp., based on the standard boiler rating of 30 lb. of water evaporated per horsepower per hour. In addition to the boiler feed pumps, general and low service pumps, which are fitted in the same manner as the boiler feed pumps, are built, which have capacities ranging from 0.435 to 4.013 gal. per stroke of both cylinders.

Wire Twisting Machine

For forming wire ties of any length from 7 to 48 in. the Wire Specialty & Machine Works, South Bend, Ind., has placed on the market an automatic wire twisting machine. In operation the machine is entirely automatic and takes wire from the coil, cuts it to length and forms a loop at each end. This automatic forming of the tie is done by having the wires, after they have been straightened and



A New Machine for Twisting Wire to Form Loops Built by the Wire Specialty & Machine Works, South Bend, Ind.

cut to length, fall on a carrier which feeds them to the two revolving heads which form up the eye and make six twists at each end.

The length of the tie to be formed can be varied from 7 to 48 in. and the variation is secured by adjusting the position of the movable head shown in the center of the machine in the accompanying engraving. This head slides on the two shafts and can be loosened and moved to any desired position readily. Loops of different shapes can be made on the ends of the wire since the equipment of the machine includes two sets of tools, one for forming an oval loop, and the other a round loop.

A decision has been handed down by Chancellor Haynes denying the Sanford-Day Iron Works, Knoxville, Tenn., a preliminary injunction to restrain the Enterprise Foundry & Machine Works, Bristol, Va.-Tenn., from the use of the name Whitney in connection with the manufacture of mine and other car wheels.

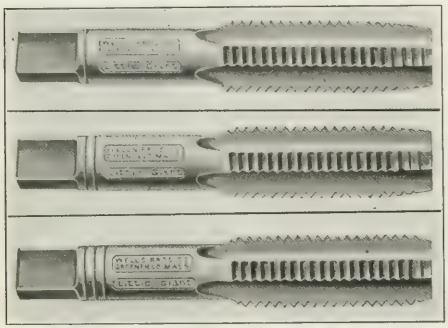
The Marion Shovel & Dredge Company, Marion, Ohio, has changed its name to the Marion Osgood Company.

Little Giant Serial Taps

With a view to distributing the work of tapping a hole more equally among the three taps of a set than is possible with the ordinary practice of using the taper, the plug and the bottoming taps in the order named, the Wells Bros. Company, Greenfield, Mass., has added an improved type of taps to the Little Giant line. The tools have been given the name Serial taps since they are made in sets of three, the different ones having rings on the shanks to designate them so that they may be picked out easily even when covered with oil.

The nominal size of the hole is cut by the No. 3 tap only, which is different from the old-style tool. The No. 1 tap does only a small part of the work since it is much smaller than the No. 3 in both outside and pitch diameters. The No. 2 tap approaches the size of the hole more closely but is still undersize. The function of this tap is to increase the size of the hole so that the last tap used, the No. 3, has relatively little to do except to remove a few thousandths of an inch of material, smooth up the thread and bring it to its exact size. The work of tapping the hole is distributed among the three taps as follows: No. 1 does 54 per cent. of the cutting; No. 2, 30 per cent., and No. 3, 16 per cent.

In designing these taps a number of experiments were made to secure the proper proportions and a special machine was designed and built to record the amount of power required to drive the various numbers of the taps. The results of these tests tended to show that the power required to drive a No. 1 tap was 53 per cent. of that necessary for the old-style taps, while for the No. 2 tap 49 per cent. was required, and only 26 per cent. was necessary to drive the No. 3 tap. It was also found that when properly proportioned the serial taps have a factor of safety of seven, while an old-style plug tap might have a factor of safety of only two.



A Set of the New Little Giant Serial Taps Made by Wells Bros. Company, Greenfield, Mass.

Where taps are required to work wrought iron, steel and all tough materials in which severe service is demanded these taps are especially desirable since in dividing the work between them each tap has a proportionate amount to do and this results in less breakage than was the case with the taps formerly used. These taps are made to meet particular needs. For tapping through open holes each tap of the set is tapered five or six threads, but if the thread were to extend to the bottom of the hole the No. 1 tap is tapered six threads; the No. 2, four threads, and the No. 3, two threads. These taps are furnished in sizes ranging ¼ to 1½ in. in diameter for cutting 20 to 6 U. S. standard threads per inch, and can also be furnished in any regularly listed machine screw or hand tap size. Left hand threads are special and can be furnished at a slight extra cost.

The Society of Chemical Industry, New York Section, will hold its next meeting at Rumford Hall, 50 East Forty-first street, New York, on Friday evening, October 20. Among the features of the programme will be an address on "The Facilities for Industrial Research," by M. C. Whitaker, and an illustrated lecture on "The Manufacture and Performances of the Edison Storage Battery," by Howard Lyon.

The Tisco Manganese Steel Chain

The Taylor Iron & Steel Company, High Bridge, N. J., in response to numerous inquiries for a chain that would stand up under severe service, has within the last few years entered into the manufacture of the standard types of chain in manganese steel. As compared with the ordinary iron and steel chains the manganese chain is said to last longer, especially in handling gritty and abrasive materials. It has resulted in reducing the items of breakage or renewal of equipment, so that in spite of its higher initial cost the new chain is cheaper in the long run. Two of the different types of chains made are illustrated, Fig. 1 being the No. 800 series chain and Fig 2 the combination or Hercules type.

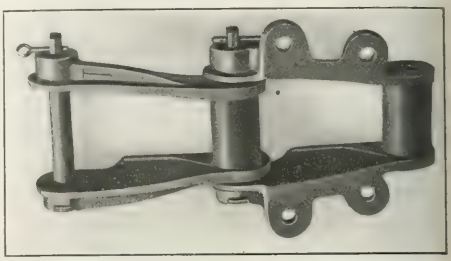


Fig. 1.—The No. 800 Series Chain with K-2 Attachment, as It Is Made in Manganese Steel by the Taylor Iron & Steel Company, High Bridge, N. J.

The detachable type of chain was the first to be perfected in this material. On account of difficulties encountered in casting it was not practical to make any smaller size than the No. 88, but this size and the larger ones are now on the market. Many special chains are now being made, and practically all of the standard types for conveying and elevating work can also be procured. Sprockets or traction wheels are made in manganese steel for all of the various types of chains, and the results secured are said to be fully as good as those obtained from the chain.

In the past chain elevators in cement plants have in a number of cases worn very rapidly because of the abrasive action of the clinker handled. In some cases it has resulted in a breakdown which allowed the entire elevator to fall into the shaft, while if this did not occur the chain had to be renewed frequently, with the result that the cost per unit of finished product was increased. One cement mill in the Middle West has had six hot clinker elevators equipped with manganese steel chains for about two years, and at the present time they are said to have shown no appreciable wear, only having worn bright in the places exposed to flexure, although the malleable chain which they replaced wore out in some 6 to 10 weeks. Other installations where this chain is said to have given satisfactory service are in steel mills where they are employed for draw chains working under heavy tension and in sand, gravel, rock, coal, ore and ash handling plants.

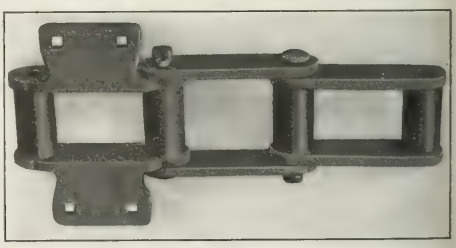


Fig. 2. The Combination or Hercules Type of Chain.

The Steel Company of Canada is building a new fire brick stove at its Hamilton, Ont., blast furnace plant. Frank C. Roberts & Co., Philadelphia, are the engineers.

Aerial Camera

For taking bird's-eye view photographs, Woodbury & Co., Worcester, Mass., have developed an unusual photographic apparatus. Fig. 1 is a view of the apparatus with the camera 125 ft. in the air, while Fig. 2 is reproduced



Fig. 1—A New Aerial Photographic Apparatus Built by Woodbury & Co., Worcester, Mass.

from an 11 x 14 in. photograph of the works of the Brown & Sharpe Mfg. Company, Providence, R. I., which was obtained by its use.

The device consists of a light triangular tower with apparatus for raising and lowering a camera and holding it in position at the top. The tower is constructed in sections which are designed to give ample rigidity when erected to hold an 11 x 14 in. camera so as to take a very sharp negative. When taken down the sections telescope into such a small space that the whole can be conveniently shipped by express or freight. In Fig. 1 the tower is extended so that the camera is 125 ft. above the ground. When the tower is in position the camera is drawn over the pulley and locks in position on the holder. Electricity is employed to operate the shutter in taking pictures.

The Louisville Steel & Iron Company

The old Louisville Bolt & Iron Company, at Louisville, Ky., is to be revived under the name of the Louisville Steel & Iron Company, formed of new capitalists who propose to commence the establishment of one of the few sheet steel manufacturing plants in the South. George H. Holzbog, of Jeffersonville, Ind., across the Ohio River from Louisville, is now promoting the organization of a $400,000 company, articles of incorporation for which will shortly be filed in Indianapolis, Ind. The plant to be revitalized covers about seven acres of ground in Jones street in South Louisville. F. W. Bonnie was president of the old company, which moved from Anderson, Ind., to Louisville in 1900 and operated a bar-iron mill successfully for some time. The capital stock was increased to provide for the installation of a sheet mill, and after the equipment for this department had been secured and installed the funds gave out and the plant was closed down. Mr. Holzbog then purchased it at a reasonable figure and has been waiting an opportunity to revive the industry.

It is proposed to completely renovate the works, overhauling the old machinery and installing a considerable quantity of new equipment. It is the purpose of Mr. Holzbog and his associates to establish a mill which will have a capacity of 25,000 tons of sheets per year. No definite announcement can yet be made as to the date when the works will be started in operation.

The Testing Society's Year Book.—The Year Book for 1911 of the American Society for Testing Materials is an octavo volume of 385 pages. It contains all the standard specifications adopted by the society, also selected specifications from miscellaneous sources, together with the usual lists of members, committees and officers, a summary of the proceedings of the 14th annual meeting and the annual report of the executive committee. The selected specifications include those for steel railroad bridges prepared by the American Railway Engineering Association; the structural steel, the special open hearth plate and rivet steel and the Bessemer steel rail specifications of the Association of American Steel Manufacturers; also the specifications of the United States Steel Products Company for Bessemer and open hearth steel rails.



Fig. 2—View of the Brown & Sharpe Mfg. Company's Plant Taken with This Apparatus.

Crucible Steel Company of America

Annual Report for the Fiscal Year Ended August 31, 1911

The eleventh annual report of the Crucible Steel Company of America, Pittsburgh, presents the following comparative profit and loss account:

	1910-11	1909-10
Gross sales	$15,902,139.00	$18,752,729.24
Operating charges:		
Manufacturing cost	10,572,038.83	12,549,952.53
Repairs and maintenance	719,031.76	812,751.01
Administrative and general expenses	303,714.32	307,629.88
Selling expenses	829,422.06	741,404.56
Taxes	128,034.94	125,255.50
Commercial discounts and interest	122,580.70	149,425.40
	12,675,022.61	14,686,414.65
Provision for depreciation	500,473.46	500,000.00
Provision for contingencies	32,504.57	72,912.53
	13,208,000.64	15,259,327.18
Net profits from operations	2,693,138.36	3,523,402.06
Other income	154,637.87	25,943.44
	2,847,776.23	3,549,345.50
Interest:		
Dividend scrip	73,300.50	14,278.25
Bonds of subsidiary companies	58,458.78	
Purchase money mortgage		1,245.02
	131,759.28	13,463.27
Net profits applicable to dividends	2,716,017.05	3,535,882.23
Cash dividends on preferred stock	1,730,277.50	1,802,191.87
Undivided earnings for the year	985,739.55	1,733,690.36
Add previous surplus	2,448,039.55	3,157,999.19
		4,891,689.55
Stock dividend (10%)		1,733,650.00
Total undivided surplus as per balance sheet	$3,433,780.40	$3,157,999.19

The balance sheet, as of August 31, 1911, is as follows:

Real estate, plant, equipment, good will, trade-marks, etc.		$44,758,515.54
Investments in and construction advances to associated companies		3,511,294.64
Cash and accrued interest on funds in The Union Trust Company, Pittsburgh, trustee of Works Improvement Fund		365,242.54
Current assets:		
Inventories of raw materials, manufactured products and stores	6,138,508.17	
Taxes, insurance, unexpired, etc	53,814.32	
Investments	300,000.00	
Bills receivable	5,000.00	
Accounts receivable (less reserve)	2,117,429.66	
Cash in banks and on hand	1,160,510.17	
		9,775,262.82
Total		$58,430,419.84
Liabilities.		
Preferred stock		8,651,387.50
Common stock		23,750,000.00
Dividend scrip due June 30 1911, less held in treasury		2,240,487.00
Current liabilities:		
Bills payable	1,577,500.00	
Accounts payable	926,775.53	
Interest and taxes accrued	86,451.81	
		2,590,727.34
Reserve funds:		
Depreciation and renewal of plants unexpended balances	540,263.52	
Fire insurance	158,261.78	
Contingent	90,000.00	
		788,525.30
Surplus:		
Net profits for the year ending August 31, 1911	2,557,518.35	
Deduct four cash dividends on preferred stock*	1,730,277.50	
	827,240.85	
Add surplus as of August 31, 1910	2,448,039.55	
Undivided surplus August 31, 1911		3,275,280.40
Total		$58,430,419.84

* August 31, 1911, the unpaid dividends accumulated on the preferred stock aggregated 17½ per cent. of which 13½ per cent was paid September 30, 1911

From the accompanying statement signed by Chairman Herbert Du Puy and President C. C. Ramsey the following extracts are taken:

The net profits applicable to dividends were $2,557,518.35, equivalent to 10.23 per cent. on the preferred stock. These profits are determined after charging against operations of the year $719,031.76 for repairs, $509,473.46 for depreciation and renewal of plants, besides $32,504.57 for contingencies

Although the gross earnings for the year, $4,080,776.02, are very gratifying, the plants are still contending with the economic difficulties of fluctuating activities which have prevailed in varying degrees since the depression of 1907. The production of the year in tons was 69 per cent. of that of the previous year, though sales were 85 per cent., based upon the same comparison. This shows that, although the output for the year was considerably less in tons, the standard of quality of material shipped was much higher.

The undivided surplus, represented by quick assets derived entirely from operating profits, after the payment of the preferred dividend of 7 per cent. per annum, $1,730,277.50, was $3,275,280.40, as compared with $2,448,039.55 in the preceding year, being an increase of $827,240.85 for the current year.

At the beginning of the year there were unfilled orders on the books of the company of 115,936 tons, and at the end, 92,113 tons. Not in any single month during the year did the receipt of orders represent normal mill capacity, which made it very evident that retrenchment was necessary to meet the decrease in business. One of the company's plants, the Aliquippa Steel Works, was therefore closed, and its orders were divided among the larger works, with a resultant economy, as a whole, in the cost of plant operation.

The company's plants are being maintained in the highest state of efficiency. To accomplish this, there has, during the past year, been expended $719,031.76 for maintenance and upkeep, all of which has been charged against income as a part of current expenses. In addition to this large sum, the directors have set aside out of profits the usual sum of $500,000 to cover depreciation and renewal of plants of the parent company, and an additional $99,473.46 for that of the subsidiary companies.

To reduce fuel costs, the directors, during the year, purchased, at a cost of over $1,600,000, some 2025 acres of the best coking and steam coal property in Greene County, Pennsylvania. In part payment for this large investment the company deeded in fee the remaining portion of the Howe-Brown Steel Works, Pittsburgh, Pa., the ground of the old Canton Steel Works, Canton, Ohio, and a piece of unimproved land on the Monongahela River south of West Elizabeth, Pa., all of which were unproductive. To operate this new coal purchase a subsidiary corporation was formed, known as the Crucible Coal Company, all of whose capital stock is owned by this company. At the site of this new purchase active construction is now going on to enable the company to produce fuel in large quantities some time during the year 1912.

In addition to this fuel operation the company purchased in March, 1911, the blast furnace plant of the Midland Steel Company, located on 423 acres of the most desirable building ground on the Ohio River, in Beaver County, Pennsylvania, some 36 miles below Pittsburgh. On this site, in connection with the blast furnace already in operation, is now being erected the most modern and economical plant for the production of the raw materials to be used in the Pittsburgh plants, the plan to be pursued being that the boats carrying coal for coking to the Midland Works will carry billets and metal to the Pittsburgh plants on their way back to the mines. The Crucible Steel Company of America owns the entire capital stock and manages it as a subsidiary company. To provide for the large improvements now being erected upon this site, the Pittsburgh Crucible Steel Company has made a bond issue of $7,500,000, the principal and interest of which are guaranteed by this company.

During the year plans were developed calling for the enlargement of the Atha Works at Harrison, N. J., through the addition of an electric steel plant to be operated by the low pressure turbine system, the erection of a new office and other considerable buildings necessary properly to take care of the growing business of that mill These improvements will be finished by the end of the current year, when the results should show greatly improved earnings.

The contracting of convict labor in Oregon came to an end September 30, when the Lowenberg & Going Company, which has operated a stove foundry at the penitentiary at Salem, Ore., for over 20 years, was notified to remove its property from the prison, and the contract for this year was broken off.

The Caldwell Air Compressor

An air-cooled air compressor employing the same cooling principle as that used in an air-cooled automobile has been placed on the market by E. R. Caldwell & Co., 34 Hilton street, Bradford, Pa. These compressors were built to supply the demand for a small but substantially built compressor having a smaller capacity than the machines usually furnished. Cooling the compressor by air possesses the advantages of greatly reducing the installation cost since no water tank or water pipe connections are

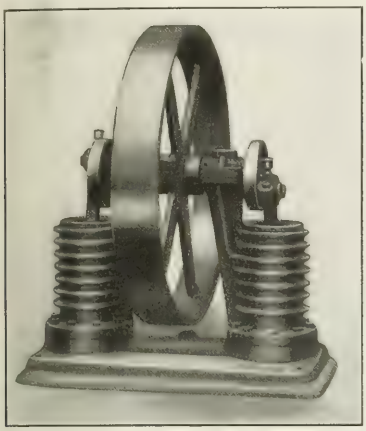


Fig. 1.—An Air-Cooled Air Compressor Built by E. R. Caldwell & Co., Bradford, Pa.

required and the danger of freezing in winter is also eliminated. Fig. 1 is an exterior view of one of the double-cylinder machines, while Fig. 2 is a sectional elevation showing some of the constructional details.

Six sizes of compressors ranging in capacity from 4 to 25 cu. ft. of free air per minute are built. The three smaller sizes, which have capacities of 4, 6 and 12½ cu. ft. per minute, are single-cylinder machines, while the remaining three, which are double the capacity of the single-cylinder compressors, have two cylinders. The cooling

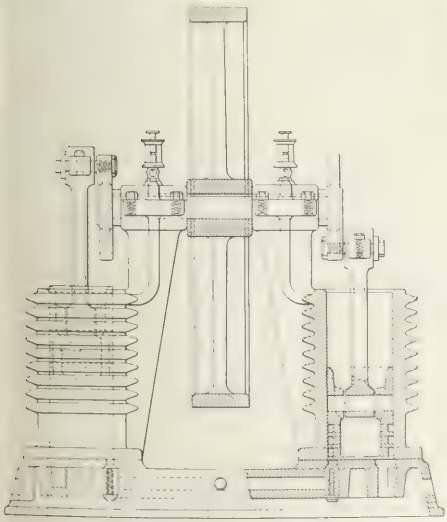


Fig. 2.—Sectional View of the Compressor.

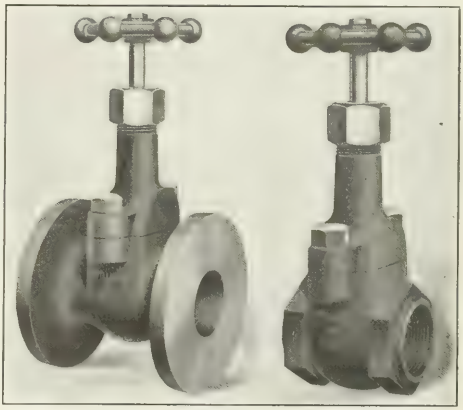
principle employed is the same as that used for cylinders of air-cooled automobiles and the compression cylinders of the air-brake system installed on locomotives. These compressors are driven by a belt from any available source of power at a speed of 200 r.p.m.

As will be noticed by referring to Fig. 2 the construction of these compressors is simple, the inlet and outlet valves being located in the base of the cylinders. The former operates by suction, opening very readily and gving easy access to the cylinders. The outlet valve, which is of the spring type, relieves the cylinder readily when necessary. In the design of these compressors an effort has been made to reduce the amount of clearance at the ends of each stroke to a minimum.

The efficiency of the cooling system can be judged from the fact that after a 10-hr. run against the pressure of 200 lb. an excessive amount of heat was not developed.

The Cino Iron Body Gate Valve

Double disk construction is the special feature of the new Cino iron body gate valve which has been recently brought out by the D. T. Williams Valve Company, Cincinnati, Ohio. The double disk construction is to enable the valve to take pressure from either side, and it is pointed out that on account of its rigid construction it is not in the least affected by the severe strains of expansion, contraction and the sagging of pipe lines. Two bronze disks with a ball and socket bearing at the center are employed. These are guided and held in position by the malleable-iron disk holder with lugs on either side which travel in corresponding grooves in the body. This forces the disks into place, causing them to conform to the taper of the seats, and thus insuring even contact and a tight seat bearing. It is claimed for these disks that due to their careful



The Two Styles of Cino Iron Body Gate Valves Made by the D. T. Williams Valve Company, Cincinnati, Ohio.

machining and fitting they are self-adjusting and will neither stick nor bind.

Hard cast iron of high tensile strength is used for the body and hub, while the stem and the disks are of high grade steam material. The hub is bolted to the body and the joint is packed. Ample space for repacking the stem is afforded the large bronze packing nut. The wheel is secured to the stem by a brass lock nut.

These valves are regularly furnished with brass mountings and either screwed or flanged ends, but if desired can be constructed entirely of iron for use in cyanide plants, and ammonia lines or for any service where the liquids would ordinarily corrode the regular brass mountings. They are guaranteed for 100 lb. pressure.

The E. Killing's Molding Machine Works, Davenport, Iowa, announces that English letters patent have been granted to Mr. Killing on his multiple cylinder jarring machine, in addition to the French and American patents already awarded to him, and that other foreign patents are still pending.

The Lehigh furnace of the New Jersey Zinc Company, at South Bethlehem, Pa., which has long been out of blast, will probably not be operated again.

Judicial Decisions of Interest to Manufacturers

ABSTRACTED BY A. L. H. STREET

Liability for Injury to Trespassing Child.—An iron works concern is not liable for injury to a child who while playing and attempting to alight from a window sill fell against the lever of a punching machine, thus setting it in motion, where the machine was on a platform and partly surrounded by a railing. (New York Supreme Court, Appellate Term; Ziegler vs. Friedman & Gordon Iron Works, 127 New York Supplement, 457.)

Remedy of Seller on Buyer's Refusal to Accept Delivery.—When a contract buyer of articles refuses to accept delivery the seller is entitled to store them and sue for the price. (New York Supreme Court, Appellate Term, Day vs. Lowenstein, 129 New York Supplement, 25.)

Time for Delivering Articles Sold.—When an agreement for sale leaves delivery to be made on notice by the buyer, the seller has a reasonable time in which to make it after receiving notice. (Arkansas Supreme Court, Brownfield vs. Dudley E. Jones Company, 136 Southwestern Reporter, 664.)

Waiver of Seller's Right to Replace Machinery Warranted.—Where the seller of machinery, in suing for the price thereof, claims that the machinery complies with the contract, and the buyer relies on a breach of warranty, the seller cannot recover on the theory that the contract permitted him to replace, no request for permission to replace having been made. (Michigan Supreme Court, Peerless Motor Company vs. Linn, 131 Northwestern Reporter, 131.)

Buyer's Right Under Warranty.—Where machinery is sold f.o.b. the seller's warranty of its condition does not extend to damage done in transit. In such case the title vests in the buyer on delivery to the carrier. If the contract of sale requires the buyer to test the machinery within 30 days after its receipt and to give notice of any defects, the giving of such notice is a condition precedent to the buyer's right to assert a breach of warranty. (Arkansas Supreme Court, Southern Engine & Boiler Works vs. Globe Cooperage & Lumber Company, 136 Southwestern Reporter, 928.)

Priority of Conditional Seller's Rights.—When machinery is sold under reservation of title in the seller until payment of the purchase price it does not become part of the real estate of a third person to which it is affixed as to such person nor as to the rights of an existing mortgagee of the land. (New Jersey Court of Errors and Appeals, Oil City Boiler Works vs. New Jersey Water & Light Company, 79 Atlantic Reporter, 451.)

Time for Payments Under Structural Steel Contract.—An agreement for the furnishing of steel work, providing for payment of 90 per cent. of the price on delivery and the remainder 35 days after completion of the work, required payments in installments as the work progressed, not entitling the owner to retain the first payment until all the material was delivered, and was controlled by a general custom requiring monthly payments. (California District Court of Appeals, Vulcan Iron Works vs. Cook, 114 Pacific Reporter, 995.)

Rights Under Conditional Sale Contract.—Where machinery is sold under a contract reserving title in the seller until payment of the price, on breach by the buyer, the seller may retake the machinery or ratify the sale and sue for the price, but, the remedies being inconsistent, he cannot, after suing on a note given for the price, subsequently sue to rescind the sale and retake the machinery. (New York Supreme Court, Appellate Term, Henry Pels & Co. vs. David M. Oltarsh Iron Works of New York, 129 New York Supplement, 371.)

Commercial Report as Libel.—A commercial report giving a lower rating than a concern is entitled to, not being libelous on its face, the concern cannot maintain suit on the ground of libel without showing special injury or damage. (Oklahoma Supreme Court, N. S. Sherman Machine Company vs. Dun, 114 Pacific Reporter, 617.)

Ratification of Contracts to Sell—Damages Recoverable on Breach by Buyer.—A manufacturing company ratified a contract to sell articles, made by its manager's acceptance of an order, by failing to disaffirm the agreement and by making and delivering part of the articles. On breach of a contract to buy the seller cannot enhance the damages recoverable by him against a guarantor of payment of the contract price by manufacturing articles after being notified that the buyer will not receive them. (Massachusetts Supreme Judicial Court, Cumberland Glass Mfg. Company vs. Wheaton, 94 Northeastern Reporter, 803.)

Circulars Not Constituting Offer to Sell.—Circulars issued by a manufacturer designed to secure sale of articles at a uniform retail price, stating the terms upon which they will be sold to the jobbing trade, and that the manufacturer would not be liable for failing to fill orders, etc., did not constitute an offer to sell upon those terms, so as to constitute a completed contract on transmission of an order, which the manufacturer refused to fill. They are mere invitations of proposals for sales. (Massachusetts Supreme Judicial Court, Montgomery Ward & Co. vs. Johnson, 95 Northeastern Reporter, 290.)

Right of Seller to Stop Shipment in Transit.—The right of a seller to stop a shipment in transit on account of the buyer's insolvency is lost when the buyer has surrendered the bill of lading to the railroad company at the destination and has rebilled the shipment to his buyer at another place and they have gone on to that destination. (United States Circuit Court of Appeals, Eighth Circuit, in re W. A. Paterson Company, 186 Federal Reporter, 629.)

Effect of Warranty of Engine's Capacity.—A contract to sell a gas engine arranged to use gasoline fuel and guaranteed to develop 55 hp. and operate a 10 per cent. overload, requires an engine of that capacity with gasoline used as fuel. (Massachusetts Supreme Judicial Court, Saco Brick Company vs. J. P. Eustis Mfg. Company, 93 Northeastern Reporter, 628.)

Rights of Buyer on Seller's Breach of Contract.—Where a contract is made for the purchase of different articles of machinery which taken together constitute an outfit and the omission of any one of the articles renders the outfit useless and the buyer offers to pay a gross price for the entire outfit, the contract is indivisible and a breach of it results from the seller's failure to deliver any separate article. Where a breach is caused the buyer has the right to rescind the contract on prompt notification to the seller of the breach and a return or offer to return the article or articles which he has received. (Georgia Court of Appeals, Georgia Supply Company vs. Coffee, 69 Southeastern Reporter, 1083.)

Rights of Patentee Concerning Infringement.—A patentee who has sufficiently described and distinctly claimed his invention is entitled to every use to which his device can be applied, whether he perceived or was aware of all such uses at the time he secured his patent or not. In patents for a combination it is well settled that if any essential element of the combination is omitted from an alleged infringing device without substituting therefor its clear mechanical equivalent there is no infringement. (United States Circuit Court of Appeals, Eighth Circuit, Acme Truck & Tool Company vs. Meredith, 183 Federal Reporter, 124.)

Rights of Inventor Before Issuance of Patent.—An inventor or his assignee has before the issuance or allowance of a patent an inchoate right of property in his invention and in a pending application for a patent which he may assign or with which he may deal as an article of property. (Massachusetts Supreme Judicial Court, Richardson Shoe Machinery Company vs. Essex Machinery Company, 93 Northeastern Reporter, 650.)

Substitution of Mechanical Equivalents Not Patentable.—Substitution of a screw to fasten together two parts of a device for a rivet used in prior devices to make the parts more readily detachable does not constitute patentable invention. (United States Court of Appeals, Eighth Circuit, Boss Mfg. Company vs. Thomas, 182 Federal Reporter, 811.)

Buyer's Remedy for Breach of Warranty.—As a general rule breach of warranty of a thing sold does not entitle the buyer to rescind the contract after it has been executed in the absence of fraud. The remedy is to sue for damages for the breach or to counterclaim in a suit brought by the seller to recover the price. (Indiana Appellate Court, A. D. Baker Company vs. Cornelious, 93 Northeastern Reporter, 686.)

Necessity for Reducing Contract of Sale to Writing.—Under the statute which makes certain oral contracts to sell chattels void where there has been no payment on the purchase price and no delivery of possession to the buyer, delivery must be accepted by the buyer with manifest intent to take possession. (New York Supreme Court, Third Appellate Division, Drake Hardware Company vs. DeWitt, 126 New York Supplement, 868.)

Trade Publications

Electrical Machinery and Appliances.—Fort Wayne Electric Works of the General Electric Company, Fort Wayne, Ind. Four bulletins. No. 1130 treats of the Northern type K direct-current motor which is adapted to meet any requirement where an intermittent service series-wound motor is applicable. The construction of this motor is described at length and there are a number of engravings showing applications of it. No. 1131 relates to the use of tungsten series lamps for street lighting. The various appliances used with the system are illustrated and described and there are a number of engravings showing streets lighted in this way. No. 1132 deals with the type TAB belt-driven self-excited alternator. This machine generates multiphase current and has been developed for use in small power and isolated lighting plants where inductive loads are encountered. These generators are of revolving armature self-excited type and are arranged for either belt or direct connection. No. 1133 calls attention to an induction type of single-phase watthour meter.

Centrifugal Pumps.—The Goulds Mfg. Company, Seneca Falls, N. Y. Bulletin No. 105. Illustrates and describes a line of single-stage, single-suction centrifugal pumps, which are intended to be used with heads ranging as high as 100 ft. These pumps are adapted for general pumping service, as well as for use on irrigation projects, in sewage disposal and water supply plants, excavation work, paper and pulp mills, for mine service, in conjunction with surface condensers in power plants, in breweries and in chemical and refining plants. Their construction is described at length and a number of the different sizes are illustrated. The pumps can be driven by direct-connected electric motors and gasoline engines, or by belt, and there are halftone engravings showing units driven in each of these three ways. A number of useful suggestions for installing, priming and starting these pumps are given and tables of dimensions, capacities and the power required for various deliveries complete the bulletin. An illustrated description of this pump appeared in *The Iron Age*, August 24, 1911.

Draught Gauge.—Precision Instrument Company, Detroit, Mich. Mailing card. Treats of the Precision dead-beat draught gauge for boiler house service. This gauge indicates the draught in inches of water, the graduations reading to tenths. Two types of gauge are made, one in a substantial cast-iron case for attaching to the boiler front and the other for portable use.

Electrical Apparatus.—Westinghouse Electric & Mfg. Company, East Pittsburgh, Pa. Circular No. 1104 and a number of loose leaf sheets. The circular relates to a line of portable meters for alternating and direct current use. These are made in both the direct and zero reading types for reading the voltage current, power, frequency and power factor of alternating-current circuits, as well as the voltage, current and power of direct-current circuits. After a brief discussion of the considerations affecting the selection of a type of instrument and the classification of the different types of meters, the various kinds are described at some length. The different meter scales which can be furnished are reproduced and a table of weights and overall dimensions completes the circular. The loose leaf sheets are designed to be added to the company's perpetual catalogue No. 3001 and treat of various types of electrical apparatus including circuit breakers, fuse blocks, measuring instruments, generator and feeder panels and distributing transformers.

Coal Boulets.—W. D. Althouse & Co., Stephen Girard Building, Philadelphia, Pa. Booklet. Size, 5 x 6½ in., describing the Elkhart boulets made from slack from the Elkhart mine in Allegheny County, Md. The boulets are ovoid in form, each weighing 1.6 oz., giving 10 to the pound. They are midway between anthracite nut and stove sizes. Analysis is given, also comparison of thermal values, with statement of advantages of using this form of fuel. Ayers & Chase, Hammond Bldg., Detroit, are agents.

Drill Vise.—The Skinner Chuck Company, New Britain, Conn. Circular. Deals with the Hopkinson drill vise, which is designed primarily for use on the upright drill, although it can be used as well on the planer, shaper and milling machine. The construction of the vise is briefly described and mention is also made of a toolmaker's vise.

Electric Lighting Fixtures.—Catalog B-19 of the Benjamin Electric Mfg. Company, Chicago, New York and San Francisco. Profusely illustrated book of 80 pages showing the numerous forms of lighting fixtures and reflectors for illumination with electricity without the use of pendants or other exposed wires. A leaflet from the company illustrates a screwdriver with a swiveling handle made up of insulating material, so that besides being of use where one is in danger of electric shock it is designed to take the place of the ratchet screwdriver.

Pumps.—American Steam Pump Company, Battle Creek, Mich. Folder No. 350. Gives a comparative estimate of the merits of simplex and duplex pumps from the standpoints of operation, construction and economy. A few reasons why the Marsh Simplex pumps will lower the fuel and maintenance bills of plants where they are installed are also included.

Ratchet Drills.—Armstrong Bros. Tool Company, 339-357 North Francisco avenue, Chicago, Ill. Booklet No. 4. Deals with the Armstrong line of ratchet drills which are made in the Packer, standard, universal and short styles. These are designed for meeting the needs of any condition of work such as hard, rough service, awkward corners and confined spaces, where a short head and long feed are essential, and also for general service. All of the different types are illustrated and brief tables of sizes are included.

Water Heater.—David C. Seymour, 49 Lawrence street, Newark, N. J. Eight-page circular. Illustrates an internal manifold water heater for manufacturing and domestic purposes, involving a malleable iron head to a heater of the usual cylindrical form, with the heating pipes fixed to the head, so that inspection or repair of the piping can readily be obtained by removing the head. The heating pipes are connected in pairs at the far end by return bends.

Ball-Thrust Bearings.—Standard Roller Bearing Company, Philadelphia, Pa. Bulletin No. 25. Pertains to the line of grooved ball and thrust bearings made by this company. The various types are illustrated with the dimensions and space is given to a number of typical applications of the bearings.

Alternating-Current Rectifiers.—Westinghouse Electric & Mfg. Company, East Pittsburgh, Pa. Three folders. All of these deal with the use of the Westinghouse-Cooper Hewitt rectifier outfits, Nos. 4201 and 4204 being devoted to the charging of automobile and telephone batteries respectively. No. 4205 calls attention to the use of one of these outfits for operating direct-current arc lamps from an alternating-current lighting circuit.

Cutters.—Union Twist Drill Company, Athol, Mass. Catalogue No. 100. Shows a new line of milling cutters which were developed by the Cincinnati Milling Machine Company as an aid to securing greater results from its high power milling machines. A discussion of the development of these cutters which was carried on under the personal direction of this company's chief engineer, A. L. DeLeeuw, is given briefly and following this are engravings and tables of dimensions of the various types of cutters which the Union Twist Drill Company is prepared to manufacture. A more extended account of the subject of milling cutter efficiency, which is briefly given in the catalog, was printed in *The Iron Age*, May 11, 1911.

Crayons.—Zelnicker Crayon Works, St. Louis, Mo. Pamphlet. Illustrates a line of indelible lumber crayons; crayons for marking glass, leather, paper, tin, castings, pipes, etc., and soapstone crayons for marking iron and steel.

Steam Heating.—Warren Webster & Co., Camden, N. J. Pamphlet. Deals with the Modulation heating system of this company as installed in the Haynes Building, Boston, Mass. Typical floor plans are reproduced, together with photographs showing portions of the system. Space is also given to a test of one of these systems installed in an office and warehouse building in Montreal.

Steel Castings.—Armor Steel Foundry Company, 4825 Spring Grove avenue, Cincinnati, Ohio. Pamphlet. Describes the use of the Gebhard process for making hardened steel castings or steel castings with hardened wearing surfaces without tempering, chilling, case-hardening or any treatment subsequent to the pouring of the metal. A number of typical Armor steel castings are shown and a number of testimonial letters and a partial list of users complete the pamphlet.

Small Tools.—Pratt & Whitney Company, Hartford, Conn., Catalogue No. 6. Size, 4½ x 7½ in., pages, 248. This catalogue cancels all previous editions and describes and illustrates the various types of small tools which this company manufactures. The book is divided into seven sections relating to taps, dies, milling cutters, reamers, punches, drills and miscellaneous tools. In addition to the descriptions and illustrations of the tools there are 24 pages of tables giving the various dimensions of the different types of threads in use, cutting speeds for various standard drills, dimensions of wrought-iron welded tubes, a comparison of the different wire gauges, weights of various substances and tables of decimal equivalents of millimeters and fractions and fractions of inches.

Bearings and Bushings.—Hyatt Roller Bearing Company, Newark, N. J. Two bulletins. The first one, No. 305, pertains to the high duty type of Hyatt roller bearings. The construction of this bearing is described followed by a discussion of its advantages and limitations. The various types of bearings are illustrated with brief specification tables and a few of the applications of it given. The other bulletin, No. 600A, describes and illustrates the maker's commercial type of standard bushings. A number of applications of this bushing are shown by both line and halftone engravings.

Steam Specialties.—The D. T. Williams Valve Company, Spring Grove avenue and Township street, Cincinnati, Ohio. Condensed catalogue No. 9. Pertains to a line of steam specialties manufactured by this company, which includes brass and iron stop and check valves, gate valves, steam cocks, water gauges, gauge cocks, brass fittings, lubricators, oil and grease cups and Cookson steam traps and separators. After a general discussion of the Williams regrinding valves and their use, the various other types of specialties are taken up, illustrated and briefly described. A page is usually given to each specialty, the engravings occupying the upper portion while a price list and brief table fill the lower third and the remainder is devoted to a brief description.

The Machinery Markets

A number of Eastern railroads are preparing lists of machinery needs, presumably covering their requirements for 1912. From all accounts some heavy purchasing will be done in that direction in the near future. Eastern automobile truck manufacturers have been buying good quantities of machinery. A good single tool business is being done in Detroit, and there is a noticeable demand for special tools and wood-working equipment. There are inquiries out against some fair-sized lists in Cleveland, where business shows a steady improvement and a stronger demand for power equipment has developed. Scattered orders for small lots of tools are being placed in St. Louis, and the week's business there has been heavier than for some time past. Good rains have revived business in Texas and the machinery demand has bettered noticeably. The Mexican demand is improving and public service enterprises there promise to help the machinery trade. Machine tool orders are coming out more frequently on the Pacific coast, and orders for equipment for new logging camps are expected to come forward soon. Trade is particularly good in the South and business is well distributed. Reports from all directions indicate that export trade is keeping up well, the demand for machine tools for shipment to Europe and South America being especially good.

New York

NEW YORK, October 18, 1911.

There are indications that a number of railroads are preparing machinery lists apparently against their needs for 1912. The Delaware, Lackawanna & Western bought some machinery in this market during the week against the small list it sent out early in the month. A larger list covering needs for a number of the company's shops is in course of preparation. The Delaware & Hudson is getting up a list for its needs at Watervliet, N. Y., and both the Maine Central and the Boston & Maine are said to be making up schedules for machinery expenditures. There is no great amount of new business in sight from other directions, although inquiries are good and a fair amount of business has been placed of late. The Westinghouse, Electric & Mfg. Company has about completed its machinery purchases for the addition to its Newark plant and some of the automobile truck manufacturers have placed orders for small lists of machine tools. The export demand is, if anything, on the increase. German car manufacturers and French and Italian automobile makers are buying machine tools. Inquiries for machine tools for South America are coming in in good volume and some nice business has been done in mining equipment for Mexico. The jobbing foundries which have not been very active of late find inquiries for small castings increasing and some machinery manufacturers are buying castings for stock.

The Hooven, Owens, Rentschler Company, through its New York office, 39 Cortlandt street, has recently taken orders from the Central Pennsylvania Traction Company, Harrisburg, Pa., for one 34 x 68 x 60-in. cross compound engine direct connected to 1500 kw. D. C. General Electric generator; Ebensburg Coal Company, Philadelphia, Pa., two 400 kw. cross compound engines; Lehigh Coal & Navigation Company, one 400 kw. direct connected engine for delivery at Lansford, Pa. The company has also sold smaller sized engines to Carr Bros., New York, for export; American Vulcanized Fibre Company, Newark, Del.; G. F. Mather's Sons, York, Pa.; George B. Schaeffer, Reading, Pa.; Moore & White Company, Philadelphia, Pa., and the Manufacturers' Refrigerating Company, New York.

The Kenilworth Rubber Works, Kenilworth, N. J., has been incorporated with $60,000 capital stock. The company has secured a factory building at Kenilworth and is equipping it for the manufacture of automobile tires and rubber novelties. The incorporators are George B. Bradshaw, Lester F. Dittenhoefer and Edward W. Lawlor.

The Senora Motor Horn Company is a new incorporation with $50,000 capital stock to manufacture automobile signal supplies. The company has temporary offices at 21 Park Row, New York. The incorporators are Russell Goldman, A. Foshay and H. Neuhardt.

The National Spark Arrester & Damper Company, 31 Nassau street, New York, has been incorporated with $100,000 capital stock to manufacture spark arresting devices and dampers. The incorporators are Philip K. Sweet, Walter W. Ames and James T. Neary.

The Clark Paper Mfg. Company, Rochester, N. Y., has purchased a site adjoining the New York Central Railroad with a view to erecting a new plant. The company will move the equipment now at its plant at Hill street and much additional machinery to be electrically driven will be added.

E. W. Edwards & Son, Rochester, will erect and equip a power house in connection with the new department store and restaurant which they are building at St. Paul and Division streets, this city.

The Laurier Brewing Company, Binghamton, N. Y., is about to add a new building and equipment to its plant at an outlay of about $50,000.

The Aetna-Wrights Health Underwear Company, Troy, N. Y., will erect and equip a four-story and basement mill 60x60 ft. with an extension 40x40 ft.

The Keystone Warehouse Company, Buffalo, N. Y., has let contract for an addition 130x140 ft. six stories and basement to its storage plant at Seneca, Hamburg and Alabama streets and the Pennsylvania Railroad. Considerable freight elevating equipment will be required.

The Pierce Arrow Motor Car Company, Buffalo, has purchased 35 acres of land adjoining the New York Central Railroad belt line not far from its present extensive plant at New York Central belt line and Elmwood avenue. The company will erect a mammoth plant for the manufacture of auto trucks and commercial vehicles. The present plant of the company, which is for the manufacture of pleasure cars, is comprised of 12 buildings covering 20 acres. The new plant will be equally extensive and its construction and equipment will involve a large monetary outlay.

The Safety Steel Company has been incorporated at Buffalo with a capital stock of $50,000 to manufacture the Hawkins patent nut lock. For the present the company will not establish a manufacturing plant, but contract for the making of its product. Chas. A. Fox is president, and J. W. Rose secretary and treasurer. The office of the company is at 744 Ellicott Square building.

The city of Erie, Pa., will install a new 20,000,000 gal. pump at the waterworks and has engaged consulting engineers, Chester & Fleming, Pittsburgh, Pa., to prepare plans for the work.

The Erie Forge Company, Erie, Pa., will soon let contracts for the erection of two manufacturing buildings to cost about $25,000.

New England

BOSTON, MASS., October 17, 1911.

Those manufacturers and dealers who attended the meetings of the National Machine Tool Builders at New York last week gained little encouragement as to the condition of the machine tool trade, but nevertheless it was clearly demonstrated that the business might be considerably worse, taking the average. Various signs point to some improvement in general business conditions in this territory. The tool steel trade, which is a pretty good barometer of industrial conditions in the metal lines, has improved. One large dealer finds that each month since June has made a gain over that preceding it, until now business is some 60 per cent. of maximum, not a high figure, excepting by comparison, but still fair, everything considered. A large dealer in imported tool steels reports an increase in orders over September, but the railroads and large railroad equipment manufacturers are not conspicuous in the buying. It is a notable fact that importers are maintaining good stocks by large purchases abroad, and the trade generally is keeping itself prepared to take care of the increase in business whenever it shall come.

The Simplex Tool & Supply Company, Boston, has occupied the store at 125 Purchase street, corner of Hartford street, and will carry a line of furnaces, ma-

THE MACHINERY MARKETS

chine tools, small tools, etc. The business has been reorganized on a substantial basis, with H. D. Evans, of the H. D. Evans Steel Company, as president. The company will deal in gas furnaces of its own make for the treatment of steels and for the melting of sott metals; the hacksaw machines of the Racine Machine & Tool Company, Racine, Wis.; the abrasive metal cutters of the Slack Mfg. Company, Springfield, Vt.; the positive pressure blowers of the Connersville Blower Company, Connersville, Ind.; the high speed taps and dies of Winter Bros., Wrentham, Mass., for which the company is the sole agent; steel balls, hacksaw blades, Meteor alloy wire, twist drills, reamers, cutters, etc.

The D. E. Whiton Machine Company, New London, Conn., has completed an addition to its works to provide for rearrangement and increased floor space in some departments, with a new tool room and drafting room.

The H. A. Mathews Mfg. Company, Seymour, Conn., manufacturer of stove and other metal trimmings, suffered an estimated loss of $75,000 by fire, October 11. A dispatch states that the presses and other heavy machinery were not injured.

The New Haven Clock Company, New Haven, Conn., will erect a four story brick addition.

The Massachusetts Institute of Technology has purchased 50 acres of land on the Cambridge bank of the Charles River basin, just outside of the city of Boston, and will create its group of new buildings on the premises. The administration buildings at Boston will be maintained for some time because of legal obstacles to their sale.

The Holtzer-Cabot Electric Company, Brookline, Mass., was not a heavy loser of machinery in the recent fire. The buildings containing equipment escaped with comparatively little damage, it is stated. The plant will be rebuilt. If machinery will be required later the trade has not been so informed as yet.

F. W. Derbyshire, Waltham, Mass., recently with the Waltham Mfg. Company, has established a business of his own at Waltham and will build a line of chucks and watchmaker's machinery.

Arthur D. Little, Inc., 93 Broad street, Boston, Mass., engineer and chemist, will erect laboratory buildings at Brookline avenue and Bellevue street. The first structure will be occupied as a complete paper making plant equipped for experimental work, the purpose being to test the value of paper making materials on a commercial basis.

The Adams Ball Company, Hartford, Conn., will erect a factory building at Elmwood, a suburb, 40 x 100 ft., two stories.

Additions to general manufacturing plants include a beam house, about 85 x 480 ft., for the American Hide & Leather Company, at Lowell, Mass., to cost $110,000; addition 30 x 200 ft., four stories, for the Old Town Canoe Company, Old Town, Maine, and a factory 30 x 54 ft., two stories, for Lewis Hawthorne, New Haven, Conn.

The Gilbert & Barker Mfg. Company, Springfield, Mass., states that the plans and specifications for its new plant were prepared by Edward H. McClintock, engineer, of that city, who will superintend the construction.

Philadelphia

PHILADELPHIA, PA., October 17, 1911.

That the machine tool trade in this district is on about a fairly even basis, with the outlook for the future a trifle more favorable, is indicated by reports gathered from both merchants and manufacturers. Considerable attention has been given by the trade during the week to the New York conventions of the National Machine Tool Builders' Association and the Machinery Section of the National Supply and Machinery Dealers' Association, as well as the convention of the American Street Railway Association, held in Atlantic City, N. J., and the trade has, to a certain extent as a result of these meetings, been inclined to look at the business situation in a somewhat more favorable light. While current business continues of the small lot order, a few inquiries of better proportions are under negotiation, the only difficulty being that the extreme cautiousness of prospective buyers results in slow closing of contracts. Inquiries have been somewhat improved generally although the major portion are still confined to small single tool requirements. There is still an absence of any important railway demand coming from the railroads in this district.

Builders of machinery, tools and equipment continue to operate their plants on a fairly even basis; in instances gains are reported in some departments, but these are largely offset by quieter conditions in other directions. Plant operations vary from 50 to 75 per cent., with instances where full time is being made, but in the majority of such cases the usual full complement of employees is usually considerably reduced. Some little export business is reported but it is largely in special tools and equipment. In the second-hand machinery market business continues irregular. Moderate purchases of power equipment are being made but propositions involving any material capacity move slowly. Business in boilers is more active than is that for engines. The foundry trade varies but little, in instances gains in orders for steel castings are reported by some foundries, although the bulk of the orders call for prompt shipment.

The Pennsylvania Railroad Company is having plans prepared for a new grain elevator to be erected probably at its Greenwich piers, which will embody all modern features in construction and operation. Plans are also being considered for improvements to some of its Delaware River piers as well as some new work of that character.

An Eastern buyer is in the market for an alligator shear, to cut up to 2 in. square. A Pitman shear with direct connected engine drive is preferred. Address communications to Box 270 A, care *The Iron Age*, Philadelphia, Pa.

Application for a Pennsylvania charter has been made by the City Light, Heat & Power Company, which is being formed to manufacture and supply light, heat and power, using electricity as power, to various cities in Berks and other counties in the coal regions in this State. Particulars regarding the personnel of the incorporators are not available at this time.

The Newton Machine Tool Works, Inc., reports the receipt of more orders in the last two weeks than for a full month previously. Inquiries are reported to be better and the outlook is considered more favorable. Recent orders have been largely for cold saw cutting off machines, milling machines and rotary planing machines, several orders for the former two classes of equipment being for export. Orders are still confined to single and small lots of tools with deliveries going forward in a general way.

The Hamilton Rubber Company, Trenton, N. J., has, it is stated, awarded a contract to Burton & Burton, of that city, for the erection of a three-story brick addition 61 x 184 ft. to its factory. Kleeman & Fowler are said to have been the architects

The Nazel Engineering & Machine Works has taken a fair volume of orders, largely for special tools which, in addition to a good amount of general repair work, keeps the plant fairly well engaged. This concern has recently shipped a 6-ton Beche forging hammer to a local concern and two 4-ton hammers to a purchaser in the Cleveland, Ohio, territory.

The R. S. Newbold & Son Company, Norristown, Pa., is very busy in all departments and has sufficient orders to keep so engaged for the next three months. Inquiries for its various equipment are being received daily and the outlook is considered very encouraging. The company has just shipped a complete set of furnace top castings to the Warwick Iron & Steel Company and another set to the Colonial Iron Company. It has orders for considerable rolling mill equipment as well as straightening machines, the latter for Gary, Ind. Among other orders is one for a large rotary shear, with a capacity for cutting circles up to 12 ft. in diameter, 1¼ in. thick, for one of the largest steel works in Austria.

The Birdsboro Steel Foundry & Machine Company, Birdsboro, Pa., finds business considerably better than it was several months ago, particularly in its machine department. The foundry departments still continue to operate below normal capacity. This company is rushing work on its new erecting shop which it hopes to have completed and ready for occupancy before the end of November.

Mergers of power and illuminating companies continue to be noted, the most recent being that under the name of the Edison Electric Company, Lancaster, Pa., with a capital stock of $1,500,000, formed by the consolidation of the Edison Electric Illuminating Company, Lancaster, Pa.; Columbia Light, Heat & Power Company; Columbia, Pa.; Lititz Electric Light, Heat & Power Company, Lititz, Pa.; Mountville, Penn Township, Rapho Township, Mt. Joy Township, East

THE MACHINERY MARKETS

& West Donegal Township electric light companies; East & West Lampeter, East & West Hempfield, Manor, Manheim, Warwick and Lancaster Townships electric companies and the Manheim Suburban Electric Company. The officers of the new company are named as follows: president, W. W. Griest, Lancaster, Pa.; vice-president, George Bullock, New York; secretary-treasurer, J. S. Graybill.

The Gray Iron Foundry Company, Reading, Pa., has recently installed a new 56-in. Barry & Zecher cupola, a new air compressor and several new disc grinders, in order to provide better facilities for its work in special lines and is preparing to manufacture the line of art metal goods formerly made by the National Brass & Iron Company, of that city, the patterns and equipment of which were recently purchased by the Gray company.

Cleveland

CLEVELAND, OHIO, October 17, 1911.

The demand for machine tools continues to show an improvement. Some of the dealers did quite a satisfactory business during the week in single tools and small lots. One dealer sold one lot of tools aggregating $4500 and has another inquiry for machinery equipment amounting to about $10,000. The latter is for factory extensions which have not yet been definitely decided upon. General inquiries are somewhat better and the market shows more life than for some time. Inquiries as a rule, however, are small. The demand for second hand machinery is a little more active.

The demand for steam power plant equipment is quite active and some boilermakers have orders for some time ahead. The demand for blowers is good. Conditions with crane builders are rather quiet, orders being mostly for small installations. The demand for pipe threading machinery is very good and some makers have all of the orders that they can fill. In electrical equipment there is a fair demand for small motors. Business has improved materially with some of the small malleable iron foundries that do not turn out heavy castings. Makers of steel stampings are getting a good volume of orders.

The project to build a large power building to furnish quarters for small manufacturing establishments, which was inaugurated in Toledo some time ago, has now taken definite shape and it is expected that the erection of a large building by a company to be called the Toledo Factories Company will be started soon. It is expected that when the building is completed many small industries will locate in that city, which would otherwise be compelled to seek quarters elsewhere because of lack of accommodations.

The Superior Metal Products Company, Elyria, Ohio, is in the market for the following equipment for its new plant: 5-hp. gas engine, lighting generator, capacity 200 to 300, 16 candlepower, 110-volt generator, a low pressure boiler for heating factory and platform weighing scales with a table 4 ft x 6 ft.

The Burke Valve Company, Cleveland, has been incorporated with a capital stock of $50,000 by W. B. Burke, W. G. Rose, T. H. Duncan, W. H. West and Fred C. Backus. The company is not yet ready to announce its plans.

The Izant-Latimer Electrical Construction Company, Warren, Ohio, has been incorporated with a capital stock of $6,000 by Clyde Latimer and others.

The National Supply Company, Toledo, Ohio, maker of oil and gas well machinery and supplies, reports a very good demand for its products from all over the world. This company has recently completed large extensions to its plant.

The Cleveland Cooperage Company has been organized with a capital stock of $60,000 to manufacture barrels and packing boxes. The company will occupy a site formerly occupied by the Ohio Cooperage Company at Clark avenue, S. W., and the Big Four Railroad tracks.

The Ranney Fish Company, Lorain, Ohio, will erect a large cold storage plant.

The American Box Company, Cleveland, will build a new factory and boiler house on West Third street. The building will be of brick, two stories, 64 ft. x 96 ft.

The Electric Signal & Engineering Company, Alliance, Ohio, has been incorporated with a capital stock of $20,000 by D. C. Schultz, Richard James and others.

The directors of the Republic Rubber Company, Youngstown, Ohio, have voted in favor of an increase of $1,000,000 in its capital stock to provide for plant extensions.

The Eberling Cement Tile Machine Company, Cleveland, has been incorporated with a capital stock of $10,000 by C. M. Eberling and others to make machinery for the manufacture of clay products.

The Novelty Sign Company will remove from Lima to Kenton, Ohio, where it will occupy the plant formerly occupied by the Runkle Company.

Chicago

CHICAGO, ILL., October 17, 1911.

The E. M. Burr Company, Champaign, Ill., has been incorporated with $100,000 capital stock to do a general foundry and machine shop business, by E. M. Burr, Nancy G. Burr and Manford Savage.

The Beaverville Light & Utility Company, Beaverville, Ill., has been incorporated with a capital stock of $6,000 for the purpose of manufacturing gas for light, fuel and power. The incorporators are Joseph O. Lambert, Nelson C. Boudreau and Delphi Codere.

The Republic Fence & Gate Company, North Chicago, Ill., has begun work on a two-story brick factory, 40 x 80 ft. Several additional fence manufacturing machines will be installed.

The Wedron Sand & Clay Products Company, Aurora, Ill., has been incorporated with a capital stock of $100,000, by George R. Ackerman, John M. Raymond and N. W. Evans.

W. M. Campbell, of Pittsburgh, Pa., will build a new bakery at Des Moines, Iowa, the building and machinery to cost approximately $60,000.

The Pella Motor Car Company, Pella, Iowa, has been incorporated with a capital stock of $10,000. The incorporators are W. H. Fowler, H. P. Van Gorp and E. J. Van Gorp.

The Red Oak & Northwestern Railway Company, Red Oak, Iowa, has been incorporated with an authorized capital stock of $250,000. The officers of the company are George C. Boileau, president, and H. W. Clovis, secretary, both of Red Oak.

The Schlitz Brewing Company, Milwaukee, Wis., has made application for a permit to erect an ice plant at the foot of Walnut street. The building is to be 146x160 ft.

The Rockwell Mfg. Company, Milwaukee, Wis., contemplates the erection of an addition 120 ft. x 130 ft. to its plant at Sixth avenue and Park street.

The Badger Wood Material Company, Merrill, Wis., incorporated with $25,000 capital stock, will erect a new plant on the Ollhoff saw mill site. Officers of the company are Ferdinand Ollhoff, president; Robert Hackbarth, vice-president and manager, and L. G. Gaylor, secretary and treasurer.

The Pfister & Vogel Leather Company, Milwaukee, Wis., will build a seven-story warehouse 100 ft. x 112 ft. reinforced concrete construction throughout on First avenue and Virginia street. The company is also contemplating a three-story office building at the same location.

The R. Fehler Brush Company, Milwaukee, Wis., is remodeling its building at 395 Reed street, and making a factory addition.

The Nameuken Iron Company, Duluth, Minn., has filed an amendment to its articles of incorporation to increase its capital stock to $1,500,000.

The Chicago, St. Paul, Minneapolis & Omaha Railroad has let contracts for the construction of a 15-stall roundhouse, a boiler and machine shop, 50x140 ft., and a store house, 25x75 ft., to be erected at Omaha, Neb., at a cost of $40,000. The machinery details will be arranged by E. B. Thompson, superintendent of motive power and machinery, who has offices at St. Paul.

Detroit

DETROIT, MICH., October 17, 1911.

General conditions during the first part of October are looked upon as extremely favorable in the machinery trade in this locality. Considerable industrial activity is being noted, and while the bulk of current orders are confined to single tool propositions, still, the number of these amount to a very respectable total and dealers express themselves as satisfied with the outlook. Special tools and equipment are in noticeable demand. The demand for castings is quite satisfactory and the

THE MACHINERY MARKETS

foundry trade is in a generally good condition, though some few exceptions are noted. Second-hand machinery is moving less briskly than during September. Furniture factories are making numerous additions to their equipment and wood-working machinery is consequently more active. Few installations of engines and boilers are reported and the installations called for are generally small. A large amount of development work is being carried forward in the iron mining region in northern Michigan, and in spite of pessimistic reports as to the outlook for the iron trade a number of mines are increasing their output and adding to their equipment. Although purchase of contractors supplies has slackened, somewhat greater activity is being shown in building circles than for some weeks past.

The Michigan Leather Packing Company has been incorporated with a capital stock of $25,000 by S. C. Leonard, J. D. Rockwell and R. G. Maloney, and will engage in the manufacture of hydraulic valves and packings. A factory site has been purchased and operations will be commenced in the near future.

Ground has been broken for a new factory for the Winkley Company, Detroit, manufacturer of oiling devices. The building will be 100x100 ft. and will cost $15,000. The factory is located in Windsor, across the river from Detroit, and will be used as a branch plant by the company.

The Commercial Engineering Company is a new organization with $50,000 capital stock to manufacture and deal in machine tools, machinery and gas engines. J. C. Heaslet, R. E. Baus and J. B. Book are the principal stockholders.

The J. T. Slocomb Company, Providence, R. I., has arranged for a special exhibition of its line of tools in Detroit from October 14 to 21, inclusive. Several tools of new design will be shown.

The American Brass & Iron Company has completed plans for the construction of a one-story foundry at its present plant.

The A. T. Hallock Company has taken over the unused plant of the Manistee Novelty Works, and is equipping it for its own use. The company manufactures a wide variety of patented wooden specialties.

The Popeman Electric Stove Company, which was recently organized at Flint, Mich., is making preparations to greatly increase its output. The company reports an excellent volume of business.

The Charles P. Limpert Company, Holland, Mich., manufacturer of furniture, has awarded the contract for a three-story addition 130x150 ft. to its factory, which will double its capacity.

The city of Ishpeming, Mich., has purchased the site occupied by the Superior Lumber Company and the company is negotiating for a new site on which a larger and more modern plant will be erected early in the spring.

The G. T. Eames Company has been organized at Saginaw, Mich., with a capital stock of $15,000 by H. H. Everard, G. T. Eames and J. H. Penniman. The company will manufacture machine tools and power equipment, specializing on a mandrel press recently patented by Mr. Eames.

J. Van Duren & Co., broom manufacturers, Grand Rapids, Mich., have purchased a site and will erect a new broom factory.

The Star Furniture Mfg. Company, Zeeland, Mich., is enlarging its plant by the erection of a two-story building 40x60 ft. Some additional wood-working machinery will probably be installed.

J. A. Klise, secretary of the American Carving & Mfg. Company, Grand Rapids, Mich., is organizing a wood-molding company and will erect a two-story factory, about 100x200 ft. for the new business.

The Spring Brook Ice Company, St. Johns, Mich., is contemplating the building of an artificial ice-making plant. D. W. Kelley has charge of the proposition for the company.

Richard Roubus, St. Louis, Mich., is organizing a company for the manufacture of automobile trucks.

The Brown-Morse Company, Muskegon, Mich., has filed notice of an increase of capital stock from $50,000 to $250,000 to take care of its rapidly increasing business. The company manufactures office devices.

The Besser Foundry Company, Alpena, Mich., has received an order for a large amount of cement mixing and tile machinery for export to South America.

The Kolb Brewing Company, Bay City, Mich., has broken ground for a boiler house in which two 150 h. p. boilers will be installed. The company has just completed a large addition to its bottling works, equipped with modern machinery.

The McMullen Machinery Company, Grand Rapids, Mich., has taken considerable new business recently, including the equipment for the Cadillac Chair Company's plant and the machinery for the Fuller & Rice Lumber Company's new mill.

The Valley Boat & Engine Company, Saginaw, Mich., has completed plans for reorganization including an increase of its capital stock to $30,000, and will make improvements to its present plant to cost about $10,000.

The Peerless Wire Fence Company, Adrian, Mich., has about completed a large addition to its factory and has installed a complete electric galvanizing plant and a five-ton electric crane.

The Holland Gelatine Company, Holland, Mich., will erect a larger plant for the installation of a new process for manufacturing gelatine and glue.

The Home Interior Finish Company has been organized at Holland, Mich., with a capital stock of $30,000, and will manufacture wooden articles.

The Richards-Wilson Pipe Covering Company, Grand Rapids, Mich., manufacturing insulating covering for underground steam pipes, has increased its capital stock from $5,000 to $30,000, and will enlarge its operations.

The Herrick Casket Company, Lyons, Mich., is negotiating for a larger factory and is planning on increasing its output.

The Terrill Equipment Company, Grand Rapids, Mich., will soon move into its new plant which will allow of a considerable increase in output. The company manufactures steel lockers and metal shelving.

A new company has been organized at Buchanan, Mich., under the style of the Simplex Ladder Company and will engage in the manufacture of stepladders. The capital stock is given at $6,000.

The Holland Furnace Company, Holland, Mich., has filed amended articles of incorporation increasing its capital stock from $50,000 to $100,000.

The Hupp Motor Car Company, Detroit, manufacturer of the Hupmobile, has secured a factory site of a little more than seven acres at Milwaukee and Mt. Elliott avenues for its new plant. Plans are now being drawn for the new buildings which will be of the most modern construction. The new plant will give the company about three times its present floor space and will enable it to manufacture a great many parts which are now made outside.

The K. & H. Lamp Company, Detroit, has been organized with a capital stock of $12,000 to manufacture and deal in motor lamps. Paul Krastin and John H. Hart are the principal stockholders.

The Briggs Mfg. Company, Detroit, is making an addition to its plant of a one-story mill and galvanized iron sand blast building.

A new foundry and machine shop will be established in Sault Ste. Marie, Mich., by H. W. King of Prentice, Wis., who has purchased as a site the mill building formerly occupied by C. W. Caskey & Son on Fort street.

Indianapolis

INDIANAPOLIS, IND., October 17, 1911.

The Hammond Steel Barrel Company, Hammond, Ind., recently incorporated, has had plans prepared for a one-story brick building, 60x200 ft., which is expected to be completed about January 1.

The Indiana Match Corporation, Crawfordsville, Ind., has been organized to take over the business of the Indiana Match Company. The authorized capital stock is $100,000. The directors are A. M. Smith, G. B. Luckett, H. H. Ristine, O. M. Gregg, H. E. Greene, Chase Harding and C. D. Voris.

The Crescent Trunk Company, Evansville, Ind., has been incorporated with $10,000 capital stock to manufacture trunks. The directors are Edward C. Kinkel, H. G. Becker and A. C. Hedderic.

The Stockford Reed & Novelty Company, South Bend, Ind., has been incorporated with $20,000 capital stock to manufacture fishing tackle, etc. The directors are F. L. Dennis, W. F. Stockford and William Miller.

The Indiana Mfg. Company, Peru, Ind., maker of refrigerators and sewing machines, has reorganized since the death of the manager, Capt. Aaron N. Dukes, and has elected Elbert W. Shirk, of Bedford, Ind., president; Joseph H. Shirk, vice-president, and John Unger, secretary-treasurer.

THE MACHINERY MARKETS

R. W. Howard has obtained a franchise at Kentland, Ind., and has organized an electric light and power company which proposes to supply light and power to Kentland, Brook, Goodland and Sheldon.

The Kokomo Sanitary Mfg. Company, Kokomo, Ind., has increased its capital stock from $30,000 to $60,000.

The Davis-Birely Table Company, Shelbyville, Ind., has been reorganized and incorporated with $300,000 capital stock. The word The has been dropped from the name. Joseph E. McCartney and Frank Whitcomb have purchased the two-thirds interest of the late Charles L. Davis. Charles Birely is president and manager, Mr. Whitcomb vice-president, and Mr. McCartney, secretary-treasurer.

The Holland-St. Louis Sugar Company will erect a beet sugar plant at Decatur, Ind., to cost about $1,000,000. The contract for the buildings has been let to a Cleveland, Ohio, construction company. The Commercial Club of Decatur provide the site of 40 acres, and wells to supply 400,000 gal. of water a day. L. G. Ellingham, Ind. secretary of State, Indianapolis, was largely instrumental in securing the industry for his home county.

The Kendallville Furniture Company, Peru, Ind., has changed its name to the Peru Chair Company.

Kemble & Kuehn, local contractors, will build an addition to the Muessel Brewing Company's plant, South Bend, Ind., to double its capacity. The improvements will cost $30,000; machinery and equipment another $100,000.

The Indiana Service Company has been organized at Anderson, Ind., to supply light and power to Anderson, Batesville, Shelbyville, Greensburg, Connersville, Rushville, Greenfield, Newcastle, Elwood, Tipton and Noblesville. The directors are Clement C. Hooven, Howard L. Otis, John T. Bacon, Charles A. Wilson and Henry D. Hughes.

The Fort Wayne Tile Company, Fort Wayne, Ind., has been incorporated with $7,000 capital stock to manufacture hollow clay ware. The directors are Paul Koehler, Frank Kintz, J. H. Koehler, William Wertfeld and Henry Braun.

The Whitesides Motor Truck Company, Franklin, Ind., will move to Newcastle and consolidate with the Safety Shredder Company of that city.

The Kling Electric Company, Peru, Ind., has been incorporated with $5,000 capital stock to manufacture electrical supplies. The directors are A. H. Kling, E. H. Kling and E. P. Kling.

The Muncie Brass & Aluminum Castings Company has been organized at Muncie, Ind., to manufacture brass and aluminum castings. It will use part of the Patrick Murphy foundry, Mr. Murphy continuing the manufacture of gray iron in part of the plant.

The South

LOUISVILLE, KY., October 17, 1911.

The past ten days have produced an amount of improvement in the Louisville machinery market commensurable with the expectations of the manufacturers and dealers who have been looking forward all summer to a banner fall season, and consequently no complaint can be registered with regard to the present status of the field. The manner in which machinery consumers, or rather purchasers, are awakening to the possibility of immediate execution of their intentions is the source of a great deal of satisfaction to the trade in general.

The prospect for the continuance of present favorable conditions is extremely auspicious. The industries of the Bluegrass region and the South are just working up to a full head of steam during the fine fall weather and whatever mechanical improvements and enlargements that become necessary as the expansion of manufacturing activity develops will be handled immediately to preclude the possibility of work along these lines having to be done during colder and more disagreeable weather that is coming. It is confidently predicted that the present period of autumnal prosperity will hold good until the middle of December or the beginning of the holiday season. Even at that date the chances of a serious slump are slight.

Contracts secured by Gateway City machinery men and manufacturers of the South during the past week have been comprehensive in character, covering railroad improvement, mill and foundry extension and the equipment of new manufacturing plants and public service stations. The spread of demand is taken as an exceedingly good indication of steady prosperity for the trade at large.

J. E. Henry, recently appointed architect and supervisor of building for the Louisville public schools by the Board of Education, has completed plans for the up-to-date heating and ventilation of the Male High School Building. Several thousand dollars' worth of heating and ventilating equipment are to be installed in the structure, which was greatly damaged by fire last summer. Bids have been asked on the work and the contract is to be awarded within a week or so.

The Overbey Tanning Institute, a semi-philanthropic organization, filed articles of incorporation in Louisville a short time ago and will establish an up-to-date tannery, completely equipped, in the near future, although the site of the plant has not yet been decided upon. The Institute has been formed with a capital stock of $1,000 for the purpose of teaching colored boys the tanner's trade, and has the following incorporators: Matthew Alley, A. Hocker, J. H. Kennedy and A. R. Wilhoit.

The Abell Elevator Company filed articles of incorporation in this city last week and is equipping a good-sized plant along the most approved lines, preparatory to starting operation as soon as possible. The factory is located on Eighth street, north of Main. The company proposes to manufacture and repair all types of elevators and has a capital stock of $50,000. Its incorporators are George Abell, Garland H. Mourning and Garland H. Mourning, Jr.

It is reported from Maysville, Ky., that the Business Men's Club of that city is considering a proposition received from New York capitalists soliciting inducements to locate and operate a big steam boiler and hot water heating apparatus manufacturing plant in that city. It is probable that a company with about $75,000 capital stock will back the establishment.

The Federal authorities in the postal service at London, Ky., have decided to install a gas engine and electric generator of large capacity in the London post-office in the near future. James Knox Taylor in Washington D. C., has asked for bids on the work and the award is to be made October 25, and will be pushed to completion immediately afterward.

The Crystal Ice Company filed articles of incorporation last week in Newport, Ky., and will establish and operate an up-to-date ice manufactory in the near future. The new company has a capital stock of $100,000. The incorporators are Joseph Adams, Benjamin A. Adams and William Schmidt.

The Crystal Ice Company, Harrodsburg, Ky., will increase the capacity of its plant two tons per day. The necessary machinery for this and other improvements is to be installed at once.

The Morganfield Ice & Milling Company, Morganfield, Ky., has planned to increase its capacity for ice production considerably and will commence work upon the improvements about December 1, rushing them to completion. A contract has been awarded to the Frick Company, Waynesboro, Pa., for the erection of a new freezing tank made of steel with a daily capacity of 20 tons of ice; also two agitators of the most approved type, with a velocity of from 300 to 1000 rev. per minute. The company has also contracted with the Brownell Company, Dayton, Ohio, for the installation of two high-pressure boilers of 100 hp. each, giving the Morganfield ice plant a power house of ample capacity.

The Southern Bitulithic Company, with headquarters in Nashville, Tenn., has just completed the erection of a $100,000 plant in Woodstock, Ala., for the crushing and separation of all sizes of stone for building purposes, the necessary machinery having been installed.

The ice plant of C. R. Sawtelle, in Anniston, Ala., is to have its capacity increased from 50 to 100 tons per day, Mr. Sawtelle having contracted for the necessary machinery.

The Howe Ice Company, Nashville, Tenn., is reported to be figuring on the establishment of a $100,000 ice manufacturing plant in Anniston, Ala.

The United States Air-Brake Release Company has filed articles of incorporation in Montgomery Ala., with a capital stock of $6,000. The company will establish a large plant for the manufacture of a patented air-brake. The officers of the new concern are: Walter Moore, president, Montgomery; M. J. Powell, vice-president, Montgomery; S. R. Bentley, secretary-treasurer, Birmingham.

The Lawrenceville Mfg. Company, Lawrenceville, Ga., has leased its big plant in that city to the Gate City Mills, of East Point, Ga. The new lessees pro-

THE MACHINERY MARKETS

pose to improve the property and re-commence manufacturing as soon as possible. The mills are owned by the Filer & Stowell Company, Milwaukee, Wis.

George C. Thompson, of Atlanta, Ga. and E. M. Scofield, a prominent Philadelphia engineer, have completed a series of surveys and estimates in Anderson, S. C., and will solicit the City Council of Anderson for a franchise to erect and maintain a gas plant in that place.

John Sullivan and associates, of Louisiana, Mo., have announced that they are planning the establishment of a button factory in Batesville, Ark.

It is reported that in a general movement toward civic improvement the officials of Lexington, Tenn., are contemplating the installation of a new electric light plant of large capacity.

The Commercial Club of Mobile, Ala., is reported to be negotiating with out-of-town business men whose identity is not disclosed for the erection of a big $350,000 cold storage plant in Mobile.

The Conner & Wallace Machine & Foundry Works has been incorporated in Columbia, Miss., with Claude Wallace as manager and M. W. Conner as secretary and treasurer.

The Galey Bolt Lock Company, Jackson, Tenn., has filed articles of incorporation to engage in the manufacture of iron bolts, locks, keys, etc. The new company has a capital stock of $100,000 by W. F. Lamb, W. T. Peter and L. D. Newton.

The Standard Ice Company, Raleigh, N. C., has been incorporated with $100,000 capital stock. The incorporators are E. C. Hillyer, A. R. D. and C. A. Johnson.

The Sullivan Hardware Company, Anderson, S. C., secured a contract a short time ago for the installation of heating and plumbing to the amount of $14,000 from the executive committee of the Anderson College.

The Asheboro Wheelbarrow & Mfg. Company, Asheboro, N. C., is figuring upon extensive mechanical equipment, improvements and enlargements in its plant in that city. A complete array of bending machinery for working angle and channel iron, forging and riveting machinery is to be installed.

The Creamery Dairy Company, of Yoakum, Tex., has announced its intention of installing an individual electric lighting plant and will also equip and maintain an ice plant of 12 tons' daily capacity. Work upon the enlargements is to be begun as soon as possible.

The Peabody Electric Company was incorporated last week in Muskogee, Okla., with a capital stock of $7,500. by A. D. Peabody, F. H. Neben and W. R. Robinson.

Extensive power plant improvements will be furthered in the near future in Richmond, Va., according to plans which are now being mapped out by the Gould interests. The capitalists are preparing to expend $600,000 in establishing a new central power station which will have a minimum capacity of 12,000 hp. and a maximum capacity of 30,000 hp.

F. S. Shields, secretary of the Board of Works, New Orleans, La. will open bids December 7 for one 6000-kw. horizontal high-pressure condensing steam turbine and alternating current unit, one 150-kw. rotary converter with stationary transformer, switchboard, etc.

The Macon Motor Car Company, Macon, Ga., is having plans prepared for a factory for the manufacture of automobiles and will shortly be in the market for about $50,000 worth of equipment. J. E. Keith is general manager.

The Hickory Handle & Mfg. Company, Conover, N. C., has been incorporated to manufacture tool handles. The company has purchased the plant formerly operated by J. Hunsucker at Conover, and will make alterations and add some additional machinery. The officers of the company are K. C. Menzies, president; J. L. Kiddle, vice-president; J. L. Cilley, secretary, and A. L. Shuford, treasurer.

The Chickasaw Motor Car Company, Memphis, Tenn., has been incorporated with $25,000 capital stock to deal in automobiles and conduct a repair shop. The company has had plans prepared for a building, 40 x 200 ft., with an L 20 x 60 ft.

The American Brake Lever Company, Floyd, Va., has been incorporated with $15,000 capital stock to manufacture brakes for all kinds of wheeled vehicles. The company is planning to erect a factory as soon as business demands. The officers of the company are V. M. Sowder, president; R. F. Tompkins, vice-president; S. R. Brame, general manager, and J. M. Peterman, secretary and treasurer.

St. Louis

ST. LOUIS, MO., October 14, 1911.

October seems to be bringing some access of activity to the machine tool market, but it has not assumed very large proportions as yet. Most of the inquiries and of the purchases as well are from smaller concerns which are adding a tool here and there. None of the large concerns is in the market either as a purchaser or with a list for future consideration. One of the features of the week has been an increase in the interest in second-hand tools in good condition and this is encouraging the dealers a little. The past week, as a whole, is reported the best in several months and the near future is looked upon as good, comparatively speaking, though not up to normal or to capacity by any means.

The Ludlow Saylor Wire Company the past week completed the equipment of its new machine shop which has been under construction. The listed purchases run to about $7,000 total.

The Des Moines Sheet Metal Company, of Des Moines, Iowa, has completed what is said to be one of the finest equipped factories in the West and has begun operations.

The Kloswove Fence & Mfg. Company, of Metropolis, Ill., has been incorporated with $24,000 capital stock and will establish a plant for the manufacture of a special design of wire fencing. The incorporators are C. E. Trovillon, R. Matthews and J. T. Kimball.

The first of the Cotton Belt Terminal buildings, recently announced, has been authorized by the city building department, to cost $165,000. The whole terminal structure is to cost $750,000 and to be equipped with all the latest labor-saving mechanical devices.

The Hackett Mining Company, Joplin, Mo., has increased its capital stock from $50,000 to $120,000 for the purpose of increasing its equipment and extending its operations.

The Cremer Lumber Company, Little Rock, Ark., has been incorporated with $200,000 capital stock by J. C. Cremer, G. G. Powell, W. W. Atkinson, A. J. Reap and R. S. Wilson, to establish lumber mills.

The Hamilton-Brown Shoe Company, of St. Louis, is arranging to build and equip another large factory in addition to those which it is already operating.

The Missouri Belting Company will erect a new factory at the northwest corner of Grand avenue and La Salle street, St. Louis, the building to be of brick construction and to cost $19,800.

The Liberty Foundry Company is erecting a one-story foundry on Reilly avenue, St. Louis; cost, $3,500.

Texas

AUSTIN, TEXAS, October 14, 1911.

Bountiful rains have fallen in nearly every part of the State, and have served to greatly revive business and to benefit the industrial situation generally. It is noticeable that there is an increased demand for machinery for manufacturing plants of various kinds. Much activity is also going on just now in the improvement of municipal public service plants. The situation in Mexico is beginning to show improvement, and it is expected that after tranquility is thoroughly established in that country the demand for American machinery will quickly become very great.

The Wichita Motor Company has received the machinery for the factory that it is installing at Wichita Falls for the manufacture of auto trucks.

H. C. Luck and associates have ordered the machinery for the automobile factory that they will install at Cleburne. All arrangements have been made for the rapid erection of the plant.

The City Council of Bryan has made arrangements for issuing $8,000 of waterworks bonds, $7,000 of electric light bonds and $5,000 sewer bonds, proceeds of which will be spent in improving these public utility plants.

The Mamie B. Mfg. Company has been formed with a capital stock of $30,000, and will erect a plant at Austin for manufacturing cotton chopper machines. The incorporators are W. B. Alexander, T. J. Cristal and Otto Ebeling.

The organization of a company with a capital stock of $300,000 for the purpose of installing a waterworks plant and distributing system at Corpus Christi is being promoted. The Business Men's Club is said to be interested in the proposition. It is proposed to construct a dam across the Oso River, several miles west

THE MACHINERY MARKETS

of town, and conserve the storm waters for the necessary supply.

The Commercial Club of Rockport is promoting the installation of an ice plant, in connection with which there will also be operated a cannery.

A. H. Hardin and associates will install an ice factory at Bartlett.

The Cameron Water Power & Light Company of Cameron, which recently entered into a 20-year contract to supply the city with lights and water, will install about $18,000 of improvements. The plans and estimates for the proposed improvements have been made by N. Warrenfield, of Dallas.

The Commercial Club of Bryan is promoting the establishment there of an automobile factory. Chicago parties are interested in the project.

Steps have been taken to install a cotton gin at Rockport. The Commercial Club is interested.

The Creamery-Dairy Company will install a twelve-ton ice plant and an electric light plant at Yoakum.

The Caddo Oil Gas Company has been formed at Greenville for the purpose of boring oil wells in Marion County. It has a capital stock of $25,000. W. J. Taylor, of Commerce, is president.

The Tolteca Cia. de Cemento Portland, S. A., will double the capacity of its large cement manufacturing plant near Mexico City. The company at present is turning out about 125 tons of cement per day.

The American Sugar Mfg. & Refining Company has been formed with a capital stock of $6,000,000 with headquarters at Portales, N. M., for the purpose of erecting a large beet sugar factory at that place. The stockholders and directors are Charles Curtis, Abram W. Smith, Charles H. Sessions, all of Topeka, Kan., and Alfred B. Quinta, of Portales.

The Armour Packing Company has purchased several lots on the corner of Spruce & Front streets, in Texarkana, and it is announced that the company will erect a large cold storage plant to cost between $40,000 and $50,000.

Concordia Ice & Cold Storage Company, Concordia, is enlarging its present capacity by the addition of a new engine house and freezing room. New machinery will be installed.

Houston has been selected for the joint headquarters of the Buffalo Pitts Company, Buffalo, N. Y., and the Seager Engine Company, Lansing, Mich., of that State, both companies being engaged in the manufacture and sale of gasoline engines.

The Pacific Coast

PORTLAND, ORE., October 10, 1911.

Orders for machine tools are coming out with a little more frequency than for some time past, though there is no business of any great importance, few orders being booked for more than one or two tools. Other lines of machinery continue in active demand. While the logging season is about over in some localities preparations are being made to open new camps, and considerable equipment is being ordered for next season. The movement of sawmill machinery also is well sustained. The immediate demand for small irrigating units is rather quiet, but considerable figuring is being done, and a material increase of sales is predicted for next spring.

The Port of Portland Commission will receive bids November 9 for the construction of a 30-in. suction dredge with steel hull. The estimated cost is $20,000.

The Fisher Flouring Mills Company, Seattle, Wash., has raised its capital stock from $400,000 to $1,000,000, with the object of doubling the capacity of its plant.

The Pacific Hardware & Steel Company, whose rolling mill in this city was recently sold to the Pacific Coast Steel Company, will continue to operate the mill to about the end of the year, using up a lot of raw material on hand, after which the plant will be taken over by the new management.

Alterations are to be made shortly on two steamers of the Grand Trunk Pacific Railroad, to cost about $50,000. Oil burners will be installed.

The Western Cooperage Company, this city, has let a contract for an electric light plant for its logging operations on the Clatskanie River.

The Clark-Kelly Mfg. Company is planning to install a wood working plant in this city.

The Meyer Water Lift & Power Company of Colorado has been looking for a factory site at Edmonds, Wash.

The Wiest Logging Company is preparing to build a logging railroad and install a camp near Kelso, Wash.

It is reported that the Algoma Lumber Company will install a sawmill of 75,000 ft. daily capacity at Klamath Falls, Ore.

Garfield County, Wash., is contemplating the purchase of a gasoline road roller.

W. F. Bryan & Sons are preparing to install a large shingle mill at Ione, Wash.

A lot of new cleaning machinery is to be installed shortly in both the Union and Capitol flour mills at Stockton, Cal.

Contracts have been closed on a large lot of electrical equipment for the Salt River Water Users' Association, Phoenix, Ariz.

An auxiliary pumping plant is to be installed at the municipal water works of Patterson, Cal.

The Armstrong Machinery Company, Spokane, Wash., manufacturer of ice and refrigerating machinery is planning to increase its shop facilities and is in the market for a horizontal boring machine of large capacity, pipe bending machinery, disk grinders and other items incidental to high pressure pipe work.

Western Canada

WINNIPEG, MAN., October 14, 1911.

The Western Canada Foundry Company has been incorporated and will establish a foundry at Yorkton, Sask. W. J. Duncan, F. S. Collacott and G. H. Bradbrook are the directors.

The Canadian Pacific Railway Company has made plans to build a 16-stall roundhouse and establish railway shops at Wilkie, Sask.

A municipal gas plant for St. Boniface, Man., is again being discussed, and the council at its next meeting will go into the question as a result of a proposal recently made.

The Manitoba Bridge & Iron Works, Winnipeg, has purchased a large site at Transcona, Man. It is surmised that the company contemplates moving its Winnipeg plant to that new town, where the Grand Trunk Pacific shops are located.

The plant and business of Brandon Implement & Mfg. Company, Brandon, Man., which failed some time ago, has been purchased by a Winnipeg syndicate, and will now be conducted under the name of the McConnell Iron Works Company, Ltd., R. J. McConnell of Carman, Man., will be manager. It is intended by the new company to further increase the manufacturing and repairing facilities of the works.

The Finger Lumber Company, The Pas, Sask., has ordered a 250 h. p. new style Corliss engine from E. Leonard & Sons, London. The engine will be used to drive the new planing mill which the company is building at that point.

A modern sawmill of large capacity is to be built at Prince Rupert, B. C., by the British Canadian Lumber Corporation, Ltd., which possesses a large area of first-class timber on Graham Island, one of the Queen Charlotte group.

A match factory operating thirty-six machines is to be erected at New Westminster, B. C., by the Dominion Match Company, backed by United States capital. The plant is expected to be in operation within three months.

The Ocean Falls Company, Ltd., has made application to the British Columbia water commissioner for a license to use 1,100 cu. ft. of water per second from Link River, which empties into Cousins Inlet. The water is to be used for paper and other industrial plants, hydraulic power and pulp mill purposes.

The Canadian Puget Sound Lumber Company, Ltd., Victoria, B. C., has surveyors at work planning the route of a standard logging railway from Jordan River to Sooke Harbor, a distance of about 20 miles along the west coast of the island. If a favorable route can be secured it is likely the company will construct its new saw mill at Sooke Harbor, which offers commanding advantages.

It is said that the Western Canada Flour Mills Company, Ltd., Winnipeg, intends erecting a large grain elevator and a flour mill at Vancouver, B. C.

The Saskatchewan Cooperative Elevator Company, Regina, Sask., is making good headway in establishing elevators at different points in that province for the

THE MACHINERY MARKETS

handling of this season's crop. The Manitoba Government Elevator Commission is also building quite a number of new elevators and renovating old ones.

C. H. Mohr, of Minneapolis, Minn., is negotiating with the Board of Trade at Wolseley, Sask., in connection with the establishment of a flour mill of 150 barrels capacity at that point.

Government Purchases

WASHINGTON, D. C., October 16, 1911

The Paymaster-General, Navy Department, Washington, will open bids October 31, under schedule 3998, for two electric hoists, one band self feeding, ripping and re-sawing machine, one double cylinder four roll surfacer; under schedule 4003, for three 4-spindle drill presses, one set penumatic flanging clamps, one rapid punch and riveter, one power press or brake, one 3-spindle radial boiler plate drill.

Major C. H. McKinstry, Denfensive Works, Philippines Division, Manila, P. I., will open bids November 8 for water tube boilers and on December 4 for engines, generators, synchronous converters and potential transformers, condensers, pumps, feed water heater and forced draft fans.

The Bureau of Supplies and Accounts, Navy Department, Washington, opened bids October 10 for one lock seaming machine, semi-automatic, as follows:

Bidder 1, E. W. Bliss Company, Brooklyn, $975; 25, Berger & Carter Company, San Francisco, Cal., $700; 104, Manning, Maxwell & Moore, New York, $700; 133, Rix Compressed Air & Drill Company, San Francisco, Cal., $[illegible] and $885; 152, Toledo Machine & Tool Company, Toledo, Ohio, $[illegible].

The Supervising Architect, Treasury Department, Washington, opened bids October 10 for mechanical equipment, excepting elevators and mail handling apparatus for the United States Post Office, Washington, D. C. Various alternate bids were received. Bids for all work and material complete are as follows:

Bidder 1, Warner & Rittenhouse, Washington, D. C., $208,092; 2, W. G. Connell Company, New York, $208,399; 3, York Engineering Company, York, Pa., $209,000; 4, Fitzpatrick & Hoepfner, Columbus, Ohio, $214,700; 5, John W. Danforth Company, Buffalo, N. Y., $215,490; 6, Hanley-Casey Company, Chicago, Ill., $220,790; 7, S. Faith & Co., Philadelphia, Pa., $224,900; 8, Hoben & Doyle, Philadelphia, Pa., $230,000; 9, Crook-Kries Company, Baltimore, Md., $249,945; 10, William A. Pope, Chicago, Ill., $256,450.

New Tools and Appliances

This is essentially a news department for which information is invited.

New Air Compressor.—H. Edsil Barr, 502 Masonic Temple, Erie, Pa., has recently developed a new type of air compressor. This machine can be driven by belt or direct-connected electric motor or steam engine. The power economy is said to be high, due to the use of the two-stage cycle of compression with adequate cooling between the stages. The complete cycle is accomplished in one cylinder having a high and a low pressure bore and a trunk piston of the proper diameters. The cylinder is single-acting. The bed is of the vertical inclosed type and rests directly on the foundation without a sub-base. One of the special features is the easy accessibility of all parts for inspection. The power and the compressing cylinders are located at right angles, an arrangement which is said to give the same smooth operation as that found in a duplex machine.

Automatic Fire-Retarding Damper.—An improved type of automatic fire-retarding damper has been recently placed on the market by The Pullman Automatic Ventilator Mfg. Company, York, Pa. This damper is designed to be used in connection with the company's Pullman ventilating cowl and is kept open by a fusible link, but as soon as sufficient heat is generated this link melts and permits the damper to drop across the pipe, thus cutting off the draft.

New Oil Engine.—A new vertical multiple-cylinder type of engine employing distillate, domestic fuel oil and solar or gas oil as fuel has been developed by the Sheffield Gas Power Company, Eleventh street and Winchester avenue, Kansas City, Mo. Although burning all three types of fuel, the engine was especially designed for handling gas oil, having a specific gravity of about 39 deg. Baume. This oil is practically unsalable on account of the enormous demand for gasoline and as a result the price is low. The heavier products are removed from the oil, which makes it possible to burn it in the cylinder of an engine and secure perfect combustion without fouling the combustion chamber. The fuel consumption per brake horsepower hour is approximately ½ gal. and it is claimed that with a 50-hp. engine it is possible to develop power cheaper than with a Corliss engine of five times that capacity operated condensing. The cost of these new engines is said to be only slightly greater than those employing natural gas as fuel.

Crank Shaper.—The Ohio Machine Tool Company, Kenton, Ohio, has recently brought out a line of single and back geared crank shapers with strokes ranging from 16 to 24 in. Pan construction is employed for the base. The table is adjustable in the vertical plane so that shafts having a maximum diameter of 2¾ in. can be passed under the ram for keyseating. Eight speed changes for the ram, ranging from 16 to 70 strokes per minute, are available on the 18-in. single geared shaper, the limits being 7 and 115 strokes for the back geared tool of the same size, and this number of variations is doubled by using double-speed countershafts. All adjustments of the ram and the length of the stroke can be made from the working side of the shaper while it is in motion.

New Offset Side Tool.—An offset side tool designed for allowing close working to the shoulder of the tool or to the chuck on a lathe and embodying features peculiar to others of the Red E tools recently described in these columns has been brought out by the Ready Tool Company, Bridgeport, Conn. It is difficult to describe the tool without an illustration and it is probable that a sample may be obtained for the asking. The shank has a special end which admits the use of flat steel such as ⅝ x ⅜ in. or ⅞ x 3/16 in. The flat steel fits into a slot designed in relation to its position in the tool to transmit the pressure through the tool shank. At the same time it allows for the sharpening of the tool by treatment of one face only, obtaining automatically the clearance at both side and front desired in securing maximum output from metal cutting tools. Emphasis is placed on the rigidity obtained with the tool. Thinner flat steel for the cutting material may be used, an adjusting screw being provided to this end.

The New York Electric Tool Company, manufacturer of Carver electric tools, has removed its main office from its former location at 136 Liberty street, New York City, to West Newton, Mass. Allen F. Carver, the designer of the company's line of electric tools, will continue his relations with the company. The business and financial management of the company has been assumed by new interests. The president is now George P. Bullard, president of the Eastern Expanded Metal Company and president of the United States Electric Signal Company, and the treasurer is Roland F. Gammons 2d, treasurer of the West Newton Savings Bank and treasurer of the United States Electric Signal Company. The New York Electric Tool Company announces that hereafter it will be managed in an energetic and progressive manner; its manufacturing facilities will be of the most modern character, and its financial resources of sufficient strength to guarantee the fulfilment of its contracts and to provide for the advancement of its business along progressive lines.

The Triumph Electric Company, Cincinnati, Ohio, reports a rapidly increasing export business. Last week a carload of equipment, including several large generators and motors, was shipped to Pekin, China. Inquiries and orders have been received from India, Cuba and New Zealand. The company also reports a large volume of business in the past six months, the sales aggregating more than 50 per cent. over the previous 10 years average.

The Brown Hoisting Machinery Company, Cleveland, Ohio, announces the opening of its San Francisco office, in the Monadnock Building, with J. P. Case as manager. A. W. Merryweather is manager of its Chicago office.

Current Metal Prices.

The following quotations are for small lots, New York. Wholesale prices, at which large lots usually can be bought, are given elsewhere in our weekly market report

IRON AND STEEL—

Bar Iron from Store—

Refined iron
1 to 1½ in. round and square ... ₤ lb 1.70¢
1¼ to 1½ in. x ¾ to 4 in. ... ₤ lb 1.70¢
1½ to 4 in. x ¼ to 6½ in. ... ₤ lb 1.80¢
Rods—¼ and 11-16 in. and square ... ₤ lb 1.80¢
Angles, Cts. ₤ lb.
3 in. x ¼ in. and larger ... 1.80¢
3 in. x 5/16 in. and ⅜ in. ... 2.00¢
3 in. x 7/16 in. and ½ in. ... 1.90¢
1¼ to 2 in. x ⅝ in. and thicker ... 1.85¢
1 to 1½ in. x ⅜ in. ... 1.95¢
1 to 1½ in. x ⅛ in. ... 2.00¢
⅞ in. x ⅛ in. ... 2.10¢
⅞ in. x ¼ in. ... 2.10¢
⅞ in. x ⅜ in. ... 3.35¢
⅞ in. x ½ in. ... 4.40¢
Tees,
1 in. ... 2.25¢
1¼ in. ... 2.10¢
1½ to 2 in. ... 1.90¢
1½ to 2½ in. x ⅜ in. ... 2.00
3 in. and larger ... 1.85¢
Beams ... 1.80¢
Channels, 3 in. and larger ... 1.80¢
Bands, 11 to 4 in. No. 8 ... 2.00¢
Burden's H. B. S. iron, base price ... 2.25¢
Clinton's best iron, base price ... 3.15¢
Norway bars ... 3.60¢

Merchant Steel from Store—

per lb.
Bessemer machinery ... 1.70¢
Tire steel, 1 in. and 5 in. base ... 2.50@3.00¢
Best cast steel, base price in small lots ... 7¢

Sheets from Store—

Black	One pass, C. R. Soft steel.	R. G. annealed.
No. 16	₤ lb 2.15¢	2.75¢
Nos. 18 to 20	₤ lb 2.50¢	3.25¢
Nos. 22 and 24	₤ lb 2.55¢	3.35¢
No. 26	₤ lb 2.60¢	3.05¢
No. 28	₤ lb 2.95¢	3.50¢

Russia, Planished, &c.

Genuine Russia, according to assortment ... ₤ lb 12 @14½
Patent planished, W. Dewees Wood ... ₤ lb A, 10¢; B, 9¢ net

Galvanized

Nos. 12 and 14 ... ₤ lb 2.75¢
No. 24 ... ₤ lb 3.10¢
No. 26 ... ₤ lb 3.30¢
No. 28 ... ₤ lb 3.60¢
No. 20 and 22 either 26 inches wide, 25¢ higher.

Genuine Iron Sheets—

Galvanized

Nos. 22 and 24 ... ₤ lb 5.50¢
No. 26 ... ₤ lb 6.00¢
No. 28 ... ₤ lb 7.00¢

Corrugated Roofing—

2½ in. corrugation	Painted.	Galvd.
No. 24	₤ 100 sq. ft. $3.75	$4.70
No. 26	₤ 100 sq. ft. 3.85	5.00
No. 28	₤ 100 sq. ft. 2.50	3.65

Tin Plates—

American Charcoal Plates (per box)

"A.A.A." coated:
IC, 14 x 20 ... $6.65
IX, 14 x 20 ... 7.90
A charcoal:
IC, 14 x 20 ... $5.60
IX, 14 x 20 ... 6.80

American Coke Plates—Bessemer—
IC, 14 x 20 ... 107 lb. ... $4.50
IX, 14 x 20 ... 5.50

American Terne Plates—
IC, 20 x 28 with an 8 lb. coating ... $8.70
IX, 20 x 28 with an 8 lb. coating ... 10.70

Seamless Brass Tubes—
List November 15, 1908. Base price, 18¢

Brass Tubes, Iron Pipe Sizes—
List November 15, 1908. Base price, 18¢

Copper Tubes—
List November 15, 1908. Base price, 21¢

Brazed Brass Tubes—
List February 1, 1911. 19½¢ ₤ lb

High Brass Rods—
List February 1, 1911. 14½¢ ₤ lb

Roll and Sheet Brass—
List February 1, 1911. 14½¢ ₤ lb

Brass Wire—
List February 1, 1911. 14½¢ ₤ lb

Copper Wire—
Base price. Carload lots mill 13½¢

Copper Sheets—

Sheet copper hot rolled, 16 oz. (quantity lots) ... ₤ lb 17¢
Sheet copper cold rolled, 1¢ ₤ lb advance over hot rolled
Sheet copper polished 20 in. wide and under, 1¢ ₤ square foot.
Sheet copper polished over 20 in. wide, 2¢ ₤ square foot.
Planished copper, 1¢ ₤ square foot more than polished

METALS—

Tin—

Straits pig ... ₤ lb 44 @45 ¢

Copper—

Lake ingot ... ₤ lb 14 @14¼¢
Electrolytic ... ₤ lb 13¾@14 ¢
Casting ... ₤ lb 13¾@14 ¢

Spelter—

Western ... ₤ lb 6¾@7 ¢

Zinc—

No. 9, base, casks ... ₤ lb 8½¢ Open ... ₤ lb 9¢

Lead—

American pig ... ₤ lb 5 @5¼¢
Bar ... ₤ lb 6⅜@6½¢

Solder—

½ & ½, guaranteed ... ₤ lb 25½@26¢
No. 1 ... ₤ lb 27½@28¢
Refined ... ₤ lb 22½@23¢
Prices of solder indicated by private brand vary according to composition.

Antimony—

Cookson ... ₤ lb. @10¾¢
Hallets ... @10 ¢
Other brands ... 9@9½¢

Bismuth—

Per lb $2.00@$2.25

Aluminum—

No. 1 aluminum (guaranteed over 99% pure), in ingots for remelting ... 21¢ and 22¢
Rods and Wire ... Base price 31¢
Sheets ... Base price 33¢

Old Metals—

Dealers' Purchasing Prices Paid in New York.

	Cents.
Copper, heavy and crucible	10.50 to 10.75
Copper, heavy and wire	10.25 to 10.50
Copper, light and bottoms	9.25 to 9.50
Brass, heavy	7.00 to 7.25
Brass, light	5.50 to 5.75
Heavy machine composition	9.00 to 9.25
Clean brass turnings	6.75 to 7.00
Composition turnings	7.50 to 7.75
Lead, heavy	3.75
Lead, tea	3.50
Zinc, scrap	4.00



NICHOLSON

Granted that just ONE mechanic in your shop can save from ten to twenty minutes time per day through the use of NICHOLSON FILES—how great will be the saving when from fifty to one hundred or more men "get busy" with the fast cutting

NICHOLSON?

NICHOLSON U.S.A.



Nicholson File Company
Providence, R. I.

THE IRON AGE

Established 1855 — New York, October 26, 1911 — Vol. 88: No. 17

Published Every Thursday by the
DAVID WILLIAMS COMPANY
239 West 39th Street, New York

Entered at the New York Post Office as Second-Class Mail Matter.

Subscription Price, United States and Mexico, $5.00 per Annum; to Canada, $7.50 per Annum; to Other Foreign Countries, $10.00 per Annum. Unless receipt is requested, none will be sent. Credit for payment will be shown by extending the date on the wrapper of your paper.

W. H. Taylor, - - - - - - President and Treasurer
I. A. Mekeel, - - - - - - - First Vice-President
Harold S. Buttenheim, - - - - Second Vice-President and Secretary

Geo. W. Cope, - - - - }
A. I. Findley, - - - - } Editors
W. W. Macon, - - - - }

M. C. Robbins, - - - - Manager
Charles S. Baur, - - - Assistant Manager

Branch Offices

Philadelphia, Real Estate Trust Building
Pittsburgh, Park Building
Boston, Compton Building
Chicago, Fisher Building
Cleveland, American Trust Building
Cincinnati, 807 Andrews Building

CONTENTS.

Iron Ore Readjustments 883
The Cancellation of the Hill Ore Lease 884
The Bonus System Man and His Foreman 885
Excluding Private Liability Insurance 885
September's Record Merchandise Exports 885
Correspondence 886
Reaction from High-Voltage Apparatus 886
Cincinnati Meeting for Promotion of Industrial Education 887
Imports of Swedish Iron Ore 887
Alloys for Steel 887
A Record at a Crane Furnace 887
The Iron and Metal Markets 888
Pittsburgh Foundrymen's Association 898
All-Steel Passenger Cars 898
Machinists' Strike Benefits 898
Personal 899
Obituary 899
The Connellsville Coke Trade 900
To Discuss Relation of Government to Business 900
To Cancel the Hill Ore Lease 901
Railroad Equipment Orders 901
Uses of Blast Furnace Gas 902
Views on Titanium in Iron and Steel 903
Locomotives to Tow Ships Through Panama Canal 903
Ingot Molds of Steel 904
French Iron Ore Production in 1910 904
International Congress on Chemistry in 1912 904
Pittsburgh and Vicinity Industrial Notes 905
Foundry of Tractor Works at La Porte 906
Suit Over a Southern Iron Company Promotion 911
A Mechanically Operated Foundry 913
Motor Driving for Planers 914
The Steel Corporation's Labor Investigation 914
The Washburn Multiple Spindle Drill 915
The International Motor Company 915
New Prentice Radial Drill 916
The Reading Iron Company's Improvements 917
New Allen Riveter Hammer 917
Lubrication of Queen City Shaper 918
St. Louis Blast Furnace Company Litigation 918
Schieren Belting at the Turin Exposition 918
High Pressure Gas Distribution 919
Test of Pulleys 920
The Dreses 6-Ft. Radial Drill 920
Railroad Appliance Exhibition 921
The Machinery Markets 922
Trade Publications 931

Iron Ore Readjustments

Buyers Would Measure Their Effect

A Reduction in Wire Products—Pig Iron Weaker—Advances in Metals

Changes in the market position have been of less importance in the past week than the announcements concerning lower iron ore freights on Minnesota roads and the decision of the Steel Corporation to terminate its lease of the Great Northern ore lands. The whole trade is deeply interested in this latter move, which is taken to mean a reaction from high royalties on Lake ores and in time an adjustment of ore prices to open market conditions in finished steel.

Already there is an attempt to gauge the effect of lower ore freights on the pig iron market for next year. A reduction in ore for 1912 has been looked for, as the $3.50 and $3.70 bases for non-Bessemer ores for this year's delivery have not been maintained, and the 20 cents now taken from Mesaba range freights begets new expectations. Pig iron buyers have been prompt to canvass the effect of the changes on the price of their iron—even that made from this season's ores.

The tendency may be to exaggerate the immediate cheapening effect of the action on the Hill ore lease, as it is yet to run for three years, during which the Steel Corporation must take out nearly 20,000,000 tons to meet contract and accumulated minimum requirements.

Some cross currents are noticed in business in finished material. Pittsburgh reports that the very low prices of the past fortnight are stimulating new demand to a considerable extent. At Chicago, on the other hand, it is noticed that specifications show some falling off. In general the scale of mill operations is still large. At Sparrows Point, Md., however, the steel plant is closed down awaiting rail orders.

The downward tendency of prices has not been arrested, but buyers are trying to buy for longer periods—an effort to which a few manufacturers are responding more willingly than others.

The chief reduction of the week has been in wire products, sales to jobbers having been made at $1.60 for wire nails and at $1.40 for plain wire. A more aggressive attitude has recently been taken by one or two interests. Present prices are at the low level of early May, 1909, from which there was an advance of $2 a ton on May 15 of that year.

Some buying of tin plates is reported on the new $3.40 basis, but large contracts for next year are yet to be placed. Meantime old contracts are being readjusted to the $3.40 level. Sheet mills are less willing to sell ahead at to-day's low level, which can-

not long be maintained without eliminating some producers from the race.

The markets for structural material and plates show some irregularities, and some buyers have not been able to obtain the lowest prices recently made on large orders. In bars, this feature is particularly noticeable, much of the current business of the mills being taken at 1.15c., Pittsburgh.

About 75,000 tons of structural steel will be required for the work now pending in the East. The Madison Square Garden contract for 22,000 tons is now expected within a month, and the Philadelphia Auditorium, 12,000 tons, is about to be placed.

In northern Ohio a sale of 8000 tons of open hearth billets was made at a price equivalent to less than $19 at Youngstown.

In several directions pig iron is weaker. In the East the fact that melters are calling for more iron than furnaces can ship has had no effect upon prices for forward deliveries. Sales are made in all districts for delivery over the first half of 1912 on to-day's basis. In the Buffalo and Chicago districts sharper competition has appeared in the past week. Buying for next year is being postponed in an almost unprecedented way. Prices are admittedly unprofitable, but consumers wait to see what further revisions of furnace costs are ahead.

The copper market has been active with some irregularity in prices. The leading seller is holding electrolytic at 12.50c., representing a slight advance for the week, though it is believed this price can be shaded. Tin and spelter are also higher, and for the time being the principal non-ferrous metals have parted company with iron and steel products. So far as copper is concerned, conditions of supply and demand are no more favorable to advancing prices than in the steel industry.

The Cancellation of the Hill Ore Lease

The official announcement that the United States Steel Corporation had leased the Great Northern Railway iron ore lands in Minnesota was made in the second week in October, 1906. Last week, just five years later, the unofficial yet evidently authorized announcement was made that the Steel Corporation would give the required two years' notice for the cancellation of the lease on January 1, 1915. With the stipulations of this remarkable lease, which fills a printed volume of 1000 pages, readers of *The Iron Age* became fully acquainted through the comprehensive article in our issue of last week. Of the reasons for the abrogation of the agreement much has been written. The Commissioner of Corporations has said in his report that so far as the Steel Corporation has a monopolistic position in the steel industry it rests chiefly on iron ore, and that "its position in the iron ore industry, while by no means constituting a monopoly, is clearly indicative of a monopolistic influence." This main conclusion of Commissioner Knox's 400-page report, taken in connection with the Supreme Court's anti-trust decisions, pointed to one act by which more than by any other the corporation could forestall a possible action under the Sherman law. So ran one interpretation of the decision to cancel. Another, based more on the accumulating disadvantages of the Great Northern lease, from the corporation's standpoint, and on the iron trade's rapid recovery from the scare over iron ore exhaustion, saw in the decision a wise withdrawal from a burdensome contract.

Events to which attention has been called from time to time have shown to how great an extent the Great Northern Railway was able to capitalize in 1906 the iron trade's exaggerated idea of a coming scarcity of ore. The great additions made to the Lake Superior ore reserves in the past five years, the remarkable Mayari and Moa discoveries in Cuba, the better-known possibilities of Brazilian and other South American deposits, the vast resources of Newfoundland and the energetic development of nearby as well as foreign sources of supply for the Eastern iron and steel industry—all have had their share in modifying the notion that the American steel trade had entered permanently upon an era of steadily advancing royalties for iron ore.

As was pointed out when it was put through, the "Hill ore deal" was made possible by the existence of a great consolidation in the steel trade. With the Great Northern ores in other hands the Steel Corporation's position might one day be disputed; if they were held without development they might become the basis of strong new competition. A royalty of 85 cents a ton in 1906, increasing by 4 per cent. a year, as against an average royalty of 25 cents on the Mesaba leases made in 1902 and of 25.3 cents on the Mesaba leases of 1903, indicated strongly the added value given to these Hill ore lands by the fact that the buyer could get all of them in one block. It was also a matter of comment five years ago that the Steel Corporation was the only possible buyer having sufficient low cost ores to allow it to take on such a large tonnage at the highest record price. The theory was that the corporation's total ore consumption would increase to such an extent that even at the maximum of 8,250,000 tons of Hill ores it would have, say, three times as much of its original cheap ores and thus pull down the average cost. But the progressive rate of increase indicated by the charts has not been realized. Against 20,885,000 tons in 1906, the Steel Corporation's Lake Superior ore shipments for 1911 will be between 19,000,000 and 20,000,000 tons, while the high point in the six years was 23,148,000 tons in 1907. It has turned out thus far that the Hill lease has added a relatively large annual tonnage to the vast minimum requirements on which the corporation must pay royalties.

Another difficulty grew out of the stipulation that the Great Northern road haul all the ore from the Hill mines. The most profitable of the Steel Corporation's Minnesota ore roads has this year been handling less than 40 per cent. of its business of 1910, and much of the loss is due to the Great Northern lease. The reduction to 60 cents in the ore rate of these roads, while it cuts directly into their revenue, has no effect on the amount paid under the lease, as any reduction in the freight increases the royalty by that much. As was pointed out in the article of last week, an ultimate reduction from 80 cents to 50 cents in the freight rate would add 30 cents to the ore royalty which, under the lease, would be $2.467 in 1946, or more than $5 to the ton of steel made from this ore!

As the Great Northern lease, with its engrossment of a block of 300,000,000 to 500,000,000 tons of ore, brought Lake ore royalties to a new high basis at one bound, its abrogation will naturally bring some revision of values. The view has been expressed in

these columns on other occasions that the problem of the American iron masters of the next generation would be not so much ore exhaustion as the high valuations of iron ore property established in recent years, with their heavy load of carrying charges and interest which must all enter into steel-making cost. The decision of the Steel Corporation to end the Great Northern arrangement, whatever the preponderating reason, is a step of great significance. It means the establishment of healthier conditions in the basic industry. It means that the domestic steel trade is not to be hampered in its development by unduly high cost of raw materials, and that our foreign trade in steel can expand without the necessity of making wide differentials between the domestic and export prices. For the moment the effect of the 25 per cent. reduction in the ore freight rate on Mesaba range roads may be given first importance—and it is immediately important in its bearing on pig iron costs for next year, while the effect of the decision as to the lease will be felt more slowly. Coming in the same week, these two developments are little short of epochal. In view of the various factors now working toward price readjustments in iron and steel and other commodities, the disappearance of an excessive valuation on ore can only be regarded as salutary.

The Bonus System Man and His Foreman

At the recent meeting of the National Machine Tool Builders' Association the question was raised as to the position of the owner where the earnings of a workman exceed those of his foreman and the latter protests. These cases are common enough. When a premium is placed on the average man's labor and he strives to the utmost to extend his earning power, his income mounts up rapidly, as experience has shown. The employer can afford to pay the higher wage, under the accepted rule that no change in the agreed rate shall be made unless equipment be improved, because he shares with the man the profits of larger and cheaper production. Where a foreman depends upon a stated wage, having no share in the premium, he is likely to be passed in the race for financial returns by those whose work he directs. This is always the case where wages are based on production. The same problem, formerly in an aggravated form, has come up in steel mills, where wages are founded upon tonnage. Expert labor, producing that upon which profits are made, must often earn more than those who direct it.

A characteristic reply to the complaint of a foreman that one of his men is earning largely in excess of his own pay, is to offer him the man's work. In a case cited at the meeting a foreman took exception to the fact that a scraper hand who had been placed on a premium basis had by hard and more intelligent effort acquired a relatively large weekly income, well in excess of the foreman's. The complaint was not in the spirit of begrudging the workman's success, but in the belief that the relative positions of the two as to authority should be carried out in the matter of wages. The owner promptly offered the foreman the job of scraping, which is no sinecure. The proposition was not accepted.

The real solution is to extend the system to include the foremen in the earnings of premiums. A bonus is placed on the production of the department, or of the individual men of the department, always taking as a basis the average of previous production. In one unique instance the foremen were given a certain number of cents per hour of time saved by each workman, but they also were penalized so much per hour for each hour lost from the basis. While a premium system is complicated by its application beyond actual productive labor, the result of extending it to foremen has been satisfactory, according to the general report of those who have tried it.

Excluding Private Liability Insurance

Massachusetts, in its recently enacted workmen's compensation law, created an anomalous condition as to insurance against accidents to workmen. As the statute stands the Massachusetts Employees' Insurance Association is created, to be started under the direction of a board of 15 members, to be appointed for one year by the Governor, their successors to be elected by the subscribers, who are the employers. An amendment provides that the liability insurance companies "shall have the same right as the association to insure the liability to pay compensation provided for by the act, and a policy holder of such company shall be regarded as a subscriber." On the other hand, the act legislates out of business the private liability insurance systems which have been established by some of the large industrial companies.

The reason given for this discrimination is that it serves to protect the small employers, because it compels owners of large works to join with them in the Massachusetts Association. But as the bars were let down for the liability insurance companies it would appear to be an injustice to discriminate against the owners. In most cases their own systems of compensation and insurance are more liberal to the workmen than those provided by the compensation laws of the various States, including Massachusetts. The law exempts the employer from the payment of damages for the first 14 days of idleness on the part of the victim. A common limit set by owners is 10 days. The amount of compensation is certainly as liberal and the money is distributed as wisely. But so far as the insurance feature is concerned all Massachusetts employers who wish to be insured must either become subscribers of the State Association or go in with the liability companies. It would be presumed that the next Legislature will see the wisdom of a fairer attitude toward the large industries.

September's Record Merchandise Exports

September made a record for that month in the volume of exports of merchandise from the United States. The Bureau of Statistics of the Department of Commerce and Labor reports the total value of such exports at $195,771,502, which is almost $30,000,000 higher than the exports of September, 1910, and very much greater than the exports in the corresponding months of previous years. The excess of exports over imports for the month was $70,613,394, although the imports kept up exceedingly well, having been slightly less than for August, but considerably in excess of those for September of any previous year. This highly favorable condition of our foreign trade is one of the bright spots of the present business situation. We are this year loaning a great deal of money to Europe, which is a striking change from our usual experience at this season, when the moving of the crops severely taxes our financial resources.

Correspondence

A Works Chemist's Protest Against Paternalism

To the Editor:—Probably in no other profession in the world is there so much incompetence as in that of iron and steel works chemistry. Cases are common of young men as absolutely ignorant of chemistry as an Italian laborer working in a ditch, and not in the least knowing what they are doing in making an analysis, who nevertheless ask for and get analytical positions at iron and steel works on equal terms with regard to salary with the college graduate in chemistry after his four years' expensive course in general science, engineering and chemistry. This is obviously a wrong condition of affairs and to devise ways of meeting it and correcting it will be the aim of the American Chemical Society at its next winter's meeting.

One of the ways proposed will be to resort to State regulation of the same sort as is now in force in the professions of law and medicine. But the advocates of this system ignore or overlook an important point that it is one of the aims of this communication to bring up. That point is that our colleges in training their men for analytical positions by teaching them general science and engineering—almost everything in fact, except analytical chemistry—this last being thrown in merely as one would sugar a pie, or season a pepperpot, are perpetrating a mild sort of a swindle upon their customers, the works (if the works really want analysts and not engineers in disguise), and that therefore if inadequately prepared analysts are legally debarred from practice it will not only bar out the home-made chemists of the works, but also the young college graduate in "chemistry." For the latter, though far better than the former, still cannot by any stretch of the imagination be considered adequately prepared in analytical chemistry. As a general scientist full of the promise of future great things in some particular line of engineering effort, he is entitled to be considered with the most profound respect. But as an analytical chemist he is at graduation obviously nothing more nor less than a somewhat mitigated humbug.

Imagine the same system of preparation and performance in vogue in other professions. Suppose a doctor, whose college training has been mostly engineering, whose after-study has been almost entirely engineering, and whose highest ambition is to get from the practice of medicine to that of engineering at the very first opportunity!

A FOUR YEARS' COURSE, EXCLUSIVELY CHEMICAL

Your correspondent's four years' college course was almost exclusively chemical, at a greater money cost than that of a regular course, and at the sacrifice of a degree, no degrees being given for special self-selected courses. At the end of his junior year he refused a position as furnace analyst. At the beginning of his senior year he declined another, as works analyst (positions were plentiful in those good old days). Toward the close of his first term senior he did accept one, but resolutely stood his employers off for six months, until he had finished his self-appointed analytical course. But in all this he wishes to confess he was impelled by nothing heroic. On the contrary, his guiding motive was pure cowardice. He feared to face his future employer poorly prepared (but had no fear, on the other hand of missing his degree in the regular course, his grades ranging from 95 to 97, and no conditions against him when he changed to special in his sophomore year); and the young chemical engineer taking up with easy assurance his more or less strange and unfamiliar analytical duties at the works has always been to him an awe-compelling spectacle. Now he has the effrontery to believe that for an analyst with no ulterior engineering aims the training he mapped out for himself was far better than that mapped out for him by his college, and he has always hoped that the four years' exclusive chemical course that he was compelled to sacrifice a degree for would eventually be supplied by our colleges without such a sacrifice. But although over a quarter of a century's fruitless waiting has dimmed this hope, never very bright, yet he must still insist as earnestly as ever that no analyst should attempt to practice without a preliminary four years' college course, exclusively chemical.

GOVERNMENT SUPERVISION NOT WANTED.

Now, then, believing this, should he agitate for the legal requirement of such a course? Heaven forbid! The employer has a right to get his analytical work done by any one—a coal heaver, if he wishes to do so; and the principal relief that your correspondent experiences in writing this letter is the relief it affords him to protest against the silly and vicious spirit of paternalism everywhere rampant in this land of the free.

The State has the right (it is its business, in fact) to brand the incompetent analyst as such, but has no right to say that the individual may not, nevertheless, employ him if he wishes to do so. This unceasing warfare against individualism everywhere and at all times in evidence is excusable in the ignorant and the unthinking, and we must expect it; but we find the educated even more inclined than the ignorant to fall in with the miserable instinct always manifest in a majority to decide for the individual what the individual should be permitted to decide for himself, and the petty disposition to deny to others the cakes and ale it does not care for itself.

In the great (small, in a sense) local option wave, for instance, what chemist has not manfully voted his conviction that the individual cannot be trusted to decide for himself whether or not a glass of beer is good for him (although if the State interfered with his two cups of black coffee for breakfast every morning he would consider it a singularly impertinent and outrageous performance). Or, in the great pure food crusade, what chemist is satisfied with Dr. Wiley's magnificent and legitimate accomplishments as they stand, and would not vote, if he had the chance, to go further and prohibit the cheap or unscrupulous dealer instead of merely showing him up? Ignoring the sacred right of the individual under the constitution to make an ass of himself in any way that he sees fit (provided he does not hurt others), and eat benzoate of soda whenever and how he likes; overlooking also the obvious fact that if a man cannot afford the pure article (as may well happen these days of heavy costs and light business), it is for him and not for the State to decide whether or not he shall take his chances with the benzoated one. Undoubtedly a market entirely bare of "bum" chemists, benzoated food products and the like would be a grand good thing; but freedom is a still better thing—not the freedom to deceive, rob and cheat; and herein, and herein only, lie the State's opportunity and its duty. It is its duty not only to safeguard the individual but his rights and freedom as well, and the prohibitionists and paternalists of all shades and classes are seeking to get the government to a certain extent do the very thing it was instituted to prevent.

When the paternalistic instinct manifests itself as in the foregoing illustrations, it is merely silly and perhaps annoying; but when it goes to the length of curbing trade and crippling business, fixing rates and prohibiting large partnerships, it becomes dangerous and vicious.

Tacony, Philadelphia, October 20, 1911.

GEORGE AUCHY.

Reaction from High-Voltage Apparatus

To the Editor:—While there is an increasing tendency to transmit electric energy in the form of alternating current at higher and higher potential, even for short distances, as witnessed by the 100,000-volt systems recently constructed, a reaction has set in concerning the generation and application of current at high voltages. For a considerable period the talk was all of the economy in first cost, operation and maintenance to be effected by eliminating transformers; and operating engineers who expressed doubts were dubbed "unprogressive" by the superintendents or managers over them. Of late, however, manufacturers of electrical equipment have been led by the accumulating business of their "trouble" departments to withdraw the earlier recommendations of high-voltage windings above, say, 6600 volts for high-speed generators of large capacity and 2300 volts for the smaller sizes, and they are devoting a larger share of attention to securing good efficiency in transformers at lower cost. Similarly the tendency to transmit current from the generator terminals directly to motors at 2200 to 2300 volts is un-

dergoing considerable restriction, particularly where the machines are operated under conditions unfavorable to the insulation, as in damp or humid places. For such service conservative engineers and managers are now making 440 volts the maximum. The determining element will frequently be the effect of a possible breakdown. Where interruption to the service means appreciable loss, even one such instance may much more than offset any possible saving from non-use of transformers and other auxiliary apparatus. ENGINEER.

Cincinnati Meeting for Promotion of Industrial Education

The fifth annual convention of the National Society for the Promotion of Industrial Education will be held in Cincinnati, Ohio, November 2, 3 and 4. Fred A. Geier, president of the Cincinnati Milling Machine Company, and vice-president of the society, together with J. Henry Cone, its secretary, and J. M. Manley, local secretary of the National Metal Trades Association, have arranged an elaborate programme. Letters received from manufacturers, educators and others indicate that the attendance will be larger if anything than at any previous meeting. Cincinnati's different educational institutions will be visited, as well as a number of the leading manufacturing establishments. The programme is as follows:

Cincinnati's Experience in Industrial Education: Thursday, November 2, 2.30 P. M. Co-operative Plan of the University of Cincinnati, by Prof. Herman Schneider, dean, College of Engineering, University of Cincinnati. Vocational Plans in the High School, by Pliny A. Johnston, principal, Woodward High School, Cincinnati. Part Time School for Apprentices, by J. Howard Renshaw, principal, Continuation School, Cincinnati. The Ohio Mechanics' Institute, by John L. Shearer, president, Ohio Mechanics Institute, Cincinnati.

Public Banquet, Hotel Sinton, November 2, 6.30 P. M. How Shall the Obligation to Provide Industrial Education be Met.

What Types of Continuation Schools Are Most Needed in American Conditions. November 3, 9.30 A. M. Chairman, Carroll G. Pearse, superintendent of schools, Milwaukee, Wis. Evening Schools, by Arthur L. Williston, principal, Wentworth Institute, Boston, Mass. Part Time Schools, by Charles McCarthy, former secretary of the Industrial Education Commission of Wisconsin. Summation of discussion by George N. Carman, director, Lewis Institute, Chicago, Ill. Report of Committee on National Legislation, by David Snedden, commissioner of education, Massachusetts.

What Can Be Done for the Factory Worker Through Industrial Education, November 3, 2.30 P. M. Chairman, John Golden, general president, United Textile Workers of America. Charles A. Prosser, deputy commissioner of Education, Massachusetts. Henry Suzzallo, professor of education, Teachers' College, New York.

Industrial Education Necessary to the Economic Development of the United States, November 3, 8 P. M. Chairman, Fred A. Geier, vice-president, National Society for the Promotion of Industrial Education. Ferdinand C. Schwedtman, president, Citizen's Industrial Association, St. Louis, Mo. Edwin G. Cooley, former superintendent of schools, Chicago. H. E. Miles, president, Racine-Sattley Company, and chairman, Industrial Education Committee, N. A. M., Racine, Wis.

Should Trade Schools for Youths Above Sixteen Years of Age be Provided at Public Expense, November 4, 9.30 A. M. Chairman, James P. Munroe, president, National Society for Promotion of Industrial Education, Boston. Charles A. Bookwalter, president of trustees, National Trades School, Indianapolis, Ind. Carroll G. Pearse, superintendent of schools, Milwaukee, Wis. George M. Forbes, president, Board of Education, Rochester, N. Y. Howell Cheney, Cheney Brothers, South Manchester, Conn. Charles H. Winslow, special agent, Bureau of Labor, Washington, D. C. Annual Business Meeting of the Society. Reports of Secretary, Treasurer and Committees. Election of Officers, Resolutions and General Business.

Imports of Swedish Iron Ore

Fully 500,000 Tons to Go to Eastern Furnaces in 1912

PHILADELPHIA, October 23, 1911.—The Swedish ore trade in this country, while of but a few years' growth, has reached large proportions. The regular European markets for the high grade Kiirunivara and Gellivara ores of Sweden, which are mined about 150 miles above the Arctic Circle, have not been neglected, but the development of these properties has gone forward so rapidly that shipments to Philadelphia for distribution to eastern Pennsylvania furnaces will reach fully 500,000 tons next year and will continue to grow, as these ores have been found to work exceedingly well with the other ores used by blast furnaces in that district. Development work at the mines is going forward rapidly and the ore body proved up at the Kiirunivara mine runs up into hundreds of millions of tons, while almost unlimited undeveloped deposits are right at hand.

At the present time the Swedish ore coming to the eastern Pennsylvania territory is within the 0.35 per cent. phosphorus limit, although ores with higher phosphorus content are occasionally purchased. As a rule, however, the actual phosphorus content runs well under the limit, frequently averaging from 0.14 to 0.18 per cent., with a metallic iron content of 67 to 68 per cent. The Bethlehem Steel Company has contracted for 3,000,000 tons of this ore on which deliveries will extend over a period of nine years, the rate of shipment increasing steadily for several years and then being maintained on an even basis during the latter portion of the contract. While a long time contract of this character is deemed desirable by interests consuming their own pig iron, purchases by merchant furnaces have been limited as a rule to their yearly requirements.

The principal difficulty experienced by importers of Swedish as well as other foreign ores is in transportation. The absence of regular return cargoes keeps ocean freights well up and at times they become almost prohibitory, confining shipments largely to producers' own vessels. Last year, ore freights from the Mediterranean to Philadelphia were around $2 early in the season, whereas $1.50 had been done in some years. Later in 1910 charters were made above $2.25, or at 9s 6d., while a good deal of chartering was at 10s. 6d. Efforts are being made to overcome this unfavorable condition in freights and it is the hope of those interested that ultimately they may be able to introduce American bituminous coal into the Swedish and Norwegian markets and thus provide return freights, aggregating 200,000 tons a year, for vessels engaged in the Swedish ore trade. The development of such a trade would be slow, however, as the use of English coal is pretty well established.

Business in Swedish ores for 1912 shipment is thus far limited practically to the contract with the Bethlehem Company and another of several hundred thousand tons, covering shipments to run over several years. A number of the eastern furnaces have not used all the ore bought for this year's delivery, owing to the unfavorable conditions in the iron market, and the consequent reduction in the productive rate. Under the circumstances deliveries in a number of instances have been deferred and current arrivals on order will enable a number of the users to get along without further heavy purchases, probably through the first quarter of next year. The bulk of the current orders for the Kiirunivara and Gellivara ores sold recently have been on the basis of 8 cents a unit, on dock at Philadelphia. Swedish ore from the former district is shipped by way of the port of Narvik, Norway, while from Gellivara shipments come by the way of Lulea, Sweden. At the latter port shipments are deferred during a portion of the winter season, while from Narvik navigation is some times delayed during December and January owing to the Arctic night and prevailing adverse winds.

Alloys for Steel.—In a pamphlet of 36 pages the Primos Chemical Company, Primos, Pa., gives with considerable fullness details concerning its alloys, particularly those of vanadium, tungsten and molybdenum. For some years the company manufactured ferrovanadium from foreign ores, but more recently it has had its own ore supply in the United States. Views are given of its mines and the surface works at Vanadium, Colorado. For twenty-three years the company has manufactured tungsten, and since 1898 from ores from its own mines in this country. Its capacity is 1000 tons of tungsten metal a year. A view is given of the company's tungsten mill at Lakewood, Colorado, having an annual capacity of 1800 tons of concentrates. The pamphlet deals also with ferromolybdenum, ferroboron, nickel, ferrochrome, titanium alloy, silicon, manganese, silicon copper, and Primos steel alloy.

A Record at a Crane Furnace.—No. 2 furnace of the Crane Iron Works of the Empire Steel & Iron Company at Catasauqua, Pa., Harry R. Hall, superintendent, made 1990 tons of iron last week, this being the largest week's record for any furnace in this group. The production of the original furnace No. 1 at Catasauqua in 1840 was 52 tons in its first week. In 1880 there were six Crane furnaces, but the plant consists of three at present, the No. 2 furnace producing as much iron as the total output of three furnaces in the eighteen eighties.

The fortnightly bulletin of the American Railway Association shows that on October 11 the net surplus of idle cars on the lines of the United States and Canada was 35,807, a reduction of 14,141 from the number reported September 27.

The Iron and Metal Markets

A Comparison of Prices

Advances Over the Previous Week in Heavy Type, Declines in Italics.

At date, one week, one month and one year previous.

	Oct. 25, 1911.	Oct. 18, 1911.	Sept. 27, 1911.	Oct. 26, 1910.
PIG IRON, Per Gross Ton:				
Foundry No. 2 standard, Philadelphia	$15.00	$15.00	$15.00	$15.75
Foundry No. 2, Valley furnace	*13.25*	13.50	13.25	14.00
Foundry No. 2, Southern, Cincinnati	13.25	13.25	13.25	14.25
Foundry No. 2, Birmingham, Ala.	10.00	10.00	10.00	11.00
Foundry No. 2, at furnace, Chicago*	*14.35*	14.50	14.50	16.00
Basic, delivered, eastern Pa.	14.50	14.50	14.50	15.00
Basic, Valley furnace	12.50	12.50	12.60	13.00
Bessemer, Pittsburgh	15.40	15.40	15.90	15.90
Gray forge, Pittsburgh	13.65	13.65	13.65	14.15
Lake Superior charcoal, Chicago	16.50	16.50	16.50	18.00
COKE, CONNELLSVILLE,				
Per Net Ton, at Oven:				
Furnace coke, prompt shipment	1.50	1.50	1.50	1.55
Furnace coke, future delivery	**1.55**	**1.55**	**1.60**	**1.70**
Foundry coke, prompt shipment	1.80	1.80	1.85	2.10
Foundry coke, future delivery	2.00	2.00	2.10	2.25
BILLETS, &c., Per Gross Ton:				
Bessemer billets, Pittsburgh	20.00	20.00	20.00	23.50
Open hearth billets, Pittsburgh	19.00	19.00	19.00	24.00
Forging billets, Pittsburgh	24.00	24.00	25.00	29.00
Open hearth billets, Philadelphia	21.40	21.40	22.40	26.00
Wire rods, Pittsburgh	26.00	26.00	26.00	28.50
OLD MATERAL, Per Gross Ton:				
Iron rails, Chicago	13.50	13.50	14.00	16.00
Iron rails, Philadelphia	*16.00*	16.50	17.00	18.00
Car wheels, Chicago*	12.50	12.50	12.75	14.00
Car wheels, Philadelphia	11.75	11.75	12.00	13.75
Heavy steel scrap, Pittsburgh	12.00	12.00	12.50	14.25
Heavy steel scrap, Chicago	*9.50*	9.75	10.00	12.25
Heavy steel scrap, Philadelphia	*11.75*	12.00	12.00	13.75
FINISHED IRON AND STEEL,				
Per Pound to Largest Buyers:	Cents.	Cents.	Cents.	Cents.
Bessemer rails, heavy, at mill	1.25	1.25	1.25	1.25
Iron bars, Philadelphia	*1.20*	1.22	1.22½	1.40
Iron bars, Pittsburgh	1.20	1.20	1.25	1.45
Iron bars, Chicago	*1.15*	1.17½	1.20	1.35
Steel bars, Pittsburgh	1.10	1.10	1.15	1.40
Steel bars, tidewater, New York	1.26	1.26	1.31	1.56
Tank plates, Pittsburgh	1.15	1.15	1.25	1.40
Tank plates, tidewater, New York	1.31	1.31	1.41	1.56
Beams, Pittsburgh	1.20	1.20	1.30	1.40
Beams, tidewater, New York	1.36	1.36	1.46	1.56
Angles, Pittsburgh	1.20	1.20	1.30	1.40
Angles, tidewater, New York	1.36	1.36	1.46	1.56
Skelp, grooved steel, Pittsburgh	1.15	1.15	1.15	1.30
Skelp, sheared steel, Pittsburgh	1.25	1.25	1.25	1.40
SHEETS, NAILS, AND WIRE,				
Per Pound to Largest Buyers:	Cents.	Cents.	Cents.	Cents.
Sheets, black, No. 28, Pittsburgh	1.85	1.85	1.90	2.20
Wire nails, Pittsburgh	*1.60*	1.65	1.65	1.70
Cut nails, Pittsburgh	1.50	1.50	1.55	1.65
Barb wire, galv., Pittsburgh	*1.90*	1.95	1.95	2.00
METALS,				
Per Pound:	Cents.	Cents.	Cents.	Cents.
Lake copper, New York	**12.62½**	12.50	12.50	12.87½
Electrolytic copper, New York	**12.50**	12.25	12.25	12.80
Spelter, St. Louis	**6.20**	6.10	5.85	5.45
Spelter, New York	**6.35**	6.30	6.00	5.60
Lead, St. Louis	4.15	4.15	4.32½	4.27½
Lead, New York	4.25	4.25	4.47½	4.40
Tin, New York	**42.05**	41.45	38.87½	36.15
Antimony, Hallett, New York	7.70	7.70	7.70	7.75
Tin plate, 100-lb. box, New York	$3.64	$3.64	$3.84	$3.84

*The average switching charge for delivery to foundries in the Chicago district is 50c. per ton.

Prices of Finished Iron and Steel f.o.b. Pittsburgh

Freight rates from Pittsburgh in carloads, per 100 lb.: New York, 10c.; Philadelphia, 15c.; Boston, 18c.; Buffalo, 11c.; Cleveland, 10c.; Cincinnati, 15c.; Indianapolis, 17c.; Chicago, 18c.; St. Paul, 32c.; St. Louis, 22½c.; New Orleans, 30c.; Birmingham, Ala., 45c. Pacific coast, 80c. on plates, structural shapes and sheets No. 11 and heavier; 85c. on sheets Nos. 12 to 16; 95c. on sheets No. 16 and lighter; 65c. on wrought pipe and boiler tubes.

Plates.—Tank plates, ¼ in. thick, 6¼ in. up to 100 in. wide, 1.15c., base, net cash, 30 days. Following are stipulations prescribed by manufacturers, with extras:

Rectangular plates, tank steel or conforming to manufacturers' standard specifications for structural steel dated February 6, 1903, or equivalent, ¼ in. thick and over on thinnest edge, 100 in. wide and under, down to but not including 6 in. wide, are base.

Plates up to 72 in. wide, inclusive, ordered 10.2 lb. per square foot, are considered ¼-in. plates. Plates over 72 in. wide must be ordered ¼ in. thick on edge, or not less than 11 lb. per square foot, to take base price. Plates over 72 in. wide ordered less than 11 lb. per square foot down to the weight of 3-16-in. take the price of 3-16-in.

Allowable overweight, whether plates are ordered to gauge or weight, to be governed by the standard specifications of the Association of American Steel Manufacturers.

Extras.	Cents per lb.
Gauges under ¼ in. to and including 3-16 in. on thinnest edge	.10
Gauges under 3-16 in. to and including No. 8	.15
Gauges under No. 8 to and including No. 9	.25
Gauges under No. 9 to and including No. 10	.30
Gauges under No. 10 to and including No. 12	.40
Sketches (including all straight taper plates) 3 ft. and over in length	.10
Complete circles, 3 ft. in diameter and over	.20
Boiler and flange steel	.10
"A. B. M. A." and ordinary firebox steel	.20
Still bottom steel	.30
Marine steel	.40
Locomotive firebox steel	.50
Widths over 100 in. up to 110 in., inclusive	.05
Widths over 110 in. up to 115 in., inclusive	.10
Widths over 115 in. up to 120 in., inclusive	.15
Widths over 120 in. up to 125 in., inclusive	.25
Widths over 125 in. up to 130 in., inclusive	.50
Widths over 130 in.	1.00
Cutting to lengths or diameters under 3 ft. to 2 ft., inclusive	.25
Cutting to lengths or diameters under 2 ft. to 1 ft. inclusive	.50
Cutting to lengths or diameters under 1 ft.	1.55

No charge for cutting rectangular plates to lengths 3 ft. and over.

Structural Material.—I-beams, 3 to 15 in.; channels, 3 to 15 in., and angles, 3 to 6 in. on one or both legs, ¼ in. and over, 1.20c. Other shapes and sizes are quoted as follows:

	Cents per lb.
I-beams over 15 in.	1.25 to 1.30
H-beams over 18 in.	1.35 to 1.40
Angles over 6 in.	1.25 to 1.30
Angles, 3 in. on one or both legs, less than ¼ in. thick, plus full extras as per steel bar card Sept. 1, 1909	1.25 to 1.30
Tees, 3 in. and up	1.25 to 1.30
Zees, 3 in. and up	1.20 to 1.25
Angles, channel and tees, under 3 in., plus full extras as per steel bar card Sept. 1, 1909	1.25 to 1.30
Deck beams and bulb angles	1.50 to 1.55
Hand rail tees	2.00 to 2.15
Checkered and corrugated plates	2.00 to 2.15

Sheets.—Makers' prices for mill shipments on sheets of U. S. standard gauge, in carload and larger lots, on which jobbers charge the usual discounts for small lots from store, are as follows:

Blue Annealed Sheets.

	Cents per lb.
Nos. 3 to 8	1.25 to 1.30
Nos. 9 and 10	1.35 to 1.40
Nos. 11 and 12	1.40 to 1.45
Nos. 13 and 14	1.45 to 1.50
Nos. 15 and 16	1.55 to 1.60

Box Annealed Sheets, Cold Rolled.

	One Pass.	Three Pass.
Nos. 10 to 12	1.50 to 1.55	.....
Nos. 13 and 14	1.55 to 1.60	.....
Nos. 15 and 16	1.60 to 1.65	1.70 to 1.75
Nos. 17 to 21	1.65 to 1.70	1.75 to 1.80
Nos. 22, 23 and 24	1.70 to 1.75	1.80 to 1.85
Nos. 25 and 26	1.75 to 1.80	1.85 to 1.90
No. 27	1.80 to 1.85	1.90 to 1.95
No. 28	1.85 to 1.90	1.95 to 2.00
No. 29	1.90 to 1.95	2.00 to 2.05
No. 30	2.00 to 2.05	2.10 to 2.15

Galvanized Sheets, of Black Sheet Gauge.

Nos. 10 and 11	1.85 to 1.90
Nos. 12, 13 and 14	1.95 to 2.00
Nos. 15, 16 and 17	2.10 to 2.15
Nos. 18 to 22	2.25 to 2.30
Nos. 23 and 24	2.35 to 2.40
Nos. 25 and 26	2.55 to 2.60
No. 27	2.70 to 2.75
No. 28	2.85 to 2.90
No. 29	2.95 to 3.00
No. 30	3.15 to 3.20

All above rates on sheets are f.o.b. Pittsburgh, terms 30 days net, or 2 per cent. cash discount in 10 days from date of invoice, as also are the following base prices per square for painted and galvanized roofing sheets, with 2½-in. corrugations.

Corrugated Roofing Sheets, Per Square.

Gauge.	Painted.	Galvanized.	Gauge.	Painted.	Galvanized.
29	.....	$2.30	22	$2.35	$3.45
28	$1.30	2.45	22	2.55	3.65
27	1.45	2.50	21	2.75	4.00
26	1.55	2.60	20	3.00	4.30
25	1.80	3.00	18	4.60	5.65
24	2.05	3.10	16	4.85	6.45

Wire Rods and Wire.—Bessemer, open hearth and chain rods, $26 to $26.50. Fence wire, Nos. 0 to 9 per 100 lb., terms 60 days, or 2 per cent. discount in 10 days, carload lots, to jobbers, annealed, $1.40; galvanized, $1.70. Carload lots, to retailers, annealed, $1.50; galvanized, $1.80. Galvanized barb wire to jobbers, $1.90; painted, $1.60. Wire nails, to jobbers, $1.60.

THE IRON AND METAL MARKETS

The following table gives the price to retail merchants on wire in less than carloads, including the extras on Nos. 10 to 16, which are added to the base price:

Fence Wire, Per 100 lb.

Nos.	0 to 9	10	11	12 & 12½	13	14	15	16
Annealed	$1.65	$1.70	$1.75	$1.80	$1.90	$2.00	$2.10	$2.20
Galvanized	1.95	2.00	2.05	2.10	2.20	2.30	2.70	2.80

Wrought Pipe.—The following are the jobbers' carload discounts on the Pittsburgh basing card on wrought pipe, in effect from October 2, 1911:

	Steel Black.	Steel Galv.	Iron Black.	Iron Galv.
Butt Weld.				
⅛ and ¼ in.	73	53	68	48
⅜ in.	74	64	69	59
½ in.	77	67	75	65
¾ in. to 1¼ in.	80	72	75	67
2 in. to 3 in.	81	74	76	69
Lap Weld.				
1¼ and 1½ in.	..	..	68	61
2 in.	77	70	72	65
2½ to 4 in.	79	72	74	67
4½ to 6 in.	78	70	73	65
7 to 12 in.	76	66	71	61
13 to 15 in.	52	..	47	..
Butt weld, extra strong, plain ends, card weight.				
¼, ¼, ⅜ in.	70	60	65	55
½ in.	75	69	70	64
¾ to 1½ in.	79	73	74	68
2 to 3 in.	80	74	75	69
Lap Weld, extra strong, plain ends, card weight.				
1½ in.	..	..	66	60
2 in.	76	70	71	65
2½ to 4 in.	78	72	73	67
4½ to 6 in.	77	71	72	66
7 to 8 in.	70	60	65	55
9 to 12 in.	65	55	60	50
Butt Weld, double extra strong, plain ends, card weight.				
½ in.	65	59	60	54
¾ to 1½ in.	68	62	63	57
2 to 3 in.	70	64	65	59
Lap Weld, double extra strong, plain ends, card weight.				
2 in.	66	60	61	55
2½ to 4 in.	68	62	63	57
4½ to 6 in.	67	61	62	56
7 to 8 in.	60	50	55	45
Plugged and Reamed.				
1 to 1½, 2 to 3 in. Butt Weld; 2, 2½ to 4 in. Lap Weld	will be sold at two (2) points lower basing (higher price) than merchants' or card weight pipe. Butt or lap weld, as specified.			

The above discounts are for "card weight," subject to the usual variation of 5 per cent. Prices for less than carloads are three (3) points lower basing (higher price) than the above discounts.

Boiler Tubes.—Discounts on lap welded steel and charcoal iron boiler tubes to jobbers in carloads are as follows:

Steel.		Charcoal Iron.	
1¾ to 2¼ in.	65	1½ in.	48
2½ in.	67½	1¾ to 2¼ in.	50
2¾ to 3½ in.	72½	2½ in.	55
3½ to 4 in.	75	2¾ to 5 in.	60
5 to 6 in.	67½		
7 to 13 in.	65		

2½ in. and smaller, over 18 ft., 10 per cent. net extra.
2¾ in. and larger, over 22 ft., 10 per cent. net extra.
Less than carloads will be sold at the delivered discount for carloads, lowered by two points for lengths 22 ft. and under to destinations east of the Mississippi River; lengths over 22 ft. and all shipments going west of the Mississippi River must be sold f.o.b. mill at Pittsburgh basing discount, lowered by two points.

Pittsburgh

PITTSBURGH, PA., October 25, 1911.—(*By Telephone.*)

Pig Iron.—Reports of sales of standard malleable Bessemer iron at $12.50 at Valley furnace are denied by furnace interests. Some malleable Bessemer iron running over 1 per cent. in manganese and high in phosphorus has sold at $12.50 at furnace, but this is off-malleable iron and was sold in connection with basic iron and at the same price. While it is admitted by consumers that prices have probably touched bottom, they do not seem disposed to contract. We note a sale of 500 tons of No. 2 foundry iron at $13.25, Valley furnace, for November delivery, and also a sale of 4000 to 5000 tons of basic and off-malleable Bessemer iron at $12.50, Valley furnace; also 500 to 600 tons of gray forge iron at $12.75, Valley furnace. We quote Bessemer iron at $14.50; malleable Bessemer iron, $13; basic, $12.50; No. 2 foundry, $13.25 to $13.50, and gray forge, $12.75, all at Valley furnace, the freight rate to the Pittsburgh district being 90c. a ton.

Steel.—Specifications against contracts for billets and sheet and tin bars are coming in at a fairly satisfactory rate and shipments of semi-finished steel by the mills this month will likely show a slight increase over September. Up to October 23 orders sent to the mills for rolling by the billet and rail sales department of the Carnegie Steel Company show an increase over the same period in September of nearly 10,000 tons. Several consumers claim they have been offered Bessemer billets at practically the same price as open hearth, but this is denied by the makers of Bessemer steel, who say they are able to get about $1 more per ton for Bessemer than for open hearth. Prices are unchanged and we quote open hearth billets, $19; Bessemer billets, $20; open hearth sheet bars, $20; Bessemer sheet bars, $21, and forging billets, $24, f.o.b. at maker's mill.

(By Mail.)

The very low prices ruling on all kinds of iron and steel products are stimulating new demand to a considerable extent. Bookings by the leading mills in the past week have been heavier than in any similar period for some months. Buyers are showing a greater desire to place orders, especially for delivery into 1912, than they have for some time. There is much interest in the report that the two railroads owned by the Steel Corporation will make a rate of 60 cents a ton on ore from the Minnesota ranges to Lake Superior instead of 80 cents, the present rate. The new rate will not go into effect until after the close of navigation, so that furnace owners will not have the benefit of it until next year. Pig iron still seems to be weak, and an order for 500 tons of No. 2 foundry iron broke the price 25c. a ton quite easily. Reports of sales of malleable Bessemer iron at $12.50, Valley furnace, have not been confirmed, and it is insisted that if such sales were made the iron was off malleable and not standard. Prices on wire products are also weaker, and concessions of $1 a ton are easily obtainable from what has been regarded as the regular market. It is stated that some contracts for tin plate have been made for delivery through the first half of 1912 at $3.40 per base box f.o.b. Pittsburgh. The low prices ruling on scrap are bringing consumers into the market, and more material is changing hands than for some time. Standard furnace coke is available for the first half of 1912 at practically present prices. The general opinion seems to be that the low prices now ruling on iron and steel products are scraping bottom, but, until the slack capacity is taken up by increased demand, no improvement in prices can be expected. In fact, it is believed that present values will continue probably through the first half of next year at least, unless an extraordinary demand should come up in the meantime.

Ferromanganese.—Consumers in this district are pretty well covered into the first quarter and half of next year, but there are inquiries out for some fairly large lots for delivery in the Chicago and Cincinnati districts. Few sales of ferromanganese have been made since the importers put up the price. We quote 80 per cent. for the remainder of this year at about $37, and for first half of next year $37.50 to $38, Baltimore, the freight rate to Pittsburgh being $1.95 a ton.

Ferrosilicon.—Prices continue very strong and are steadily advancing. It is said that $62, f.o.b. cars Pittsburgh, has been done on several small lots for reasonably prompt shipment. We quote 50 per cent. at $62 and are advised that some sources of supply are asking as high as $64, Pittsburgh. We quote 10 per cent., $22; 11 per cent., $23, and 12 per cent., $24, f.o.b. cars Ashland, Ky., or Jackson, Ohio.

Muck Bar.—No recent sales have been made here. We quote best grades made from all pig iron at $28, Pittsburgh, but this may be shaded.

Skelp.—The market continues quiet. We quote grooved steel skelp at 1.15c.; sheared steel skelp, 1.20.; grooved iron skelp, 1.40c., and sheared iron skelp, 1.60c., all for delivery at consumers' mills in the Pittsburgh district.

Wire Rods.—In sympathy with the wire market, prices on wire rods are weak and with little new inquiry. Consumers are not specifying in a satisfactory way against their contracts. We quote Bessemer, open hearth and chain rods at $26, f.o.b. Pittsburgh, but this price might be shaded.

Plates.—Some contracts for cars have been placed and others will be given out in the near future. A good deal of other work is coming up in plates from shipbuilding companies and also for water works systems and the outlook is better than for some time. The material for several new vessels will be rolled by the Carnegie Steel Company. The Riter-Conley Mfg. Company, of this city, has taken some work to be erected in Mexico, requiring about 1500 tons of plates and shapes, which will also be furnished by the Carnegie Company. The New York Central Railroad has placed 2000 steel underframe box cars, 40 tons capacity each, with the American Car & Foundry Company to be built at either

THE IRON AND METAL MARKETS

Detroit or St. Louis, and the plates and shapes will go to the Chicago district. The Pressed Steel Car Company has taken 500 tank cars for the Union Tank Line and has also taken 41 motor, passenger and baggage cars for the Pennsylvania Railroad. The Baltimore & Ohio has asked bids on 1500 steel underframe box cars and the rest of the reported 4500-car inquiry is expected to follow later. The Chicago, Rock Island & Pacific is in the market for 500 furniture cars, 250 flat cars and 25 cabooses, while the Southern Railway is in the market for 50 ventilated box cars. An inquiry is out for a syphon for an aqueduct for Los Angeles, Cal., taking about 9400 tons of plates, bids to close November 17. The plates will be shipped bent and punched, to be assembled on the ground. The general demand for plates is showing betterment, and the mills have more orders on their books than for some months. We quote wide and narrow plates at 1.15c. on ordinary orders and 1.20c. in small lots, f.o.b. at mill. On a very desirable contract for large tonnage and attractive rolling specifications it is probable that the lower price named might be slightly shaded by one or two mills.

Structural Material.—The formal contract with the Carnegie Steel Company for 59,000 tons of plates, shapes and bars for the Quebec Bridge has at last been signed by the St. Lawrence Bridge Company, but shipments will not commence for some time. The Fort Pitt Bridge Works, which recently took some track elevation work at Cleveland, requiring about 5000 tons of steel, has ordered the material from the Carnegie Steel Company. The McClintic-Marshall Construction Company has taken 800 tons for new buildings for the Algoma Steel Company, Sault Ste. Marie, Ontario, and 1200 tons for an addition to the Bellevue Hospital in New York City. The Pittsburgh Bridge & Iron Works has taken 700 tons for an addition to the Government Testing Laboratory in this city. The Thompson-Starrett Company has taken an office building in Charleston, W. Va., about 500 tons, but the order for the material has not yet been placed. The Massillon Bridge & Structural Company, Massillon, Ohio, has taken a baseball stadium at Detroit, about 500 tons. Prices on plain material continue low and we quote beams and channels up to 15 in. at 1.20c., Pittsburgh, but 1.15c. is done on very desirable orders.

Sheets.—A fair amount of new business is being entered by the mills for delivery over the remainder of this year, but some of them do not favor entering orders for delivery into next year at present prices, believing that the market may improve meanwhile. Specifications against contracts are coming in at a fairly satisfactory rate and the mills are operating to probably 60 per cent. of capacity. It is claimed that with sheet bars ruling at about $21, Pittsburgh, sheet prices are as low as they have ever been in the history of the trade and that they are not likely to go lower unless there should be a further decline in prices of bars. One pass black sheets continue to rule at about 1.90c., but on desirable orders some mills are naming 1.85c. at mill, which is bottom of the market. No. 28 galvanized sheets are ruling at 2.90c., but some mills are naming 2.85c. on good orders. Prices on galvanized sheets are reported to be a little firmer, due to the higher spelter market.

Tin Plate.—Since the reduction from $3.60 to $3.40 per base box, several mills state that they have received contracts for tin plate from the meat packers and other large consumers for delivery over the first half of 1912, and it is also stated that some business has been placed at the new price for delivery over all of next year. The tin plate mills are now operating to about 65 per cent. of capacity, but as old contracts have been pretty well cleaned up and consumers will not commence to specify on their new contracts for some little time, it is not probable that this rate of operation will be increased in the near future, but on the contrary may shrink. We quote 100-lb. cokes, 14 x 20, at $3.40 per base box, f.o.b. at maker's mill. The tin plate makers are now generally quoting f.o.b. mill so that to some points of shipment the delivered price figures out slightly less than $3.40 per base box, plus the full freight rate from Pittsburgh.

Steel Bars.—A slight increase in the new demand for steel bars is reported, buyers being willing to place orders a little more freely, believing that 1.10c. on steel bars, which is being done on desirable orders, is probably close to bottom. Specifications against contracts are coming in a little more freely. There is only a fair demand for iron bars, made up mostly of small orders to meet current needs, and specifications against contracts are rather slow, while prices seem to be slightly weaker. We continue to quote steel bars at 1.10c. for desirable orders and 1.15c. in small lots, while iron bars are ruling at 1.20c. to 1.25c., maker's mill, plus freight to point of delivery.

Merchant Steel.—The new demand is better than for some time, due to the low prices ruling, but buying is still confined to small lots to cover actual needs. Shipments this month by the mills will probably show a small increase over last month. Quotations, which are more or less shaded, are as follows: Iron finished tire, ¼ and ⅜ in. and heavier, 1.40c.; under these sizes, 1.45c.; planished tire, 1.50c.; channel tire, 1.70c., base; toe calk, 1.80c.; flat sleigh shoe, 1.45c.; concave or convex, 1.60c.; cutter shoe, tapered or bent, 2.15c.; spring steel, 1.85c.; machinery steel, smooth finish, 1.75c.

Hoops and Bands.—There is practically no new buying of hoops by the cooperage concerns, and specifications against contracts are not coming in at a satisfactory rate. The new demand for bands is also light, being only for small lots to cover actual needs. We quote steel hoops at 1.35c. and bands at 1.15c., extras on the latter as per the steel bar card, but on very desirable orders for shipment at the convenience of the mill these prices would be shaded by some mills, although not over $1 a ton.

Rivets.—The low prices ruling are making the new demand a little better, but buyers are still placing orders only for small lots to cover actual needs. We quote structural rivets at 1.50c. and boiler rivets at 1.60c., f.o.b. Pittsburgh. On a desirable contract for prompt shipment these prices might be shaded.

Wire Products.—New buying of wire nails and wire is still confined to small lots to cover actual needs, jobbers specifying against nails and wire for only such quantities as are needed to maintain stocks. Prices on wire products are weak and concessions of $1 a ton are being made from the basis recently quoted. We quote wire nails at $1.60 to $1.65; cut nails, $1.50 to $1.55; galvanized barb wire, $1.90 to $1.95; painted, $1.60 to $1.65; annealed fence wire, $1.40 to $1.45, and galvanized, $1.70 to $1.75, all f.o.b. Pittsburgh, usual terms, full freight added to point of delivery.

Spelter.—The market is firm at 6.15c., East St. Louis, equal to 6.27½c., Pittsburgh.

Shafting.—New orders are only for small lots to cover actual needs. Specifications against contracts continue very unsatisfactory. We quote cold rolled steel shafting at 60 and 5 per cent. off in small lots and 60 and 10 per cent. off the list in carload and larger lots, delivered in base territory. On a desirable specification, for prompt shipment, this price might be shaded.

Railroad Spikes.—Only small orders are being placed to meet current needs. We quote railroad spikes in base sizes at $1.40 to $1.45, f.o.b. Pittsburgh.

Merchant Pipe.—Reports are that the Texas Company, which recently placed 130 to 150 miles of 6-in. line pipe with the Republic Iron & Steel Company, is now in the market for 250 miles of 6 to 8-in. Reports that the Standard Oil Company of Mexico was in the market for 200 miles of 8-in. are denied, but it is stated that it is inquiring for 47 miles. Recent orders placed include 15 to 20 miles of 3-in., 10 to 15 miles of 2-in. steel pipe and about 20 miles of 2-in. iron pipe. The new demand for merchant pipe is fair, and the leading mills are said to be operating to from 60 to 70 per cent. of capacity. It is stated that the new discounts on pipe are being quite well maintained.

Boiler Tubes.—Some fair sized orders are being placed for locomotive tubes, but the new demand for merchant tubes continues very dull. Regular discounts on both iron and steel tubes continue to be more or less shaded.

Coke.—A leading Eastern consumer is reported to have placed a contract for 5000 tons a month of standard grade furnace coke for shipment over the first half of 1912 at about $1.65 per net ton at oven. We also note sales of about 10,000 tons of furnace coke for November shipment at $1.55 per net ton at oven. There is a fairly active demand for foundry coke and some inquiries are out for large tonnages for the first half of 1912. We quote standard makes of furnace coke for prompt shipment at $1.50 to $1.55 and for the remainder of the year $1.55 to $1.60 per net ton at oven; foundry coke, 72-hr., prompt, $1.85 to $2, and contract, $2.10 to $2.40.

Iron and Steel Scrap.—The very low prices ruling on all kinds of scrap have stimulated buying and more

THE IRON AND METAL MARKETS

material is moving from dealers to consumers than for some time. A feature of the market is that some dealers are short on heavy steel scrap and are willing to give a little more money for it than consumers are paying. The Pennsylvania and Baltimore & Ohio railroads sold very little material on their October lists on account of the low bids received. It is the dealers' general opinion that prices are probably as low as they will go, and some are not trying to force sales, believing that the market will be better later on. The embargo on scrap routed to Monessen, Pa., has been lifted and this is helping the local market. We note sales of 2500 to 3000 tons of heavy steel scrap, at $12, delivered, a Youngstown interest having taken in considerable in the last few days. We also note sales of 800 to 1000 tons of cast iron borings at about $8.25, delivered. Quotations are again reduced on nearly all grades of scrap to conform to sales made in the past week, and now quote as follows per gross ton, f.o.b. Pittsburgh, unless otherwise noted:

Heavy steel scrap, Steubenville, Follansbee, Sharon, Monessen and Pittsburgh delivery	$12.00
No. 1 foundry cast	$12.50 to 12.75
No. 2 foundry cast	11.75 to 12.00
Bundled sheet scrap, f.o.b. consumers' mill, Pittsburgh district	10.25 to 10.50
Rerolling rails, Newark and Cambridge, Ohio, Cumberland, Md., and Franklin, Pa.	12.50 to 12.75
No. 1 railroad malleable stock	11.50 to 11.75
Grate bars	9.00 to 9.25
Low phosphorus melting stock	15.00 to 15.25
Iron car axles	20.50 to 21.00
Steel car axles	16.00 to 16.25
Locomotive axles	22.00 to 22.50
No. 1 busheling scrap	11.00 to 11.25
No. 2 busheling scrap	7.00 to 7.25
Old car wheels	12.00 to 12.25
†Sheet bar crop ends	13.75 to 14.00
*Cast iron borings	8.00 to 8.15
*Machine shop turnings	8.75
Old iron rails	14.50 to 14.75
No. 1 wrought scrap	12.00 to 12.25
Heavy steel axle turnings	9.75 to 10.00
Stove plate	9.00 to 9.25

*These prices are f.o.b. cars at consumers' mills in the Pittsburgh district.
†Shipping point

Chicago

CHICAGO, ILL., October 24, 1911

The slight comfort that has been derived from the tonnage showing in October as compared with September is being dissipated as prices continue to sag and specifications show signs of falling off. Interest appears to be centered in the question of how long mills will continue to quote prevailing prices. The fact that among the pioneers in the quoting of low prices are some of the most strongly intrenched producers points to the probability of buyers retaining their present advantage for some time to come. Specifications for plates, structural material and bars, which have been the mainstay of the finished steel market, show decreases, although the mills report a fair tonnage of car and bridge structural shapes and plates on their books. Prices are generally $1 a ton lower than quoted a week ago and quotations in the West on plates and shapes range from 1.33c. to 1.38c., Chicago. The local pig iron market is colorless and the apathy of melters seems to have reduced trading, both present and prospective, to a dead level. The market for scrap continues very limited; sales are few and local prices are practically established by buyers' offers.

Pig Iron.—Another week during which buyers have displayed but little interest has served only to accentuate the anemic condition of the local pig iron market. Where a foundry receives an order for castings a purchase of immediate shipment pig iron may result and to such transactions the major portion of the week's business may be attributed. It is estimated that melters in this territory are operating at about 60 per cent. of capacity and upon this basis there is little occasion for active inquiry. In addition, incentive to interest in 1912 iron has been discouraged by offers from furnaces covering delivery through the first quarter at current prices and the trade has come to feel that the consideration of future purchases is unnecessary at this time. A few instances are cited where less than $10, Birmingham, has been accepted for No. 2 iron on spot shipments, but for remainder of the year shipment purchases on the basis of $10 are in line with the market. The asking price for local Northern iron continues to be $14.50, more particularly as regards delivery in the first quarter. For immediate shipment there is room apparently for some bargaining. We quote for Chicago delivery, except for local irons, which are f.o.b. furnace, the following prices on prompt shipments:

Lake Superior charcoal	$16.50 to $17.00
Northern coke foundry, No. 1	14.75 to 15.00
Northern coke foundry, No. 2	14.35 to 14.50
Northern coke foundry, No. 3	14.00 to 14.35
Northern Scotch, No. 1	16.00
Southern coke, No. 1 foundry and No. 1 soft	14.85 to 15.10
Southern coke, No. 2 foundry and No. 2 soft	14.35 to 14.85
Southern coke, No. 3	14.10 to 14.35
Southern coke, No. 4	13.85 to 14.10
Southern gray forge	13.60 to 13.85
Southern mottled	13.60 to 13.85
Malleable Bessemer	14.50 to 15.00
Standard Bessemer	17.40
Basic	15.50
Jackson Co. and Kentucky silvery, 6 per cent	17.90
Jackson Co. and Kentucky silvery, 8 per cent	18.90
Jackson Co. and Kentucky silvery, 10 per cent	19.90

Rails and Track Supplies.—A disposition on the part of some of the Western railroads to make inquiry as to 1912 requirements is being manifested in a tentative manner. From two or three sources inquiry for rails to be shipped this year is also reported. Specifications, however, show a slight falling off as regards both rails and track fastenings. We quote standard railroad spikes at 1.60c. to 1.70c., base; track bolts with square nuts, 2c. to 2.10c., base, all in carload lots, Chicago; standard section Bessemer rails, 1.28c.; open hearth, 1.34c.; light rails, 40 to 45 lb., 1.16c. to 1.20½c.; 30 to 35 lb., 1.19½c. to 1.24c.; 16, 20 and 25 lb., 1.20½c. to 1.25c.; 12 lb., 1.25c. to 1.30½c.; angle bars, 1.50c. to 1.60c., Chicago.

Structural Material.—Interest in structural material as in other finished steel lines is largely concerned with the question of price. Some variation in quotations is noted, depending upon the nature of the specifications, and prices in this territory equivalent to 1.15c., Pittsburgh basis, are not uncommon, while less desirable sales are made at quotations $1 a ton higher. Contracts for fabricated work let during the week contained no tonnage of importance, although an aggregate of 2646 tons was placed. The general contract for buildings for the Union Iron Works, San Francisco, calls for 527 tons of steel which will be furnished by the McClintic-Marshall Construction Company. The Morava Construction Company will furnish 810 tons for the Citizens Bank Building, Tampa, Fla. Contracts taken by the American Bridge Company include 284 tons of girder spans for the Oregon Electric Railway, Rock Creek, Ore., and 289 tons for the St. Joseph Tanning Company, St. Joseph, Mo. The Minneapolis Steel & Machinery Company will furnish 162 tons for a penstock for the Beaver River Power Company, Bliss, Idaho; the Central Iron Works, 163 tons for the Lewis A. Hicks Company, San Francisco, and Dyer Bros., 133 tons for two towers for the Santa Cruz Portland Cement Company, Santa Cruz, Cal. Contracts were also awarded for 174 tons for a steel tank for the American Steel & Wire Company and 104 tons for the Brunet Falls Mfg. Company, Eau Claire, Wis. Mills report specifications for railroad car structural shapes in good volume and also specifications for steel bridges. We quote for plain shapes, mill shipment, at Chicago, 1.33c. to 1.38c. and from store, 1.65c.

Plates.—The past week did not offer as good a showing of plate specifications as had been received in the preceding weeks of the month. Steel cars and bridge work are responsible for a large proportion of the tonnage now in the mills. Very low quotations continue to come to light, and apparently, where freight advantage permits, prices equivalent to 1.15c., Pittsburgh, and less are not too low to offer for desirable specifications. We quote for Chicago delivery, mill shipment, 1.33c. to 1.38c., and from store, 1.65c.

Sheets.—Market rumors to the effect that prices on sheets are now so low as to force some mills out of the market and thus relieve the situation are gaining currency. There is little doubt that the margin of profit in current quotations is uncomfortably small, but the evidence is that the last penny is more welcome than enforced idleness and a real strengthening of the market is not immediately in sight. Orders show a slight decrease in volume. We quote Chicago prices as follows: Carload lots, from mill, No. 28 black sheets, 2.08c.; No. 28 galvanized, 3.08c.; No. 10 blue annealed, 1.58c. Prices from store, Chicago, are: No. 10, 1.90c. to 2c.; No. 12, 1.95c. to 2.05c.; No. 28 black, 2.30c.; No. 28 galvanized, 3.35c.

Bars.—The steel bar market is soft and prices for such business as can be found range between 1.25c. and

THE IRON AND METAL MARKETS

1.33c., Chicago. Orders including attractive extras would not be turned away on an even lower basis. Bar iron presents a similar aspect and quotations from 1.15c. to 1.17½c. are the rule. We quote as follows, f.o.b. Chicago: Soft steel bars, 1.25c. to 1.33c.; bar iron, 1.15c. to 1.20c.; hard steel bars rolled from old rails, 1.17½c. to 1.20c. From store, soft steel bars, 1.55c. to 1.60c., Chicago.

Wire Products.—Wire nails have not only been in demand in disappointing volume, but have suffered as regards prices from the competitive efforts of the several mills. Plain wire for manufacturing purposes has been in fair demand, but agricultural requirements have been the chief support of the trade in wire products. Jobbers' carload prices, which are also quoted to manufacturing buyers, are as follows, per 100 lb.: Plain wire, No. 9 and coarser, base, $1.58 to $1.63; wire nails, $1.78 to $1.83; painted barb wire, $1.78 to $1.83; galvanized, $2.08 to $2.13; polished staples, $1.78 to $1.83; galvanized, $2.08 to $2.13, all Chicago.

Cast Iron Pipe.—The demand is somewhat slack and requirements recently advertised have been slow of placing. Awards at Woodstock, Ill.; Long Beach, Cal., and Muskegon, Mich., are still pending. At Chicago 500 tons were awarded to the United States Cast Iron Pipe & Foundry Company. We quote as follows, per net ton, Chicago: Water pipe, 4-in., $26.50; 6 to 12-in., $24.50; 16-in. and up, $24, with $1 extra for gas pipe.

Old Material.—The bottom to which prices of old material at Chicago will descend is apparently dependent upon the Eastern markets. Local consumers are taking so little that scrap must either be sold out of the local market or practically at the buyer's price. Declines from the quotations of a week ago are noted on nearly all grades of scrap and we have revised our prices accordingly. Offerings by the railroads are heavy only in view of the lifeless market and include a small list from the Toledo, St. Louis & Western and one from the Soo line. The Chicago, Burlington & Quincy has about 2500 tons and the Chicago, Rock Island & Pacific about 2000 tons, of which the principal item is 600 tons of rerolling rails. We quote for delivery at buyers' works, Chicago and vicinity, all freight and transfer charges paid, per gross ton, as follows:

Old iron rails	$13.50 to $14.00
Old steel rails, rerolling	12.00 to 12.50
Old steel rails, less than 3 ft.	10.75 to 11.25
Relaying rails, standard section, subject to inspection	24.00
Old car wheels	12.50 to 12.75
Heavy melting steel scrap	9.50 to 10.00
Frogs, switches and guards, cut apart	9.75 to 10.25
Shoveling steel	9.00 to 9.50
Steel axle turnings	8.25 to 8.75

The following quotations are per net ton:

Iron angles and splice bars	$11.75 to $12.25
Iron arch bars and transoms	13.00 to 13.50
Steel angle bars	9.00 to 9.50
Iron car axles	17.50 to 17.50
Steel car axles	15.25 to 15.75
No. 1 railroad wrought	10.00 to 10.50
No. 2 railroad wrought	9.00 to 9.50
Steel knuckles and couplers	9.25 to 9.75
Steel springs	9.75 to 10.25
Locomotive tires, smooth	13.50 to 14.00
Machine shop turnings	5.75 to 6.25
Cast iron borings	5.00 to 5.50
No. 1 busheling	8.00 to 8.50
No. 2 busheling	5.75 to 6.25
No. 1 boilers, cut to sheets and rings	6.75 to 7.25
Boiler punchings	12.00 to 12.50
No. 1 cast scrap	10.00 to 10.50
Stove plate and light cast scrap	8.50 to 9.00
Railroad malleable	9.50 to 10.00
Agricultural malleable	8.50 to 9.00
Pipes and flues	7.00 to 7.50

Philadelphia

PHILADELPHIA, PA., October 24, 1911.

Interest centers in the finished material market, where price concessions still continue available if the business offered is attractive. Open quotations for plates and shapes are unchanged, but it is more freely admitted that they can be shaded. Fabricated structural material, while in good inquiry, lacks definite developments. Railroads are making further inquiries for cars, but the aggregate does not appear particularly encouraging to builders. Steel bars are easier, with prices showing a lower tendency, while iron bars are openly quoted at a lower basis. Billets are firm, while sheets have been in better demand. The statistical position continues to favor the pig iron seller, but has not resulted in any particular strengthening in the market.

Iron Ore.—Very little new business is anticipated at this time, although small purchases are made from time to time to piece out requirements. Developments in foreign ore are particularly quiet. Importations during the week included 6050 tons from Spain, 5039 tons from Sweden and 15,265 tons from Cuba.

Pig Iron.—Consumers are showing a trifle more interest in the market, not particularly that the method of making purchases has changed, although a few more sizable lots were taken on, but rather due to the indifference of the majority of the principal producers in this district. It is clearly evident that stocks on furnace yards are steadily declining, and that few producers contemplate any further increase in the active capacity at the present basis of prices. There is also a growing scarcity in some brands of foundry iron for shipment the remainder of the year; producers are pretty well sold up and while they may still be able to take care of regular customers' needs, they are not willing to sell very far ahead at to-day's quotations, as from present indications no material advance for early 1912 deliveries is anticipated. Several sales of 500-ton lots of No. 2 X and No. 2 plain iron are reported and, in one instance an order for 1200 tons was taken, the former grade at $15 and the latter at $14.75, delivered, shipments ranging from early to the end of the first quarter. A new selling basis of the leading Virginia producer is announced, in which a differential between the higher grades for first quarter shipment applies. This company now quotes No. 2 X at $12.75, No. 2 plain, $12.50, and No. 3 foundry and lower grades, $12.25, at furnace, for the delivery named, with $12.50 applying for all foundry grades for this year's delivery. The latter quotation about represents the general market for Virginia foundry, for three months' delivery, although it is probable that it would be shaded for less desirable brands. Several 1000-ton blocks of Northern No. 3 and No. 4 iron have been moved at a price close to $14.20, delivered, while a trade deal involving 1000 tons of Virginia low grade, with a pipe foundry in that district, is reported. Negotiations are still pending for some large lots of low grade iron by Delaware River interests, but no important transactions have yet been announced. A better inquiry for forge iron comes from puddling mills, with negotiations pending for several 500-ton lots, while an inquiry for several thousand tons, previously reported, is still pending. Several small and one moderate lot sale are reported at prices ranging from $14.25 to $14.45, delivered. Developments in steel making irons are meager. The recently reported inquiry for first quarter basic is still unclosed, with no fresh inquiry coming out. First quarter basic has been quoted, it is stated, at $14.75, delivered. Small lots of low phosphorus iron are moving at the market. The general range of quotations for delivery in buyers' yards in this territory is unchanged, although shipments, instead of being confined to this year, are frequently extended to cover the first quarter of 1912:

Eastern Pennsylvania No. 2 X foundry	$15.00 to $15.25
Eastern Pennsylvania No. 2 plain	14.75 to 15.00
Virginia foundry	15.00 to 15.50
Gray forge	14.25 to 14.50
Basic	14.50
Standard low phosphorus	20.00

Ferroalloys.—Some uncertainty surrounds transactions in ferromanganese. While the principal sellers claim to be holding at $38.50, Baltimore, for 80 per cent. for next year's delivery occasional small speculative lots for early shipment are evidently moving at prices ranging from 50c. to $1 under that figure. No inquiry of any size has recently developed in this district. Local sellers quote 50 per cent. ferrosilicon at $62, delivered, without fresh inquiry. Furnace ferrosilicon within the Bessemer limits as to phosphorus and sulphur is quoted at $27.30 to $28.30, delivered here.

Billets.—Orders do not come out freely, but there is a tendency toward better quantity buying. The recent weakness in prices does not seem so pronounced, and while $21.40, delivered here, is still available for open hearth rolling billets on strongly competitive business ordinary current orders command $22.40, delivered. Differentials on forging billets are irregular, although the market is quotable at $26.50 to $27.50, delivered in this district.

Plates.—Sharp competition for large quantities continues, but all mills do not meet the low prices reported. Orders have been closed for some 3000 tons of ship plates, which are said to have been placed with an Eastern mill. There is still considerable business in

THE IRON AND METAL MARKETS

ship and structural plates pending. The general run of miscellaneous business continues on an even basis. For ordinary current business mills in this district make quotations ranging from 1.35c. to 1.45c., delivered in this vicinity, although on strongly competitive business prices as low as 1.30c. are reported, but not officially quoted.

Structural Material.—A better run of orders is reported in plain shapes. Several contracts for fabricated work are still under negotiation. Some new propositions have developed, including an addition for the New York Shipbuilding Company, requiring some 1700 tons. A six-story office building in Williamsport, Pa., is nearly ready for estimate. A hotel in Washington, D. C., covering about 500 tons, is being figured on. The addition to the erecting shop for the Baldwin Locomotive Works is still unclosed. Quotations cover quite a wide range, dependent on quantity and specifications. For ordinary plain shapes 1.40c. is usually quoted, but on desirable business as low as 1.30c., delivered here, has been named.

Sheets.—Eastern mills report a materially better run of business; consumers are ordering in larger quantities and placing some contracts for more extended periods. Mills are therefore operating on a more favorable basis and prices show a greater tendency toward firmness. A fair volume of business in ordinary sheets is also to be noted.

Bars.—Some little contracting is noted in iron bars and mills are a trifle better fixed as far as orders are concerned. Some mills are operating on a 75 per cent. basis. Prices have, however, developed further weakness, and on particularly desirable business 1.20c., delivered, can be done for iron bars, although 1.22c. to 1.25c. represents quotations covering ordinary business. Steel bars are not particularly active and it is reported that 1.25c., delivered here, can be shaded.

Coke.—Small contracts for foundry coke have been entered and consumers are taking deliveries freely. A fairly good demand for heating coke is reported, this grade being quoted at $1.20 to $1.30 at oven. Foundry grades still command from $2 to $2.35, at oven, according to grade. Some inquiry for furnace coke is reported both for prompt and forward delivery, although business transacted is largely confined to spot shipments. The following range of prices per net ton is named for delivery in this district:

Connellsville furnace coke	$3.65 to $4.05
Foundry coke	4.15 to 4.50
Mountain furnace coke	3.40 to 3.65
Foundry coke	3.95 to 4.40

Old Material.—Consumers are giving the situation a little more attention and purchases in some grades have been larger. It is pretty generally considered that prices are now at bottom and that but a slight buying movement would materially stiffen the market. Sales of heavy melting steel have been made at prices ranging from $11.75 to $12, delivered, in one instance 2000 tons moving at the inside figure. Rolling mill grades are being inquired for a little more freely, and some classes of specialties have been in better demand. Moderate sales of iron rails and car wheels have been made. Bids went in on October 25 for 610 tons, approximately, of Panama scrap, arriving at this port. This is understood to be material collected before the recent contract for the remaining French material on the Isthmus was closed. A few changes are noted in recent quotations. The following range about represents quotations at which the ordinary current business for prompt shipment can be done, delivery in buyers' yards, eastern Pennsylvania and nearby points, taking a freight rate from Philadelphia varying from 35c. to $1.35 per gross ton, for shipment ranging from prompt to the remainder of the year:

No. 1 heavy melting steel scrap	$11.75 to $12.25
Old steel rails, rerolling (nominal)	13.00 to 13.50
Low phosphorus heavy melting steel scrap	16.25 to 16.75
Old steel axles (nominal)	18.00 to 18.50
Old iron axles (nominal)	23.50 to 24.00
Old iron rails (nominal)	16.00 to 16.50
Old car wheels	11.75 to 12.00
No. 1 railroad wrought	13.75 to 14.25
Wrought iron pipe	11.25 to 11.75
No. 1 forge fire	10.00 to 10.50
No. 2 light iron (nominal)	6.00 to 6.50
Wrought turnings	8.00 to 8.25
Cast borings	7.50 to 7.75
Machinery cast	12.25 to 12.75
Railroad malleable (nominal)	11.00 to 11.50
Grate bars, railroad	9.25 to 9.75
Stove plate	9.25 to 9.75

Cleveland

CLEVELAND, OHIO, October 24, 1911.

Iron Ore.—The Pittsburgh Steamship Company announces that it will load its last ore boats this season during the week ending November 18. That company yesterday notified managers of independent vessels that no more outside shipments will be loaded by it after this week. No barges of the Pittsburgh fleet will be sent up the lakes for ore after to-morrow, and those now in commission will be laid up as soon as they arrive at lower lake ports. This will cut down the number of vessels employed in the ore trade by about 50. Merchant ore firms expect to be about through with their shipments by November 15. We quote prices as follows: Old range Bessemer, $4.50; Mesaba Bessemer, $4.25; old range non-Bessemer, $3.70; Mesaba non-Bessemer, $3.50.

Pig Iron.—The market shows some improvement both in the volume of inquiry and sales. A western Ohio malleable consumer has bought 250 tons of malleable iron for prompt shipment from a nearby furnace at a reported price of $13.75. The same melter is in the market for 1500 tons for delivery during the remainder of the year and the first half of next year. A Michigan stove maker has bought 1500 tons of 5 to 6 per cent. silicon iron for the first half delivery. A Cleveland foundry has purchased 600 tons of No. 3 foundry for the last and first quarter. A sale of 500 tons of No. 2 foundry was made in Akron for the first quarter delivery. A local interest has sold 500 tons of No. 2 foundry for prompt shipment in Pittsburgh at $13.25, Valley furnace. A Cleveland foundry is in the market for 1000 tons of foundry iron for November and December delivery. Another 1000 ton inquiry is from a central Ohio implement manufacturer, this being for 600 tons of No. 2 soft and 400 tons of No. 2 strong for the first half delivery. Another inquiry is for 500 tons of foundry iron for the next two months. Several smaller inquiries for foundry iron for the remainder of the year and for the first quarter are pending. Several sales of Southern iron, in lots of from 100 to 300 tons, are reported. Reports of a leading selling agency show a fair gain in shipments during the past two months. September showed an increase over August and October so far shows about a corresponding increase over September. For Cleveland delivery we quote as follows for prompt shipment and for the last quarter:

Bessemer	$15.40
Basic	13.40
Northern foundry, No. 2	13.75
Gray forge	13.00
Southern foundry, No. 2	$14.35 to 14.60
Jackson County silvery, 8 per cent. silicon	17.05

Coke.—The market is very quiet, the only demand being for small lots of foundry grades. We quote standard Connellsville furnace coke at $1.50 to $1.55 for prompt shipment and $1.55 to $1.60 for the remainder of the year. Connellsville 72-hr. foundry coke is held at $1.85 to $2.10 for prompt shipment and $2.10 to $2.40 for contract.

Finished Iron and Steel.—The demand in finished lines is only moderate. Consumers generally are buying only in small lots for early requirements. We note the sale of 10,000 tons of open hearth billets. Of these 8000 tons were contracted for by a northern Ohio consumer for delivery until April 1 at less than $20, delivered, which is equivalent to a shading of $19, Youngstown. The demand for steel bars is not active and prices are still unsettled. While mills generally are asking 1.10c. to 1.15c., Pittsburgh, there are frequent reports of a price quotation of 1.10c., Youngstown, which in this market means a concession of $1 a ton from the 1.10c., Pittsburgh, price. Plate prices are irregular. While 1.20c., Pittsburgh, is the usual quotation this price is not being maintained by the smaller mills or by all of the larger ones. The minimum quotation appears to be 1.15c. The structural market is firm at 1.20c. The demand for structural material is only fair. Little work is in prospect requiring good sized tonnage. The Forest City Steel & Iron Company, Cleveland, has taken 600 tons for trestle and building work for the American Stove Company, Cleveland. Offices to be erected in Cleveland by the National Electric Lamp Company will require 200 tons. Orders for sheets are not numerous. Small Ohio sheet mills are generally busy, but have orders for only a short time ahead. Sheet prices are stationary at 1.85c. to 1.90c. for No. 28 black and 2.85c. to 2.90c. for No. 28 galvanized. Both of the local bar iron mills are getting

THE IRON AND METAL MARKETS

enough orders to keep running. Iron bars are quoted at 1.20c., Cleveland, which price is being maintained.

Old Material.—A local consumer has bought 3000 tons of steel making scrap, mostly heavy steel, at prices ranging from $10.50 to $11. The remainder of the tonnage contracted for was turnings at $7.75 to $8 per gross ton, delivered. The market generally is very dull. There is very little inquiry from consumers, and dealers do not want to buy as their outlook for early sales is not very promising. Prices are still weak, but quotations generally are unchanged. The Nickel Plate Railroad received bids October 24 on a list of about 500 tons. Dealers' prices per gross ton, f.o.b. Cleveland, are as follows:

Old steel rails, rerolling	$12.25 to $12.50
Old iron rails	14.00 to 14.50
Steel car axles	17.00 to 17.50
Heavy melting steel	10.50 to 11.00
Old car wheels	11.25 to 11.50
Relaying rails, 50 lb. and over	22.50 to 23.50
Agricultural malleable	10.50 to 11.00
Railroad malleable	11.00 to 11.25
Light bundled sheet scrap	9.50 to 10.00

The following prices are per net ton, f.o.b. Cleveland:

Iron car axles	$18.50 to $19.00
Cast borings	6.00 to 6.25
Iron and steel turnings and drillings	6.50 to 7.00
Steel axle turnings	7.50 to 8.00
No. 1 busheling	9.00 to 9.50
No. 1 railroad wrought	11.25 to 11.75
No. 1 cast	11.00 to 11.50
Stove plate	9.00 to 9.25
Bundled tin scrap	11.00 to 11.50

Leading vessel owners in Cleveland have taken up the matter of attempting to form a merger of the independent fleets. A meeting has been called to discuss the subject and to consider plans for a combination, and it is possible that some definite action will be taken before the end of the year. Conditions in the lake trade have been very unsatisfactory during the last two or three years and vessel men see little hope of much improvement until some change is made in the method of conducting the lake transportation business. With the bulk of the independent boats under one management vessel owners believe that they will be able to effect economies that would come to a large fleet under competent management. With the boats under one management only as many as are needed would be put in commission; there would be a saving as compared with the present methods and stockholders would be more certain to get a fair return from their investments.

Birmingham

BIRMINGHAM, ALA., October 23, 1911.

Southern iron makers have been watching very closely the condition of the Pittsburgh market, as well as the sales made by Eastern blast furnaces. It has been noted with much interest here that, despite the fact that there was an increase in production during September, pig iron consumption is undoubtedly slightly in excess of the production at this time. However, this is due largely to the consumption of steel-making irons, with the result that foundry iron is still at low ebb. As a matter of fact, prices ruling today are as low as they have been any time in many months, and pig iron is offered here for shipment through to July 1, 1912, at $10 for No. 2, while some concession has been made in grades corresponding to No. 2 foundry by analysis, where the iron is on the yard and has been sold on an analysis basis, strictly for prompt shipment. Shipments this month have been liberal; at the same time the production in this district will doubtless be fully up to the production of any month of the year. There are only about three interests that will consider sales for delivery into the year 1912. Undoubtedly present selling prices do not take care of the actual cost of production, including reasonable charges for royalty and depreciation at a great many furnace plants in this district. Quotations f.o.b. cars Birmingham, per ton of 2240 lb. are as follows:

No. 1 foundry and No. 1 soft	$10.50
No. 2 foundry and No. 2 soft	10.00
No. 3 foundry	9.50
No. 4 foundry	9.25
Gray forge	9.00

Cast Iron Pipe.—Shipments are moving forward on previous contracts at a very satisfactory rate. The plant of the Dimmick Pipe Company, which, as previously reported, has been taken over by the United States Cast Iron Pipe & Foundry Company, is being overhauled and in a few weeks will be ready for operation. It is understood that when this plant is put in operation, one of the other plants of the United States Cast Iron Pipe & Foundry Company will be shut down and overhauled, and that in a like manner, one by one the entire list of shops of the company will be taken in hand. Quotations remain as follows per ton of 2000 lb., f.o.b. cars Birmingham district foundry: 4-in. to 6-in., $23; 8-in. to 12-in., $22; over 12-in., average, $21, with gas pipe taking its usual differential of $1 a ton higher.

Old Material.—There is still very little demand for scrap iron in this market, and there is less life in the market than in a long while. Prices are far from attractive and the tendency is to accumulate and hold for higher prices, rather than to seek to place material on the prevailing schedule of prices, which would be approximately as follows, per gross ton f.o.b cars here:

Old iron axles (light)	$12.50 to $13.00
Old steel axles (light)	11.50 to 12.00
Old iron rails	11.50 to 12.00
No. 1 railroad wrought	10.00 to 10.50
No. 2 railroad wrought	8.50 to 9.00
No. 1 country wrought	6.50 to 7.00
No. 2 country wrought	6.00 to 6.50
No. 1 machinery, cast	8.50 to 9.00
No. 1 steel	8.00 to 8.50
Tram car wheels	7.50 to 8.00
Standard car wheels	9.00 to 9.50
Light cast and stove plates	6.00 to 6.50

Buffalo

BUFFALO, N. Y., October 24, 1911.

Pig Iron.—There has been quite a little buying during the week, principally in small lots, aggregating 7000 to 8000 tons, largely foundry grades, but including a few small lots of malleable and one or two of basic. Deliveries are for remainder of year and first quarter to first half of 1912. Some improvement in demand from foundries supplying the railroad trade was noted in the week. It was rumored an inquiry for a large tonnage of basic from the Chicago district was under negotiation; but it could not be substantiated among Buffalo furnaces. Shipments on contracts continue large. Prices are approximately the same as last week's schedule. We quote as follows, f.o.b., Buffalo, for current quarter and delivery over first quarter of next year:

No. 1 X foundry	$13.75 to $14.00
No. 2 X foundry	13.25 to 13.75
No. 2 plain	13.00 to 13.50
No. 3 foundry	13.00 to 13.25
Gray forge	13.00
Malleable	13.75 to 14.25
Basic	13.75 to 14.25
Charcoal	16.50 to 17.25

Finished Iron and Steel.—A larger amount of business in steel bars has been placed during the current week than for some time past and the tone of the market is somewhat stronger. The leading interest reports a heavier tonnage of new business in bar products than for many weeks. A slightly firmer feeling is noted for small lot orders on the part of sellers, although this does not extend to large tonnage orders. There are some fair sized inquiries for plates before the trade; but prices are somewhat less steady in this line and some extremely low figures have been made on desirable business. There seems to be quite a desire on the part of many buyers to take advantage of the prevailing low prices and lay in stock rather than risk holding off longer for the chance of prices reaching any lower level. A moderate amount of inquiry for shapes has been received during the week and a number of orders have been placed, principally in small lots. In fabricated structural lines the week has been quiet. A good many structural jobs of considerable importance, however, are to come up for figuring this fall and during the winter. There is a good deal of grade crossing work in the city of Buffalo to come before contractors for bids early next year. Bids were opened this week for the steel for the new Shea Theater building, about 350 tons. Bids also went in this week on the New York Telephone Company's building on Elmwood avenue, requiring 240 tons. Figures are soon to be taken for the Vocational High School building at Syracuse.

Old Material.—The week has shown no change from the conditions prevailing during the past few weeks. Demand is slack, with very little new business in sight. No changes in prices are noted; dealers are not endeavoring to force sales by price reductions; preferring to

THE IRON AND METAL MARKETS

hold material rather than to dispose of it at prices at present obtainable. We quote as follows per gross ton, f.o.b., Buffalo:

Heavy melting steel	$12.50 to $13.00
Low phosphorus steel	16.00 to 16.50
No. 1 railroad wrought	14.00 to 14.50
No. 1 railroad and machinery cast scrap	13.50 to 14.00
Old steel axles	18.50 to 19.00
Old iron axles	22.00 to 22.50
Old car wheels	13.00 to 13.50
Railroad malleable	12.75 to 13.00
Boiler plate	12.50 to 13.00
Locomotive grate bars	11.00 to 11.50
Pipe	7.25 to 7.50
Wrought iron and soft steel turnings	7.25 to 7.40
Clean cast borings	7.00 to 7.25

Boston

BOSTON, MASS., October 24, 1911.

Old Material.—The market continues dull and uneventful, with no large transactions of importance. Prices are soft, and No. 1 wrought and soft steel has dropped 50 cents. The prices quoted below are those offered by the large dealers to the producers and to the smaller dealers and collectors, per gross ton, carload lots, f.o.b. Boston, and other New England points, taking Boston rates from eastern Pennsylvania points. In comparison with Philadelphia prices the differential for freight of $2.30 a ton is included. Mill prices are approximately 50 cents a ton more than dealers' prices.

Heavy melting steel	$10.00 to $10.50
Low phosphorus steel	11.45 to 11.95
Old steel axles	14.00 to 14.50
Old iron axles	17.50 to 18.50
Mixed shafting	12.75 to 13.25
No. 1 wrought and soft steel	10.50 to 10.75
Wrought iron pipe	9.25 to 9.50
Skeleton (bundled)	8.75 to 9.00
Cotton ties	8.00 to 8.25
No. 2 light	4.50 to 5.00
Wrought turnings	5.75 to 6.00
Cast borings	5.00 to 5.50
Machinery, cast	12.50 to 13.00
Malleable	11.00 to 11.50
Grate bars	6.00 to 6.50
Stove plate	8.50 to 9.00

St. Louis

ST. LOUIS, MO., October 23, 1911.

Although there is some improvement in the total of business for the past week, prices remain at the level last reported. Everything is bought for immediate shipment. Buyers seem to be satisfied that they can have as good prices or even better when coming requirements bring them into the market again.

Pig Iron.—Sales the past week have been of the carload lot order and not many of these. Although the quotation stands, nominally, at $10 to $10.50, Birmingham, for No. 2 Southern, according to delivery, it is pretty well understood that buyers can do better. Despite the low prices there is no apparent tendency to come into the market for bargains. There is some tendency to make inquiries for analysis iron, but usually this is very evidently a means of getting around the quotations on standard grades.

Coke.—Coke movement the past week has been almost altogether on requisitions on existing contracts. About the only purchasers in the market are seeking the product for winter heating purposes. The quotations on 48-hr. coke stands $1.60 to $1.70 at oven, but little is doing. For 72-hr. best selected Connellsville or Stonega, the figure is $1.90 to $2.15 for last quarter delivery. For first quarter the range is $2.10 to $2.25. The only sale reported during the week amounting to anything was 600 tons of 72-hr. Connellsville by the Pioneer Company.

Finished Iron and Steel.—Prompt shipment is the order of the day in conjunction with finished steel orders, the evident intent of purchasers being to get the material into use and to get their payment therefor before it becomes necessary to settle. Absolutely nothing is going into stock. In structural steel the week's tonnage has been better than the total of last week, but the orders were all small. In standard rails the only transaction of the week was one of about 7700 tons sold by the local branch of the Steel Corporation to the Kansas City, Clay County & St. Joseph Interurban road for delivery in November and December. That road has completed its financial arrangements and construction is already under way. Light rails continue to show increased request from the coal mines, which are becoming more active, but the lumber roads are doing very little. Bars and plates show little movement even on an acknowledged basis of $1.10, Pittsburgh, for the former. Track fastenings have been in only fair request.

Old Material.—A small list came out during the week, 400 tons from the Chicago & Eastern Illinois, but this has not closed yet. It is not expected, however, that it will show any improvement in prices. Dealers are taking what they can get at low prices to ship on contracts and are buying, where advisable, against future rises, but there is no specific activity in the market, nor does there appear to be any expectation of any for some time to come. Dealers' prices, per gross ton, f.o.b. St. Louis, are as follows:

Old iron rails	$12.00 to $12.50
Old steel rails, rerolling	11.50 to 12.00
Old steel rails, less than 3 ft.	10.50 to 11.00
Relaying rails, standard sections, subject to inspection	22.50 to 23.00
Old car wheels	12.00 to 12.50
Heavy melting steel scrap	10.50 to 11.00
Frogs, switches and guards cut apart	10.50 to 11.00

The following prices are per net ton:

Iron rail plates	$10.50 to $11.00
Iron car axles	18.00 to 18.50
Steel car axles	16.00 to 16.50
No. 1 railroad wrought	10.25 to 10.75
No. 2 railroad wrought	9.25 to 9.75
Railroad springs	9.25 to 9.75
Locomotive tires, smooth	13.00 to 13.50
No. 1 dealers' forge	7.00 to 7.50
Mixed borings	5.00 to 5.50
No. 2 busheling	8.50 to 9.00
No. 1 boilers cut to sheets and rings	7.00 to 7.50
No. 1 cast scrap	8.50 to 9.00
Stove plate and light cast scrap	7.00 to 7.50
Railroad malleable	7.50 to 8.00
Agricultural malleable	6.50 to 7.00
Pipes and flues	7.50 to 8.00
Railroad sheet and tank scrap	7.00 to 7.50
Railroad grate bars	6.50 to 7.00
Machine shop turnings	6.50 to 7.00

The German Iron Market

BERLIN, October 13, 1911

From the Silesian district it is reported that business has latterly improved and that an advance in prices is planned. From the Siegerland district, where the best German ores are mined, it was announced yesterday that the Ore Association had decided to restrict its production to 70 per cent. of the capacity of the mines, after having hitherto kept up a production of 85 per cent. The cause assigned is that the furnaces are calling for ores less promptly. The pig iron figures published several days ago show a decline in production, but not of sufficient volume to make itself felt so seriously in the ore trade. The product for the month was 1,250,700 metric tons, against 1,285,900 tons in August. This gives a daily rate of 41,482 tons, which is 134 tons a day less than in August. High water mark was touched in April with 42,847 tons. For the first nine months of the year there was a gain of 585,200 tons over the corresponding period of 1910.

It is expected that the Pig Iron Syndicate will fix its list prices very soon. However, the fact now transpires that there are still some points to be arranged between the syndicate and the Luxemburg-Lorraine group.

It is reported that the efforts begun some six weeks ago looking toward another organization of the bar trade are not making any visible progress; most of the works show little disposition to take part. In view of the fact that the bar trade continues very active it is already stated that another appeal will be made to the Steel Works Union to increase the allotments in this specialty. Some of the works are exceeding their allotments and paying the penalty of 20 marks per ton on the excess. Of course it does not pay them to do it, but they are willing to incur this heavy penalty in order to be able to apply, with some show of reason, for big allotments when the negotiations for renewing the Union are taken up within a few months. It is stated that a committee will be appointed at the end of this month to begin the preparation of the plans for renewing it upon its expiration at the end of next June.

According to late news from the hardware trade of the region about Remscheid and Solingen the effects of the war in the Mediterranean Sea are beginning to be pretty severely felt in some lines. Many orders have been canceled from both countries. At Solingen some of the shops have had to reduce their make by one-third, while at the railroad station large quantities of cutlery have been piled up waiting in vain for orders to be sent forward. The unfavorable business position in Russia is also felt in the hardware trade. It is difficult to make collections there.

THE IRON AND METAL MARKETS

This week there is a further batch of important company reports. The Bochumer Guss-stahl Verein reports gross profits of 6,248,000 marks, which compares with 5,420,000 marks last year; the dividend is 12½ per cent. on a capital of 30,000,000 marks, against 12 per cent. last year on 25,200,000 marks. On the other hand the Bismarckhütte of the Silesian district, a concern of considerable importance, has been compelled to pass its dividend, after having paid 7 per cent. last year. The directors say the reduction in earnings was caused partly by the bad state of the market for bars and pipes, partly by delay in getting building operations on the works completed. The annual stockholders' meeting of the Hasper Company called forth very optimistic remarks from the general manager concerning the state of business in the iron trade. He said the various mills were crowded with orders for bars, plates and wire to an extraordinary degree and he expected these conditions to continue for some time. He added that the Morocco situation and the Italian-Turkish war had been hitherto without effect on the iron trade.

Iron shares are again rising on the Berlin Exchange, after having lost heavily in September.

Cincinnati

CINCINNATI, OHIO, October 25, 1911.—(*By Telegraph.*)

Pig Iron.—There was some improvement in the total amount of iron sold in the past week. Among sales reported are 1400 tons, about equally divided between Northern and Southern grades, for a central Indiana melter. A southern Indiana consumer took 800 tons of No. 2 Southern foundry and 400 tons of Southern gray forge was contracted for by a Michigan manufacturer. Order books show an increase in the number of carload to 100-ton orders. Although prompt shipment prices are unchanged deliveries have been extended and No. 2 foundry is now obtainable for first half shipment on a basis of $10, Birmingham, and $13, Ironton. While the nominal quotation for malleable is $13.25 at furnace it is being sold in small quantities at $13, with deliveries extending into next year. About 1200 tons of malleable was bought by a central Ohio firm from a nearby furnace for delivery through the next six months. Inquiries include 600 tons of No. 2 Southern foundry and 400 tons of Northern for a central Ohio melter. From the same territory is one for 300 tons of No. 2 Southern foundry to be shipped this year. It is reported that 100 tons of Lake Superior charcoal iron was recently sold to a customer in the Birmingham district. There is no change in the Northern furnace situation, but it is stated that stocks are steadily declining in the Hanging Rock district. Based on freight rates of $3.25 from Birmingham and $1.20 from Ironton we quote, f.o.b. Cincinnati, as follows, for prompt shipment:

Southern coke, No. 1 foundry and 1 soft	$14.00 to $14.25
Southern coke, No. 2 foundry and 2 soft	13.25 to 13.75
Southern coke, No. 3 foundry	12.75 to 13.25
Southern coke, No. 4 foundry	12.50 to 13.00
Southern gray forge	12.50 to 13.00
Ohio silvery, 8 per cent. silicon	16.95 to 17.20
Lake Superior coke, No. 1	14.70 to 14.95
Lake Superior coke, No. 2	14.20 to 14.45
Lake Superior coke, No. 3	13.70 to 13.95
Basic, Northern	14.20 to 14.45
Standard Southern car wheel	25.50 to 25.75
Lake Superior car wheel	19.00

(By Mail.)

Coke.—Business is very dull and there is no demand for either furnace or foundry grades, with the exception of a limited call from small foundries that are purchasing on a hand to mouth basis. A few contracts have been made lately covering small quantities of coke for gas making and domestic purposes, and it is rumored that in one district purchasers were able to obtain 72-hr. coke at prices usually ruling for the 48-hr. product, although it is admitted that in such cases the coke was loaded for shipment and had to be moved promptly. Connellsville furnace coke is quoted at $1.50 to $1.55 per net ton at oven for prompt shipment, with Wise County and Pocahontas grades bringing about $1.60 to $1.65. Foundry coke in all three districts remains around $1.90 to $2 per net ton at oven for immediate shipment and contract business for both furnace and foundry grades is solicited at an advance of from 10c. to 25c. per ton.

Finished Material.—Mill agencies report a larger number of inquiries as a result of the present low prices prevailing, but state that contracts now being placed are for very small tonnages. Sheets are only in fair demand and steel bars are also moving a little slowly. The local warehouse quotation for steel bars is 1.60c. and for structural material 1.70c.

Old Material.—The market continues very weak and the maximum buyers' prices given below about represent their selling figures. A seller would also have a hard time obtaining the minimum quotation for any material that he might have to offer. No change in the situation is anticipated until pig iron prices are revised. The approximate prices paid by buyers, delivered in their yards in southern Ohio and Cincinnati, are as follows:

No. 1 railroad wrought, net ton	$10.00 to $10.50
Casting borings, net ton	4.50 to 5.00
Steel turnings, net ton	5.50 to 6.00
No. 1 cast scrap, net ton	9.25 to 9.75
Burnt scrap, net ton	6.25 to 6.75
Old iron axles, net ton	16.25 to 16.75
Bundled sheet scrap, gross ton	7.25 to 8.25
Old iron rails, gross ton	13.25 to 13.75
Relaying rails, 50 lb. and up, gross ton	20.75 to 21.50
Old car wheels, gross ton	10.00 to 10.50
Heavy melting steel scrap, gross ton	9.75 to 10.25

The Domhoff & Joyce Company, Cincinnati, which has represented the Stonega Coke & Coal Company in the exclusive sale of its foundry coke in Central Western territory since the ovens were put in operation about 15 years ago, has steadily widened its selling limits. The Chicago district was added when the Domhoff & Joyce Company opened its Chicago office, and about three years ago, when it opened an office in St. Louis, the territory was extended to the entire Western section. In all this time F. A. Goodrich & Co. retained Michigan, but on October 21 the Stonega Company advised the Domhoff & Joyce Company of the award of the exclusive selling agency for that locality and it is now the sole Western representative in the sale of Stonega and Roda foundry cokes. The new territory will be divided among the men traveling from the company's Chicago, Indianapolis and Cincinnati offices.

New York

NEW YORK, October 25, 1911.

Pig Iron.—The scale of inquiry and of actual buying has changed very little since last week. The market shows the sentimental effect of the decision to cancel the Great Northern Ore lease, but in some quarters the point seems to be overlooked that the status of the Hill ores will not change for three years. However, the reduction in ore freight rates on Minnesota roads is regarded as a factor having a more immediate bearing on the market since it will be effective on ore shipped in April, 1912, and will amount to 40 cents a ton of pig iron. Some further buying is reported by furnace castings manufacturers in New Jersey, and several other foundries on that side of the river have been in the market. There is also a fair amount of inquiry from New England, one Providence company's notification that it would buy for the first few months of 1912 bringing out very active solicitation for the business. Buffalo prices have been a trifle weaker and selling for the first quarter and even for the first half of 1912 is reported at prices ranging from $13 to $13.25 (according to delivery) at furnace for No. 2X. Rather sharp competition in the New England market is reported also in the case of Lebanon Valley foundry iron. In some cases canal charters from Buffalo to New York have been made as low as $1.50, which is lower than was possible in the last few weeks of the season in 1910. However, sales based on water shipment from Buffalo are about at an end for this year. Our quotations are as follows for Northern iron at tidewater: No. 1 foundry, $15.25 to $15.50; No. 2X, $15 to $15.25; No. 2 plain, $14.50 to $14.75. For Southern iron we quote $15 to $15.25 for No. 1 foundry and $14.50 to $14.75 for No. 2 foundry.

Cast Iron Pipe.—The market is dull and no public lettings of size have appeared since the announcement of the bids to be opened October 31 for the 7000 tons of 48-in. water pipe for Brooklyn. Car load lots of 6-in. continue to be quoted at $21 to $22 per net ton, tidewater, although prices were considerably shaded on a recent letting.

Finished Iron and Steel.—Practically no new projects have appeared since last week's report and practically none of the projects pending has been closed. Prices remain at the same basis, relatively firm, as

THE IRON AND METAL MARKETS

compared with those recently obtaining in other sections of the country. In fact, some work, even in plates, in lots of 50 to 75 tons, has gone for very good prices. It is admitted that the lower range of prices remains substantially undisturbed through the lack of single large orders. The volume of business in bar iron continues still below normal and there is nominally no change in price for refined iron. The award of 1500 tons for the Otis Elevator building in New York has been practically closed; it is expected that within a week's time the steel will be placed for the 1500-ton Seamen's Institute, Coenties Slip. The award of the 8000 to 10,000 tons of the Philadelphia Auditorium building rests between the Pennsylvania Steel Company and the American Bridge Company. The McClintic-Marshall Construction Company is understood to have the 4000 tons for the Washington postoffice and also 1600 tons for the New York Shipbuilding Company. A theatre on the Bowery, New York, requiring 800 tons is advanced as a new project and the Hotel Flanders, West Forty-seventh street, is to have a 700-ton addition. There is nothing new to report of other projects recently mentioned in this column. Quotations are: Plain structural material and plates, 1.36c. to 1.46c.; steel bars, 1.31c. to 1.36c.; bar iron, 1.20c. to 1.25c., all New York. Plain material and plates from store, New York, 1.70c. to 1.80c.

Old Material.—Scrap market conditions have grown worse in the past week so far as concerns prices of the descriptions most commonly in demand. There is a limit to rejections of material even in a market like the present, as consumption must go on even though at a low rate. In some directions material is taken with a little more freedom on contracts, but new buying is very light. Reports continue of very low prices in particular cases where material has been rejected and it is believed conditions can hardly get any worse in this respect. We quote dealers' prices, per gross ton, New York and vicinity, as follows:

Old girder and T rails for melting	$9.25 to	$9.50
Heavy melting steel scrap	9.25 to	9.50
Relaying rails	20.00 to	21.00
Rerolling rails	11.25 to	11.75
Iron car axles	19.50 to	20.50
Old steel car axles	15.00 to	15.50
No. 1 railroad wrought	11.00 to	11.50
Wrought iron track scrap	10.50 to	11.00
No. 1 yard wrought, long	10.25 to	10.75
No. 1 yard wrought, short	9.25 to	9.75
Light iron	3.75 to	4.25
Cast borings, clean	5.75 to	6.25
Mixed borings and turnings	4.75 to	5.25
Wrought turnings	5.25 to	5.75
Wrought pipe	8.50 to	9.00
Old car wheels	9.75 to	10.25
No. 1 heavy cast, broken up	9.75 to	10.25
Stove plate	7.75 to	8.25
Locomotive grate bars	7.75 to	8.25
Malleable cast	9.75 to	10.25

Ferroalloys.—Some sales of odd lots of spot ferromanganese are reported to have been made at $38, but it is believed that these odd lots are now about cleaned out. The recent inquiries of Western consumers are evidently not yet closed, as dealers here have been again approached to make new quotations. Ferromanganese for delivery next year is quoted at $38.50, Baltimore. Ferrosilicon is in little demand just now, and $64, Pittsburgh, is the quotation for the remainder of the year, with some sales reported to have been made at that figure.

Metal Market

NEW YORK, October 25, 1911.

The Week's Prices

Cents Per Pound for Early Delivery.

	Copper, New York.			Lead		Spelter	
Oct.	Lake.	Electrolytic.	Tin, New York.	New York.	St. Louis.	New York.	St. Louis.
19	12.50	12.50	41.70	4.25	4.15	6.35	6.20
20	12.50	12.50	42.00	4.25	4.15	6.35	6.20
21	12.62½	12.50	....	4.25	4.15	6.35	6.20
23	12.62½	12.50	42.00	4.25	4.15	6.35	6.20
24	12.62½	12.50	41.95	4.25	4.15	6.35	6.20
25	12.62½	12.50	42.05	4.25	4.15	6.35	6.20

A great deal of copper has been sold at higher prices, but all sellers have not supported the full advance made by others. Good quantities of lead have been sold as the result of recent price reductions. Spot tin is a little higher and is moving freely. Spelter continues to advance and is scarce.

Copper.—Large amounts of copper have been sold, but it is hard to estimate how much. The market advanced sharply last Thursday, within a day going up to 12.62½c. for electrolytic. The United Metals Selling Company made its price for electrolytic 12.50c. on Monday, however, and that is the market at the present time. During Friday and Saturday, while the nominal market for electrolytic was 12.62½c., some heavy sales were made, but reports were current of large transactions at 12.50c. Although sellers other than the United Metals Selling Company are now openly asking more than 12.50c. some of them are known to be making quiet sales at around the latter price. The market is very uncertain. The exports so far this month have been large, amounting to 16,886 tons. The London market was easy this morning with spot copper selling at £55 10s. and futures at £56 5s.

Pig Tin.—The feature of the pig tin market this week was the announced change in the rules of the London Metal Exchange which is to be effective on three months' contracts after November 1. Under the new rules deliveries on contracts are not confined to Straits and Australian brands and a schedule of values has been adopted which allows a seller to deliver any brand of pig tin and in case of delivering common tin where Straits or Australian has been ordered the sale is subject to a rebate of £7 per ton under the contract price. The action of the London Exchange has tended to steady the market, as it is believed that the new rule will be a factor in preventing future corners. Spot tin is decidedly more plentiful here, although it is selling at a higher price than a week ago. Some large sales to tin plate mills were made during the week. This morning pig tin was sold in New York at 42.05c. The London market was firm with both spot and futures selling at £191 12s. 6d.

Tin Plates.—The domestic demand for tin plates is seasonably dull, with 100-lb. coke plates offered at $3.64. Large sales for export are being made and the foreign price is unchanged at 13s. 7½d. for plates at Swansea, Wales.

Lead.—Lead is selling well and recent price reductions have made it apparent that many consumers were short of stocks. The market is reported to be slightly firmer in the West, where outside sellers were cutting prices somewhat. It is believed in some quarters that the recent action of the leading interest in making two sharp reductions in its quotations was prompted with a view to forestalling any reduction in the present lead tariff. We quote the New York market at 4.25c. and St. Louis at 4.15c.

Spelter.—Spelter is very firm and it is difficult to get, as many producers claim to be sold up and dealers are decidedly short. The market is growing stronger and the advance has extended to futures. The fact that in the European market spelter is higher than it has been in many years is influencing the situation here and consumers are excited over the fact that many dealers refuse to quote for deliveries beyond December. The London market is now around £27 10s., which is equal to about 6c. in New York, while the market here is around 6.35c. and in St. Louis 6.20c. The market is fluctuating from day to day and it is hard to make a dependable quotation.

Antimony.—The antimony market continues weak and there is no demand except from the jobbers, who are buying in small lots. Cookson's is now offered at around 8c.; Hallett's, 7.70c., and Chinese and Hungarian grades from 6.75c. up. Hallett's is said to be somewhat scarce.

Old Metals, New York.—Business continues very quiet, with dealers' selling prices nominally unchanged, as follows:

	Cents per lb.
Copper, heavy and crucible	11.75 to 12.00
Copper, heavy and wire	11.37½ to 11.50
Copper, light and bottoms	10.50 to 10.75
Brass, heavy	8.00 to 8.25
Brass, light	6.50 to 6.75
Heavy machine composition	10.25 to 10.50
Clean brass turnings	7.75 to 8.00
Composition turnings	8.50 to 9.00
Lead, heavy	4.15
Lead, tea	3.90
Zinc, scrap	4.50

Chicago

OCTOBER 23.—Although the market activity in metals has shown no great increase, a somewhat stronger tone prevails as evidenced by slightly higher prices for copper and tin and the scarcity of spelter for spot shipment. Improvement is also noted in the prices of old metals. We quote at Chicago: Casting copper, 12.37½c. to 12.50c.; Lake, 12.62½c. to 12.75c., in carloads, for prompt shipment; small lots, ¼c. to ⅜c. higher; pig tin carloads, 43c.; small lots, 45c.; lead, desilverized, 4.25c.

to 4.30c., for 50-ton lots; corroding, 4.50c. to 4.55c. for 50-ton lots; in carloads, 2½c. per 100 lb. higher; spelter, 6.25c. to 6.30c.; Cookson's antimony, 9.25c., and other grades, 8.25c. to 8.75c., in small lots; sheet zinc is $8, f.o.b. La Salle, in carloads of 600-lb. casks. On old metals we quote for less than carload lots: Copper wire, crucible shapes, 10.75c.; copper bottoms, 9.62½c.; copper clips, 10.25c.; red brass, 9.75c.; yellow brass, 7.75c.; lead pipe, 4c.; zinc, 4.25c.; pewter, No. 1, 26c.; tinfoil, 32c.; block tin pipe, 36c.

St. Louis

OCTOBER 23.—The lead market has shown a little improvement and the quotation now stands at 4.15c. and quite firm. Spelter eased off during the week, but is firming up again and is now quotable at 6.20c. Tin is up again to 42.45c. Lake and electrolytic copper are both quotable at 12.85c. Cookson's antimony is 8.35c. In the Joplin market there has been considerable activity in blende, the price for zinc sulphide setting the high mark for the year. The assay price reached $45.68 per ton on the 60 per cent. zinc content basis. The top price paid was $49.18 per ton, with $1 premium for low lead content. Open market bids reached $45 per ton, assay basis, with choice lots bringing $48. One lot which has been held for high prices, 3000 tons in all, was sold at a private price. Calamine continued strong at $24 to $25 per ton on the 40 per cent. metallic content basis, the top grades bringing $32 per ton. Lead ore sold at $54 to $56 per ton. On old metals we quote for less than carload lots: Light brass, 4c.; heavy brass and light copper, 8c.; heavy copper and copper wire, 9c.; zinc, 3c.; lead, 3.25c.; pewter, 20c.; tinfoil, 29c.; tea lead, 3c.

Iron and Industrial Stocks

NEW YORK, October 25, 1911.

Among the industrial stocks interest has centered in the past week in United States Steel common and the Great Northern Ore certificates. The latter, which were at 50 on Wednesday, October 18, declined to 40 the next day on the announcement of the expected cancellation of the Steel Corporation lease of the Hill or Great Northern iron lands. There was a slight recovery later and on Tuesday, October 24, the certificates closed at 41½. Steel common, which had been 60⅞ on October 18, dropped to 57⅝ on the following day, but rallied later. The closing quotation on Tuesday, October 24, was 59¾. The range of prices on active iron and industrial stocks from Wednesday of last week to Tuesday of this week was as follows:

Allis-Chalm., com...	2⅜- 3	Pressed Steel, com.	28½- 29
Allis-Chalm., pref...	9¾- 11¾	Pressed Steel, pref.	95
Beth. Steel, com.	28 - 28¾	Railway Spring, com.	27 - 27½
Beth. Steel, pref....	55 - 56	Republic, com.	22 - 23
Can. com.	97⅛- 101½	Republic, pref.	84 - 85
Can, pref.	85½- 86¾	Sloss, com.	40
Car & Fdry., com...	45½- 50½	Pipe, com.	12½- 13¾
Car & Fdry., pref...	113 -115	Pipe, pref.	42 - 43½
Steel Foundries	29 - 30½	U. S. Steel, com....	57⅝- 60⅞
Colorado Fuel.....	27 - 28	U. S. Steel, pref...	108⅝-109¾
General Electric...	149 -151½	Westinghouse Elec..	63⅜- 64⅞
Gr. N. Ore Cert....	40 - 50	Am. Ship, pref.....	80 - 86¼
Int. Harv., com....	103⅜-109	Chi. Pneu. Tool....	45 - 46
Int. Harv., pref.....	120½	Cambria Steel.....	43⅜- 44½
Int. Pump, com.....	27 - 27¼	Lake Sup. Corp.....	26¼- 27½
Int. Pump, pref.....	81½- 82	Crucible Steel, com.	101⅜- 105⅝
Locomotive, com....	33½- 35	Crucible Steel, pref.	76 - 77½
Locomotive, pref....	102 -103⅜	Harb. Wk. Ref., pref.	97 - 99
Nat. En. & St., Pref	93¾		

Dividends Declared

The National Lead Company, regular quarterly, 1¾ per cent. on the preferred stock, payable December 19.

The Cambria Steel Company, regular quarterly, 1¼ per cent., payable November 15.

The McCrum-Howell Company, regular quarterly, 1¾ per cent. on the preferred stock, payable November 1.

Henry R. Worthington, Inc., subsidiary of the International Steam Pump Company, regular semi-annual, 3½ per cent. on the preferred stock, payable November 1.

Pennsylvania Steel Company, regular semi-annual, 3½ per cent. on the preferred stock, payable November 1.

The Buffalo Forge Company, Buffalo, N. Y., has recently furnished the Bethlehem Steel Company the forced-draft equipment necessary to take care of the increased size of its Saucon plant. The contract calls for a 200-in. standard Buffalo steelplate fan, direct connected to a 10 x 20-in. horizontal side-crank Buffalo steam engine. About 6 years ago, when this plant was built, six similar Buffalo outfits were installed by the company.

Pittsburgh Foundrymen's Association

Eliot A. Kebler, chairman of the Programme Committee of the Pittsburgh Foundrymen's Association, has made the following announcements for the winter and spring meetings of this organization:

November meeting—Prof. J. J. Porter, "Quality of Pig Iron, Its Independence of Chemical Composition and Its Relation to Methods of Manufacture."

December meeting—Brooks J. Goodin, "Coke Districts;" W. E. Weinn and Harvey Cory, "Coal Washing Machinery for Coke Manufacture."

January meeting—"Practical Demonstration of Different Methods of Welding." Meeting to be held in the foundry of the Carnegie Technical Schools."

February meeting—Joint meeting with the Pittsburgh Foundry Foremen's Association. Subject: "Brass."

March meeting—Subject: "Steel."

April meeting—Subject: "Mechanical Appliances in the Foundry."

May meeting—Subject not assigned.

June meeting—Dr. Richard Moldenke, secretary of the American Foundrymen's Association, and H. E. Field, of Pittsburgh, "Molding Sands." This will be the annual meeting of the Pittsburgh Association.

All-Steel Passenger Cars.—The Long Island Railroad Company has just ordered 40 all-steel cars for delivery in 1912, consisting of 15 coaches for steam service, 20 motor and 5 combination baggage and passenger cars. They will be built by the American Car & Foundry Company, and the estimated cost is $500,000. Ninety of the 100 steel cars ordered last year have been received. With the equipment now under construction, this railroad will have a total of 455 all-steel passenger and mail cars, comprising more than half its entire equipment, and representing an outlay of over $7,500,000. If its earnings warrant further large expenditures, at the end of six years the Long Island will have in operation only cars of steel construction for passenger service. All recent orders for new equipment indicate that the transportation systems of the United States are relegating wooden cars to the scrap heap. The Pennsylvania was the first railroad in this country to adopt the all-steel passenger car. Since June, 1900, over 2000 such cars have been placed in its service. Aside from being non-collapsible and fireproof, another valuable feature of the steel car is a central box girder 24 in. wide by 19 in. deep, extending the entire length of the car, which prevents telescoping in collisions.

Machinists' Strike Benefits.—The biennial report of the president of the International Association of Machinists shows that in the two years ending June 30, 1911, the association paid in strike benefits $585,400. From April 1, 1891, to June 30, 1911, the amount paid for strike benefits was $2,410,405. In June, 1911, the membership according to the report was 70,036. However, the total number voting for president at the recent election was only 28,621. If the report of membership is correct, the election, which resulted in the overthrow of the last administration, brought out an exceedingly light vote.

Foreign manufacturers are taking an active interest in the visit of members of the Society of Automobile Engineers to Europe. Many of them have expressed a willingness to open their establishments to the inspection of the party which leaves New York on the Mauretania November 1. The latest invitation is from the famous house of Lemoine in Paris, perhaps the leading manufacturer of motor vehicle axles and forgings in Europe, offering an inspection of the various processes of axle construction during the stay of the members in Paris.

The Society of Automobile Engineers has issued its list of members showing a total of 914, of whom 720 are full members and 100 associate members. Henry Souther, president of the Henry Souther Engineering Company, Hartford, Conn., is president. The headquarters of the society are at 1451 Broadway, New York; Coker S. Clarkson, secretary and general manager.

The Ready Tool Company, Bridgeport, Conn., has purchased the entire business of the M. B. Hill Mfg. Company, Worcester, Mass., maker of milling machine and lathe dogs.

Personal

A cablegram from Peking says that Charles M. Schwab has started to return to the United States and that the rebellion has prevented the completion of his negotiations with the Chinese government for battleship work.

Jennings S. Cox, Jr., Santiago de Cuba, general manager of the Spanish-American Iron Company, and Pedro Aguilera, also connected with the company, were taken by a party of bandits near one of the Cuban iron ore properties October 13 and held for a ransom. Mr. Cox was released in order to secure the money. Later a party of armed men captured the bandits and released Aguilera.

The name of the town of South Sharon, Pa., has been changed to Farrell in honor of President James A. Farrell, of the United States Steel Corporation.

Charles F. Huhlein, for 22 years general manager and for eight years also vice-president of B. F. Avery & Sons, Inc., Louisville, Ky., has been elected president to succeed the late George C. Avery. William Black, secretary of the company, who has been connected with it for 18 years, has been elected a director and vice-president. Thomas C. Humphries, auditor, has been elected secretary.

Edward B. Busby, formerly with the Electric Welding Products Company, Cleveland, Ohio, has been made sales manager of the Anderson Forge & Machine Company, Detroit, Mich.

C. D. Chasteney has resigned his position as sales manager of the De Laval Steam Turbine Company, Trenton, N. J., having acquired an interest in the Turbine Equipment Company, 30 Church street, New York, which represents the De Laval Company in New York State, parts of New Jersey and Connecticut. He has been with the De Laval Steam Turbine Company since the organization of the American company over 10 years ago.

J. J. Wood, factory manager of the Fort Wayne Electric Works, Ft. Wayne, Ind., has returned from a three months vacation in Europe. While abroad he secured the American rights for the manufacture of a French electrical ice-making machine. It will be redesigned and built at the Ft. Wayne works.

Alexander E. Outerbridge, Jr., will present a paper at a meeting of the various sections of the Franklin Institute, Philadelphia, on Thursday evening, October 26, on "A Practical Application of Fluorescence in Testing Oils for Industrial Purposes."

Andrew Carnegie returned to New York from Scotland October 20.

A. R. Roy, of the Swedish Iron & Steel Corporation, 12 Platt street, New York City, read a paper on "Swedish Steels" before the New York Railroad Club on the evening of October 20.

At the annual meeting of the Republic Iron & Steel Company, October 18, the following were elected directors for the term expiring in 1914: Edward J. Berwind, Harry Bronner, Charles G. Gates and Grant B. Schley. Mr. Gates succeeds his father, the late John W. Gates.

George W. Greene, formerly Pittsburgh manager of the American Bureau of Inspection and Tests, has severed that connection and is now associated with the Hildreth-Jones Company of Chicago and Hildreth & Co. of New York, in the capacity of mechanical engineer.

E. A. Johnson, Eastern sales manager for the Duff Mfg. Company, has been appointed general sales manager with headquarters at the company's main office in Pittsburgh. C. A. Methfessel has been appointed Eastern sales manager to succeed Mr. Johnson, with headquarters at the company's office, 50 Church street, New York.

George C. Smith, for about 10 years in charge of auxiliary organizations of the Westinghouse interests at Pittsburgh, has resigned, and has been succeeded by Calvert Townley, assistant to the president of the Westinghouse Electric & Mfg. Company. Mr. Smith will now give his entire time to other enterprises in which he is interested. He is a member of the engineering and construction firm of James Stewart & Co., and also the New York representative of the Canadian Syndicate, Ltd., of Montreal and Toronto.

W. P. Snyder, Jr., has been appointed assistant to President W. P. Snyder, Sr., of the Shenango Furnace Company, Oliver Building, Pittsburgh. He is now on a trip to upper Lake ports on the new ore boat James M. Schoonmaker, recently launched.

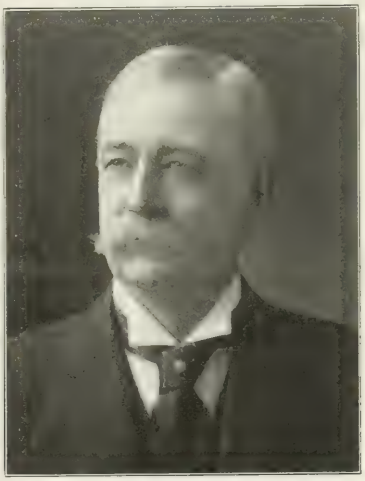
C. P. Wadsworth, for 23 years chief engineer of the W. J. Rainey Coke Company in the Connellsville coke region, has resigned, effective November 1. He has not made plans for the future.

Obituary

A. R. Treadway

Augustine R. Treadway, widely known as one of the oldest and leading hardware manufacturers in the country, and until recently president of the Peck, Stow & Wilcox Company, died from heart failure at his home in Cleveland, Ohio, October 16, aged 75 years. He was born in New Haven, Conn., from old New England stock. After leaving the public schools he went to Philadelphia, where he was employed as a clerk in a business conducted by relatives. On becoming of age he returned to New Haven and engaged in the stove, furnace and steam heating business in partnership with an uncle under the firm name of Treadway & Warner, later becoming L. & A. R. Treadway. He was actively interested in this business for some 20 years. About 1873 he became manager of the Aetna Nut Company, Southington, Conn. That company was in bad financial condition at the time, and he succeeded in putting it on its feet.

In 1879 Mr. Treadway moved to Cleveland and organized a hardware manufacturing concern under the name



A. R. TREADWAY

of Willcox, Treadway & Co., his associates being William Willcox, M. B. Willcox, S. W. Sessions, I. P. Lamson and Thomas H. Lamson. Mr. Treadway was manager of the business of the firm which later was incorporated as the Willcox & Treadway Company. In 1881 it was consolidated with the Peck, Stow & Wilcox Company, which at the time was an old-established concern engaged in the manufacture of hardware and tools. In addition to its Cleveland plant this company has plants in Southington, Conn., where its main offices are located, and at Plantville and East Berlin, Conn., and offices and warehouses in New York City. On the consolidation Mr. Treadway became manager of the Cleveland works of the company, and in a short time was elected vice-president. In 1899 he became president, which position he retained until last July, when he resigned because of advancing years and was succeeded by his son, Lyman H. Treadway, who at the time was vice-president and manager of the Cleveland

works. He was also a director in the Union Rolling Mill Company, Cleveland, and was associated with three Cleveland banks as director. He was a member of the Cleveland Chamber of Commerce. He leaves a widow, three sons and a daughter. His sons are Lyman H. Treadway and Francis W. Treadway, of Cleveland, the latter recently lieutenant-governor of Ohio, and Charles F. Treadway, of New Haven, Conn.

Robert Mather

Robert Mather, chairman of the board of directors of the Westinghouse Electric & Mfg. Company, died at his residence in New York City, of peritonitis, October 24, aged 52 years. He was born at Salt Lake City, Utah. At the age of 13 he entered a factory, working three years to learn how telegraph instruments and switchboard apparatus were made. Later he obtained his first railroad experience in the office of the master mechanic of the Chicago, Burlington & Quincy Railroad. While working there he managed at nights to prepare for college, and in 1882 he was graduated from Knox College. Three years later, still studying nights while he worked by day at railroading, he obtained his master's degree at the college. From 1882 to 1885 he worked in the treasurer's office of the Chicago, Burlington & Quincy, devoting his spare time to the study of law, and in 1886 he was admitted to the Illinois bar. In 1889 he became local attorney at Chicago for the Chicago, Rock Island & Pacific Railroad, and in 1902 he was made general counsel for the road, becoming its president in 1904. In January, 1909, at the time of the reorganization of the Westinghouse Electric & Mfg. Company, he was elected chairman of its board of directors and thereupon severed his railroad connections. At the time of his death he was director of the La Grange Mining Company, S. S. McClure Company, Equitable Life Assurance Society, Mercantile Trust Company, Havana Electric Railway Company, Westinghouse Lamp Company, Canadian Westinghouse Company, R. D. Nuttall Company, Niagara, Lockport & Ontario Power Company, Perkins Electric Switch Mfg. Company, Bryant Electric Company, National Bank of the Republic, of Chicago, Chicago, Rock Island & El Paso Railway Company, and general counsel of the Chicago & Alton Railroad Company.

The Connellsville Coke Trade

The condition of the Connellsville coke trade is reported as follows by the Weekly Courier, Connellsville, Pa.:

The Connellsville coke trade figures for last week indicate that there is a slight falling off in production and shipments, but not a sufficient one to be significant. In the face of this fact is the further information that the active oven list is increasing, slowly to be sure, but positively as a fact. The merchant coke trade of the Connellsville region is being murdered by the assassins of insane competition. So violent has become their price-cutting competition that consuming interests have ceased to contract, finding better terms in the open market. Production last week showed a decrease of 4138 tons as compared with the week before, the total being 310,205 tons against 314,343 tons. The output of the furnace ovens fell off 2700 tons, the total being 176,466 tons as compared with 179,166 tons the preceding week. The output of the merchant ovens was 133,739 tons as against 135,177 tons, a decrease of 1438 tons. A total of 26,166 ovens was in operation. The number of active ovens was increased by the firing of 169 ovens at Low Phos, and decreased by the blowing out of 2 ovens at Burchinal, 10 at Katherine, 25 at Washington No. 1 and 25 at Washington No. 2, making a net increase of 107 ovens.

To Discuss Relation of Government to Business

The relation of government to business is to be made the general topic of a dinner meeting on Friday evening, November 10, at the Hotel Astor, New York City, of the Academy of Political Science in the City of New York. The guests of honor are Judge Elbert H. Gary and Attorney-General George W. Wickersham. Robert Mather, whose sudden death is announced elsewhere on this page, was to be one of the speakers, the list of which includes Senator Albert B. Cummins, of Iowa, John Hays Hammond and George W. Perkins.

The dinner is one of the sessions of the annual meeting of the Academy. The first session takes place at Columbia University, 2.30 p. m., November 10, and its topic is the improvement of labor legislation. Those to discuss the question include P. Tecumseh Sherman, former commissioner of labor, New York; Miles M. Dawson, Prof. Henry R. Seager, of Columbia University; Prof. Edward T. Devine, Columbia University; John Calder, Remington Typewriter Company; Mrs. Florence Kelley, National Consumers' League, and Dwight W. Morrow, of the New York Bar. A session to discuss social efficiency in business is to be held at Columbia University, 10.30 a. m., November 11. The speakers include Prof. Irving Fisher, Yale University; Raynal C. Rolling, assistant general solicitor, United States Steel Corporation; Dr. G. W. Price, New York State Factory Investigating Commission, and Mrs. John Hays Hammond. The last session, 2.30 p. m., November 11, at Columbia University, is to consider financial facilities for wage earners.

Among the trustees of the Academy are President A. Barton Hepburn, Chase National Bank; Thomas W. Lamont, of J. P. Morgan & Co., and President Frank A. Vanderlip, National City Bank, New York, and the personnel of the advisory council is President Nicholas Murray Butler, Columbia University; J. Pierpont Morgan, Senator Elihu Root and Francis Lynde Stetson.

Correction.—The Titanium Alloy Mfg. Company, 1225-1226 Oliver Building, Pittsburgh, Pa., calls attention to an error which appeared on page 849 of *The Iron Age* of October 19. The statement is there made that "during 1910 the quantity of rails treated with titanium was 326,316 gross tons." The word "rails" should have read "steel," as this tonnage refers to the entire quanuty of Bessemer, basic open-hearth and acid open-hearth steel treated with titanium.

The opening session of the American Mining Congress, at the Hotel La Salle, Chicago, Tuesday afternoon, October 24, witnessed a first day enrollment of nearly 300. The attention of this, the fourteenth annual, meeting is to be given in a great measure to matters pertaining to coal mining. The programme, however, is exceedingly diversified and will feature addresses by John Hayes Hammond on "Mining as an Investment"; Walter L. Fisher, Secretary of the Interior, on "The Alaskan Situation" and President Taft on "The Federal Government and the Mining Industry." A number of other men of national reputation are appointed to present subjects for discussion. The final meeting will be held on Saturday evening at which the President will speak.

A notably quick shipment of an equipment of pumps has been made by the Blake & Knowles Steam Pump Works, 115 Broadway, New York. A fire recently destroyed the pump house with contents of the Atlantic Creosoting & Wood Preserving Works, Norfolk, Va., putting the entire plant out of commission and subjecting the company to a large daily loss owing to unfilled contracts. The pumping equipment, consisting of one carload, was shipped in three days after the order was placed. It comprised vacuum pumps, pressure pumps and tank pumps for handling creosote oil and also a large air compressor.

The Hess-Bright Mfg. Company, Twenty-first street and Fairmount avenue, Philadelphia, Pa., maker of ball bearings, states that it has been advised by the Deutsche Waffen und Munitionsfabriken that the DWF bearings have been awarded the Gran Premio at the Turin Exposition, now being held at Turin, Italy, this being the highest distinction. The Hess-Bright Company is importer for the German company.

The Pollak Steel Company, Cincinnati, announces that it succeeds the Block-Pollak Iron Company in the manufacture of open hearth steel railroad car and locomotive axles, also special heat-treated axles and forgings for cars and locomotives.

To Cancel the Hill Ore Lease

The Steel Corporation Will Also Reduce the Rail Rate on Ore

The announcement has been made in the past week on the authority of the United States Steel Corporation, though no officer of the corporation is directly quoted, that it will cancel its lease of the Great Northern iron ore properties and that it will reduce the freight rate on iron ore carried by its two Minnesota range railroads to 60 cents a ton. As indicated in the exhaustive and timely article, "The Great Northern Iron Ore Lease" which appeared in *The Iron Age* of October 19, page 854, the lease may be terminated on January 1, 1915, provided notice is given two years before that date. The intimation which the Steel Corporation has now given comes more than 14 months in advance of the specified time and is to be construed therefore as having a further purpose than that of simple notification. In view of the publicity recently given to the Government's attitude toward the Steel Corporation and to the very large proportion of Lake Superior ores controlled by the corporation, the announcement of the decision to cancel the ore lease is given special significance. It has been interpreted by some writers in the past week in the light of the following extract from the "Summary of the Report of the Commissioner of Corporations on the Steel Industry," by Herbert Knox Smith, of which Part I was published in July last:

The Steel Corporation's Control of Ore

The system of leasing ore mines, as employed in the Lake region, is important in this connection. A very large part (approximately two-thirds in 1910) of the corporation's total holdings in the Lake region is held by lease. Frequently there is no initial investment in such leaseholds, and even where a bonus is paid it is usually small, while the minimum tonnage on which royalty must be paid, whether mining operations are conducted or not, is generally unimportant. The Hill lease is, of course, a very marked exception in both respects.

It will be seen, therefore, that this ore-leasing system, where there is no limit placed on the number of leases that can be combined under a single interest, greatly facilitates the gathering in by a great concern like the Steel Corporation of a vast amount of ore reserves, far in advance of any commercial need for them. This not only prevents others from getting such property but also secures to such a concern the benefit of any appreciation in value which may come about either from natural causes or as a result of this very concentration of ownership. Obviously, a system which thus lends itself to such marked concentration of ore property for many years in advance (a common term of lease being 50 years), at a comparatively small cost, involves questions of the highest public importance. It might be said that the lease system as thus applied in the Lake ore region really affords an opportunity for a wealthy interest to attempt a corner in ore reserves on what is, in effect, a margin basis. Of course, in such extensive acquisitions there is a decided speculative risk, just as in similar efforts to control commodity markets, particularly the possibility of the discovery of available deposits elsewhere or new methods of mining which may render what are now non-available ores available for present commercial purposes.

The dominating position in the ore industry enjoyed by the Steel Corporation through this great ownership of ore reserves is hightened because of its very marked degree of control of the transportation of ore in the Lake Superior district. The corporation owns two of the most important ore railroads, the Duluth & Iron Range Railroad and the Duluth, Missabe & Northern Railway. The ore rates on these railroads are about 1 cent per ton-mile. Their operating expenses are very low, that of the Duluth, Missabe & Northern in 1910 being below 30 per cent. of gross earnings as against an average of 66 per cent. for all the railroads of the country. The net earnings of these ore railroads, which are chiefly from the ore traffic, are phenomenal. This has the practical effect of reducing the Steel Corporation's net cost of ore to itself at upper Lake ports and, on the other hand, of increasing that cost to such of its competitors as are dependent upon the corporation's railroads for transportation.

Hence, not only on account of its great holdings of ore but also on account of these peculiar advantages enjoyed in the transportation of the ore the Steel Corporation occupies an extremely commanding position in the iron and steel industry. Indeed, in so far as the Steel Corporation's position in the entire iron and steel industry is of monopolistic character, it is chiefly through its control of ore holdings and the transportation of ore.

The High Ultimate Royalties on Hill Ore

Leaving out of consideration the time chosen for the announcement, one of the chief reasons for the decision to cancel the Hill ore lease is no doubt the conclusion reached that it imposed a burden of cost that should not be borne longer than necessary. The article in last week's *Iron Age* brought out very plainly the high royalties which would have to be paid in the later years of the lease. As has been repeatedly stated, any reduction in freight rates on the Minnesota ore rates would be added to the royalty in the case of ore mined by the Steel Corporation under the Great Northern lease. The final paragraph of the article referred to showed that the Steel Corporation in 1946 would pay a royalty amounting to $2.176 per ton on a 59 per cent. ore, provided the freight rate remained at 80 cents. If the freight rate from the mine to upper Lake dock should be reduced at any time from 80 cents to, say, 50 cents the royalty would go to $2,467, or a charge for royalty alone of more than $5 a ton on steel made from this ore.

It has been stated by the Hill interests in the past week that no intimation had yet been received by the Ore Trustees of the Great Northern Railway that the Steel Corporation lease would be terminated. It is to be expected that when the formal notification is made an official statement will be made on behalf of the Steel Corporation.

As was shown in our article of last week the minimum to be produced by the Steel Corporation in 1911 from the Great Northern properties is 3,750,000 tons at a royalty rate of 98.6 cents a ton. It was shown also that the deficit on the minimum requirements of the lease amounted to 5,683,191 tons at the end of 1910. In order to make this up in 1911 and 1912, the corporation would need to mine about 7,000,000 tons of Hill ore (or one-third its total production) in each of the two years. In the three years the lease will still run the minima of the Steel Corporation will be 4,500,000 tons, 5,250,000 tons and 6,000,000 tons, respectively. On the last-named amount, which must be mined in 1914, the royalty will be at the rate of $1.088.

The Reduction in Ore Freights

As to the reduction on ore freights, it is stated that it will be effective in thirty or forty days, and the conclusion is that it will apply to shipments in 1912. As this reduction by the Steel Corporation will be followed by a reduction on the Great Northern freight rate to Superior, the royalty on the Steel Corporation's Great Northern ore in 1914 would amount to $1.288 a ton. The present rate on iron ore is 80 cents per gross ton from all Mesaba Range points to Duluth. The rate covers all shipping points on the Duluth, Missabe & Northern Road and all the Mesaba Range points on the Duluth & Iron Range Railroad. From Tower on the Vermilion range, on which all the shipping mines but one belong to the Steel Corporation, the rate is 90 cents to the docks at Two Harbors, and from Ely it is $1. When the proposed change takes effect there will be a flat rate of 60 cents a ton from all points on the two ranges.

The question arises whether the 20 cents reduction in ore freights will be acceptable to ore shippers and to those officially charged with supervision of railroad rates. The last effort to secure a reduction in the rate on Minnesota iron ore from the mine to Lake Superior dock was through a case brought before the Minnesota State Railroad Commission. This case was taken into the courts and it was held that the carrying of lake ores was interstate commerce; that the Minnesota ore road was but one link in the chain of transportation, which included also the Lake haul and that by rail from lower Lake port to the blast furnace. Under this decision it followed that the State Railroad Commission had no jurisdiction over the ore rate.

Railroad Equipment Orders.—The Baltimore & Ohio Railroad's order for 4500 freight cars, which has been under consideration for weeks, is about to be placed. The Pennsylvania is in the market for 300 tank cars and has ordered 35 coaches and 17 combination passenger cars from the Pressed Steel Car Company and 30 coaches from the American Car & Foundry Company. The new York Central has ordered 2000 steel underframe box cars from the American Car & Foundry Company and 30 Pacific-type locomotives from the Baldwin Locomotive Works. The Southern Railway is inquiring for 500 all steel gondola cars and 50 steel underframe box cars. The Canadian Northern Railway Company has ordered 1000 wooden box cars from the Nova Scotia Car Company.

Uses of Blast Furnace Gas

Results in the Open Hearth Furnace, When Mixed with Coke Oven Gas

In his dissertation for the degree of doctor of engineering, presented at the University of Breslau, Rudolf Buck discussed at length the "Uses of Blast Furnace Gas." After a brief historical introduction he takes up the subject under the following headings:

1. The uses of blast furnace gas in well known ways, with special consideration of the latest developments.
2. The blast furnace gas burner.
3. The use of blast furnace gas in the foundry.
   (a) In pipe foundries.
   (b) In ordinary foundries.
4. Its use in open hearth furnaces.
5. Its use for the heating of coke ovens.

Especial stress is laid on the suitability of blast furnace gas for use in the foundry, for drying molds of all kinds, heating ladles, etc. Many tests have been made of the gas alone, and when mixed with coke oven gas, and also of hot air from the blast furnace stoves. Coke oven gas, because of its large percentage of hydrogen, is not suitable for foundry use. For instance, in drying a pipe mold the lower part is well dried, but the water produced from the hydrogen when burnt condenses in the upper part and keeps it moist. Because of this, coke oven gas either alone or mixed with blast furnace or producer gas should not be used for foundry work. Hot air from the stoves is not economical, as the blast furnace gas can be burned more profitably directly in the foundry. Waste gases from the stoves and boilers are not suitable, because of the great variation in temperature.

Methods of Cleaning the Gases

The composition of the blast furnace gas is briefly considered, and then its purification is taken up. Emphasis is laid upon dry cleaning, brought about by sudden changes in the direction of the gases, and by reducing the velocity by increasing the area of the pipes. The so-called dust pockets are for this latter purpose; they also serve to uniformly lower the temperature. It is not impossible that the change in volume caused by the drop in temperature has an important influence on removal of the flue dust. The most suitable construction for these dry purifiers has not yet been decided upon, many different types being experimented with. The main thing is to build them with the greatest possible diameter in order to bring about the greatest possible lowering in velocity.

An example may be taken from practice. The dry cleaner is 65 ft. 7½ in. high and 27 ft. 10½ in. diameter. The incoming gas has an average velocity of 19.7 in. per second, and the highest value is 31.5 in. per second. The dust was from 2.6 to 3.5 grains per cu. ft. and the temperature 390 deg. F. The gas left with a temperature from 170 to 212 deg. F. and from 0.65 to 0.78 grain of dust per cu. ft. This corresponds to 60 deg. lowering of the amount of dust. It is impossible, however, to use this roughly cleaned gas direct in gas engines. To-day gas cleaning is divided into rough and final cleaning. The first is divided into dry and wet rough cleaning. The latter, that follows the rough cleaning, is divided into wet cleaning in fans or centrifugal washers and dry cleaning with filters and fans. The most important thing about wet cleaning is that it is necessary to reduce both the dust and the water as low as possible and also to cool the gas to a minimum. These subjects are dealt with briefly, the author favoring centrifugal washers for removing the very fine dust. He complains, however, of the cost of effecting wet cleaning by whatever system.

Advantages of Cleaned Gas

The advantages of cleaning the gas are given as follows:

1. The troubles brought about by pipes being stopped up with flue dust are either removed entirely or reduced to a minimum.

2. The volume of the gas is greatly reduced, whereby the pipes may be made smaller, thus bringing about lower erecting costs.

3. The steam in the gas is condensed and separated.

4. The gas is more easily lighted and burnt.

5. The heating value of the gas is increased and its efficiency greater for any kind of use.

6. The operation of stoves and boilers is more regular.

7. The cost of cleaning pipes and tubes is lower and the furnace will not have to stop so often.

8. The cleaning of the stoves, bringing about loss of heat, will not be necessary so often and the unfavorable action on the brick work through cooling and cleaning will be less

9. The life of the whole apparatus will be considerably increased and the cost for material will be less.

10. The heating surfaces in the stoves being cleaner the efficiency will be greater. This means saving of gas.

11. The operation of the gas engines will be more certain.

12. Electrical energy can be produced by means of gas engines and the excess over requirements can be sold to neighboring works or communities.

13. Thorough final cleaning of blast furnace gas makes its use possible in open hearth furnaces, in mixers, for drying operations, in foundries, for heating furnaces in rolling mills, etc.

14. It can be used to heat coke ovens, the dearer coke oven gas being sold in large part for lighting purposes.

These advantages are not brought about by removing the dust only, but also by cooling and reducing the water to the lowest possible amount. The drying of the gas can hardly be effected except by vigorous cooling, when the maximum amount of steam is condensed and separates as water. Practice has shown that the loss of heat through cooling is not so great as the poor efficiency brought about by wet gas.

The use of blast furnace gas in engines, stoves and boilers is briefly taken up, and then comes an important section on burners. These burners are designed to give as complete combustion of the gas as possible, and flames of various shapes to suit operations in the foundry. This section of the paper is illustrated with drawings of the burners and photographs of the flames. It is followed by a well-illustrated section on the use of the gas in the foundry.

Blast Furnace Gas in the Open Hearth

Producer gas can be replaced by coke oven gas, or better still by a mixture of coke oven and blast furnace gas. The mixture should be in such proportion that the gas is from 179 to 213 B.t.u. The amount of gas necessary for the operation, which depends on the size of the furnace and the stage of the process, is easily regulated by valves in the separate gas pipes. Tests have been made at Friedrich-Wilhelms Hütte in Mülheim-on-the-Ruhr, and for over two and a half years two acid furnaces of 12 to 15 tons have been heated successfully. The process can be carried out with blast furnace gas alone, but it takes so long that the quality of the steel can easily be impaired. With the use of the mixed gases, on the other hand, the operation is not only quite as successful as with producer gas, but is carried on more quickly and to better advantage. A mixture of coke oven and blast furnace gas in about the proportion of 1 to 4 is necessary, so that the coke oven gas is added to the other before coming to the reversing valve.

In Friedrich-Wilhelms Hütte the blast furnace gas is brought from the furnaces in an elevated pipe line 23.6 in. in diameter; the coke oven gas comes in an underground pipe line 9.8 in. in diameter. The arrangement of the furnace and the size of ports and checkers are the same as when using producer gas. Details are given of the six test heats, illustrated by diagrams.

In Test No. 1 the mixture was in the ratio of 1 to 4 and the average heating value of the mixture was 213 B.t.u. per cu. ft. Its analysis gave 5.4 per cent. CO_2, 0.2 per cent. O, 18 per cent. CO, 28.5 per cent. H_2, and 5.1 per cent. CH_4. Temperature measurements made on the furnace after the charge was melted varied between 1744 and 1900 deg. C. These were taken with a Wanner pyrometer through the middle door. Details are also given, both for this and the other heats, of the temperature and composition of the waste gases and the temperature of the heating gases, both taken in the checkers. The analysis of the finished steel was 0.224 per cent. C, 0.049 per cent. S, 0.062 per cent. P, 0.52 per cent. Mn and 0.18 per cent. Si

*Reproduced in Stahl und Eisen, issues of July 20 and 27 and August 3, 1911

In the second test the mixture of gases was in the ratio of 1 to 4.5. The average heating value was 186.8 B.t.u., and the analysis gave 4.2 per cent. CO_2, 0.8 per cent. O, 16 per cent. CO, 29 per cent. H_2 and 3 per cent. CH_4. The analysis of the finished steel was very similar to the one given above, and the temperature of the furnace varied from 1640 to 1900 deg. C.

In the third test the mixture was again in the ratio of 1 to 4. The analysis of the mixture gave 4.4 per cent. CO_2, 0.6 per cent. O, 15 per cent. CO, 36.7 per cent. H_2 and 4.2 per cent. CH_4. The average heating value was 199.3 B.t.u. The furnace temperatures varied from 1692 to 1900 deg. C, and the analysis of the final steel was 0.28 per cent. C, 0.053 per cent. S, 0.067 per cent. P, 0.49 per cent. Mn and 0.18 per cent. Si.

The fourth test was not continued long enough to get the finished steel. Blast furnace gas alone was used. Its analysis gave 8.8 per cent. CO_2, 0.2 per cent. O, 31.0 per cent. CO and 2.1 per cent. H_2. The average heating value was 112.3 B.t.u. The furnace temperature during the period of testing varied from 1478 to 1549 deg. C.

The fifth test also did not last very long. The mixture was in the ratio of 1 to 6.5. The average heating value was 162.9 B.t.u., and the analysis gave 5.8 per cent. CO_2, 0.6 per cent. O, 19.2 per cent. CO, 21.2 per cent. H_2 and 2.3 per cent. CH_4. The furnace temperature varied from 1494 to 1640 deg. C.

In the last test the mixture was in the ratio of 1 to 3. Its analysis gave 3 per cent. CO_2, 0.2 per cent. O, 11.2 per cent. CO, 38.2 per cent. H_2 and 5.5 per cent. CH_4. The average heating value was 224.7 B.t.u. The temperature of the furnace increased to a maximum of 1900 deg. C. The analysis of the final steel is not given. The samples of gas for analysis were taken about half way through each test, and carefully analyzed with the Orsat apparatus. They were taken just before entering the reversing valve. The unusually low value for methane, compared with the hydrogen of the mixed gas, can not be explained. The coke oven gas had on the average 1.5 per cent. CO_2, 7 per cent. CO, 42 per cent. H_2 and 24 to 28 per cent. CH_4. The blast furnace gas has been given already. The results of analysis, however, cannot be questioned.

Blast furnace gas is also used with success to heat an annealing furnace for steel castings. This furnace is so arranged that blast furnace-coke oven mixed gas or producer gas can be used.

The tapping spouts of the open hearth furnaces are also heated with blast furnace gas.

The paper closes with a description of the way in which blast furnace gas may be used in by-product coke oven practice, thus setting free more of the rich coke oven gas for lighting purposes. G. B. W.

Views on Titanium in Iron and Steel

In a paper read before the American Electro-Chemical Society at its Toronto meeting, Charles V. Slocum reviewed briefly the use of titanium alloy in iron and steel, quoted from a number of authorities on the subject and paid a tribute to Auguste J. Rossi as accomplishing a triumph in that he should take an element so long considered useless and make out of it "so wonderful a servant in the iron and steel industry." A few of the notes regarding the application of the alloy have been taken from the paper together with the quotations from students of the subject.

Titanium alloy is best added to the ladle of steel after tapping from the furnace and before the slag begins to run. For open-hearth steel the supply should be placed convenient to the ladle and shoveled in precisely as so much coal. For soft steel an addition equivalent to 0.03 per cent. titanium is sufficient to make the steel more ductile. Larger quantities are of increased benefit, but cannot always be added because of the carbon content and also because of the density imparted to the steel, which increases as the proportion of alloy is increased, and therefore is not always desirable. In high-carbon steels this increased density is desired and more alloy is used. The addition of the alloy permits the use of a considerably higher carbon content without increasing the brittleness, and several railroads are now using as much as an equivalent of 0.10 per cent. titanium or more in securing tough, durable rails. In the crucible practice the best results have been obtained by adding the titanium alloy to the pots before they are removed from the furnace, giving more time for washing and deoxidizing before teeming.

Titanium as a Deoxidizer

Leading authorities seem to agree that titanium achieves its remarkable results through its strong deoxidizing powers together with its effect of giving the slag formed sufficient fluidity to completely separate it from the metal.

"The presence of titanium oxide lowers the melting point of slags occluded in iron and steel and imparts thereto sufficient fluidity to account for their elimination."[1]

"Titanium * * * has a stronger affinity for oxygen than have the well-known deoxidizers; * * * it probably gives the slag such a consistency that it separates more completely from the molten iron."[2]

"The treatment of all steels with ferrotitanium for the purpose of purifying the metal is strongly recommended, the presence of nitrogen to the extent of 0.02 to 0.035 or 0.045 in certain steels being enough to cause the metal to break asunder, destroying all elongation and reduction of area".[3]

"The great affinity of oxygen and titanium is an absolutely sure means of completely deoxidizing the steel, the advantages of which need no further elaboration. It has been proved that an ingot of steel containing a very small quantity of titanium will show practically no segregation."[4]

The cost of treatment with titanium varies from a minimum of 25 cents to a maximum of $2.00 per ton of metal treated. The amount to be used is very small, and should be proportioned according to the carbon content of the steel and to the amount of impurities present.

[1]Bradley Stoughton, U. S. Patent Office Proceedings, Ser. No. 463610.
[2]Henry M. Howe, Ibid
[3]H. le Chatellier, Paper, Congress of Metallurgists, Belgium, 1905.
[4]F. von Maltitz Stahl und Eisen No. 43 1909

Locomotives to Tow Ships Through Panama Canal

A new system of towing will be employed in taking vessels through the Panama Canal, according to specifications shortly to be issued by the Government calling for 40 electric locomotives to be used on the work. The system is the invention of Edward Schildhauer, of the canal engineering staff, and it is to be patented with the proviso that the Government be entitled to use it without remuneration. It is planned to utilize the locomotives for taking the vessels through the locks at the rate of two miles an hour. The vessel to be towed will be held between four lines of taut hawsers. The hawsers are to be attached to the windlasses of four locomotives operating on the lock walls, two forward towing and two aft being towed by their hawsers, thus holding the ship steady.

The locomotives are run on a level, except where they pass from one lock to another, at which point they will climb exceptionally heavy grades. There will be two sets of tracks along the lock walls, one for the return of unattached towing engines. The tracks will be of the 5-ft. Panama Canal gauge laid on 90-lb. Bessemer rails on Carnegie steel ties. Each locomotive will consist of three parts, two tractors with a windlass between them. The windlass will be mounted on a truck and joined to each tractor by a drawbar and trunnion, having the effect of a universal joint. The windlass will have two speeds, one for coiling the line under a load and another for coiling an unattached line. Full specifications showing the mechanical details of both tractors and windlasses will be issued from the Washington office of the Canal Commission.

Pipe threading dies have come in for special attention at the hands of the National Tube Company, Pittsburgh, Pa. What constitutes a properly made die and what such dies will do in relation to satisfactory cutting of both steel and wrought pipes are some of the points taken up. The treatment of the subject is not without its parallel to that of tools for cutting metal at high speed. To aid in the campaign of education, the company has prepared some illustrations showing among other things the so-called lip of the cutting edge of the pipe threading chaser, in its Bulletin No. 9.

Ingot Molds of Steel

Stahl und Eisen for August 10, 1911, has a short article on steel ingot molds, by A. Thiele, of Rothe Erde. The experiment of replacing cast iron molds by steel is very recent and not many results have been obtained. So far as the writer knows these results have not been very encouraging. The chief defect has been that after a few heats the molds deteriorate, the cross-section changes and they become useless for further work. Using different kinds of steel did not obviate this difficulty. Mr. Thiele finally succeeded in solving the problem by reinforcing the deterioration zones by suitable sections that were cast in the body of the metal. These sections balanced the tendency toward contraction because of their moments of resistance and greater transverse strength as compared with cast iron.

Molds produced by this process, which is protected by German patent No. 224,122, stand 250 heats on the average, sometimes much more; they give good cause, therefore, for considering the replacement of iron molds for square ingots with steel. The number of heats a mold will stand is not always a good measure of its superiority. The molds mentioned above lost 8.8 to 11 lb. per ton of steel, which was about 6.6 lb. per ton better than with the old iron molds. It is well known that the lower part of iron molds is often badly attacked, whereby the bases of the ingots are enlarged, often causing broken rolls and other troubles. These bad conditions are completely removed by the use of steel molds, for the lower part remains of the same section throughout their life, and if they are well taken care of the ingots remain nice and clean.

As to the economy of using steel molds, this depends largely on local conditions. The simplest case is to take the steel and iron molds as costing the same and estimate what a saving of 0.6 lb. per ton of steel amounts to. In many cases, however, the molds can be made cheaper than those of gray hematite iron, and when used up they are worth more as scrap. The molds are made in much the same way as those of cast iron. For reinforcement I-beams 2.35 in. or mine rails 2.56 in. were used. These were cut in lengths of about 27 in. and placed on each of the four sides lengthwise in groups of three parallel to each other. They were fastened in the foundry mold with nails, so that on the outer side of the finished mold they would be exposed to the air and would be covered on the inner side with a layer of steel from 0.6 in. to 0.78 in. thick.

After training the foundry workmen a perfectly satisfactory casting was produced. Either basic open hearth or Bessemer low carbon steel was found to be suitable. When using the molds water cooling ought to be avoided if possible. Molds produced in this way have no thicker walls than the old iron ones and already after standing 200 heats have lost only 11 lb. per ton of steel.—G. R. W.

French Iron Ore Production in 1910

According to official statistics just published by the French Government, the production of iron ore in France last year amounted to 13,261,715 metric tons, or 2,591,745 tons more than in 1909. The gain, which was equal to 24 per cent., was chiefly in the new Briey basin, which has steadily been rising in importance for some years and already furnishes nearly two-thirds of the entire French ore production. Last year's production in that basin rose to 8,567,190 tons, against 6,340,478 tons in 1909, and 4,580,233 tons in 1908.

The exports of ores from France last year to Germany amounted to 1,292,000 tons, and to Belgium 2,874,000 tons—much the largest part of which was from the Briey basin. Not less than 11 great German companies have acquired ore lands there, comprising about 15,000 acres. These are the Gelsenkirchen Company, Krupps, Burbacher, Hörder, Hoesch, Phönix, Thyssen, Rombach, Rochling, Gebruder Stumm and Aumetz-Friede. There is a heavy demand for the Briey ores in Germany and Belgium for the reason that they are considerably richer than those of Lorraine and Luxemburg, though these latter belong geologically to the same formation.

The competition of the Briey ores has already made itself severely felt in Luxemburg, where the local ore production dropped from 7,492,000 tons in 1907 to 5,794,000 tons in 1909. In 1910 there was a gain of 500,000 tons owing to the activity in the iron industry. It is certain that the imports of Briey ores into Germany will increase rapidly in the next few years, inasmuch as a number of the great companies above mentioned have only begun this year to develop their properties there. It is estimated that the production of the Briey basin will rise to 18,000,000 to 20,000,000 tons within four or five years. Experts estimate the quantity of ore in it at 2,500,000,000 tons. The German interest in the district has greatly increased since the government railroads made a heavy reduction in the freight rates on ores from there early in 1910.

International Congress on Chemistry in 1912

Committee appointments for the eighth International Congress of Applied Chemistry to be held in New York City and Washington, D. C., in September, 1912, have been practically completed and pamphlets giving the constitution and by-laws, general rules, committees and official representatives may without doubt be obtained from Dr. Bernhard G. Hesse, secretary of the congress, 25 Broad street, New York. The opening meeting is to be held in Washington, September 4, but the other meetings, both business and scientific, will be held in New York September 6 to 13, inclusive.

One of the sections has to do with metallurgy and mining and its work is in the hands of an executive committee assisted by a corresponding sectional committee. The personnel of these committees is in part as follows:

President, Joseph W. Richards, Lehigh University, South Bethlehem, Pa.
Vice-President, J. B. F. Herreshoff, Nichols Copper Company, General Chemical Company, 25 Broad street, New York City.
Secretary, Walter S. Landis, Lehigh University, South Bethlehem, Pa.
Arthur L. Walker, Columbia University, New York City.
James Douglas, Phelps, Dodge & Co., and El Paso & Southwestern Railroad Company, 99 John street, New York City.

Sectional Committee.

Lawrence Addicks, United States Metals Refining Company, Chrome, N. J.
Alfred H. Cowles, Sewaren, N. J.
James Gayley, 71 Broadway, New York City.
John Hays Hammond, 71 Broadway, New York City
P. Heroult, 149 Broadway, New York City.
Henry M. Howe, Columbia University, New York City.
H. H. Laughlin, Jones & Laughlin Steel Company, Pittsburgh, Pa.
J. A. Mathews, Halcomb Steel Company, Syracuse, N. Y.
Richard Moldenke, American Foundrymen's Association, Watchung, N. J.

Another section is to be given over to fuels and asphalt, and the sectional committee, with the officers of the executive committee, includes the following:

President, David T. Day, United States Geological Survey, Washington, D. C.
Vice-President, F. Schniewind, United Coke & Gas Company, 17 Battery place, New York City.
Secretary, Edward W. Parker, United States Geological Survey, Washington, D. C.
Irving C. Allen, United States Bureau of Mines, Pittsburgh, Pa.
L. P. Breckinridge, Yale University, New Haven, Conn.
Chas. A. Davis, United States Bureau of Mines, Washington, D. C.
R. H. Fernald, Case School of Applied Science, Cleveland, Ohio.
I. C. W. Fraser, United States Bureau of Mines, Pittsburgh, Pa.
Clifford Richardson, 30 Church street, New York City.
F. M. Stanton, United States Bureau of Mines, Pittsburgh, Pa.

There is also a section on paints, drying oils and varnishes. The president of the executive committee of the section is Maximilian Toch, Toch Brothers, 320 Fifth avenue, New York City, and the vice-president is Gustave W. Thompson, National Lead Company, 129 York street, Brooklyn, N. Y.

The Lyons Boiler Works, De Pere, Wis., reports the following boiler orders recently received within five days: Four 400 hp. each, for the new Rand-McNally building in Chicago; three 200 hp. each, for the Woodmen of the World building in Omaha; one 300 hp. for the Wolf River Paper & Fiber Company, Shawano; one 250 hp. for the Spaulding Hotel, Duluth; one 150 hp. for the King County Hospital at Seattle, Wash.; one 145 hp. for the Walter Bros. Brewing Company, Menasha; two 200 hp. each, for the Chicago, Burlington & Quincy Railroad; one large boiler for the steamer Cotton Blossom, Mount Pleasant, W. Va.

Pittsburgh and Vicinity Industrial Notes

The Youngstown Sheet & Tube Company, Youngstown, Ohio, recently made a shipment of 10,000 ft. of 14-in. steel pipe to a customer, which was furnished in 40-ft. lengths with a sleeve coupling in the center and flange couplings on the end, thus materially facilitating the laying of the pipe in the field. The pipe was loaded on steel cars and was promptly delivered and in perfect condition, there being no shifting of any of the pipes nor damage to them whatsoever, despite their great length. The company is specially equipped to manufacture large sizes of pipe in both steel and iron, but it also makes small sizes. Of its 10 pipe mills, 4 make pipe, 8 in. and larger, the maximum size being 20 in. The company carries in stock a complete range of sizes of large pipe.

Contracts have been let for a modern hotel at Youngstown, Ohio. J. G. Butler, Jr., of the Brier Hill Iron & Coal Company, and chairman of the Bessemer Pig Iron Association, is a heavy stockholder in the new enterprise. The architects are Clinton & Russell, who built the Hotel Astor in New York City, while the contract for the building has been placed with Caldwell & Drake, Columbus, Ind., who recently finished building a court house in Youngstown, costing about $2,000,000. The new hotel is to be finished by October, 1912, and will cost about $1,000,000.

In connection with the open-hearth plant to be built by the Youngstown Sheet & Tube Company a jobbing mill will be built to roll plates from 3/16 in. to No. 14 gauge. For the open-hearth plant, which will consist of six 100-ton furnaces, the only contract placed so far is for the steel buildings which went to the American Bridge Company. Contracts for the open-hearth furnaces, blooming mill, engines and other equipment will likely be placed the coming week.

The United Engineering & Foundry Company, Farmers' Bank Building, Pittsburgh, has received a contract from the Milton Mfg. Company, Milton, Pa., for a 500-ton high-speed steam-hydraulic forging press, which it expects to ship about December 1. The Milton company makes all kinds of nuts for heavy service and will use this press in making the larger sizes of nuts.

The Treadwell Construction Company, Midland, Pa., is operating its plant full time on orders for steel tanks, plate work for blast furnaces and steel plants, and also on the 11-ft. water-pipe line for the city of Los Angeles, Cal. On the last-named contract the company has made shipments of over 100 carloads, or about half the quantity.

The Falls Creek Board of Trade, Falls Creek, Pa., David C. Whitehill, corresponding secretary, has started on a campaign to induce manufacturing concerns to locate at that place. It is issuing literature showing the advantages of Falls Creek as a manufacturing center, special stress being laid on its railroad facilities and cheap fuel.

J. & J. B. Milholland, Pittsburgh, have received contracts for the erection of a complete coal-crushing plant, operated by an inclosed type high-speed engine, for the Washington Coal & Coke Company, Washington, Pa., and two gravity inclines for coal-mine operations to be installed for the St. Louis & Rocky Mountain Mining Company at Raton, New Mexico. The latter order is a duplicate of an order filled by the company last year.

The Penn Motor Car Company, which recently purchased a site of three acres in the New Castle, Pa., district, has awarded a contract to the Richardson Construction Company, Pittsburgh, for the erection of a new plant. The main building will be 60 x 510 ft., with six wings, each 60 x 150 ft. An office building, power plant and other buildings will also be erected. The contract calls for the completion of the main building by the middle of January, 1912.

H. E. Barney and C. W. Laughlin, formerly connected with the Pittsburgh office of Manning, Maxwell & Moore, have resigned and have organized the Laughlin-Barney Machinery Company with a capital of $50,000. Its offices will be Union Bank Building. The company has been appointed agents in the Pittsburgh district for the following concerns: Newton Machine Tool Works, Philadelphia, slab milling machines, slotters, rotary planers and special machinery; Kearney & Trecker Company, Milwaukee, Wis., plain and universal and vertical milling machines; Ajax Mfg. Company, Cleveland, Ohio, upsetting heading and forging machines for bolts and rivets and a general line of forging machines. The company is also agent for Reliance bolt cutters for cutting and threading bolts from 1 to 6 in. in diameter.

The Youngstown Furnace & Supply Company, operating a foundry at Niles, Ohio, has decided to discontinue the manufacture of stoves and ranges, and hereafter will devote its attention entirely to making heating furnaces and furnace supplies.

H. S. Wilkinson has been elected a director of the Crucible Steel Company of America, Pittsburgh, succeeding A. W. Mellon, resigned. Beginning with the coming year, the annual meeting of stockholders of this company will be held on the third Friday in November, instead of the third Friday in October.

The Mohawk Condensed Milk Company is building a plant at Weirton, W. Va., near the works of the Phillips Sheet & Tin Plate Company for the manufacture of cans for its different milk factories.

George T. Ladd, manufacturers' agent, Farmers' Bank Building, Pittsburgh, has received an order for a 12 and 16-in. pipe installation with the necessary valves for a hydraulic mining operation for the Guadalupe & Porce Mining Company, Colombia, South America. He also has the contract for supplying the automatic stop, check and relief valves to be used in the improvements to the Washington Tin Plate Company's plant, Washington, Pa.

The A. W. Wycoff Company, Farmers' Bank Building, Pittsburgh, has been appointed general sales agent in western Pennsylvania, eastern Ohio and northern West Virginia for the Kerr Turbine Company, Wellsville, N. Y., manufacturer of the Kerr steam turbine, turbine-driven generators, pumps, fans and blowers. The turbines are built in three types for high pressure, exhaust steam and mixed flow, and have been adopted by the United States Government.

At the annual meeting of stockholders of the Carbon Steel Company, of Pittsburgh, held last week, Charles McKnight was elected president to succeed Frank B. Robinson, and T. S. Atwater, vice-president to succeed E. G. Buchannon. The plant of this company is equipped with eight 50-ton open hearth steel furnaces and two trains of rolls, one 36-in. universal and one 128-in. plate mill, forging hammers, etc. The annual capacity is 125,000 tons of open hearth ingots and 85,000 tons of finished steel.

Frank G. Wallace was appointed receiver last week of the Pittsburgh Lamp, Brass & Glass Company with plant on the N. S., Pittsburgh. The company is capitalized at $1,500,000, equally divided between preferred and common stock. In the petition filed in the court by Alfred R. Hamilton of the company, it is stated that the company has increased its business at such great expense that it will not be able to meet its obligations, and that numerous suits are threatened.

The Steel Alloys Company, of Wheeling, W. Va., has purchased the plant and property of the West Virginia Bridge & Construction Company at Wheeling for $20,275.

The general offices of the Monongahela River Consolidated Coal & Coke Company, now merged with the Pittsburgh Coal Company, have been removed from Water street to the Oliver Bldg., Pittsburgh.

The plant of the Eureka Steel Company, West End, Pittsburgh, has been sold at receivers' sale to M. A. Ablersberg, Homestead, Pa. The plant was recently built for the manufacture of tool steel, and it is understood that the new owner will operate it.

The growth of the Carnegie Technical Schools in Pittsburgh has been so great that another building, to cost $100,000 or more, will be erected in addition to the structures already planned. It will be for the exclusive use of the civil engineering department of the School of Applied Science and will contain two large testing laboratories to be equipped with heavier machinery than is found in any similar institution in the world.

The Petroleum Iron Works Company, Sharon, Pa., recently closed a contract for the building of a penstock at Jonqueire, Canada, to be 12 ft. in diameter, a mile long, from ½ to 15/16 in. thick, and which will weigh approximately 3000 tons. It is now being fabricated at the shops. C. H. Todd, president, and C. P. Wagner, engineer of the company, are in Canada, with a view of locating a temporary plant for the handling of the construction in the field.

Foundry of Tractor Works at La Porte

Arrangement and Equipment of Machinery of the M. Rumely Company, Producing Oil-Pull Traction Engines

The narrative of the M. Rumely Company, La Porte, Ind., as manufacturer of hullers, separators and steam tractors, begins in the earliest chapters of the development of harvesting and soil cultivation by power machinery. Within the past two years this company has reaffirmed its position as a pioneer in this field by placing on the market an oil burning internal combustion traction engine. For the exclusive manufacture of this type of tractor, a plant apart from the existing works of the company has been built—and is now being increased—with capacity sufficient to produce 3600 Oil-Pull tractors annually. The description of another tractor works, published in *The Iron Age* of June 29, together with this article, presents indications pointing significantly to the great need of displacing men and horses with mechanical power, if the cultivation of the tremendous farming areas of the United States Northwest and Western Canada is to proceed unhampered. This necessity has arisen out of the scarcity of labor and the impossible expense of maintaining throughout the year a sufficient organization, whose capacity can then be made useful only during a very short season.

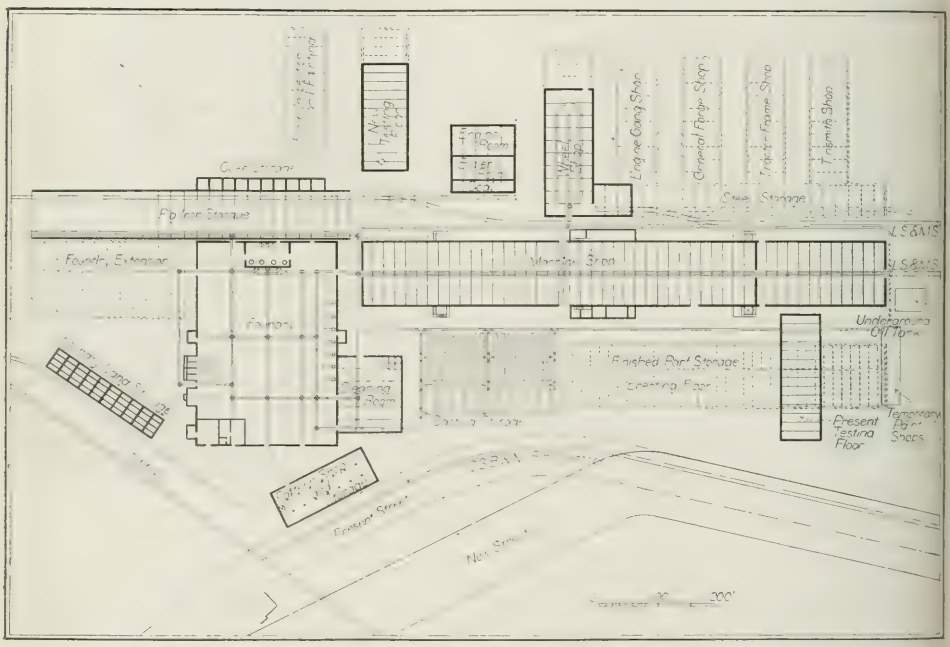


Fig. 1.—General Ground Plan of the Complete M. Rumely Tractor Plant at La Porte, Ind.

Oil Fuel for Traction Machinery

Three sources of power for traction machinery have been employed—steam, gasoline and kerosene. The steam engine has been forced to contend against the excessive cost of coal and frequent inaccessibility of water in the west. The gasoline engine has had its greatest development only in the past few years and its use for traction power has been correspondingly recent. The oil engine in the past has been far from successful, particularly as regards proper combustion and regulation. At the same time, from the standpoint of fuel cost, the oil engine has enjoyed a conspicuous advantage, increasing proportionately as the demand for gasoline has increased, until at the present time kerosene is obtainable at the lowest price recorded. To a great extent this condition has been the incentive in the investigations from which a means has been developed for securing the proper combustion and regulation of a kerosene mixture capable of being utilized in the successful operation of an internal combustion engine. By acquiring the Secor-Higgins patents the M. Rumely Company has, it is believed, obtained such a means and to this fact is due entirely the extensive plant, a ground plan of which is shown in Fig. 1.

The carburettor that embodies mechanically the Secor-Higgins principles is employed not only in the operation of the Oil-Pull tractors already in service, but also in the line of stationary oil engines being manufactured in Milwaukee under these patents and in the adoption of the same device by a well known manufacturer of pneumatic tools which company is to use an oil engine as the motive power for isolated lighthouse compressor units. A perspective cross-section of the carburettor is shown in Fig. 2. Its principle has been developed from the hypothesis that air forced into a vacuum of any definite degree, through apertures having a fixed area ratio, will always flow at the same rate and in the same quantity, and in contact with kerosene and water, will draw in and atomize a constant proportion of each under constant conditions. It follows that if a port area ratio in the carburettor can once be established to give the correct mixture for proper combustion under any one load, increasing or decreasing the port areas in that fixed ratio will always yield a proper mixture for any load. The presence of water vapor in the carburettor mixture contributes to a regulation of the temperature and also to the scavenging of the cylinder when the explosion dissociates the vapor into nascent

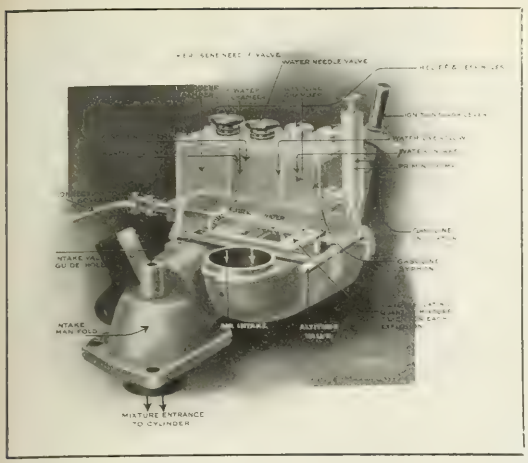


Fig. 2.—Details of Secor-Higgins Carburettor.

hydrogen and oxygen. A detailed description of the valve arrangement by which the constant condition under which the correct mixture is obtainable and of the governor connection through which the load fluctuations are transmitted to the carburettor will not be taken up at this time.

The departments and buildings included in the complete tractor plant and their relative location in the layout, are indicated in the ground plan, Fig. 1. This entire plant scheme is to be completed by the end of 1912. This account will embrace only that portion now in operation, including chiefly the foundry, machine and erecting shop, wheel shop, testing floor power plant, and the accessories of each. The present article will be given up to the foundry, leaving the remaining subjects for a subsequent article. Construction of these buildings was begun in June, 1910, and completed in December of the same year.

General Design of the Foundry

The foundry is a steel frame building 320 ft. long and 220 ft. wide with Federal tile roofing, concrete walls above the window ledges and brick below. Fig. 3 is a cross-section showing the design of the structural work which is arranged with a main central bay 60 ft. wide with 34 ft. of clearance under the truss, and an 80-ft. gable roof span on each side, 14 ft. from floor to truss chord. These side bay trusses are supported in the middle by columns dividing the span into two 40-ft. bays or a total of five bays in the entire width of the building. The building is located on filled ground and the concrete footings under the building columns are carried on driven piles. The columns are placed at 20-ft. centers.

The foundry layout is illustrated very completely in Fig. 4. The storage yard lies at right angles to the direction of the foundry and immediately adjoining the cupola or east end of the foundry building. The yard is contained within a crane runway 73 ft. wide and 500 ft. long. At the far side from the building a switch connecting two trunk lines traverses the storage space and on this material is brought in. The unloading and distributing operations are handled by a 5-ton Pawling & Harnischfeger crane equipped with a 46-in. 5-ton Electric Controller & Mfg. Company magnet. The runway for a length of 300 ft. adjacent to the cupola charging elevators is roofed over as illustrated in Fig. 5 to afford protection where most of the handling is necessary.

For sorting up and weighing the cupola charges, an electrically driven Fairbanks scale car operates along a depressed scale track located as shown in Fig. 4. This depression allows running the pig iron trucks and charging tray trucks directly on the scale car from the industrial trackage system of the foundry and more particularly in this connection, from the charging elevator platforms. To relieve congestion on the cupola charging floor a stretch of industrial track paralleling the scale track is laid for the storage of charging trucks. This track is also used for carrying off the cupola cinder in Hunt type ash buggies.



Fig. 4.—View of Storage Yard Showing Crane and Type of Roof.

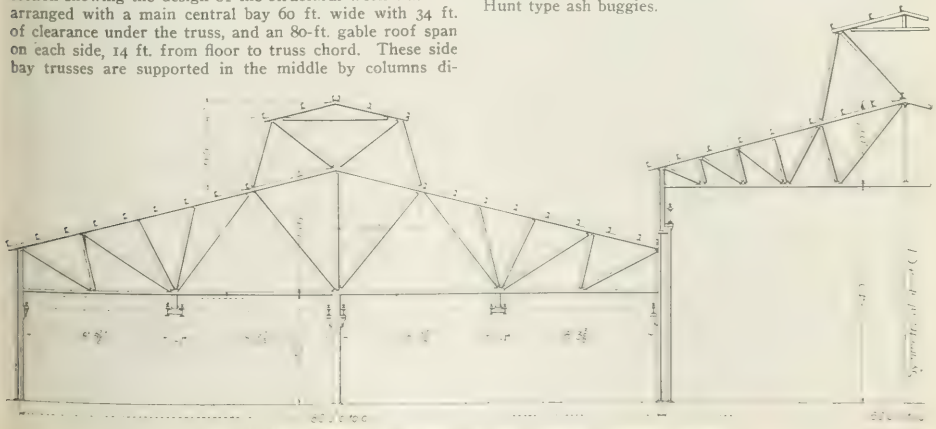


Fig. 3.—Cross Section of Foundry Building Showing Structural Design.

Cupola Department and Hot Metal Handling

The cupola room is enclosed in brick partitions, occupying 40 x 60 ft. at the east end of the central bay of the foundry. It is arranged with a mezzanine and charging floor, plans of which are included in Fig. 4. A view of the cupola room from the molding floor is shown in Fig. 6 and of the charging floor in Fig. 7. Provision has been made for four cupolas of which two are installed. They are 48 in. diameter, one built by the Whiting Foundry Equipment Company, and one by the Calumet Engineering Works, both of Harvey, Ill. One cupola is used for semi-steel mixtures and the other for gray iron. The cupola capacity is designed for an approximate output of 100 tons

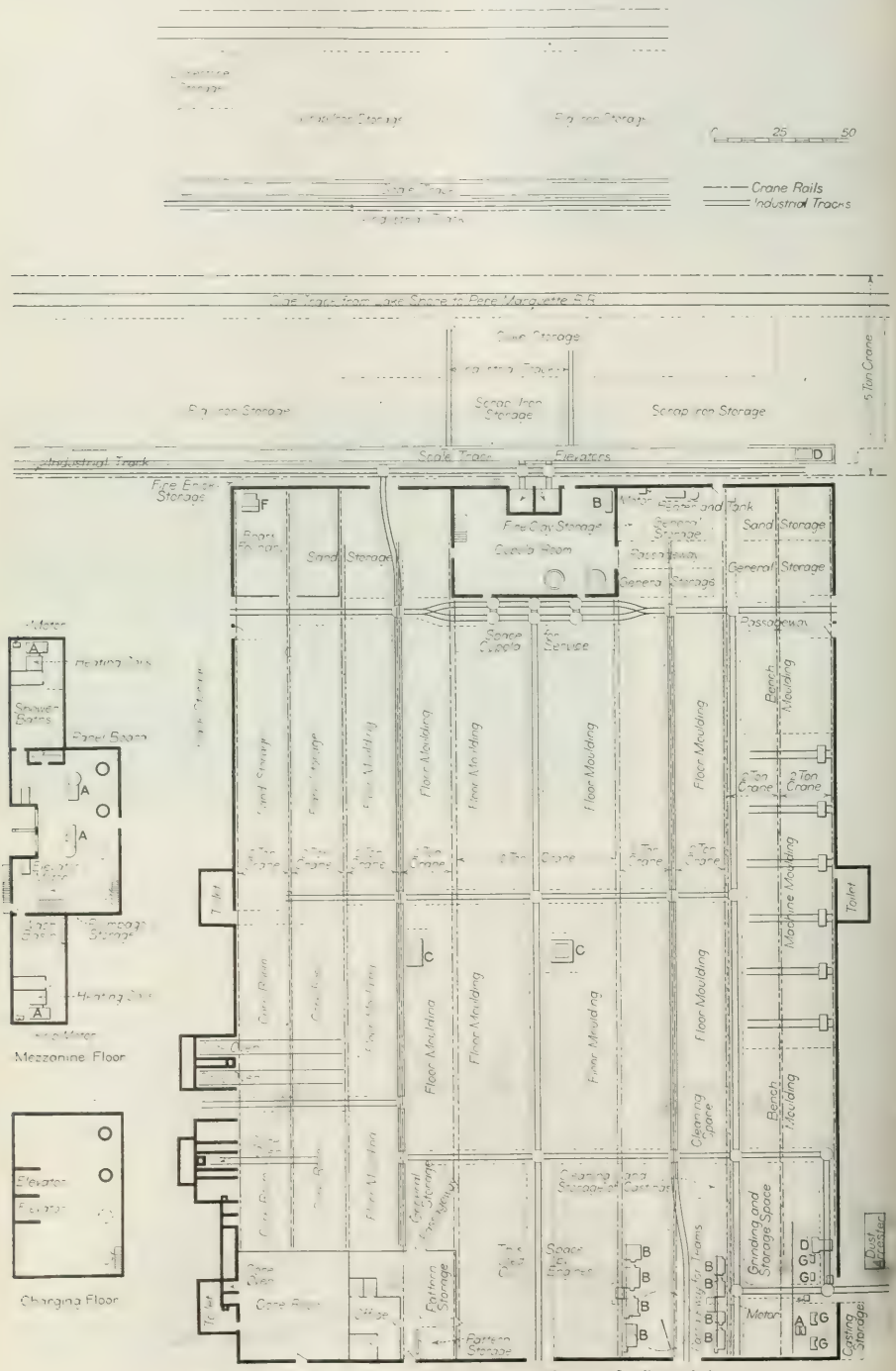


Fig. 5—Floor Plan of the Foundry of the M. Rumely Company, La Porte, Ind.



Fig. 6.—Cupola Room from Central Molding Floor.

daily. The cupolas have been operated on a fuel consumption ratio of 9 to 1. The mezzanine floor is at a height of 12 ft. above the main floor and 9 ft. 10 in. below the charging floor. On it are located the pressure blowers, comprising one Connersville unit, capacity 24 cu. ft. per revolution, and a No. 10 B. F. Sturtevant type, both direct motor driven by 30 hp. units. Each blower delivers to either cupola. Large wash rooms equipped with lockers and shower baths open off this floor. The ventilating fans for the foundry which are also arranged with heating coils to provide an auxiliary indirect heating system during the winter season, are located as shown in the floor plan. They are driven by 15-hp. motors. The charging floor is built substantially, being made of 6-in. channels, laid flange to flange on I-beam girders. The charging elevators are Otis electrically operated having 8 x 8 ft. platforms and a capacity of 5 tons each.

The castings to be made in this foundry range from very small parts in large numbers to heavy pieces like crank cases, gears and pulleys weighing close to a ton each. The equipment both as regards conveying and molding was designed and arranged with relation to the foundry floor to accommodate this wide range in weight and to reduce to a minimum, manual handling and molding. A study of Fig. 4 will make apparent the manner in which this has been worked out. The molding floor embraces about 36,000 sq. ft. which, with continuous melting, presumes an output of 2 tons of finished castings per day for each 700 sq. ft. of floor space.

Reference to Figs. 4 and 6 indicates the manner of handling and distributing the hot metal. The cupola spouts project over the curtain wall in front of the cupola room and pour the metal in 1-ton ladle trucks spotted on two parallel industrial tracks immediately in front of the cupolas. From this storage and distributing point the industrial trackage traverses each aisle or bay, so that the original ladle is brought to within a few feet of the work at any point. Here the metal is transferred by means of crane hoists into 700-lb. ladles from which the mold is poured. Each molder pours his own work.

The crane service comprises eight runways, parallel to each other in the direction of the foundry axis. In the center bay the 60-ft. space is served by one 5-ton and one 10-ton Pawling & Harnischfeger crane with a 3-ton auxiliary hoist. In addition, from a number of columns in the central bay, a jib crane is hung carrying a 2-ton Peerless hoist.

The 80-ft. width of the north bay is spanned by four 2-ton Whiting electric cranes equipped with Sprague hoists, floor operated. In the south bay with the exception of the 20 ft. along the wall used for bench and squeezer machine molding, the floor is served by three similar 2-ton cranes



Fig. 7.—Cupola Charging Floor.

operating from end to end of the building. These combined floor and overhead facilities render every portion of the molding floor accessible for mechanical conveying.

The Use of Molding Machines

The classification of work is illustrated in the floor plan. In the main bay, the floor molds in the heavier work are put up. A general view of this floor is presented in Fig. 8. The heaviest work such as the crank cases weighing 1800 lb. and fly-wheels for which the rectangular and circular metal flasks shown in the illustration are used, are made on Norcross 24-in. cylinder jarring machines. The master gears were formerly molded by hand, but recently two 60-in. diameter, 8-in. draw heavy doubleshaft Pridmore stripping plate machines have been installed for that purpose. The castings of medium weight are also made up on Pridmore stripping plate machines of which there are two 28-in. diameter, three 28 x 28 x 8-in. draw, three 28 x 28 x 10-in. draw, and two 14 x 14-in. standard machines. One of these machines and the molds made thereon, together with a view of the pouring operation, are shown in Fig. 9. The cast-



Fig. 8.—Heavy Molding Floor in the Central Bay.



Fig. 9.—Stripping Plate Machine Work

iron flasks are designed for 15-in. pulley molds and have taper self-aligning lugs. The usual output of a machine is about 55 molds a day. This work is done under the smaller cranes in the south bay adjacent to the heavy work floor.

The installation of the jarring machines has afforded the company an interesting comparison with the hand molding of the heavier pieces. Three molders and two helpers, ramming both cope and drag of a crank case mold upon the jarring machine, will complete a mold in approximately two hours as compared with a full day's work by hand with two molders and one helper. This is a saving of between $6 and $7 per mold in labor alone. On flywheels a corresponding saving of about $3.50 per mold is made where five are put up on a machine each day.

In the 40-ft. bay along the south side of the foundry the machinery equipment for making up the small molds in snap flasks is located. A view of this bay is shown in Fig. 10. This equipment consists of twelve Tabor Mfg. Company squeezer machines. The machines are mounted on wheels and are placed on wide gauge tracks running across the bay to the wall. Sand for the molds is piled parallel to the tracks. Work is begun with the machine at the inner end of the track. As the making of molds progresses the machine is pushed out toward the wall, the finished molds replacing the sand as it is used up. The arrangement has been found to increase the capacity of the machines, and molds of the character illustrated in Fig. 10 are made at the rate of sixteen per hour. Fig. 11 is a view of one of these machines in greater detail. Some of the irregular smaller snap flask work is put up by hand on tables mounted in the same manner as the Tabor machines.



Fig. 10.—South Bay of Foundry Showing Row of Squeezer Molding Machines.



Fig. 11.—One of the Squeezer Molding Machines with Operator

Accessory Departments

A part of the core room is shown in Fig. 12. This work occupies the west end of the north bay for a length of about 220 ft. of which 40 ft. is partitioned off. In this room small cores are made by girls, the room being provided with shelf core ovens and all necessary materials so that it is essentially self-contained. Four track ovens 7 x 15 ft. and two shelf ovens for baking cores are built in the wall of the main core room. They are fired from pits outside. This department also enjoys the same crane and track service as the molding floor.

The cleaning room for castings, in the completed plant layout, provided for at the southwest corner of the foundry building where the finished castings may be delivered directly into the castings storage yard, is not yet built. For the present the west end of the south bay of the foundry is used for this purpose. It is equipped with eight tumblers and cinder mills built by the Central Iron Works, of Quincy, Ill. Fig. 13 shows one of the two groups of four tumblers. Each group is driven from a shaft belted direct to a motor. A portion of the dust piping is shown in this illustration. From the tumblers and the four-motor driven grinders shown in the plan, Fig. 4, the dust is drawn by an overhead fan and discharged into a dust collector outside of the building and illustrated in Fig. 14. This collector has hopper bottoms with foot valves for the removal of the accumulated dust. The crane service available for handling the castings in this department is also indicated in Fig. 13. Air hammers are used for shipping.

The location of storage space for flasks, patterns, clay sand and other materials within the foundry are indicated in the plan drawing. The sand storage includes a sand mixing floor equipped with two vertical axis rotating type electrically driven mixers. The floor is spanned by a hand operated I-beam crane carrying a 2-ton Peerless hoist. The sand is all mixed at this point, loaded into a ½-yd. bucket and carried wherever required. The molders handle the sand very little and do not shake out their own flasks or cut-over the sand. Sand bins of poured concrete have been completed recently. They parallel a railroad switch and the sand is shoveled from the car into

an elevator delivering to an overhead transfer hopper which distributes the sand to the proper bin. A re-inforced concrete pattern storage building of fireproof construction has also been completed recently. In addition to providing safety for the patterns, space is provided for a wood working shop and for a shop draughting office. The industrial track system connects the pattern storage with the foundry.

At the northeast corner of the foundry building space has been allotted for a small brass foundry with a two-pot floor pit furnace. Part of the brass molding is bench work and part is snap flask work for which a Tabor squeezer is provided. The equipment includes a grinder, band saw and a brass reclaimer..

The foundry is heated for the most part by direct radiation from overhead steam coils augmented by a hot-air indirect system which is used interchangeably as a ventilating plant. For artificial lighting, regenerative flaming arcs are used. They are suspended from about the level of the bottom truss chords and between every second truss.

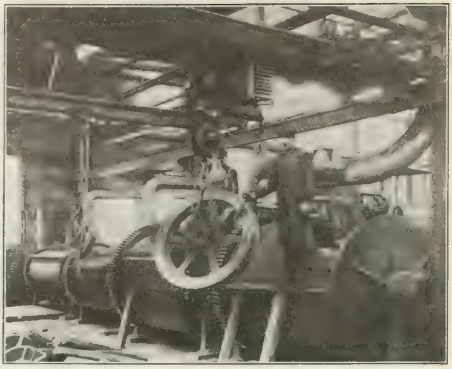


Fig. 13.—One Row of Tumbling Barrels.

Suit Over a Southern Iron Company Promotion

The New York Court of Appeals gave a decision on October 20 in the case of August Heckscher, New York, against William Edenborn, formerly of the American Steel & Wire Company, a director of the United States Steel Corporation and now president of the Louisiana Railway & Navigation Company. Mr. Heckscher was awarded $237,000 damages, representing the original cash subscription of himself and associates to the syndicate which organized the Sheffield Coal & Iron Company, Sheffield, Ala. The syndicate which Mr. Edenborn organized purchased the properties of the United States Iron Company in Alabama and elsewhere. Mr. Edenborn's name was on the subscription agreement for $500,000 which, it appeared later, it was his intention to pay in the stock of the United States Iron Company, of which he owned 50 per cent. The stock of this latter company was later put into the Sheffield Coal & Iron Company at $700,000, of which $350,000 represented Mr. Edenborn's subscription. Mr. Heckscher and his associates contended that they believed the subscription was to be paid in cash and that they did not know of Mr. Edenborn's interest in the United States Iron Company. A number of the stockholders, including several officers of the American Steel & Wire Company, assigned their claims to Mr. Heckscher who tendered back the stock which had been accepted by the syndicate members and demanded repayment in full of the subscription money from William Edenborn. In the decision of the Court of Appeals Justice Hiscock said: "The defendant did not occupy the position of an ordinary vendor, but he was inviting others to confer upon him a fiduciary relationship. If he knew and they were ignorant of some fact which touched the very substance of that relationship and legally destroyed his ability to meet its full requirements, it was his duty to advise them of it, and for his failure so to do they were entitled to repudiate the agreement and avoid what has been done under it.



Fig. 12.—Foundry Core Room Showing Core Racks.

The International Exhibition of Sofia, Bulgaria, will be opened June 1 and closed August 31, 1912. The exhibition will be held under the presidency of the Royal Minister of Commerce and Agriculture, and will embrace all products of industry, commerce, agriculture, arts, instruction, hygiene, alimentation and sports. It has obtained the protection of the municipality and of the Chamber of Commerce and Industry of Sofia. The office of the organization committee is at 5 Alexander place, Sofia.

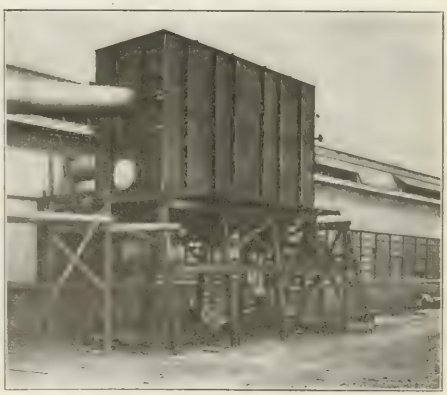


Fig. 14.—Elevated [illegible] Foundry.

A Mechanically Operated Foundry

Equipment for Continuous Pouring and Sand and Mold Conveying

In the old sense the term foundry is a misnomer if applied to the brand new installation at the metal-wheel works of French & Hecht, Davenport, Iowa, it is rather a forced concrete structure with nearly all glass sides and a modified monitor roof, the foundry proper being on the second floor, while the spaces for the storage of sand and coke and the tumbling barrels, grinders, etc., are located beneath. The molding and casting of small work weighing not over 75 lb. are done on the continuous plan, the mechanical equipment being arranged in completely circular form. Circular conveyors distribute sand to the down-spouts; a circular traveling platform or table shown

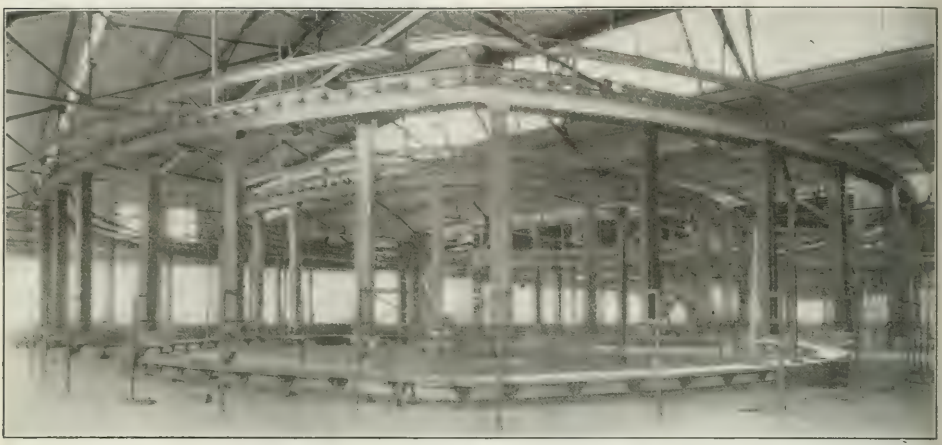


Fig. 1.—General View of the Circular Equipment Showing the Sand Elevators and Conveyors, the Down Spouts, the Molders' Stations, the Mold Conveyor Table and the Cupolas Installed in the New Foundry of French & Hecht, Davenport, Iowa.

castings factory. The entire plan and details of arrangement and equipment were conceived and worked out in the mechanical department of French & Hecht. Much of the construction work was done in the company's own shops. Equipment purchased outside, whenever not entirely standard, was made to harmonize with the one comprehensive plan which was so carefully worked out. A number of modern foundries were visited, the suggestions of foundry experts were sought, the particular needs of the special work to be done in the plant carefully considered and the present plant was the result. Fig. 1 is a general view of the circular equipment installed by the Webster Mfg. Company, Tiffin, Ohio, while Fig. 2 is a plan showing the drive employed. Figs. 3, 4 and 5 are views in the foundry showing a portion of the charging floor, the twin cupolas and the ladle trolley track and the castings chute and elevators and mixing machines for the molding sand.

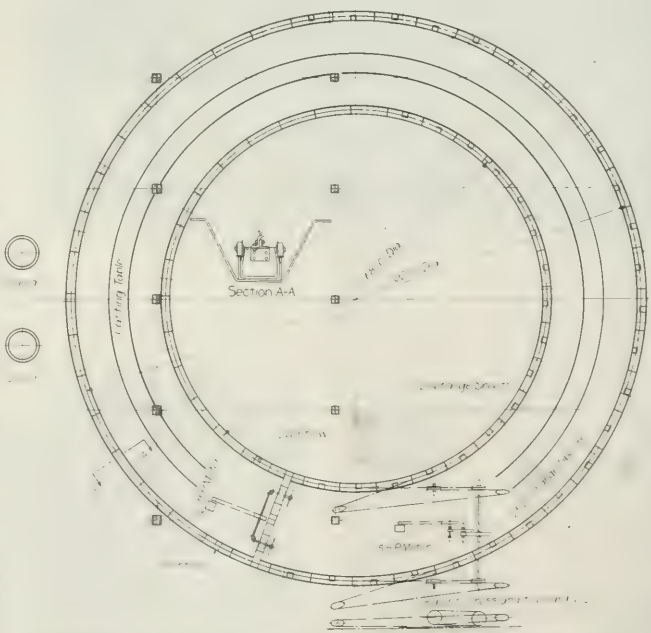


Fig. 2. Plan of the Sand Conveyors, Showing Drive, Casting Table, Cupolas, etc.

The building housing the foundry is a two-story reinforced concrete structure with nearly all glass sides and a modified monitor roof, the foundry proper being on the second floor, while the spaces for the storage of sand and coke and the tumbling barrels, grinders, etc., are located beneath. The molding and casting of small work weighing not over 75 lb. are done on the continuous plan, the mechanical equipment being arranged in completely circular form. Circular conveyors distribute sand to the down-spouts; a circular traveling platform or table shown in Fig. 1 receives the molds as they are made and carries them around to the cupolas, where they are poured off, without stopping, from ladles suspended from trolleys on an endless overhead rail, as shown in Fig. 4. This rail passes around the cupolas and over a portion of the mold conveying tables.

Passing a few feet farther the molds are broken out into a hopper in the floor from which the sand is spouted to the mixing machine below, while the castings are carried away in a chute to the cleaning floor. A view of the mixing machine and the castings chute is given in Fig. 5. A general panoramic view of the molding floor, showing the overhead sand conveyors, the spouts to the molding stands and the circular mold-conveyor platform, is given in Fig. 1, while Fig. 2 gives a plan of the circles, indicating the method by which the sand conveyors are driven.

The charging floor, a portion of which is illustrated in Fig. 3, is of ample area, thus giving room for storing lining brick, iron, coke, etc. The charges are made up on the lower floor of the building in charging trucks,



Fig. 3.—View Showing a Portion of the Charging Floor.

which are then lifted by the elevators, pushed along on tracks to either cupola, where air hoists which are clearly shown in front of the cupolas do the tilting and dump the charges. The blower supplying the blast is located behind and between the cupolas, gates in the tuyere pipes on the foundry floor below regulating the amount of air used.

Sand Mixing and Conveying

The sand screening and mixing machine shown in Fig. 5 is located on the ground floor, and the sand which is shaken out from the molds above is fed into it by the hopper. New sand is added as required and the mixture is delivered from the machine to the boots of the twin steel-encased elevators which extend upward 42 ft. to the floor above to feed the inner and outer circular sand conveyors. Gates are provided in the boot spouts, which are operated from the molding floor so as to regulate the delivery of sand to the elevators.

An electric motor belted to a countershaft drives the elevator, the power being transmitted through miter gearing at each end of the countershaft to the head gearing. The elevators discharge the sand into conveyors which, as can be seen from the section at AA, Fig. 2, are of the simple drag type with steel-plate flights and a trough of cast iron. This trough is 14 in. wide and 8 in. deep inside, and is made in 6-ft sections. The flights are spaced 16 in. apart and each one is rigidly secured to the 1½ × 3-in. bar of steel, which, in sections end to end, forms the continuous circular member of the moving parts. There is a cross bar with a flanged wheel at each end running on rails formed by angle irons along the upper edges of the trough on each side which supports and carries the moving parts. At this point there is also an outward-facing V-grooved jaw, or cable grip. The circle of these jaws, spaced at intervals of 16 in. all the way around the conveyor, forms a sheave receiving a wire rope by which the conveyor is operated. The arrangement of these wire rope drives, which derive their power from an electric motor, is shown in Fig. 3. The outer conveyor has a diameter of 102 ft., measured to the center of the trough, and the inner one has a diameter of 68 ft.

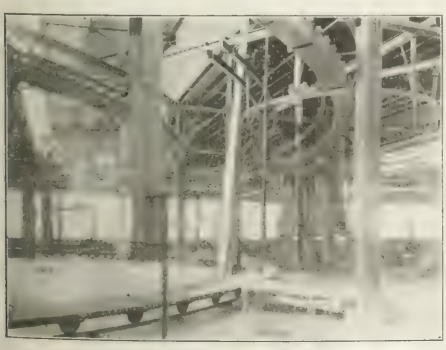


Fig. 4.—The Cupolas and the Trolley Track for Ladles.

Along that portion of the circle devoted to molding are located 42 down-spouts to the molders' stations, 25 from the outer conveyor and 17 from the inner. Each of these spouts is 9 in. square, inside measurement, and has a double undercut discharge gate controlled by a hand lever at the bottom. The supply of sand is kept slightly in excess of the maximum demands of the molders so that a little is always carried past the last discharge spouts and around to the tail discharge spouts near the elevators. By watching the tailings from these spouts the attendant regulates not only the total supply of sand but also its division between the two conveyors.

The Circular Mold Conveyor

Nearly if not quite all the previous forms of mechanical mold carriers have been of jointed construction with many moving parts. A departure from this practice has been made by French & Hecht in constructing a circular cast-iron table bolted into a practically rigid unit with no working joints whatever. This rigid circle operates on a single track laid on the floor with one file of supporting wheels as shown in Fig. 1. A motor-driven lineshaft crosses this circle under the floor and is controlled by an attendant at the center of the circle. At each end of the lineshaft there is a worm-gear connection to the chain drive for the mold conveyor which is thus driven at two diametrically opposite points. From his position in the center it is possible for the attendant to regulate the speed of the conveyor according to the work of the men pouring off the molds as they pass the cupolas. The molders' stations being located both outside and inside the mold conveyor, it is possible to utilize every running foot of the table.



Fig. 5.—The Castings Chute and Elevators and Mixing Machine for the Sand.

This circular equipment for small work occupies only about half of the second floor. The remainder of the floor space which is located on the other side of the cupolas and is served by them is given over to heavy work, principally machine molding. A large core room with sand-elevating machinery, also furnished by the Webster Mfg. Company, is located on this floor as well. The two-story arrangement of the foundry as a whole permits of the quick removal of sand and castings from the molding floor to the mixing machinery and the tumbling barrels on the floor below, both descending directly by gravity.

Graphite is so many things that it isn't that careless dispatching of references to the subject by the mere use of the word itself can hardly be condoned. A paper by W. C. Arsem, read before the recent convention of the American Electro-Chemical Society at Toronto, referred at length to the conflict of authorities on the subject, and explained in detail some experiments he had made which led to the conclusion that graphite is an allotropic form of carbon, having a specific gravity of 2.25 to 2.26.

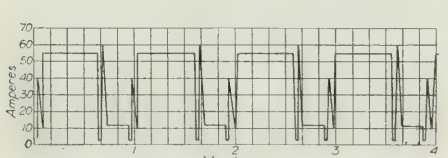
Motor Driving for Planers*

Current Variations with Direct Connected Reversing Motor

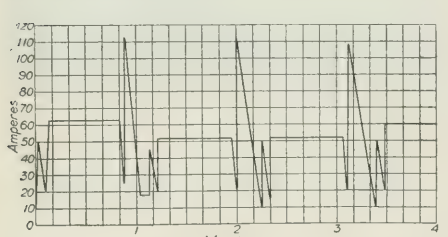
BY GEORGE W. RICHARDSON

A motor to drive a planer reversing with every stroke from the shortest to the full stroke of the planer table must be a very slow speed motor, controlled by automatic controller and requiring dynamic braking to stop the table so that there will not be any counter-electromotive force at the time the applied electromotive force is applied to the armature of the motor at the moment of reversals. This must be so arranged that the dynamic braking relay is off at the moment the applied electromotive force is connected and that the dynamic braking take effect at the moment the applied electromotive force is opened. This is really the success of the direct connected reversing motor drive to-day on planers.

In our machine shop we have a 120-in. planer which was driven by a 45-hp. compound wound constant speed motor driving through a countershaft to the belt shaft containing the flywheel and belt pulleys. These belts were vertical and 6 in. wide and four-ply. They reversed from one pulley to the other in the usual way. At the moment of these reversals the motor would be extremely



Current Demand with Richardson Motor on 42-in. Planer. Cutting speed, 17 ft. per min.; return speed, 44 ft. per min.; two round nose tools, ½-in. cut, 3/32-in. feed, cutting cast steel.



Current Demand with 50-hp. Reversing Motor on 8-ft. Planer. Cutting speed, 12.5 ft. per min.; return speed, 42.8 ft. per min.; one tool, ⅝-in. cut, ⅛-in. feed, cutting annealed nickel chrome steel.

overloaded. These high peaks of current continually coming on the motor at every reversal caused trouble and we were always doing some repairs. Over 2 gal. of oil were used per day on the planer. The actual delays to the work due to the conditions probably amounted to at least 25 to 30 per cent. of the time of cutting material.

I was asked to try one of my double armature motors to see if we could overcome the difficulties we were having with the old drive. I installed one 50-hp., 220-volt, compound wound double armature motor on the 120-in. planer on December 1, 1909, using an automatic controller from one of our mill tables, with the exception that I added some new features, such as dynamic braking, field weakening relays and no-voltage and overload relays. This outfit has not given us any trouble whatever, except the first few days in getting the controller adjusted. For a period of 19 months the apparatus has not cost over $8. The apparatus uses approximately one pint of oil per day. The planer does not chatter. The full speed of the double armature motor while cutting is 224 r.p.m., and the center shaft speed is 128 r.p.m. The peak load is 100 amp., approximately 30 hp., starting torque. The dynamic braking current is approximately 150 amp. The periphery speed of the armatures while cutting is 896 ft. per min., and 1792 ft. per min. on the return stroke of the table. This makes the motor easy to reverse, due to the low centrifugal force of the armatures. The cutting speed is from 20 to 25 ft. per min., and the return speed is from 20 to 50 ft. per min.

A reversing motor drive that has been placed on Pond planers is no doubt a good apparatus for this kind of work. They use a single armature special-made interpole motor, wound 1 to 4 speed, that is 250 to 1000 r.p.m., using dynamic braking for stopping the motor before reversing. The periphery speed of the armature of a 50-hp. motor for a 96-in. planer is approximately 1177 ft. per min. to 4710 ft. per min. The cutting peak load is 50 amp., while the reversing peak load is 112 amp. The cutting speed 12 to 25 ft. per min. and the reversing speed 12 to 48 ft. per min.

The lower curve in the accompanying cut shows the ampere load on the 50-hp. Niles-Bement-Pond Company's reversing motor drive on a 96-in. planer, cutting speed 12½ ft. per min., return speed 42 ft. per min., one tool cutting ⅝-in. with ⅛-in. feed, cutting annealed nickel-chrome steel. This curve shows the peak load to start motor was 50 amp., then, as the speed increased, the time of start to the time of cut was 5 sec. and the current dropped to 20 amp. Then, as the tool cut into the material the current went up to 62 amp. for 43 sec., then the current was off for 2½ sec. Then, reversing to high speed, the current rose to 112 amp. and the speed kept getting faster until the current was down to 18 amp., taking about 10 sec. time, then the line continued straight for 5 sec., which was the full return stroke Then the peak from return to cut rose to 45 amp. and dropped down to 20 amp. for 5 sec. before the tool started the second cut, then the current rose to 51 amp. The other cuts and reversals were practically the same, except the curve shows that the motor kept getting faster on the return stroke and the current made a practically straight line for 15 sec., the full return stroke. The full field of the motor was approximately 10 amp.

The upper curve shows our 15-hp. motor driving a 42-in. Pond planer. This is a two-armature motor, capacity 60 amp. This curve shows that at the time this test was taken the cutting speed was 17 ft. per min., return speed 44 ft. per min. Two tools were used, each taking a ½-in. cut and a 3/32-in. feed, cutting cast steel. The shunt field of this motor took 3 amp. To start required a peak load of 40 amp., then, as the speed increased, the current dropped to 10 amp. in 3½ sec. before the tool started to cut, then the current rose to 55 amp. for 33 sec.; then the current was off for 1½ sec. when the return peak rose to 60 amp. and the motor got to full speed in 2½ sec. Then the current dropped to 12 amp. for 13½ sec., then the current was off and so on. This curve shows that the double armature motor drives gets up to speed quickly with peak loads only to the capacity of the motor. Therefore, the motors run cool and without trouble.

*From a paper read before the Association of Iron and Steel Electrical Engineers, New York, September 26. The author is electrical superintendent, American Bridge Company, Philadelphia.

The Steel Corporation's Labor Investigation

Charles M. Cabot, a Boston stockholder of the United States Steel Corporation, has recently corresponded with Chairman Gary concerning the committee created by a resolution passed at the last annual meeting of the corporation to investigate labor conditions at various steel plants. It was provided in the resolution that the committee report by October 1, 1911. In a recently published statement Judge Gary said: "The committee was named soon after the annual meeting. Some of the appointees accepted, others declined. I have had some difficulty in securing a committee of good men, as considerable work is involved. The full number has lately been obtained and has been requested to organize, and I believe they will do so within a short time and on the return of one of the members who is away from home. So soon as the committee is organized I will give out the names. The above information was communicated to Mr. Cabot some days since. There has been no unnecessary delay."

The Washburn Multiple Spindle Drill

A new multiple-spindle sensitive drill manufactured by the Washburn shops of the Worcester Polytechnic Institute, Worcester, Mass., has been brought out to handle drills having a maximum diameter of 9-16 in. Like the motor-driven drill illustrated in *The Iron Age*, September 28, 1911, the new drill is equipped with a belt tightener, which permits the tension of the belt to be varied instantly at the will of the operator, the tension being controlled by automatically locked tighteners operated through a rack and pinion. Fig. 1 shows two views of the drill from opposite sides of the table while details of the oil bath for the spindle pulley are given in Fig. 2.

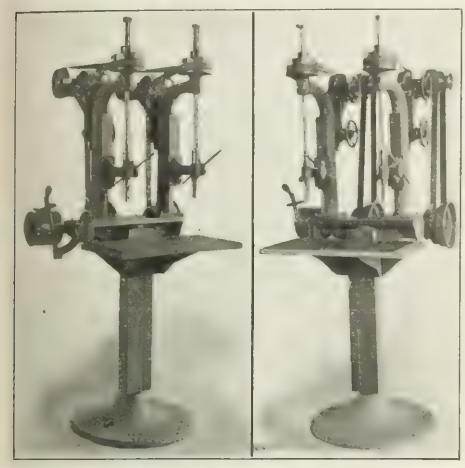


Fig. 1.—Two Views of a New Multiple-Spindle Drill Built by the Washburn Shops of the Worcester Polytechnic Institute, Worcester, Mass.

The countershaft is located at the rear of the column and forms a part of the machine, the drive from this shaft being by an open belt to the back shaft, and then by a quarter-turn belt to the spindle pulley. Both of these shafts have ring-oiling bearings and the spindle runs in an oil bath of an entirely new design, details of which are shown in Fig. 2. The pulley *a* is keyed to the spindle *b* at *c*, and the quill *d* is driven into the column *e* at the point *f*, the column having been bored for this purpose in line with the head bracket. In this way the spindle runs absolutely free at either 610, 1016 and 1830 r.p.m., the tension of the belt on the pulley being taken by the quill. The flange *g* is made a part of the quill instead of forming a part of the pulley. The ring *h* is located within the pulley so as to be concentric with the bearing *d*, the space between the ring and bearing being an oil cup which keeps the bearings flooded with oil while at the same time it also acts as a retainer and prevents the lubricant from spattering.

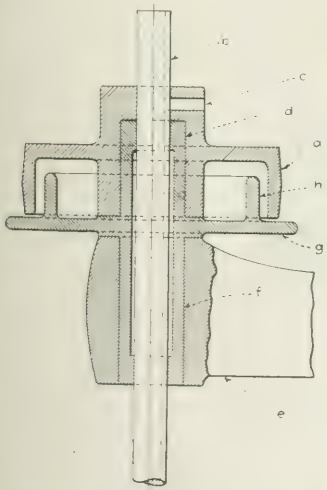


Fig. 2.—Details of the Oil Bath for the Spindle Pulley.

The spindle is bored to conform to a No. 1 Morse taper and when the countershaft is operating at the speed recommended by the builder, namely 610 r.p.m., three spindle speeds ranging from 610 to 1830 r.p.m. are available. These drills are made with two, three or four spindles. The table of the two-spindle machine measures 14 x 28 in., the distance between the center of the post and the center of the spindle is 8 in. and the spindle has a feed of 3 in. The weight of the machine is 715 lb.

The International Motor Company

An organization for selling motor trucks and furnishing service to their owners has been incorporated as the International Motor Company under the Delaware laws, with general offices at 30 Church street, New York. This company, capitalized at $10,000,000, is to have the commercial management and general supervision of the Saurer Motor Company and Mack Brothers Motor Car Company. The manufacturing will be carried on as at present, with the Saurer motor truck plant at Plainfield, N. J., and the Mack Brothers' plant at Allentown. Both companies are to be continued as distinct organizations. A combined output of 2000 trucks is planned for the coming fiscal year. Sales branches and agencies of both the Saurer and Mack Brothers companies will become branches and agencies of the International Motor Company, which will also conduct in all of the principal cities service stations for the most thorough inspection and maintenance of both Saurer and Mack trucks.

The officers of the International Motor Company are: President, C. P. Coleman; chairman of board, W. D. Sargent; vice-president, J. M. Mack; treasurer, F. C. Richardson; secretary, Vernon Munroe. The directors are: Otis H. Cutler, president American Brake Shoe & Foundry Company; Frederick H. Eaton, president American Car & Foundry Company; Benjamin Strong, Jr., vice-president Bankers' Trust Company; Arthur H. Lockett, Pomroy Brothers, bankers; Hunter Marston, Blair & Co., bankers; Charles H. Sabin, vice-president Guaranty Trust Company; George B. Case, White & Case, attorneys; William G. Pearce, vice-president American Brake Shoe & Foundry Company; C. P. Coleman (formerly secretary and treasurer Singer Sewing Machine Company), president Saurer Motor Company; W. D. Sargent, president Reading Steel Casting Company; Herbert H. Dean, Edward B. Smith & Co., bankers; Joseph S. Mack, treasurer Mack Brothers Motor Car Company; Montgomery Hare, attorney; Thomas E. Rush, attorney; Warren A. Wilbur, president E. P. Wilbur Trust Company; Harry W. Davis, secretary Delaware Trust Company; Martin E. Kern, vice-president Mack Brothers Motor Car Company.

There is a special interest in this latest development in the motor truck industry in America which brings into association two of the oldest—perhaps the two oldest—motor truck concerns in the world. Adolph Saurer began building his trucks in 1864 in Switzerland. Four Saurer factories were established in Europe at intervals, and the fifth, which is now associated with the International Motor Company, was started in this country under license a few months ago. The Mack Brothers turned out their first truck in 1900. Their factory now turns out four complete motor trucks a day. The Mack truck was the first successful American-built gasoline truck.

At Hibernia, N. J., October 26, a wall more than 200 ft. thick, which separated the old shaft from a new one that was being sunk in the iron mines of the Wharton Steel Company, was cracked by a blast and water from the old shaft quickly filled the new one, drowning 12 of the 60 miners who were in it. They were more than 1400 ft. under ground when the water poured in.

New Prentice Radial Drill

Machine Equipped Practically Throughout with Ball Bearings

The No. 7 4-ft. arm heavy-pattern drilling machine recently brought out by Prentice Brothers Company, Worcester, Mass., possesses a number of new features which mark it as a distinct advance over its predecessor in this line. In the description of a new 30-in. geared speed change, vertical drilling machine which appeared in *The Iron Age*, April 27, 1911, mention was made that it was the intention of the company to make ball-bearing construction standard throughout its entire line and that experiments with a ball-bearing radial drill were being made. The result of these experiments is the drill shown in the accompanying engravings. The tool is equipped throughout with ball bearings, except in the feed mechanism and these have demonstrated that a saving of 50 per cent. in power is secured in the drilling of any hole with a natural increase in capacity. Speeds as high as 800 r.p.m. are practicable, and the pulling power of the large gear ratio has been demonstrated to operate an 8-in. pipe tap through a 3-in. cast-iron flange. The especially novel points about the new drill are the distribution of the speed-changing mechanism between the speed box and the head, a safety device to prevent the dropping of the spindle counterweight, and the use of a new safety apparatus to prevent the arm from being run too high or too low. Fig. 1 is a view of the drill, while Figs. 2 and 3 show the arrangement of the back gears used in the drill and details of the safety device used to prevent the spindle counterweight from falling in case the supporting chain should break respectively.

The Speed-Changing Mechanism

In the older type of radial there were eight changes of speed in the speed box, controlled by three levers. This has been reduced to four changes with two levers, and the head has been equipped for high and low-speed mechanism, in addition to the back gears which increase the speeds to 16. The upper of the two levers seen at the left of the head controls the high and low speed; the lower, the back gears. The result of this arrangement is that the necessity no longer exists of racing the heavy intermediate shafting and gears between the head and the speed box. The theory is that a very large waste of power is eliminated by this new division of [illegible]. At a pulley speed of 300 r.p.m. the 16 spindle speeds range from 9 to 265 r.p.m. The total gear ratio is 33.3 to 1.

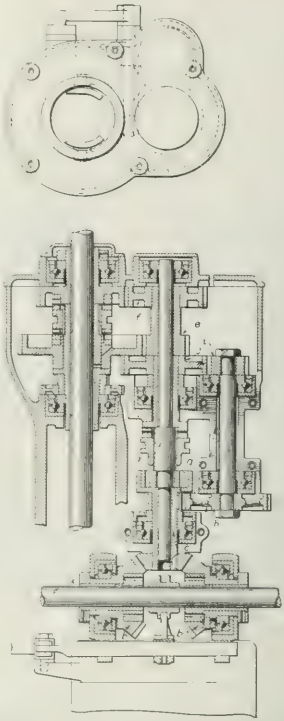


Fig. 2. Plan View and Sectional Elevation of the Back Gears Used in this Drill.

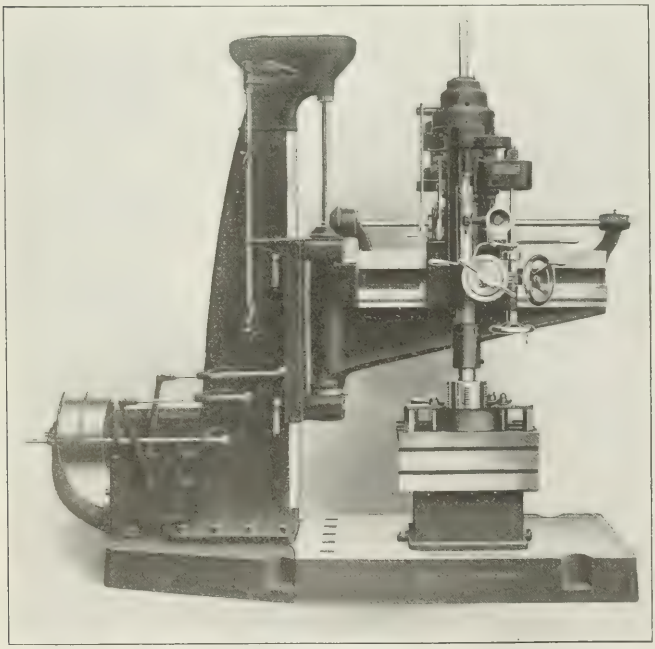


Fig. 1.—The No. 7 Ball Bearing Radial Drill Built by the Prentice Brothers Company, Worcester, Mass.

The details of the speed-changing mechanism of the head are shown in Fig. 2. The power is transmitted through the horizontal shaft *a* to the reversing bevel gears *b* used for tapping, which deliver their power to the bevel and friction cup *c*. By engaging the internal expanding friction with the cup, the back shaft *d* is thrown into action at the same speed as the bevel gear. On this shaft are keyed the gears *e* and *f*, the former furnishing the slow speed and the latter the high. When the back gears are in operation, the friction spool is disengaged and the clutch is thrown into engagement with an upper clutch sleeve. In this position the power is delivered to the backshaft through the gears *g*, *h*, *i* and *j*.

To obviate a possibility of injuring the gearing by running the arm too high or too low, the drill has been equipped with a new safety-stop mechanism, seen on the side of the column in the photograph. The top of this shaft is connected by levers with the tumbler gears which control the raising and lowering of the arm. A partial rotation of the shaft throws these tumbler gears

out of mesh with the raising screw gear, and the feed stops. On the shaft are two inclined cams operated by the projecting finger on the saddle. The action of this finger against the inclined cam surface causes a partial rotation of the shaft to stop the feed.

The company has applied to this machine a new safety-stop device to prevent the falling of the counterweight of the spindle in case of the breaking of the chain. This

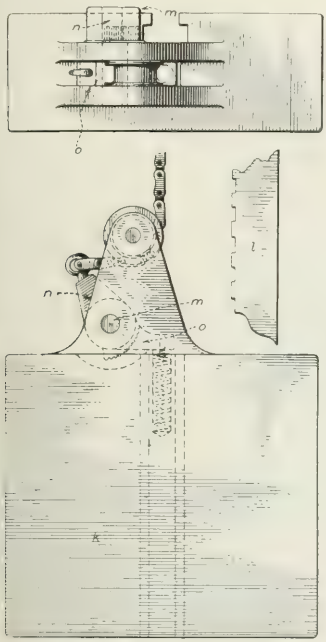


Fig. 3.—Details of the Safety Stop Motion.

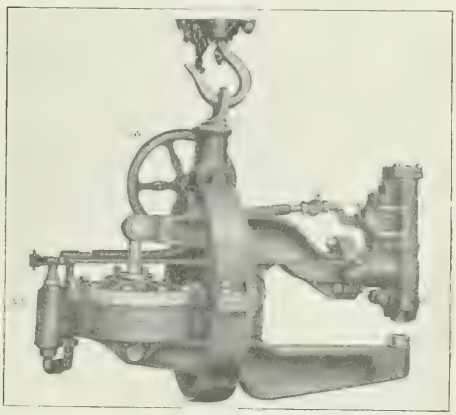
mass of metal hangs open, suspended by a chain, the breaking of which may result in a serious accident. The safety device is designed absolutely to hold the weight in any position it may be at the moment of breaking of the chain. The weight *k*, Fig. 3, travels in a guide, a front view of which is seen at *l*. Through the ears of the weight is the short shaft *m* upon which are keyed a toothed eccentric *n* and a projecting finger *o*. At the end of the eccentric piece is the eyebolt to which is fastened the chain that passes under a sheave and upward. The projecting finger *o* rests against a powerful coiled compression spring which sets in a hole drilled in the weight. The edge of the guide is closely notched to assist the function of the toothed eccentric cam. Therefore, upon the breaking of the chain the compression spring acts instantly to throw the toothed surface of the eccentric against the notched edge of the guide, the combination of cam form and irregular surface serving to hold the weight in essentially the position it occupied when the chain parted.

The Reading Iron Company's Improvements.—The rebuilding of the Ninth street mill of the Reading Iron Company, Reading, Pa., has been practically completed and it is running full. The entire building has been rebuilt, structural iron columns having replaced wooden supports. The mill continued in operation during the reconstruction work, except when temporarily interfered with by the erection of some of the columns. The improvement places this mill in first-class condition, modern machinery having been introduced several years ago. It furnishes skelp to the tube department of the company's plant. The rebuilding of the No. 5 mill on South Seventh street will now go forward, the contract having been awarded to L. H. Focht & Son. This building will be similar in design and construction to the No. 6 mill at Seventh and Laurel streets. The Reading Iron Company has made most remarkable progress in the modernizing and rebuilding of its various plants. Old wooden buildings are being replaced by steel structures and the equipment of its various mills has been rapidly brought up to the best modern practice.

New Allen Riveter Hammer

A notable addition to the line of hammer riveters built by the John F. Allen Company, 370 Gerrard avenue, New York, N. Y., has recently been made. This riveter, on account of its shorter reach and lighter weight, is intended for work that is beyond the scope of the regular builder's boiler riveter machines. The reach is 15½ in., and it possesses sufficient power to drive rivets from ⅜ to 1 in. in diameter.

In operation the work to be riveted is placed so as to bring the rivet head on the die D with the free end of the rivet pointing toward the axis of the hammer cylinder C. Upon moving the handle B toward C air is admitted to the cylinder A. This closes the arms X and Y and a pressure of about 4000 lb. holds the plates to be riveted firmly between the die D and the nozzle N. When the button G is pressed air at a pressure of from 60 to 100 lb. is admitted to the cylinder C. This causes the hammer to



A New Hammer Riveter Made by the John F. Allen Company, New York, N. Y.

strike the end of the rivet a series of quick blows, thus heading the rivet in a few seconds. Releasing the pressure upon the button G arrests the motion of the hammer A movement of the handle B toward the rear of the riveter opens the arms X and Y at once and releases the plates which are moved into position as soon as the rivet is inserted and the riveting operation repeated.

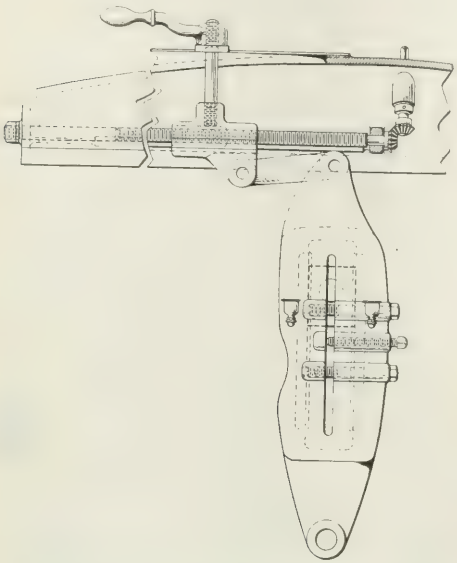
The machine is in balance when suspended from the hook S and can be swung in any direction. It is turned on its long axis L by the hand wheel W, which operates a worm engaging the worm wheel inclosed in the supporting ring R.

William J. Linton, manufacturers' agent, has removed from 136 Liberty street to more commodious offices at 50 West street, New York City. His business connections are now such that he can submit proposals on power plant equipment, either new or used, erected on foundations and installed ready for operation. This feature is expected to prove a great convenience to many who are considering the purchase of either steam or electric power plants.

The Russian Minister of Commerce has introduced into the Duma a bill for the promotion of Russian shipbuilding. It provides for bounties of 75 rubles (ruble = 51.5 cents) per ton of gross capacity and 135 rubles per indicated horsepower for steel ships constructed in Russian yards of Russian raw material, and bounties of 2 rubles per pood in the case of ships built in Russian yards of imported raw material. The law is to remain in force for 15 years.

Lubrication of Queen City Shaper

The lubrication of machine tools is a small but comparatively important question, and after considerable experimental work the Queen City Machine Tool Company, Cincinnati, Ohio, has decided to equip all of its shapers



The Sight Feed Method of Lubricating the Ram Bearing of Shapers Used by the Queen City Machine Tool Company, Cincinnati, Ohio.

with a sight feed lubricator on the ramway of each side of the machine. How this is accomplished, together with the lubrication of the sliding block bearings in the rocker arm is brought out in the accompanying illustration.

The lubricator, which is made by the D. T. Williams Valve Company, Cincinnati, Ohio, is placed near the center of the ram guide bed and the oil is distributed over the entire bearing regardless of the length of the stroke. This distribution of the lubricant is facilitated by grooving the clamps and the ram slide. This arrangement does away with the pouring of oil into four or five oil holes at each side of the shaper, which frequently become clogged with dirt when it is necessary to lubricate the ram bearings.

For lubricating the sliding block bearings and the rocker arm an ordinary brass oil cup loosely packed with a small piece of waste is placed on each side of the rocker arm. A hole for a small tube leading to the sliding block bearing is drilled through the rocker arm and at each stroke of the machine sufficient oil is fed to the bearings. This method of lubrication saves the operator time, since the oil cups require filling once in every three or four days. Another advantage of this method of lubrication is the matter of cleanliness, which while a comparatively small factor is nevertheless something worthy of consideration.

The contract for 2000 tons of rails, to be delivered at Moncton, N. B., for the Transcontinental Railway, has been let to the Dominion Steel Corporation, of Sydney, Nova Scotia.

St. Louis Blast Furnace Company Litigation

Application for a receiver for the St. Louis Blast Furnace Company was made at St. Louis October 20 in the United States Circuit Court by the Whitney-Kemmerer Company, of Pennsylvania. The petition alleges that on January 1, 1910, the company issued through the St. Louis Union Trust Company $200,000 in first mortgage bonds. The petitioners hold $6,000 of these bonds. The petition also alleges that the company is insolvent, unable to pay its debts and without sufficient funds to operate. A temporary court order restrains the company from doing any further business until the litigation is disposed of. About two weeks ago a foreclosure sale of $124,000 of the company's bonds was had on a loan of $62,000 made by a local bank, and the collateral was bid in by the bank.

The defendants in the present suit are the company, the St. Louis Union Trust Company, trustee for the bonds; the McPheeters Warehouse Company and A. P. DeCamp, president of the furnace company. Mr. DeCamp says that the company has assets considerably in excess of its liabilities; that the great majority of the creditors are satisfied with the present handling of the affairs of the company, and that he is satisfied the petition for a receiver will be dismissed.

Schieren Belting at the Turin Exposition

An illustration is herewith given of the exhibit of the Charles A. Schieren Company, manufacturer of leather belting, Schieren Building, New York City, at the Turin Exposition, now being held in Turin, Italy. This exhibit was arranged in an attractive pavilion and comprised impressive specimens of the products of the company. There were also shown seven unusual and hard belt drives, all running under one roof. One of these drives was running with one of the company's Duxbak waterproof belts continually saturated with water. The space was favored with a visit from the King of Italy, who pronounced the exhibit exceedingly interesting and instructive.

On October 17 the company was advised by cable that it had been awarded the Grand Prix for its exhibit. Last year it was awarded the Grand Prix at the Brussels Exposition.



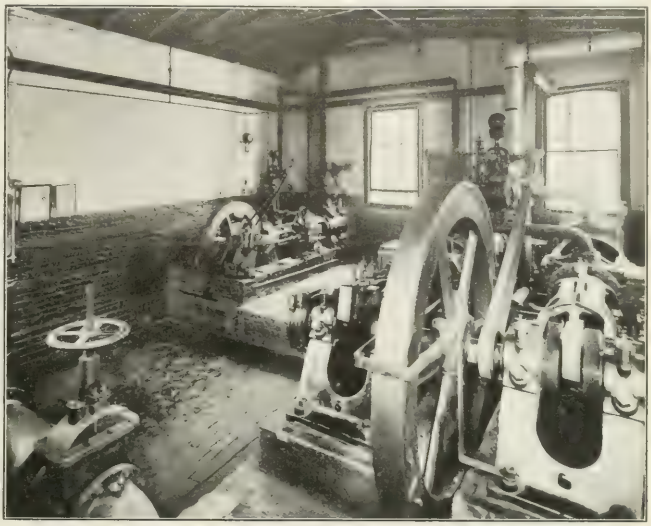
The Charles A. Schieren Company's Exhibit of Belting at the Turin Exposition

High Pressure Gas Distribution

How the Public Service Supply Was Increased at Flushing, N. Y.

An example of the progress made in the high-pressure system of gas distribution, doing away with unsightly gas holders and introducing various economies, is had in the installation of the New York & Queens Gas Company at Flushing, Long Island, N. Y. Here a low-pressure system was transformed into a high-pressure system.

The district served is a large and growing one and the demands on the equipment had reached such a point that it was necessary either to lay more or larger distributing mains or install another district holder, or by some other means increase the pressure to supply the distant consumers. A large drop in pressure was shown by gauge readings, for at the works there was a 5-in. water pressure, but at Bayside 7 miles away, there was only 1½ in. water pressure. As the cost of compressors was small compared with that of a gas holder, it was decided to install 4 mi. of high-pressure main and deliver the gas at 3½ in. pressure into the low pressure on the line feeding Bayside, so that it would increase the pressure both ways.

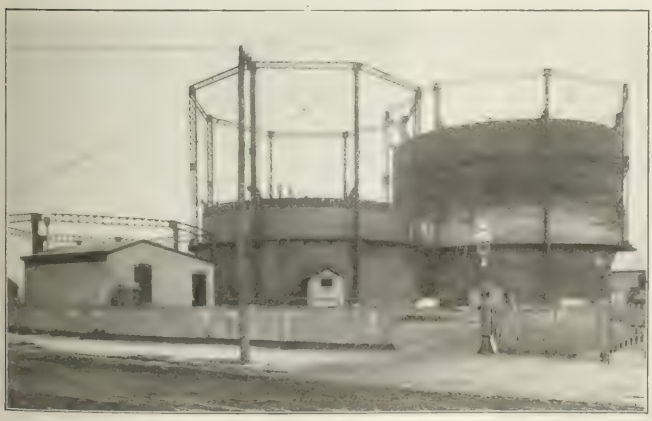


Interior of Compressor House of the Flushing, N. Y., Gas Works.

A small compressor house was built at the works and two Laidlaw-Dunn-Gordon duplex steam-driven gas compressors were installed. The large one has 12-in. steam and 16-in. gas cylinders with a stroke of 12 in., uses steam at about 100 lb. and compresses the gas to 50 lb., while the smaller compressor has 8-in. steam and 14-in. gas cylinders with an 8-in. stroke. The compressors are connected so that either can be run independently of the other or both at the same time. The small one is generally in service during the day when the load is comparatively light, and the large one from 5 o'clock in the afternoon until 10 at night; or, should the load be exceptionally heavy, both can be used. Gas enters the compressors at a pressure of 5 in. of water and is discharged into the mains at 30 lb. per square inch at the rate of 40,000 cu. ft. per hour. Before entering the mains it passes through controlling and check valves, the latter preventing the gas from returning to the compressors.

The distributing system comprises 4 mi. of high-pressure mains and 84 mi. of low. The former are of 4-in. wrought pipe having recessed screwed couplings with the threads covered with red lead and shellac before making up. Every 400 ft. an expansion coupling is inserted and at every 1000 ft. a gate valve. The fittings were furnished by the Dresser Mfg. Company, Bradford, Pa., and the valves were made specially for gas tightness at high pressure by the Eddy Valve Company, Waterford, N. Y., and the Ludlow Valve Mfg. Company, Troy, N. Y. At the end of the 4 mi., the 4-in. line is connected to a 20-in. line. Gas is introduced into the latter through two Reynolds regulators set in a manhole in the street. From the high-pressure mains consumers are fed through service pipes, in each of which before entering a house is a regulator for reducing the pressure. In the low-pressure part of the system no regulators, of course, are required, the usual cocks only being fitted.

High-pressure gas does away with the unsightly district holders, as stated, with their great initial cost. Maintenance costs are also greater, it is understood; than those of the compressors. Smaller pipes can be installed and as a distributing system covers many miles, the saving in cost of piping often may be of very large proportions. The cost of compressing gas at the New York & Queens Gas Company, according to M. H. Spear, secretary and manager of the company, does not exceed 2 cents per 1000 cu. ft. The fluctuation in pressure is of course discernible in the lights.



Relative Unobtrusiveness of Compressor House at Left; Gas Holders at Right

---

Governmental repairing of ships is suggested by the Isthmian Canal Commission as a means for utilizing the admittedly complete machine shops on the Canal Zone after the Panama Canal is completed. The adoption of such a plan will doubtless be objected to on the ground that the United States is entering into competition with private enterprise. Certain it is that ships arriving at the canal after long voyages are likely to need repairs to engines and hulls, and projectors of the scheme feel that such work may well be undertaken by the canal administration for fair prices in addition to levying tolls and maintaining the waterway.

Tests of Pulleys

Transmission Capacity of Different Pulleys with Leather Belt Drive

The findings of an extended series of tests of different kinds of pulleys transmitting power by means of leather belts, conducted on a belt-testing machine in the laboratory of Sibley College, Cornell University, were reported in a paper presented before the National Association of Cotton Manufacturers at its recent meeting at Manchester, Vt., by Prof. Will Miller Sawdon. The work was undertaken at the request of the Rockwood Mfg. Company, Indianapolis, Ind., and the tests were all made with single-ply oak-tanned leather belts, 5 in. wide and 0.224 in. thick, and 33 ft. long. The pulleys were all nominally 24 in. in diameter with an 8-in. face. A constant belt feed of 2200 ft. per minute or 348 r.p.m. of the driving pulley was maintained throughout. Cast-iron, wood and paper pulleys were used, including those with cork projections. Some idea of the extent of the tests may be gained when it is stated that for cast-iron pulley tests alone nearly 9000 observations of the slip of the pulleys were taken.

It is to be remembered that in order to transmit power from one pulley to another there must be a difference in the tensions set up between what is called the tight and slack sides of the belt. The capability to produce this difference depends in part on the nature of the two surfaces. That pulley is best in which the measure of friction of the pulley on the belt surface is the greatest and the slip is the least. The tests show that for slips of 1 to 2 per cent., as commonly used in practice, the plain cast-iron pulley has the lowest values of coefficient of friction and the plain paper pulley has the highest. The values of the plain wood pulley lie between these limits. An interesting feature is that wood pulleys up to ½ per cent. slip follow very closely the performance of the paper pulleys, after which the slip increases rapidly and at 1 per cent. the coefficient of friction is only approximately a mean between those of the cast-iron and the paper pulleys. Beyond 3 per cent. slip the coefficient of friction is less than that for cast iron. This condition explains in part a commonly accepted understanding that the wood pulley has a small capacity for carrying an overload. To accept overload capacities as much as 50 per cent. of the normal load, the wood pulleys must be designed larger in diameter or for use with a wider belt than the normal load would demand.

Pulleys with cork inserts made under specifications for 1¼-in. diameter, xx straight mucilage corks by the Armstrong Cork Company, set in 1 1/16-in. diameter sockets and spaced 2¼ in. between centers and of composite construction were tested. This gave a cork area of from 37 to 39 per cent. of the total pulley face. It is general practice to make the cork area from 25 to 33 1/3 per cent. of the total area. Two separate and complete tests were made on the cork insert pulleys, one for a projection of the corks of approximately 1/34 in. beyond the pulley face and the other for a projection of approximately 1/64 in.

In the case of the cast-iron pulleys, each of the cork-insert curves shows a material increase in the values of the coefficient of friction at lower slips and running up to 3 per cent. For the longer corks the values of the coefficient of friction between 1 and 6 per cent. slip are close to those of the plain wood pulleys. Below 1 per cent. slip the wood pulleys have the higher values. With the shorter corks, considerable advantage is shown over plain cast-iron pulleys as well as plain wood pulleys up to about 4 per cent. slip, after which the coefficients are but little higher than for the plain cast iron. Either of the cork-insert cast-iron pulleys, however, shows a large overload capacity at high slips.

In the wood pulleys the cork inserts slightly increase the transmitting capacity for very low slips and up to about ½ of 1 per cent. Between ½ and 1¾ per cent. slip the plain wood pulleys have the higher values, while beyond 2½ per cent. the cork inserts again show an advantage. This is particularly interesting in that, though capable ultimately of carrying much greater loads, through the allowable ranges of slip, the cork inserts actually prove detrimental.

The tests on the paper pulleys with cork inserts are also interesting in that in each case the use of cork inserts has proven detrimental to the transmitting capacity of the pulleys for practically the entire range of slip. For the longer cork projection this is more marked than for the shorter. Unfortunately, in the paper and in the cork pulley tests, the capacity of the machine did not permit of higher loads being carried to determine the maximum values of the coefficient of friction and corresponding slips.

The Dreses 6-Ft. Radial Drill

One of a New Line Generously Supplied with Ball Bearings

A new line of plain radial drills with 5, 6 and 7 ft. arms has been developed by the Dreses Machine Tool Company, 227 West McMicken avenue, Cincinnati, Ohio. Several changes have been made in the design of these tools from those formerly built, the more important being the adding of an extra bearing for the head on the rear of the arm and mounting the spindle driving gear on ball bearings to reduce the friction exerted on this part by the pull of the spindle as it is being fed downward. Fig. 1 shows the middle, or 6-ft. size, while Figs. 2 and 3 illustrate details of its construction, being a section through the column showing the arrangement of the inner and the outer members and a rear view of the head respectively.

The column, as will be seen by referring to Fig. 2, is made in two sections, the outer one swinging on an inner fixed column that reaches nearly to the top. The diameters of both are greatly increased at the lower end and there is a third bearing at the point *a* which adds strength and rigidity. A place for a large roller bearing to rest and swing on is provided by the reinforced portions as well as means for clamping the column easily and firmly. The clamping handle is always within easy reach of the operator since it follows the arm, and no pressure is exerted on the rollers of the bearing when the arm is clamped in position. These rollers are tapered and of large diameter and are protected from chips and dirt.

Box construction is employed for the arm which is parabolic in elevation. A conveniently located handle raises and lowers it at a ratio of 2 to 1 and to prevent the arm from being moved too far in either direction, an automatic knockout is furnished at the top and bottom. The thrust of the elevating screw is taken up by a ball bearing. Long and wide bearings are provided for

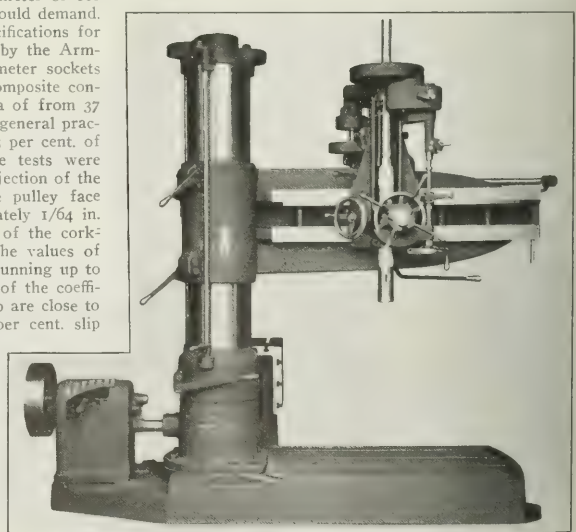


Fig. 1.—The New 6-Ft. Plain Radial Drill Built by the Dreses Machine Tool Company, Cincinnati, Ohio.

the head on the face of the arm, and in addition there is a third bearing on the rear of the arm formed by the back gear bracket as shown in Fig. 3. This additional bearing adds to the support of the head, distributes the torsional strain over the whole arm, which is an important feature, and eliminates bending and strain of the rear shaft and rapid wear of the bevel gears and their bearings. A single handle on the left side of the head above the face of the arm serves to clamp and release the head. A compound spiral-gear arrangement and the third support in the rear enables it to move easily along the arm.

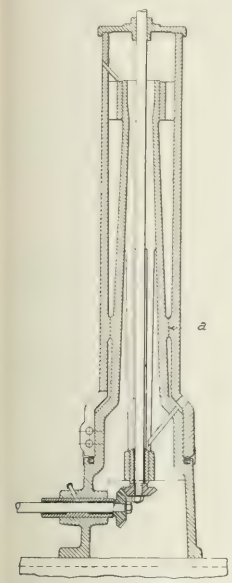
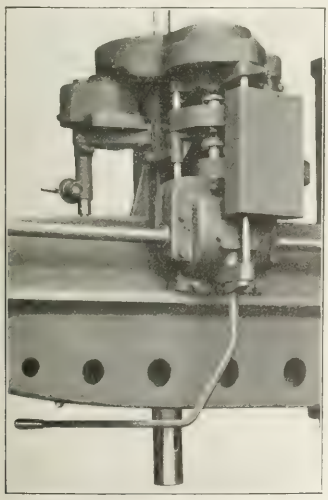


Fig. 2.—The Arrangement of the Inner and Outer Columns.

In the design of the spindle driving gear an important improvement has been made to reduce the friction to which this gear is subjected by the pull exerted upon it when the spindle feeds down. This has been done by making the spindle driving gear rest and revolve on a ball bearing. The mechanism for the feed which is of the all-geared type is inclosed in a small case. Eight changes in all are available; four of these ranging from 0.007 to 0.022 in. per revolution of the spindle are secured by the little handle on the feed shaft at the right of the head and are increased from 0.026 to 0.80 in. by the little crank above, both being within easy reach of the operator. The use of a ratchet clutch enables the hand feed to work ahead of the power feed.

A swinging dog attached to an extension on the spindle sleeve is brought into contact with an adjustable dog on the feed bar and there is a graduated scale by which the depth of a hole can be gauged from zero fixed to this adjustable dog. Several of these dogs can be put on the feed bar and the swinging dog brought into contact with them successively for different depths of holes. A safety release for the end of the feed is provided. The quick advance and return device has four levers, any one of which engages and disengages the feed instantly and also serves as a pilot wheel for hand operation of the spindle.


Fig. 3.—Rear View of the Head Showing Bearing on Back of Arm.

The starting, stopping and tapping mechanism, which is of the friction type, is embodied in the head and operated by the horizontal lever shown below the arm in Figs. 1 and 3. The large diameter friction bands are double expanding and are made of phosphor bronze to avoid cutting. The bevel gears containing the frictions run in an oil bath. The speed-changing lever on the head enables the tap to be backed out at 2½ times the cutting speed. Three speed changes, rendering 21 different spindle speeds available, are provided for the head, the arrangement being patterned after automobile transmission gearing.

Any desired speed can be secured without stopping the machines. The speed variator is of the tumbler-gear type and has seven changes. The teeth are of the 20-deg. involute pointed form to insure strength and easy engagement. To overcome momentum when starting the speed variator runs at the slowest speed at all times and is provided with the builder's self-releasing overtake clutch which was illustrated in *The Iron Age* of August 13, 1908. In the variator one gear runs loose on the variable-speed shaft and is clutched by four pawls located in fixed gears mounted on this shaft. These pawls are kept in contact with the inner surface of the gear by spiral springs and will release the two gears when the fixed ones run faster than the loosely mounted one.

Three sizes of tool with arms 5, 6 and 7 ft. long are built and range in weight from 10,000 to 16,000 lb. In a test of the middle size an 8-in. pipe tap was fed in a 2½-in. plate and a hole was drilled in cast iron by a 4-in. high-speed drill at a cutting speed of 100 ft. per minute and a feed of 0.027 in. per revolution of the spindle.

Railroad Appliance Exhibition.—The annual exhibition of appliances used in the construction and maintenance of steam and electric railroads will be given by the National Railway Appliances Association at the Coliseum and First Regiment Armory in Chicago March 18 to 23, inclusive, 1912. This is the week during which the American Railway Engineering Association will hold its thirteenth annual convention, and the Railway Signal Association will hold its spring meeting. The Railway Appliances Association has been incorporated under the name of National Railway Appliances Association with offices at 537 South Dearborn street, Chicago. The price of the floor space will be 45 cents per sq. ft., the additional charge of 5 cents per sq. ft. over last year having been made because of the necessity of buying fixtures this year, instead of renting them as heretofore. The first allotment of space will be made on or about November 1. It is advisable to have all applications for space in the hands of the secretary, Bruce V. Crandall, 1400 Ellsworth Building, 537 South Dearborn street, Chicago, before that date.

The Disco self-starter for gas and gasoline engines is hereafter to be made in Detroit, where the Ignition Starter Company has located both its factory and offices to secure increased production facilities. Communications should be addressed to the company at 724 Ford Building, Detroit. The self-starter comprehends an arrangement by which acetylene gas, such as is obtainable from the acetylene lighting tank found on the automobile, delivering the acetylene gas to each of the cylinders of the engine and then exploding the gas by use of the ignition system. In the case of automobiles, the visible portion of the self-starter is a small crank on the dashboard.

Illustrations of lathe chucks of a wide range of types, accompanied with brief descriptive matter and tables necessary for those planning to make intelligent selection of chucks, are printed on single sheets of paper of letter size by the Skinner Chuck Company, 94 Reade street, New York City, for such use as attaching to correspondence of, for example, machinery dealers, where such literature would be distinctly appropriate. A group of the leaflets, fastened together, can undoubtedly be had for the purchasing agent's or superintendent's library.

The Machinery Markets

The machinery trade in the East is still looking forward to the expected railroad buying and in the meantime orders and inquiries for small amounts of machinery are coming from the general manufacturing field. An improvement is noticed in Philadelphia and the railroads are asking for bids on some single tools. The Chicago trade is bidding against a small list of machine tools and the trade has just filled a good-sized order placed by a local steel company. Second-hand machinery is scarce in Chicago. The Cleveland market is quiet, but a good demand exists for handling equipment, such as hoists, cranes, etc. Inquiries are coming out more freely in Cincinnati, but prospective purchasers are slow in closing orders. There are increased inquiries in Detroit and small power electric units are selling well. In St. Louis the machine tool market is improving and there is an increased demand for second-hand machinery. Most of the buying in that market is for small lots of machines. Business is generally dull on the Pacific Coast, although the demand is excellent for equipment for municipal power plants.

New York

New York, October 25, 1911.

Machinery dealers are awaiting news from the railroads, as it is expected that a number of those mentioned in these columns last week will come forward with lists in the near future. The Delaware, Lackawanna & Western and the New York Central will probably be the first to buy. The latter company is expected to make purchases against the list it has had before the machinery trade for a long time. There are a number of new projects in the way of small manufacturing enterprises in this vicinity that will call for machinery expenditures, and inquiries are good. Dealers continue to get some good business from auto truck manufacturers in the East and there is a fair amount of steady buying of small lots of tools. The contractors on the New York subway work are good customers at this time for outdoor equipment and small lots of metal working machinery which will be used for temporary repair shops established along the work. The Public Service Commission recently awarded another sectional contract for subway extensions to the Lexington avenue division to the Hagerty-Drummond Company, Philadelphia, which will do more than $3,000,000 worth of contracting work on the extension. The W. H. Atwood Reaping & Mowing Machine Company, Hoosic Falls, N. Y., has been making some purchases of machinery in this market for a factory extension and the Baron de Hirsch Fund Trade School is expected to spend some money soon for metal working equipment to be established in a six-story extension to its manual training department.

The Dixon Cascade Pump Company, Inc., 17 Canfield street, Newark, N. J., will erect a new plant at the corner of Badger avenue and Runyon street, Newark, for the manufacture of its centrifugal pumps. The plant will be 75x200 ft. and one story. The company proposes to spend about $10,000 for new machinery and its entire expenditure will be $50,000.

An extensive addition is to be made to the plant of M. Gould's Son & Co., manufacturers of trunk hardware at 61 Hamilton street, Newark, N. J. The addition will consist of a four-story brick building, 35x85 ft. Fred A. Phelps, whose office is in the Union Building, Newark, is the consulting engineer.

James Stewart & Co., 30 Church street, New York, have been awarded the general contract for the construction of a plant at Edgewater, N. J., for the Midland Linseed Company, of Minneapolis, Minn. Bids are now being taken on the machinery and power equipment.

A two-story automobile service building is to be erected at 588 Broad street, Newark, N. J., by Eisele & King. The building will be 28x90 ft. and will include a machine shop.

The Celluloid Company, Newark, N. J., which has in the past been a generous purchaser of machinery in the New York market, is erecting a two-story brick addition to its plant, 51x66 ft., at a cost of $10,000.

The American Railway Supply Company, 24 Park Place, New York, has had plans prepared by Van Vleck & Goldsmith, 111 Fifth avenue, for a two-story brick factory building, 51x87 ft., for the manufacture of brass tags and badges. The company will move its equipment from its present quarters, but will need a new 24 or 25 hp steam engine and boilers.

The Nestor Film Company has under course of erection a factory building, two stories, 20x100 ft., at Avenue E and Forty-third street, Bayonne, N. J. The company has temporary offices at the works and will soon be ready for equipment for the making of moving picture appliances and films.

The Acme Sheet Metal Company, Jersey City, N. J., has been incorporated with $50,000 capital stock. The company is having plans prepared for a factory for the manufacture of steel ceilings, etc. The incorporators are N. C. Duane, N. E. Wiggins and George W. Everitt. The company has temporary offices at 257 Broadway, New York.

The Zaremba Company, Buffalo, N. Y., maker of evaporators, vacuum evaporating apparatus, etc., has leased a factory building at Elk street and the Buffalo Creek Railroad, in which necessary manufacturing equipment will be installed.

The Thomas Motor Cab Company, Buffalo, has removed its plant from the Century Telephone building, Elmwood avenue and the New York Central Railroad belt line, to the southwest corner of West Mohawk and Staats streets, where it is occupying a three-story and basement building with an area of over 30,000 sq. ft.

The Buffalo Box Factory, Buffalo, is building an extensive brick addition to its plant at Scoville street and the Pennsylvania Railroad.

The Onondaga Brass Company, Syracuse, N. Y., has been incorporated to take over the business of a company of the same name. The management and officers of the company will remain the same as before its incorporation. No additional machinery purchases are contemplated for the present.

The city of Syracuse, N. Y., will erect a vocational high school to cost about $280,000, from plans of Architects Merrick & Randall. Considerable machinery and power equipment, metal and woodworking tools will be required.

The Central New York Gas & Electric Company has completed plans for the enlargement of its power plant at Geneva. A new boiler of 520 hp. capacity and other equipment will be installed, the total cost of the improvements amounting to about $40,000.

The Volney Paper Company, Fulton, N. Y., is taking figures for an addition which it contemplates making to its present three-story factory building.

The Salamanca Furniture Company, Salamanca, N. Y., is having plans prepared for a four-story and basement factory building 53x159 ft., which it will erect this winter or early in the spring.

The Salamanca Mirror Company, Salamanca, is taking bids for a one-story brick factory building 55x160 ft. Grinding and polishing machinery equipment will be required.

The National Iron Foundry & Supply Company, Williamsport, Pa., has completed plans for the building of a plant at Oneida, N. Y., and construction work will be commenced this fall.

The Mohawk Hydro-Electric Company, Ephratah, N. Y., has been authorized by the Public Service Commission to issue bonds to the amount of $56,000 for the purpose of making improvements to the power plant recently leased from the Fort Plain Gas & Electric Light, Heat & Power Company at Nelliston, N. Y., and the construction of transmission lines.

The Motor Specialties Company, Oswego, N. Y., has been incorporated with a capital stock of $175,000 to manufacture motors, engines, motor-vehicles and motor-boats. Among the incorporators are Arthur Lovell, Plainfield, N. J., and Howard H. Williams, 31 Nassau street, New York city.

The Ideal Wrapping Machine Company has been incorporated with $150,000 capital stock at Middletown, N. Y., where it will establish a plant for the manufacture of wrapping machines, &c. The incorporators are Olin S. Fellows, Archibald E. Hopkins and Frederick B. Williams, Middletown.

The Lakeside Forge Company has been incorporated at Erie, Pa., by Frederick Bell McBrier and others, to manufacture iron and steel forgings. The capital stock is $100,000.

THE MACHINERY MARKETS

New England

BOSTON, MASS., October 24, 1911.

The dealers in machine tools and other manufacturing equipment have had a quiet week. No new lists are out, so far as can be learned, and trade is generally dull. The Boston & Maine Railroad has made much progress in preparing the ground for the great locomotive and car repair shops at Billerica, Mass., and the work of erecting the buildings will proceed without delay, with the prospect of having them ready for occupancy in 1912. The list of equipment should be one of the largest, if not the largest, ever placed in New England, for the enterprise entails a total outlay of between $2,500,000 and $3,000,000.

Protracted rains have relieved many industries by giving them their full water power and the promise of a continued supply for the winter. Much anxiety had existed that the reservoirs and natural sources would not be renewed before winter had set in, which in this section means waiting for the thaws of late winter. The situation in New England regarding labor is excellent, hardly a murmur being heard in any industrial lines. Significance is placed on the fact that most industries which manufacture for the ultimate consumer, to meet the thousand and one wants of daily existence, are satisfactorily busy, and in many cases filled up with orders. Some improvement is noted in the textile industries. It is significant that in spite of the protracted reduced activities of the cotton mills the companies have not found it necessary to reduce their regular dividends.

The Vibrationless Pneumatic Tool Company, 260 North street, Concord, N. H., manufacturer of vibrationless tools for the stone and iron trades, is in the market for a turret lathe, engine lathe, milling machine, cylindrical grinding machine and a drill press. The corporation has just been reorganized and has established works at Concord. J. C. Coulombe is the president; C. J. French, mayor of Concord, vice president, and A. K. French, secretary and treasurer. The product includes pneumatic riveters.

The entire business of the American Ship Windlass Company, Providence, R. I., will be moved to Philadelphia, and its departments housed with those of Williamson Bros. of that city, who are the owners of the Providence industry. The windlass end of the business went to Philadelphia some months ago, but the automatic stoker department remained, and in Providence it was hoped that this would continue. The owners deemed it wise, however, to concentrate the works.

The Norton Grinding Company, Worcester, Mass., gave a demonstration of a new car axle grinding machine at its works, October 18 and 19, at which were present a large number of representative railroad men. The machine is semi-automatic in its operation, including the handling of the 800-lb. axles, pneumatic power being employed in bringing the centers into position and in releasing them, and in lifting the work that its ends be reversed. The contention is that by grinding axles the diameter of the bearings are reduced less than by turning; a more perfect cylinder is obtained, and the speed of production is greater.

Interior New England must profit more than most industrial sections of the country by the development of water power, for the cost of coal is high owing to distance from tidewater and the long all-rail haul. Already the cheaper power has resulted in the further development of manufacturing plants on a large scale, where otherwise extensions would have been carried on elsewhere. It is therefore of vital interest to many manufacturers that the Central New Hampshire Power Company has been organized on an apparently substantial basis to develop the power of New Hampshire's streams draining 1,500 sq. miles of territory, admirably adapted to the concentration of water in storage reservoirs. The engineers who have been over the situation carefully estimate a potentiality of nearly 100,000 guaranteed 10-hour hp and some 20,000 secondary hp. Robert C. Bacon, Brattleboro, Vt., is the president of the corporation, which has a Maine charter, with authorized capital stock of $15,000,000. The plan calls for the establishment of 17 power plants, together with numerous reservoirs, so located that water can be used over and over again, in some cases as many as five times. The topography of the country makes the creation of reservoirs, comparatively speaking, inexpensive. Sugar River will develop 42,000 hp in five stations; at Claremont, Chandler, Newport, Croydon Flats and Pollard's Mill; Concoocook River, 34,000 hp in five developments, at Penacook, Contoocook village, West Hopkinton, Henniker and Hillsboro; Blackwater River, 9200 hp in two stations, in Webster; Warner River, 2500 hp at Davisville; on Smith River, 7000 hp at Danbury; and on the Mascoma River 10,000 hp at Lebanon. The distance of transmission to industrial centers further south in New England is by no means excessive in any instance.

Philadelphia

PHILADELPHIA, Pa., October 24, 1911.

While there has been no marked gain in the volume of business transacted by merchants or manufacturers in this territory, orders have been in somewhat larger number and the trade is more encouraged with the outlook for the future. Buying is, however, still confined to propositions of the smaller size, although negotiations are still pending on at least one list of fair proportions. The trade still reports difficulty in closing pending inquiries, buyers deferring as long as possible the placing of definite orders. Competition continues extremely sharp in all lines of the machinery business. Special tool makers are more actively engaged, as a rule, than builders of the usual standard types of metal working equipment. A few inquiries have recently come from some of the local railroads, principally for single tools. The railroad demand continues very unsatisfactory, however, and does not show any sign of immediate betterment. Buying is light and scattered among a large variety of second-hand wood and metal working equipment. The call for castings for machinery parts has been comparatively quiet; in some instances steel casting plants have received a better run of orders, although the major portion of the work has been in the nature of locomotive castings. Gray iron foundries still report business of an irregular nature. The market for engines and boilers does not show any material improvement; considerable business is pending, principally in equipment of the medium and smaller horsepowers, but closes slowly.

Proposals are being taken by the Hess-Bright Mfg. Company for the erection of a new plant on the site recently acquired by it at Front street and Erie avenue. Plans were prepared by Dodge, Day & Zimmerman, comprising a two-story building 38 x 200 ft., of slow burning mill construction, which will be occupied by the office, inspection, testing and shipping departments and a steel frame building 200 x 220 ft., with saw tooth roof, for general manufacturing purposes.

The Philadelphia & Reading Railway has had inquiries before the trade for a heavy duty crank shaper and a 36-in. lathe. It is reported that the company's shops at Reading, Pa., have a somewhat better volume of business ahead.

The New Jersey Wire Cloth Company, Trenton, N. J., has moved a portion of its manufacturing department to Roebling, N. J., where buildings for its accommodation have recently been completed. Owing to the lack of available land for extensions at the Trenton plant, the increased demand for its product has and will continue to be taken care of at the new plant, where constant improvements are being made. The removal of a portion of its plant at this time was for the purpose of the concentration of its various departments. Some departments will continue to be operated at Trenton, which may or may not be ultimately removed to the Roebling works.

Current reports that the Otto Gas Engine Works was having plans prepared for a new plant, to be erected at Mt. Holly, N. J., are erroneous. Tentative plans are being prepared by local engineers for a proposed plant for the Otto Sales Company, which is considering the purchase of the automobile manufacturing department of the Otto Gas Engine Works, and, in view of such purchase being consummated, would erect a plant for the manufacture of the automobiles. At the time the Otto Sales Company acts as the selling agents for the Otto Automobiles.

The Nelson Valve Company reports the receipt of a larger number of small orders, which aggregate a better total than that in August or September and considers the outlook for business as being improved.

The Department of Wharves, Docks and Ferries, Joseph F. Haskarl, Director, will take bids until November 1, for furnishing electrical equipment for Vine Street Pier and Immigrant Quarters, for which $5500 is available. Specifications may be had at the office of the Director, 565 Bourse Building, this city.

The Philadelphia Textile Machinery Company has purchased a tract of land of about 8½ acres at Tabor

THE MACHINERY MARKETS

Road on the North Penn Branch of the Philadelphia & Reading Railroad. The purchase was made, not with a view of building a new plant at this time, but rather with the idea of being prepared for any future extensions.

The Root Dairy Supply Company, West Grove, Pa., will remove its manufacturing plant to Chester, Pa. Plans for the new plant are in course of preparation although the actual removal will not be made until next June or July.

The Light Mfg. Company, Pottstown, Pa., notes a somewhat better demand for its product and from present indications looks forward to much more active conditions. This concern has given considerable attention recently to the placing of its machinery and tool equipment in first class shape, so as to be better enabled to take care of prospective business.

The Cigar Machine Corporation of America, 205 West Lombard street, Baltimore, Md., will build a new plant at Curtis Bay, that city, which is to be one story, 300x300 ft., for the manufacture of automatic cigar making machines. The company is at present having its machines made at Providence, R. I.

Chicago

CHICAGO, ILL., October 24, 1911.

Machinery dealers in this market are finding a great deal of effort necessary in bringing such inquiries as are current to a focus, and a disposition on the part of machine shop operators to make the old machine serve a little longer is being manifested. Very few purchases are made without some trade deal being involved. At the same time some dealers report a scarcity of second hand machinery available for resale. For the most part recent inquiries of importance in this market are still unplaced. The Illinois Central Railroad purchased a large pipe machine and a 52-in. boring mill was sold to one of the plants of the International Harvester Company. The bulk of the business taken during the past ten days has been made up of sales of machines from the floor. A wide variety of tools has been in demand, but inquiries are generally for one or two machines only. Currency is being given to a report that the recent large lists for the Chicago & Alton Railway will not be placed this year. An inquiry for about $5000 in machinery from a local manufacturer is noted. The Laclede Steel Company, St. Louis, Mo., has ordered for its new steel plant machinery to the amount of several thousand dollars.

The Klemm Company, 1364 Grand avenue, Chicago, will build a one-story factory at that address to cost $1800. The architect is T. J. Raynerson.

The Triumph Bed Spring Company, Chicago, has been incorporated by Oscar Rehe, Frank Smith and Albert C. Benson, with a capital stock of $5000.

The Central Fire Sprinkler Company, Chicago, has been incorporated with $10,000 capital stock to manufacture and deal in automatic water sprinklers. The incorporators are A. J. Parker, F. M. Peterson and M. Summers.

The plant formerly occupied by the Webster Mfg. Company, on West Fifteenth street, Chicago, and recently sold to the W. S. Cuyler Wire Works, Cleveland, Ohio, was damaged by fire recently to the amount of $125,000. The greater portion of this damage was suffered by the Standard Mfg. Company, which was occupying one of the buildings, in losses on its machinery.

The Ideal Stencil Machine Company, Belleville, Ill., has been incorporated to manufacture stencil machinery. Geo. Remnsider is president and J. W. Marsh secretary and treasurer. The company has an authorized capital stock of $50,000.

The Mendota Mfg. & Transfer Company, Mendota, Ill., is constructing a plant to include a machine shop, blacksmith shop, general factory building and boiler room.

The Yale Mfg. & Sales Company, Milwaukee, Wis., has purchased the plantof the Oostburg Steel Foundry Company, which it will convert into a plant for the manufacture of metal novelties.

The Milwaukee Concrete Mixer & Machine Company, Milwaukee, Wis., is contemplating the erection of a $5,000 plant. Business growth has made this expansion necessary and a suitable site is now being sought.

H. M. Odgen, Milwaukee, Wis., is taking bids through Architect Schmetzky for a four-story brick factory 50 x 150 ft., to be built on Fourth street.

Henry J. Nelson, Green Bay, Wis., has purchased the building and machinery of the Dean Mfg. Company at Seymour and will move the machinery to Green Bay for the equipment of a machine shop.

The plant of the Hartman Trunk Company, Racine, Wis., was damaged recently by fire, with a loss of $85,000. Temporary arrangements have been made for the conduct of the business and new fireproof buildings will replace those destroyed as soon as possible.

The Wisconsin Iron & Wire Works, Milwaukee, Wis., is remodeling a part of its plant at a cost of $3000.

The Cream City Foundry Company, Milwaukee, Wis., is planning the erection of an addition to its plant at Fifteenth and Oklahoma avenues. A part of the addition will be built this fall and the remainder in the spring.

At Donnellson, Iowa, it has been decided to expend the sum of $8,500 for installing a water works system.

The Cownie Tanning Company, Des Moines, Iowa, C. R. Cownie, president, is planning the expenditure of $20,000 in the improvement of its plant. A large part of the outlay will be for new machinery.

At Sioux Falls, S. D., a bond issue of $300,000 was voted to provide for the installation of additional water works and sewerage.

Cleveland

CLEVELAND, OHIO, October 24, 1911.

The improved demand for machine tools noted in the previous two weeks has not been maintained. Following quite a spurt in buying the market is again quiet, both sales and inquiries being light. About the only business that came out during the week was a small volume of single tool orders. The demand for second hand machine tools is also inactive. Local machine tool builders continue to operate their plants at a productive capacity that in most cases is greater than their volume of business and some have accumulated good sized stocks. Makers of handling machinery report a good demand for hoists and other small equipment, but there is little demand for heavy handling machinery. Locomotive cranes, however, continue to move fairly well.

The manufacturing situation in general in this territory in metal working lines shows little change. The demand for a large share of the numerous small products that are of general everyday use is nearly normal. The automobile industry is regarded in a very satisfactory condition. Makers are not showing concern over the future and hesitancy about turning out cars in advance of sales that they were at this time last year. Some of the local automobile plants are being run full at double turn. Makers of automobile parts and accessories are generally busy.

The Metal Trades Superintendents' and Foremen's Club of Cleveland, on October 21, resumed its regular monthly meetings, which were discontinued during the summer months. A talk on the screw machine and its products was given by Emmet Leckner, foreman of the Chandler & Price Company, Cleveland. A general discussion of the subject followed. The opening meeting was in the nature of a smoker and refreshments were served. At the November meeting, James H. Herron, consulting engineer, Cleveland, will give a talk on Heat Treating of Steel.

The new plant of the Ironton Punch & Sheet Works, Ironton, Ohio, is nearing completion. It includes the plants of the Olive Foundry Company, Ironton, and of the Cincinnati Punch & Shear Works. In addition to the line of machinery formerly made by the latter company, the new plant will manufacture power metal working machinery. The new main building is 100 x 264 ft. The machine shop, foundry, forging room and other buildings have been remodeled and considerable new equipment has been added.

The Cleveland Pneumatic Tool Company, Cleveland, will shortly begin the erection of a building 50 x 50 ft. to be used as a stock room. This will permit the removal of the stock room from the present plant and provide additional room for manufacturing purposes.

The Burke Valve Company, Cleveland, recently incorporated with a capital stock of $50,000, was organized to place on the market a new motor tire valve. The company will not establish a plant, having arranged with a Cleveland manufacturing plant for making its valves.

The Electric Lap Welding Company, Cleveland, has been incorporated with a capital stock of $50,000 by George H. Tyler, George W. Boesel, H. G. Stacey, W. E. Gray, R. F. Nailler and H. C. Johnson.

The Packard Electric Company, Warren, Ohio, has increased its capital stock from $50,000 to $100,000 and

THE MACHINERY MARKETS

has a number of improvements and expansions in view. The erection of a frame and brick building, 24 x 30 ft., in which to make insulating varnish, will be started shortly. The company is planning to build a large brick and steel factory building next spring. This will be used for the manufacture of insulation cable, insulated cloth, transformers and other products.

The Goodyear Tire & Rubber Company, Akron, Ohio, has awarded a contract to the Hunkin-Conkey Construction Company, Cleveland, for an addition to its plant. It will be a two-story brick building, 30 x 120 ft.

The Ohio Pottery Company, Zanesville, Ohio, will build a new plant to replace one that was burned a few weeks ago.

The Standard Structural Company, Cleveland, has been incorporated with a capital stock of $10,000 by P. H. Anthony, Mark A. Copeland, G. B. Kennerdell, Joseph A. Schlitz and W. S. Mitchell.

The Martin Adjustable Piano Bench Company, Cleveland, has been incorporated with a capital stock of $15,000 by C. H. Martin, F. A. Brodbeck, Jr., S. G. Taylor and H. M. Farnsworth.

The Columbus Wire & Iron Works Company, Columbus, Ohio, will enlarge its plant by the erection of a two-story addition, 43 x 110 ft.

The John W. Brown Mfg. Company, Columbus, Ohio, is having plans prepared for a three-story addition to its plant, 27 x 70 ft. The company makes automobile and carriage lamps.

The Riley Shoe Mfg. Company, Columbus, Ohio, has had plans prepared for a large addition to its plant, but will delay letting contracts for the extension until next spring.

The Canton Corrugating Company, Canton, Ohio, has been incorporated with a capital stock of $100,000 by H. L. Riley and others.

The Robinson & Albright Company, Marysville, Ohio, will shortly begin the erection of a new packing plant.

The Standard Churn Company, Wapokoneta, Ohio, has been incorporated with a capital stock of $60,000 by F. H. Heman and others.

Cincinnati

CINCINNATI, OHIO, October 24, 1911.

While inquiries for machine tools are coming in freely they are slow developing into real orders. There is a continued absence of buying on the part of the railroads, automobile manufacturers and other large users of tools, and there is no indication that this particular class of the trade will come into the market any time soon, except for single machines.

Second-hand machinery dealers generally report business as being quite dull, although second-hand power equipment is in fair demand. The foundries report a slight improvement, and they are now operating to about 60 per cent of capacity.

The Cincinnati Branch, National Metal Trades Association, held a meeting on the evening of October 18, at the new Ohio Mechanics' Institute and discussed fully means for promoting the interests of shop apprentices. A special committee was appointed to investigate conditions, and will make a report at a future meeting.

The Pioneer Motor Car Company, Marietta, Ohio, newly incorporated, has had plans prepared for a modern three-story garage that will be 58x190 ft., and of reinforced concrete construction. Some equipment for the repair shop will be required. H. B. Coen is named as one of the principal incorporators.

It is reported that the Ault & Wiborg Company, Cincinnati, will soon erect a large addition to its varnish plant on Northern avenue.

Hilb & Baur, Cincinnati, scrap iron merchants and second-hand machinery dealers, confirm the report that they will soon make a large addition to their building in the western part of the city.

The Ohio Products Company is a new Cincinnati incorporation with $60,000 capital stock. It is the announced purpose of the new company to build a large distilling plant at some point in the South for the purpose of extracting wood alcohol, turpentine, &c., from waste sawmill products. G. B. Groesbeck is one of the principal incorporators.

The Foos Gas Engine Company, Springfield, Ohio, has authorized Architect R. C. Gotwald to draw up plans for the large addition to its plant, previously mentioned. The new structure will be about 95x205 ft., one story.

The new factory of the Union Thread Company in Carthage, a Cincinnati suburb, is nearly completed, and the work of installing the necessary equipment will be commenced at an early date.

The Bauroth Machine Company, Toledo, Ohio, has changed its name to the Bauroth Machine & Stamping Company.

The Norwalk Motor Car Company, Martinsburg, W. Va., has been incorporated with $300,000 capital stock, by F. A. Minor, S. P. Hopkins and others. No manufacturing plans have yet been given out.

F. A. Kemlein, secretary, the Builders' Exchange, Dayton, Ohio, reports very satisfactory progress being made on the large five-story concrete building now being constructed in Edgemont suburb for the Ohmer Fare Register Company. The McCormick Building on First street and the Bimm power building and warehouse are two structures now under way that will be used for light manufacturing purposes when completed.

The Ventilating Sash Lock Company, Princeton, W. Va., has been incorporated with $15,000 capital stock to manufacture sash locks. J. W. Thorn and B. S. Peter are among the principal incorporators.

It is reported that the American Steel Package Company, Defiance, Ohio, contemplates making an addition to its plant.

The Leabarjan Mfg. Company, Hamilton, Ohio, is building a factory to manufacture the Leabarjan patented music punch. The company will not only be in the market soon for special light machinery and jigs, but will require some power equipment. John C. Lease of Hamilton is understood to be the head of the new company.

Architect G. W. Drach, Union Trust Building, Cincinnati, has completed plans for the addition to the power plant of the Central Mfg. Company at Lockland, Ohio, recently mentioned.

Detroit

DETROIT, MICH., October 24, 1911

Satisfactory conditions prevail in most branches of the local machinery market. Numerous inquiries continue to come in and dealers report a considerable volume of sales of single tools and small lots. Electrical equipment in the smaller units is selling well. Saw mill machinery continues in demand. Considerable business in small shop equipment is being transacted and the demand for machinists' small tools is very brisk indeed. Manufacturers of tools are being kept fairly busy but their activity varies according to the nature of tools built. Little second-hand machinery is moving, although inquiries for this class of equipment are fairly good. Little municipal work of direct interest to the trade is being done, some minor improvements to electric light plants being the extent of this business. Considerable new construction work is in view, in spite of the approach of winter, including a number of factory additions.

Ground has been broken for the erection of a new manufacturing building for the Hudson Motor Car Company, adjoining its present plant. The new building is of steel and concrete construction, two stories and 60 x 530 ft. A large amount of new equipment will have to be purchased.

The Acme Heater Company, manufacturer of electric stoves and specialities, is building a new factory at Scotten and Michigan avenues.

The Detroit Insulated Wire Company is increasing its capacity by the erection of a new factory building of three stories.

The Pingree Shoe Company is completing a large two-story addition to its present plant on Jefferson avenue, and is reported to be in the market for considerable shoe manufacturing machinery. The company recently increased its capital stock.

The village of River Rouge, Mich., is making improvements to its electric light plant, and will probably purchase a new generator in the near future.

The Public Lighting Commission has taken out a permit for the construction of a five-story shop building adjoining the present electric light plant. Details as to the equipment to be installed have not as yet been announced.

The Michigan Stamping Company has been incorporated with a capital stock of $10,000. J. H. French, H. P. Cope and J. T. Murray are the principal stockholders.

The Detroit Wood Pulley Company has been incorporated with a capital stock of $12,500. Daniel W. Avery is the principal stockholder.

THE MACHINERY MARKETS

Jordan & Steele, Hastings, Mich., manufacturers of sink frames, will merge their business into a stock company and enlarge their plant.

The Escanaba Pulp & Paper Company, Escanaba, Mich., has been incorporated with a capital stock of $30,000, and will engage in the manufacture of paper.

The Berkey & Gas Furniture Company and the Oriel Cabinet Company, both of Grand Rapids, Mich., have completed a merger of their businesses and the capital stock of the new company will be $1,000,000.

The Pere Marquette Railroad Company has awarded contracts for the construction of a woodworking shop at Saginaw, Mich. The new building will be two stories 80 x 150 ft. and will cost $8,000 exclusive of the mechanical equipment.

The Cummer-Diggins Lumber Company, Cadillac, Mich., is contemplating the erection of a shingle mill in the near future. The company has just completed a $20,000 addition to its plant.

The plant of the J. B. Armstrong Mfg. Company, Flint, Mich., maker of automobile axles, has been sold to the Western Spring & Axle Company, Cincinnati. No additions to the plant are contemplated at present

A company with $25,000 capital stock has been organized at Monroe, Mich., to take over the business of the Elkhart Mfg. Company, Elkhart, Ind., and the plant will be moved to Monroe where large manufacturing quarters have been secured. H. S. Hubbard is president of the new company. Magnetos are to be manufactured.

A foundry and machine shop is being established at Sault Ste. Marie, Mich., by B. W. Prentice.

Williams Bros., Cadillac, Mich., are making extensive additions to their saw mill plant in that city, including the installation of considerable new machinery.

The Central Station Engineering Company of Chicago has asked the city of Kalamazoo, Mich., for a franchise to construct and operate a central heating plant. It is considered probable that the franchise will be granted.

The Standard Foundry & Mfg. Company has been organized at Alma, Mich., to engage in the foundry business and the manufacture of shop machinery. A factory building 65 x 45 will be erected.

Improvements are being made at the Lakeside Iron Works, Marquette, Mich., which will greatly increase the company's facilities. Considerable air and electric machinery is being installed.

The Michigan Auto Joint Company has organized at Grand Rapids, Mich., to manufacture universal joints and automobile accessories. The capital stock is $10,000 and stockholders include C. E. Perkins and F. Carter.

A pipe organ factory is to be built at South Haven, Mich., as a branch to the plant of Cosavant Bros., St. Hyacinth, Que. Plans are now being drawn and it is the intention to have the building completed early in 1912.

The Miller Car Company, Detroit, has taken out a permit for the construction of a one-story brick factory on Richmond avenue in that city to cost $5,000.

The Eastern Michigan Edison Company will begin at once the construction of a power plant on the Huron river at Ann Arbor, Mich. The new plant will involve the expenditure of $250,000 and will develop 800 hp. Power will be furnished to Ann Arbor, Ypsilanti and neighboring towns. Gardner S. Williams is the architect in charge.

The Engineering Products Company, Detroit, manufacturer of electrical specialties, has moved into its new plant, a one-story building 80 x 115 ft. on Goldsmith avenue near the Michigan Central Railroad tracks. The company is in the market for the following machine tools: two lathes, one 12 and one 20 in.; two drill presses, one 18 and one 24 in.; one milling machine; one planer; one power hacksaw; one 5 hp. 3-phase induction motor, 220 volts, together with small tools and supplies.

Indianapolis

INDIANAPOLIS, IND., October 24, 1911.

The Indiana Gas Engine Company, with $25,000 capital stock, has been incorporated at Indianapolis by G. G. Westerfield, I. W. Connally and C. A. Korbly. It will manufacture gas engines of a new type.

The Wasmuth-Endicott Company, Huntington, Ind., has been incorporated with $20,000 capital stock to manufacture kitchen furniture. The directors are E. M., D. A., A. D., F. L., H. R. Wasmuth, H. A. Dinius and C. E. Endicott.

The Sterling Furniture Company, Indianapolis, has been incorporated with $20,000 capital stock to manufacture furniture. The directors are E. W. Bassett, F. B. Moreland and B. Denny.

The Central Gas & Power Company, Evansville, Ind., has been incorporated with $100,000 capital stock to distribute electrical energy. The directors are P. J. Scheller, H. Dannettell and H. J. Peckinpaugh.

The Bliss Sanitary Garbage Can Company has been organized at Grabill, Ind., with $40,000 capital stock to manufacture tin and metal articles. The directors are J. Witmer, B. B. Schlatter and A. Egly.

The Bedford Stone Company, Bedford, Ind., has been incorporated with $20,000 capital stock to quarry and manufacture stone. The directors are F. E. Allen, G. W. Tarleton and W. F. Brooks.

The Campfield Raggle Block Company, Richmond, Ind., has increased its capital stock from $1000 to $10,000.

The Crane Company, Chicago, dealer in heating and plumbing supplies, has let the contract to the William P. Jungclaus Company, of Indianapolis, for a fireproof office and warehouse in Indianapolis. The contract price is $80,000.

The Decatur Motorcar Company, Decatur, Ind., has increased its capital stock from $200,000 to $350,000.

The Central Indiana Water, Light, Heat & Power Company has been incorporated at Francesville, Ind., with $125,000 capital stock, to supply Francesville and other towns. The directors are E. A. Rossiter, Hazel Keenon, Edward Smalley, Chas. Lohrer and A. J. Cooper.

The American Playground Device & Swing Company, Terre Haute, Ind., has been incorporated with $10,000 capital stock to manufacture gymnasium and playground equipment. The directors are W. H. Freeman, G. W. Kreitenstein and O. T. Fries.

The Farmers Peat Fuel Company, Indianapolis, has been incorporated with $75,000 capital stock to manufacture peat pressing machinery. The directors are R. S. Lawrence, P. A. Lavallee and C. B. Marshall.

The Peru Basket Company has been incorporated at Peru, Ind., with $30,000 capital stock to manufacture baskets. The directors are G. R. Chamberlin, A. H. Chamberlin and T. A. Keyes.

The Laporte Radiator Company, Laporte, Ind., has been incorporated with $100,000 capital stock to manufacture radiators. The directors are A. J. Rumely, Emmet Scott and V. P. Wilkins.

The South

LOUISVILLE, KY., October 24, 1911.

The passage of the week in machinery circles has brought about the usual degree of improvement which is looked for at this season of the year, and which, fortunately for everybody concerned, has not been in the least lacking at any stage of the fall of 1911 to date. The demand for all sorts of equipment is steadily improving and the dealers scout the idea of a dull period breaking until it absolutely becomes so cold in the land of cotton that there is no chance for factory improvement or equipment installation to proceed. It is generally agreed that a month or possibly six weeks of brisk activity is ahead of the machinery makers and dealers.

It developed last week that the Louisville Lighting Company, in this city, reorganized by the election of a new president, Brig. Gen. John Harries, vice Fred M. Sackett, resigned, is contemplating putting in a strong bid for the municipal franchise that is to be awarded by the General Council for the erection and maintenance of a big central steam heating station in the Gateway City. This means that the Kentucky Electric Company will have a strong competitor for the privilege of furnishing steam heating service to the public, and it is a matter of question as to whether the Louisville or the Kentucky company will ultimately erect the heating plant

The American Automobile Mfg. Company, New Albany, Ind., directly across the Ohio River from Louisville, held a meeting of its directors last week and elected George H. Wilson, a well-known manufacturer of Louisville, president of the company. The company, in addition to continuing the manufacture of its Jonz two-cycle motor car upon an extended scale, will make a four-cycle machine in the near future and is planning the production of commercial cars as well as pleasure vehicles. While no new automobile manufacturing equipment will be required by the extension

THE MACHINERY MARKETS

just at present, improvements will undoubtedly be necessitated in the plant in the near future.

The Brush Creek Coal & Mfg. Company is equipping a mine near Barbourville, Ky., and expects to be shipping by January. 1 A lot of the mining apparatus is yet to be secured and installed. The Gibson-Carr Company, of Middlesboro, Ky., is also preparing to operate a big mine in the Barbourville district, to be ready for business about January 1.

The new Louisville Bolt & Iron Company, formed to operate a big sheet steel manufacturing plant in Louisville, Ky., filed articles of incorporation at Indianapolis, Ind., last week, placing its capital stock at $400,000. The corporate name of the company is the Louisville Steel & Iron Company and the central offices will be located in Indianapolis, although the plant, which is capable of handling $1,000,000 worth of business a year, is located in South Louisville. George H. Holzbog, a Jeffersonville, Ind., capitalist, is promoting the organization of the company, and the following directors have been elected: Walter T. Verigan, Elias D. Salsbury, Randolph T. Wedding, Lawrence A. Wiles and Ernest M. Sherburne.

The municipal authorities of Corbin, Ky., according to a recent announcement, are considering the construction of a good-sized water-works.

The city authorities at Cadiz, Ky., have decided to offer a municipal franchise for the operation of an electric light plant for sale. The proposed plant will be equipped with turbines, as the power is to be generated by water. A. C. Burnett, secretary of the Cadiz Commercial Club, is promoting the formation of the public service corporation.

A proposed bond issue having been recently defeated in Maryville, Tenn., the city authorities of that place, headed by Mayor A. K. Harper, are contemplating the award of franchise privileges for corporations which wish to construct water-works and sewerage systems in Maryville.

The Mayor of Waverly, Tenn., recently secured a vote of the Council of that city favoring the purchase of a water-works and electric lighting plant from the Lucas Land & Lumber Company, Waverly. The new acquisition of the Waverly officials is to be enlarged and extended to accommodate city-wide demand for water and lighting.

Jasper Bowens is promoting the organization of a company to erect and maintain an electric lighting and power plant at Whitesburg, Ky.

The municipal authorities of Decatur, Ala., have decided to erect a $50,000 electric lighting and power plant and are now drawing plans for the institution.

The Mayor of Auburndale, Fla., is having plans drawn for the establishment of an up-to-date electric plant in Auburndale.

H. L. Milner has secured a franchise from the city authorities of Morgantown, N. C., and is now starting work upon a big electric light and power plant.

The Howe Ice Company, Nashville, Tenn., of which Harry Howe is president, has completed plans for the erection of a branch ice plant in Atlanta, Ga., and is planning to increase the capacity of its plant in Nashville 100 tons per day.

The Asbury Marble Company filed articles of incorporation with $25,000 capital stock at Knoxville, Tenn., last week and will engage in a general quarrying business in the Knoxville marble fields, installing a complete array of quarrying equipment. The incorporators of the new company are James B. Jones, Arthur Burkhardt and others.

William G. Cummins, Pittsburgh, Pa., is now in Nashville, Tenn., planning the establishment of a factory to make water-works fittings. A suitable structure for the work will be secured and equipped as soon as possible and a full line of hydrants, faucets and valves will be produced.

The Paxton Lumber Company, Bristol, Tenn., will erect a large planing mill and operate it in connection with the Paxton woodworking plant in Bristol as soon as possible.

J. C. Bilbry is figuring upon the equipment and operation of a manufactory for vehicle hubs and spokes in Carthage, Tenn., in the near future.

The Central Lumber Company, Chattanooga, Tenn., is planning the establishment of a complete wood working plant for the manufacture of poplar, oak and chestnut lumber, cross-arms, etc., and will also engage in a machinery and mill supply business. The capacity of the Central woodworking plant is to be in the neighborhood of 35,000 ft. of lumber per day.

T. B. Felder and others, Atlanta, Ga., have incorporated the Shaw Kiln Company with a capital stock of $500,000 and are now planning the establishment of a brick and tile manufacturing plant of large capacity.

The Surrey Chair Company, Elkin, N. C., has been formed to establish a chair factory. Equipment for the plant is yet to be secured.

The Dean Mfg. Company, Newport, Ky., is preparing to enlarge its plant and will provide increased capacity to accommodate growing business. The company is now manufacturing all sorts of gasoline engines for motor boats, and automobiles, and proposes to equip a department for the manufacture of aeroplane engines.

The Muhlenberg Sentinel Publishing Company, publishing one of the leading papers in the Greenville, Ky., district, is planning to rebuild and install a lot of new machinery in its printing plant, which was burned a short time ago.

The Kaul Lumber Company, Tuscaloosa, Ala., is planning the erection of a plant, the cost of equipping which will be in the neighborhood of $300,000.

The Calloway Engine & Improvement Company, Jonesboro, La., has been incorporated to manufacture a turbine engine under the patents of G. E. Calloway. The incorporators are G. W. Sadler, A. C. Thomas, B. F. Blumdell and others.

The Galey Lock Nut Company, Jackson, Tenn., has been organized with a capital stock of $100,000 to manufacture and market a patented lock nut. The officers of the company are W. F. Lamb, president; G. D. Seiler, secretary and treasurer.

The town of Amory, Miss., will receive bids until November 7 for furnishing material and constructing water works and sewers, which include one 100,000-gal. tank, two 500-gal. per minute motor driven pumps, one air lift system and approximately five miles of mains, hydrants, valves, etc. The Solomon Norcross Company, Atlanta, Ga., is the engineer in charge.

The Southern Mfg. Company, Gadsden, Ala., whose plant was recently burned, has had plans prepared and is investigating sites for the erection of a new plant. The company will be in the market for power and equipment for a planing mill and sash and blind factory which will employ about 100 men.

St. Louis

ST. LOUIS, MO., October 21, 1911.

The conditions in the machine tool market show the same tendency toward improvement that was indicated last week, but as then the developments are of the individual order rather than in big lists from large establishments. The aggregate, however, in comparison with past conditions is very satisfactory. The inquiry for second-hand tools in good condition continues to improve.

The Plantation Equipment Company was incorporated in St. Louis the past week by William C. Zelle, William G. Brenneke, Henry C. Zelle, Charles E. Zelle, Arthur A. Zelle and Conway Elder, with $100,000 authorized capital stock. The company will manufacture gasoline propelled agricultural machinery and implements. While its own plant is being built and equipped its product will be turned out on contract by a machine shop at Belleville, Ill.

The Miller Machine Company, Bridgeport, Ill., has been incorporated with $6,000 capital stock and will equip a plant at once. The incorporators are George D. Miller, L. Miller and R. D. Donnelly.

The John G. Massie Mfg. Company, with $50,000 capital stock, has been incorporated by John G. Massie, Leon G. Smith and Frank D. Wyant. A plant will be equipped at once.

The Fisher-Hicklin Mfg. Company, Sweet Springs, Mo., has been incorporated with $40,000 capital stock by Charles and Edward Fisher and John Hicklin.

The Minor-Graham Lead & Zinc Company, Joplin, Mo., has been incorporated with $30,000 capital stock by John F. Minor, W. P. Graham, W. P. Fulkerson. It will put in a mining equipment.

The C. W. Haas Tire Seat Company has been incorporated at Peoria, Ill., with $75,000 capital stock for the manufacture of tires for automobiles, accessories, etc. The incorporators are C. W. Haas, Richard C. Uckena and Emmet C. May.

The Imperial Clock Company, which recently incorporated in Missouri and established a large new plant in St. Louis, has been prevented by injunction from removing the machinery of its original small plant from Granite City, Ill. A minority of the stockholders of the original company are fighting the extension of the company.

THE MACHINERY MARKETS

The Dorris Motor Car Company, of St. Louis, has taken out the city permit for the construction of the first unit (to cost $68,000) of its new addition for the manufacture of automobiles.

The American Furnace Company, St. Louis, has taken out a permit for the construction of a new factory building, to cost $16,000, exclusive of mechanical equipment.

The Dalton Adding Machine Company, Poplar Bluff, Mo., has leased quarters in St. Louis for a branch factory and distributing station.

The Union Pacific Railroad round house at Sidney, Neb., was destroyed by fire recently with an estimated loss of $250,000.

The Missouri Pacific Railroad is reported as planning the erection of car shops at Fort Scott, Kan.

The Mutual Ice & Cold Storage Company, Topeka, Kan., is planning the expenditure of $50,000 for improvements and additions to its plant.

At Ponca City, Okla., the question of issuing bonds to the amount of $30,000 to build an electric light plant is under consideration.

Texas

AUSTIN, TEX., October 21, 1911.

A noticeable feature of the machinery trade at this time is the increase in the demand for mining equipment in Arizona, New Mexico and Mexico. In Texas many industrial plants are being promoted. The mildness of the winter climate all through Texas makes it possible for industrial projects to be carried on without interruption throughout the year, and in fact most of the work of this character is done during the winter season when labor is more abundant.

The Kenedy Light & Power Company is installing an electric light plant at Kenedy. The plant will be so arranged that its capacity may be easily increased when the demand becomes larger.

The Standard Water Meter Company has been formed at Dallas with a capital stock of $10,000. The incorporators are G. K. Garrison, C. A. Chase and T. P. Roberts.

The Business Men's Club is promoting the establishment at Plainview of a beet sugar factory to cost $600,000. Sugar manufacturers of Chippewa Falls, Wis., are interested in the proposed enterprise.

The Cleburne Motor Car Mfg. Company has been formed to install a plant at Cleburne for the manufacture of automobiles. The erection of the factory will soon be started.

The Medina Irrigation Company, which is constructing a dam and irrigation system near San Antonio at a cost of about $6,000,000, will also erect large cotton mills and oil mills and other industrial plants to utilize the products grown upon the land that is to be reclaimed. The construction of an electric interurban railway to run from San Antonio through the irrigated property and intermediate towns will be started in a short time, it is stated.

A syndicate of Lowell, Mass., cotton mill men will establish a large cotton goods plant at San Benito. B. F. Yoakum of New York, chairman of the Frisco Railroad Board and Executive Committee, is associated with them in the project.

The city of Hamlin is installing additional machinery in its waterworks plant and making other improvements to the system.

Patricia Gonzales will establish a buggy and carriage factory at Berclair.

The Commercial Club of Temple is promoting the establishment there of a large iron foundry and machine shop. A. Alstadt is back of the project.

The Gonzales Bridge & Iron Company has begun the erection of its plant at Gonzales, which will be devoted to the manufacture of bridge material.

The American Sugar Mfg. & Refining Company which was recently formed will soon begin the erection of a large beet sugar factory at Portales, N. M. In connection with this enterprise it is probable that a railroad will be constructed through what is known as the shallow water belt where farmers will engage extensively in growing sugar beets.

The Chapala Hydroelectric & Irrigation Company of Guadalajara, Mexico, will soon complete the installation of its new hydroelectric plant at Puente Grande and will remodel and reconstruct its power transmission system that extends to the Hostotipaquillo and Etzatlan mining districts.

Deutz Brothers and associates will install a plant for the manufacture of machines for shredding the fiber of the maguey plant at San Luis Potosi, Mexico. A company has been formed under the name of the Compania Desfibradora Forseck, S. A., to erect and operate the proposed plant.

The Ray Central Mining Company will install a large mill and other machinery and make general improvements to its property situated at Ray, Ariz., at a cost of about $1,500,000, according to estimates made by the board of directors.

The Sunset Mining & Smelting Company of Cerrillos, N. M., will install a concentrator at its property at that place. Headquarters of the company are at Cerrillos.

The Mololoa Mining Company will install a reduction plant at its mine near Hostotipaquillo, State of Jalisco, Mexico. W. M. Matthews is general manager.

Edmund Putnam and associates will install an electric hoist and other machinery at the Providencia mine near Parral, Mexico.

The Live Oaks Copper Company will install a 150-ton mill at its property near Miami, Ariz.

The Douglas Copper Company will install churn drills upon its property near Ray, Ariz.

Emilio Arroyo of Parral and associates will install a large amount of machinery at their Europa mines near Parral, Mexico.

The Victoria Mining Company will install hydroelectric machinery at its placer mines near Greaterville, Ariz.

Chas. Ross will install a pump upon his Colossol mine at Fairview, N. M.

The Compania Explotadora y Exploradora will install hoisting machinery and make other improvements at its mines at Guanacevi, State of Durango, Mexico.

The Atlas Metal Works, Dallas, has had plans prepared for a factory building, 75 x 250 ft., which it will erect on a 35 acre site recently acquired. The company has not as yet prepared a list of the equipment needed.

The Pacific Coast

SAN FRANCISCO, CAL., October 17, 1911.

The machine tool market in California is without animation, though the aggregate volume of business is somewhat better than last month. The principal movement is on very small orders, with scarcely any inquiry from the larger interests, and local shops are keeping out of the market almost entirely. Very little is heard from shops in the oilfields, which purchased a good many tools early in the summer. The general outlook, however, is considered fair, with some indications of gradually increasing activity during the coming year.

Within the past year a large number of machine tools, and considerable other equipment, have been purchased for manual training schools in the Coast district, and some business of this nature is still in prospect. A very fair order has just been placed with Louis G. Henes, representing Manning, Maxwell & Moore and other manufacturers, for the complete equipment of forge, woodworking and machine shops of a school at Salt Lake City.

Several new orders have come out for electrical equipment, both for private enterprises and municipal lighting plants. The Great Western Power Company is starting active work on a large project at its Big Meadows site, which will call for considerable contractors' equipment, as well as electrical machinery. Waterworks equipment is an important factor, with prospects of increasing inquiries during the coming year. There is some inquiry for railroad supplies, rolling stock, etc., from logging interests, and with many extensions under way interurban traction companies will probably be in the market for similar supplies within the next few months. Rock crushing machinery is quiet, but the outlook is better than for some time past.

The Union Iron Works has taken out a building permit for its new shop building.

Contracts have been let for the Westinghouse Air Brake Company's buildings at Emeryville, Cal., and it is expected that some shop equipment will be installed, but so far there has been no definite inquiry.

The Howes Machinery Company, San Francisco, has been incorporated with a capital stock of $50,000, by H. A. Norman, W. E. and E. E. Howes, C. C. C. and A. G. Cunningham.

A large number of electric motors have recently

THE MACHINERY MARKETS

been sold to oil well operators in districts which are now being reached by power distribution lines.

The Cyclops Iron Works, now on Main street, manufacturer of brewing and refrigerating machinery, is preparing to put up a two-story brick building on Folsom street near Fourth.

Frederick C. Roberts & Co. have taken the contract for steam turbines, generators and switchboard in the San Francisco Hospital, at $23,198. The boiler contract was awarded to the Robert Dalziel, Jr., Company.

A lot of machinery is to be added shortly to the municipal pumping plant of Whittier, Cal.

It is reported that a pumping plant is to be installed at the Lakeview oil well, which for a time was the largest gusher ever opened in California.

The Capital Gas Engine Company, Sacramento, Cal., has been incorporated with a capital stock of $100,000, by James Shaw, F. F. Thompson, C. H. Hardy, A. F. Harrison and W. A. Mackinder. The company has taken over the Bell Machine Shop, which will probably be enlarged.

F. C. Holman is installing a machine shop at Sonora, Cal.

The Brown-Doane Company has announced its intention to install a sash and door factory at Red Bluff, Cal.

A report has been circulated that a malleable iron plant was to be established at San Bernardino, Cal. The plant under discussion is already in operation near Riverside, Cal., and it is announced that it will not be moved.

Negotiations are under way for the establishment of a new oil refinery by a Colorado concern in the vicinity of Los Angeles.

Plans are being drawn for a 100-ton concentrating plant for the Globe Western Company, Miami, Ariz.

H. G. Fenton, Escondido, Cal., has installed a rock crusher of 100 tons daily capacity.

Jas. Hewitt, Gibsonville, Cal., has purchased a five-stamp ore mill.

The Gorham Engineering Company has added a number of small tools to its gas engine plant in Oakland.

The Standard Oil Company is preparing to add a new unit to its large oil pumping plant near Martinez, Cal.

The Klamath Falls Iron Works, Klamath Falls, Ore., has purchased property adjoining its present location for the purpose of adding to its plant.

Eastern Canada

TORONTO, ONT., October 21, 1911.

The fine weather has been favorable to business. Outdoor operations that are often brought to a standstill at this season are keeping hosts of workers employed. House building, railway construction, the carrying out of large public works in cities, the linking up and extension of power transmission systems, the working of mines, etc., are now proceeding as energetically as they were a month ago. There is a very large absorbent demand. If there were not, the output of the now large manufacturing capacity of Canadian works producing machinery, etc., would speedily begin to accumulate, which it is by no means doing. Trade returns show that the importations of such plants are increasing. It is safe to say that no other country in the world of Canada's population is at the present time swallowing up a greater quantity of new equipment. The railways keep on adding to their mileage. Their total demand for equipment is now of large dimensions. There is some speculation as to the profitableness of business if trade in the United States continues to fall away throughout the twelvemonth that remains before the holding of the Presidential election. Buyers are understood to be looking forward to lower prices, and contracts for installations to be put in some months hence are said to be undertaken, in some cases, upon calculations that the plant can be bought at lower prices when time for placing it in position is near at hand.

The Dominion Casket Company proposes to buy the factory of the Canada Furniture Company in Guelph, Ont., and carry on business there.

Negotiations have begun for establishing at Niagara Falls, Ont., a branch of the Stotts Railway Signal Company. Also an American company manufacturing vacuum cleaners is considering the question of locating branch works there.

It is rumored that the Bayless Pulp & Paper Company, whose dam at Austin, Pa., broke with such frightful consequences about a fortnight ago, will move to Quebec.

The ratepayers of Alliston, Ont., have approved a by-law to grant municipal privileges to the Dettor Woolen Company, which will establish there a plant for the manufacture of silverware.

The factory the Brockville Auto Company is building at Brockville, Ont., is nearly ready for the installation of the machinery.

The Stone Mfg. Company is about to establish a factory at Ingersoll, Ont.

The Cossit Company, Brockville, Ont., has a two-story addition to its scale factory under way.

The Nova Scotia Power Company is preparing to begin construction work on its site on the Gaspereaux River.

Great progress is being made in the Porcupine camp of northern Ontario in the work of building the place up anew after the destructive effect of the fire of last spring. At the Dome mine the power house, the machine shop and accessory buildings are being put up. Steel for the mill and the cyanide plant are on the way. A new crusher has been bought and equipment for stamp mills are coming. In the mill 500 tons of steel will be used. The Dominion Bridge Company, Montreal, has the order for this.

The Clinton Motor Truck Company is proposing to establish a factory in Clinton, Ont., if certain municipal privileges are granted.

The Dominion Government has approved the plans of the Cedar Rapids Mfg. Company, Montreal, to carry out its great power improvement and industrial scheme on the St. Lawrence River.

P. W. Gardiner & Son, Galt, Ont., are adding a large extension to their factory.

The Merchants' Rubber Company, Berlin, Ont., is preparing to build a very large addition to its factory.

The Bishop Construction Company, Montreal and Toronto, has the contract to erect the buildings of the Canadian Yale & Towne, Ltd., St. Catharines, Ont.

The Town Council of Galt, Ont., is considering the installation of a plant for the pumping of the water supply by hydroelectric power.

The Montreal Board of Control has reported in favor of the tender of the W. E. Seagrave Company, Walkerville, Ont., for the supply of motor trucks for the fire protection service, the company's tender being $20,650. The $11,500 tender of the representative of the Waterous engines was also approved, two engines to be supplied.

Large extensions are being made at the works of the E. B. Eddy Company, Hull, Que.

The promoters of the Ontario Adjustable Hub & Wheel Company are making a proposal to Berlin, Ont., for the establishing of the plant there.

The machinery purchased in Europe by the chairman of the Ontario Hydro-Electric Power Commission for the purpose of demonstrating the uses of electricity on the farm and in the home has now reached Toronto.

The commissioners of the Trans-Continental Railway, Ottawa, will receive, up to November 8, tenders for the construction and erection of the following: Two 150-hp horizontal return tubular boilers at Napadogan, N. B.; two 150-hp horizontal return tubular boilers at Edmundston, N. B.; two 150-hp horizontal return tubular boilers at Cochrane, Ont.

F. N. Burt Company, Toronto, is erecting a factory to cost $80,000.

The Canadian Light & Power Company, Montreal, has purchased the Dominion Light, Heat & Power Company's interests.

The British Canadian Explosives Company will erect a factory on an extensive site it has just purchased in East Sherbrooke, Que.

The City Council of Ottawa has at last decided to close the contract for the installation of a Heenan-Froude incinerator for $34,650.

M. M. Tracey, Connecticut, has a proposal before the Council of Cookshire, Que., for the establishment of a large match factory there.

The McGeachy Dairy Company, Chatham, Ont., is building a new factory, for which it will require boiler, engine and latest dairy machinery and electric fittings.

The Delhi Canning Company, Delhi, Ont., is about to make an extension of its plant and will be installing new machinery.

The Burill Company, manufacturer of cream separators, Brockville, Ont., has just awarded a contract for the erection of an addition to its factory.

The Ford Motor Company is about to purchase equipment for its power department at Walkerville, Ont.

THE MACHINERY MARKETS

The W. C. Crawford Co., Tilbury, Ont., is building a factory there for the manufacture of handles and will be in the market for equipment.

The Dominion Wood & Lumber Company has under consideration a proposal to establish a chemical plant at Trout Creek, Ont., to cost $250,000. J. Kaufman, Berlin, Ont., is president.

The Bretton Automatic Scale Company is about to locate in Welland, Ont.

The Canadian Automatic Transportation Company, Toronto, requires lathes, drills, shapers and other machine shop appliances for its factory.

The Blockaders Lumber Mills, near Weymouth, N. S., was totally destroyed by fire recently. The mill will be rebuilt and machinery for its equipment will be required.

The Auto Top Company is erecting a large factory in Walkerville, Ont., for which equipment will be required.

The E. M. F. Company, Walkerville, Ontario, is spending $70,000 upon an addition to its factory. Machinery will be required.

The Russell Motor Car Company, Toronto, is making an extensive addition to its plant in North Toronto.

The Imperial Oil Company has plans in preparation for extensive additions to be made to its refining plant at Sarnia, Ont.

Steam & Radiation, Ltd., manufacturer of radiators and boilers, have completed plans for a foundry building, 120x240 ft., and a machine shop, 200x200 ft., to be erected at St. Catharine's, Ont.

Western Canada

WINNIPEG, MAN., October 21, 1911.

E. W. Bachus, president of the Ontario & Minnesota Power Company, stated a few days ago that inside of a year he would have a large paper and pulp mill at Fort Frances, West Ontario, to use the Canadian share of the power. The town has been urging this for some time.

The Brandon Creamery Company, Brandon, Manitoba, is enlarging its plant and is adding a new cold storage.

The Standard Patent Candle Company, Cape Town, South Africa, is negotiating in connection with establishing a factory at Vancouver, B. C.

It is announced that the Manitoba Glass Works, at Beausejour, Man., will increase the capacity of its plant.

The citizens of Prince Rupert, B. C., have carried by-laws providing for an expenditure of not more than $500,000 on waterworks and electric light system.

The Fort George Timber & Trading Company is considering the installation of an electric plant to supply light and power for the town of South Fort George, B. C.

The ratepayers of Edmonton, Alberta, have voted approval of the establishment of a municipal gas plant.

Plans are being prepared for a filtration plant for the city of Saskatoon, Sask.

New shops and yards are to be built by the Canadian Pacific Railroad Company at Coquitlam, B. C.

A company that is now making motor trucks at Warren, Ohio, is said to be considering the idea of establishing a plant at Port Arthur, Ont.

It is the estimate of Sir Donald Mann that the projected enlargement of the blast furnaces at Port Arthur and the addition of a foundry, etc., will cost between $3,000,000 and $4,000,000.

According to the Evening Chronicle of Port Arthur, Ont., the construction of the C. P. R. terminals on Island No. 1 will mean an expenditure of $10,000,000.

The Western Dry Dock & Shipbuilding Company has its plant at Fort William, Ont., nearly ready for operations. Upwards of 300 men are now employed upon it. The plant will be ready to undertake repairs of any kind and to build ships. Next year there will be important extensions.

The Crown Timber & Trading Company, Vancouver, B. C., proposes to build and operate a large sawmill at Millside, near New Westminster, B. C.

It is announced by the French Complex Ore Reduction Company that it will erect a zinc smelter at Nelson, B. C., and also plants to turn to account black manganese oxide.

The Powell River Paper Company at Powell River, B. C., is now ready to operate its new 80-ton paper mill there.

It is stated that $2,000,000 of British capital is about to be applied to the work of extending the business of E. H. Heaps & Co., lumber manufacturers. Besides adding to the sawmill capacity the company will erect modern machine shops for the manufacture of internal combustion engines, motor trucks, etc.

The B. C. Electric Railway Company, Vancouver, B. C., is building a new car barn and workshop at New Westminster to cost $25,000.

The city of Calgary, Alberta, will undertake to supply power up to 1,800 hp to the C. P. R. shops that are to be erected there.

The car shops the Canadian Pacific Railway Company is to build at Calgary, Alberta, will cost $2,250,000 and employ about 2000 men.

The McConnell Iron Works Company has purchased the plant and business of the Brandon Implement & Mfg. Company, Brandon, Man.

The municipality of High River, Alberta, will spend $125,000 on waterworks and sewerage, for which plans are being prepared.

The Schaake Machine Works Company, New Westminster, B. C., has applied for the lease of several water lots on Lulu Island as a site for machine works to cost $50,000.

G. W. Robinson, secretary-treasurer of the city of Lethbridge, Alberta, will receive up to November 24 tenders for the following equipment for power station extension: Boiler and accessories, mechanical draft and economizer, steam turbo-generator set and condensing equipment, steam engine driven exciter, substation equipment.

Government Purchases

WASHINGTON, D. C., October 23, 1911.

The office of the Commissioners of the District of Columbia will receive bids until November 9 for furnishing and delivering one gasoline self-propelled pumping engine for use in the fire department of the District of Columbia.

The Paymaster General, Navy Department, Washington, will open bids Oct. 31, under schedule 3972, for one electrically-operated dough-mixing machine, one vertical single-barrel steam capstan and one gas-producing apparatus, all for Mare Island Navy Yard.

The Isthmian Canal Commission, Washington, opened bids October 17, for furnishing two motor-driven centrifugal pumps, capacity 1500-gal. each, as follows: Alberger Pump Company, New York, $5700 and $5760; American Well Works, Aurora, Ill., $5457; Blackall & Baldwin, New York, $4651 and $4926; Camden Iron Works, Camden, N. J., $6000; De Laval Steam Turbine Company, Trenton, N. J., $5900; Manning, Maxwell & Moore, New York, $5788.20; Platt Iron Works, Dayton, Ohio, $5700; Aldene Union Company, Schenectady, N. Y., $5820; Henry R. Worthington, New York, $5557, $5678 and $6226; Westinghouse Electric & Mfg. Company, $4994, $5289 and $5495.

The Strauss Bascule Bridge Company, Fort Dearborn Bldg., Chicago, reports that its design has recently been adopted for the following new bridges: Stark County Commissioners, Canton, Ohio, 37-ft. single-leaf span over the Ohio & Erie canal at Massillon, Ohio; Department of Public Works of Canada, A. R. Dufresne, assistant chief engineer, Ottawa, Ont., 55-ft. 6-in. single-leaf highway span over St. Andrew's Lock near Winnipeg, Man.; United States Government, Lieut.-Col. J. G. Warren, corps of engineers, U. S. Army, Buffalo, N. Y., 165-ft. single-leaf highway span over Black Rock Channel at Ferry street, Buffalo.

The Cape Cod canal will be completed in 1913, according to Commodore J. W. Miller's prediction before the Atlantic Deeper Waterways convention at Richmond, Va., last week. He said that more than 25,000,000 tons of shipping is now at the mercy of Cape elements each year. From deep water in Buzzards Bay to the end of the eastern breakwater will be only 13 miles. The channel will be 30 ft. deep at high water and will have no locks. It will be lighted electrically and a railroad has been constructed the whole length of the line. One-half of the work has been completed.

Trade Publications

Blue Print Machine.—Revolute Machine Company, 417 East Ninety-third street, New York, N. Y. Pamphlet. Describes and illustrates a new type of blue print machine in which arc lamps especially made for this kind of work are employed. The various features of the machine are described and there are halftone engravings showing both sides of it, as well as a sectional line drawing.

Heating and Ventilating.—The Green Fuel Economizer Company, Matteawan, N. Y. Pamphlet. Contains a reprint of the description of the heating system in the foundry of the Waterbury Castings Company, which appeared in *The Iron Age*, January 27, 1910. The shop heating and ventilating system used in the Abendroth & Root Mfg. Company's plant is also illustrated.

Steel Posts and Poles.—American Steel Post Company. Santa Fe avenue and Violet street, Los Angeles, Cal. Pamphlet. Concerned with the Carbo steel posts which can be used for fencing factory properties and railroad rights of way and for use as flag poles and poles for supporting wires for various purposes.

Boring and Turning Mill.—Colburn Machine Tool Company., Franklin, Pa. Bulletins Nos. 45 and 46. Illustrate the 30-in. and 34-in. boring and turning mills of this company. The smaller size which is covered in Bulletin No. 45 has swivel turret head and belt feeds and the other has swivel turret head and all geared feeds. Both machines can be equipped for adjustable-speed motor drive, while the larger one can also be driven by a constant-speed motor. Both tools are illustrated both with and without the various parts indicated. An illustrated description of a 30-in. mill appeared in *The Iron Age*, March 9, 1911.

Tool Steel.—Charles G. Stevens Comany, Monroe and Jefferson streets, Chicago, Ill. Catalogue. Lists the various kinds of high-grade tool steel carried in stock by this company.

Pipe Unions.—National Tube Company, Frick Building, Pittsburgh, Pa. Folder. Concerned with the Kewanee union which it is pointed out has no inserted parts. These unions are tested individually at the factory with 125 lb. of compressed air while immersed in water. An illustrated description of the durability test to which these unions are subjected appeared in *The Iron Age* June 9, 1910.

Thermometers.—The Brown Instrument Company, 311 Walnut street, Philadelphia, Pa. Circular No. 5. Covers a line of thermometers which are made in both V shape and round case styles as well as with separable sockets. These instruments can be furnished with either straight or angle stems as may be desired. In addition chemical thermometers having paper, porcelain and etched scales are also listed.

Lubricants.—International Acheson Graphite Company, Niagara Falls, N. Y. Pamphlet entitled Three Little Stories of Three Big Events and Three Winning Lubricants. Describes the aeroplane flight of Lincoln Beachey over Niagara Falls, the winning of a 500-mile automobile race at Indianapolis and the Vanderbilt cup race. The lubricant used in these three events was Oildag, which is the deflocculated graphite diffused in oil. The advantages of this lubricant together with Gredag, which is a combination of graphite and grease, are pointed out.

Lathe Chucks.—The Hoggson & Pettis Mfg. Company, New Haven, Conn. Catalogue No. 9 C. Concerned with the Sweetland lathe chucks, which are made in the independent, geared scroll and combination styles. All of these are illustrated and tables showing the different sizes in which the chucks are made are given under the halftone engravings. Space is also given to reversible and face plate jaws and a number of special chucks, including round and square base planer chucks, a positive driving drill chuck and a friction chuck for cutting-off machines, lathes and screw machines.

Grinding and Polishing Machinery.—The Webster & Parks Tool Company, Springfield, Ohio. Pamphlet. Size, 6 x 9 in.; pages, 31. Deals with a line of grinding machines ranging from a small bench grinder weighing 50 lb. to self-oiling floor machines handling wheels 30 in. in diameter and 6 in. wide. Several types of buffing and polishing lathes are also shown, together with a special ring-wheel and grinder and one for plate edges. A sliding-head attachment, a plain surface grinding attachment, bevel safety flanges for use on the sides of bevel abrasive wheels and wheel guards are also illustrated and briefly described. The construction of the automatic oiling devices used on the grinder and the buffing and polishing lathes is shown.

Fans.—Garden City Fan Company, Chicago, Ill. Two sectional catalogues. The first, No. 110, illustrates the Standard and Cycloidal types of steel plate fans of this company, which are designed for blowing and exhausting. No. 120 covers a line of steel plate steam fans and hot blast apparatus. The various types of apparatus are illustrated in both catalogues and there are a number of line drawings showing the different positions of discharge openings that can be furnished.

Electric Welding.—The Toledo Electric Welder Company, Knowlton and Langland streets, North Side, Cincinnati, Ohio. Bulletin No. 10. Shows how metal sheets can be joined together by the spot-welding process at any desired point by a spot the size of a rivet without punching holes or using rivets. After a discussion of the savings effected by this process a number of the different machines used are illustrated and described.

Tanks.—Hamburg Boiler Works, Hamburg, Pa. Catalogue No. 3. Concerned with a line of tanks of all descriptions for water, gas and air, which can be used as blow-off, drip, pressure, elevator, pneumatic and receiver tanks. These are made in a number of different sizes ranging in capacity from 40 to 1000 gal. The dimensions and weight of the various tanks are given and a number of rules for ascertaining the safe working pressure of a cylindrical tank or plate steel drum completes the catalogue.

Machine Tools.—The W. P. Davis Machine Company, 257 St. Paul street, Rochester, N. Y. Loose leaf catalogue. Lists a line of machine tools, which includes lathes, turret lathes, drills, keyseaters, cutting-off machines and special machinery. The make up of the catalogue is identical for each tool, an engraving being given at the top of the leaf with brief specifications below and a condensed description at the bottom. Among the tools shown is the 26-in. turret boring, forming and turning lathe, an illustrated description of which appeared in *The Iron Age*, March 30, 1911.

Generators and Corliss Engines.—Allis-Chalmers Company, Milwaukee, Wis. Two bulletins. The first, No. 1080, superseding No. 1048, points out the advantages of using the Allis-Chalmers alternators which are built in both the engine and flywheel types. These machines are of the revolving field style and are built for voltages ranging from 240 to 13,200 and frequencies of 60 and 25 cycles per second. The construction of the generators is described at length, and the text is supplemented by halftone engravings, together with views showing the generators installed in a number of power houses. Bulletin No. 1512 is a reprint of a previous one giving general description and specifications for the builder's compound Corliss engines. These are built in a number of different types, all of which are illustrated.

Baling Presses.—Whitman Agricultural Company, St. Louis, Mo. Catalogue. Refers to a line of baling presses for all kinds of fibrous material. These can be operated by steam or belt power, by horsepower in the full circle type and also by hand. The various kinds of presses are all illustrated and briefly described.

Alternators and Incandescent Lamps.—General Electric Company, Schenectady, N. Y. Two bulletins. The first, No. 4847, describes the standard line of belt-driven alternating-current generators, known as the form B machines, which are built in capacities ranging from 50 to 200 kw. and are adapted for three-phase or two-phase windings without change except in the armature coils, the exciters and all the accessories being the same for both types. These generators are wound for voltages of 240, 480, 600, 1150 and 2300 volts. No. 4850 illustrates and describes the new drawn-wire tungsten filament with which the Mazda lamps are now equipped. The pressed tungsten filament formerly used was inclined to be delicate, but the drawn-wire filament now employed does not suffer from this disadvantage since it is much stronger at all periods during its life. The bulletin is divided into four parts giving the construction, classification, uses and application of these lamps, and the illustrations show not only the lamps and the various accessories supplied but also typical installations. A number of curves showing the distribution of light with various types of reflectors are also reproduced, together with a diagram showing the comparison of electric-lighting costs between 1885 when it was possible to obtain 800 candle hours for $1 and the present time when it is possible to secure 8000 candle hours for the same amount.

Electrolier.—Waterloo Malleable Iron Works, Waterloo, Iowa. Bulletin No. 6. Treats of a new type of electrolier in which five gloves are mounted on cross-arms at the top.

Commutator Slotting.—National Carbon Company, Cleveland, Ohio. Booklet. Treats of the work done by the various manufacturers of electrical apparatus and commutators along the line of slotting or grooving commutators, which consists in cutting away the mica below the surface of the copper segments. The illustrations show the various methods employed from that of mounting the commutator in a lathe and performing the operation with a circular saw or lathe tool to the use of regular slotting machines or a shaper equipped with a special tool.

Automatic Stop-Valve.—Rockwell Furnace Company, 26 Cortlandt street, New York City, N. Y. Bulletin No. 29. Concerned with the Lalor automatic stop-valve for automatically stopping the flow of oil in case of breakage of the oil line or abnormal flow to the burners. These valves are made in sizes ranging from ¾ to 4 in. and are designed to operate at from 10 to 200 lb. pressure without adjustment. If desired a master valve can be installed in the pumping system and will close automatically should any break of large proportion occur at any point on the system, while smaller valves can be placed on branch lines to control one or a group of furnaces. Exterior and sectional views of the valve are given as well as line drawings showing the location of the valves in a pumping system.

Press Guard.—Geuder, Paeschke & Frey Company, St. Paul avenue and Fifteenth street, Milwaukee, Wis. Circular. Concerned with the Cream City accident preventor for punch, stamping and forming presses and similar treadle-operated machines. The device, an illustrated description of which appeared in *The Iron Age*, May 4, 1911, consists of a folding gate that works automatically with the treadle and causes the gate to unfold in advance of the descent of the press, thus effectually blocking the approach to the die. There are a number of line drawings showing the various types of presses to which this device can be applied.

Current Metal Prices.

The following quotations are for small lots New York. Wholesale prices, at which larger lots can be bought, are given elsewhere in our weekly market report.

IRON AND STEEL—

Bar Iron from Store—

Refined iron:
1 to 1⅞ in. round and square.....₤ lb 1.70c
1½ to 4 in. x ½ to 1 in.....
1½ to 4 in. x ⅛ to 1 in.....₤ lb 1.80c
Reds—No. 4 and 11 to 6 inches, and squares 1 to 3 inches.....
Angles—
3 in. x 3 in. and larger.....1.80c
3 in. x 2½ in. to 2½ in.....2.00c
2½ in. x 2½ in. to 2 in.....2.10c
2 in. x 2 in. to ½ in. and thicker.....1.80c
1 in. x 1 in. to ½ in.....2.00c
1 in. x ⅛ in.....2.60c
⅞ in. x ⅛ in.....1.90c
½ in. x ⅛ in.....2.35c
⅜ in. x ⅛ in.....2.60c
Tees—
3 in.....2.25c
2½ in.....2.10c
2 in. to 1½ in.....1.90c
1½ to 2½ in. x 5/16 in.....2.10c
3 in. and larger.....1.80c
Beams.....1.80c
Channels, 3 in. and larger.....1.80c
Bands—1¼ to 6 in. x 5/16 to ½ in.....2.00c
Refiners' "H. B. & S." iron, base price.....2.95c
"Burden's Best" iron, base price.....
Norway bars.....6.00c

Merchant Steel from Store—

Bessemer machinery.....1.70c
Tire steel, 1 in. and smaller, slow.....2.50@2.60c
Best cast steel, base price in small lots.....7c

Sheets from Store—

Black	One pass, Soft steel	C. R. cleaned	R. G.
No. 16	₤ lb 2.45c	2.75c	
Nos. 18 to 20	₤ lb 2.50c	2.85c	
Nos. 22 and 24	₤ lb 2.55c	2.95c	
No. 26	₤ lb 2.60c	3.05c	
No. 28	₤ lb 2.95c	3.30c	

Russia, Planished, &c.

Genuine Russia, according to assortment.....₤ lb 12 @14½
Patent planished, W. Dewees Wood.....₤ lb A, 10c; B, 9c net

Galvanized

Nos. 12 and 14.....₤ lb 2.75c
No. 24.....₤ lb 3.10c
No. 26.....₤ lb 3.30c
No. 28.....₤ lb 3.60c
No. 20 and lighter 36 inches wide, 25c higher

Genuine Iron Sheets—Galvanized

Nos. 22 and 24.....₤ lb 5.50c
No. 26.....₤ lb 6.00c
No. 28.....₤ lb 7.00c

Corrugated Roofing—

	Painted	Galvd
2½ in. corrugated, per square	$3.75	$4.50
No. 24, 100 sq. ft.	$4.20	$5.00
No. 26, 100 sq. ft.	3.85	4.50
No. 28, 100 sq. ft.	2.50	3.05

Tin Plates—

American Charcoal Plates (per box)

A A A Canaan—	
IC, 14 x 20	$6.65
IX, 14 x 20	7.90
A Barrett—	
IC, 14 x 20	5.70
IX, 14 x 20	6.90

American Coke Plates—Bessemer—
IC, 14 x 20.....107 lb.....$4.00
IX, 14 x 20.....5.00

American Terne Plates—
IC, 20 x 28 with an 8 lb. coating.....$8.70
IX, 20 x 28 with an 8 lb. coating.....10.70

Seamless Brass Tubes—

List November 13, 1908. Base price, 18c

Brass Tubes, Iron Pipe Sizes—

List November 13, 1908. Base price, 18c

Copper Tubes—

List November 13, 1908. Base price, 21c

Brazed Brass Tubes—

List February 1, 1911 19½c ₤ lb

High Brass Rods—

List February 1, 1911 14½c ₤ lb

Roll and Sheet Brass—

List February 1, 1911 14½c ₤ lb

Brass Wire—

List February 1, 1911 14½c ₤ lb

Copper Wire—

Base price. Carload lots mill 13½c

Copper Sheets—

Sheet copper hot rolled, 16 oz. (quantity sold).....₤ lb 17c
Sheet copper cold rolled, 1c ₤ lb advance over hot rolled.
Sheet copper polished 20 in. wide and under, 1c ₤ square foot.
Sheet copper polished over 20 in. wide, 2c ₤ square foot
Planished copper, 1c ₤ square foot more than polished

METALS—

Tin—

Straits pig.....₤ lb 44 @45

Copper—

Lake ingot.....₤ lb 14 @14¼c
Electrolytic.....₤ lb 13¾@14
Casting.....₤ lb 13½@14

Spelter—

Western.....₤ lb 6¾@7¼c

Zinc—

No. 9, base, casks...₤ lb 8½c Open...₤ lb

Lead—

Spanish pig.....₤ lb 5 @5½c
American pig.....₤ lb 5 @5½c
Bar.....₤ lb 6 @6½c

Solder—

½ & ½, guaranteed.....₤ lb 25½@26
No. 1.....₤ lb 23½@24
Refined.....₤ lb 22 @22½c
Prices of solder indicated by private brand vary according to composition.

Antimony—

Cookson.....₤ lb. @10½c
Hallett.....@10 c
Other brands.....9@9½c

Bismuth—

Per lb $2.00@$2.25

Aluminum—

No. 1 aluminum (guaranteed over 99% pure), in ingots for remelting.....21c and 22c
Rods and Wire.....Base price 31c
Sheets.....Base price 35c

Old Metals—

Dealers' Purchasing Prices Paid in New York

	Cents.
Copper, heavy and crucible	10.50 to 10.75
Copper, heavy and wire	10.25 to 10.50
Copper, light and bottoms	9.25 to 9.50
Brass, heavy	7.00 to 7.25
Brass, light	5.50 to 5.75
Heavy machine composition	9.00 to 9.25
Clean brass turnings	6.75 to 7.00
Composition turnings	7.50 to 7.75
Lead, heavy	3.75
Lead, tea	3.50
Zinc, scrap	4.00

NICHOLSON U.S.A. TRADE MARK

NICHOLSON

NICHOLSON U.S.A. TRADE MARK

Time is not the only saving effected through the use of **Nicholson Files.**

Their hard cutting surface and perfect temper gives them a **lasting quality** that makes them by far the most **economical** of all files to use.

Our Book, "File Filosophy," tells how best to use them.

NICHOLSON FILE COMPANY

PROVIDENCE, R. I., U. S. A.

THE IRON AGE

Established 1855 — New York, November 2, 1911 — Vol. 88: No. 18

Published Every Thursday by the

DAVID WILLIAMS COMPANY

239 West 39th Street, New York

Entered at the New York Post Office as Second-Class Mail Matter.

Subscription Price, United States and Mexico, $5.00 per Annum; to Canada, $7.50 per Annum; to Other Foreign Countries, $10.00 per Annum. Unless receipt is requested, none will be sent. Credit for payment will be shown by extending the date on the wrapper of your paper.

W. H. Taylor, - - - - - - President and Treasurer
I. A. Mekeel, - - - - - - - First Vice-President
Harold S. Buttenheim, - - - - Second Vice-President and Secretary

Geo. W. Cope, - - - - }
A. I. Findley, - - - - } Editors
W. W. Macon, - - - - }

M. C. Robbins, - - - - Manager
Charles S. Baur, - - - Assistant Manager

Branch Offices

Philadelphia, Real Estate Trust Building
Pittsburgh, Park Building
Boston, Compton Building
Chicago, Fisher Building
Cleveland, American Trust Building
Cincinnati, 807 Andrews Building

CONTENTS

Buying by Railroads ... 933
The Suit to Dissolve the Steel Corporation ... 934
Keeping Down Idle Labor ... 935
British and American Export Trade ... 935
Steel Foundry Extensions ... 937
The Steel Corporation's Quarterly Statement ... 937
Minnesota Iron Ore Valuations ... 937
Machine for Close Measuring Available Free ... 937
The Iron and Metal Markets ... 938
New Tools and Appliances ... 949
Patents and the Public Welfare ... 950
The Sherman Act and the Labor Trust ... 950
Personal ... 951
Obituary ... 951
British Wage Earners ... 951
A Suit to Dissolve the Steel Corporation ... 952
Dodge Iron-Center Wood-Rim Pulley Test ... 956
American Iron and Steel Institute Directors ... 956
Pittsburgh and Vicinity Industrial Notes ... 957
Morgantown Seeks Additional Industries ... 957
The Organizer of Men in Management ... 958
Unique Advertising Device Made of Toncan Metal ... 959
The Upson Nut Company's Steel Plant ... 960
Box Column Drilling Machine ... 968
Motor-Driven Lathe Center Grinder ... 969
Machine Shops of Rumely Tractor Works ... 970
The Morris 16-In. Lathe ... 976
New List Prices for Iron Body Gate Valves ... 977
The New Silver Saw Table ... 977
Case Hardening of Steel ... 978
Swedish Iron and Steel Statistics ... 980
Baltimore Industrial Notes ... 981
New Wire Brush ... 981
Cambria Axles and Forgings ... 981
Ransom Emery Wheel Guard ... 982
The Pig Iron Production of Japan ... 982
Product of Titanium Steels This Year ... 982
Western Steel Corporation Bankruptcy ... 982
The Miami 14-In. Lathe ... 982
Grant Motor-Driven Ceiling Riveter ... 983
New Standard Gear Cutters ... 983
Freight Handling in Small Shipments ... 984
Canton Industrial Notes ... 984
Oldham Riveting Hammer ... 985
Self-Contained Sand-Blast Machinery ... 985
Drill Converting Attachment ... 985
Customs Decisions ... 986
The Machinery Markets ... 987
Government Purchases ... 997
Trade Publications ... 997

Buying by Railroads

Orders for 10,000 Cars Last Week

Lower Prices in Bars and in Pig Iron—Rail Inquiry for 1912

Whether the Steel Corporation suit has already been a factor in iron and steel markets is merely a matter of opinion. Where buying has fallen off, that has been the reason given, but against it is the fact that the Steel Corporation's own bookings—practically all for early shipment—were better than in several weeks.

That a long period of close competition is ahead will doubtless be taken as an obvious view of the situation the suit has created. Those longest in the steel trade will suggest in this connection that the low prices of periods like the present discourage extensions and are apt to be followed by times of rapidly expanding demand, inadequate capacity, and prices swinging as far up as before they had swung down.

The scale of operations at leading steel works has slackened but little. One Steel Corporation blast furnace went out in the Pittsburgh district and one was started up in the Chicago district. The statement of the corporation for the third quarter of the year was better than had been looked for. That for the final quarter may reflect some falling off both in volume and in prices, though the export trade continues to figure strongly.

There are more indications than have appeared in months that the railroads have about reached their limit in the postponement of equipment buying. The car orders of the past three years have amounted to about one year's legitimate requirements, counting that a 10 per cent. replacement should be made each year. In the week new car contracts have amounted to nearly 10,000. The New York Central followed its order for 2000 reported last week by placing 3000 for the Pittsburgh & Lake Erie, and it is reported to be still in the market for 5000. The Grand Trunk has bought 2000 cars and the Chesapeake & Ohio 2000. The B. & O. is now figuring on 5000 and the Southern Railway will buy 500.

Pittsburgh reports the beginning of rail inquiry for 1912, the Norfolk & Western being in the market for 25,000 tons, a part of which has already been placed. Two Eastern rail mills are closed down, having worked off all the business scheduled for 1911.

Bar business has shown some increase, but competition has grown keener and 1.10c., Pittsburgh, is common, with here and there a deeper cut. There are indications that the pace in bars is growing uncomfortably hot, and conditions are such that a stiffening in the price of any one manufacturer might lead to a general stand against further decline.

The wire trade has not been greatly stimulated by the lower prices of the past ten days. In the South

the Pittsburgh basing has been swept aside by recent transactions in wire and wire nails at prices lower than in many months.

Tin plate mills are now operated to about 50 per cent. of capacity. The status of the $3.40 basis for 1912 contracts has not yet been definitely settled, the larger business being still held back. A Canadian order just entered calls for 150,000 boxes for delivery next year. Sheet mills find buyers disposed to wait for further concessions; the mills, on the other hand, are not willing to take long contracts at to-day's prices.

The billet, rail and sheet-bar business of the Carnegie Steel Company in October was the largest month's total since March and exceeded that for September by 27,000 tons. The larger mills have only slightly shaded $19 for open hearth billets, but as low as $18.50 at mill is reported.

Pig iron markets have had one of the quietest weeks of the year. Raw material prices for 1912 are entering more largely into calculations of buyers and sellers and the trade is pretty much at sea on that question. Bessemer pig iron has declined to $14.25 at Valley furnace and sales of malleable Bessemer have been made as low as $12.50 at furnace in the Central West.

The Suit to Dissolve the Steel Corporation

The suit of the Government to dissolve the United States Steel Corporation comes at a time when market conditions are refuting with disastrous emphasis the charge that there is any monopoly or any restraint of trade in steel products. Surprising as the Government's action is, it is perhaps as well that it comes at this time; for as long as the Steel Corporation's status under the Sherman act went untested, so long, in the present state of public opinion on the trust issue, was the steel industry menaced by the possibility of such an attack. The inquiry of the Stanley Committee has indicated plainly that the Steel Corporation would be an issue in the coming national campaign, and judicial proceedings now may set forward the final decision of the question. On the other hand, there is the possibility that the litigation just begun may even outlast the Sherman act in its present shape. It is entirely conceivable that the developments in the case or the developments in industry resulting from this and other prosecutions will bring a decided change in sentiment. There are hopeful signs, too, in the protests already coming from some prominent figures in public life against the general attack on great corporations.

It has been said that the officers of the Government are only doing their plain duty in starting such prosecutions. That statement would be more convincing if the law were plain or even the decisions which are now made the occasion of activity by the Department of Justice. The strange feature of the Government's action against the Steel Corporation is that it is begun following Supreme Court decisions which made the application of the Sherman law less sweeping than preceding decisions made it. For 10 years the Steel Corporation has gone on without hindrance from the Government. Its form of organization and its policies have met with no official protest until the present year. This was not because it worked in the dark. Not a material statement in the voluminous petition filed at Trenton last week, apart from some that are untrue or misleading, is new. It is fair to ask, therefore, whether the Government itself is not in part responsible for much that has been developed in this formative period of the consolidations, under at least the sanction of tolerance.

So far as the inception of the Steel Corporation is concerned, there was much to find fault with in the acts of its promoters. It was a time when the lust for the enormous profits of industrial promotions was fairly riotous. After the panic and the depression of the 'nineties the tide of a new prosperity was rising rapidly. It seemed to many that co-operation and consolidation were to establish this prosperity so firmly that there could never be a return to the competition that in the iron trade had at times been ruinous. Quite as much did the Steel Corporation's stock and bond issues represent the capitalizing of this prosperity as the capitalizing of what measure of control it had of the machinery of production in iron and steel. And with the exception of 1904, the six years following its creation gave returns that helped to bear out the belief in a new era. The conditions seemed made for the purposes of the trust promoters. Never had the profits of iron and steel manufacture in this country paralleled those of the years in which the promoters of the Steel Corporation distributed their first holdings. It was not consolidation that produced these profits, as the Government's petition asserts, for all blast furnace and steel companies, with but few exceptions, shared them. Out of that prosperity came the millions for promotion and other millions of stock market profits based on the public's acceptance of the swollen scale of values at which properties were acquired for purposes of consolidation.

What the Government's action proposes is not to take away any of the scores of millions the promoters and those who sold out to them were able in that carnival of money-making to take out of the steel industry. That is plainly impossible. But for all the sins of the exploiters it is now the purpose to make the 120,000 stockholders of the Steel Corporation suffer. As this journal pointed out in the early years of the corporation's history, what was most open to censure in it was not the work of the managers of its great operations, in the markets and at the works. Its conversion plan and the things in its original putting together now most criticised by the Government were the product of banking and promoting interests, whose ownership in it is relatively small.

It is truth to say that as time has passed and the Steel Corporation has developed a policy in reference to its customers, its competitors, its employees and the public, there has been an evolution out of early mistakes and disfavor into a growing appreciation by its officers, of the responsibilities of its position and the demands of public opinion. It has been said that the cancellation of the Hill ore lease would not have been decided on, nor the reduction in ore freights, but for the threat of Government action. That may or may not be the fact. These steps, at all events, indicated a willingness to remove the grounds of complaint to which attention had been directed by the Commissioner of Corporations and the Stanley Committee, and suggested that further changes might be brought about if there were a disposition on the part of the Administration to conserve rather than to rend and destroy.

In the actions against the Standard Oil Company and the American Tobacco Company, the charge of monopoly was based on extermination of competition or a systematic policy of injury to competitors. The petition against the Steel Corporation founds the mo-

nopoly charge on its failure to injure its competitors. It is, no doubt, a surprise to the independent steel producers who attended the Gary dinners, to find that by such action they were participating in an unlawful restraint of trade and in the furtherance of monopoly in steel products. And if such co-operation as was secured under the Gary idea subjects the Steel Corporation to prosecution, it is hard to see how the other participants in that movement can escape. But there is high authority for the view that there is no monopoly or attempted monopoly under the Sherman law unless impediments are placed in the way of competitors. If the Supreme Court should so hold, the Government's case will fall, so far as it attempts to find in the co-operative movement one of the chief of the corporation's offendings.

In matter and manner the Government's petition reads more like a political campaign document than a pleading in a case involving momentous issues. Its recklessness of statement, its "thundering in the index" lead one to doubt at times whether it is intended to be taken at par. What has happened in the Standard Oil Company and the American Tobacco Company cases suggests that the Department of Justice will be satisfied with far less than is called for in its threatening petition. Serious thought need hardly be given to the Government demand that each of the constituent companies be dissolved. As we have said before, in relation to this proposal, it involves a physical impossibility. The American Tin Plate Company, for example, acquired about 40 companies. There are but 17 of these tin plate plants in existence today.

Many months will elapse before the final determination of the Steel Corporation suit. The steel trade will go on with the same freedom from control, it may be assumed, that exists to-day, and for a time the pace may be a hard one for some producers. Some of them, indeed, may fall by the way. Three years, four years, may go by with the dissolution proceedings still pending. Other governmental policies, more constructive, may by that time have supplanted that of attack upon large companies. There may even be such progress toward the solution of the trust question as to make it possible for corporation officers to know whether they are within the law without facing a suit for dissolution.

Keeping Down Idle Labor

Systematized records of employees' absence from work afford information which is of great value in keeping down the percentage of idle labor and by so doing reducing overhead costs of manufacturing. There is a wide difference between men in the constancy of their labor and the effort of the employer is always toward securing those who are the most dependable. In a general way, absence from work may be classified as the unavoidable, including sickness and bereavement; the result of dissipation, and the very important and not so easily controlled type, which may be subdivided between the lazy and the enthusiast whose private hobbies lead him from his regular employment. The ardent fisherman or hunter, the man whom wanderlust catches occasionally, and he who turns his skill to private ends, even to private gain—these are examples of the last-named subdivision. Accurate data as to the reasons given for absence and the duration, and the consequent losses to the owner, constitute an admirable check which must yield good returns.

In works where the health of employees is systematically studied the records are already proving of actual financial value, no small part of the result being in the better control of idleness. A complete record, going beyond the medical, would tell the whole story. The physical examination permits of getting close to the workman, and the physician may co-operate in records extending beyond his actual province, though, of course, he would be slow to reveal confidences.

The absence of a workman from his post in the shop breaks the rhythm of production. It is as important to maintain the balance of a plant in the personnel of the employees as to maintain the balance of equipment. In fact, the two elements merge one into the other.

We venture to state that the percentage of idle hours due to the absence of workmen, as compared with the full producing force, varies widely in different works. If records are not systematized, the percentage must depend entirely upon the personal factor of the superintendent and foreman; upon the degree of their leniency toward delinquents; upon their insistence that regularity of attendance shall be an all-essential element in retaining employment. If one man in 10 is out of a works, overhead costs must climb high, as compared with an average of one in 20. It may be accepted as an axiom that a plant where dependable men are employed throughout requires a smaller investment to manufacture a given product than one where the force is often disorganized by the absence of operators.

The study of employees' health should lead naturally to the remainder of the recording system. The habitually absent and tardy, and those who frequently desire to leave their work early, would soon be classed by themselves, and unless their failings were rectified others would take their places. As a moral influence in a plant, the system should have a most salutary effect.

British and American Export Trade

While there is no evidence that the increase in the iron and steel export trade of the United States in the past twelvemonth has been directly at the expense of the British trade, there is clear evidence that British trade has not expanded as ours has. Returns for the United States are available through August and for the United Kingdom through September. The United States exports in August were 2 per cent. less than the average monthly exports in the eight months, while British exports in September were 7 per cent. less than the average. These variations are negligible, and the totals for the eight and nine months periods respectively may be taken as representative of the movement for the year, as well as of the trend at the latest time for which information is available. Accordingly we estimate exports for each country for the calendar year on the basis of the returns thus far in, and compare these estimates with the actual results in the past two calendar years:

Iron and Steel Exports, Calendar Years—Gross Tons.

	United States.	Great Britain.
1909	1,239,708	4,373,381
1910	1,535,693	4,741,905
*1911	*2,160,000	4,500,000

*Estimated.

British exports increased from 1909 to 1910, but 1911 exports are falling just about midway between the records for those years. American exports, on

the other hand, increased from 1909 to 1910 and then showed a still larger increase in 1911. The gain appears to be at the rate of 625,000 tons a year, which is 41 per cent., while the British loss is only 240,000 tons, less than two-fifths as great as the American gain. The relative loss was very small, only 5 per cent., because the total British exports in 1910 were more than three times the American.

It is difficult to trace the British loss in detail, because it was spread over so many items. The actual exports in the nine months ending September were 3,554,633 tons in 1910 and 3,386,917 tons in 1911, a decrease of 168,000 tons. Pig iron lost 30,000 tons; spiegeleisen, ferronmanganese, etc., 22,000 tons; rails, 83,000 tons; wrought tubes, pipes and fittings, 8,000 tons, and "unenumerated" 28,000 tons. Many items showed slight gains. The only conspicuous loss was that in rails, from 346,777 tons to 263,356 tons, or 83,421 tons. Our own rail exports, comparing eight-month periods, increased from 243,244 tons to 311,732 tons, or 68,488 tons. One would naturally infer that England's loss was our gain, but the alignment in the international rail trade is such that it is not safe to draw inferences. There is great complaint in England that British participation in the international syndicate has been losing orders, while on behalf of the American mills it is stated that there is no participation in the international agreement.

Whatever may be developed as to the relation between British and American exports, it is a fact that the British economic position in iron and steel is not good. Imports and exports, covering scrap, pig iron, rolled material, castings, forgings, etc., but not finished machinery, have been as follows in gross tons in the first nine months of the years indicated:

	Imports.	Exports.
1907	663,781	4,135,960
1908	808,637	3,204,366
1909	897,180	3,192,304
1910	1,022,942	3,554,633
1911	1,336,374	3,396,917

The exports have shown considerable fluctuations, with no regular movement, while the imports have grown rapidly, and with remarkable steadiness. They have exactly doubled in four years. The character of some of the imports is surprising. Below we give a table showing all the items in which the movement in the first nine months of this year exceeded 30,000 tons, or a rate of 40,000 tons a year:

British Imports, First Nine Months—Gross Tons.

	1907.	1911.
Pig iron, all kinds	71,924	129,981
Scrap (except rails)	20,594	38,386
Blooms, billets, slabs	*220,491	344,204
Sheet and tin plate bars	.....	243,405
Wrought iron bars	45,669	86,938
Girders, etc	67,363	55,363
Steel bars and shapes	15,515	68,048
Steel plates, ⅜-in. up	27,310	65,645
Wire rods	24,072	66,628
Wire	45,159	31,188
Wire nails	28,772	66,628
All other	96,912	139,960
Total	663,781	1,336,374

*Includes sheet and tin plate bars, also ingots; ingots not included in 1911.

The imports of ingots, blooms, billets, slabs, sheet and tin plate bars, etc., in the first nine months of 1907 amounted to 220,491 tons, increasing in the corresponding period this year to 344,204 tons of blooms, billets and slabs and 243,405 tons of sheet and tin plate bars, as shown above, while imports of ingots amount to 17,195 tons, making a grand total of 604,804 tons, an increase of 384,313 tons, or 174 per cent. This material came chiefly from Germany and the United States. Our total exports, in eight months of this year, amounted to 161,424 tons, and probably went mainly to England.

German and American unfinished steel created a scare in England more than a dozen years ago, but the movement did find a large number of defenders, who pointed out that British rolling mills would not be importing it if they were not able to finish it and sell the finished product, and as similar finished products were being exported, the operation was not, on the whole, disadvantageous. It was better to do this than not export at all. Time has not brought accretions to the ranks, and there are now relatively few to be found who will defend these unfinished steel imports as a blessing in any disguise. The Iron and Coal Trades Review makes no attempt to do so. Commenting on a portion of the figures we have cited, it says:

> Turning to the imports, it is very unsatisfactory to find that our total imports for the nine months were nearly 1,300,000 tons. Deducting imports of pig iron, it appears that at the present moment our imports of iron and steel are at the rate of 48 per cent. of our exports. For a country which up to a few years ago was not only the premier, but practically the only country exporting iron and steel on a large scale, these figures have a grave significance. The greater part of the imports, of course, consists of billets and sheet bars, of which we imported in the first nine months of the year 587,000 tons, as against 357,000 tons and 406,000 tons in the corresponding periods of 1910 and 1900 respectively. Whatever may be the position of the home or export trade in iron and steel, the import trade is clearly booming.

As iron and steel manufacture was practiced years ago, the successive operations being distinct and usually affording a considerable profit, the character of business England does might be considered more or less satisfactory. We at one time had a blast furnace industry (which indeed imported a great deal of ore) selling pig iron to steel works, while the steel works in turn sold unfinished steel to rolling mills. There were even wire nail works which bought wire, and corrugating plants which bought flat sheets, but the old order has passed away. In the first nine months of this year Great Britain imported 4,972,955 tons of iron ore, exporting only 5,374 tons; exported 870,757 tons of pig iron, importing only 129,981 tons; imported 604,804 tons of unfinished steel, exporting only 3,595 tons, and exported about 2,602,978 tons of finished products, importing about 580,398 tons. This back-and-forth movement cannot win in the long run. Success is to be attained by carrying the operations from the raw material in the ground to the finished products ready for actual use.

Attention has been called to the remarkable reversal in our tin plate movement, whereby our imports have this year dropped to very small proportions, while our exports have become large, and instead of importing much more than we export we are now exporting much more than we import. This reversal was brought about by American mills capturing practically all of the packers' business, these packers having formerly used Welsh tin plate, imported with benefit of drawback. As noted in these columns October 12, the tin plate movement in the first eight months of 1910 and 1911 has been as follows:

	1910.	1911.
Imports	51,082	12,706
Exports	7,586	36,094

In July and August the imports were 533 tons and

the exports 10,517 tons, showing a balance of exports over imports of 5,000 tons per month, while last year the imports exceeded the exports by a balance of 4,500 tons a month, thus indicating a reversal of about 100,000 tons a year in the tin plate movement.

It is most interesting to observe from the British statistics that this very sudden increase in our tin plate trade was not accompanied by any decrease whatever in the British trade. The total tin plate exports in the first nine months of this year were 364,577 gross tons, of which 12,780 tons went to the United States. We have computed the rate per year from these figures for nine months, and compare the tonnages with the tonnages for full calendar years in the following table, representing gross tons:

British Tin Plate Exports.

	To United States.	Grand total.
1904	71,862	359,634
1905	63,052	354,951
1906	61,518	374,802
1907	58,920	405,329
1908	60,602	402,869
1909	64,446	439,804
1910	73,636	483,020
1911	*17,000	*486,000

*Estimated.

This year, therefore, British tin plate exports promise to make a new tonnage record, and this despite not only the loss of the American trade, to the extent of 57,000 tons, but also the establishment of American exports at a rate 43,000 tons greater than last year. That, however, does not necessarily imply great staying powers on the part of the Welsh tin plate trade. The demand in foreign markets must have increased very decidedly and as South Wales has had the trade for so many years it could hardly be otherwise than that it should get the orders. The astonishing thing is that the American mills could capture the first 100,000 tons of business not protected by the tariff. To add 100,000 tons to the first 100,000 tons would not represent nearly so remarkable a development. The tonnages are not large for our own trade. Thus British exports have not yet reached half a million tons in a year, and the production cannot greatly exceed that amount, because the domestic consumption of tin plate is relatively small. Our own production last year was nearly three-quarters of a million tons, and this year's tonnage promises to exceed the three-quarters of a million mark.

Steel Foundry Extensions.—The Scullin-Gallagher Iron & Steel Company, St. Louis, manufacturer of open hearth steel castings, recently purchased three cranes of 30, 10 and 5 tons capacity from the Alliance Machine Company, Alliance, Ohio, and two cranes of 25 and 10 tons capacity from the Niles-Bement-Pond Company, New York. This equipment together with the six new mold drying ovens, new core room and five ovens, and the extensions to the main foundry, annex and chipping shops of the company's No. 2 plant, will more than double its capacity for making miscellaneous steel castings. The No. 1 plant, the capacity of which was doubled less than a year ago by the addition of three traveling cranes, 18 new jib cranes and a very large air compressor of 5500 cu. ft. of free air per min. capacity at 125 lb. pressure, will continue to be employed entirely in the production of steel castings for railroad purposes.

The Edwin B. Stimpson Company is sending out illustrated circulars calling attention to its new home at 68 and 70 Franklin avenue, between Flushing and Park avenues, Brooklyn, N. Y. The company has at this address a new three-story building of its own, which is equipped with machinery for the manufacture of perforated metals, buckles, eyelets, washers, metal checks, etc.

The Steel Corporation's Quarterly Statement

The United States Steel Corporation has issued its statement of earnings, covering its subsidiary companies, for the quarter ending September 30, 1911. It compares as follows with the corresponding quarter of 1910:

	1911.	1910.
July earnings	$8,750,467	$12,132,188
August earnings	10,710,145	13,132,755
September earnings	10,062,113	12,100,244
Total after deducting all expenses incident to operations, including ordinary repairs and maintenance of plants, and interest on bonds and fixed charges of subsidiary companies	29,522,725	37,365,187
Less charges and appropriations for sinking funds on bonds of subsidiary companies and depreciation and extraordinary replacement funds	6,806,568	6,316,462
Net earnings	22,716,157	31,048,725
Deduct interest for the quarter on U. S. Steel Corporation bonds outstanding	5,761,157	5,824,146
Sinking funds on the U. S. Steel Corporation bonds:		
Installments	1,012,500	1,012,500
Interest on bonds in sinking funds	538,306	475,316
	7,311,963	7,311,962
Balance	15,404,194	23,736,763
Dividends for the quarter on stocks of U. S. Steel Corporation:		
Preferred, 1¾ per cent	6,304,919	6,304,919
Common, 1¼ per cent	6,353,781	6,353,781
Surplus for the quarter	2,745,494	11,078,063
Less appropriation on account of expenditures made and to be made on authorized appropriations for new plants, construction, etc.	.....	7,500,000
Balance of surplus for the quarter	$2,745,494	$3,578,063
Unfilled orders on hand September 30, tons	3,611,317	3,158,106

The earnings for the quarter ending June 30, 1911, were $28,108,520, and for the quarter ending March 31 were $23,519,203.

The unfilled orders June 30, 1911, were 3,361,058 tons, and March 31 were 3,447,301 tons.

Minnesota Iron Ore Valuations

The Minnesota Tax Commission has completed its work of equalizing the values of the iron mineral properties of St. Louis, Itasca and Lake counties. In 1910 the shipments were 26,191,981 tons and on May 1, 1911, there were in stock piles and assessed as personalty 6,719,124 tons. These two items are deducted from the total remaining tonnage of 1910. During 1910 there was developed by drilling new ore amounting to 53,011,393 tons, which is now added.

The final figures for the 1911 valuation are based upon 1,368,236,579 tons reported for taxation and assessed for $232,465,603 (which includes $900,000 for well-located prospects). Adding $3,340,920, assessment on prospects and mineral lands within the Mesaba ore belt, the total assessment on tonnage and mineral properties for 1911 is $235,806,523. The 1910 valuation was based upon 1,348,136,221 tons which, with prospects and mineral lands, was assessed at $224,669,845. The 1911 assessment shows a net increase over 1910 of 20,100,358 tons and of $11,136,678.

Machine for Close Measuring Available Free.—The New Departure Mfg. Company has installed at its Western branch, 1016 Ford Building, Detroit, Mich., a measuring machine which is available to the trade in general for close measuring. This service is offered without cost. The machine positively indicates variations of one-fortieth of one one-thousandth of an inch and is a duplicate of the machine used by the company at its factory in Bristol, Conn., in accurately manufacturing gauges used for inspecting New Departure ball bearings. This machine is so delicate that it is affected by temperature. In setting the machine, a microscope is used in which are hair lines which correspond to similar lines on a graduated bar. A complete set of measuring plugs and disks used for measuring the bore and diameter of New Departure bearings has also been placed in the Detroit offices. The correctness of these measuring instruments has been certified by the United States Bureau of Standards.

The Iron and Metal Markets

A Comparison of Prices

Advances Over the Previous Week in Heavy Type. Declines in Italics.

At date, one week, one month and one year previous.

	Nov. 1, 1911.	Oct. 25, 1911.	Oct. 4, 1911.	Nov. 2, 1910.
PIG IRON, Per Gross Ton:				
Foundry No. 2 standard, Philadelphia	$15.00	$15.00	$15.00	$15.75
Foundry No. 2, Valley furnace	13.25	13.25	13.25	14.00
Foundry No. 2 Southern, Cincinnati	13.25	13.25	13.25	14.25
Foundry No. 2, Birmingham, Ala.	10.00	10.00	10.00	11.00
Foundry No. 2, at furnace, Chicago*	14.35	14.35	14.50	16.00
Basic, delivered, eastern Pa.	14.50	14.50	14.50	14.75
Basic, Valley furnace	12.50	12.50	12.60	13.00
Bessemer, Pittsburgh	*15.15*	15.40	15.55	15.90
Gray forge, Pittsburgh	13.65	13.65	13.65	14.15
Lake Superior charcoal, Chicago	16.50	16.50	16.50	18.00
COKE, CONNELLSVILLE, Per Net Ton, at Oven:				
Furnace coke, prompt shipment	1.50	1.50	1.50	1.55
Furnace coke, future delivery	1.55	1.55	1.60	1.70
Foundry coke, prompt shipment	1.80	1.80	1.85	2.10
Foundry coke, future delivery	2.00	2.00	2.10	2.25
BILLETS, &c., Per Gross Ton.				
Bessemer billets, Pittsburgh	20.00	20.00	20.00	23.50
Open hearth billets, Pittsburgh	19.00	19.00	19.00	23.50
Forging billets, Pittsburgh	24.00	24.00	25.00	28.50
Open hearth billets, Philadelphia	21.40	21.40	21.40	26.00
Wire rods, Pittsburgh	26.00	26.00	26.00	28.50
OLD MATERIAL, Per Gross Ton:				
Iron rails, Chicago	**14.50**	13.50	13.75	16.00
Iron rails, Philadelphia	*15.50*	16.00	16.50	18.00
Car wheels, Chicago	*12.00*	12.50	12.50	13.50
Car wheels, Philadelphia	*11.50*	11.75	11.75	13.75
Heavy steel scrap, Pittsburgh	12.00	12.00	12.25	14.25
Heavy steel scrap, Chicago	9.50	9.50	10.00	12.25
Heavy steel scrap, Philadelphia	11.75	11.75	12.00	13.50
FINISHED IRON AND STEEL, Per Pound to Largest Buyers:	Cents.	Cents.	Cents.	Cents.
Bessemer rails, heavy, at mill	1.25	1.25	1.25	1.25
Iron bars, Philadelphia	1.20	1.20	1.22½	1.40
Iron bars, Pittsburgh	1.20	1.20	1.20	1.45
Iron bars, Chicago	1.15	1.15	1.20	1.35
Steel bars, Pittsburgh	1.10	1.10	1.15	1.40
Steel bars, tidewater, New York	1.26	1.26	1.31	1.56
Tank plates, Pittsburgh	1.15	1.15	1.20	1.40
Tank plates, tidewater, New York	1.31	1.31	1.36	1.56
Beams, Pittsburgh	*1.15*	1.20	1.25	1.40
Beams, tidewater, New York	*1.31*	1.36	1.41	1.56
Angles, Pittsburgh	*1.15*	1.20	1.25	1.40
Angles, tidewater, New York	*1.31*	1.36	1.41	1.56
Skelp, grooved steel, Pittsburgh	1.15	1.15	1.15	1.25
Skelp, sheared steel, Pittsburgh	1.25	1.25	1.25	1.35
SHEETS, NAILS AND WIRE, Per Pound to Largest Buyers:	Cents.	Cents.	Cents.	Cents.
Sheets, black, No. 28, Pittsburgh	1.85	1.85	1.85	2.20
Wire nails, Pittsburgh	1.60	1.60	1.65	1.70
Cut nails, Pittsburgh	1.50	1.50	1.50	1.60
Barb wire, galv., Pittsburgh	1.90	1.90	1.95	2.00
METALS, Per Pound:	Cents.	Cents.	Cents.	Cents.
Lake copper, New York	*12.50*	12.62½	12.50	12.87½
Electrolytic copper, New York	*12.37½*	12.50	12.25	12.75
Spelter, St. Louis	6.20	6.20	5.85	5.80
Spelter, New York	6.35	6.35	6.00	5.95
Lead, St. Louis	4.15	4.15	4.32½	4.27½
Lead, New York	4.25	4.25	4.47½	4.40
Tin, New York	*41.62½*	42.05	40.15	36.80
Antimony, Hallett, New York	7.70	7.70	7.70	7.75
Tin plate, 100-lb. box, New York	$3.64	$3.64	$3.84	$3.84

*The average switching charge for delivery to foundries in the Chicago district is 50c. per ton.

Prices of Finished Iron and Steel f.o.b. Pittsburgh

Freight rates from Pittsburgh in carloads, per 100 lb.: New York, 16c.; Philadelphia, 15c.; Boston, 18c.; Buffalo, 11c.; Cleveland, 10c.; Cincinnati, 15c.; Indianapolis, 17c.; Chicago, 18c.; St. Paul, 32c.; St. Louis, 22½c.; New Orleans, 30c.; Birmingham, Ala., 45c. Pacific coast, 80c. on plates, structural shapes and sheets No. 11 and heavier; 85c. on sheets Nos. 12 to 16; 95c. on sheets No. 16 and lighter; 65c. on wrought pipe and boiler tubes.

Plates.—Tank plates, ¼ in. thick, 6¼ in. up to 100 in. wide, 1.15c., base, net cash, 30 days. Following are stipulations prescribed by manufacturers, with extras:

Rectangular plates, tank steel or conforming to manufacturers' standard specifications for structural steel dated February 6, 1903, or equivalent, ¼ in. thick and over on thinnest edge, 100 in. wide and under, down to but not including 6 in. wide, are base.

Plates up to 72 in. wide, inclusive, ordered 10.2 lb. per square foot, are considered ¼-in. plates. Plates over 72 in. wide must be ordered ¼ in. thick on edge, or not less than 11 lb. per square foot, to take base price. Plates over 72 in. wide ordered less than 11 lb. per square foot down to the weight of 3-16-in. take the price of 3-16-in.

Allowable overweight, whether plates are ordered to gauge or weight, to be governed by the standard specifications of the Association of American Steel Manufacturers.

Extras.	Cents per lb
Gauges under ¼ in. to and including 3-16 in. on thinnest edge	.10
Gauges under 3-16 in. to and including No. 8	.15
Gauges under No. 8 to and including No. 9	.25
Gauges under No. 9 to and including No. 10	.30
Gauges under No. 10 to and including No. 12	.40
Sketches (including all straight taper plates) 3 ft. and over in length	.10
Complete circles, 3 ft. in diameter and over	.20
Boiler and flange steel	.10
"A. B. M. A." and ordinary firebox steel	.20
Still bottom steel	.30
Marine steel	.40
Locomotive firebox steel	.50
Widths over 100 in. up to 110 in., inclusive	.05
Widths over 110 in. up to 115 in., inclusive	.10
Widths over 115 in. up to 120 in., inclusive	.15
Widths over 120 in. up to 125 in., inclusive	.25
Widths over 125 in. up to 130 in., inclusive	.50
Widths over 130 in.	1.00
Cutting to lengths or diameters under 3 ft. to 2 ft., inclusive	.25
Cutting to lengths or diameters under 2 ft. to 1 ft. inclusive	.50
Cutting to lengths or diameters under 1 ft.	1.55

No charge for cutting rectangular plates to lengths 3 ft. and over.

Structural Material.—I-beams, 3 to 15 in.; channels, 3 to 15 in., and angles, 3 to 6 in. on one or both legs, ¼ in. and over, 1.15c. to 1.20c. Other shapes and sizes are quoted as follows:

	Cents per lb.
I-beams over 15 in.	1.20 to 1.25
H-beams over 18 in.	1.30 to 1.35
Angles over 6 in.	1.20 to 1.25
Angles, 3 in. on one or both legs, less than ¼ in. thick, plus full extras as per steel bar card Sept. 1, 1909	1.20 to 1.25
Tees, 3 in. and up	1.20 to 1.25
Zees, 3 in. and up	1.15 to 1.20
Angles, channels and tees, under 3 in., plus full extras as per steel bar card Sept. 1, 1909	1.20 to 1.25
Deck beams and bulb angles	1.45 to 1.50
Hand rail tees	2.00 to 2.15
Checkered and corrugated plates	2.00 to 2.15

Sheets.—Makers' prices for mill shipments on sheets of U. S. standard gauge, in carload and larger lots, on which jobbers charge the usual discounts for small lots from store, are as follows:

Blue Annealed Sheets

	Cents per lb.
Nos. 3 to 8	1.25 to 1.30
Nos. 9 and 10	1.35 to 1.40
Nos. 11 and 12	1.40 to 1.45
Nos. 13 and 14	1.45 to 1.50
Nos. 15 and 16	1.55 to 1.60

Box Annealed Sheets, Cold Rolled.

	One Pass.	Three Pass.
Nos. 10 to 12	1.50 to 1.55	.....
Nos. 13 and 14	1.55 to 1.60	.....
Nos. 15 and 16	1.60 to 1.65	1.70 to 1.75
Nos. 17 to 21	1.65 to 1.70	1.75 to 1.80
Nos. 22, 23 and 24	1.70 to 1.75	1.80 to 1.85
Nos. 25 and 26	1.75 to 1.80	1.85 to 1.90
No. 27	1.80 to 1.85	1.90 to 1.95
No. 28	1.85 to 1.90	1.95 to 2.00
No. 29	1.90 to 1.95	2.00 to 2.05
No. 30	2.00 to 2.05	2.10 to 2.15

Galvanized Sheets, of Black Sheet Gauge.

Nos. 10 and 11	1.85 to 1.90
Nos. 12, 13 and 14	1.95 to 2.00
Nos. 15, 16 and 17	2.10 to 2.15
Nos. 18 to 22	2.25 to 2.30
Nos. 23 and 24	2.35 to 2.40
Nos. 25 and 26	2.55 to 2.60
No. 27	2.70 to 2.75
No. 28	2.85 to 2.90
No. 29	2.95 to 3.00
No. 30	3.15 to 3.20

All above rates on sheets are f.o.b. Pittsburgh, terms 30 days net, or 2 per cent. cash discount in 10 days from date of invoice, as also are the following base prices per square for painted and galvanized roofing sheets, with 2½-in corrugations.

Corrugated Roofing Sheets, Per Square.

Gauge.	Painted.	Galvanized.	Gauge.	Painted.	Galvanized
29	....	$2.30	23	$2.35	$3.45
28	$1.30	2.45	22	2.55	3.65
27	1.45	2.50	21	2.75	4.00
26	1.55	2.60	20	3.00	4.30
25	1.80	3.00	18	4.60	5.65
24	2.05	3.10	16	4.85	6.45

Wire Rods and Wire.—Bessemer, open hearth and chain rods, $26 to $26.50. Fence wire, Nos. 0 to 9, per 100 lb., terms 60 days, or 2 per cent. discount in 10 days, carload lots, to jobbers, annealed, $1.40; galvanized,

THE IRON AND METAL MARKETS

$1.70. Carload lots, to retailers, annealed, $1.50; galvanized, $1.80. Galvanized bar wire to jobbers, $1.90; painted, $1.60. Wire nails, to jobbers, $1.60.

The following table gives the price to retail merchants on wire in less than carloads, including the extras on Nos. 10 to 16, which are added to the base price:

Fence Wire, Per 100 lb.

Nos.	0 to 9	10	11	12 & 12½	13	14	15	16
Annealed	$1.55	$1.60	$1.65	$1.70	$1.80	$1.90	$2.00	$2.10
Galvanized	1.85	1.90	1.95	2.00	2.10	2.20	2.60	2.75

Wrought Pipe.—The following are the jobbers' carload discounts on the Pittsburgh basing card on wrought pipe, in effect from October 2, 1911:

Butt Weld.

	Steel—Black.	Steel—Galv.	Iron—Black.	Iron—Galv.
⅛ and ¼ in.	73	53	68	48
⅜ in.	74	64	69	59
½ in.	77	67	72	62
¾ in. to 1½ in.	80	72	75	67
2 in. to 3 in.	81	74	76	69

Lap Weld.

1¼ and 1½ in.	..	..	68	61
2 in.	77	70	72	65
2½ to 4 in.	79	72	74	67
4½ to 6 in.	78	70	73	65
7 to 12 in.	76	66	71	61
13 to 15 in.	52	..	47	..

Butt Weld, extra strong, plain ends, card weight.

¼, ¼, ⅜ in.	70	60	65	55
½ in.	75	69	70	64
¾ to 1½ in.	79	73	74	68
2 to 3 in.	80	74	75	69

Lap Weld, extra strong, plain ends, card weight.

1½ in.	..	..	66	60
2 in.	76	70	71	65
2½ to 4 in.	78	72	73	67
4½ to 6 in.	77	71	72	66
7 to 8 in.	70	60	65	55
9 to 12 in.	65	55	60	50

Butt Weld, double extra strong, plain ends, card weight.

½ in.	65	59	60	54
¾ to 1½ in.	68	62	63	57
2 to 3 in.	70	64	65	59

Lap Weld, double extra strong, plain ends, card weight.

2 in.	66	60	61	55
2½ to 4 in.	68	62	63	57
4½ to 6 in.	67	61	62	56
7 to 8 in.	60	50	55	45

Plugged and Reamed.

1 to 1½, 2 to 3 in. Butt Weld
2, 2½ to 4 in. Lap Weld

} will be sold at two (2) points lower basing (higher price) than merchants' or card weight pipe. Butt or lap weld, as specified.

The above discounts are for "card weight," subject to the usual variation of 5 per cent. Prices for less than carloads are three (3) points lower basing (higher price) than the above discounts.

Boiler Tubes.—Discounts on lap welded steel and charcoal iron boiler tubes to jobbers in carloads are as follows:

Steel.		*Charcoal Iron.*	
1¾ to 2¼ in.	65	1½ in.	48
2½ in.	67½	1¾ to 2¼ in.	50
2¾ to 3¼ in.	72½	2½ in.	55
3½ to 4 in.	75	2¾ to 5 in.	60
5 to 6 in.	67½		
7 to 13 in.	65		

2½ in. and smaller, over 18 ft., 10 per cent. net extra.
2¾ in. and larger, over 22 ft., 10 per cent. net extra.

Less than carloads will be sold at the delivered discount for carloads, lowered by two points for lengths 22 ft. and under to destinations east of the Mississippi River; lengths over 22 ft. and all shipments going west of the Mississippi River must be sold f.o.b. mill at Pittsburgh basing discount, lowered by two points.

Pittsburgh

PITTSBURGH, PA., November 1, 1911.—*(By Telephone.)*

Pig Iron.—A further break in prices of Bessemer iron has taken place and in the past week sales of small lots have been made at $14.25, Valley furnace, and one lot of 200 tons for prompt shipment was sold at $14.10, Valley, or $15, Pittsburgh. Malleable Bessemer has also further declined, sales of about 3000 tons having been made in the past week at $12.50, Valley furnace. There is very little doing in foundry iron, buyers placing orders only for small lots for current needs and showing no disposition to make contracts for next year. We quote: Bessemer, $14.25; malleable Bessemer, $12.50; basic, $12.50; No. 2 foundry, $13.25, and gray forge, $12.75, all at Valley furnace, the freight rate to the Pittsburgh district being 90c. a ton.

Steel.—Specifications against contracts for billets and sheet bars are fairly active, but new inquiry is dull. There have been some negotiations between the steel mills and the sheet and tin plate mills for sheet and tin plate bars for first quarter, but so far no contracts have been closed. The billet and rail sales department of the Carnegie Steel Company reports that orders sent to the mills for rolling in October exceeded September by 27,000 tons, October having been the largest month in billets and rails the company has had since last March. We note sales of 4000 to 5000 tons of open hearth and Bessemer billets for prompt shipment at about $19 for open hearth and $20 for Bessemer at maker's mill. We quote open hearth billets, $19; Bessemer billets, $20; open hearth sheet bars, $20; Bessemer sheet bars, $21, and forging billets, $24, f.o.b. at maker's mill.

Steel Rails.—The first actual inquiry for steel rails for 1912 delivery has come from the Norfolk & Western Railroad, which is asking for 25,000 tons for the first quarter of next year. Further inquiry from other roads is expected within a short time. The Carnegie Steel Company reports a fairly active market on light rails and is making regular shipments abroad. In some cases light rails for export bring slightly higher prices than domestic business. We quote light rails as follows: 8 and 10-lb. sections, 1.295c.; 12 and 14-lb., 1.205c.; 16, 20 and 25-lb., 1.16c.; 30 and 35-lb., 1.15c.; 40 and 45-lb., 1.105c.

(By Mail.)

A leading official of one of the larger independent steel companies, in referring to the suit to dissolve the United States Steel Corporation, says that "it would be a national calamity" if this should be brought to pass, and it may be stated that this opinion is held by most of the iron and steel companies that are direct competitors of the Steel Corporation. In the 10 years of its existence the treatment of its competitors and its customers by the Steel Corporation has been most considerate. Numerous instances can be recalled when its subsidiaries have furnished badly needed material to competing interests to help them out, even when it could be hardly spared. Three or four years ago, when there was a famine in the supply of billets and sheet bars, the Carnegie Steel Company furnished them to its competitors, although badly needing the steel for its own mills. But a few months ago the American Sheet & Tin Plate Company furnished pig tin to competing tin plate plants that were short of that metal and would have had to have shut down if they had not been helped out. The general opinion here is that the United States Government will not be successful in this suit. For the moment there is no doubt that it has checked business, but this will probably be only temporary. The tendency of prices on nearly all lines is still downward.

Ferromanganese.—Efforts of the importers to obtain $38 and $38.50 for 80 per cent. ferromanganese for delivery in the first half of 1912 have failed, two sales being reported—one of 500 tons and one of 800 tons—for first half of next year at about $37.50, Baltimore. For delivery over the next two or three months $37, Baltimore, has been quoted, the freight rate for delivery in the Pittsburgh district being $1.95 a ton.

Ferrosilicon.—The high prices ruling for 50 per cent. ferrosilicon have checked the demand. The supply of 50 per cent. seems to be pretty well controlled by one or two interests, and the recent heavy advances in prices are being held. We quote 50 per cent. at $62, with some sellers asking as high as $64 to $65, Pittsburgh. We quote 10 per cent., $22; 11 per cent., $23, and 12 per cent., $24, f.o.b. cars Ashland, Ky., or Jackson, Ohio.

Skelp.—A sale of 500 tons of narrow grooved steel skelp is reported at 1.10c., maker's mill, equal to 1.15c., delivered in the Pittsburgh district. We quote grooved steel skelp at 1.15c.; sheared steel skelp, 1.20c.; grooved iron skelp, 1.40c., and sheared iron skelp, 1.60c., all for delivery at consumers' mills in the Pittsburgh district.

Wire Rods.—The local market continues very dull and specifications against contracts are unsatisfactory. Prices are weak and while $26, Pittsburgh, is being quoted on the small lots that are coming out, it could be shaded if any large business was offering.

Plates.—The report that the Grand Trunk Railroad had placed an order with the Pressed Steel Car Company for 2000 steel cars, the plates to be furnished by the Carnegie Steel Company, is untrue. The railroad company is in the market for these cars, but the contract has not been given out. The Baltimore & Ohio has finally inquired for 1000 box cars, 1500 composite gondolas and 1500 steel gondolas. The Union Pacific is still in the market for 65 postal and baggage cars; the Chicago, Rock Island & Pacific for 500 furniture, 250 flat cars and 25 cabooses; the Delaware, Lackawanna & Western for 987 steel underframes; Wessell,

THE IRON AND METAL MARKETS

Duvall & Co., New York, for 200 box cars, 100 gondolas and 100 stock cars to be shipped abroad; the Southern Railway for 500 ventilated box cars, and the Norfolk & Southern for 300 to 500 box cars. The Pressed Steel Car Company has sold to the Pennsylvania Railroad 41 motor passenger and 24 motor passenger and baggage cars for suburban traffic. The Carnegie Steel Company has recently taken contracts for a heavy tonnage of plates from several of the shipbuilding concerns and more actual business is now in sight and is being placed than for some time. We quote wide and narrow plates at 1.15c. on ordinary orders and 1.20c. in small lots, f.o.b. at mill. On a very desirable contract for large tonnage and attractive rolling specifications it is probable that the lower price named might be slightly shaded by one or two mills.

Structural Material.—Considerable work has been placed in the past week and more is in sight. The Cambria Steel Company, Johnstown, Pa., has taken 2500 tons for the Rice Hotel at Houston, Texas, and the Virginia Bridge & Iron Company has taken 1500 tons for the Hurd Hotel at Tampa, Fla. The McClintic-Marshall Construction Company has taken 650 tons for the Michigan Trust Company Building, Grand Rapids, Mich., and 1700 tons for additional buildings for the New York Shipbuilding Company at Camden, N. J. Prices on structural material are ruling fairly strong and we continue to quote beams and channels up to 15 in. at 1.15c. to 1.20c., Pittsburgh, prices depending on desirability of the order.

Sheets.—A fairly heavy volume of new business is being placed with the mills. There seems to be a feeling among the trade that possibly prices of sheets have not touched bottom, and for this reason orders are being placed rather conservatively. It is stated that the demand for electrical sheets is quite heavy, but prices are ruling lower than for some time. Some consumers of sheets are willing to place contracts at present prices for long delivery ahead, but as a rule the mills are not willing to take such orders. Nevertheless, some contracts for black and galvanized sheets involving a good tonnage have been placed with local mills for delivery through the first half of next year. The market is fairly strong and No. 28 gauge, one pass, black annealed sheets are ruling at 1.90c. on small orders and 1.85c. for desirable specifications. No. 28 galvanized sheets continue to rule at 2.85c. to 2.90c. The sheet mills generally are operating to about 60 per cent. of capacity.

Tin Plate.—Several of the leading tin plate makers state that since the price of $3.40 per base box went into effect some excellent contracts have been placed by large consumers, particularly the can makers and salmon packers. So far, however, there has not been general eagerness by consumers to contract ahead, the feeling being that prices will certainly not be any higher in the near future. Shipments to Canada and to foreign countries continue heavy and form quite a good part of the tonnage that is moving from the mills. Operations among the tin plate mills are steadily growing less, as they have not started as yet to run on stock orders. At present they are operating to only 50 to 55 per cent. of capacity. We continue to quote 100-lb. cokes, 14 x 20, at $3.40 per base box, f.o.b. at maker's mill, but some evidences of weakness have recently developed.

Bars.—The new demand for steel bars is only fairly active, but in most cases is for small lots to cover current requirements of consumers. The opinion is growing that prices on steel bars have probably touched bottom and for this reason a slight increase in specifications against contracts is noted. The demand for iron bars is quiet. We quote steel bars at 1.10c. for desirable orders and 1.15c. in small lots. Iron bars are ruling at 1.20c. to 1.25c., maker's mill, depending on the order, freight added to point of delivery.

Merchant Steel.—New orders are still confined to small lots to meet actual needs. Specifications against contracts are quiet. Shipments by the mills in October will show a falling off as compared with September. Quotations, which are more or less shaded, are as follows: Iron finished tire, ¼ and ½ in. and heavier, 1.40c.; under these sizes, 1.45c.; planished tire, 1.50c.; channel tire, 1.70c., base; toe calk, 1.80c.; flat sleigh shoe, 1.45c.; concave or convex, 1.60c.; cutter shoe, tapered or bent, 2.15c.; spring steel, 1.85c.; machinery steel, smooth finish, 1.75c.

Hoops and Bands.—The demand is very dull and specifications against contracts are also unsatisfactory. We quote steel hoops at 1.35c. and bands at 1.15c., extras on the latter as per the steel bar card, but on very desirable orders for shipment at the convenience of the mill these prices would be shaded by some mills, although not over $1 a ton.

Rivets.—Both structural and boiler rivets are in slightly better demand. We quote structural rivets at 1.50c. and boiler rivets at 1.60c., f.o.b. Pittsburgh. On a desirable contract for prompt shipment these prices might be shaded

Wire Products.—The reduction of $1 a ton in wire products has not stimulated the demand, which continues only for small lots. Specifications against contracts are unsatisfactory and in some cases have been held up entirely. We quote wire nails at $1.60; cut nails $1.50; galvanized barb wire $1.90; painted $1.60; annealed fence wire $1.40 and galvanized fence wire $1.70; all f.o.b. Pittsburgh, usual terms, full freight added to point of delivery. To some points of shipment, notably in the South, delivered prices on wire products are being made in competition with Ohio River mills that are less than the Pittsburgh price plus the freight rate.

Spelter.—The market is very strong and we quote prime Western at 6.20c., East St. Louis, equal to 6.32½c., Pittsburgh.

Shafting.—New orders are light and only for small lots, while specifications from consumers, notably the automobile builders and the implement makers, are very unsatisfactory. Consumers seem to be taking in as little material as possible. We quote cold rolled steel shafting at 60 and 5 per cent. off in small lots and 60 and 10 per cent. off the list in carload and larger lots, delivered in base territory. On a desirable specification, for prompt shipment, this price might be shaded.

Railroad Spikes.—New orders are only for small lots to cover track repair work. We quote railroad spikes in base sizes at $1.40, f.o.b. Pittsburgh.

Merchant Pipe.—Some small orders for gas and oil lines are being placed and while some large projects requiring line pipe are under way it is not likely that much will be done with these this year, as the season is too late. The Youngstown Sheet & Tube Company, Youngstown, Ohio, has received an order from the Isthmian Canal Commission for 20,000 ft. of 2 to 10-in. pipe. The High Grade Oil Company, Butler, Pa., has placed an order with a local mill for about 20 miles of 3-in. and 16 to 18 miles of 2-in. steel line pipe. One local mill reports that its orders for tubular goods in October showed a slight increase over September. The general demand for merchant pipe has held up better so far this year than usual, and, as a rule, the leading pipe mills are operating to from 65 to 70 per cent. of capacity. It is stated that the new discounts on iron and steel pipe are being fairly well held.

Iron and Steel Scrap.—An item of interest in the scrap trade is that the Jones & Laughlin Steel Company has come in the market in the past week or 10 days as a buyer of heavy steel scrap, and local dealers report sales of 8000 to 10,000 tons of special grade and at as high as $12.60 delivered to its works on the South Side in this city. This buying has given a slightly stronger tone to the local market on heavy steel scrap. Other consumers are taking in more material than for some time, but in a general way prices on the other grades do not show any signs of betterment. Dealers are quoting as follows, per gross ton, f.o.b. Pittsburgh, unless otherwise noted:

Heavy steel scrap, Steubenville, Follansbee, Sharon, Monessen and Pittsburgh delivery	$12.00
No. 1 foundry cast	$12.50 to 12.75
No. 2 foundry cast	11.75 to 12.00
Bundled sheet scrap, f.o.b. consumers' mill, Pittsburgh district	10.25 to 10.50
Rerolling rails, Newark and Cambridge, Ohio, Cumberland, Md., and Franklin, Pa.	12.50 to 12.75
No. 1 railroad malleable stock	11.50 to 11.75
Grate bars	9.00 to 9.25
Low phosphorus melting stock	15.00 to 15.25
Iron car axles	20.50 to 21.00
Steel car axles	16.00 to 16.25
Locomotive axles	22.00 to 22.50
No. 1 busheling scrap	11.00 to 11.25
No. 2 busheling scrap	7.00 to 7.25
Old car wheels	12.00 to 12.25
*Cast iron borings	8.00 to 8.15
*Machine shop turnings	8.75
†Sheet bar crop ends	13.75 to 14.00
Old iron rails	14.50 to 14.75
No. 1 wrought scrap	12.00 to 12.25
Heavy steel axle turnings	9.75 to 10.00
Stove plate	9.00 to 9.25

*These prices are f.o.b. cars at consumers' mills in the Pittsburgh district.
†Shipping point.

THE IRON AND METAL MARKETS

Boiler Tubes.—More new orders for boiler tubes for locomotives are being placed than for some time. Local interests have taken an order for boiler tubes for 100 locomotives to be built by the Canadian Pacific Railroad. The new demand for merchant tubes is very dull. Prices on both locomotive and merchant tubes are more or less shaded.

Coke.—A local interest reports sales of about 12,000 tons of standard furnace coke for November shipment at $1.60 per net ton at oven. Prices on both furnace and foundry coke are firmer than for some time. Several inquiries from blast furnace owners for coke for the first half of next year are in the market, but these are very slow in being closed up. The output of coke in the Upper and Lower Connellsville regions last week showed an increase over the previous week of about 5000 tons. We quote standard makes of furnace coke for prompt shipment at $1.50 to $1.55 and for the remainder of the year $1.55 to $1.60 per net ton at oven; foundry coke, 72-hr., prompt, $1.85 to $2, and contract, $2.10 to $2.40.

The Ohio Iron & Metal Company, of Cleveland, dealer in iron and steel scrap, is discontinuing its branch office in the Farmers' Bank Building, Pittsburgh, in charge of H. D. Stalnaker, and is also discontinuing its Philadelphia and Chicago offices.

Chicago

CHICAGO, ILL., October 31, 1911.

A general survey of the market indicates that recent events have increased the conservatism of buying interests, and where the prevailing low prices were beginning to appear interesting to them the prospect of a prolonged period of low values has now been reaffirmed. Mill bookings are expected, therefore, to represent only the current requirements of purchasers for some time to come. During the past week plate specifications have shown some increase, followed in lesser degree by steel bars and structural shapes. Sheet tonnage has fallen off somewhat and mills are operating on a lower schedule of activity. A general reluctance to place orders prevails in all directions and the pig iron market in particular reflects this condition. Prices for old material continue weak and there are those who predict still lower values.

Pig Iron.—The market during the past week shows practically no change. A little more iron for delivery in the first quarter has been placed in scattered lots of small quantity. No inquiries of unusual importance are noted and the buying even in the lots of a few hundred tons fluctuates widely in volume from day to day. For local Northern iron the asking price of furnaces remains at $14.50, f.o.b. furnace. Southern No. 2 iron continues on the basis of $10, Birmingham. In some instances analysis distinctions are not so sharply drawn as during a period of stronger prices. We quote for Chicago delivery, except for local irons, which are f.o.b. furnace, the following prices on prompt shipments:

Lake Superior charcoal	$16.50 to $17.00
Northern coke foundry, No. 1	14.75 to 15.00
Northern coke foundry, No. 2	14.35 to 14.50
Northern coke foundry, No. 3	14.00 to 14.35
Northern Scotch, No. 1	16.00
Southern coke, No. 1 foundry and No. 1 soft	14.85 to 15.10
Southern coke, No. 2 foundry and No. 2 soft	14.35 to 14.85
Southern coke, No. 3	14.10 to 14.35
Southern coke, No. 4	13.85 to 14.10
Southern gray forge	13.60 to 13.85
Southern mottled	13.60 to 13.85
Malleable Bessemer	14.35 to 14.50
Standard Bessemer	17.00
Basic	14.75
Jackson Co. and Kentucky silvery, 6 per cent	16.40
Jackson Co. and Kentucky silvery, 8 per cent	17.40
Jackson Co. and Kentucky silvery, 10 per cent	18.40

Rails and Track Supplies.—The situation from the standpoint of railroad buying holds little of interest to report. In practically every direction railroad equipment purchases are at a minimum, although mills are now engaged with the tonnage furnished by recent car purchases. Track fastenings are moving with a little less activity and prices are increasingly favorable to buyers. We quote standard railroad spikes at 1.60c., base; track bolts with square nuts, 2c. to 2.10c., base, all in carload lots, Chicago; standard section Bessemer rails, 1.28c.; open hearth, 1.34c.; light rails, 40 to 45 lb., 1.16c. to 1.20½c.; 30 to 35 lb., 1.19½c. to 1.24c.; 10, 20 and 25 lb., 1.20½c. to 1.25c.; 12 lb., 1.25c. to 1.30½c.; angle bars, 1.50c., Chicago.

Structural Material.—The award of the Field Museum tonnage, recently reported as 10,000 tons, has been revised and the contract placed with the Hansell-Elcock Company, Chicago, calls for 6929 tons. The Vierling Steel Company, Chicago, will fabricate 2500 tons for the Otis Elevator Company warehouse in this city. Steel for an addition to the Michigan Trust Building, Grand Rapids, Mich., amounting to 650 tons, will be furnished by the McClintic-Marshall Company. There is less activity in seeking structural tonnage regardless of price in this market, and to this extent a firmer condition obtains. We quote for plain shapes, mill shipment, at Chicago, 1.33c. to 1.38c., and from store, 1.65c.

Plates.—Conditions during the past week have offered some little encouragement by reason of increased specifications, but from the standpoint of prices little improvement can be noted. In the West the mill situation as regards tonnage on the books is quite satisfactory and a continuance of the current volume will probably require additional capacity in operation in order to maintain present prompt deliveries. We quote for Chicago delivery, mill shipment, 1.33c. to 1.38c., and from store, 1.65c.

Sheets.—Where some of the Western mills were operating at close to 100 per cent. recently, their schedules are now cut down to about 80 per cent. Buyers seem inclined to hold back requisitions as long as possible and specifications are cut to minimum requirements. Where desirable business is involved concessions of $1 a ton from regular quotations are necessary to obtain the business not infrequently. We quote Chicago prices as follows: Carload lots, from mill, No. 28 black sheets, 2.08c.; No. 28 galvanized, 3.08c.; No. 10 blue annealed, 1.58c. Prices from store, Chicago, are: No. 10, 1.90c. to 2c.; No. 12, 1.95c. to 2.05c.; No. 28 black, 2.30c.; No. 28 galvanized, 3.35c.

Bars.—The market for both iron and steel bars offers little consolation to the mills. There is little doubt that bar iron prices are nearer the cost of production than they have been in many years. Quotations above 1.17½c., Chicago, would fail of taking any of the few orders current. Steel bar prices continue close to the basis of 1.10c., Pittsburgh. We quote as follows, f.o.b. Chicago: Soft steel bars, 1.25c. to 1.33c.; bar iron, 1.15c. to 1.20c.; hard steel bars rolled from old rails, 1.17½c. to 1.20c. From store, soft steel bars, 1.55c. to 1.60c., Chicago.

Old Material.—The shrinkage in value of old material continues, though it is less decided than in some previous weeks. Conditions are such that from every standpoint, consumers' as well as dealers', it is desirable to hold a minimum stock. Evidences seem to indicate that with possibly one exception there are no large accumulations of scrap in this territory. Speculation has been unprofitable for so long a period that it is now entirely absent in this market and liquidation has been carried to a noteworthy extent. The only offering from railroads selling in this market is about 1400 tons by the Northern Pacific. We quote for delivery at buyers' works, Chicago and vicinity, all freight and transfer charges paid, per gross ton, as follows:

Old iron rails	$14.50 to $15.00
Old steel rails, rerolling	12.00 to 12.50
Old steel rails, less than 3 ft.	10.75 to 11.25
Relaying rails, standard section, subject to inspection	24.00
Old car wheels	12.00 to 12.50
Heavy melting steel scrap	9.50 to 10.00
Frogs, switches and guards, cut apart	9.75 to 10.25
Shoveling steel	9.00 to 9.50
Steel axle turnings	8.25 to 8.75

The following quotations are per net ton:

Iron angles and splice bars	$11.75 to $12.25
Iron arch bars and transoms	13.00 to 13.50
Steel angle bars	8.75 to 9.25
Iron car axles	16.75 to 17.25
Steel car axles	15.25 to 15.75
No. 1 railroad wrought	10.00 to 10.50
No. 2 railroad wrought	9.00 to 9.50
Steel knuckles and couplers	9.25 to 9.75
Steel springs	9.75 to 10.25
Locomotive tires, smooth	13.50 to 14.00
Machine shop turnings	5.75 to 6.25
Cast and mixed borings	5.00 to 5.50
No. 1 busheling	8.00 to 8.50
No. 2 busheling	5.75 to 6.25
No. 1 boilers, cut to sheets and rings	6.75 to 7.25
Boiler punchings	12.00 to 12.50
No. 1 cast scrap	10.00 to 10.50
Stove plate and light cast scrap	8.50 to 9.00
Railroad malleable	9.50 to 10.00
Agricultural malleable	8.50 to 9.00
Pipes and flues	7.00 to 7.50

Wire Products.—The necessities of wire mills as regards tonnage continue to bring out lower prices than are regularly quoted. Those departments furnishing what is the raw material of certain other

THE IRON AND METAL MARKETS

makers of wire products have particularly felt the restricted volume of buying. The wire nail trade continues short of expectations, while the demand for fencing holds up fairly well. Jobbers' carload prices, which are also quoted to manufacturing buyers, are as follows, per 100 lb.: Plain wire, No. 9 and coarser, base, $1.58 to $1.63; wire nails, $1.78 to $1.83; painted barb wire, $1.78 to $1.83; galvanized, $2.08 to $2.13; polished staples, $1.78 to $1.83; galvanized, $2.08 to $2.13, all Chicago.

Cast Iron Pipe.—The cast iron pipe business is very light and municipal lettings of importance are entirely lacking. At Muskegon, Mich., bids have been rejected and a new letting advertised for November 6. We quote as follows, per net ton, Chicago: Water pipe, 4-in., $26.50; 6 to 12-in., $24.50; 16-in. and up, $24, with $1 extra for gas pipe.

Philadelphia

PHILADELPHIA, PA., October 31, 1911.

The trade has a tendency to pause, while endeavoring to get some light on the effect of the suit by the government against the Steel Corporation. At this time there is little available to base opinions, but a feeling is apparent that little beyond a temporary hesitancy in business will be noted. Transactions in practically all lines of crude and finished products show little betterment. Concessions are still being made in competition for desirable orders. The demand for pig iron continues along narrow lines; in one or two instances slight concessions on foundry grades are reported, but have so far not affected general quotations. The old material market is quiet. Coke continues dull.

Iron Ore.—Nothing in the way of new business in foreign ore has developed. The reduced freight charges on Lake ores will not, it is believed, directly affect the ore market in the East at this time, although consumers will probaby endeavor to get prices on other ores reduced on the same basis. Importations during the week include 13,850 tons of Cuban, 12,275 tons of Newfoundland, 5033 tons of Swedish and 4900 tons of Grecian ore.

Pig Iron.—Transactions have been comparatively light, although somewhat better buying is reported on the part of nearby consumers. A shade of weakness in prices for foundry grades is noticeable in one or two directions, but these have not been such as to affect the general range of quotations, the concessions reported not being over 10 cents below the usual quotations for standard analysis brands. Prompt iron is comparatively scarce in this district and producers are not anxious to load up their order books at the present range of prices for any extended shipment. The bulk of the sales for foundry grades have been in small lots for either prompt or near future shipment, at from $15 to $15.25, delivered, although, as previously stated, $14.90 has been done in a few instances. Occasionally an odd lot of No. 2 X is sold at $15.35 and even $15.50. Sales of No. 2 plain iron are reported at both $14.75 and $15. There is probably a little better inquiry for the higher grades of foundry iron. One New Jersey interest is in the market for 1000 tons for delivery over the next three months, while several local consumers have inquiries out for 500-ton lots. Several inquiries for moderate quantities for strictly first quarter delivery are also reported. The cast iron pipe foundries are still negotiating for several round lots of low grade iron, principally Southern brands. Some small buying by the same interests in which Northern low grade iron has been taken is also reported. The most important transaction in Virginia foundry iron was the sale of a lot of 1500 tons to a New Jersey stove interest for delivery in the next three months at $12.50 at furnace. Small and moderate lot sales of Virginia foundry at prices ranging from $12.25 for prompt to $12.50 for near future delivery are also reported. Several sales of small lots of low grade iron to cast iron pipe makers in that territory have also been made. A better movement in rolling mill forge iron has developed; several 500-ton lots of Northern forge have been sold for early shipment at prices varying from $14.25 to $14.50, delivered. One inquiry for 1500 tons of this grade, which was before the trade last week, is understood to have been withdrawn. A purchase of 1000 tons of basic by a central Pennsylvania melter has been reported, but contemplated further purchases by the same interest have been held up. The purchase of a block of 5000 tons of basic for early 1912 shipment, which has been before the trade for several weeks, has not yet been consummated. No business of importance in low phosphorus iron is reported, small lots selling at the market. The following range of prices is named for standard brands, deliveries in buyers' yards in this district during the next 60 days and into or through the first quarter of next year:

Eastern Pennsylvania No. 2 X foundry	$15.00 to $15.25
Eastern Pennsylvania No. 2 plain	14.75 to 15.00
Virginia foundry	15.00 to 15.50
Gray forge	14.25 to 14.50
Basic	14.50
Standard low phosphorus	20.00

Ferroalloys.—An inquiry for some 300 tons of 80 per cent. ferromanganese, for next year's delivery, is before the trade, on which prices appear to be firm at $38.50, Baltimore. While no business in prompt lots has developed, little doubt is expressed that lower quotations would be available on speculative material. Fifty per cent. ferrosilicon is firm at $62, delivered, while furnace ferrosilicon, within Bessemer limits as to sulphur and phosphorus, is quoted at $27.30 to $28.30, delivered here. No business in either grade is reported.

Billets.—While the bulk of the business is still confined to small lots, the trade is more encouraged with the situation, as some of the larger consumers are showing more interest in the market. Producers claim that at $21.40, delivered here, rock bottom has been reached for open-hearth rolling billets and that that price now applies only on desirable orders, $22.40 being named for ordinary small lots. Forging billets are quoted at $26.50 to $27.50, according to specifications, delivered in this district.

Plates.—Few large contracts have come out, although one order for several thousand tons of boat plates is said to have been placed during the week. A fair demand for marine boiler and tank steel is noted, quantities in instances running into several hundred tons. Open quotations for ordinary steel plates, delivered in this district, range from 1.35c. to 1.40c., and while it is said that 1.30c. could be done for desirable business, nothing is reported to have developed recently on which the lower basis has been named.

Structural Material.—A large number of good propositions are pending, but close slowly. The structural material for the Municipal Convention Hall has not, it is said, been definitely placed. That for the Baldwin Locomotive Works erecting shop addition is still held up, while the material for the Royster Building in Norfolk, 1600 tons, will require re-estimating. The New York Shipbuilding Company has placed the order for the addition to its plant, about 1700 tons. Several good propositions are in sight, including the new Stock Exchange Building and the new Manufacturers' Club in this city. Several large apartment houses in Baltimore, Md., and in this city are also being figured on. There have been several small buildings placed, requiring a few hundred tons of material each, also some small bridge orders. Prices of plain material are pretty generally on a 1.35c. to 1.40c., delivered here, basis, although on desirable orders 1.30c. can be done. For fabricated work prices continue extremely low.

Sheets.—Makers in this district report a better run of general orders, with a tendency on the part of consumers to take care of their needs up to the end of the year. Order books are therefore in better shape and Eastern mills have been able to operate on a better basis. No further price weakness appears to have developed and No. 28 gauge, Western one pass sheets command 2.05c., delivered here, while Eastern three pass sheets command a materially higher price.

Bars.—The demand has not been active, and the present price level of either iron or steel bars has not been seriously tested. Small orders continue to be placed at recent quotations,—1.20c. for desirable orders, and up to 1.25c., delivered, for the ordinary run of business in iron bars, and 1.25c. as an open quotation for steel bars. The latter are, however, not particularly strong at that basis.

Coke.—New business has been rather quiet, although sellers report heavy shipments on contracts. Transactions are closely confined to small lots in both foundry and furnace grades, mostly for prompt delivery. Prices are practically unchanged, the following range, per net ton, delivered in buyers' yards in this district, about representing the market:

Connellsville furnace coke	$3.65 to $4 05
Foundry coke	4.15 to 4 50
Mountain furnace coke	3.40 to 3.65
Foundry coke	3.95 to 4.40

THE IRON AND METAL MARKETS

Old Material.—Quiet conditions continue to prevail in practically all grades. Consumers continue to take on odd lots, largely of the bargain counter class, but there is still an absence of any pronounced buying. Moderate lot sales of heavy melting steel are moving at prices ranging from $11.75 to $12, delivered. The lot of approximately 610 tons of Panama scrap, offered last week, was awarded to the Alan Wood Iron & Steel Company at its bid of $10.05, on cars here. A cargo of about 1100 tons of Cuban scrap, mixed grades, was received at this port during the week, the various classes of material being applied on contracts held by the seller. Rolling mill grades of scrap are not in very active demand, transactions being confined to small lots, both buyers and sellers awaiting further developments. Prices of leading grades show but little change, the following range about representing quotations at which the ordinary current business for prompt shipment can be done, delivery in buyers' yards, eastern Pennsylvania and nearby points, taking a freight rate from Philadelphia varying from 35c. to $1.35 per gross ton, for shipment ranging from prompt to the remainder of the year:

No. 1 heavy melting steel scrap	$11.75 to $12.25
Old steel rails, rerolling (nominal)	12.75 to 13.25
Low phosphorus heavy melting steel scrap	15.75 to 16.25
Old steel axles (nominal)	18.00 to 18.50
Old iron axles (nominal)	22.50 to 23.50
Old iron rails (nominal)	15.50 to 16.00
Old car wheels	11.50 to 11.75
No. 1 railroad wrought	13.75 to 14.25
Wrought iron pipe	11.25 to 11.75
No. 1 forge fire	9.50 to 10.00
No. 2 light iron (nominal)	6.00 to 6.50
Wrought turnings	8.00 to 8.25
Cast borings	7.50 to 7.75
Machinery cast	12.25 to 12.75
Railroad malleable (nominal)	11.00 to 11.50
Grate bars, railroad	9.25 to 9.75
Stove plate	9.25 to 9.75

Cleveland

CLEVELAND, OHIO, October 31, 1911.

Iron Ore.—The reduction of rail freight rates from 80c. to 60c. a ton on ore from the Mesaba range to Duluth and the reduction from 90c. and $1 from points on the Vermillion range have added to the uncertainty regarding ore prices for next season. While furnacemen look for a reduction in ore prices from the two ranges that will at least be equivalent to the reduction in freight rates there seems to be little probability that ore firms will take any action on the matter of readjusting prices for some time. Ore sellers are inclined to do nothing regarding 1912 prices until consumers are ready to buy for their next year's requirements so that they can be guided by conditions that then exist in the iron and steel trade. Present conditions do not indicate an early buying movement. It may be well along toward spring before consumers come into the market for their ore. Over two-thirds of the Lake Superior ore comes from the two ranges that will have the lower freight rates. Of the total shipments during 1910 slightly over 67 per cent. came from the Mesaba range, on which the freight rate has been reduced 20c., and 2.8 per cent. came from the Vermillion range. We quote prices as follows: Old range Bessemer, $4.50; Mesaba Bessemer, $4.25; Old range non-Bessemer, $3.70; Mesaba non-Bessemer, $3.50.

Pig Iron.—New low prices on foundry iron have been made, sales being reported at prices less than equivalent to $13, Valley furnace, for No. 2. We note the sale of about 1500 tons of No. 2 foundry for delivery the remainder of the year and through the first quarter at $12.65, Cleveland furnace, for shipment to Columbus with a freight rate of $1.20. Another central Ohio manufacturer who had an inquiry out for 1000 tons for the first half has bought at $13 or less at furnace for No. 2. One interest made a quotation of $13, Valley furnace, on each of these inquiries but failed to get either order. We also note the sale of 1000 tons of No. 2 foundry to a Cleveland foundry for November and December delivery. The nominal Cleveland quotation of No. 2 foundry has been reduced to $13 at furnace, for both local delivery and for outside shipment, and for delivery extending through the first quarter. Valley furnaces generally do not appear to be meeting the competition, mostly holding at $13.25 for No. 2 foundry. A few small lot sales are reported and some inquiries for small lots are coming out, the largest being three for 500 tons each. Few consumers want to buy for delivery after the first of the year and the possibility of lower ore prices as a result of the reduction in freight rates is expected to cause more hesitancy on the part of buyers, who feel that lower ore prices would result in a further reduction in pig iron prices. There is no inquiry of any size for Bessemer or basic iron. The nominal price of $14.50 on Bessemer does not appear to be firmly maintained. Some sales of Southern iron in lots of 100 to 300 tons are reported. In spite of the limited demand for pig iron, shipments on contracts continue very good, having shown considerable improvement during the past three months and some stocks have been largely reduced. For Cleveland delivery we quote as follows, delivered, for the last and first quarters:

Bessemer	$15.40
Basic	13.40
Northern foundry, No. 2	13.25
Gray forge	13.00
Southern foundry, No. 2	$14.35 to 14.65
Jackson County silvery, 8 per cent. silicon	17.05

Coke.—The furnace coke market is quiet. The demand for foundry grades shows an improvement. Some small contracts have been closed for delivery the remainder of the year. We quote standard Connellsville furnace coke at $1.50 to $1.55 per net ton at oven for prompt shipment, and $1.55 to $1.60 for the remainder of the year. Connellsville 72-hr. foundry coke is held at $1.85 to $2.15 for prompt shipment and $2.10 to $2.40 for contract.

Finished Iron and Steel.—Mills are getting a fair volume of orders but they are almost entirely for small tonnages. Consumers are buying almost entirely for immediate requirements. Some agencies report an improvement in specifications on contracts. A good volume of specifications is coming from the implement makers. The price situation shows very little change, prices on most lines being unsettled. While 1.10c., Pittsburgh, is generally the minimum quotation on steel bars the market is disturbed by continued reports that steel bars can be bought at 1.05c., and it appears probable that some business is being taken at the latter price. Prices on plates range from 1.15c. to 1.20c. Structural material is firmer than other lines but concessions of 50c. a ton from the regular 1.20c. price are reported. The demand for sheets is fairly active. The sheet market is firm at the minimum quotations of 1.85c. for No. 28 black and 2.85c. for No. 28 galvanized, these prices being for car lots. Low prices of soft steel bars have forced makers of rerolled steel bars to reduce their quotation on hard steel bars in some cases to 1.08c. Lower prices are being quoted on rivets and the demand for boiler rivets is fairly good. We quote structural rivets at 1.50c. to 1.55c., Pittsburgh, and boiler rivets at 1.60c. The demand for structural material is not active. The only new inquiries are for small lots, mostly of 100 tons and under. The demand for iron bars is light. The price is firm at 1.20c., Cleveland mill.

Old Material.—The market is very dull. Prices continue weak but the absence of transactions in several grades makes quotations on some of these grades largely nominal. A local consumer reports the purchase of 1000 tons of heavy steel scrap for the first quarter delivery at $11. Local dealers have advanced their quotations on heavy steel scrap to a minimum of $11. Youngstown and Sharon mills are understood to be willing to pay $12 for this grade, the freight rate from Cleveland being $1 a ton. Yard dealers do not want to buy at present and are not offering stocks at current prices. The Wheeling & Lake Erie and the Big Four Railroads received bids October 30 on small tonnages. The Pennsylvania Lines, West, have a list out to be closed to-day. Dealers' prices per gross ton, f.o.b. Cleveland, are as follows:

Old steel rails, rerolling	$12.25 to $12.75
Old iron rails	14.00 to 14.50
Steel car axles	17.00 to 17.50
Heavy melting steel	11.00 to 11.25
Old car wheels	11.25 to 11.50
Relaying rails, 50 lb. and over	22.50 to 23.50
Agricultural malleable	10.50 to 11.00
Railroad malleable	11.00 to 11.25
Light bundled sheet scrap	9.50 to 10.00

The following prices are per net ton, f.o.b. Cleveland:

Iron car axles	$18.50 to $19.00
Cast borings	6.00 to 6.25
Iron and steel turnings and drillings	6.50 to 6.75
Steel axle turnings	7.25 to 7.75
No. 1 busheling	9.00 to 9.50
No. 1 railroad wrought	11.00 to 11.25
No. 1 cast	11.00 to 11.50
Stove plate	9.00 to 9.25
Bundled tin scrap	11.00 to 11.50

THE IRON AND METAL MARKETS

Birmingham

BIRMINGHAM, ALA., October 30, 1911.

Pig Iron.—The action of the United States Government in filing suit for the dissolution of the United States Steel Corporation has had a tendency to shut off buying. Thus far, however, no concessions seem to have been made in prices, and it is thought that they can hardly go any lower than those now ruling; at the same time no buying movement of any consequence is expected soon and the furnace interests seem to be content to let the market take its course and simply to take care of the business that comes along from day to day. Foundries continue to order out iron due on their contracts at a very satisfactory rate and predictions are made that stocks will show still another reduction for the month. There have been a few lots of 100 to 500 tons sold during the week and the price, pretty generally, has been $10 at furnace for No. 2. Quotations remain as follows, per ton of 2240 lbs., f.o.b. cars Birmingham furnaces:

No. 1 foundry and No. 1 soft	$10.50
No. 2 foundry and No. 2 soft	10.00
No. 3 foundry	9.50
No. 4 foundry	9.25
Gray forge	9.00

Cast Iron Pipe.—Some good inquiries are pending before the local producers and special interest is being given to the inquiry of the United States Government on requirements for Colon. It is thought that the Alabama producers will get this order for the Canal Zone, which approximates 5000 tons of 20-in. water main. A good many of the small municipalities of the country are adding water works systems and extending water mains, taking advantage of the low prices ruling on cast iron water pipe. This is helping producers here to continue operations and it is confidently expected that they will be able to run at a fairly satisfactory rate without any material change in prices for some months. Quotations per net ton, f.o.b. cars at foundries in this district, remain approximately as follows: 4-in. to 6-in., $23; 8-in., to 12-in., $22; over 12-in., average, $21, with gas pipe taking its usual differential of $1 a ton higher.

Coke.—Some additional interest is being manifested in the coke market. Prices, however, remain low, practically on a $3 schedule for 72-hr. foundry hand-picked coke f.o.b. ovens here. The expected blowing in of one additional furnace stack in this district has tended to make a little better demand for furnace coke, though the price of that grade still remains very low.

Old Material.—Dealers report some small sales, but not enough to have any material effect on the scrap iron market. The railroads do not seem inclined to turn loose any tonnages to the dealers at any concession in price, and, therefore, little of interest is transpiring. Dealers continue to quote f.o.b. their yards. Birmingham, per gross ton, approximately as follows:

Old iron axles (light)	$12 50 to $13.00
Old steel axles (light)	11.50 to 12.00
Old iron rails	11 50 to 12 00
No. 1 railroad wrought	10 00 to 10.50
No. 2 railroad wrought	8.50 to 9.00
No. 1 country wrought	6.50 to 7.00
No. 2 country wrought	6.00 to 6.50
No. 1 machinery, cast	8 50 to 9 00
No. 1 steel	8.00 to 8.50
Tram car wheels	7.50 to 8.00
Standard car wheels	9 00 to 9.50
Light cast and stove plates	6.00 to 6.50

It is reported that the Southern Iron & Steel Company will blow in, between November 1 and 15, its furnace at Alabama City, Ala., which has been idle for some months. The output will be basic iron, for the consumption of the company at its own steel and wire plant at Alabama City.

St. Louis

ST. LOUIS, MO., October 30, 1911.

The market continues in the same condition which has obtained for the past several weeks, with the buyers keeping out of the market in all lines—pig iron, coke, finished material and scrap—except for immediate consumption on specific requirements. Prices, while low, do not show any sign of demoralization.

Pig Iron.—There are some signs of buying for the first half of next year, but they are not large. The purchases of No. 2 Birmingham during the week will aggregate little more than 2000 tons, all in small lots. There is an inquiry in the market for 500 tons of No. 2 Southern and for 1000 tons of car wheel iron. The price remains around $10 for No. 2, Birmingham basis. The Southern furnaces have begun some agitation here with their customers for a reduction of the freight rate, which is $3.75 from Birmingham here, but there has been, as yet, no concerted action on the part of the buyers in support of the furnaces. It is urged that the rate for an indestructible and easily transported article of commerce is out of proportion with rates on other merchandise. There are assertions of sales of No. 2 Southern pig as low as $9.50, but these are not quotations and are probably arrived at by the analysis route.

Coke.—There are no signs of special activity in coke, that market being affected by the conditions in pig iron, which is moving so slowly as to leave little need for the fuel. The prices still stand at about $1.50 for 48-hr. coke; $1.90 to $2.15 for 72-hr. prompt shipment and $2.10 to $2.35 for delivery over the coming year.

Finished Steel.—In the finished product there is a pretty fair tonnage moving, running up a good aggregate for the month, all things considered. The orders continue reasonably good, although at even the present low prices of steel there are no concerns anxious to place orders for stock. The present understanding is that the Barr building, which will require about 10,000 tons, will be held up for some time to await a better feeling for the final financing. In plates there is practically nothing doing. The quotations stand at about 1.20c., Pittsburgh, for structural, 1.10c. for bars, 1.20c. for plates, with perhaps 1.15c. in special circumstances. Standard rails show no movement, the buying year being about closed for this territory. Light rails are showing fair orders from the coal companies, but nothing from the lumber roads. Track fastenings continue in fair demand.

Old Material.—A list from the Missouri Pacific during the week showed the effect of the new management's work in laying new rails, for 1100 tons of old rails were displaced by the new material, and this line of old material is expected to increase right along now. The plant of the Harry Benjamin Equipment Company, formerly owned by the Block-Pollak Company, has been put in shape and started up this week. The situation generally is one of waiting for something to turn up, for the man who does the least business now loses the least money. Dealers' prices per gross ton, f.o.b., St. Louis, are as follows:

Old iron rails	$12 00 to $12.50
Old steel rails, rerolling	11.50 to 12.00
Old steel rails, less than 3 ft.	10.00 to 10.50
Relaying rails, standard section, subject to inspection	22.50 to 23.00
Old car wheels	11 50 to 12 00
Heavy melting steel scrap	10 00 to 10 50
Frogs, switches and guards cut apart	10.00 to 10.50

The following prices are per net ton:

Iron fish plates	$10 00 to $10.50
Iron car axles	17 00 to 17 50
Steel car axles	15 00 to 15.50
No. 1 railroad wrought	10.25 to 10.75
No. 2 railroad wrought	9.25 to 9.75
Railroad springs	9.25 to 9.75
Locomotive tires, smooth	13 00 to 13.50
No. 1 dealers' forge	7 00 to 7.50
Mixed borings	5.00 to 5.50
No. 1 busheling	8.50 to 9.00
No. 1 boilers cut to sheets and rings	7.00 to 7.50
No. 1 cast scrap	8.50 to 9 00
Stove plate and light cast scrap	7.00 to 7.50
Railroad malleable	7.50 to 8.00
Agricultural malleable	6.50 to 7.00
Pipes and flues	7.50 to 8.00
Railroad sheet and tank scrap	7.00 to 7.50
Railroad grate bars	6.50 to 7.00
Machine shop turnings	6.50 to 7.00

San Francisco

SAN FRANCISCO, CAL., October 24, 1911.

Notwithstanding the prevailing belief that prices have reached about the lowest possible level, our merchants and consumers of steel products are still limiting their purchases pretty closely to current needs, and the agents of manufacturers have no hope of any general revival before the first of the year. Small orders are coming out a little more freely, especially from jobbers at interior distributing points, where general conditions are extremely favorable. Local merchants are watching the market closely, and are expected to place liberal orders at the first indication of firmness in the East. There are, however, several deterrent factors, including the proximity of the inventory season and the possibility of a reduction in

THE IRON AND METAL MARKETS

the tariff. There is also a tendency to hold off until the local stock to be carried by the United States Steel Products Company is complete and its policy is definitely established.

Bars.—Orders have been placed this month for a very fair tonnage of reinforcing bars, though most individual purchases are small. Conditions are favorable for a heavy movement in this line next year, but the present tendency is to hold stocks down as low as possible. Orders for soft steel bars are mostly of a sorting-up nature, though the distributive market is in a little better condition, and some increase is noted in the aggregate tonnage. A number of local merchants are getting in some foreign material from time to time, but the amount is not very great, and new orders placed with foreign manufacturers are comparatively light. Local resale prices are fairly well maintained at the former quotations of 2c. for steel and 1.90c. for iron.

Structural Material.—Both contracts and new inquiries are still subject to more or less delay, and recent fabricating orders are limited to a few comparatively unimportant jobs. The Westinghouse warehouse, requiring only about 80 tons, was taken by the McClintic-Marshall Construction Company, which also has the contract for the Union Iron Works shop building, a little over 400 tons. A contract will be closed in a few days for a local warehouse, requiring about 150 tons. The Failing building contract, Portland, Ore., has gone to the Northwestern Steel Company, and the Oregon Journal building, in the same city, is up for figures. No inquiry has been received on the Standard Oil building, though the foundation contract has been let, and plans for the superstructure will be finished very soon. The Los Angeles Times contract has not yet been closed, but will probably be let to a local fabricator. The project of another bridge over the Willamette has been taken up again at Portland, Ore., the estimated cost being about $800,000. The Pacific Construction Company has taken a contract for steel jail cells at Fresno, Cal.

Rails.—The movement of both standard and grooved rails is better than for some months. The principal feature in the market is an active and increasing inquiry from interurban traction companies operating in the northern and central part of the State. Some rails are being sold to new lines, which are likely to be in the market on a still larger scale next year, though the largest are from well-established roads. The Northern Electric will place an order for a large tonnage within a few days, and an order has been placed for an extension of the Monterey, Cal., street railroad. The Central California Traction Company is preparing to extend its line from Lodi to Lockeford, Cal. Plans are being made for a new line from Sacramento to Woodland, Cal. The town of Santa Barbara, Cal., has taken bids on a lot of 25-lb. rails, but the general demand for such material is very light, with few orders of any consequence.

Sheets.—A slight improvement is noted in a jobbing way, but the consuming trades are not inclined to acquire any surplus over present requirements. Merchants are buying only what is necessary, and are expected to hold their stocks down to a minimum until after the first of the year. Resale prices continue weak and unsettled.

Plates.—Tank manufacturers are fairly busy, and small orders are coming out in better shape than earlier in the month.

Merchant Pipe.—Merchants continue to report a slow movement, and while they are buying a little more freely large orders are almost entirely lacking. It is considered too near the end of the year to make any material addition to stocks, especially as prompt delivery can be easily obtained. Oil country goods remain very quiet.

Cast Iron Pipe.—The tonnage of business placed in the last two weeks is rather light, though small orders are numerous and a fair volume of new inquiry is coming out. The Pacific Gas & Electric Company has ordered small lots for use at San Francisco, Oakland and Sacramento, and the Monterey County Gas & Electric Company has ordered a lot of water pipe. The city of Long Beach has placed its order for 1700 tons of 12 to 24-in. pipe with the United States Pipe Company, to be delivered by sea. There is considerable inquiry from Oregon and Washington, and a substantial tonnage for that district has been booked of late. The San Diego Consolidated Gas Company has placed a small order, and the city of Phoenix, Ariz., is in the market for 500 tons of 6-in.

Pig Iron.—The requirements of local foundries are very small at present, and with the annual inventory season near at hand the tendency is to avoid any accumulation of stock. Supplies on hand and under contract, however, are moderate, and a fair movement is expected after the first of the year. According to reports from China the Han Yang furnaces are in the hands of the revolutionists, and it is impossible to move any pig iron from there. This may cause some delay in the delivery of Chinese pig iron on contracts. Prices show no quotable change, English, Continental and Chinese iron of ordinary foundry grade being quoted at $20 to $24, while No. 2 Southern is nominal at $20.50 to $21.

Old Material.—Continued dullness and heavy accumulations of cast iron scrap have weakened the market, and a considerable tonnage has been moved at $14 per net ton, with prospects of some additional business at the same figure. Steel melting scrap finds little demand locally, and the only event of any interest is the shipment of 500 tons to Italy. Prices are quoted as follows: Cast scrap, per net ton, $14; steel melting scrap, per gross ton, $10.50 to $11; wrought scrap, per net ton, $11 to $15; rerolling rails, per net ton, $11.

Buffalo

BUFFALO, N. Y., October 31, 1911.

Pig Iron.—Inquiry has been somewhat checked by the disturbing influences of the news of the reduction of Lake ore freight rates, the cancellation of the Hill ore leases and the suit for the dissolution of the Steel Corporation. The new business was comprised largely of orders for consumption within the next two or three months. Consumers' interest in forward delivery business has apparently subsided temporarily. Producers are also apathetic regarding sales for next year, owing to the unremunerative prices which obtain and the evident belief among consumers that there is a possibility of the bringing about of a still lower price situation. All furnaces are shipping heavily on contracts and in excess of production, and the reports from the territory tributary to this market are that foundries are becoming increasingly busy and are melting as much iron as at any time in their history. This has a tendency to steady the situation so far as the producers are concerned. Harriet X furnace of the Wickwire Steel Company resumed operations last week after being blown out several weeks for relining and repairs. We quote as follows, f.o.b. Buffalo, for current quarters and first quarter of 1912:

No. 1 X foundry	$13.75 to $14.00
No. 2 X foundry	13.25 to 13.75
No. 2 plain	13.00 to 13.50
No. 3 foundry	13.00 to 13.25
Gray forge	13.00
Malleable	13.75 to 14.25
Basic	13.75 to 14.25
Charcoal	16.50 to 17.25

Finished Iron and Steel.—The demand in finished products for the week just ending shows less inclination on the part of buyers to lay in stock and that there has been a return to the hand-to-mouth buying which has characterized the market during the past few months. Prices in this territory are practically the same as for last week: Steel bars, 1.10c., for large lots, and 1.15c. for small orders; shapes, 1.20c. and 1.25c. Inquiries for bar materials aggregating a good tonnage have been received from the Canadian trade during the week. Specifications for barbed wire for western Canada for the spring trade are coming forward in fairly good volume for shipment before the close of the Lake season. Among the orders from Canada received during the week is included 150,000 boxes of tin plate for delivery during 1912 and one for 300 tons of plates to be used in the construction of a large penstock for power generation. The week in structural lines shows some reduction in activity as compared with the earlier weeks of the fall season, but a fairly good volume of business is coming up for bids right along. Plans are being prepared by the Strauss Bascule Bridge Company, Chicago, for a steel bascule bridge 50 ft. wide by 165 ft. in length to be built by the United States Government over the ship canal at Ferry street, Buffalo. Bids for steel and for erection will be received the latter part of December

THE IRON AND METAL MARKETS

by Lieut.-Col. J. G. Warren, Corps of Engineers, U. S. A., Buffalo. Bids are to be received November 8 for the 2500 tons of steel for the New York Telephone Company's building, Buffalo. The Buffalo Structural Steel Company was low bidder for the 200 tons of steel for the New York Telephone Company's substation at Elmwood avenue and Allen street, Buffalo, and the Lackawanna Bridge Company was low bidder for the 350 tons of fabricated steel for the new Shea theatre, Buffalo.

Old Material.—The market still lacks any semblance of activity. Inquiry is exceedingly limited and there has been only a small amount of buying in any line during the week. Heavy melting steel was the largest item in the small volume of transactions noted. The most encouraging feature of the situation is that there is a slight increase in the movement of material on old contracts. Prices are unchanged. We quote as follows, per gross ton, f.o.b. Buffalo:

Heavy melting steel	$12.50 to $13.00
Low phosphorus steel	16.00 to 16.50
No. 1 railroad wrought	14.00 to 14.50
No. 1 railroad and machinery cast scrap	13.50 to 14.00
Old steel axles	18.50 to 19.00
Old iron axles	22.00 to 22.50
Old car wheels	13.00 to 13.50
Railroad malleable	12.75 to 13.00
Boiler plate	12.50 to 13.00
Locomotive grate bars	11.00 to 11.50
Pipe	9.25 to 9.50
Wrought iron and soft steel turnings	7.15 to 7.40
Clean cast borings	7.00 to 7.25

Boston

BOSTON, MASS., October 31, 1911.

Old Material.—Conditions are unchanged in the scrap metal market, a general dullness pervading all lines. The Canadian market holds up, however. The prices quoted below are those offered by the large dealers to the producers and to the smaller dealers and collectors, per gross ton, carload lots, f.o.b. Boston and other New England points, taking Boston rates from eastern Pennsylvania points. In comparison with Philadelphia prices the differential for freight of $2.30 a ton is included. Mill prices are approximately 50 cents a ton more than dealers' prices.

Heavy melting steel	$9.50 to $10.00
Low phosphorus steel	11.45 to 11.95
Old steel axles	14.00 to 14.50
Old iron axles	17.00 to 18.00
Mixed shafting	12.75 to 13.25
No. 1 wrought and soft steel	10.50 to 10.75
Wrought iron pipe	8.75 to 9.00
Skeleton (bundled)	7.00 to 7.50
Cotton ties	7.00 to 7.50
No. 2 light	4.50 to 5.00
Wrought turnings	5.00 to 5.50
Cast borings	4.50 to 5.00
Machinery, cast	12.50 to 13.00
Malleable	9.25 to 9.75
Grate bars	6.00 to 6.50
Stove plate	8.00 to 8.50

J. Lipsitz, dealer in old material, Chelsea, Mass., has purchased a large tract adjoining his present yard for the purpose of increasing his facilities. The Boston & Albany Railroad is building an addition to the yard trackage. The yard will be equipped by January 1 with powerful shears, a hoisting engine and a drop for breaking heavy iron. Mr. Lipsitz expects to have his yard one of the best equipped of its kind in New England.

The German Iron Market

BERLIN, October 20, 1911.

This week a number of price advances for iron and steel are to be reported. The Pig Iron Syndicate has at last given out its list for the first half of 1912, and begins to take contracts today at the new prices. These are as follows, with the last previous price in parentheses for comparison: Hematite, 74.50 marks (70 marks); foundry No. I, 70.50 (66); No. III, 67.50 (64). These are the prices at Oberhausen, while the old ones were at furnace. Steel-making iron of the Siegerland district is raised to 64 marks at Siegen, against 62 to 63 marks. The Luxemburg-Lorraine qualities have been advanced variously from 1 to 2 marks. The Syndicate is selling at seaport points at 3 to 4 marks below the official list in order to meet English competition. In the Silesian district an advance of bars and plates, both of basic steel and wrought iron, by 2.50 to 5 marks has been reported this week.

An Advance in Plates Expected

It has been expected that the Steel Works Union would raise the price of half-rolled steel material in view of the higher prices for pig; but it appears that no such intention exists for the present. On the other hand, an early advance of plates by the convention controlling that specialty is looked for with practical certainty. This will be due, not to the higher prices of pig, but to the unusually active state of business in plates. It is reported that some of the big concerns with a mixed production will move an advance of the 1912 prices at the next meeting of the convention. It seems obvious that the state of business would admit of higher prices, especially in view of the fact that export prices have already risen. The net cash price of heavy basic steel plates at the mills is now 113 marks for export, equivalent to 121 marks f.o.b. Antwerp. Business in plates has increased further, and the mills are unable to keep up with their orders. Later on, however, the plate market will feel the effect of new competition, as the Gelsenkirchen Company, as well as the Stinnes concern and other companies, is building new plate mills.

The general tone of the market is optimistic. Mills are generally well employed, and it is expected that conditions will rather improve than the reverse. Political anxieties in connection with Morocco, Tripoli and China are playing no part in the general market aspect. The export demand for various steel products remains very good. Thus the wire rod association increased its exports in September to 15,200 tons, as against 11,300 tons in August. The wire mills report that their business has grown active, but prices remain unremunerative, ranging between 13.25 and 13.50 marks per metric cwt. in the home market.

Steel Works Union Renewal

The Steel Works Union reports that its business this month has kept about up to the volume of September. Some surprise has been expressed that the Union did not take initial steps at its last monthly meeting toward its prolongation; and now the call for the next monthly meeting, which will be held on Monday, contains no reference to action in that matter. It is reported from the trade, however, that a more optimistic feeling regarding the renewal now prevails

Tin Plate Mills to Be Built

A revival of interest in tin plate manufacture in Germany has been observed recently. It is a remarkable fact that, although the country has the most efficient iron trade among all European countries, the manufacture of tin plates has been much neglected, despite the fact that there is an adequate protective duty. By far the greater part of Germany's consumption is imported from England. This, however, will probably be changed in time. In the Rhenish-Westphalian district the Van der Zypen-Wissen Works are erecting a tin plate mill with a capacity of 20,000 tons; and this week it is reported from the Silesian district that the Eisenhütte Silesia has also decided to erect a mill.

The big Luxemburg fusion of the Burbach, Esch and Düdelingen concerns, which is just now being completed, will lead to extensive expansion in producing capacity. The concern has bought ground at Esch in Luxemburg for the enlargement of its plant there. One furnace will be rebuilt to a capacity of 200 tons a day, and two new furnaces of like capacity will be erected, while two further ones are projected, to be built later on. It is proposed to raise the pig iron capacity of the Esch establishment to 1000 tons a day. This has hitherto been only a furnace plant, but now a basic steel plant will be added, having a capacity of 1500 tons a day, with a blooming mill of the same capacity. A bar mill will also be erected, but of less capacity. It is expected that all these new mills will go into operation in about two years.

It is reported on good authority today that negotiations have been nearly completed for a fusion of the Mannstaedt Façoneisenwalzwork, one of the best-known manufacturers of shaped bars in Germany, with the Aumetz-Friede Company of Lorraine. The manager of the latter has already been elected to the Mannstaedt board.

THE IRON AND METAL MARKETS

Iron and Steel Exports

Germany's exports of iron and steel during the past nine months have been as follows in metric tons:

	1911	1910
Pig iron	567,287	564,761
Waste and scrap	130,000	114,191
Steel material	471,233	351,232
Beams and structural forms	294,702	303,695
Bands and hoops	88,708	85,835
Bars, simple and shaped	481,969	463,163
Steel rails	380,307	348,343
Track supplies	98,576	128,508
Heavy plates	217,188	188,081
Medium and thinner plates	77,516	66,765
Wire rods	105,018	88,983
Wire	286,746	300,977
Wire nails	43,789	51,673

The news from the Belgian market this week indicates that the strong tendency of prices continues. A yesterday's dispatch from Brussels states that the export price of basic steel products has been raised 1 shilling—heavy plates to 120 to 121 shillings; plates of 3/32-in. thickness, to 129 to 131 shillings, while plates of 1/16-in. thickness rose 2 shillings to 130 to 132 shillings. The home price of beams was raised 2.50 francs.

New York

NEW YORK, November 1, 1911

Pig Iron.—New business has dropped off sharply. It appears that a good many foundries, whether or not they intended to buy for the early months of 1912, will have iron in their yards at the end of the year that will carry them for from one to three months in the new year. Much of the iron of such buyers was contracted for in the strong buying of June and July. There has been no like scale of buying since midsummer and there is no immediate prospect of it. The last real buying movement ended with furnaces taking a stand for higher prices for 1912 delivery. In the past four months, while there has been a certain amount of selling at higher prices than the basis of $13 to $13.25, Buffalo, for example, on which large business was done in the summer, the net outcome has been to bring the market back to that basis. In the past week business in the New York district and in New Jersey has been chiefly in 100-ton and 200-ton lots. One sale of 1000 tons is reported at Newark. The New England buyer whose inquiry brought representatives of seven firms in haste to his office has decided not to contract at this time. Purchases in the New England district, all told, have, probably, not been more than 1500 to 2000 tons in the past week. A good many melters are still urging the furnace companies to expedite shipments. Quotations are as follows for Northern iron at tidewater: No. 1 foundry, $15.25 to $15.50; No. 2X, $14.75 to $15.25; No. 2 plain, $14.50 to $14.75. For Southern iron we quote $15 to $15.25 for No. 1 foundry and $14.50 to $14.75 for No. 2 foundry.

Finished Iron and Steel.—Last week's description of the market conditions could well be reprinted to explain the situation at this writing. Few decisions have been made regarding structural work projected and practically nothing new has been offered for figuring. About the only encouragement recently offered is a 2000-ton bridge at Williamsport, Pa., for the Pennsylvania Railroad. One reason advanced for the present period of marked quiet is that the American people as a whole want an industrial rest; that it is not due to the political situation solely, or to overbuilding or to hesitancy on the part of financial interests. Fabricated prices continue low, as do prices of plain material, but the prevailing range is above the bottom prices ruling elsewhere. Business in bar iron has dropped off still more than last week, but refined iron is generally held between 1.25c. and 1.30c., delivered in New York. One maker has been out of the market for some time except for finished iron products, and reports a satisfactory volume of business in bolts, railroad spikes and the like, 75 per cent. of which have gone to the railroads. The volume of business in plates has also been materially reduced. Eastern mills which have been running for some time on small-lot orders, are considering operating on part time, if indeed some are not already doing so. In addition to the structural awards given last week may be mentioned the following recent contracts: Building for the New York Shipbuilding Company, 1600 tons, to the McClintic-Marshall Construction Company; bridge for the Buffalo, Rochester & Pittsburgh Railroad, at Bradford, Pa., 350 tons, to the Lackawanna Bridge Company; addition to the plant of the Sprague Electric Company, 300 tons, to Levering & Garrigues Company; small bridge for the Seaboard Air Line, 200 tons, to the Virginia Bridge & Iron Company; bridge for the Buffalo, Rochester & Pittsburgh Railroad, 700 tons, to the American Bridge Company; Metropolitan storage warehouse, Boston, 400 tons, to the Boston Bridge Company; Orpheum Theater, Philadelphia, 250 tons, to the Philadelphia Steel & Wire Company. Quotations are: Plain structural material and plates, 1.36c. to 1.46c.; steel bars, 1.26c. to 1.31c.; bar iron, 1.20c. to 1.30c., all New York. Plain material and plates from store, New York, 1.65c. to 1.75c.

Cast Iron Pipe.—F. V. Smith & Son were awarded the contract on Tuesday for furnishing and laying 6800 tons of 48-in. pipe in South Brooklyn by the New York Board of Water Supply. As the previous purchase of pipe for the same system of water supply is understood to have been made at a shade under $20 per net ton delivered, this new lot will probably be bought at a low figure. No public lettings of importance are announced for this vicinity, but a good demand is experienced for small lots for prompt shipment. Carload lots of 6 in. continue to be quoted at $21 to $22 per net ton, tidewater.

Old Material.—Conditions show no change for the better. Such buying as now occurs is merely from hand to mouth, no large lots being reported. Steel works are well supplied with stock or are covered by contracts for a considerable period, and the rolling mills are not in the market to any extent. Foundries are taking cast scrap at ruling prices, but seldom in quantities over 50 tons. Rejections appear to be as numerous as at any time, and dealers having contracts to fill appear to be in a worse plight than those having no orders. Purchases are made by the former for the purpose of filling their contracts, but when rejections are made they are either compelled to grant concessions which leave them without profit or obliged to store the material in their yards and thus lock up their capital. Dealers' prices, per gross ton, New York and vicinity, are quoted as follows:

Old girder and T rails for melting	$9.25 to	$9.50
Heavy melting steel scrap	9.25 to	9.50
Relaying rails	20.00 to	21.00
Rerolling rails (nominal)	11.25 to	11.75
Old iron car axles	19.00 to	19.50
Old steel car axles	15.00 to	15.50
No. 1 railroad wrought	11.00 to	11.50
Wrought iron track scrap	10.50 to	11.00
No. 1 yard wrought, long	10.25 to	10.75
No. 1 yard wrought, short	9.25 to	9.75
Light iron	3.75 to	4.25
Cast borings, clean	5.50 to	6.00
Mixed borings and turnings	4.75 to	5.25
Wrought turnings	5.75 to	6.25
Wrought pipe	8.50 to	9.00
Old car wheels (nominal)	9.50 to	10.00
No. 1 heavy cast, broken up	10.00 to	10.50
Stove plate	7.75 to	8.25
Locomotive grate bars	7.75 to	8.25
Malleable cast	9.75 to	10.25

Ferroalloys.—Ferromanganese is firm at $38, Baltimore, and some sellers are asking more. Large consumers have apparently covered their needs for the present year and there are inquiries out for delivery over the first quarter of next year. The usually quoted price is $38.50. Ferrosilicon is quiet at around $60.50, delivered Pittsburgh, for early shipment.

Cincinnati

CINCINNATI, OHIO, November 1, 1911. (By Telegraph.)

Pig Iron.—Buyers are generally hesitating about placing orders for more than an immediate supply, and while there are rumors that considerable business is being booked under cover, when traced down the fact is revealed that even the larger consumers are only providing for nearby requirements. The cancellation of the Steel Corporation's ore leases, together with other recent developments that are locally considered as being of a semi-political nature, has exerted a halting tendency on both the larger and smaller consumer. There are rumors from other sections, but from buyers sources, that $10, Birmingham, has been slightly bettered on some prompt shipment No. 2 foundry. So far as this market is concerned, $10 is minimum, although, as previously reported, deliveries have been extended and ten-dollar iron is offered for shipment throughout the first half. Northern iron is moving slowly and, following the lead of Southern producers, Northern furnaces would book first half business at the present prompt shipment quotation of $13, Ironton. Recent sales include one for 500 tons of Southern analysis iron to an Illinois melter, based on $10 for No. 2 foundry.

THE IRON AND METAL MARKETS

November-December shipments. For the same delivery a central Ohio firm paid $9 25, Birmingham, for 100 tons of No. 4 foundry, indicating that the lower grades are scarcer. Among general inquiries before the trade is one for 900 tons for a northern Ohio manufacturer. Michigan territory also furnished several requests for quotations on medium-sized lots. Malleable is quoted at $13 for either prompt or first quarter shipment. Based on freight rates of $3.25 from Birmingham and $1.20 from Ironton we quote, f.o.b. Cincinnati, as follows, for prompt shipment:

Southern coke, No. 1 foundry and 1 soft	$14.00 to $14.25
Southern coke, No. 2 foundry and 2 soft	13.25 to 13.75
Southern coke, No. 3 foundry	12.75 to 13.25
Southern coke, No. 4 foundry	12.50 to 13.00
Southern gray forge	12.50 to 13.00
Ohio silvery, 8 per cent. silicon	16.95 to 17.20
Lake Superior coke, No. 1	14.70 to 14.95
Lake Superior coke, No. 2	14.20 to 14.45
Lake Superior coke, No. 3	13.70 to 13.95
Basic, Northern	14.20 to 14.45
Standard Southern car wheel	25.50 to 25.75
Lake Superior car wheel	19.00

(By Mail.)

Coke.—New business in both furnace and foundry grades continues scarce, although shipments on contracts are said to be moving along in a satisfactory manner. The automatic curtailment in production to meet current requirements enables producers to maintain prices, and when any reduction in the regular market figures is reported it is generally on a carload or two that was already loaded and had to be moved. We continue our quotations of $1.50 per net ton at oven on Connellsville furnace coke for prompt shipment, and around $1.60 to $1.65 for Wise County and Pocahontas brands. Furnace coke is stationary in all three fields at from $1.90 to $2 for immediate shipment. Future contract business on both 48-hr. and 72-hr. coke would be taken on at an advance of about 10c. to 25c. per net ton.

Finished Material.—Buying is mainly confined to small lots, and competition in every line is keen. Steel bars appear to be in a little better demand, and while 1.15c., Pittsburgh, is the regular quoted figure on limited quantities, desirable tonnages could be placed at 1.10c. This same condition applies to bands. Hoops are now quoted at 1.30c., and so far as this territory is concerned it is not known that this price has been shaded. The local warehouse price on structural material is 1.70c.

Old Material.—Business is almost at a standstill. The rolling mills and foundries are purchasing on a hand-to-mouth basis, and as prices are very weak it is an extremely hard matter for dealers to get any large contracts signed up. As a consequence the dealers are indifferent about taking on any additional stocks, and practically every kind of scrap material is in poor demand. The minimum figures given below represent about what the buyers are willing to pay for delivery at their yards in southern Ohio and Cincinnati, and the maximum figures the average selling prices f.o.b. at yards:

No. 1 railroad wrought, net ton	$9.50 to $10.25
Casting borings, net ton	4.50 to 5.00
Steel turnings, net ton	5.50 to 6.00
No. 1 cast scrap, net ton	9 00 to 9.75
Burnt scrap, net ton	6.25 to 6.75
Old iron axles, net ton	16.25 to 16.75
Bundled sheet scrap, gross ton	5.75 to 6.50
Old iron rails, gross ton	13.00 to 13.75
Relaying rails, 50 lb. and up, gross ton	20.75 to 21.50
Old car wheels, gross ton	9.50 to 10.25
Heavy melting steel scrap	9.25 to 10.00

Metal Market

NEW YORK, N. Y., November 1, 1911.

The Week's Prices

Cents Per Pound for Early Delivery.

	Copper, New York.			Lead		Spelter	
		Electro-	Tin,	New	St.	New	St.
Oct.	Lake.	lytic.	New York.	York.	Louis.	York.	Louis.
26	12.62½	12.50	41.80	4.25	4.15	6.35	6.20
27	12.60	12.45	41.00	4.25	4.15	6.35	6.20
28	12.55	12.40	....	4.25	4.15	6.35	6.20
30	12 50	12.37½	41.50	4.25	4 15	6.35	6.20
31	12.50	12.37½	41.62½	4.25	4.15	6.35	6.20
Nov.							
1	12 50	12.37½	41.62½	4.25	4.15	6 35	6.20

Copper has weakened although it is somewhat scarce for early delivery. Tin is a little higher but steady. Spelter continues high and scarce. Lead is firmer.

Copper.—Copper is about ⅛c. lower than it was a week ago for both Lake and electrolytic. The metal is somewhat scarce for early delivery but the demand has lessened noticeably and the buying now is only desultory. It is believed that most of the large consumers have filled their wants until the end of the year and most of the inquiries coming forward are for delivery in January. Electrolytic is now 12.37½c. and Lake, 12.50c. The London market is steady and spot was selling this morning at £55 10s. and futures at £56 3s. 9d. The exports of copper in October were lighter than any month since February, amounting to only 21,904 tons.

Copper Averages.—The Waterbury average for October was 12.50c. The average price of Lake copper in New York for the month was 12.53c. and the average price of electrolytic was 12.31c.

Pig Tin.—The new rule of the London Exchange allowing for deliveries of any grade of pig tin under a three months' contract went into effect to-day, and the market has steadied noticeably. The effect of this rule will be that speculators in pig tin, instead of being able to control the market by having only 50 per cent. of the world's supply, will have to obtain control of all the available tin to effect a corner. Under ordinary circumstances the statistics for October tin, made public this morning, would tend to advance the market as they show a falling off in the visible supplies. This has been discounted, however, by a reduction in the price of futures in the London market in anticipation of the new standard tin rule. In the London market this morning spot tin was sold for £190 and futures for £187, whereas a week ago both spot and futures were selling at £191 12s. 6d. The domestic market is quiet and the metal is in fair local supply. Stocks for immediate delivery, however, are fairly well concentrated. The October statistics, compiled by C. Mayer, secretary of the New York Metal Exchange, show that deliveries into consumption during October were good, amounting to 3500 tons, and the total deliveries for ten months were 450 tons under the total deliveries for the first 10 months of last year. The total visible supply October 31 was 4022 tons below that of October 31, 1910. The arrivals in this country during the month were 3194 tons.

Tin Plates.—The price of tin plates at Swansea, Wales, has been reduced 2½d. and it is now 13s. 3d. The domestic demand is not heavy, but exports are large. The usual quotation for 100-lb. coke plates is $3.64.

Lead.—Lead is not in heavy demand and in the West independent sellers are contesting the market with the leading interest and as a rule are making sales at 2½ points under the price quoted by the American Smelting & Refining Company. In New York the price is 4.25c. and in St. Louis 4.15c. The market here is firm.

Spelter.—Spelter is decidedly scarce and the market is uncertain. There are rumors of manipulations on the part of some of the leading producers and sellers, but the fact remains that spot supplies are hard to get. Spelter could be bought all the week in St. Louis at 6.20c. and in New York at 6.35c., but that has generally been the bottom price. In some cases consumers who were short of stocks have been obliged to pay more.

Antimony.—Excepting a small demand from the jobbers, antimony is dull. Hallett's is not very plentiful, but it can be had at 7.70c. Cookson's is offered at 8c. and perhaps a little less. Chinese and Hungarian grades are offered at from 6.75c. up.

Aluminum.—One ton of aluminum in ingots, guaranteed over 99 per cent. pure, was recently purchased in New York for 19.80c. a pound. As this order was offered generally to sellers for a number of weeks before a concession under 20c. could be obtained, it is believed the price is rock bottom on the basis of early payment after delivery.

Old Metals.—Trade is dull, without any change in dealers' selling prices, which are nominally as follows:

	Cents per lb.
Copper, heavy and crucible	11.75 to 12.00
Copper, heavy and wire	11.37½ to 11.50
Copper, light and bottoms	10.50 to 10.75
Brass, heavy	8.00 to 8.25
Brass, light	6.50 to 6.75
Heavy machine composition	10.25 to 10.50
Clean brass turnings	7.75 to 8.00
Composition turnings	8.50 to 9.00
Lead, heavy	4.15
Lead, tea	3.90
Zinc, scrap	4.50

Chicago

OCTOBER 30.—The past week has shown little departure from the commonplace and most prices have remained unchanged, although in some directions it is

THE IRON AND METAL MARKETS

felt that current quotations are being artificially maintained. Tin in this market is slightly lower. We quote at Chicago: Casting copper, 12.37½c. to 12.50c.; Lake, 12.62½c. to 12.75c., in carloads, for prompt shipment; small lots, ¼c. to ⅜c. higher; pig tin, carloads, 42c.; small lots, 45c.; lead, desilverized, 4.25c. to 4.30c., for 50-ton lots; corroding, 4.50c. to 4.55c. for 50-ton lots; in carloads, 2½c. per 100 lb. higher; spelter, 6.25c. to 6.30c.; Cookson's antimony, 9.25c., and other grades, 8.25c. to 8.75c., in small lots; sheet zinc is $8, f.o.b. La Salle, in carloads of 600-lb. casks. On old metals we quote for less than carload lots: Copper wire, crucible shapes, 10.75c.; copper bottoms, 9.62½c.; copper clips, 10.25c.; red brass, 9.75c.; yellow brass, 7.75c.; lead pipe, 4c.; zinc, 4.25c.; pewter, No. 1, 26c.; tinfoil, 32c.; block tin pipe, 36c.

St. Louis

OCTOBER 30.—The metal market here shows a fair demand, but nothing of extraordinary character. Tin is quotable at 41.45c. The figures on copper are 12.85c. for Lake and 12.75c. for electrolytic. Cookson's antimony is 8.35c. In lead the market shows a slight improvement, the quotation being 4⅛c. Spelter is strong at 6.20c. In the Joplin market the past week the highest price for the year was paid for zinc blende, the contract offerings being in excess of $51 for the choicest lots. The basis price for grades carrying 60 per cent. metallic zinc was fixed at $46.99. The bulk of the ore was sold, however, in the open market, where the basis ranged down from $45 to even $40 and the choice lots brought $48. Calamine brought $24 and $25 per ton on an assay basis of 40 per cent. metallic zinc, the choice lots commanding $32. Lead was stronger at $56 to $57 per ton in the ore. We quote miscellaneous scrap as follows: Light brass, 4c.; heavy brass and light copper, 8c.; heavy copper and copper wire, 9c.; zinc, 3c.; lead, 3.25c.; pewter, 20c.; tinfoil, 29c.; tea lead, 3c.

Iron and Industrial Stocks

NEW YORK, N. Y., November 1, 1911.

The stock market was seriously disturbed in the past week by the news that the United States Government had at last brought action against the United States Steel Corporation under the Sherman anti-trust act, which became known after the close of the Stock Exchange on Thursday, October 26. United States Steel common, which had sold at 60 on Thursday, declined to 50 on Friday, with the total of sales for the day amounting to 702,200 shares. The preferred stock, which had sold at 109⅜ on Wednesday, declined to 103 on Friday. Both classes of stock recovered to some extent from their depression, the preferred selling up to 105¼ on Saturday and the common up to 54¼ on Monday. Other stocks naturally sympathized with the decline in United States Steel stocks. The range of prices from Wednesday of last week to Tuesday of this week on active iron and industrial stocks was as follows:

Allis-Chalm., com...	2½- 3	Nat. En. & St., com.	13¼- 14½
Allis-Chalm., pref...	10 - 10⅝	Pressed Steel, com...	28 - 30½
Beth. Steel, com....	27¼- 28¼	Pressed Steel, pref.	95¼- 95½
Beth. Steel, pref....	55 - 56	Railway Spring, com.	25 - 27
Can, com.....	9⅜- 10½	Railway Spring, pref.	97¼- 99
Can, pref.....	83 - 86½	Republic, com.....	18 - 22
Car & Fdry., com...	46 - 48½	Republic, pref.....	74⅜- 83⅜
Car & Fdry, pref...	113 -114	Sloss, com.....	38 - 40
Steel Foundries....	27½- 29	U. S. Steel, com...	50 - 60
Colorado Fuel.....	25⅝- 27½	U. S. Steel, pref...	103 -109¾
General Electric....	146¼-150¾	Westg. Elec.....	60¾- 64
Gr. N. Ore Cert....	41 - 42⅛	Chic. Pneu. Tool...	44½- 45
Int. Harv., com....	102 -108	Cambria Steel.....	43¾- 44⅜
Int. Harv., pref....	117 -121	Lake Sup. Corp....	27¼- 28⅝
Int. Pump, com....	23 - 27¼	Crucible Steel, com.	9⅜- 10⅜
Lackawanna Steel.....	30	Crucible Steel, pref.	73½- 76¾
Locomotive, com....	32½- 33¾	Harb. Wk. Ref., com....	45
Locomotive, pref....	102 -103		

Dividends Declared

The Pressed Steel Car Company, regular quarterly, 1¾ per cent. on the preferred stock, payable November 22.

The International Harvester Company, regular quarterly, 1¾ per cent. on the preferred stock, payable December 1.

The Peck, Stow & Wilcox Company, quarterly, 1¾ per cent., comparing with 2½ per cent. quarterly for some time past with usual extras on August 15 yearly of from 2 to 6 per cent. The stock was recently increased from $1,250,000 to $1,500,000.

The United States Steel Corporation, regular quarterly, 1¾ per cent. on the preferred stock, payable November 29, and regular quarterly, 1¼ per cent. on the common stock, payable December 30.

New Tools and Appliances

This is essentially a news department for which information is invited.

Turning Lathes.—The Whitcomb-Blaisdell Machine Tool Company, Worcester, Mass., has recently brought out a 14-in. x 6-ft. plain turning lathe. Three spindle speeds are available, the variation being secured by sliding gears from the driving pulley. The same number of feed changes are provided, and these are secured by three-step pulleys, a belt and a splined rod. One of the special features of the lathe is a brake for the headstock spindle. This is brought into engagement when the shifter rod throws the driving belt on the loose pulley and acts on the rim of the faceplate. The equipment of the lathe includes an oil reservoir underneath the pan base and an oil pump mounted on the pan.

A Vertical Surface Grinder.—An automatic surface grinder capable of handling work having a maximum width of 1 ft. and a length of 3 ft. has been placed on the market by the Hemming Brothers Company, New Haven, Conn. The body of the machine is cast in one piece with the brackets which carry the spindle. This part is driven at a constant speed and is provided with ball thrust bearings and an automatic take-up which prevents vibration of the wheel when running. The spindle drive is by a 4-in. belt to a 12-in. pulley mounted on an upper horizontal shaft, at the opposite end of which is a rawhide pinion meshing with a large bevel gear on the upper end of the spindle. Eight graduations of power feed, ranging from 2 to 10 ft. per minute, are provided for the table, and changes from one to the other can be made while the machine is in motion by simply shifting a lever. Hand feed is also provided for the table, which can be adjusted vertically either by hand or automatically. The automatic feeds range from 0.00025 to 0.010 in. per traverse of the platen and an automatic stop enables easy duplication. The platen is entirely surrounded by a pan which catches the cooling water that is fed to the work through the hollow grinding spindle and conducted back to the circulating pump. Guards are provided for the wheel and all gears and the working parts located on the outside of the machine so as to be readily accessible.

Ball and Roller Bearings.—The Norma Company of America, 20 Vesey street, New York, N. Y., is manufacturing an annular ball bearing which differs from the usual construction by having the outer race open on one side. In this way it is possible to take the bearing apart easily and the parts can be mounted independently of each other. Bronze is used for the ball cage, which has an elastic grip on the balls at their axes of rotation. All of the ordinary sizes are made for light, medium and heavy service. In addition the company is also manufacturing roller bearings for medium and heavy duty. These are also of the open type and can be readily taken apart and the parts mounted separately. The rollers are held in a cage to prevent binding. To take care of any slight error in mounting, the inner race is cylindrical, while the outer one is slightly convex. These bearings are made in the same sizes as the ball bearings and are said to be capable of carrying more than twice the radial load that the same size of ball bearing will sustain.

Grinding Compound.—The fact that a grinding wheel is nothing more or less than a series of microscopic cutting points requiring lubrication to make the grinding process more effective has been taken into consideration by the White & Bagley Company, Worcester, Mass., who has developed a compound for use in all kinds of grinding.

The annual meeting of the National Gas and Gasoline Engine Trades Association will be held at the Hotel Hollenden, Cleveland, Ohio, December 5 to 8 inclusive. The 6th has been set aside as Engine Manufacturers' Day, in accordance with a request made at the last convention by the Engine Manufacturers' Section that time be allowed at coming conventions for its own special meeting. The mornings of other days will be devoted to exhibitors and the afternoons to a programme which is now being arranged.

Patents and the Public Welfare

BY F. W. BRADY

With no intention of quoting or analyzing recent court proceedings and decisions in cases which have involved industrial contentions in which patents have materially figured, it is well to note the ominous cloud on the horizon which threatens every enterprise which controls, owns or operates under letters patent of the United States. In the endeavor to interpret and enforce our national statutes, every resource has been employed to disintegrate the centralized forces which have been alleged to work harm to the nation. In this regard there are no comments to offer. However, the injection into these proceedings of a possible qualification of the rights granted with a patent merits the deep consideration of every person who has the interest and progress of our nation at heart.

From a vague and small beginning which made reference to certain alleged questionable procedure by which associated concerns might, by intent, use their patents collectively, for the ostensible purpose of saving the expense of continued litigation, but, by inference the purpose might be construed to be the crushing of competition, the attention given to the quantity and manner of patent ownership and control has been more and more marked until it appears to assume the form of a direct menace to our industrial development.

Our patent laws and the authorized procedure thereunder have always, without qualification, provided a monopoly as far reaching as human language may prescribe. The official patent document, executed by the Commissioner of Patents, to quote its language, grants "unto the said John Smith, his heirs and assigns, for the term of seventeen years from ———, the exclusive right to make, use and vend the said invention throughout the United States and Territories thereof." Years ago this grant was authorized, and, with the restriction placed around the objects which are legally patentable, there has never been a doubt that the inventor, his heirs or assigns could barter and dispose of the rights as became fitting on the occasion.

From the viewpoints of patentee and patent owner or licensee, we have been assured that one form of monopoly has thus been provided and legalized by the issuance of a patent by the United States Government. This has been the sole inducement offered in return for the conception, mental effort, periods of experiment and development, and the expense connected therewith. By what theory of political economy should persons devote their energies to the public welfare, even though their personal profit may be a motive, in part, if, after a measure of success, they are to be questioned as to the disposal of well-deserved rights and their guaranteed privileges, one of the latter being the right to assign their grants as they see fit?

A patent procured and issued under our flimsy system has no defined standing or power until the highest tribunal has passed a final opinion upon its validity. In such event, for the attention and disbursements in behalf of the prosecution or defense of our rights, something tangible and of worth is in our possession, but without any questions or allusions as to the scope of the powers granted with the patent, as to its use or sale.

In view of past decisions and practices, it is difficult to reconcile the known powers given with the issuance of a patent with the mere mention of the word "patent" as a part of any alleged illegal procedure of the owners thereof during the now current trust-dissolving attacks. The line of demarcation between inventor's rights and the public's privileges to the brain and efforts of the former is being slowly shifted toward the narrower zone of the patentee, against all precedent and in contradiction to his vested rights.

Any individual, firm or corporation manufacturing any sort of patentable merchandise is bound, for future salvation, to procure or acquire numerous patents; not for immediate use, but to insure the possibility of meeting changed conditions or developments of the future. This is but foresight, with the knowledge that IF an invention shall become of use it is the owner's property without question. It comes to pass that, out of one hundred patents owned or under license, one may be worth more than the cost of its procurance. The balance is deadwood, pure and simple, and represents cash outlay for no return. The one case of value may be far reaching in its scope and be the means, in whole or in part, of producing wares which no others can meet in the open market after striving to "get around" the patent, or through the substitution of another system. The unfortunates may find their businesses threatened; their existence as an enterprise in danger of annihilation. As the sale of goods or wares is a matter of buyers' choice, no law seems applicable to compel a division of patent rights that all may participate in the benefits arising therefrom.

Are we approaching a state of compulsory license whereby our inventions shall become public property for fear of the prosperity which may come of one's efforts to better or cheapen his product? Or has the trust and monopoly antagonism become so acute that, after all other means have been exhausted, the privileges given to an inventor, "his heirs and assigns," are to be confiscated or qualified? The shadow of this deplorable state is already before us, and deserves the attention of the entire industrial world, not only on the western hemisphere but abroad, where our destiny as producers and developers is of marked concern.

The Sherman Act and the Labor Trust.—At a meeting of the Board of Directors of the National Association of Manufacturers in New York City last week a resolution was passed asserting that "the National Association of Manufacturers unqualifiedly stands for the equal enforcement of law," and demanding "the enforcement of the Sherman anti-trust law upon the restraint of trade practiced by labor unionism, which already stands convicted before the Supreme Court of the United States, with the same vigor as corporations and individuals are now being prosecuted under that law."

The Northern Equipment Company, Chicago, announces that it has completed a sales arrangement for the Copes boiler feed regulators and pump governors with the Dravo-Doyle Company, Pittsburgh, Pa., which has recently established a steam specialty department. D. D. Pendleton, who has for the past five years represented the Northern Equipment Company in the Pittsburgh district, has completed arrangements with the Dravo-Doyle Company so that it will have all rights in that district, thus giving the latter company complete jurisdiction over the Pittsburgh, Cleveland, Philadelphia, Chicago and West Virginia territories.

The annual meeting of the American Society of Naval Architects and Marine Engineers will be held November 16 and 17, at 29 West Thirty-ninth street, New York City. The annual dinner will be held at the Waldorf-Astoria, November 17, on which occasion the John Fritz medal for 1911 will be presented to Sir William H. White, the famous British naval constructor, in recognition of his many achievements.

A conspicuous feature in the modern group of factory buildings now under way for the Hupp Motor Car Company, at Griffin street and the Michigan Central Belt Line, Detroit, Mich., is the large expense of Fenestra steel windows. These will be glazed with ribbed glass to give diffused daylight through all the working floors, without shadows, and no glare, doing away with any need for shades or awnings, even on the south and west.

Pittsburgh this week is celebrating the centennial of the opening of steam navigation on the Ohio River, the first ceremonies taking place on Monday and lasting for several days. One hundred years ago a small steamboat, the New Orleans, built by Nicholas Roosevelt, started down the Ohio, marking the opening of river navigation from Pittsburgh to Southern cities.

The Bossert Company, Utica, N. Y., has been steadily increasing its manufacturing facilities for nearly two years. It now has probably one of the most complete plants in the country for the large and economical production of sheet metal stampings, particularly heavy and difficult drawing and forming work from steel, copper, brass, aluminum and other ductile metals.

Personal

Franklin Alter, president of the American Tool Works Company, Cincinnati, Ohio, celebrated his 80th birthday October 28. He entertained a number of friends at dinner in his home at Avondale. In spite of his advanced age Mr. Alter is more active than many men 20 years younger.

David Van Alstyne, vice-president of the Allis-Chalmers Company, Milwaukee, Wis., in charge of the manufacturing department, has resigned, effective November 15. C. E. Search, formerly Mr. Van Alstyne's assistant, has been appointed works manager. Mr. Van Alstyne went to the Allis-Chalmers Company from the vice-presidency of the American Locomotive Company. He will engage in business in New York.

At the meeting for organization, following the recent annual meeting of the Republic Iron & Steel Company, the following were elected to the Executive Committee: James Campbell, John Lambert, John F. Harris, Grant B. Schley and John A. Topping. The officers of the company have been re-elected.

Charles S. Gingrich, of the Cincinnati Milling Machine Company, Cincinnati, addressed the Cleveland Engineering Society, Cleveland, Ohio, on the evening of October 24 on "Modern Machine Shop Milling Processes," illustrating continuous milling by the rotary process, continuous milling by the reciprocating process and gang milling.

Julian Kennedy, the well-known consulting engineer, Bessemer Building, Pittsburgh, who was quite ill at his summer home in Canada for some months, has so far recovered as to be able to attend to business again.

T. Frame Thomson, London, England, chairman of the Otis Steel Company, Ltd., is now in this country and will spend some time at Cleveland.

O. P. Stehn resigned as manager of the Cleveland office of Manning, Maxwell & Moore, November 1, to accept a position with the Hydraulic Pressed Steel Company, Cleveland.

H. N. Anderson, chief engineer of the Speedwell Motor Car Company, Dayton, Ohio, has tendered his resignation, to take effect December 1, intending to give his entire time to his new process of rolling the teeth in steel gear blanks while hot. A description of this process was published in *The Iron Age* of November 3, 1910.

Obituary

EDWARD WILLARD PECK, secretary-treasurer of the Co-operative Foundry Company, Rochester, N. Y., died October 20, of pneumonia, aged 66 years. A native of Rochester, Mr. Peck received his early education in the private schools of Rochester and New Haven. He had been associated with the Co-operative Foundry Company since its formation 44 years ago and held the office of secretary-treasurer for a number of years. He was an active member in the National Association of Stove Manufacturers and in the Stove Founders' National Defense Association. At the time of his death he was president of the Standard Sewer Pipe Company, president of the New York State Sewer Pipe Company, vice-president and a member of the executive committee of the Stromberg-Carlson Telephone Mfg. Company, a trustee of the Monroe County Savings Bank, a director of the Lincoln National Bank and a director of the Rochester Telephone Company.

WILLIAM H. KERR, superintendent of the Tonawanda Iron & Steel Company's furnaces, North Tonawanda, N. Y., since 1890, died at his home October 27 after a long illness, aged 63 years. He was born in Butler, Pa. Before entering the service of the Tonawanda Iron & Steel Company, he was employed by the Carnegie Steel Company at Pittsburgh.

The regular monthly meeting of the Pittsburgh Foundrymen's Association will be held in Engineers' Hall, Oliver Building, Pittsburgh, on the evening of November 6. It will be addressed by Prof. John J. Porter of the University of Cincinnati on "The Quality of Pig Iron, Its Independence of Chemical Composition and Its Relation to Methods of Manufacture."

British Wage Earners

Earnings and Hours of Work in the Iron and Steel Industry

Since 1906 the British Board of Trade has been preparing for publication the results of an inquiry into the wages and hours of labor prevailing in the principal industries in the United Kingdom, including agriculture. The results of this investigation, as far as iron and steel manufacturing, shipbuilding and the metal trades are concerned, have been recently made public. In 1906 there were approximately 1,500,000 persons employed in these and allied industries in Great Britain and the returns secured by the Board of Trade covered 744,557. The average weekly wage secured by these workers according to age groups was as follows:

Class of employees.	Number.	Average weekly wage.
Men	577,861	$7.84
Boys (under 18)	136,653	2.57
Women	20,922	2.96
Girls (under 18)	9,121	1.74

The average weekly earnings, the number of hours worked each week, and the average number of days' holiday granted per annum are shown in the following table for all employees in the principal branches of industry investigated:

Industry.	Number of employes.	Weekly earnings.	Hours per week.	Holidays per year.
Engineering and boilermaking	368,552	$6.29	53.1	13.4
Iron and steel	53,981	8.75	54.4	12.4
Light iron castings, etc	12,333	5.97	53.8	11.5
Pig iron	13,995	8.10	55.2	7.3
Railroad car building	45,829	6.62	53.6	7.3
Shipbuilding	109,285	7.43	52.9	10.8
Tin plate	10,921	7.79	47.8	10.8

The average weekly wages of men workers for the different departments and occupations of the principal branches of iron and steel manufacturing is shown, as far as figures are available, in the statement below:

Industry.	Weekly earnings.
Iron puddling	$9.27
Steel making:	
Bessemer process	9.03
Open hearth	16.01
Crucible	6.64
Cogging and rolling	13.30
Forging	11.00
Tin plate manufacturing:	
Foremen	12.92
Furnacemen	10.83
Rollers	14.31
Shearers	14.39
Annealers	10.12
Tinmen	9.72
Assorters	11.91
Picklers	10.77
Engineering and boilermaking:	
Patternmakers	9.11
Joiners	8.40
Molders (iron and steel)	9.15
Smiths	10.45
Turners	9.74
Fitters, erecters and millwrights	9.64
Planers, borers, etc	7.75
Platers (boiler shops)	12.06
Riveters and calkers	10.55

In all of the different branches of the industry concerned with the manufacture of iron and steel products there has been a large increase in average weekly earnings of employees in the past 20 years. In the manufacture of pig iron it has amounted to 30.5 per cent.; in tin plate mills to 25.7 per cent.; in engineering and boilermaking to 25.9 per cent., and in car building and repairing to 22.2 per cent. The increase in weekly earnings of employees in all industrial establishments related to the manufacture of iron and steel was 25.7 per cent.

A computation was also made of the annual earnings of employees by dividing the aggregate annual wages bill in a number of representative establishments by the average number of workmen employed. According to this method, the annual earnings of employees of establishments producing pig iron, reduced to United States money, was $384; of iron and steel mills $399; of tin plate mills $360; of engineering and boilermaking plants $336; of shipbuilding establishments $338; of car building and repairing plants $321, and of plants making light iron castings, etc. $287.

The Treadwell Engineering Company, Easton, Pa., has absorbed the Lebanon Steel Casting Company, Lebanon, Pa.

A Suit to Dissolve the Steel Corporation

The Government Brings Action Under the Sherman Act—Features of a Remarkable Petition—Steel Corporation Directors Act on the Hill Ore Lease and on Ore Freights

Events have culminated rapidly in the past week in the matters relating to the United States Steel Corporation, which for some time had been prominent in public attention. On Thursday afternoon, October 26, the Government filed a suit in the United States Circuit Court at Trenton, N. J., asking for the dissolution of the Steel Corporation on the ground that it was organized and is conducted in violation of the Sherman anti-trust act. At a meeting of the directors of the Steel Corporation held earlier on the same day resolutions were adopted providing for the surrender of the lease of the Great Northern iron ore lands and for reducing to 60 cents a ton the rate on iron ore over the two Minnesota roads of the Steel Corporation. On Friday afternoon, October 27, Chairman Gary made public a statement commenting upon the action of the Government in bringing the dissolution suit. In the matter following, these various developments of the week are taken up in the order of their occurrence.

To Cancel the Great Northern Lease

Action by the Steel Corporation Directors

At a meeting of the directors of the United States Steel Corporation held on Thursday, October 26, the following resolutions were adopted:

"That there be recommended to the board of directors of the Great Western Mining Company the surrender on January 1, 1915, of the lease between that company and the West Missabe Land Company, Ltd. and others dated January 2, 1907. Pursuant to the provisions of article 17 of the said lease.

"That there be recommended to the board of directors of the Duluth, Missabe & Northern Railroad Company reductions of freight rates on iron ore from points of the Mesaba iron range reached by the lines of that company, to Duluth, Minn., to amounts not exceeding 60c per gross ton, with the suggestion that all points upon the said range reached by the lines of the said company be included in one zone or district for the purpose of establishing freight rates upon iron ore over the line of the said company to Duluth.

"That there be recommended to the board of directors of the Duluth & Iron Range Railroad Company reduction of the freight rates on iron ore from points on the Vermilion and Mesaba iron ranges reached by the lines of that company to Duluth and Two Harbors, Minn., to amounts not exceeding 60c per gross ton, with the suggestion that all points upon the said ranges reached by the lines of the said company be included in one zone or district for the purpose of establishing freight rates upon iron ore over the lines of said company to Duluth and Two Harbors."

The above action was in pursuance of previous action of the Finance Committee of the Steel Corporation, of which announcement was made one week previous. The reduction in the Duluth, Missabe & Northern rate to Duluth is from 80 cents, or 25 per cent. On the Vermilion range, where all the shipping mines but the Section 30 belong to the Steel Corporation, the rate is now 90 cents from Tower to the Two Harbors docks and $1 to the same docks from Ely. From Mesaba range points the Duluth & Iron Range rate is 80 cents. The intent of the resolution quoted above is to give all Duluth & Iron Range points a 60-cent rate.

The Government's Petition

It Asks for a Decree of Dissolution—The Hill Ore Lease

The Government's petition for the dissolution of the United States Steel Corporation was filed in the Circuit Court at Trenton, N. J., October 26 by Assistant Attorney General John B. Vreeland of the New Jersey District, acting under the immediate direction of Attorney General Wickersham. Ex-Secretary of War Jacob McGavock Dickinson is associated with the Attorney General as special counsel to the Government. The individuals mentioned in the petition are J. Pierpont Morgan, John D. Rockefeller, Andrew Carnegie, Charles M. Schwab, George W. Perkins, E. H. Gary, John D. Rockefeller, Jr., Henry C. Frick, Charles Steele, James Gayley, William H. Moore, J. H. Moore, Edmund C. Converse, Percival Roberts, Jr., Daniel G. Reid, Norman B. Ream, P. A. B. Widener, William P. Palmer.

The principal corporate defendants are the following: United States Corporation, Carnegie Steel Company, Carnegie Company of New Jersey, Federal Steel Company, National Steel Company, American Steel & Wire Company of New Jersey, National Tube Company, Shelby Tube Company, American Tin Plate Company, American Sheet & Tin Plate Company, American Sheet Steel Company, American Steel Hoop Company, American Bridge Company, Lake Superior Consolidated Iron Mines, H. C. Frick Coke Company, Tennessee Coal, Iron & Railroad Company, Great Western Mining Company.

Additional defendants are the Union Steel Company, Clairton Steel Company and a number of mining and land companies in Minnesota, chiefly companies owning portions of the Great Northern ore lands or mines located on those lands. Among them are the West Mesaba Land Company, Ltd., the Wright Land Company, Ltd., the Wells Land Company, Ltd., and the Stone Land Company, Ltd. The trustees of the Hill lease are also mentioned. This indicates that special stress will be put upon the acquisition of the Hill lands. William P. Palmer is the only president of a subsidiary company mentioned as a defendant, a probable indication that the American Steel & Wire Company is singled out among subsidiary companies for attack as in restraint of trade.

Decrees the Court Is Asked to Make

The grounds on which the various allegations of violation of the Sherman act are made are set forth at great length, as will be referred to later; then in conclusion comes the Government prayer for relief, which is as follows:

In consideration whereof, and inasmuch as adequate remedy in the premises can only be obtained in a court of equity, the United States of America prays your Honors:

First—To order, adjudge and decree that the combinations and conspiracies and monopolizations of trade and commerce hereinbefore described are unlawful, and that all acts done or to be done to carry out the same, or any part thereof, are in violation of the act of Congress of July 2, 1890, entitled "An Act to Protect Trade and Commerce Against Unlawful Restraints and Monopolies."

Second—That the defendants, and each and every one of them, and the officers, directors, stockholders, and agents of the defendant corporations, and of each and every one of them, be perpetually enjoined from doing any act in pursuance of or for the purpose of carrying out the same.

Third—That the United States Steel Corporation, in and of itself, as well as each and all of the elements composing it, whether separate or individual, whether considered collectively or separately, be decreed to be illegal and in restraint of trade, and an attempt to monopolize and a monopolization within the first and second sections of said act of Congress of July 2, 1890, and that it be dissolved.

Fourth—That each and all of the said constituent or subordinate companies shown, as aforesaid, to have been combined in restraint of trade and commerce and in monopolization of trade or commerce

within the meaning of the Anti-Trust act, each in and of itself, as well as each and all the elements composing each, respectively, whether considered collectively or separately, be declared to be illegal, in restraint of trade, and an attempt to monopolize and a monopolization within the first and second sections of said act, and that each be dissolved.

Fifth—That the holding of stock by any one of the defendant corporations in another of the defendant corporations under the circumstances shown be declared illegal, and that each of them be enjoined from continuing to hold or own such shares and from exercising any right in connection therewith.

Sixth—That the said several defendant corporations shown as aforesaid to be constituents or subsidiaries of the United States Steel Corporation be enjoined and prohibited from declaring or paying any dividends to the said United States Steel Corporation or to any person or corporation for its use.

Seventh—That it be decreed that the several individual defendants combined each with other persons and corporations to restrain trade and commerce and to attempt to monopolize and in monopolizing within the first and second sections of said act, and that each of them be enjoined from continuing to carry out the purpose of any of the above-described combinations and conspiracies and attempts to restrain commerce and trade, or to monopolize any part of commerce and trade among the States and with foreign nations.

Eighth—That such orders and decrees be made in respect of the stock issued under the several combinations aforesaid as shall be in accordance with equity and good conscience, and that such disposition be made of the said various properties as shall effectuate the purposes of the said anti-Trust act.

Ninth—That the said lease entered into as aforesaid by the Great Northern interests and the Great Western Mining Company be decreed to be illegal, in restraint of trade and commerce, an attempt to monopolize and a monopolization within the first and second sections of said act, and that the same be now canceled.

Tenth—The United States also prays for such other and further relief as the nature of the case may require and the court may deem proper in the premises.

To the end, therefore, that the United States of America may obtain the relief to which it is justly entitled in the premises, may it please your Honors to grant to it writs of subpoena directed to the said defendants and each and every one of them, commanding them and each of them to appear herein and answer, but not under oath (answer under oath being hereby expressly waived), the allegations contained in the foregoing petition, and abide by and perform such order and decree as the court may make in the premises, and upon hearing hereof to permanently enjoin said defendants as hereinbefore prayed, and, pending a final hearing of this case cause a temporary restraining order to issue enjoining the defendants and each of them and each of their officers, agents, and servants as hereinbefore prayed.

Consolidations Preceding the Steel Corporation

The Government reviews in great detail the conditions in the steel trade before the consolidations of 1898-1900 and the formation of the Federal Steel Company, the Carnegie Company of New Jersey, the American Steel & Wire Company, the National Tube Company, the National Steel Company, the American Tin Plate Company, the American Steel Hoop Company, the American Sheet Steel Company and other corporations prior to the formation of the United States Steel Corporation itself in 1901. It also describes the corporation's acquisition of the Tennessee Coal, Iron & Railroad Company.

In dealing with all these consolidations the petition points out the profits of the underwriting syndicates. It shows that the underwriters of the Federal Steel Company got $5,680,000 preferred stock and $8,400,000 common stock in return for $4,800,000 cash and their services in organizing the concern.

THE SUBSIDIARIES ALLEGED TO BE ILLEGAL.

The petition then says: "The purpose and effect of such consolidation were a combination between said consolidated companies and the Federal Steel Company, their officers, agents, promoters, and underwriters in restraint of trade and commerce among the several States and with foreign nations, within the meaning of Section 1, and were an attempt by the said parties to monopolize and a monopolization of part of the trade or commerce among the several States and with foreign nations, within the meaning of Section 2 of the Anti-Trust act." This paragraph is substantially repeated with regard to each of the other consolidations as they occur. The Carnegie Company of New Jersey is taken up next and the list given of concerns consolidated under its ownership.

THE AMERICAN STEEL AND WIRE COMPANY.

In turn the American Steel & Wire Company is referred to as combining under one management and control all of the leading concerns engaged in the production in the United States of wire, wire nails and other wire products. The petition asserts that up to this consolidation these concerns had been in substantial competition with one another. One of these companies, the American Steel & Wire Company of Illinois, was itself a consolidation of six competitor companies. It is alleged that stockholders of the old Consolidated Steel & Wire Company received $490 in stock of the New Jersey concern for $100 of their old stock. "As a result of this consolidation the American Steel & Wire Company of New Jersey," the petition declares, "obtained an almost complete monopoly of barbed wire and of woven wire production and controlled approximately four-fifths of wire fencing and nails produced in the United States. The prices were greatly increased. The price of nails in 1901 was more than 200 per cent. of the price in 1897."

OTHER CONSTITUENTS.

The National Tube Company is spoken of as controlling, when it was organized, 90 per cent. of the iron and steel wrought tubing of the United States, its constituents having been competitors previously.

The National Steel Company is referred to as controlling 12 per cent. of the steel ingot production of the country. "At least $5,000,000 of the common stock" went for promotion.

The American Tin Plate Company was "a consolidation of 39 plants, with 279 mills, engaged in the tin plate industry in the United States. It issued $46,000,000 of capital stock. It acquired practically every tin plate concern in the United States, and secured thereby an almost complete monopoly of that branch of the industry. Ten million dollars of the common stock went to the organizers."

The American Steel Hoop Company comes next with a capital stock of $33,000,000, of which $5,000,000 went for promotion. The petition says that it "brought into combination under one control the leading concerns engaged in the production of cotton ties, steel bands, hoops and like products in the United States."

Then follows the American Sheet Steel Company, of which the Government says: "It took over the principal manufacturers of sheet steel of all kinds." A large amount of its capital stock went for promotion.

Competition After the First Consolidations.

The petition traces the conditions leading up to the formation of the United States Steel Corporation. There was, it states, active competition between the Carnegie Steel Company, the Federal Steel Company and the National Steel Company. These three were also in competition with some of the consolidated companies dealing with the lighter finished products.

> The success achieved and the power gained by the consolidations aforesaid stimulated these companies and those controlling them severally to larger enterprise and more ambitious plans, involving further elimination of competition and restraint of trade and commerce. * * * The leaders in the steel industry feared the breaking down of the restraints upon trade and the overthrow of the partial or complete monopolies which they had established. The Carnegie Company and the Federal Company saw the danger of their former customers becoming their rivals. Both companies took steps looking to the manufacture of finished products.

The petition cites the manner in which the Carnegie Company precipitated a crisis by the announcement of its intention to erect an immense tube plant at Conneaut, Ohio, and says:

> If each of these actual and prospective competitors had worked out its own destiny in trade, commerce, and production, unobstructed by combinations or agreements entered into for the purpose of restraining competition and trade and commerce among the States, and between the States and foreign countries, new plants would have been established, and said trade and commerce would have developed under different conditions and free from restraints which, as will be shown, were imposed with the purpose and effect of unduly restraining such trade and commerce and monopolizing in part such trade and commerce. An opportunity was offered through further consolidation and restriction of trade and commerce, for enormous profits as a reward for effecting the combination, and as a result of the flotation of inflated stocks.

The Steel Corporation's Capitalization

Referring to the capitalization of the Steel Corporation the petition says:

> The capitalization was many million of dollars, not less than $600,000,000, in excess of the value of the properties thus taken over. It was vastly in excess of the amount upon which those properties under normal conditions could earn a fair return. The earnings of the corporation were not commensurate with its actual

capital, nor were they entirely the legitimate fruits of the earning capacity of those properties separately controlled, however well administered, but were to a very large extent, approximately one-half, the result brought about by the power exerted over trade and commerce by such a vast combination of capital, the restraint imposed upon trade and commerce, the suppression of competition, the influence upon the control of prices, and the many direct and indirect advantages derived from the co-operation of so many men of influence in trade and commerce, who, formerly acting in rivalry, were by the combination drawn together in a common interest. Consumers and the public at large were through the power created and exerted by such a vast combination compelled to pay an unlawful tribute of many millions of dollars annually to the corporations.

The new inflated capitalization of the corporation exceeded the old inflated capitalization of the constituent concerns plus the new cash capital provided and sundry stocks by $415,481,732, or by over 45 per cent. The main prospect for maintaining earnings on the many millions given for promotion and issued in excess of valuation was the power in the business achieved by combination, the potency of vast aggregation of capital, the affiliations brought about with powerful banking and transportation companies and the direct and indirect control of trade that thereby ensued. This was a fictitious basis resting on an unlawful combination.

The petition says that the underwriting syndicates received $64,998,768 par value of preferred and $64,998,837 par value of common stock of the Steel Corporation for its services. Stress is laid also on the statement that in order to get rid of Andrew Carnegie as a competitor, J. P. Morgan and associates paid not less than $492,006,160 for a property which a short time before J. P. Morgan refused to take at $160,000,000 under the Frick option.

Growth of the Corporation

Of the acquisitions by the Steel Corporation after its formation the petition says, referring first to the American Bridge Company: "By this acquisition of this large monopolistic combination, which was a large consumer of steel product for the sale of which there was competition, the corporation added greatly to its strength and power to restrain competition and trade and commerce."

The second of these acquisitions was the Lake Superior Consolidated Iron Mine, which "combined a large number of important mining companies and properties which previously were competitive." The petition says that the stock of this company was heavily watered, but the corporation paid 135 of preferred and 135 of its common stock for each $100 of this watered stock. This company had from 300,000,000 to 400,000,000 tons of ore, and owned the Duluth, Missabe & Northern Railway, which runs from Duluth into the Mesaba range, and operated at a low cost with very high earning. The petition says:

"It was a very important acquisition to the corporation. The control of this road with that of the Duluth & Iron Range Railroad (acquired in the original consolidation) gave the corporation a very effective control of ore transportation in the Minnesota ore regions, not only with respect to its own production, but also to that of many of its competitors."

The Bessemer Steamship Company was the third acquisition of the corporation. Then came the Shelby Steel Tube Company, which was a consolidation of several seamless tube companies. This combination produced about 90 per cent. of the entire output of the country. "Through this acquisition the corporation got rid of a competitor of its constituent company, the National Tube Company, and established its supremacy in the seamless tube branch of the steel industry."

The corporation also took over a one-sixth interest in the Oliver Iron Mining Company and the Pittsburgh Steamship Company, the other five-sixths of each concern being owned by the Carnegie Company.

The Union Steel Company was the next acquisition of the Steel Corporation. According to the petition, it was an important competitor of the corporation. It was formed of the Union Steel Company of Pennsylvania and the Sharon Steel Company of Pennsylvania. The Sharon Company owned valuable property, and its operations were such as brought it into sharp competition with the corporation. The Union Steel Company, after its combination with the Sharon Company, had a pig iron capacity of about 750,000 tons yearly and an annual steel ingot capacity of about 850,000 tons. The petition says that the price paid for these properties was in excess of their actual value, but "the corporation desired to eliminate the competition of influential interests back of the Union concern, particularly that of H. C. Frick."

The petition then describes the acquisition of the Troy Steel Products Company and the Clairton Steel Company. In taking the Clairton Company, says the petition, the corporation got rid of a competitor and its monopolistic control of ore and coal was increased.

The Great Northern Ore Lease

Referring to the lease of the Great Northern ore properties in Minnesota in 1906 the petition says: "By this transaction the corporation desired to prevent this ore either from being mined and sold to independent competitors, or from being utilized to build up a new and dangerous competitor in the iron and steel business. The practical effect was to forestall competition and to greatly increase the corporation's control of the ore resources of the country. The royalty agreed to be paid was unprecedentedly large, thus showing the extent to which the corporation was willing to go to prevent this ore falling into the hands of competitors. By this acquisition the corporation strengthened its dominating position. * * * The petitioner has been informed by the corporation that its Finance Committee on October 17, 1911, unanimously decided to cancel said lease. However, under the terms of said lease, no such cancellation can take effect before January 1, 1915, and there is no limitation upon the amount of ore that can in the meantime be taken out by the corporation."

The Tennessee Company Purchase

At great length the petition goes into the circumstances of the acquirement of control of the Tennessee Coal, Iron & Railroad Company in the panic of 1907. It says:

The properties of this company were located mainly in Alabama and Tennessee. Owing to the character of its coal and iron deposits, their location, and that of limestone, with reference to each other and to furnaces and transportation, the Tennessee Company could manufacture pig iron cheaper than it could be made in any other part of the United States. On account of its vast holdings of coal and iron properties, the steady growth of the manufacturing interests of the South, the fact that the known commercially available coal and iron deposits of the United States had been almost entirely acquired by manufacturing companies looking to their development, the gradual overlapping of the zones of competition, and its control by a strong and aggressive syndicate of capitalists, it was a strong, probable future competitor of the corporation. Most of the rails in the United States had been made out of Bessemer ores. On account of accidents attributed to inherent weakness in such rails a demand arose for an open-hearth rail, and for such process the ores owned by the Tennessee Company were available.

In 1907 a sensation was created in the steel rail market by E. H. Harriman, who controlled a large railroad mileage, ordering from the Tennessee Company 157,500 tons of open-hearth steel rails at $1 more per ton than the price of Bessemer rails. This at once put that company into a position of an actual competitor of the corporation and of a possible competitor that could not be ignored, of great potentiality.

The corporation was not slow to discern the situation. James Gayley, first vice-president of the corporation, having acquainted himself with the properties of the Tennessee Company, had already recommended to Mr. Frick, who then was a director of the corporation, that it acquire the properties of the Tennessee Company. This was about six months before the purchase was made. A syndicate which purchased, at $110 per share, 118,500 of the total 225,000 shares of the Tennessee Company, acquired the control for the purpose of development and operation. Subsequently a syndicate composed partly of the original members purchased 50,000 additional shares at $120 or $130 per share, thus putting 168,500 shares under syndicate control.

After these purchases the company expended $7,000,000 in betterments and additions, and was preparing to spend $3,000,000 more. It was the purpose of the syndicate to bring the whole plant up to moderate standards and to increase the capacity and conditions warranted. The company had rails booked for 1908 delivery of about 350,000 tons.

Then follows a recital of the financial difficulties of Moore & Schley and the familiar history of the Trust Company of America episode, the outcome of which was the purchase of $30,374,825 of Tennessee Company stock by the corporation:

The corporation exchanged for the stock its own bonds on a basis which paid par in cash for stock which Gary a few days before said was not worth more than sixty cents on the dollar.

While as to much of the situation the facts are in doubt, it is certain that the corporation availed itself of the embarrassment of Moore & Schley at a most critical period, and the hammering of the Tennessee stock and the threatening of a general financial calamity, to acquire the control of a competitor, taking on a formidable aspect.

By this purchase the corporation acquired 447,423 acres of mineral lands in Tennessee, Georgia, and Alabama, containing approxi-

mately 400,000,000 tons of merchantable ore and 1,200,000,000 tons of coal, of which over one-third is coking coal. The Tennessee properties embraced eighteen developed and active iron ore mines and twenty-three coal mines, sixteen blast furnaces, the ownership of several land companies holding extensive tracts of land, and the Birmingham Southern Railroad Company, a terminal property of great value, connecting the various mines and plants in the Birmingham district with all the diverging trunk lines. The capacity of the Tennessee Company's blast furnaces a year was about 1,600,000 tons and its steel ingot capacity was about 500,000 tons. The possibilities of the Tennessee properties and the development of its raw material are immense, and greatly increase the control by the corporation over the total available ore supply of the country.

The corporation thus greatly strengthened its control of the iron ore supply of the country and its predominating position in the iron and steel trades of the South, eliminated a competitor, and unlawfully acquired a power which is a menace to the welfare of the country, and should be destroyed.

Referring to President Roosevelt's acquiescence in the Tennessee purchase, the petition says that the facts in the matter were not fully disclosed to him by Messrs. Gary and Frick, who went to Washington to lay the matter before him, and that their statement to him that but little benefit would come to the corporation through the purchase "was a misleading one."

Control of Fuel, Ore and Transportation

In section 7 the petition discusses the position attained by the corporation through ownership or control of coal, coke, iron ore and transportation. It says:

> The profits derived by the corporation from its transportation properties, chiefly railroad lines, represent a large part of its earnings, and these are largely derived from the rates and tolls imposed by the corporation upon other steel manufacturers who have to have their ore transported in the Minnesota ore region by the Duluth & Iron Range and the Duluth & Missabe railroads. By the power thus acquired a burden is imposed upon competitors and a restraint is thereby exercised upon trade and commerce between the States. Since 1904 the Duluth & Iron Range Railroad Company has paid dividends upon the capital which have averaged more than 100 per cent. per annum. For the same period those of the Duluth, Missabe & Northern Railway Company have been from 102 per cent. to 140 per cent. per annum upon the capital stock. Petitioner has recently received information of the purpose of the corporation to reduce the rates of these roads 10 or 20 cents per ton.
>
> Through the ownership of the Elgin, Joliet & Eastern Railway, and more particularly through the Bessemer & Lake Erie, the corporation has a further important advantage over most of its competitors with respect to transportation. Its minor railroad properties, particularly the Union Railroad of Pittsburgh, the Chicago, Lake Shore & Eastern Railway, the Connellsville & Monongahela Railway and that of the Tennessee company, are important factors in its transportation system and give it an advantage over its competitors.

As to coal and coke, the petition says that the control of the Tennessee company has added vastly to the strength of the corporation by the locking up of raw material and preventing its acquisition by possible competitors. It cites the fact that Judge Gary testified before the Ways and Means Committee of the House in December, 1908, "that the corporation pretty nearly controlled the ultimate ore supply of the country."

"The control of such a large proportion of available ore," the petition goes on, "and of so much of the transportation of the ore from the ore fields gave the corporation the power to largely control the iron and steel market and force its plans and wishes on its competitors, restrain competition, control market prices, restrain trade and commerce between the States and with foreign countries, and this it has since 1901 continuously done, in contravention of the Anti-Trust act."

Extensions and Changes Since 1901

Section 8 of the petition deals with the extensions made by the corporation out of its earnings since its organization and says that the investment of its earnings has been from $400,000,000 to $450,000,000, thus further increasing its power, influence and dominancy.

Then follows, in section 9, a long and detailed discussion of the changes that have occurred in the properties of various constituent companies. This section includes a table showing the amounts of total outstanding capitalization of the various subsidiary companies of the Steel Corporation, together with the amount of such capitalization owned by the corporation. A similar table is given for each of the constituent companies of each of the subsidiary concerns of the Steel Corporation. The intent of this section is to show in detail every concern owned or controlled by the Steel Corporation.

Section 10 of the petition puts into technical legal language the charge of the government as to the various consolidations of the constituent companies of the Steel Corporation. Its concluding paragraph says:

> All the business of the corporation and its controlled companies is conducted without competition among them, and as a part of a general plan and combination by which they have partly destroyed competition in trade and commerce among the States and with foreign nations, and have, by their strength, acquired a great influence over competitors whereby they are brought into harmonious action with the corporation in restricting competition and in restraining such trade and commerce.

Pools and Interlacing Directorates

Recent consolidations in the steel business are briefly reviewed and these pools and agreements are considered, including the Plate Association, the Structural Steel Association, the steel rail combination, the wire rope combination, the rubber-covered wire combination, the horseshoe manufacturers' combination, the underground power cable combination, the weatherproof and magnet wire combination, the lead-encased rubber cables combination, the bare-copper wire combination and others. Then the question of interlocking directorates is dealt with and the petition says:

> In addition to pools, a more euphonious, refined, but none the less effective, method came into vogue. Conditions had so changed as to make the way for this new procedure easy. When the iron and steel products were made by independent concerns, which, in their desire for business, brought about from time to time sharp competition, the only method of restraint was an agreement or pool, and this was not always effective, for they frequently played false to such combinations. Under the policy of the corporation there grew up a community of interest and a power to influence action to a common purpose never exceeded in the commercial history of the world. Here came into existence a system of interlacing of directorates which embraced almost the entire commercial and financial powers of the country. Appended as exhibit C is a list of the officers and directors of the corporations and also a list of the various companies with which they severally were connected, as of the year 1910. This shows the status substantially as it has been for preceding years and as it is at the present time. It has been a constantly growing system since the creation of the corporation, and therefore the personnel and alliances vary for the several years since 1901, but the system and the power achieved by it have been practically the same from 1901 down to the present time.

Co-operation with Competitors

Finally the petition discusses at length combinations other than pools and agreements, and referring evidently to independent steel companies, though without designating them as such, it says:

> Under the auspices of the corporation these interests, naturally competitive but harmonized by this network of correlations and overshadowed and dominated by the power of the corporation arising from its pre-eminence in the business, and the irresistible strength of its alliances, come together from time to time, find out the views of the corporation in respect of prices and output and all that hitherto was affected by pools and formal agreements, reach a common understanding and purpose and proceed to carry them out. It is not here alleged that merely assembling and mutually exchanging information and declaration of purpose amounts to an agreement or combination in restraint of trade. These meetings and their results have gone further. What they actually accomplished shows the great and dangerous power achieved by the corporation through unlawful combination exercised over the trade and commerce of the country. The concerted action taken has prevented fluctuations in prices and competition.
>
> At the meetings have been represented of the iron and steel trade in the United States fully 90 per cent. of the total. In no line of business in the world at any time has there been such a large percentage of those engaged in a business as the percentage of those in this country who at these meetings go along day by day, hand in hand, pursuing the same course.

THE GARY DINNER OF JANUARY, 1911.

> At the time of one of these meetings, held in New York January 11, 1911, there was not in the country a demand for more than 50 per cent of the total producing capacity in the lines of those represented, and there was not enough business to go around, and there was no possible way of protecting themselves from competition except by coming to an understanding that each would be satisfied with a portion of the business, which was understood by all, and this understanding was carried out and no one of them competed for the recognized business of the others.
>
> The meetings accomplished more than did the old pools and agreements, which were frequently broken. It was understood and

agreed that they were bound to protect one another; that to carry out this purpose their honor was at stake, and that the obligation binding on them was even dearer than life itself, and that no one of them should act or fail to act except with a distinct and clear understanding that his honor was involved, and that this was more binding on him than any written or verbal contract.

EXCHANGE OF INFORMATION.

When bidden by the chief executive of the corporation they came at any time, from any distance, ready, willing and anxious to turn over to him and to his friends all that was in their minds and in their hearts concerning their own business. When they met the chief executive of the corporation admonished them that no one of them should forget the high moral obligation he was under toward his neighbor, and that it was of the highest importance at that particular time that every one of them should have a keen and abiding sense of the personal obligation which he had toward all the others, and to make no mistake of running the risk of trespassing within the domain of the right of his neighbor who had given his confidence and trust, and who was willing at all times to put within the knowledge, and therefore more or less under the charge and control, of the others the very direction of his affairs.

By these meetings and interchange of information and understandings each became in honor bound not to get the trade of the other, and each by the concerted action acquired participation in the direction of the affairs of the other.

The main purpose of the meeting of January 11, 1911, was the question of maintaining or changing the prices of the commodities in which they dealt. A majority came to a consensus which was accepted and followed by all.

At these meetings they not only exchanged information, but advocated control of prices, and reached a common understanding which was followed, under solemn admonition that they were bound by an obligation more estimable than life.

MAINTENANCE OF PRICES.

These meetings brought about the maintenance of prices. It was understood by them that they were traveling together, and that they were going to stand together. They understood and acted upon the understanding that a statement as to what one would do as to prices or output was a promise and a pledge upon honor to the others.

At the meeting of January 11, 1911, and at the other meetings there was a general expression of opinion that prices should be maintained, and in pursuance of this understanding and agreement they were maintained. When an understanding was reached individual declarations were made of intention to follow the movement. It was recognized that they follow the policy laid out for them by the head of the corporation. This meeting of January 11, 1911, was attended by about eighty representatives of iron and steel concerns, being a large majority in number and output of such concerns in the United States. They understood that the purpose was to consider the prices of iron and steel, that the consensus of opinion was that the prices should not be lowered, but that they should be maintained, and that by virtue of what occurred they were in honor bound to each other to maintain them. In fact, they, in pursuance of this action, did maintain them.

By the aforesaid pools, agreements, meetings and acts of corporation, the said several companies and individual defendants, in addition to the several unlawful agreements and combinations by which all of the companies and properties aforesaid were brought under one control, have combined or conspired in restraint of trade and commerce among the several States and with foreign nations within the meaning of Section 1, and to monopolize a part of the trade or commerce among the several States and with foreign nations within the meaning of Section 1, and to monopolize a part of the trade or commerce among the several States and with foreign nations within the meaning of Section 2 of the anti-trust act.

Chairman Gary's Statement

Below is the statement given out by Chairman Gary of the United States Steel Corporation on Friday, October 27, the day following the filing of the Government's petition:

"I think it would be improper for me at this time to make any comments concerning the suit which has been brought by the Government against the United States Steel Corporation, except to say I regret exceedingly that the Department of Justice felt called upon to institute proceedings. If any harm results, it will fall upon the stockholders and employees, aggregating a very large number, and any loss to them must be deplored. It is a time for every one to keep cool, with a disposition to patiently await results, knowing that in the end justice will be done to all interests.

"I believe a disclosure of all the facts applicable to the allegations contained in the Government's bill of complaint as a ground for relief will show that the suit ought to be decided in favor of the corporation on the merits; and that the following facts will be established:

"1. That in the organization of the United States Steel Corporation those in charge had no intention of creating a monopoly or of restraining trade.

"2. That the corporation never has had, or attempted to exercise, a monopoly or to restrain trade.

"3. That the conduct of the affairs of the corporation has clearly and positively negatived any effort or intention to violate any provision of the Sherman law.

"4. That the existence of the corporation has been of benefit and not of injury to its employees, its customers, its competitors and the general public.

"5. That no misrepresentation was made to the President relative to the Tennessee Coal & Iron properties, and that the motive of those connected with the purchase was to prevent threatened general financial disaster which would have adversely affected the corporation as well as others."

Dodge Iron-Center Wood-Rim Pulley Test

On May 13 the Dodge Mfg. Company, Mishawaka, Ind., through its Boston branch, received an order from the William Slater Mills, Jewett City, Conn, for two iron-center wood-rim pulleys with a proviso calling for a rim speed test of one hour at 8000 ft. per min. The proposition was accepted.

The specifications for one pulley called for 100-in. diameter, 22-in. crown face, 5⅞-in. approximate bore, and the other for 74-in. diameter, 22-in. crown face, 4 15/16-in. approximate bore, the rims of solid maple, the hubs of solid iron, to transmit 340 hp. at 6700 ft. per min. rim speed with 21-in. belt. To be absolutely on the safe side, the Slater Mills asked for a sworn statement of the test.

On June 10 the pulleys were ready for business. The one-hour test was made in the wood pulley shops under the direction of the superintendent, W. J. Chesbro, and the general superintendent, E. H. Ahara, gave instructions just before the start to operate the pulleys at a speed in excess of specifications. The story of the result is told in the following: The 100-in. diameter pulley, minimum speed, 374 r.p.m.; average speed, 375 r.p.m; average rim travel for the hour, 9817 ft. per min. The 74-in. pulley, minimum speed, 510 r.p.m.; average speed, 510 r.p.m.; average rim travel for the hour, 9880 ft. per min. The speeds of the shaft were noted at frequent intervals during the test to secure an accurate average of the speed under which the pulleys were operated. A letter from F. D. Balloa, superintendent of the Slater Mills, dated October 11, says: "The Dodge iron-center wood-rim pulleys have thus far run in a very satisfactory manner."

Several years ago a customer ordered an iron-center wood-rim pulley, 46½-in. diameter, 16-in. crown face and 4-in. bore under a test of 9000 ft. per minute. He got 10,000, and a companion pulley built for further test was run at the terrific speed of 29,200 ft., or a little over 5½ miles per min.

American Iron and Steel Institute Directors

A special meeting of the American Iron and Steel Institute was held at the offices, 30 Church street, New York, October 26, at which most of the members were represented by proxies. An amendment to the constitution increasing the number of directors from 15 to 21 was adopted, and an election was held resulting in the choice of the following:

J. G. Butler, Jr., Youngstown, Ohio.

Charles S. Price, president Cambria Steel Company, Johnstown, Pa.

Robert Hobson, general manager Steel Company of Canada, Hamilton, Ont.

Frank S. Witherbee, Witherbee, Sherman & Co., Inc., New York,

F. W. Roebling, secretary and treasurer John A. Roebling's Sons Company, Trenton, N. J.

Isaac M. Scott, president La Belle Iron Works, Steubenville, Ohio.

Percival Roberts, Philadelphia, a director of the United States Steel Corporation, was elected a member of the institute.

Pittsburgh and Vicinity Industrial Notes

The department of chemistry of the School of Applied Industries of the Carnegie Technical Schools, Pittsburgh, is offering a course in chemistry and metallurgy for foundrymen and others interested in allied branches of work. The first lecture was given October 30. The tuition for the course is $16 per year.

At the organization meeting of the board of directors of the Crucible Steel Company of America held in Pittsburgh, October 27, the following were elected for the ensuing year: Executive Committee, Herbert Du Puy, C. C. Ramsey, James H. Park, George E. Shaw, H. S. A. Stewart, John A. Sutton, H. D. W. English; Herbert Du Puy, chairman; C. C. Ramsey, president; John A. Sutton, first vice-president; J. W. Dougherty, second vice-president; O. H. Wharton, third vice-president; G. W. Sargent, fourth vice-president; Charles W. Rowlands, secretary; George A. Turville, treasurer.

The Cambria Steel Company, Johnstown, Pa., has appointed W. Beverly Robinson & Co., Montreal, Can., its agents for Canada for the sale of rails, billets, cars, wire products, etc. The Canadian firm maintains large warehouses for the carrying of stocks.

Hiram Swank's Sons, Johnstown, Pa., recently completed a new stock house 50 x 150 ft. and three new kilns at its plant at Irvona, Clearfield County, Pa., which makes seven there. This plant is practically new, having only recently been finished, and manufactures fire brick, standard shapes, nozzles and runner brick. The firm also operates a plant at Johnstown, Pa., where its office is located.

The Westinghouse Electric & Mfg. Company has received an order from the Central Pennsylvania Traction Company, Harrisburg, Pa., for six double equipments of No. 101 C motors and K-36-F control; Morgantown & Dunkard Valley Railroad Company, Morgantown, W. Va., quadruple, direct current, No. 306 interpole motors equipped with K-35-G control; Detroit United Railways Company, Detroit, Mich, four quadruple interpole motors equipped with multiple unit control; Cleveland Railways Company, Cleveland, Ohio, 20 quadruple, direct current, interpole motors equipped with K-35-G control.

The Connellsville Iron Works, Connellsville, Pa., of which W. E. Kelly is general manager, is building two separator tanks each weighing 3 tons for the West Penn Power Company, Green Junction, Pa., on which delivery will be made this week. The Connellsville Iron Works specializes in steel mine cars, mine equipments and plate work, including boilers and boiler repairs. Its equipment department contains five larries on which prompt shipments can be made. It recently completed an addition to its plant and installed additional equipment and is in excellent shape to handle work in its line.

The Fairbanks Company is now occupying its new warehouse at Liberty avenue and Twenty-ninth street, Pittsburgh, where it carries in stock a large line of machine tools, gas engines, Oneida split-steel pulleys, shafting hangers, belting, trucks, barrows, valves, steam and water specialties, factory, mill and mine supplies and scales.

The Heppenstall Forge & Knife Company, Pittsburgh, is making some additions to its plant and has taken out a permit for the erection of a steel building to cost $25,000. Some new machinery for the manufacture of forgings, shafts and shear knives will be installed.

The Youngstown Sheet & Tube Company, Youngstown, Ohio, has secured a contract from the Isthmian Canal Commission for 20,000 ft. of 2 to 12-in. pipe.

George J. Hagan, 401 Peoples' Bank Building, Pittsburgh, has been appointed agent in the Pittsburgh district for the American Stoker Company, New York City.

The plant of the Shenango Iron & Steel Company at Wheatland, Pa., recently bought by Max Solomon, scrap iron dealer, Oliver Building, Pittsburgh, will be dismantled and the machinery scrapped. At one time this was one of the leading industries in the Shenango Valley.

The United Engineering & Foundry Company, Farmers' Bank Building, Pittsburgh, has received a contract from the Pittsburgh-Crucible Steel Company, Midland, Pa., for a 40-in. blooming mill, tables and manipulator. This blooming mill will be similar to the ones built by the company for the Republic Iron & Steel Company, Youngstown, Ohio, and for the American Rolling Mill Company, Middletown, Ohio, an illustrated description of the latter mill having appeared in *The Iron Age* of August 31. It will have the new modern type of housing, including convenience of adjustment and the rigid character of the top roll carrying connections and its extreme adaptability for changing and repairing. The manipulator will be of the Wellman-Kennedy type, arranged with turn-over fingers and manipulating slabs on both sides of the mill.

The Cleveland, Painesville & Eastern Railroad Company, Willoughby, Ohio, is now engaged in enlarging its plant and changing the operating voltage from 13,200 to 22,000. In making this change it has ordered two 1500 kw. and two 50 kw. 6600 volt turbo-generator units from the Westinghouse Machine Company, Pittsburgh. Its previous equipment consisted of compound steam engines and electric generators, but, appreciating the advantages of turbine drive, it has selected Westinghouse-Parsons turbo units for the additional capacity which it is installing. The system is three-phase, 25-cycle and the distance covered is approximately 38 miles.

Morgantown Seeks Additional Industries

The Morgantown Board of Trade, with headquarters in the Price Building, Morgantown, W. Va., which has a membership of over 500, is carrying on a campaign to secure new manufacturing enterprises. A fund of $312,000 has so far been raised for manufacturers who locate there and this amount will be considerably increased before the campaign closes. The town offers manufacturing sites with cheap oil, coal and gas, good water, plenty of labor, good railroad facilities, etc. It is reached by the Baltimore & Ohio Railroad and Morgantown & Kingwood Railroad, and an extension is being built to it by the Pittsburgh & Lake Erie from Martin, Pa. It also has good interurban railroad connections. The town now has fifteen industries, but the Board of Trade is desirous of securing diversified lines of manufacture. In the vicinity are 120,000 acres of the Pittsburgh coal seam and 75,000 acres of the Freeport seam, with slack water to Pittsburgh and excellent river shipping facilities. The work of interesting manufacturers is in the hands of Dr. I. C. White, president of the Board of Trade and State Geologist, and Glenn Hunter, secretary of the board. A descriptive folder has been issued setting forth the advantages of the locality.

Magnalium, a remarkable alloy of aluminum with a small proportion of magnesium, manufactured in Germany, is handled by G. A. Crayen & Co., 81 New street, New York City, Morris R. Machol being in charge of the metal department. The extreme lightness and density of magnalium, with its high thermal conductivity, make it well adapted for aeroplane engine cylinders. On account of the toughness and strength of the metal, it is being used, not only for cylinders, but also for crank cases, water pumps, intake manifolds, and the various other things connected with the manufacture of an engine which could admit of the use of castings of any kind. The use of this metal for cylinders makes a considerable reduction in the weight of the average aeroplane engine, because as a general rule the cylinders are a large proportion of the weight of the motor.

Hickman, Williams & Co., dealers in pig iron, coke, etc., announce that, owing to the fact that they have lately centralized their bookkeeping and accounting departments at their Cincinnati office, and as J. O. Henshaw, one of their partners, is making his headquarters now in Philadelphia instead of New York, they decided to discontinue their New York office November 1. The territory handled by their New York office will now be handled from their office in the Pennsylvania Building, Philadelphia, Pa., as headquarters. The selling force in the New York territory will remain the same. The Boston office will still attend to business in the territory covered from that point in the past.

The Organizer of Men in Management

Pointed Observations Recently Made by John Calder

The genius of the organizer of men as distinguished from the mere systematizer of things and the attitude that shop management is an art rather than a science—in short, special emphasis on the human factor in directing the industrial establishment—are two conspicuous points brought out in an address on the economic administration of industrial establishments made before a joint meeting of the Engineering Club and the Altoona Railroad Club at Altoona, Pa., October 25, by John Calder, manager of the Remington Typewriter Works, Ilion, N. Y. The address was introduced with figures to show the considerable length of time which transpires before a manufacturing company turns over its capital once, or, in other words, the large percentage which the capitalization of a business has to the value of the product turned out. This condition of affairs is advanced as one argument why there is need for greater efficiency in shop management. The speaker dwelt at some length with the problems of the Remington typewriter works, outlining the organization, submitting a chart of the successive division of responsibility and explaining briefly the duties of each department and their relations. An insight into the scheme of operations may be had from the organization chart here reproduced, but space limitations make it necessary to draw on the paper only from the instructive observations covering the importance of organization and the systematizer. A printed copy of the paper, which perhaps may be obtained from one of the clubs or from Mr. Calder, would give explanation of the organization chart.

At the outset, Mr. Calder emphasizes, we must reckon with the fact that the organization, not the system, is the primary consideration. This is not the order of precedence prescribed by some professional systematizers, but any other is a mistake. Every business worthy of the name must be provided with an organization, and no matter what particular system may be followed it cannot attain economic distinction if it is not effectively organized.

The primary object of organization is to bring brainy men together for work and action. A wise organization seeks and encourages men of ambition. It believes that the ambitious man is not necessarily dangerous. It knows that success demands an aggregation of strong individualities, free to contribute their quota of wisdom, but loyally subordinating their individual preferences to the general policy, once declared. In order that its work may be well done and its action strong and forcible the organization must move forward as a harmonious unit. No amount of clever scheming alone will secure this. Herein lies the task and the genius of the organizer of men as distinguished from the mere systematizer of things. His work is much easier to talk about than to carry out, but it needs brief mention here.

Emerson says "Every great business is but the lengthened shadow of one man," and he is right. The modern administrator of industrial establishments is a manager of men rather than of things, and the human factor touches his business on all sides. An organization cannot go into commission. It must have a strong, resourceful leader and a carefully selected, well-trained loyal and enthusiastic staff. This will only come through intimate contact with a man, not a mere machine or inanimate system. The cold-bloodedness of some of the modern schemes for exploiting the higher human energies is not only repelling—it is a fatal defect.

The Systematizer

Any system, however attractive and justifiable in some of its features, is, like the plant itself, worth no more than it can earn. No manufacturer is in business as a subject of experiment which may not point the way but merely warn others from following. All money and worry expended on system beyond the earning point is wasted. An admitted experiment of measured duration and conclusive nature is one thing, but a shop revolution covering years of transition experiences is irretrievable and usually unsupportable. In concerns in which system is an expensive hobby and not an economical tool, all kinds of extravagancies will creep in and will be justified by some philosophy which ignores common sense.

One of the claims brought before proprietors by some of the external practitioners of system is that it will not only render the efficiency of their business self-perpetuating—a most desirable end if attainable—but that it will also enable them to become, to a large extent, independent of their managers and higher executives. This is a somewhat mischievous doctrine. No army of clerks, mechanically following planning instructions however perfect, can take the place of the full use and recognition of able engineering administrators and shop assistants under any conceivable works system.

It is the belief of the writer that the best type of shop system is evolved, not from the outside, but in the shop itself through careful analysis of its special conditions and requirements by the responsible administrator thoroughly in sympathy with and experienced in advanced practice. A busy and prosperous administration can sometimes be helped by system advice from the outside. It should never be controlled by it.

Shop Management an Art

Shop management is an art rather than a science. It has to deal with too many unknown quantities and variables either to aspire to scientific rank or to adopt a fixed creed. Few individual businesses can afford the interference and expense involved in carrying out effectively the extensive scientific program. The installation of the whole machinery of scientific management has been very seldom attempted. Nevertheless, there is plenty of scope for more systematic analysis and regulation of shop processes and expenditures. The business world, and engineers in particular, owe much at present, and will owe more, to the ability and devotion with which the author of "Scientific Management" (Frederick W. Taylor) has elaborated and advocated his particular combination of things old and new.

There are several rules in regard to office and shop routine which the writer would recommend all managements to observe, irrespective of the class of work done. Have a well-considered system of doing things, definite and businesslike in all departments, designed for your own case. Make the connection between departments clear to all employees by the use of a chart (such as that shown). Have as little system and as few forms as possible. Make them a means, not an end. Do not treat the system as a fetich. It is a good servant but a bad master. Prune and pare your system until it gives the utmost economy and dispatch. Do not fail to note closely what your system costs, and if it is really paying its way. Very few experts can answer that question. With many it is purely a matter of faith.

In many cases with us the "trade" is still the economic unit instead of the "task," and this is particularly so in the metal manufacturing and the building industries, not only so, but labor has shown no disposition to improve the "trades," many of which are notoriously wasteful of time and effect. There can be little doubt in these days, when the high cost of living is a live topic, that economic necessity, if not inclination, will finally drive us to take up in all seriousness the conservation and intensive application of human energies in every department of activity, distributive as well as productive, and that new avenues of usefulness will open up for the production engineer.

It may be emphasized here that the underlying practical motive of the system is not indiscriminate speeding at the expense of the workers, but the securing by co-operation of the economies obtainable through either anticipating or locating and removing all wasted time and ineffective or unnecessary effort and expense, whether clerical, manual or mechanical. It is directed toward enabling employee and capitalist alike, under the most favorable conditions, to make the most of the opportunities of the working day, and in so doing a very large part of the usual burden is removed from the shoulders of the employee and placed upon the organization.

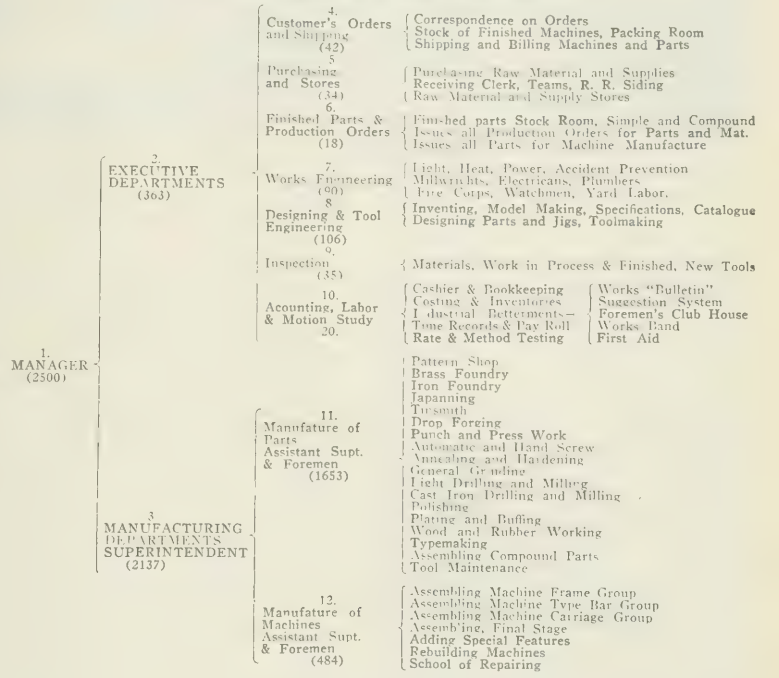
Organization of the Remington Typewriter Works

The organization is indicated on the chart by the numbered and grouped functions which the various assistants control. The figures below each division on the chart indicate the total number of employees engaged in that section and afford by comparison some idea of the relation under the system of direct labor upon the product to the various preliminary and operating services found necessary.

The foremen are not functionalized out of existence as proposed in some systems and made to feel that they count for little in the general scheme of things. Relieved of all clerical duties and, because of the motion studies and straight piece work based upon them, of practically all policing duties, the foremen are left free to manage their own shops and to make the most of—if possible to suggest improvements upon—the equipment and instructions given them. Under these conditions they prove to be the most valuable employees on the pay roll and the most fruitful in good suggestions. Busy foremen are not able to carry out with the necessary detail and thoroughness the preliminary rate and method tests required by the system. If these were left to the shops, progress would be much slower, but they are keen critics of the results when presented for application and not seldom are able to "go one better."

As a result of the organization and the system followed a very compact industrial unit is obtained occupying less than 300,000 sq. ft. of floor area with its manufacturing operations and covering with its buildings and yards a rectangular plot of land only 1000 ft. long by 250 ft. wide. There is no waste or unused space anywhere within the various buildings or yards and the time occupied in mere handling or transport of work in process is cut down to a minimum owing to the ordered sequence of the operations, their close proximity and the rapid flow of the stock.

Organization of Remington Typewriter Works, Ilion, N. Y.



The buildings contain 1600 machine tools operated by mechanical power and 60 operated by hand labor, besides a large quantity of finely made and costly jigs, tools and fixtures and other labor-saving equipment. Many of the machines have been specially designed and constructed at the works The greater portion, however, are standard machine tools with slight adaptations for repetition operation by straight piece work under studied conditions which enable them to be used on an intensive scale not attempted in ordinary engineering. The automatic screw machines, for instance, 160 in number, are all run on a piece work system under close inspection, and the ordinary, somewhat indifferent day operator of a group of machines has been transformed into a busy and vigilant opponent of idle spindles.

A monthly periodical edited by the manager is issued to the foremen and assistants with news likely to interest and encourage them, with judicious criticism or appreciation of departmental performances and with full acknowledgment and a detailed list of all the "good suggestions" adopted during the previous month and the names of the contributing foremen. Much rivalry is aroused, and each issue contains 50 to 150 accepted suggestions of considerable value. In advancing a foreman his record in this respect is considered in addition to executive ability.

A suggestion system separate from that of the foremen is conducted for employees, and a prize of not less than $20 in gold is awarded for each accepted suggestion or group of suggestions. The ordinary employees are not nearly so fruitful in suggestions of value as the foremen, but the door for them is kept wide open and all necessary privacy for this purpose is afforded.

Among other industrial betterments arising out of an atmosphere of good feeling are a library and a hospital, the gifts respectively of C. W. Seamans and H. H. Benedict, the founders of the Remington typewriter business. A well-equipped clubhouse and recreation park, honor badges for long and efficient service, a works band, a baseball league and a field day are some of the other social institutions. The policy of the corporation has been merely to provide such facilities as are not available from public enterprise in a small community and not within the means of the employees.

Unique Advertising Device Made of Toncan Metal

A huge bottle, made of sheet steel, bearing the label of a well-known headache remedy, tops the Emerson Building, one of the tallest structures of Baltimore, Md. From the sides of the bottle blaze the rays from 554 incandescent lights, formed into letters 10 ft. in hight and 6 ft. in width. The bottle itself is 70 ft. in hight and 20 ft. 7 in. in diameter. This unique advertisement required 365 days for construction, and although it contains more than 30 tons of massive metal it is so cleverly constructed and so perfectly balanced that it is easily caused to revolve at the rate of one revolution every 30 seconds by a motor of only three horsepower.

One of the problems confronting Williams & Shock, who engineered the contract, was the selection of a material capable of withstanding long exposure to all climatic conditions and of proved durability. At first ¼ in. copper was considered, but later Toncan metal of 14 and 16 gauge galvanized was chosen by the architects in preference to other materials. The rust-resisting and anti-corrosive features of Toncan metal especially adapted it for this purpose. This material was supplied by the Kahl-Holt Company, Baltimore, and the metal work was erected by Vaile & Young, metal workers of that city. Toncan metal sheets are manufactured by the Stark Rolling Mill Company, Canton, Ohio.



The Upson Nut Company's Steel Plant

Open Hearth Furnaces and Blooming and Bar Mills Built to Fill the Gap Between Blast Furnace and Bolt and Nut Works

For a number of years it had been the ambition of Andrew S. Upson, late president of the Upson Nut Company, Cleveland, Ohio, to build a steel plant that would be a connecting link between the blast furnace and the bolt and nut works of that company. When his expectations were about to be realized, less than a week before some of the open-hearth furnaces of the new works were to be fired, Mr. Upson died on April 2 last, leaving as a monument to his energy a finely equipped plant, one in which, in a comparatively limited space, ore is received directly on the docks and through the various processes of manufacture is transformed into billets and merchant bars, bolts and nuts and allied products.

Some difficulties had to be overcome in laying out the plant, because of the limitations of the building site, which was hemmed in by railroad tracks. Instead of having an abundance of new land, as has been the case with so many steel works built in the past decade, the engineers had to make their plans to fit the site. The layout provides ample room for the various departments, but practically every foot of the ground was utilized. The plant is located in the heart of Cleveland, on the east side of the Cuyahoga River, a short distance above the Superior avenue viaduct, the steel works lying between the blast furnace, which is on the bank of the river, and the bolt and nut works. With the river on the west, the plant is surrounded on the other sides by railroad tracks, the Erie being on the south and the Big Four on the north and east. Ore brought from Lake Superior mines is unloaded directly from the boats to the storage yard. The blast furnace, which is one of the oldest in Cleveland, has a daily capacity of about 200 tons.

General Arrangement

The new steel plant includes four open-hearth furnaces that show an average output of 65 tons each per heat, a 34-in. blooming mill and a finishing mill. It has a capacity of 12,000 tons of ingots per month and a finishing-mill capacity of 6000 tons per month. About 50 per cent. of the steel made is consumed in the bolt and nut works, the remainder being placed on the market in the form of billets and bars. Interesting features of construction grow out of the fact that the plant is laid out on two levels, the contour of the ground making this arrangement practical and desirable. The open-hearth casting floor and the ingot-stripping yard are on one level, 20 ft. above the river level. Fifteen feet higher is the upper level, on which are the scrap yard, the open-hearth charging floor, the floor of the pit-furnace building, and the blooming and finishing mills. This arrangement permits of taking material from the scrap yard to the charging floor of the open-hearth building on the same level, while steel ingots in molds leave the same building on another yard level. A more convenient provision for handling scrap to the open-hearth furnaces could scarcely be devised. An interior view of the open-hearth building is given in Fig. 1, while Fig. 2 shows the



Fig. 1.—View at Point B, Fig. 2, of Pouring Side of Open Hearth Furnaces.

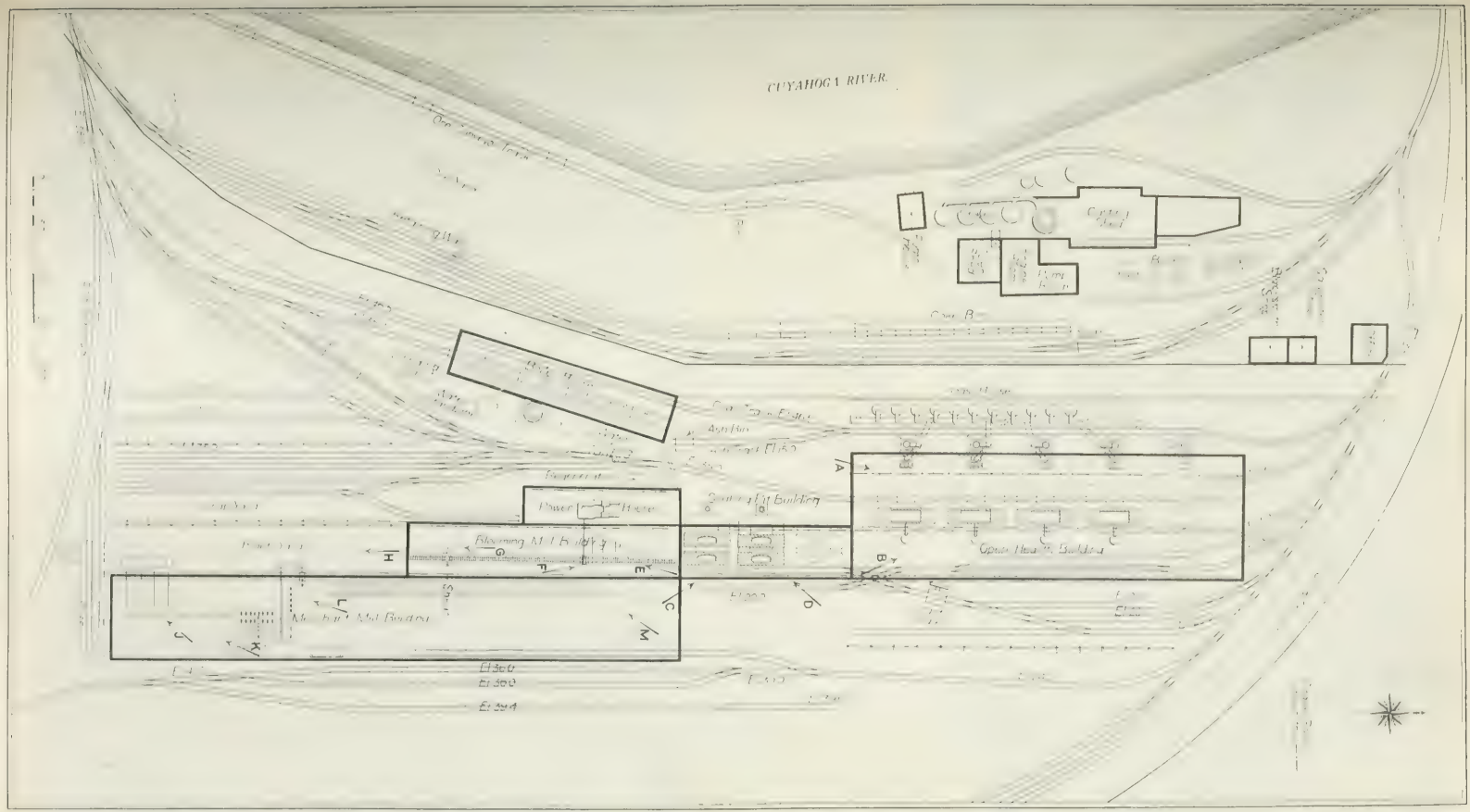


Fig. 2.—General Arrangement of the Blast Furnace and Steel Works of the Upson Nut Company. The reference letters apply to views shown in other illustrations.

general arrangement of the plant. There is a continuous runway with a 50-ft. crane span extending from the pouring side of the open-hearth plant through the soaking pit and blooming-mill buildings and the billet yard (alongside the finishing mill), a distance of 1286 ft. For handling material on cars throughout the plant and adjacent yards 10,810 ft. of standard-gauge tracks are provided. The plant was designed by and built under the direction of E. H. Martin, who is now manager of the steel department of the Upson Nut Company.

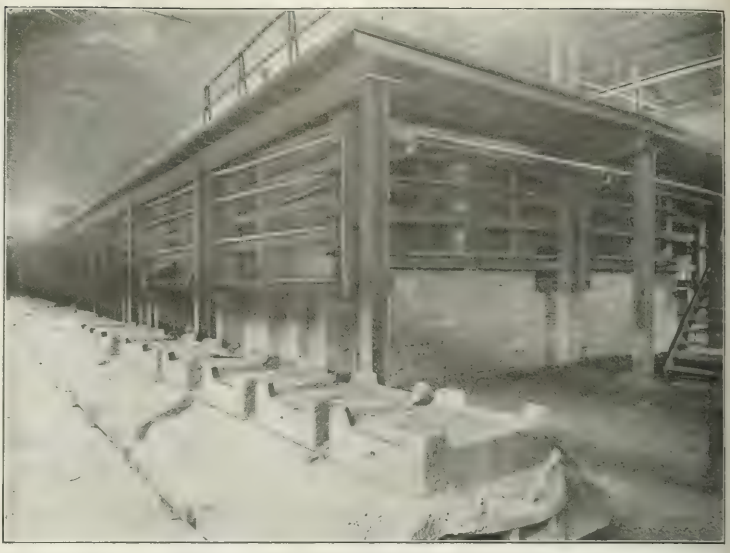


Fig. 4.—View of Soaking Pits from Point D, Fig. 2.

Open Hearth Furnaces

The open-hearth building is 408 ft. long and 130 ft. wide. Foundations are in for another furnace in addition to the four now in operation. The charging-floor bay is 59 ft. wide and the pouring floor 50 ft. wide. The furnaces are spaced at 72 ft. centers. The dimensions inside posts and side walls are 32 x 14 ft. The furnaces are equipped with the Knox water-cooled welded steel frames and doors, there being three charging doors and one small door at each end. The doors are hydraulically operated. The fuel is natural gas, but the plant is equipped for the use of producer gas should the natural gas supply run low. The gas valves are of the Schild reversing type, and the ordinary Siemens type of air valves is used, both made by the S. R. Smythe Company, Pittsburgh. This company built the open-hearth furnaces, the soaking pits and the reheating furnaces in the finishing mill.

To avoid interference with the crane on the charging side the gas mains, instead of being placed overhead, connect with the furnaces from beneath the charging floor. There being but one blast furnace, no mixer has been provided, though the advantage of an intermediate reservoir is recognized, and ultimately one may be built. A locomotive hauls the hot metal from the blast furnace in ladles of 40 tons capacity to the charging floor, where it is handled by a 40-ton ladle crane built by the Morgan Engineering Company, Alliance, Ohio. The hot metal is poured from the ladle into a pouring trough, through which it flows into the furnace. All of the crane equipment throughout the entire plant was furnished by the Morgan Engineering Company, with the exception of one small crane. The charging machine was also built by the Morgan Company.

The pouring floor is spanned by a 125-ton ladle crane with a 20-ton auxiliary. Each furnace is served by a 5-ton electrically operated jib crane, hung from the adjoining column. The pouring ladles have a capacity of 75 tons. A special feature in connection with the open-hearth furnaces is the arrangement for the removal of slag. The

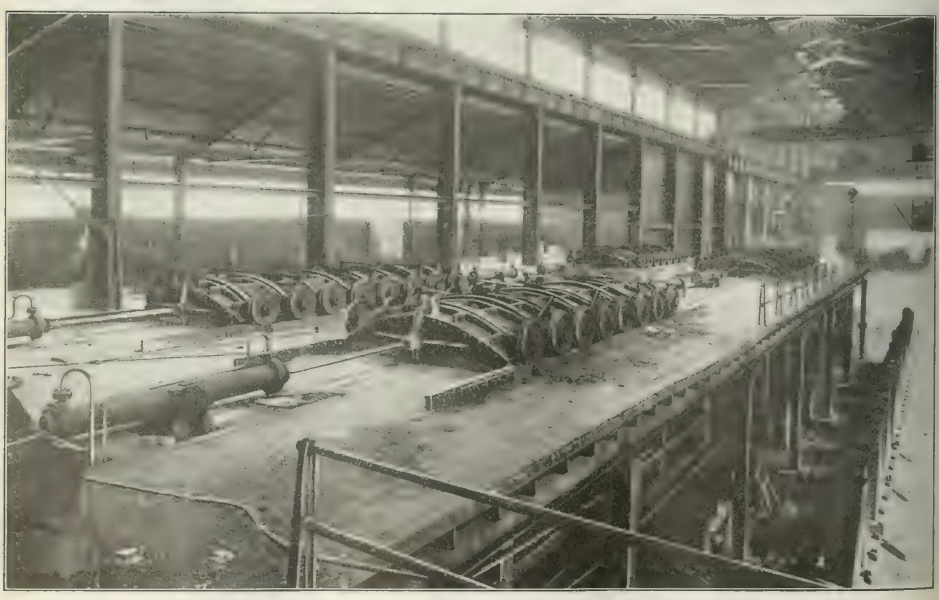


Fig. 3.—Top of Soaking Pits from Point C, Fig. 2.

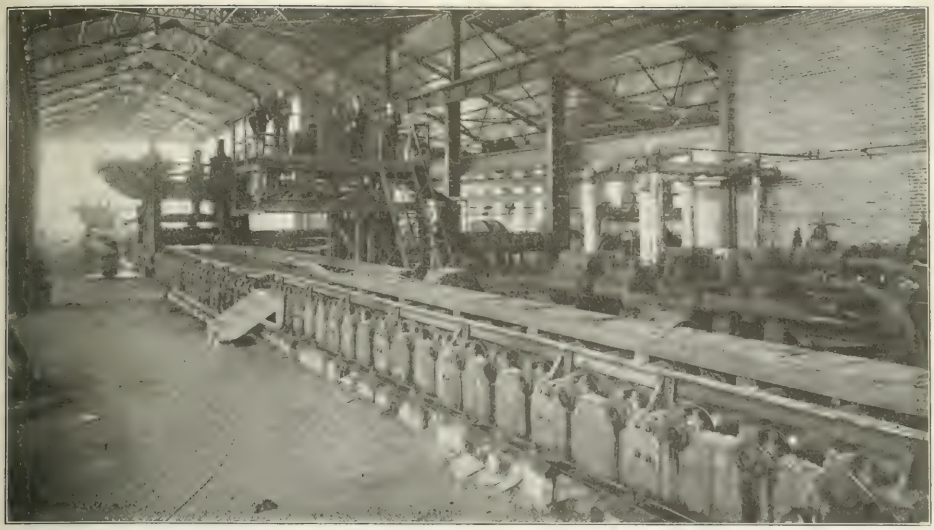


Fig. 5.—View from Point E, Fig. 2, of Approach to Blooming Mill.

overflow from the ladles runs through a spout into a Weimer slag pot at the side. It is also arranged that the primary slag from the furnaces can run into the slag pot if desired to tap off. The slag pots are lifted into Weimer cars and taken to the slag pile outside, where they are handled by a 10-ton crane. Here the slag is crushed and a portion of it is sent back to the blast furnace, while the remainder is thrown on the dump.

The Scrap Yard

The scrap yard, which is conveniently located with reference to the charging floor and on the same level, is 437 ft. long and 80 ft. wide. It is served by a 10-ton crane. A magnet is used for unloading scrap from the cars and for picking up material from the stock pile for the charging boxes. Three other magnets are used in different parts of the works. Three of the magnets were furnished by the Electric Controller & Mfg. Company, Cleveland, and one by the Cutler-Hammer Clutch Company, Milwaukee, Wis.

Gas Producers

Adjoining and running parallel to the open-hearth building on the west side is the gas house, 300 ft. long and 30 ft. wide. This is equipped with 11 Hughes mechanical gas producers, built by the Wellman-Seaver-Morgan Com-

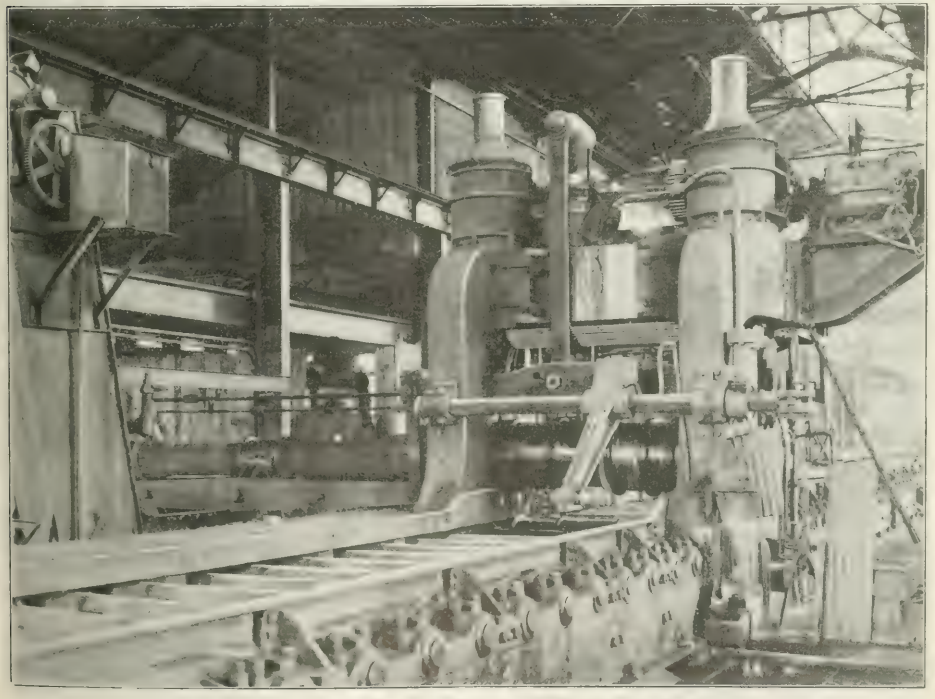


Fig. 6.—View from Point F, Fig. 2, at Blooming Mill, Showing Heat Number Stock

pany, Cleveland. Eight of the producers are for the open hearth plant, two for each furnace, and three are for the soaking-pit furnaces. Foundations are in for three additional producers.

Soaking Pit Building

The ingots are stripped in a yard adjoining the casting floor, under a 100-ton stripping crane, and from there they are taken to the soaking-pit building. This is 180 ft. long and 53 ft. wide. In addition to the four pit furnaces room is provided for a fifth and sixth furnace, to be built when needed. These furnaces are 20 x 7 ft. and each has a capacity of 22 17½ x 19-in. ingots. The doors are so arranged that only one can be open at a time. They are operated by hydraulic cylinders. The Schild gas valve and the modified Siemens air valve are used for controlling the supply of gas and air in the pit heating furnaces. While the pits are fired with natural gas, they are arranged to be fired with producer gas generated by three Hughes mechanical gas producers. A special feature of the soaking pits is that their tops are on the upper level, while the regenerators are all in the open on the lower level. This plan of erection permits the tapping of cinder from side spouts as well as from the bottom of the pits. It also affords better ventilation and makes the pits easier to get at. The above-ground construction of the soaking pits is shown in Figs. 3 and 4. The ingots are charged into the pits and drawn by a 4-motor, 15-ton crane.

The Blooming Mill

The blooming-mill building, which opens directly off the soaking-pit building, as shown in Fig. 5, is 176 ft. long and 53 ft. wide. The blooming mill, Fig. 6, is a 34-in two-high mill, driven by a 46 x 60-in. direct-connected reversing Mesta engine of 500 hp. The rolls are 29 in. diameter and 75 in. long between collars. Exhaust steam is taken from the engine through a Rateau generator into a mixed-pressure turbine to generate electrical power. The mill tables are motor driven. In general practice the mill takes a 17½ x 19-in. ingot 6 ft. long and rolls it down to a 4 x 4-in. billet. The billets pass to a runout table, which carries them to a Mesta shear, Fig. 7, with a capacity of 10 x 10-in. hot metal.

An interesting feature of the blooming mill is a mechanical device for stamping the heat numbers on the ingots as they leave the rolls. This is shown in Fig. 6. The general practice is to stamp billets by hand, although the blooming mill of one Eastern steel plant has an attachment for a similar purpose. The stamping device consists of a shaft attached to the housings of the mill, on which an arm oscillates, a stamp being set in the revolving head



Fig. 8.—Billet Conveyor from Point H, Fig. 2

of the arm. The arm is operated by a hydraulic cylinder. When the ingot starts through the rolls on the last pass the arm is brought down into the position shown in the illustration, and the head containing the stamp revolves on the ingot, as it passes out on the runout table, under a hydraulic pressure of 500 lb. The heat number is stamped on the metal every 10 in. A duplicate rotating head is provided so that a new number can be quickly substituted when the heat is changed. The arm can be moved back and forth on the shaft by means of a chain and lever attachment, so that the stamp will operate over any pass. The device was designed by L. G. Schmidt, who until recently was connected with the Upson Company.

Billet Conveyor

The billets, coming from the shear table of the blooming mill, are discharged on a billet conveyor, Fig. 8, which was designed and installed by the C. O. Bartlett & Snow Company. The billets are carried up and discharged in



Fig. 7.—View from Point G, Fig. 2, of Billet Shear, Conveyors and Billet Yard.

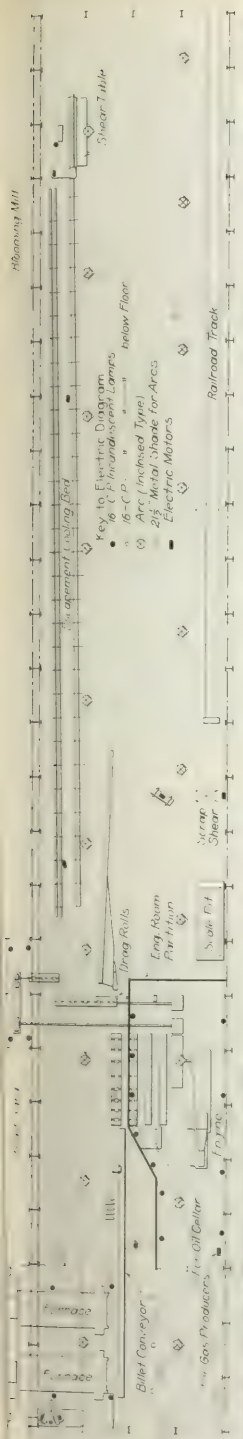


Fig. 10.—Plan of Merchant Mill, Including Lighting Arrangements.

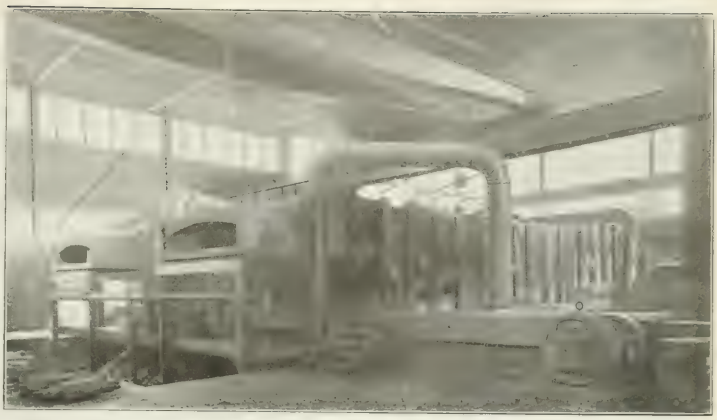


Fig. 11.—Reheating Furnaces from Point D, Fig. 2.

piles in the billet yard, along the full length of the conveyor, which is approximately 340 ft. Gates are arranged for discharging the billets to the continuous heating furnaces, where they are reheated for the merchant mill. A gate at the end of the conveyor is also provided for discharging the billets directly into railroad cars.

The conveyor consists of heavy cast-steel pans carried on 8-in. self-oiling rollers, and is driven by a 35-hp. motor. The steel framework is protected with heavy cast-iron pipes filled with concrete up to a hight of 6 ft. from the ground level, along the side of the conveyor where the billets and slabs are discharged. The conveyor has a speed of approximately 40 ft. per minute. It is provided with a sprinkling system for cooling the billets while they are being conveyed. The receiving end of the conveyor is provided with dead rolls, plates, etc., for the proper discharge of the billets from the shear table, which runs at a high speed, on the conveyor without injury to the latter.

The billet yard, which is alongside of the finishing mill, is 322 ft. long and 50 ft. wide. It is commanded by a 15-ton crane.

Scrap Conveyor

For handling the crop ends underneath the blooming mill shear a scrap conveyor was provided by the C. O. Bartlett & Snow Company. The crop ends fall from the shear through a chute upon an inclined conveyor, which carries them up and drops them into charging boxes so that they can be charged directly into the open-hearth furnaces. The conveyor consists of a heavy cast-steel apron, over which the crop ends are dragged by means of bars moved at either end by forged-steel roller chains. This conveyor is of very heavy construction and is driven by an electric motor.

The Finishing Mill

The finishing mill is housed in a building 598 ft. long and 85 ft. wide, the lower end of which adjoins the blooming mill building. A plan is given in Fig. 9. The mill is of the Morgan semi-continuous type designed and built by the Morgan Construction Company, Worcester, Mass. It finishes from 7/16 to 2-in. rounds and equivalent sections in squares and flats. The 4-in. billets are delivered to the back of the heating furnaces by the conveyor and crane in the billet yard and are placed on an inclined

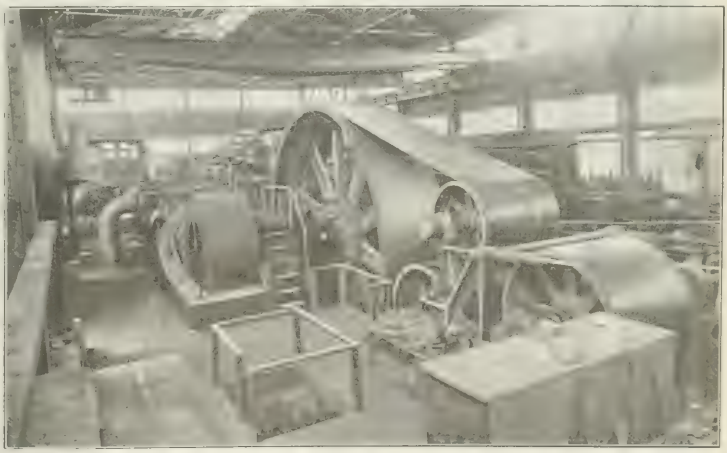




Fig. 12. View from Point L, Fig. 2, of Finishing Rolls and End of Cooling Bed.

platform, on which they are rolled down in front of a steam pusher. The pusher consists of two heavy swinging arms actuated by a steam cylinder under the platform.

The heating furnaces, two in number, Fig. 10, are 12 x 34 ft. and will receive billets 11 ft. long. The furnaces are of the Morgan regenerating type. The air blast is furnished by two Sturtevant fans, each driven by a self-contained motor. The furnaces are fired with natural gas. Billets are conveyed from the heating furnaces to the continuous mill on an electrically driven rolling table. This table is divided in the center by a hydraulic shear, which cuts the billets to the desired length, according to the size of bar to be rolled, the billets being cut to a length that will make bars 300 ft. long when they reach the cooling bed.

The conveyor delivers the billets to the first pass of the continuous roughing mill, which consists of eight stands of 14-in. rolls. Beyond the continuous train and at one side are four stands of 11½-in. finishing rolls of the Belgian type. Adjoining these latter stands are one pair of 7½-in. rolls and one stand of 8½-in. rolls, both of the Belgian type. Whether the metal is to be run through the last two stands depends on the sizes to be rolled.

The merchant mill is driven by a 32 x 56 x 60-in. C. & G. Cooper cross-compound condensing engine of 3000 hp., Fig. 11. The first eight stands are driven direct from the engine shaft through gears, each stand having a size of gear adjusted to the speed required. The other stands are belt driven from a fly-wheel, 22-ft. diameter, with a 62-in. face and weighing 132,000 lb.

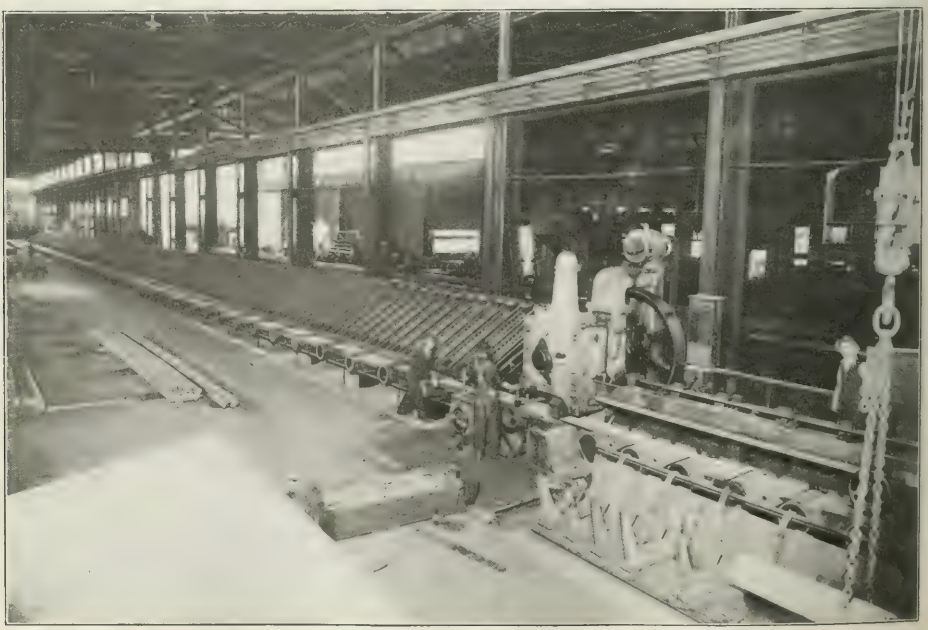


Fig. 13.—Cooling Bed and Bar Shear from Point M, Fig. 2.

The bar stock passes from the finishing trains to a cooling bed 300 ft. long of the Edwards inclined escapement type. Fig. 12 shows the finishing rolls and the end of the cooling bed. By the time the bar reaches the conveyor at the bottom of the bed it is thoroughly cooled. The conveyor carries the bars to a Morgan bar shear, Fig. 13 which cuts them in multiple to desired lengths. The shear is connected to a table with an adjustable gauge. The cut bars fall on the table back of the shear and an automatic pusher shoves them from the table to the scale platform. After being weighed they are taken from the scales in bundles by a crane. At the opposite side of the building is a Long & Allstatter No. 1½ shear, which is used for cutting short lengths. In case short bars are desired the bars are cut to a multiple of the desired length on the first shear and are resheared to the required length on the second shear. The bundled bars for shipment are loaded on cars on a depressed track, the car floor being level with the mill floor. Other equipment for handling stock in the merchant mill includes a bar twisting machine built by the United Engineering & Foundry Company, reels for coiling light bars and a Thomas Carlin & Son alligator shear for cutting scrap. In the finishing mill are two 15-ton cranes with an 85-ft. span.



Fig. 14.—Steel Bin for Ashes.



Fig. 15.—Rateau Regenerator at Right.



Fig. 16.—Coal Bins and Gas Pipes.

The Power Plant

The electric power plant is a General Electric installation throughout. The power building is 161 ft. long and 40 ft. wide. Electric power, which is used in the operation of the bolt and nut works as well as the steel plant, is developed by two 750-kw. turbo-generators of the Curtis type, both condensing. One is a high-pressure set that develops three-phase, 60-cycle current at 440 volts. The other is a mixed pressure set of the same rating. The voltage of the generators is held constant by means of a Tirrill regulator. Exhaust steam from the blooming mill engine is supplied to the mixed pressure set through a Rateau regenerator 7 ft. in diameter and 42 ft. long, Fig. 15. The plant is equipped with two 57-in. Helander condensers, built by the Mesta Machine Company. One condenser is used with the two turbines and the other with the finishing mill engine. Power for operating the bolt and nut works is furnished almost entirely by the mixed pressure set. Power for operating the cranes, the blooming mill table and the ore bridge is furnished by two 300-kw. motor generating sets, comprising synchronous motors with 250-volt generators. There is also a 15-kw. marine set and a 30-kw. motor generator set for excitation.

Condensing and service water is obtained by three motor-driven De Laval centrifugal pumps, two for a 100-ft. head and one for a 40-ft. head, all giving a capacity of 15,000,000 gal. in 24 hours. The pumps are driven by Westinghouse induction motors, two 150-hp. and one 50-hp. three-phase, type CCL.

The pumping station for service water is 30 x 25 ft. and is located near the river bank about 700 ft. from the steel plant. The pump house floor is 12 ft. above the river level and 23 ft. below the upper yard level. Water is taken from the river through a concrete tunnel. Two 150-hp. pumps deliver into a standpipe adjoining the boiler house for the supply of the boilers and for general cooling purposes. The water is both filtered and purified by a Dodge water purifier before being used in the boilers. Water for the two condensers is pumped direct by a 50-hp. pump.

Hydraulic power is supplied by two compound hydraulic steam pumps located in the blooming mill building. These pump against a head of 500-lb. per square inch. They were built by the Epping-Carpenter Company, Pittsburgh.

The boiler plant consists of eight units of 550 hp. each of Stirling boilers, which are equipped with McKenzie mechanical stokers. There is but one stack, 12 ft. diameter inside and 200 ft. high. The boiler house is 233 x 50 ft. Special attention has been given to the economical handling of coal and ashes. The coal is brought in on a trestle above the boiler house and is dumped into bins, Fig. 1, one bin of 50 tons capacity being provided for each boiler. From the bins it is automatically fed into the stokers.

The ashes are taken from the ash hoppers under the stokers in small industrial cars that are run out by hand through a tunnel underneath the stokers. These cars are discharged from the bottom into a pit, from which the ashes are elevated by a bucket elevator into a steel bin, Fig. 14, having a capacity of 50 tons. This bin is provided with two gates and chutes for discharging the ashes into standard railroad cars running on a track directly under the bin. The elevator and ash bin for the boiler house ash-handling plant were installed by the C. O. Bartlett & Snow Company, Cleveland, Ohio.

Coal-Handling Plant for Producers

The coal-handling plant for the producer house was furnished by the C. O. Bartlett & Snow Company. The coal drops into a track hopper from hopper bottom cars. The hopper is provided with a feeder of the plunger type for feeding the coal into a two-roll crusher having 24 x 24-in. rolls provided with steel toothed segments. It is arranged to by-pass the coal through the crusher by separating the rolls, in which case the feeder acts as a feeder to the elevator, which elevates the coal from the crusher to a steel flight conveyor. This conveyor distributes the coal in the hopper along the full length of the producer house. The hopper, or storage bin, has a capacity of 72 hours' supply of coal. This plant is capable of handling 50 tons per hour. The elevator, conveyor, crushers, etc., are operated by independent alternating-current motors.

The Pencoyd Works of the American Bridge Company, Pencoyd, Pa., put its 23-in. mill in operation last week and is now operating in all departments.

The Keystone furnace of the Reading Iron Company, Reading, Pa., which has been undergoing extensive repairs, will be ready to be blown in within a few weeks.

Box Column Drilling Machine

A New All-Geared Tool of the Sibley Machine Tool Company

Direct drive and the elimination of superfluous parts are the two special features of a new box column, all-geared drilling machine built by the Sibley Machine Tool Company, South Bend, Ind. The speed box is located on the top of the column and unnecessary parts that do not affect the range of the tool and its convenience of operation are said to have been eliminated. The machine has been designed with a view to convenience and it can be started and stopped, the feeds and speeds changed and the table adjusted without making it necessary for the operator to move from his position in front of the press. Fig. 1 is a general view of the new drill, while the remaining line engravings show various details. Fig. 2 is an elevation of the speed box. Fig. 3 shows front and side elevations of the feeding mechanism and Fig. 4 is a sectional elevation of the lower portion of the column showing the oil cup and tank of the lubricating system.

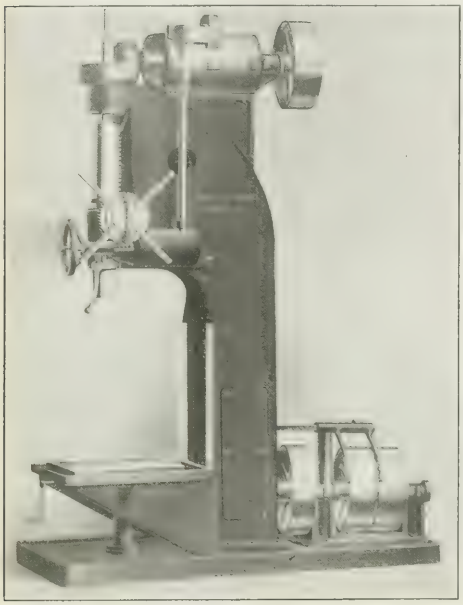


Fig. 1—The New Box Column All-Geared Drilling Machine Built by the Sibley Machine Tool Company, South Bend, Ind.

It will be noticed from Fig. 1 that the machine is heavy and compact and that there are no exposed moving parts. The speed box is located on the top of the column which is said to be the logical place, and this situation necessitates the use of only one pair of bevel gears to deliver power to the cutting tool. Eight speeds are available, and any of these can be selected instantly without the employment of intermediate change gears. The feed gears which are semi-steel are always in mesh and the changes are effected by an internal key. Six long split bushings having an ample bearing surface carry the main gear shafts which are of high carbon steel. The entire mechanism runs in an oil bath as illustrated in Fig. 2 to insure constant and thorough lubrication, and hoods at the ends of the bearings catch the surplus oil which returns to the gear case through large drains. The high carbon steel spindle and its graduated sleeve are finished by grinding. The spindle runs in two bronze bearings, equipped with self-oiling devices and a ball thrust collar is employed to take care of the thrust.

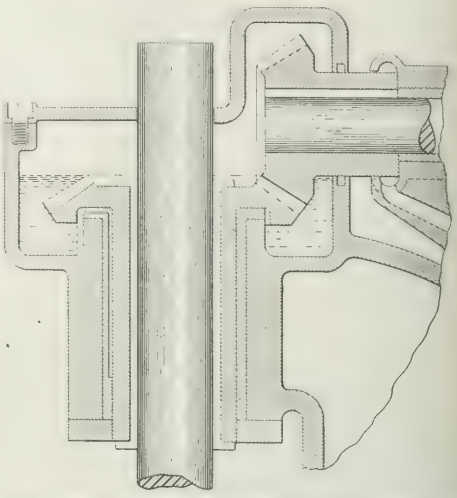


Fig. 2. Detail of the Speed Box Showing Bevel Gears Running in Oil.

The main driving shaft which rotates the spindle directly also drives the feed mechanism and the reduction gearing is of such a ratio that a powerful feed is obtained. There is only one pair of steel bevel gears in the entire feeding mechanism and these, together with the rest of the gears and the steel worm, are inclosed and run in an oil bath. Four changes and a neutral position are obtained by moving a small knob in the center of the hand wheel. An adjustable collar on the graduated spindle sleeve trips a latch when the desired depth of hole has been reached and the entire mechanism swings down from the worm gear on a large hinge pin. Front and side elevations of this mechanism are given in Fig. 3.

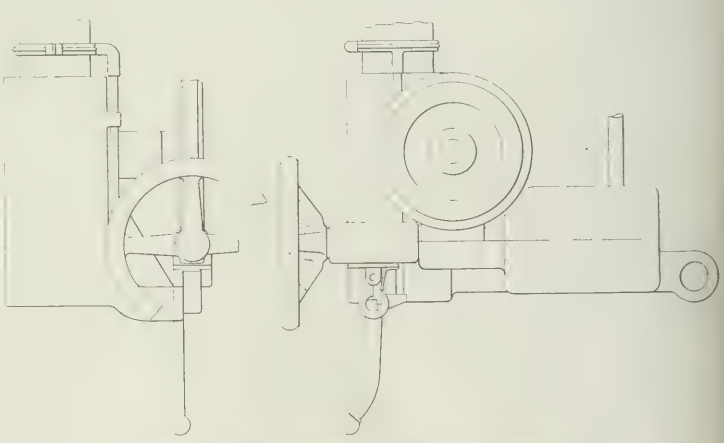


Fig. 3.—Front and Side Elevations of the Feed Mechanism

All the gears of the machine are inclosed and run in oil baths. The countershaft bearings, together with those

of the spindle, are equipped with self-oiling devices. One of the exclusive features of the machine is the pump and tank for supplying lubricant to the cutting tool. The tank, the pump, and all pipes are inclosed within the column as shown in Fig. 4 and the cutting compound returns to the tank through a drain in the table. In this way it is possible to keep the machine in neat condition and chips and dirt are prevented from getting into the compound.

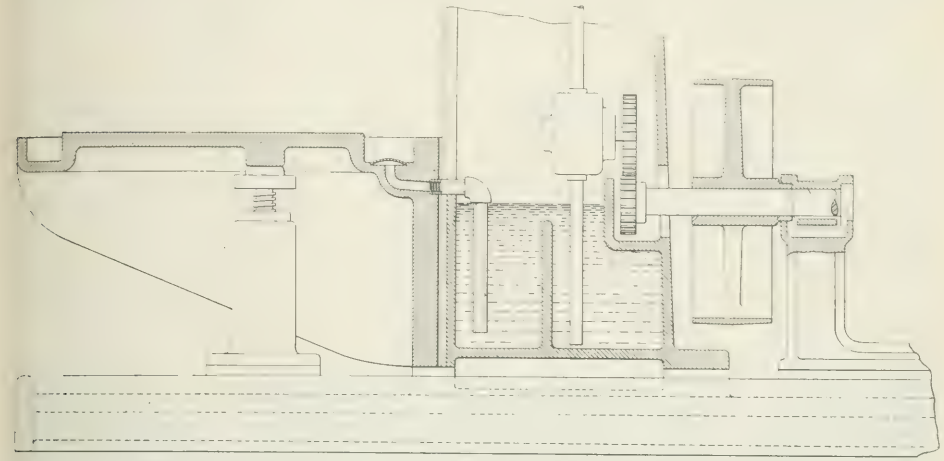


Fig. 4.—Sectional Elevation of the Lower Part of the Column Showing the Oil Pump and Tank.

The following table gives the principal dimensions and specifications of the drill:

Swing, in.	24
Maximum distance between spindle and table, in.	27
Vertical adjustment of spindle, in.	12
Number of feed changes	4
Minimum feed per revolution of spindle, in.	0.008
Maximum feed per revolution of spindle, in.	0.032
Diameter of smallest drill handled, in.	3/4
Diameter of largest drill handled, in.	1 3/4
Minimum diameter of spindle, in.	1 3/4
Diameter of spindle sleeve, in.	3 3/8
Morse taper of hole in spindle	No. 5
Working surface of table, in.	16 x 20
Vertical adjustment of table, in.	20
Diameter of pulleys, in.	13
Face width of pulleys, in.	4 1/2
Minimum spindle speed, r.p.m.	75
Maximum spindle speed, r.p.m.	480
Countershaft speed, r.p.m.	400
Over-all hight, in.	82
Weight, lb.	2200
Floor space required, in.	29 x 57

"Tests of Nickel-Steel Riveted Joints," by Arthur N. Talbot and Herbert F. Moore, has just been issued as Bulletin No. 49 of the Engineering Experiment Station of the University of Illinois. This bulletin describes tests of riveted joints of nickel-steel in tension and in alternated tension and compression. The slip of rivets and the strength of joints were determined. From the tests, the general conclusion is drawn that in riveted joints, designed on the basis of ultimate strength, the use of nickel-steel may be of advantage; but that in riveted joints designed on the basis of frictional hold of rivets, while it may be advantageous to use nickel-steel for the plates, rivets of ordinary steel seem to resist slip as well as rivets of nickel-steel. Copies of the bulletin may be obtained gratis upon application to W. F. M. Goss, director of the Engineering Experiment Station, Urbana, Ill.

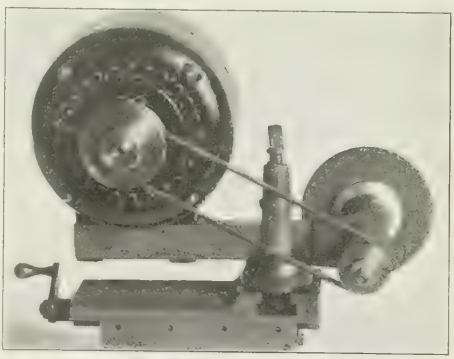
The Kuhner Engine Company, Oxford, Md., has just completed the erection of a machine shop, one story, 50 x 160 ft., of concrete construction. Later on the company will be in the market for miscellaneous equipment, including some machine tools, but is not yet ready to consider propositions.

The United States Cast Iron Pipe & Foundry Company is to move its offices, except the local sales office and executive committee rooms in the Empire Building, New York City, to its works at Burlington, N. J., about May, 1912.

Motor-Driven Lathe Center Grinder

A new motor-driven lathe center grinder has been placed on the market by the Willey Machine Company, Jeffersonville, Ind. The grinder is intended to be mounted on the compound rest of the lathe, the motor being placed on the bar projecting from the tool post and driving the emery wheel through a round belt. In this way it is possible to use a standard motor and run the wheel at a high speed.

To set the wheel at the proper angle for grinding the centers, the compound rest is swiveled and the screw feed



A Motor-Driven Grinder for Lathe Centers Made by the Willey Machine Company, Jeffersonville, Ind.

employed. The centers of lathes having plain rests can be ground by taking a number of cuts the width of the wheel in succession. For grinding milling cutters, reamers, etc., a tooth rest is furnished. Two sizes of tool are built having wheels 4 and 6 in. in diameter, and faces 1/4 and 7/8 in. wide.

At Newark, Wayne County, N. Y., November 14 and 15, a peremptory sale of the entire Mora automobile plant, including 60 cars, will be made to the highest bidder. The machinery of the plant has been assembled in the past three years and is therefore of modern type. The engine of the Mora car is a reproduction of the Packard engine, being one of the highest powered engines on the market. Bidders will be offered an opportunity of purchasing single cars, and arrangements will be made with the purchasers of the patterns to supply the owners of Mora cars with any parts desired.

Machine Shops of Rumely Tractor Works

Arrangement and Equipment of Machinery for Making and Erecting Oil-Pull Tractors at La Porte, Ind.

An unusually interesting group of manufacturing buildings, typifying modern ideas of factory arrangement and equipment, has been built by the M. Rumely Company, at La Porte, Ind., for the manufacture of its Oil-Pull tractors, which comprise self-contained power units especially for harvesting, soil cultivation and general farm work. The design of the foundry building and accessory departments was described at length in these columns in the issue of October 26 and it remains to outline the features of remaining parts of the works.

The relative location of the machine shop with reference to the foundry may be observed from the plan given in Fig. 1 in the last issue. Pending the construction of an erecting shop, a portion of the machine shop is now used for the assembling of the tractors. This association of machine and erecting floors is incidental, however, and the nature of it is indicated in the floor plan of the machine shop, Fig. 19. The present machine shop is 612 ft. long and 100 ft. wide with a 50-ft. longitudinal bay and a 25-ft. bay on each side. A 200-ft. addition to the machine shop is now in process of erection. A cross-section showing the simple style of structural design is presented in Fig. 16. In the main bay the clearance under the bottom truss chord is 44 ft. 7¾ in., which is enough higher than the side bay to give a monitor effect. A gallery is hung in each side bay the full length of the shop at a height of 15 ft. above the main floor. The building columns have a longitudinal spacing of 17 ft. The crane service in the center bay is supplied from a 5-ton Cleveland crane, one 5-ton and one 10-ton Pawling & Harnischfeger crane with 3-ton auxiliary. Jib cranes carrying ½ to 1½-ton hoists are hung from the columns over the heavy duty machines. Running down the center of the bay a broad gauge trucking track is laid and the industrial system from the foundry, steel and castings storage enters the shop under the crane.

The space on either side of the track in the center bay is used, as indicated in the floor plan, for the storage of parts for machining, the location of the various pieces being adjacent to the machines upon which they are to be finished. This is illustrated in Fig. 17. The rough castings—crankcases, engine cylinders, gears and flywheels—and the shaft forgings are brought into the shop at the end near the factory. The structural shapes and wheels for making up the tractor frames are brought down from the gallery where they are fabricated at the end adjacent to the erecting floor. Storage space for these parts is provided as illustrated in the floor plan. Along one side of the building and adjoining the assembling floor a general stock room 150 ft. long and the full width of the side bay, is located. On the same side nearer the central entrance door are testing and inspection facilities and the general shop office. On the opposite side of the shop is a tool room.



Fig. 15.—General View of the Machine Shop, with Its Balcony Floors

The demand for tractors has crowded the shop ahead of the establishment of a fixed routing of work, and certain of the machining operations as now performed are expedient rather than a matter of choice. For example, the crankcases have had to be machined on planers thus far and only recently has it been possible to arrange this work for machining on a milling machine. The floor plan, Fig. 19, with the accompanying key, illustrates the

general scheme in the placing of tools. The machines necessary to each of the operations involved in the complete finishing of a part are located so as to reduce move-

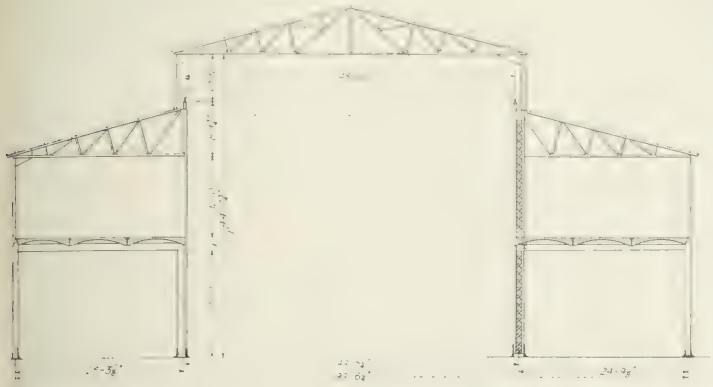


Fig. 16.—Cross Section of Machine Shop Indicating Structural Design

ment of the uncompleted work, lengthwise of the shop, to a minimum. The work moves forward and backward across the bay as illustrated by the placing of planers and lathes on both sides of the central bay. The tool drive is in part by individual motors, but more largely by group belt drive from motors.

The machining of the crankcases on a group of six Cincinnati planers, arranged three on each side of the main bay, has some interesting features. The nature of the work required may be understood from the view of this part shown in Fig. 18. The machining of all the necessary surfaces in the fewest possible operations is complicated by the fact that in one direction the plane of the base of the crankcase is not parallel with the top. The planers are equipped with four heads. The piece is first set up on its feet to be machined in the direction in which top and base are parallel, in which position the top face for the cover joint is machined. It is then turned 90 degrees and upside down and set in a jig sloped at the proper angle and two sides and the bases are machined. To machine the remaining two sides and the bearings inside it is necessary to again turn it right side up and set it in the jig. The bearings and the cylinder openings in the crankcase are finished on a C. C. Wormer Machinery Company two-spindle horizontal boring machine and the cover bolt holes are drilled on a group of radial drills including one Fosdick and three furnished by the Western Machine Tool Works, Holland, Mich.

The crankshaft bearing caps are planed up on a single-head Pond Machine Tool Company planer.

The heavy lathe group consisting of eight on one side of the main bay and three opposite is largely used for turning the various shafts including the crank shaft and master gear shaft. In machining the double throw crank shaft and journal bearings are turned on one lathe and the crank pins on another machine, rigged up with an offset center in the tail stock and a jig for offsetting the crank on the face plate. For facing the throw cranks, the shaft is set up on a Cincinnati planer fitted with two heads. With a tool on each side the opposite faces are finished in the same operation. The master gear shaft requires four long keys spaced at 90 degrees around the shaft. Instead of cutting keyways and fitting keys, the shaft is turned oversize for the length of the keys and then put on an Ingersoll milling machine which mills out the excess stock down to the shaft diameter

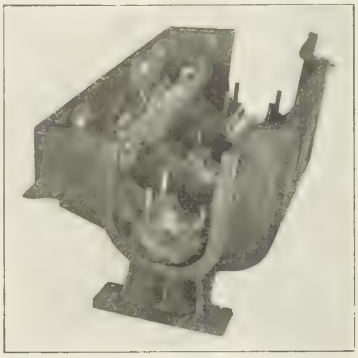


Fig. 18.—Engine Crank Case Indicating Required Machine Work

leaving four solid keys. Several types of lathes are installed including Lodge & Shipley geared head, Schumacher & Boye, Le Blond high speed and New Haven Mfg. Company heavy duty. These lathes are also used for turning some of the smaller pulleys and flywheels to relieve the group of four Niles-Bement-Pond horizontal boring mills on which most of the flywheels, gears and pulleys are turned up. For the shafts requiring a high finish, a 20 x 120-in. belt-driven Landis Tool Company precision grinder is available.

For boring and facing the engine cylinders three Barrett Boring Machine Company, Meadville, Pa., horizontal boring machines are provided and the complete machining of the cylinders, boring and facing, in one setting insures absolute alignment. These machines are also used for finishing the cast-iron hub spiders for the tractor wheels. The wheel spokes are bolted to the hub flange and a corresponding number of holes are drilled in one operation on two Baush Machine Tool Company vertical drilling



Fig. 17.—Crank Shaft Storage and General Storage of Parts in Center Bay.

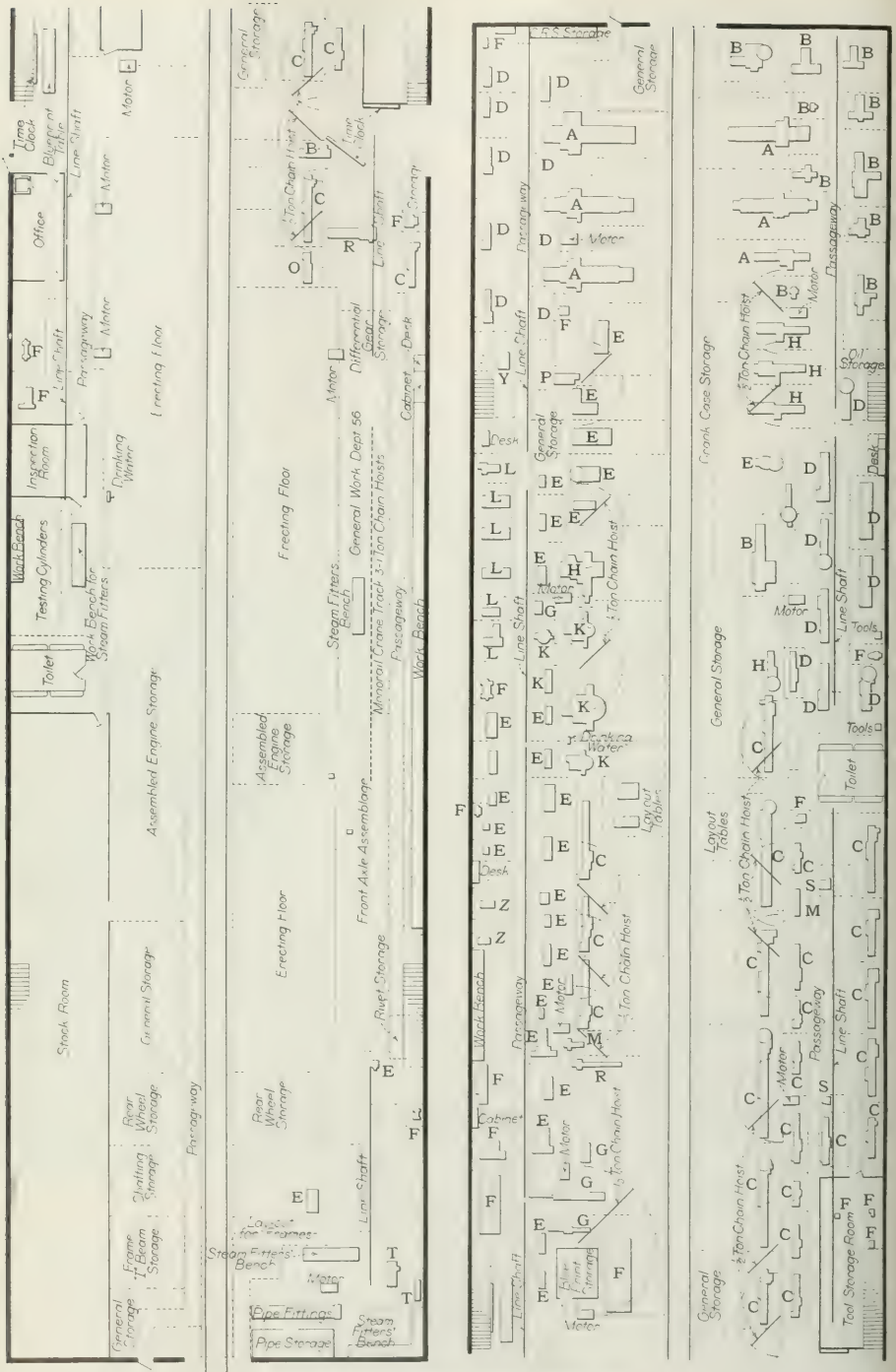


FIG. 10.—PLAN OF MAIN FLOOR OF PUMP MACHINE SHOP.

Key to Machines:

A. Planers.
B. Milling Machines.
C. Engine Lathes.
D. Turret Lathes and Screw Machines.
E. Drill Presses.
F. Grinders.
G. Reamers and Keyseating Machines.
H. Bolt Mills Horizontal.
K. Boring Mills Vertical.
L. Gear Cutters.
M. Centering Machines.
P. Punching and Shearing Machines.
Q. Saws.
R. Shapers.
K. Hydraulic Machinery.
S. Arbor Presses.
T. Pipe Machines.
U. Furnaces.
V. Rolls and Bending Machines.
W. Bolt Threaders.
Y. Auto. Tapper.

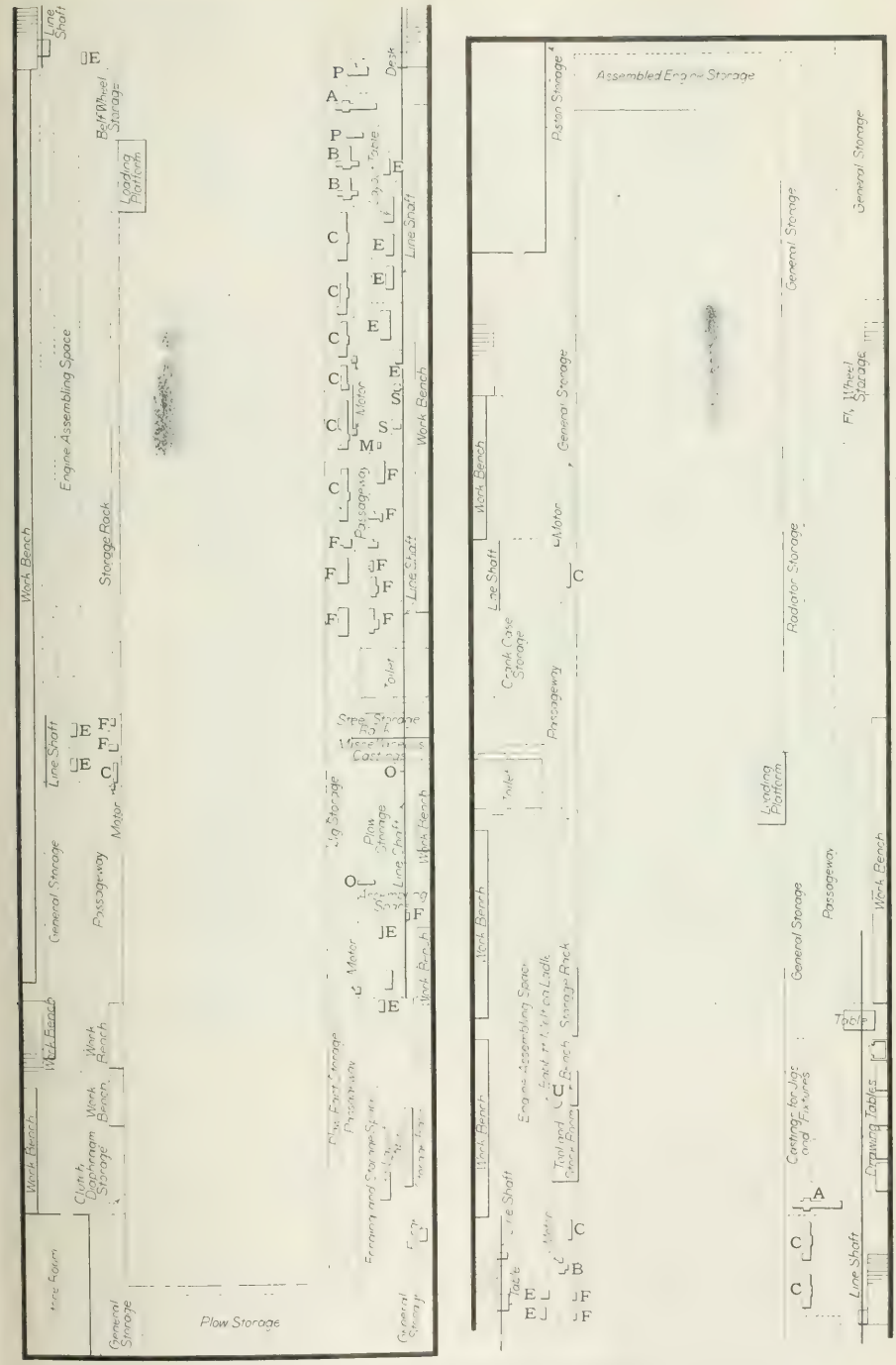


FIG 20.—PLAN OF GALESBURG PLANT OF THE MOLINE MACHINE SHOP.

Key to Machines:

A, Planers.
B, Milling Machines.
C, Engine Lathes.
D, Turret Lathes and Screw Machines.
E, Drill Presses.
F, Grinders.
G, Broaching and Keyseating Machines.
H, Barrel Mills Horizontal.
K, Boring Mills Vertical.
L, Gear Cutters.
M, Centering Machines.
N, Punching and Shearing Machines.
O, Saws.
P, Shapers.
R, Hydraulic Machinery.
S, Arbor Presses.
T, Pipe Machines.
U, Furnaces.
V, Rolls and Bending Machines.
Y, Bolt Threaders.
Z, Auto Tapper.

machines. One of these machines is belt driven and the other motor driven so that the enforced shutdown of both is unlikely to occur simultaneously.

In the northerly bay of the shop directly back of the planers are grouped milling machines of varied type and manufacture including Brown & Sharpe, Kempsmith, Milwaukee, Pratt & Whitney & Le Blond. On these machines a wide range of work is performed, requiring both vertical and horizontal spindles as well as plain and universal equipment. On an Ingersoll miller bearing caps are machined in multiple arrangement.



Fig. 21.—View Showing Particular Function of Overhanging Balcony Platform.

In the same bay back of the heavy lathes the boring and reaming of small gears and flywheels is handled on five Gisholt and five Steinle turret lathes. One of the latter lathes is equipped for turning up piston rings from a continuous cylindrical shell casting. The one tool for surfacing the casting to the piston ring diameter is followed by a cutting-off tool which automatically turns off the rings of desired width. For pressing on to the several shafts, the wheels and gears machined on the turrets, a Chas. E. Elmes Engineering Works hydraulic press is conveniently located. The engine pistons are machined on a patent head Lodge & Shipley lathe which is a part of a mixed group of medium size lathes arranged near the tool room. A No. 4 and No. 5 Greenerd arbor press are included in this group.

At the end of the opposite bay containing the group of planers a row of five Pratt & Whitney turret machines are installed for working up bar stock into studs and pins for various purposes. Small brackets are machined on a Smith & Mills shaper and the engine valve stems are finished two at a time on a double chuck bolt cutter. The gear-cutting machines are grouped in this bay and include a gear-cutter and a hobbing machine built by the Newark Gear Cutting Machine Company, a gear-generating machine of the type built by the Gleason Works, Rochester, N. Y., and four machines of the Gould & Eberhardt type. The miscellaneous drilling operations and some of the large work for which vertical boring mills are more adaptable, are performed on an adjoining group of machines.

In this section vertical boring mills of Colburn & Rogers type and several types of upright drills are installed including models built by the Cincinnati, Rockford, Hamilton, Aurora Tool Works, John B. Morris, and an Economic upright. Two Baker Bros., Toledo, tapping machines are used both for tapping the hole and for putting in the stud. The placing of studs with these machines can be made a comparatively rapid operation. For grinding cams and piston rings, two Norton grinders are used. Two LaPointe broaching and keyseating machines handle the major portion of the keyway cutting.

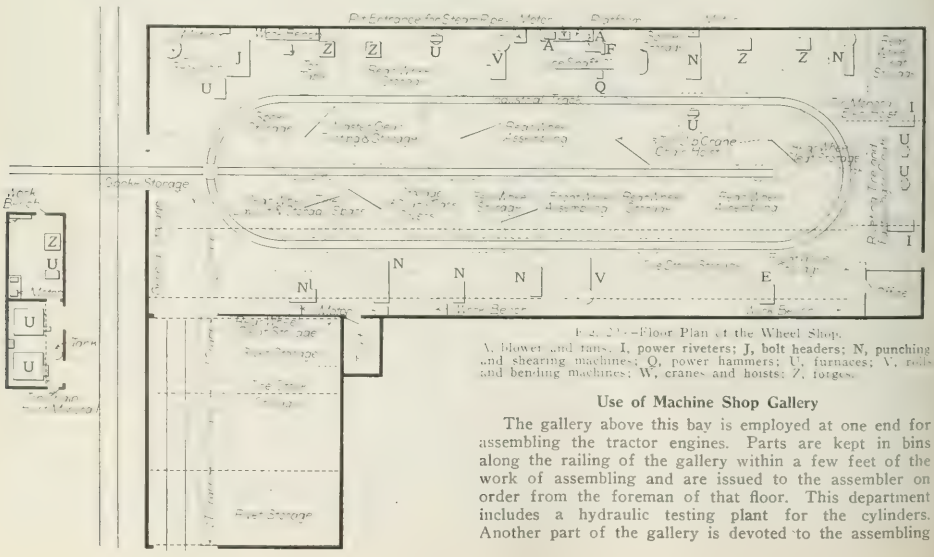


Fig. 22.—Floor Plan of the Wheel Shop.
V, blower and fans; I, power riveters; J, bolt headers; N, punching and shearing machines; Q, power hammers; U, furnaces; V, rolls and bending machines; W, cranes and hoists; Z, forges.

Use of Machine Shop Gallery

The gallery above this bay is employed at one end for assembling the tractor engines. Parts are kept in bins along the railing of the gallery within a few feet of the work of assembling and are issued to the assembler on order from the foreman of that floor. This department includes a hydraulic testing plant for the cylinders. Another part of the gallery is devoted to the assembling

of the crankshafts in the crankcases, the hand-fitting and bench work on the pistons and connecting rods taking up the gallery between the two assembling operations. An I-beam trolley with Cyclone and Triplex chain hoists traverses the gallery floor. One end of the opposite gallery is used for the storage, assembling, and painting of the tractor radiators; the other end for the fabrication of the structural framework. The middle section of this gallery is used for light machine work and tool grinding. For grinding the teeth on the cutting bar of the LaPointe keyseaters, a small motor with a grinder on its armature shaft is mounted on the tool post of a Cincinnati planer and with the bar set upon the planer table the operation becomes very simple. A Universal Boring Machine Company horizontal boring machine, two small Le Blond millers, several small lathes, a shaper and three grinders of Landis Diamond and Espen-Lucas types are used—in conjunction with bench equipment for fitting by hand—to prepare the various small parts of the engine for assembling in the other gallery. Bar stock for working up into small shafts and pins is handled in four Cleveland automatic machines arranged along the gallery railing. For setting keys in this small work and where a driving fit is required, Greenerd arbor presses are used. The handling of material from the main floor to the gallery, and vice versa, is provided for from two loading platforms overhanging from each gallery as illustrated in Fig. 21. The artificial lighting of the machine shop is by tungsten clusters.

The Wheel Shop

The wheel shop in which the tractor wheels are built up is a building 70 x 200 ft. with a rivet, spoke and tire steel storage annex 50 x 60 ft., as shown in the ground plan, Fig. 22. The storage room is spanned by three parallel 2-ton cranes and hand hoists under which a spur from the yard switch tracks enters at right angles, extending into the wheel shop so that material may be handled readily in and out of storage. In the wheel shop the machines are placed around the wall and in the center the material is handled and riveted. Over the punching and shearing machinery, a runway of 18 ft. span provides for the installation of four 1½-ton chain hoist travelers operating the entire length of the shop. Material is handled to and from these machines to the middle of the shop by three 3-ton jib cranes with an 11-ft. radius and three 1-ton jib cranes with 10-ft. radius arranged within an industrial track loop which connects this shop with the rest of the plant.

The wheel spokes are riveted to the rim through two flanges which are upset, complete in two operations, on an Acme Machinery Company bolt heading machine. The spokes are heated in a Rockwell oil furnace and the two bolt holes are punched simultaneously in a Long & Allstatter horizontal punch. The shearing and punching of the rims is performed on single Long & Allstatter guillotine shear and vertical open-gap punch. The spokes and tire treads are riveted on the tire, hot, in two Hanna Engineering Works gap riveters. One-ton electric hoist monorails hung over these riveters support the work. The rivets are heated in Tate-Jones oil burning furnaces. The general forge work is also done in this shop an[illegible] forges are used. Blast is supplied from a Connersville and a Buffalo Forge fan mounted overhead but delivering through a blast pipe laid under the floor.

The Power Plants

The power and boiler plants are located in a separate building which also provides for an electrical repair shop and store house. The power plant is practically a Nordberg installation. In consists of two 19 x 36 x 36-in. cross-compound units, direct connected to 500-kw direct-current Fort Wayne generators running at 120 r.p.m. The engines are equipped with the Nordberg patent long-range cut-off valve gear and are run condensing. A 32 x 32 x 14-in. duplex steam-driven jet condenser takes care of the two engine units, one of which is a spare, and also the 1500-cu. ft. air compressor. This compressor delivers air for the pneumatic riveting and chipping tools at 100 lb. pressure. The boiler plant consists of a battery of six hand-fired Atlas Engine Works boilers. A C. W. Hunt industrial track and car, coal and ash handling system is used.

The current from the main power plant is augmented by that generated in the tractor testing shed and illustrated in Fig. 23. In this shed a row of generators is mounted on an elevated platform of a length such that on either side eleven tractors may be tested simultaneously. The tractors are belted up to the generators and, as the tests are continuous for a minimum of 48 hr., a large aggregate of power is developed. The present shed is to be supplanted by a permanent testing plant more advantageously located and this location is to be used as a paint and inspection shed.



Fig. 23 View of Temporary Testing Shed of Rumely Tractor Works

The shop system in operation at this plant because of its rapid growth and comparative newness is, in many respects, in a formative state. An aggressiveness in the adoption of methods embodying as much of scientific management principles as the constructive period through which the plant is passing will permit is, however, quite apparent. In the foundry, where the use of machines makes possible the employment of a large proportion of unskilled labor, the work is departmentized with supervising instructors in each department available for routing work to the best advantage and for personal contact with each employee and his particular task. Analyses of production are made continuously and equitable piece rates are established for a large proportion of the work. Similar methods are in operation in the machine shop

The Morris 16-In. Lathe

A New Machine Tool Possessing Increased Productive Capacity

Ability to withstand the stress of heavy duty service, great driving power coupled with the requisite strength in the design of the details and the incorporation of a number of novel features tending to increase the productive capacity characterize a new 16-in. quick change engine lathe which has recently been brought out by the John B. Morris Machine Tool Company, Cincinnati, Ohio. Some of the special features of the new tool are the use of the back gears which are double frictions possessing ample pulling power on large diameters, an improved type of headstock reinforcement, the combination of a system of sliding gears with the regular cone and tumbler gears of the quick change mechanism, a new way of connecting this mechanism with the feed rod and the lead screw and the employment of an interesting arrangement of clutches in the apron for engaging the carriage feed. The power of the machine is apparent from the statement that it is capable of taking a ¼-in. cut in 0.60 per cent. carbon steel at a peripheral speed of 75 ft. per minute and a feed of ⅛ in. A view of the lathe is given in Fig. 1, while Figs. 2 and 3 illustrate some of the details, the former showing the arrangement of the gears in the quick change mechanism and the latter being a rear view of the apron.

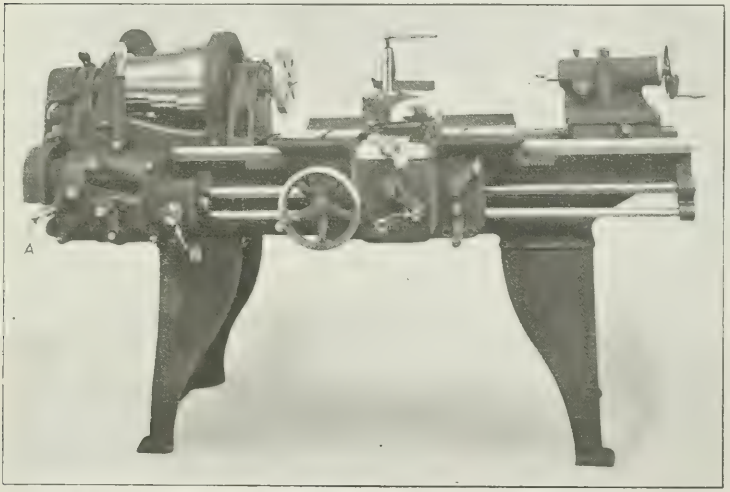


Fig. 1.—A New 16-In. Quick Change Engine Lathe Built by the John B. Morris Machine Tool Company, Cincinnati, Ohio.

The quick change gear mechanism illustrated in Fig. 2 consists of the usual cone and tumbler gear combined with a system of sliding gears which through the use of 21 gears enables 45 changes of feed or thread leads to be secured. The three levers shown on the front of the gear box, Fig. 1, control the changes in the feeds, which range from 2 to 60 threads per in., the one at the left, A, Fig. 1, being used to secure the extreme range. Steel is used throughout the machine in the construction of the feed gears which are exceptionally heavy for a tool of this kind, the lightest gear in the mechanism having the diametral pitch of 9. To render as wide a range of threads as can be obtained on a standard engine lathe available, the end of the lathe is fitted with the regular quadrant and quadrant gear for connection to change gears when it is necessary to secure a special thread. The manner of connecting the feed rod and the lead screw with the quick change gear mechanism is a new feature, the connection being accomplished by a sliding gear. The knurled handle B at the extreme right of the gear box controls the operation of this sliding gear and is arranged so that when the lead screw is in operation the feed rod is at rest and vice versa. This makes the quick change gear box a complete mechanism and enables it to be taken out of the lathe bed as shown in Fig. 2 without disturbing the adjustment of the lead screw or the feed rod.

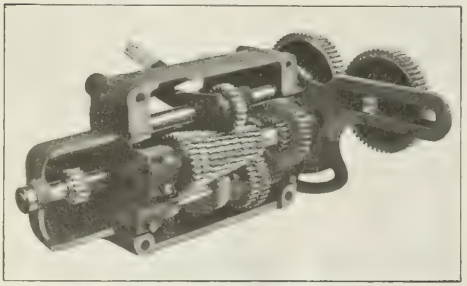


Fig. 2.—The Quick Change Gear Box Removed from the Lathe, Showing the Arrangement of the Gears.

A one-piece casting of box section with all studs and gears supported in bearings at either end is used for the apron, which is supplied with the usual bevel gear reversing mechanism. This interlocks with the half nut so that it is impossible to engage the lead screw and the feed rod at the same time. A novel arrangement of clutches is employed to overcome the difficulty usually encountered in engine lathes due to the inability of the operator to manipulate the revolving knurls for engaging the feeds on account of the high speed at which these parts revolve. The frictions, which are of the expanding ring type, are 5 in in diameter and are engaged by means of a toggle lever movement. These frictions are shifted by the single crank handle C, Fig. 1, on the front of the apron, and when this lever is thrown to the right the longitudinal feed is engaged, while if thrown to the left, it engages the cross feed. This lever being stationary at all times, it is possible for the operator to work up to a shoulder without the necessity of throwing out the feed and running the carriage up by hand, and in addition it is in a particularly convenient position for him to manipulate at all times. A positive stop makes it impossible to throw the lever from one feed to the other without first pulling the plunger pin in the handle out, thus making it impossible to pass directly from the longitudinal to the cross feed or vice versa.

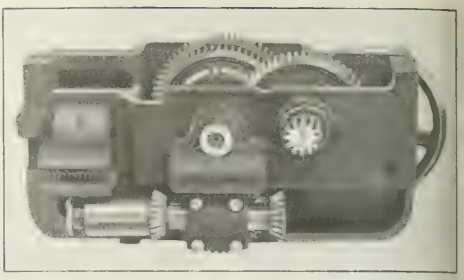


Fig. 3.—A Rear View of the Apron.

The carriage is carried on a V at the front and on a flat surface at the back of the bed, the bearing being 26½

in. long. A long flat clamp at the back and two taper gibs at the front which bear on the machined surface directly under the front V hold the carriage in position. It is pointed out that the location of these gibs makes it impossible for the carriage to lift or to climb the V and at the same time they will not throw the carriage out of alignment should they be improperly adjusted. The width of the front V is exceptionally large, being 1½ in. wide. The carriage bridge is wide and drops down in a deep double box section between the shears. It is not necessary to notch the bridge for clearance since the tailstock ways are dropped below those for the carriage, and in this way the carriage bridge is kept rigid. The compound rest is made heavy to withstand the strains imposed upon it by the modern high speed steels. A single bolt which is conveniently located with reference to the operator's position operates the clamping device which consists of a V-shape clamping ring of the same general construction as that employed in radial drills for clamping the arm to the column. The advantages of this arrangement are said to be a quick adjustment of the rest and keeping the bottom slide more rigid than it would be with the T slot turned in it.

The box section tailstock is of massive construction, and is arranged with the regular type of set-over for turning tapers. The spindle is 2 3/16 in. in diameter and is clamped by a taper plug similar to that used in the overarm of milling machines. Two large bolts which come up directly in front of and behind the tailstock spindle, and reach to the top of the tailstock where the nuts are in a convenient place for the operator are used to clamp the tailstock to the bed.

The bed which is strongly ribbed with cross girths is 11¾ in. deep and 14½ in. wide. The front girth which is located directly beneath the front spindle bearing extends to the top of the ways in order to resist the twisting strain on the bed at this point. It will be noticed from Fig. 1 that the legs are set in from the ends of the bed, thus shortening the span between the supports and making use of the familiar cantilever form of construction.

The swing of the lathe is 16½ in. over the shears and 10 in. over the carriage. The lathe when equipped with a 6-ft. bed will mount work 32 in. long between centers and weighs approximately 2100 lb.

New List Prices for Iron Body Gate Valves

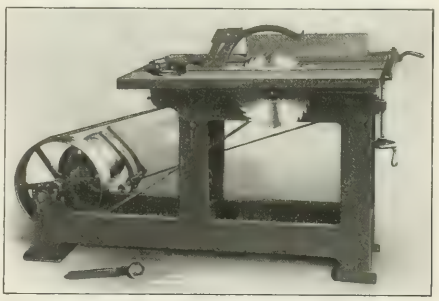
A new schedule of list prices covering iron body gate valves of standard, medium and extra heavy construction is about to be issued. A number of manufacturers have been striving for some time to eliminate the irregularities in the present list resulting from the development of improvements which placed certain types out of relation with other types. The new list is intended to become operative November 15, but the date may have to be extended. The new list is also calculated to take into account the changes which may be necessary to conform to the standard flange fittings which have been pretty generally standardized by a committee of the American Society of Mechanical Engineers. The last meeting to consider this subject on the part of the engineers' committee was scheduled to be held October 25. An adoption of the standards as now proposed would involve in some cases the use of flanges of larger diameter for certain sizes of fittings than is now made by a number of leading manufacturers. They will require also in some cases a larger number of bolts of larger diameter spaced on a bolt circle of larger diameter than is now in vogue. Elaborate tests, it is understood, have been made at Cornell University to ascertain the stresses set up in bolts used with flanges subjected to high static pressure. The tests were made to serve in establishing the standards.

Annealing arrangements in malleable iron foundries is the subject of a pamphlet printed for general distribution, describing mechanical handling devices which have enjoyed satisfactory use in a plant for a year and a half. Copies of the pamphlet can without doubt be obtained from George K. Hooper, Hooper-Falkenau Engineering Company, 165 Broadway, New York City. A plan and elevation of the installation is given to show how the material is handled by dropping the pots filled with scale on a grating under which is a conveyor which carries the scale to a point where it is screened and crushed, and the dust is removed.

The New Silver Saw Table

For shop and factory use and for the ordinary run of work a new saw table, for which the advantages of simplicity, efficiency and accuracy are claimed has been recently placed on the market by the Silver Mfg. Company, Salem, Ohio. This table is very similar to the one which was illustrated in *The Iron Age* September 9, 1909, but differs from it in having the saw stationary and the table adjustable, while in the earlier table the reverse was the case. A new design of frame is also used.

The table, which is slightly lighter than the one used on the other machine and weighs 50 lb. less, is hinged at the back of the frame on a 1-in. steel shaft, and the rise and the fall at the front is regulated by a screw and hand wheel. Iron strongly ribbed and planed perfectly smooth is used for the table, which has a working surface of 31 x 38 in. The cut-off or miter gauge slides in two grooves, extending one on each side of the saw line for the entire length of the table and enables a miter up to a maximum of 45 deg. either way to be cut. Grooving heads having a maximum width of 2 in. can be used, and when grooving operations are to be performed the wooden throat piece can be removed. The frame, which is of a new design, is cast in one solid piece and is both strong and well proportioned. The 1⅜-in. saw mandrel is 24 in. long and is carried in babbitted bearings 3½ in. long set in top of the solid frame, an arrangement which eliminates the vibrations of the saw. The journal caps are adjustable for wear and are held in place by four cap screws. The pulley on the mandrel



A New Type of Saw Table Built by the Silver Mfg. Company, Salem, Ohio.

has a 4⅞-in. face and is machine finished all over. Saws up to a maximum diameter of 14 in. can be used, although the regular diameter is 2 in. less. A 1-in. hole is cut in the saw for the mandrel to pass through. When it is desired to change the saw this can be easily done by raising the table and removing the throat piece. The projection of the saw above the table when level is 3 in. A clamping collar having a diameter of 4 in. is used.

Metal fences are used. A hand wheel holds the ripping fence rigidly in place at an angle of 45 deg. The maximum distance between this fence and the saw is 18 in., the desired width of the cut being indicated by a scale graduated in sixteenths. This fence can be clamped at any point or removed entirely to leave the table clear for special work. A safety guard is attached to a metal guard over the saw and serves to protect the operator from injury.

The belt shifter is within easy reach at the right of the operator and has a device to prevent the belt from creeping back from the position in which it is set. The countershaft is 30 in. long and is supported in bearings 5 in. long at the end of the solid frame. Tight and loose self-oiling pulleys, 10 in. in diameter and having a 5-in. face, are mounted on the countershaft and are designed to run at a speed of 650 r.p.m., which gives the saw a speed of 3000 r.p.m.

The regular equipment of the table includes a 12-in. saw of either the cut-off or rip type, a cut-off fence, a nut wrench for the mandrel and a safety guard. If desired a boring bit or chuck can be fitted to the rear end of the arbor and a special boring attachment can be furnished also.

Case Hardening of Steel*

New Industrial Process and Results from Its Use

The type of furnace which experience has proved to be best adapted to the case-hardening of small and medium-sized objects with the mixed case-hardening agent (granular carbon and carburizing gas) consists of cylindrical muffles arranged vertically and heated by producer gas. It is a double-muffle furnace provided with regenerators, of the kind constructed by C. M. Stein, of Paris, for the Sampierdarena Engineering Works, of G. Ansaldo, Armstrong & Co.

The parts of the apparatus particularly applied to the case-hardening process are represented in the drawing, which shows a section through the center of the vertical

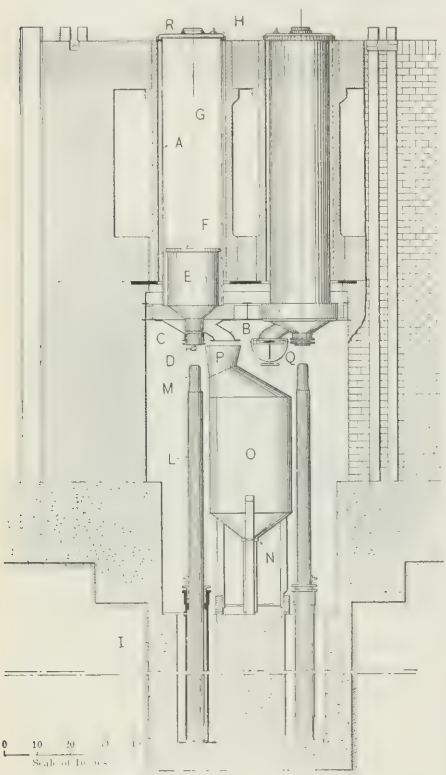


Fig. 1.—Section of Vertical Case Hardening Furnace.

muffles of the furnace with the accessory apparatus completely mounted. Inside each of the muffles of refractory material is placed a cylindrical retort of mild steel, A, the external diameter of which is about 0.4 to 0.8 in. less than the internal diameter of the muffle. Mannesmann seamless tubes serve very well for making the retorts, as they are easily obtainable in stock sizes up to 14 in. diameter. For retorts of larger diameter, as in the case of the furnace here represented, tubes welded by the autogenous process are used.

The retort is supported on a bottom flange attached to a frame fixed to the brickwork of the furnace. The arrangement which serves to hold the retort, whether it is being supported by the bottom flange or by the upper flange, H, intended to receive the cover, is such as to enable one retort to be replaced by another in a few minutes. To the bottom flange is attached a cast-iron funnel, B, closed at the bottom by a non-return valve Q.

*From a paper read before the October meeting of the Iron and Steel Institute at London, Eng.

The steel nozzle C, admitting the carburizing gas, passes through an opening in the side of the funnel, provided with a good-sized boss. The gas, which, as has been previously stated, may consist of carbon monoxide or dioxide, in a pure state or mixed with other gases, is introduced through the screwed tube D, and through the nozzle C. This latter is connected to the hollow cast-steel dish E, intended to support the pieces to be case-hardened by means of the disk F, consisting of a steel plate covered with refractory material.

The carbon monoxide, after passing through the hole bored axially in the nozzle C, is delivered into a small distributing device placed inside the dish E, from which it passes to the case-hardening chamber A, through a number of holes provided in the disk F. During case-hardening the dish E is supported upon a series of projections on the same lower flange to which the funnel B is attached. This ring has thus to sustain the entire weight of the dish E, the disk F, and any articles to be case-hardened which may be resting directly or indirectly on the disk.

Mode of Operating

In the case of spur wheels, the maximum diameter of which might be 4 to 6 in. less than the internal diameter of the retort, the first thing to be done is to unscrew the tube D; then by means of the plunger L, actuated by the hydraulic cylinder I, the whole of the parts C, E and F are lifted together, the blunt conical end of the plunger engaging with these as it rises. The plunger is cooled internally with water circulation, to avoid heating it in case it should accidentally remain raised inside the retort for too long a period. When the piston has reached the end of its stroke, the upper surface of the disk being now only about 12 in. below the cover of the retort, the cover is removed, and the wheels to be case-hardened are piled horizontally one on top of the other upon the disk. As the wheels are inserted one by one, the apparatus carrying the weighted portions gradually sinks, and the charge is complete when the apparatus has reached the lowest position indicated in the figure. In that position the last wheel charged should be at least 12 in. below the upper edge of the retort.

Generally, the articles to be case-hardened are charged hot at a temperature of about 1500 to 1650 deg. F., this being a matter of prime importance, as it affects most favorably both the quality of the product and the economy and regularity of the operation. For the preliminary heating of the pieces a small coal-fired muffle will serve, since the uniformity of temperature which can be obtained in such a furnace is quite sufficient for the purpose. If, however, the case-hardening furnace is not being worked to its fullest capacity, one of the vertical muffles may be used for the preliminary heating of the articles, while the case-hardening of the charge is proceeding in the other. In that case the best method of working the furnace is to use the muffles alternately, the one for case-hardening and the other for pre-heating the pieces.

As soon as the articles to be case-hardened have been inserted as described, the cover is placed on the retort and the bottom discharge pipe N, leading from the iron box O, is passed through the central opening in the cover. This box is full of the granular carbon still hot (generally at about 1650 deg. F.), which was discharged from the retort after use during the case-hardening operation last concluded. The box is easily swung above the muffles, being suspended by a tackle from a swinging arm. The outer walls of the box, notwithstanding that its contents of granular carbon are at a temperature of about 1800 deg. F., do not become heated above 400 to 500 deg. F. during the time required for the loading and unloading of the retort, even when working under the most unfavorable conditions.

The box O having been adjusted as indicated, the butterfly valve which closes the lower end of the opening N is gradually opened, and in a few seconds the whole of the free space in the retort surrounding the pieces is filled with glowing granular carbon. The author has previously pointed out that the hot granular carbon employed by him for case-hardening with his mixed medium constitutes a mass which, particularly at high temperatures, is endowed with a mobility comparable to that of a liquid. On this account it is able to penetrate simply by its own weight into all crevices among the articles to be case-hardened,

and between these and the walls of the retort. The filling up may be further assisted by means of iron rods introduced through holes in the cover and manipulated by the operator who stands on the furnace.

When the granular carbon has been filled in up to a level of ¾ or 1 in. below the upper edge of the retort

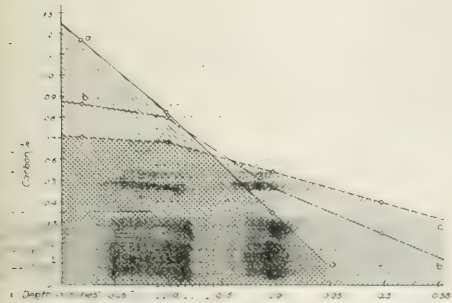


Fig. 2.—Diagram Showing Effect of Case Hardening.

the butterfly valve of the tube N is closed, the box O is lifted, the central opening of the cover is closed, the plunger L is lowered and the tube D is screwed into the nozzle C, through which the carbon monoxide or dioxide, pure or mixed with air, is admitted gradually to the distributor E and thence into the retort. In order to regulate the current of carbon monoxide an ordinary gas meter of the dry type is used. The case-hardening then proceeds without further trouble, the only thing that is necessary to be watched and regulated being the current of gas and the temperature.

For the observation of the temperature, an operation which, with the type of furnace described and when adjusted properly, does not often require to be made, an ordinary thermo-electric pyrometer is used by passing it through any one of the holes in the cover from time to time and inserting it into various parts of the mass of granular carbon. The temperature should be maintained quite constantly at a fixed point between 1650 and 2000 deg. F.

The gas issuing from the retort through the pipe fixed in the cover can be collected in a gasometer, and after suitable regeneration it will serve for further heats. The necessary length of the heating period can be determined with the greatest precision, and is dependent on the result which it is required to obtain. When the heating has proceeded long enough the current of carbon monoxide is shut off, the tube D is removed and the discharge of the retort is undertaken. Where results of a very special nature are not aimed at, the discharging operation begins

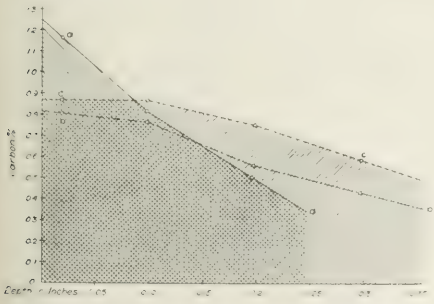


Fig. 3.—Diagram Showing Effect of Case Hardening.

by withdrawing the whole of the granular carbon at once, and removing it through the non-return valve Q in the box O, now placed underneath.

Where, however, exceptionally graduated case-hardening is required the specific action of the carbon monoxide is isolated during the last phase of the case-hardening from the direct action of the granular carbon. A quantity of the granulated carbon is drawn out from the retort. Only those parts of the case-hardened pieces are uncovered in which a well-graduated case-hardening is required. Sufficient solid carbon is retained in the retort to ensure the desired chemical equilibrium of the gas. The remainder of the carbon is removed from the retort after the second phase of the case-hardening with isolated carbon monoxide has proceeded long enough to obtain the desired results.

Results of Operation

In almost all cases occurring in the practical production of case-hardened pieces for machine construction, in which the carburized zone is seldom required to exceed 0.08 in. in thickness, the period of case-hardening never exceeds 2 hr., and may even be reduced to 1 hr., the time being reckoned from the moment of completing the charging operation to that at which discharging begins. It therefore includes the time necessary for bringing the temperature up to working point, which requires not more than 10 min., owing to the fact that both the solid carbon and the pieces are already hot when charged.

The foregoing particulars show that in practice, under ordinary working conditions, the time for a complete heat is less than 2½ hr., and since the weight of a charge, which retorts of the size shown in the accompanying sketch can conveniently hold, varies from a minimum of 220 lb. in exceptionally unfavorable cases to a maximum of over 1100 lb., it will be seen that the productive capacity of each retort ranges from a minimum of 1 ton to a maximum of 5 tons of case-hardened steel pieces per 24 hr.

The furnace with vertical muffles has distinct advantages in the speed of working for a given charge, simplicity of operating, and in the uniformity of the treatment of all the pieces forming the charge in the muffle. The clearance spaces left in the retort are reduced to a minimum.

In the accompanying tables are collated the results of estimations of the carbon in successive layers of a thickness of 0.02 in., obtained by case-hardening with the mixed agent, followed by exposure to the action of carbon monoxide isolated in the manner previously described. The material used was an ordinary mild steel of the following composition: Carbon, 0.12 per cent.; silicon, 0.06 per cent.; manganese, 0.47 per cent.; sulphur, 0.02 per cent.; phosphorus, 0.03 per cent.

[illegible]

No. of the Range of Single Layers Analyzed.	Distance from the Surface of the Central Portion of the Layer Analyzed. in.	Amount of Carbon in the Single Layers. First Determination. per Cent.	Second Determination. per Cent.	Mean. per Cent.
1	0.02	1.16	1.18	1.17
5	0.10	0.80	0.82	0.81
10	0.195	0.33	0.35	0.34

Both in the first series of experiments, as well as in the succeeding series, similar pieces of steel were subjectd simultaneously to each of the various treatments and under identical conditions, one piece of which was used after each operation for the purpose of making a quantitative determination of the carbon in the successive layers.

[illegible]

No. of the Range of Single Layers Analyzed.	Distance from the Surface of the Central Portion of the Layer Analyzed. in.	Amount of Carbon in the Single Layers. First Determination. per Cent.	Second Determination. per Cent.	Mean. per Cent.
1	0.02	0.82	0.86	0.85
5	0.10	0.76	0.80	0.78
10	0.195	0.46	0.46	0.46
15	0.29	0.23	0.27	0.25

[illegible]

No. of the Range of Single Layers Analyzed.	Distance from the Surface of the Central Portion of the Layer Analyzed. in.	Amount of Carbon in the Single Layers. First Determination. per Cent.	Second Determination. per Cent.	Mean. per Cent.
1	0.02	0.69	0.71	0.70
5	0.10	0.66	0.68	0.67
10	0.195	0.52	0.54	0.53
15	0.29	0.38	0.40	0.39

The numerical data contained in the three tables relating to the first series are graphically represented in Fig. 2.

In the second series the material used was a chromium nickel steel of the composition here given. This is a steel of the kind ordinarily used for Krupp armor-plates.

The author proposes later to present particulars relating to case-hardening to considerable depths as carried out upon this steel by the process described in the paper. The composition is: Carbon, 0.33 per cent.; silicon, 0.06 per cent.; manganese, 1.15 per cent.; sulphur, 0.02 per cent.; phosphorus, 0.015 per cent.; chromium, 1.50 per cent.; nickel, 3.17 per cent.



Fig. 4.—View of the Case Hardening Installation.

Second Series.

(a Case-Hardening for 10 Hr. at 2000 Deg. F. with the Mixed Agent.

No. of the Range of Single Layers Analyzed.	Distance from the Surface of the Central Portion of the Layer Analyzed, in.	Amount of Carbon in the Single Layers. First Determination, per Cent.	Second Determination, per Cent.	Mean, per Cent.
1	0.02	1.18	1.14	1.16
5	0.10	0.79	0.82	0.81
10	0.195	0.49	0.51	0.50

(b After Reheating the Same Carburized Zone for 5 Hr. at 2000 Deg. F. in Isolated Carbon Monoxide.

No. of the Range of Single Layers Analyzed.	Distance from the Surface of the Central Portion of the Layer Analyzed, in.	Amount of Carbon in the Single Layers. First Determination, per Cent.	Second Determination, per Cent.	Mean, per Cent.
1	0.02	0.80	0.81	0.80
5	0.10	0.76	0.78	0.77
10	0.195	0.58	0.58	0.58
15	0.29	0.45	0.44	0.45

(c After Reheating the Same Zones for a Further 5 Hr. (Total Reheating Period 10 Hr.) at 2000 deg. F. in Isolated Carbon Monoxide.

No. of the Range of Single Layers Analyzed.	Distance from the Surface of the Central Portion of the Layer Analyzed, in.	Amount of Carbon in the Single Layers. First Determination, per Cent.	Second Determination, per Cent.	Mean per Cent.
1	0.02	0.87	0.85	0.86
5	0.10	0.85	0.88	0.87
10	0.195	0.75	0.75	0.75
15	0.29	0.60	0.58	0.59

The numerical data contained in the three last tables, relating to the second series, are graphically represented in Fig. 3.

The principal causes of brittleness and peeling, which always occur in a greater or less degree in steels case-hardened by the ordinary process, are excessive concentration of carbon in the superficial zones of the case-hardened pieces, and the rapid diminution of the carbon in passing to the deeper layers. The ability to alter the form of the curves of case-hardening, as shown in the diagrams, suggests that case-hardening can also be successfully applied to those special steels on the exterior of which the ordinary process of case-hardening yields carburized zones, which are practically useless on account of their excessive brittleness.

Swedish Iron and Steel Statistics.

The following statistics of the production of coal, iron ore, pig iron, steel ingots and castings, and rolled iron and steel in Sweden in 1909 and 1910 are taken from the Bulletin of the American Iron and Steel Association, which states that it is indebted chiefly for them to General Director Richard Akerman, of Stockholm.

Products—Metric Tons.	1909.	1910.
Iron ore	3,886,060	5,552,678
Coal	246,808	302,786
Pig iron, including direct castings	444,764	603,939
Charcoal blooms from pig iron	120,669	151,713
Bessemer ingots and castings	63,351	97,583
Open-hearth ingots and castings	248,757	372,451
Crucible ingots and castings	927	2,215
Blister steel	391	212
Total steel	313,426	472,461
Bar iron and steel	155,736	204,955
Nail and wire rods and bands	92,647	137,465
Other shaped iron and steel bars	13,188	23,412
Plates, not including sheets	14,398	22,081
Tube blocks, hollow blooms, billets	31,201	43,690

The production in 1910 of first quality iron ore amounted to 4,938,044 metric tons. Of this total only 132,190 metric tons contained less than 50 per cent. of metallic iron, while 984,269 tons contained from 50 to 60 per cent. and 3,821,585 tons contained from 60 to 70 per cent. of metallic iron.

Of the total production of pig iron in 1910 598,660 metric tons were made in blast furnaces, and 890 tons of pig iron, 4,242 tons of ferrosilicon, and 147 tons of other ferroalloys were made in electric furnaces. Included in the total production in 1910 are 10,319 tons of castings made direct from blast furnaces.

Of the total production of steel ingots and castings in 1910 463,298 tons were ingots and 8951 tons were castings. Of the production of Bessemer ingots and castings 44,150 tons were acid Bessemer and 53,433 tons were basic Bessemer, and of the total production of open-hearth ingots and castings 146,510 tons were acid and 225,941 tons were basic. Included in the 2215 tons of crucible steel ingots and castings reported are 431 tons made by the crucible-electric process. In 1909 there were produced 591 tons of open-hearth electric steel. The production of steel ingots and castings by the acid Bessemer and acid open-hearth processes in 1910 amounted to 190,660 tons and by the basic Bessemer and basic open-hearth processes to 279,374 tons.

In 1910 the production of manganese ore amounted to 5752 metric tons, as compared with 5212 tons in 1909.

The question of rusty water in domestic water-heating services is of such wide-spread interest that an opportunity to get in convenient form some of the studies of experts on the subject is welcome, and so mention is made of the appearance of three bulletins from the National Tube Company, one giving a paper read before the American Society of Heating and Ventilating Engineers by the metallurgical engineer of the company, F. N. Speller, who made a detailed study of the corrosion of both wrought iron and steel pipes in bath houses of New York City; another containing an article by Ira H. Woolson on the same subject, and the third bulletin outlining the salient features, including illustrations, of the paper read by Mr. Speller before the American Society for Testing Materials showing how tubes are tested to insure the quality of the metal.

The Philadelphia Roll & Machine Company, Philadelphia, has adopted a trade mark, which it will place on all its castings to indicate that they are not made by the cupola process. Because of their strength and wearing qualities, the company designates its air furnace charcoal iron rolls and other castings as Near Steel.

The New Jersey Arnold Damper Company has begun the erection of a concrete steel and brick factory building on property recently acquired at Netcong, N. J. The work is to be done from the plans of Frank B. De Lara, industrial engineer in charge. The company will manufacture automatic flue dampers.

Baltimore Industrial Notes

J. Henry Miller, Inc., has the contract for the erection of the F. S. Royster Company's 12-story office building, in Norfolk, Va. Bids have gone in on the structural work, comprising some 1600 tons, but it is said that plans are to be revised and new bids for the structural work asked.

Proposals for the second section of the storm water drain in the bed of Jones' Fall, Baltimore, were opened by the Board of Awards, October 26, and referred to the Sewerage Commission for tabulation. Fisher & Corozza are said to be the lowest bidders. The section of work extends from Center street to Guilford avenue.

The Chesapeake Iron Works reports business in October as having been rather quiet. Few large contracts for structural steel work have been taken, although there has been considerable miscellaneous business both in structural and ornamental iron work placed on its order books. A recent small contract was closed for an addition to the Baltimore News Building.

Dietrich Brothers have completed the erection of the structural steel work for the new Baltimore Bargain House Building and are busy on the addition to the Maryland Casualty Building. New contracts for structural work have not been very heavy, although several covering buildings requiring from 100 to 200 tons have been taken. A very fair business in plain shapes and plates is reported. The major portion of recent orders come from local concerns.

The rail mill of the Maryland Steel Company at Sparrow's Point has been temporarily closed down owing to a shortage of orders for this year's delivery. The marine department of the works is comparatively busy and the outlook for further orders promising. Other departments of the plant are not very actively engaged.

It is stated that two-thirds of the property needed for the proposed commercial wharf and recreation pier, to be erected in East Baltimore, has been acquired. The estimated cost of this pier is $850,000, of which over half will apply on the construction.

The Water Department of the city will ask for proposals at an early date for the construction of a dam above Rock Raven Run. The dam is to be 192 ft. high, planned for a further increase to 230 ft., and will provide a reservoir for 3,000,000,000 gal, of water. A. F. Quick, City Hall, is the water engineer.

The Baltimore Bridge Company has taken a number of orders during the month, the majority of which have been for export. These include an extra span for the Santa Clara Bridge and a 42-ft. plate girder span for the Madre de Dios Bridge, as well as some general work in bridge material for the Northern Railway, Costa Rica. Material for a 20-stamp section mill will be furnished the Alban-Garey-Goldfield Company, Costa Rica, and material approximating 275 tons for cargo cranes on the Isthmus of Panama will be furnished the Maine Electric Company. Several small local contracts have also been taken, including material for an extension to the roof garden of the Emerson Hotel. The plant of the company is operating at full capacity.

The contract for sewerage screens for the municipal sewage disposal plant, for which bids were taken by the Board of Awards, under Sanitary Contract No. 77, has, it is stated, been awarded to the D'Olier Engineering Company, Philadelphia, Pa.

Wallace Stebbins & Sons note a good demand for mill and machine shop supplies, aggregate orders for which have been larger than during the previous month. They have also booked some good orders for heating equipment, including the installation of a plant in the House of the Good Shepherd, Baltimore. The installation of a complete heating system in the National Park Seminary has been completed. Power transmission equipment is reported fairly active.

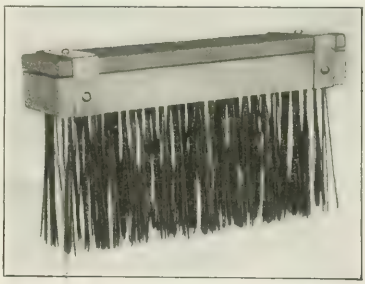
The Monarch Engineering & Mfg. Company notes sales of a moderate amount of special foundry equipment with the demand for oil-burning melting furnaces fairly good.

Crook-Kries & Co. note an increasing demand for heating and ventilating work, as well as power equipment. Recent contracts include three 72-in. x 16 ft. boilers for the Sherwood Distillery, Cockeysville, Md. An order has also been taken for the high and low pressure pipe and pipe fitting work for the high pressure pumping station for the city of Baltimore, while additional heating apparatus for the Southern Building, Washington, D. C., for which this company has the contract, has been ordered, owing to changes in plans of some portions of the building. This company will also install two 100 hp. boilers in the Women's Hospital, and extend the heating system of the Nurses' Home, of the same institution. A large amount of general work is reported, and the estimating department is very busy on a number of new propositions, some of which are of considerable size.

The T. C. Bashor Company has had a particularly active month in power equipment. Among orders received was one for a Skinner engine and a 50 K. W. Fort Wayne generator, direct connected, for the Hotel Caswell. Power equipment including three 150 hp. Bashor boilers, pumps, piping, etc., will be furnished the Industrial & Development Company, Sutton, W. Va. A 75 hp. Bashor boiler and a 50-hp. Nagle Corliss engine are being furnished the A. H. Colmary Company, Baltimore. Considerable tank work is under construction for the Davidson Chemical Company as well as for other purchasers. A fair inquiry for heating and ventilating work is reported, with considerable work of this character under contract. The demand for mill and machine shop supplies is said to be steadily increasing.

New Wire Brush

A new wire brush has been placed on the market by the F. & M. Company, 14 Greendale avenue, Worcester, Mass., employing flat wire together with extra wires at the ends to take brunt of the thrust. The flat wire is oil tempered to take a right-angle bend and each wire is formed before being put into the body. Hard wood, planed



A New Type of Flat Wire Brush Made by the F. & M. Company, Worcester, Mass.

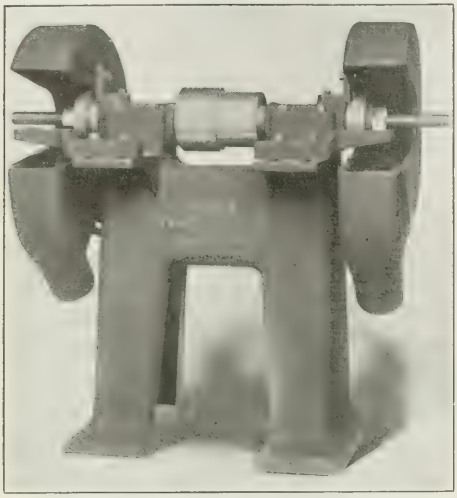
and smoothed, is used for the body and the cover, which are fastened together with two clamps of 5/8x3/64 in. steel forced over and locked on the under side. The ends of the brush on account of the hard service they get have each 24 extra wires to secure greater durability.

Cambria Axles and Forgings

The Cambria Steel Company, Johnstown, Pa., has issued a leather-bound catalogue of 78 pages which treats of steel axles for use on passenger cars, freight cars, tender trucks, engine trucks, driving trucks, electric trucks, street cars, mine cars, etc., and steel forgings intended for general purposes, including crank pins and piston rods. Considerable general information is given regarding the process used by the Cambria Steel Company in manufacturing its axles and forgings, the steel being treated by the Coffin process. The contents include the standard specifications for steel axles adopted in 1905 by the American Society for Testing Materials, also the standard specifications adopted in 1899 by the Master Car Builders' Association. In addition to the standard grades and Coffin-treated axles, the company has adopted a novel and very useful quality of steel axles which it has named Cambria Special, and these have proved very successful under the severe conditions of electric roads and have met with much favor on the largest rapid transit lines. Much space is given to sectional views showing principal dimensions of standard axles and to useful tables for engineers.

Ransom Emery Wheel Guard

Adjustability for wear and the taking care of dust exhaust pipe connections are two special features characterizing the new emery wheel guard that has been placed on the market by the Ransom Mfg. Company, Oshkosh, Wis. The guard is made of steel castings and combines in one the guard for the emery wheel and the exhaust pipe, thus complying with the legislative enact-



A New Guard for Emery Wheels Built by the Ransom Mfg. Company, Oshkosh, Wis.

ments of a number of states. To enable the operator to get close to the wheel at all times the guard is made adjustable so that it can be set back as the emery wheel wears down. When it is necessary to change the wheel this can be done without disturbing the main guard, as the upper plate is made removable.

The Pig Iron Production of Japan

Consul General Thomas Sammons, Yokohama, reports that an estimate supplied by the Department of Finance places the production of pig iron in Japan for 1910 at 71,963 tons, valued at $1,410,685. The average production for the past 10 years has been 50,030 tons, valued at $1,010,529, but the output has been increasing, the figures for 1901 having been 32,455 tons, valued at $602,196. In 1910 Japan imported pig iron to the extent of 117,227 tons, of which 98 per cent came from Great Britain, and less than one-tenth of 1 per cent from the United States. The remainder was divided between China, Sweden, and Germany, in that order. Japan also imports iron ores, 208,191 tons having been received in 1910, with a value of $579,819, of which China supplied 61 per cent, Korea 35 per cent, and Great Britain 3 per cent, the 1 per cent remaining coming from other countries.

Product of Titanium Steels This Year

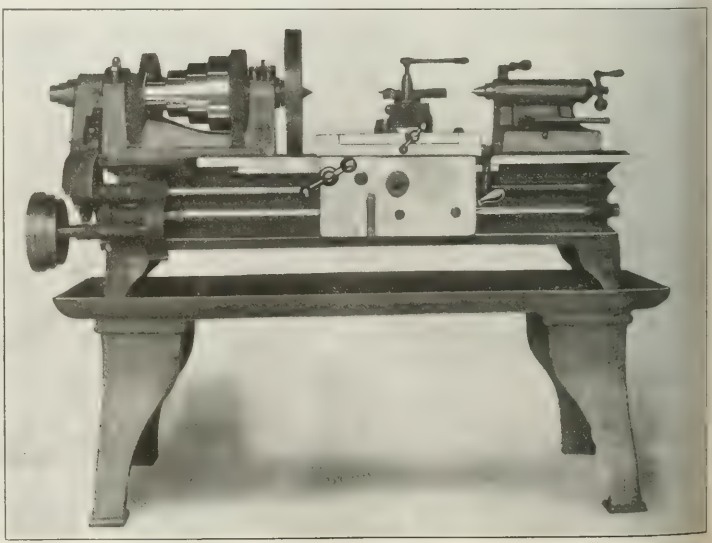
Charles V. Slocum, general sales agent of the Titanium Alloy Mfg. Company, Oliver Building, Pittsburgh, Pa., has made a computation of the exact quantity of titanium alloy ordered from his company by various consumers for the nine months ended October 1, 1911. The total, which excludes all Bessemer business, is 1,089,360 lbs. of alloy. If this alloy was used on the basis of one-half of one per cent. it would represent the manufacture of 108,936 net tons of basic and acid open-hearth steel and crucible steel. As no Bessemer steel business whatever is included, it is claimed that these figures prove conclusively that titanium is proportionately as popular in the higher grades of steel products as it is for rails. If the volume of business in these alloys continues as good to the end of the year a probable output of 150,000 tons of titanium steels will be attained entirely exclusive of Bessemer. The list of consumers comprises 70 names.

Western Steel Corporation Bankruptcy.—The Western Steel Corporation, whose affairs have been before the courts for several weeks, was adjudgd bankrupt at Seattle, Wash, October 27, by United States District Judge Cornelius H. Hanford. This action followed the filing of a stipulation signed by attorneys representing the steel company and the Metropolitan Trust Company of New York, the principal creditor, whereby the corporation withdrew all opposition to the proceedings.

The Miami 14-In. Lathe

A new lathe designed for use in manual training schools, automobile garages and manufacturing plants in general is being built by the Miami Valley Machine Tool Company, Dayton, Ohio. The tool is rated as a 14-in. lathe, with an actual swing of ¼ in. more. The spindle which has a 1 1/16-in. hole through it runs in large phosphor bronze bearings. The carriage has three bearings on the bed, all of which are hand scraped, the third bearing giving additional strength to the cross bridge which is heavily ribbed.

In the accompanying engraving the lathe is mounted on an oil pan supported by four legs, but if desired it can be furnished with straight legs without the oil pan. Other changes in the equipment of the tool include a draw-in spindle and collets and a taper attachment which enable the tool to be converted into a high grade lathe for use in the tool room.

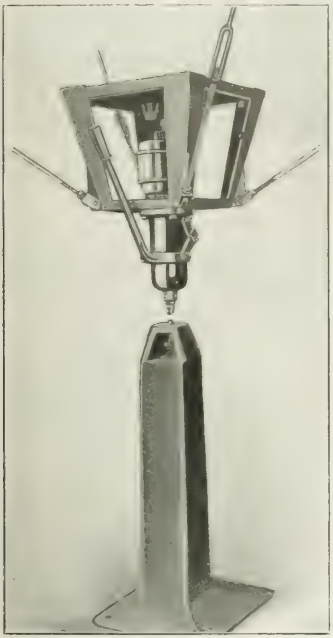


A New 14-In. Lathe for Manual Training Schools and Automobile Garages Built by the Miami Valley Machine Tool Company, Dayton, Ohio

Grant Motor-Driven Ceiling Riveter

For riveting automobile bodies, fenders and other light work of a bulky nature or irregular shape that could not formerly be handled in a machine easily, the Grant Mfg. & Machine Company, Bridgeport, Conn., has recently brought out a motor-driven ceiling rotary rivet spinning machine. The motor is direct connected to the spindle of the machine and is encased in a cast-iron frame, the whole being suspended from the ceiling by tie rods. The pedestal or anvil is bolted in position on the floor, thus permitting the work to be swung around in the most convenient position for riveting.

Unlike the regular single spindle rivet spinners, one of which was illustrated in *The Iron Age*, September 16, 1909,



A New Motor-Driven Ceiling Riveter Built by the Grant Mfg. & Machine Company, Bridgeport, Conn.

and the multiple-spindle machine, an illustrated description of which appeared in *The Iron Age*, January 26, 1911, this machine is operated by a hand lever that is placed in such a position as to be entirely out of the way of the article being riveted, while at the same time the operator has ready access to it. If desired the machine can be supplied with a belt drive in place of the motor drive illustrated.

A charcoal pig iron for chilled car wheels, chilled rolls and gas and steam cylinders has been announced by the Superior Charcoal Iron Company, Grand Rapids, Mich. In addition to the more common grades, it includes No. 3, No. 4, No. 5 and No. 6, and grades No. 3 and 4, it is stated, give transverse tests of 22,000 to 28,000 lbs. per sq. in. and a tensile strength of 30,000 to 38,000 lbs. The grade known as high No. 3 averages 0.56 per cent silicon; the low No. 4 contains 0.44 per cent silicon, and high No. 4 contains 0.35 per cent silicon. It is explained that with the special iron and selected old wheels that have stood service it is possible to produce car wheels of sufficient strength to exceed greatly all required tests without the use of ferromanganese.

C. W. Leavitt & Co., 30 Church street, New York, announce that they are representing the H. H. brand of French antimony, guaranteed 99 per cent. This brand is made by one of the largest refiners in the world, having control of its own mines.

New Standard Gear Cutters

The gear cutting machines shown in the illustrations are new types which have just been brought out by the Standard Mfg. Company, Bridgeport, Conn. They are adaptations of the company's standard machines and are intended for a class of work that is so standard in character as to

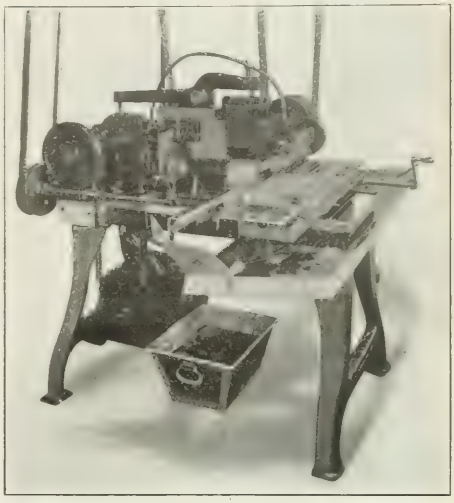


Fig. 1.—A Rack Cutter Recently Developed by the Standard Mfg. Company, Bridgeport, Conn.

take them out of the special class. One, a rack cutter, is illustrated in Fig. 1 and the other, which is a worm cutter, is shown in Fig. 2.

The rack cutting machine, Fig. 1, has a table equipped with power feed and an automatic index and a hand return. It will take work up to 8 in. in width, and will automatically cut racks to 22½ in. in length, and longer if the work is reset to the feed. In common with other machines of the line it will cut both plain and irregular faces. The slide carrying the cutter spindle rises as soon as the cut is taken and clears the blank on the return stroke, indexing at the same time. The travel of the slide which carries the cutter is controlled by an interchangeable cam on the cam shaft, making it easy to change to any length of cut. An automatic stop renders the mechanism idle on the completion of the piece.

The worm cutter as shown in Fig. 2 is arranged to cut a double pitch worm. A master worm in the master worm

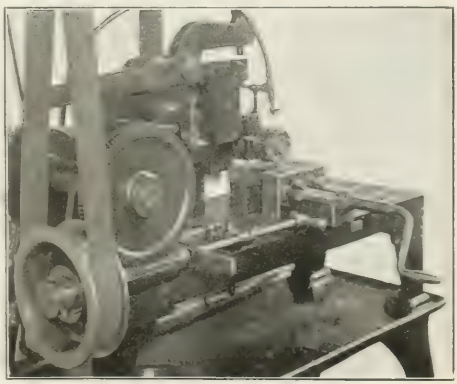


Fig. 2.—The New Worm Gear Cutter.

hub of the feed mechanism controls the course of the work against the cutter, and the amount of feed is governed by the number of revolutions of the work.

Freight Handling in Small Shipments

The Pennsylvania Railroad furnishes the following interesting account of the manner in which it distributes small shipments of merchandise:

It would be too much to suppose that bulky freight will ever be handled as rapidly as are the mails, but through the perfection of methods and facilities—the employment of scientific management in transfer yards—the railroads are aiming toward such rapidity, and at the same time working wonders in economy. A clerical force of 210 and a warehouse force of 249 are kept busy at the transfer station of the Pennsylvania Railroad at Waverly, N. J., where last year over 100,000 cars of freight, in less than solid carload lots, were received, and their contents, sorted into solid carload lots, sent to hundreds of destinations. The result of their labor was a saving of 11,352 cars in the performance of the business, and an incalculable amount of time to thousands of shippers. This station is situated between Newark and Elizabeth. Into it cars are fed from 13 transportation companies, two terminal companies and the docks of New York City, also freight arising in Jersey City and Newark. During rush seasons as many as 700 cars are taken care of in a day.

As an illustration of the working of the transfer system, suppose a car loaded with freight originated in a small town in New York State destined for 15 other towns throughout the United States. The car would be rushed to Waverly, where its contents would be consolidated with other shipments to the same 15 towns, or to another transfer near those that were too small to command a solid car from Waverly. The freight that is handled in this way is called preference freight, and the trains that carry it run on schedule with the same precision and almost the same speed as passenger trains. The transfer platforms at Waverly afford standing room for 212 cars. On certain tracks the outbound cars are lined up empty. The loaded inbound cars are ranged on the opposite sides of the platforms and their contents are transferred to about 250 cars which are dispatched directly to 121 different points daily.

The system is worked out so well that the transferring is carried on with the greatest precision and celerity. Beside each outgoing car there is a number and a box containing tickets bearing the same number. The checkers in charge of unloading are provided with waybills for each piece of freight. They also have a chart showing the positions of the outgoing cars and their numbers, which represent the places they are to be sent. As the articles are removed they are checked off on the waybills. The checker then turns each piece over to a truckman together with a slip of paper on which the number of the car that is to receive it is written in pencil. The latter, when he has deposited it, takes one of the tickets out of the box. This should bear the same number as the one given to him by the checker and he is required to bring them both back to show that he has made his delivery at the right place. Waybills are made out for the new cars, which are pulled out to make room for others as fast as they are complete.

This is the work that is performed by the warehouse force, but the clerical end of the business is far more complicated. Besides the waybills, of which 3500 are sometimes made in a day by a force of 52 clerks, there is the accounting to be done. Divisions of earnings and settlements must be made with 15 outside companies. The method of keeping track of what the company owes to and what is owed by the other companies for handling freight is similar to that employed in a clearing house. In addition to the warehouse force, which is occupied directly with the transfer of freight, eight distinct departments are required to look after the details of the transference. There are a Pennsylvania Railroad accounting department, a Union Line accounting department, separate departments for east and westbound waybills and card records, a tracing department and a transfer record department.

The Waverly transfer was opened in September, 1904. At first it was planned to handle only the freight from the New York, New Haven & Hartford and the Long Island railroads. Its capacity was 96 cars. After six weeks it became necessary to employ day and night shifts to keep up with the business. The station was soon enlarged to accommodate 200 cars, and later its capacity was increased to 212. Illustrative of the transfer's rapid growth is the fact that the tonnage for less than carload lots has increased nearly twofold from 1905 to 1910, and the total tonnage has more than doubled in the same period. The number of inbound and outbound cars has grown in like proportion. The difference between the number of inbound and the number of outbound cars represents the saving made by handling the freight in solid carload lots. This difference amounted to 10,872 cars in 1905 and 11,352 in 1910.

That greater economy in the matter of car mileage is being generally practiced by the railroads is indicated by the increase in average load per car received at the transfer, which was from 5.67 tons in 1905 to 6.33 tons in 1910. Of course these figures also bear some relation to increased business, which makes it possible to load more heavily. From the beginning there has been a great saving in all mileage at the transfer, the outgoing cars carrying an average load of 6.44 tons in 1905 and 7.42 tons in 1910.

Canton Industrial Notes

Manufacturers of sheet metal products in Canton, Ohio, report a moderate demand for ceilings, roofing and other products used in building lines and a good demand for metal filing cases and furniture. Some of the manufacturers are devoting more attention to the latter lines than formerly. The demand for sheet metal forming machinery is quite active. The increased demand for special high grade sheets for automobile stock, metal furniture and other products has led some of the Ohio sheet mills to specialize more on sheet specialties and some mill extensions are being planned to provide a larger output in high grade sheets for special purposes.

The Canton Sheet Steel Company will enlarge its plant by the erection of an extension 60 x 140 ft. to its mill building and an addition 40 x 150 ft. to its wareroom. A new hot mill will be installed and four stands of cold mills, making six hot mills in the plant and 12 cold rolls. The new train will be motor driven. A motor of about 500 hp. will be installed for that purpose. The new equipment will be provided for cold rolling fine finished sheets for metal furniture and automobile stock. It is expected that the additional capacity will be ready for operation by January 1.

The Canton Mfg. Company has received a $15,000 contract for installing its fireproof metal windows in four buildings of the new plant of the Larkin Company, Buffalo, N. Y.

The Union Metal Mfg. Company is building an extensive addition to its plant to be used in the manufacture of a new line of products to be brought out shortly. These will include inside fixtures for houses, store fixtures, interior columns for houses, churches and lodge rooms, lighting fixtures for houses, window trimming fixtures for stores, ornamental lamp fixtures for entrances to buildings and kindred ornamental metal products in enameled steel and bronze. Ovens for baking enamel and lacquer will be installed in the plant extension.

The Berger Mfg. Company recently acquired a 130-acre site adjoining its plant, on which it expects to erect a blast furnace and steel plant, the purpose being to supply the adjoining plant of the Stark Rolling Mill Company with sheet bars. According to the present plans the erection of the new plant will not be started until 1913.

The Canton Foundry & Machine Company has recently added some new equipment and during the coming year it expects to double the capacity of its machinery department. The company reports a good demand for sheet metal forming machinery. Shipments have been made recently to Manila, Australia and Germany, and some other foreign inquiries are pending. Its machinery department is being operated overtime.

The Canton Corrugating Company, recently incorporated, will build a plant for corrugating sheets and for the manufacture of roofing, siding and other sheet metal products. A site for a plant has been secured near the plant of the Canton Sheet Steel Company. C. A. Irwin, of the latter company, and Wheeling, W. Va., men are understood to be interested in the new company.

The purchase of the plant of the Royal Foundry Company, Canton, by Carl E. Geschwind and Henry Greenwald, Youngstown, Ohio, is announced. The building may be sold and the equipment moved to Youngstown.

Oldham Riveting Hammer

A novel valve construction and impossibility of short-stroking are two special features of a new longstroke riveting hammer recently developed by George Oldham & Son Company, Frankford, Philadelphia, Pa. Fig. 1 shows the exterior of the hammer, while Fig. 2 is a sectional view showing the valve construction.

The valve mechanism, which is located entirely at one end of the cylinder, allows for a heavy valve with large bearing surfaces. The cup-shaped valve moves in the same direction as the piston or the hammer, which, it is explained, is different from most riveters, since the valve

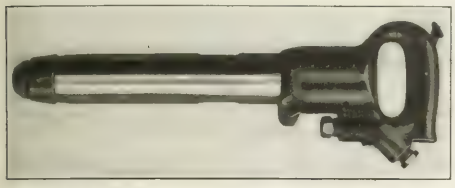


Fig. 1.—The Longstroke Riveting Hammer Made by George Oldham & Son Company, Frankford, Philadelphia, Pa.

and the piston usually move in opposite directions. It is pointed out that as a result air will not leak into the compression chamber, and pressure will not be dissipated, thus causing the tool to short stroke, due to the valve changing the direction of its motion earlier than it should.

When the hammer is traveling backward the valve is held down by its own weight together with the air pressure on a large area in the rear of the valve, the combination tending to prevent the valve from reversing earlier than it should. The piston is shot back with enough force to overcome the weight of the hammer and the pressure of air on the valve, and when the piston enters the latter it will trap a body of air within the imperforate cup-shaped valve and compress it, thus forming a cushion. In this way the valve and the piston travel backward in unison, because of the momentum of the latter, until the valve reaches the limit of its stroke. In addition to making short stroking impossible this construction is said to reduce the vibration to a minimum.

Another feature of the hammer is the novel device employed for preventing the handle from working loose. This clamp relieves the handle from all strain and keeps it from moving and if broken or mutilated it can be readily replaced at a nominal expense.

Three sizes of hammers are made for riveting, the maximum rivet diameters being ¾, 1 and 1½ in. The length of these three sizes are 18½, 20½ and 21½ in. respectively, and the weights are 21¼, 23¼ and 25 lb.

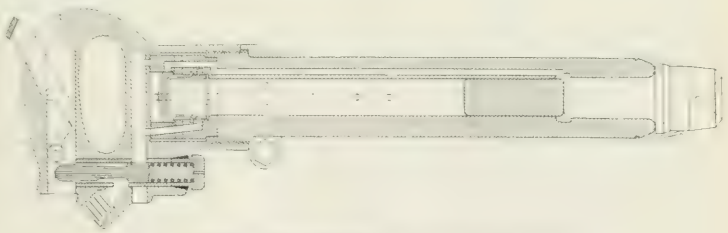
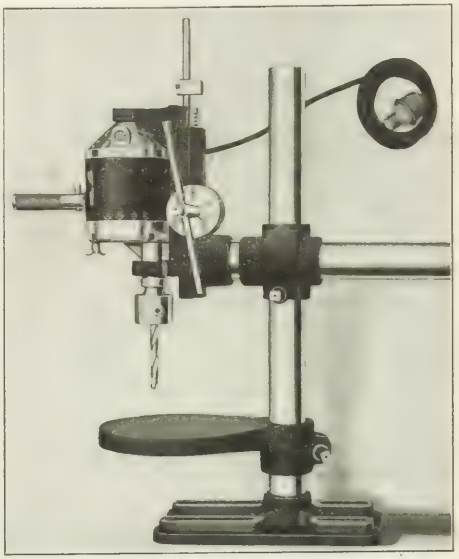


Fig. 2.—A Sectional View of the Hammer, Showing Its Construction

Self-Contained Sand-Blast Machinery.—Sand-blast tumbling barrels and sand-blast machines of a large range of types, made by Vogel & Schemmann, Kabel in Westphalia, Germany, may be obtained in this country through their recently appointed United States representative, the Wiener Machinery Company, 50 Church street, New York City. The sand-blast tumbling barrels and the other forms of sand-blast machines are noteworthy for their self-contained character, many of the designs comprehending a unit which may be placed at any point in a shop and which does not require a special department, but is designed to run dustless. According to the character of the work, the table on which the material is placed for cleaning may be of a rotary type or of the sliding type, and the materials are carried within the machine enclosures. Arrangements are of course provided for using the sand over and over again.

Drill Converting Attachment

For converting hand or breast drills into bench drills when desired the Hisey-Wolf Machine Company, Cincinnati, Ohio, has placed on the market a new attachment which can be used in connection with any alternating or



A Hand Drill Converted into a Bench Machine by the New Attachment Made by the Hisey-Wolf Machine Company, Cincinnati, Ohio.

direct current, hand or breast, screw feed or heavy duty drill up to ⅞-in. capacity, and as can readily be seen the range of work possible with the tool and consequently its value are increased.

The cross arm and the column are made of steel tubing. Lever feed and a quick return by hand are regularly furnished, although if desired a wheel and worm feed can be substituted. The cross arm has both horizontal and vertical adjustment and a radius of 24 in. in all directions at any angle. The table is adjustable, both vertically and horizontally, on the column. The drill is fastened rigidly to the slide on the cross arm by brackets and since the caps are easily removed the drill can be readily detached and converted into an ordinary hand or breast drill.

The attachment is made in two sizes, the first or No. 1 size handling drills up to a maximum diameter of ½ in., while the No. 2 size is for drills of from ¾ to ⅞ in. The following table gives the principal dimensions and specifications of the two sizes:

	No. 1.	No. 2.
Travel of slide, in.	7	9
Distance from base to top of column, in.	26	29
Diameter of table, in.	10	12
Weight, lb.	70	95

The American Hoist & Mfg. Company has removed its establishment from Hamburg to Lock Haven, Pa., owing to the necessity of enlarging its manufacturing facilities to take care of its increased business.

Customs Decisions

Knitting Machines

The Board of United States General Appraisers has decided that knitting machines are not "machine tools" within the meaning of the tariff act of 1909. The issue came before the customs tribunal on an appeal by P. C. Kuyper & Co. from a decision by the collector at New York. The machines perform the ordinary operation of knitting in the manufacture of knitted articles and fabrics and are intended to be operated either by hand or power. They were returned for duty at the rate of 45 per cent. ad valorem as "manufactures in chief value of metal," while the importers allege that they should be allowed to enter at 30 per cent. as machine tools. Judge Fischer states in his decision for the board that, as commonly spoken of, there is no doubt that the articles are machines rather than machine tools. He says:

"If these knitting machines are to be regarded as falling within the common understanding of the term machine tools it is evident to us that looms and other machines in which yarn or thread is woven or manipulated would have to be likewise considered. These machines are not machine tools either within the meaning of the term as technically understood nor within its broad meaning referred to in the Myers case as applicable to tools, which, while they still remain tools within the definitions given by the lexicographers, partake of the character of machinery by reason of the power and principle applied. These machines are not such as are used in workshops for planing, drilling, sawing, etc., nor are they tools as distinguished from machines. The protests are overruled."

Sewing Machines

The board took favorable action on another protest filed by Kuyper & Co. regarding the classification under the present tariff of machines that are used to sew parts of knit articles together. They were assessed at 45 per cent. under the metal paragraph and were claimed to be dutiable properly at 30 per cent. as sewing machines. This claim the board sustains and reverses the collector.

Hydraulic Motors and Pumps

A. K. Baylor failed to have his contention sustained for the free entry of hydraulic motors and pumps for use on motor cars. They were assessed at 45 per cent. as manufactures of metal and were alleged to be "models of inventions." It is held that as the articles are to be used for demonstrating a principle which is afterward to be applied and utilized through different machines the articles are not models within the intent of the tariff law.

Iron Drums for Containers

The board has taken adverse action on a protest filed by the E. I. Dupont de Nemours Powder Company and similar protests by other importers regarding the classification of iron drums used in the importation of crude glycerine. The drums were deemed by the collector to be "unusual" coverings, and as such dutiable at the rate of 35 per cent. ad valorem. It was claimed by the importers that the drums are the usual containers of free goods, and should be granted free entry. This claim is denied by Judge Fischer, who writes the opinion for the board.

Steel Rolls for Calico Printing

Alfred de Liagre failed to convince the board that lower duty should accrue on steel pattern rolls or dies used for the purpose of sinking patterns on copper rollers for producing printed effects on calico. The pattern for printing has been cut on the steel rolls or dies, and these act as models or patterns from which the copper rollers for printing are made. Duty was assessed as "manufactures of metal," at 45 per cent. ad valorem, whereas the importer asked for a lower rate under the provision for "plates" engraved for printing. The board holds that pattern rolls or dies are not plates within the meaning of the tariff.

Tin Cans

The board has taken adverse action on protests filed by Davies, Turner & Co., and others, regarding the classification under the tariff act of 1909 of boxes, canisters, and other receptacles, either made of metal lacquered or of metal printed by the lithographic process. Duty was separately assessed on the metal coverings under paragraph 195, as unusual coverings. It was claimed that they are free of duty or subject to the same duty as their contents as the usual coverings or containers of the merchandise imported. Judge Fischer says that the metal coverings are not hermetically sealed and are not, therefore, within the excepting clause of paragraph 195. The decision says that paragraph 195 specifically provides for the articles in controversy, and that the terms of the paragraph requires that they be held dutiable under that provision. The claims are overruled.

Cotton Belting

Merchandise invoiced as "cotton belting" and "cotton driving rope," used for the transmission of power, was imported by Pitt & Scott, Ltd. The collector returned the articles for duty at the rate of 45 per cent. under the provision in the tariff act of 1909 for "manufactures of cotton." The importers alleged that the merchandise should be granted entry at 35 per cent. ad valorem under the paragraph for "belting for machinery." In finding for the importers, Judge Cooper holds that while the belting is undoubtedly composed in chief value of cotton, the provision in the law for "manufactures of cotton" cannot control in this case. He holds that the use of an article must decide its classification.

Toy Sewing Machines

The board has overruled a protest filed by Butler Bros. regarding the classification of so-called toy sewing machines. It appears that the machines are not practical sewing machines and are intended for the use of children. They were returned for duty at the rate of 35 per cent. under the provision in the present tariff for "toys." The importers maintained that the articles are in fact the regular sewing machines specified in the present law. The protests are denied and the collector affirmed.

Knitting Machines

The board has decided a controversy between the government and E. O. Spindler regarding the classification of knitting machines in favor of the importer. They were returned for duty by the collector at New York as "manufactures of metal," at 45 per cent ad valorem. It was successfully alleged by the protestant that the machines fall within the provision in the tariff act of 1909 for "sewing machines," with duty at the rate of 30 per cent. The collector is ordered to reliquidate the entries on the basis of the lower duty.

Wolfram Ore

The board took adverse action on protests filed by the Mineral Products Mfg. Company, and O. G. Hempstead & Son, relative to the classification of wolfram ore. It was assessed at 10 per cent ad valorem under the provisions of paragraph 190, act of 1909, as "tungsten-bearing ores of all kinds." It was claimed to be exempt from duty under paragraph 626 as "crude minerals not specially provided for." The collector's classification is affirmed.

Sheet Steel Cask Linings

The board took adverse action on protests filed by several importers asking that thin sheet-steel coverings in the form of drums, which serve as the inside lining of wooden casks, be regarded as the "usual" coverings for merchandise. They were returned for duty at the rate of 30 per cent as "unusual" coverings. The collector's assessment is affirmed. The importers affected include the Smith, Kline & French Company, Geisenheimer & Co., O. G. Hempstead & Son, and others.

Automobile Tire Bolts

The board has taken adverse action on protests filed by the Dubied Machinery Company and Michelin Tire Company, in cases affecting the classification of so-called security bolts. They are employed for holding automobile tires firmly in place on the rims of the wheels. Duty was imposed at 45 per cent, either as manufactures of metal or as parts of automobiles. The contention was that the articles are "bolts" within the meaning of paragraph 144 of the existing law. Under this claim the duty is 1½ cents a pound. Judge Fischer denies the claim.

The Machinery Markets

The railroads are placing a good volume of scattered orders for machine tools for early delivery. The New York, New Haven & Hartford has come forward with a list calling for $50,000 worth of equipment. Most of the railroad activity is in the East. Philadelphia dealers received orders against a $15,000 list during the week and some business is pending there for small lots of machinery, although the competition is sharp. In Cleveland inquiries have improved and makers of metal products are the principal buyers, while the automobile trade is placing some orders. Contractors' equipment and second-hand machinery for railroad construction work have the call in Cincinnati. General conditions have improved in St. Louis, although the buying is limited to single tools. In Detroit a number of automobile companies are developing plans for extensive additions and small manufacturers in general are becoming more active. Business is generally quiet on the Pacific coast, but better than it was a year ago. The logging industry is looked to for some trade in that market. Power equipment, wood-working equipment and contractors' outfits are in principal demand in the South and the situation is encouraging.

New York

NEW YORK, November 1, 1911.

The railroads are attracting attention in the machinery trade. The event of the week was the appearance of a list from the New York, New Haven & Hartford covering extensive requirements which it is said will be installed in shops to be built at New Haven. The list calls for expenditures amounting to fully $50,000, and it includes a number of large lathes, planers, shapers, other machine tools and an assorted list of shop equipment. The Delaware, Lackawanna & Western has been doing some scattered buying and the New York Central closed orders for a few tools during the week. The buying done by the Delaware & Lackawanna, it is understood, is only preliminary, as a large list is now in course of preparation covering that company's 1912 shop needs. The Lehigh Valley is inquiring for machine tools and the character of the requests for bids indicates that it will soon prepare a list. Inquiries from various other railroad sources demonstrate that the carrying companies are taking a more active interest in their machinery requirements. Car and locomotive builders have also developed as good customers of machine tools of late and most of the purchasing coming from that direction is for replacements. Automobile truck manufacturers are buying good round lots of machinery. There are inquiries now in this market from the Autocar Company, Ardmore, Pa., which it is reported will spend about $10,000 for machine tools. In this column last week the W. A. Wood Mowing & Reaping Machine Company, Hoosic Falls, N. Y., which has been buying equipment, was misnamed as the W. H. Atwood Company. A number of New York machinery houses have figured up their October receipts in orders and find that month's business was decidedly better than were August or September. The export business continued strong and some good round lots of metal working machinery have been sold for delivery to Canadian manufacturers. Export agents who represent the German and Italian trade continue good customers for American machinery.

The Henry Mfg. Company has been incorporated with $100,000 capital stock, to manufacture an automatic device for starting gasoline engines. The company has temporary quarters at 141 West Fifty-first street, New York, and is having plans prepared for a factory of larger dimensions in the near future. The affairs of the company are in the hands of William F. Mohr, 33 New street. Associated with Mr. Mohr in the enterprise are George L. Henry and Charles W. Caffry.

The new plant which the Otis Elevator Company is to erect at Twenty-sixth street and Eleventh avenue, New York, will be 100 x 197 ft., seven stories, and is estimated to cost $400,000. Clinton & Russell, 32 Nassau street, are the architects.

The Bloomfield Chemical Company has acquired a tract of land at Cleveland and Passaic avenues, Harrison, N. J., where it is planning to erect a new factory for the manufacture of chemicals. The estimated cost of the building is $5,000.

The Salamanca Furniture Company, Salamanca, N. Y., recently mentioned as having a new plant in course of erection, will be in the market soon for planers, molders, shapers, band saws, dovetailers, resaws, heater, warming system and power equipment.

The Ideal Wrapping Machine Company Middletown, N. Y., has had plans prepared for a small factory for the manufacture of wrapping machines and light-running machinery. Work will soon be commenced and the plant is expected to be completed about January 1, when bids for the machinery will be taken.

The Myers Loading Machine Company, Buffalo, N. Y., has been incorporated with a capital stock of $100,000, to manufacture special machinery. Geo. F. Myers, Wm. S. Harrison and John K. Kerr, Buffalo, are the incorporators.

The Frontier Cut Glass Company, Buffalo, has been incorporated with a capital stock of $10,000, and will engage in the manufacture of cut glass. The directors are Joseph and C. B. Warner of New York City, Herbert W. Morris, Jno. W. Murray and Fred C. Howard, Buffalo.

The Buffalo Dehn Company, Buffalo, has been incorporated to manufacture fine wire novelties and specialties, including some patented articles. A factory will be established for which specially constructed wire-working machinery will be required. The company has offices in the White Building. The directors are Bradley Goodyear, president; Bainbridge D. Folwell, vice-president; Geo. H. Field, secretary and treasurer; Martin Dehn, managing director, and Edward H. Letchworth.

The Fleishman Malting Company, Buffalo, is building a heating plant addition, one story, to its extensive malting plant at Niagara street and the Niagara River branch of the Erie Railroad.

John K. Stewart & Sons have been incorporated at Amsterdam, N. Y., to manufacture textiles, with a capital stock of $300,000. The incorporators are John K., C. D., and S. S. Stewart.

The branch foundry to be located at Oneida, N. Y., by the National Foundry Mfg. & Supply Company, of Williamsport, Pa., will be known as The Oneida Foundry Company. It will be incorporated under the laws of the State of New York and operated as a general jobbing foundry. The moulding room will be 50 x 154 ft., and there will be a cupola house, coal and coke sheds, etc. Boiler, engine, generator and motor equipment have been provided for, as well as line shafting; but the new company will be in the market for a cupola, elevator, fan and casting cleaning machinery.

The H. O. Craven Mfg. Company, Schenectady, N. Y., has recently been incorporated with a capital stock of $50,000, and will engage in the manufacture of carbureters for gasoline engines. Horace O. Haven, Joseph A. Field and Geo. W. Dounan, Schenectady, are the directors of the new company.

A one-story pottery manufacturing plant, 100 x 200 ft., is to be built at Lafayette, N. Y., by Lesseer & Schwartz, 34 Morris street, Jersey City, N. J.

The Groton Bridge Company, Groton, N. Y., has received a contract from the Gray Chemical Company, Port Allegheny, Pa., for the erection of a chemical factory building, 96 x 86 ft., one story.

The General Automatic Company, Syracuse, N. Y., has been incorporated to manufacture automatic cash registers, etc. The capital stock of the company is $250,000, and the directors are C. B. Cory, E. J. Richardson and W. S. Barlow, of Syracuse.

A six-story addition, 52 x 180 ft., is to be made to the Remington Typewriter Works, Ilion, N. Y., and work upon it has been commenced. The cost will be about $75,000.

THE MACHINERY MARKETS

The Hoosier Sales Company, Jamestown, N. Y., has been incorporated with a capital stock of $150,000, and will build a plant in that city for the manufacture of electrical goods and appliances. The incorporators are Frank L. Wyman, Indianapolis, Ind., and Scott H. Penfield and Benj. S. Dean of Jamestown.

The Erie Pump & Engine Works, Erie, Pa., has been incorporated by J. G. Pradt, Milton W. Shreve and D. H. Dumond, and will establish its plant in Erie. The capital stock of the company is $50,000.

Business Changes

The United Machinery Company has recently removed from 136 Liberty street to 88 Center street, New York. The company has a large store and will display a number of prominent lines of wood and metal working machinery. Catalogues and price lists from manufacturers of machine tools and supplies are desired.

New England

BOSTON, MASS., October 31, 1911.

The month cleaned up larger totals of business for the dealers than they had anticipated, the extreme dullness of the opening week proving no criterion of what was to come. The year's business to date is behind that of 1910, but the shrinkage has not been so great as had been expected, if the autumn was to bring no marked improvement. The machinery builders report conditions as unchanged. A continued improvement in the textile industry, both cotton and woolen, promises to have indirect results on business in the near future and direct results later, when the textile machinery builders will feel it, to the relief of their present stagnant market.

The United Shoe Machinery Company, Beverly, Mass., has no list out for the equipment of the new buildings recently completed, and the trade presumes that there will be some delay in going ahead with improvements until matters have been adjusted in relation to the litigation involving the company as an alleged trust. The shops are running on full time, and the presumption is that the new equipment will be needed to take care of the natural increase of business which must come with improvement in the shoe industry.

The Abbott Ball Company, Hartford, Conn., manufacturer of steel balls for burnishing metal goods and of the Abbott tumbling barrel for use with steel balls, will erect a factory at Elmwood, a suburb of Hartford, 40 x 100 ft., two stories, of brick-and-steel construction. The company will purchase a 25-hp. fuel oil engine, and will require storage tanks of about 12,000-gal. capacity, with two or more open tanks for hardening purposes.

George H. Turner has been elected vice-president of the Coe Brass Mfg. Company, Torrington, Conn., succeeding James A. Doughty, who has retired because of ill health after 25 years' connection with the business. Elisha J. Steele, who has been the treasurer, will assume the duties of the secretaryship and George E. Cole has been made treasurer.

F. W. Derbyshire, Waltham, Mass., has established his shops in the Jenness Building, 157-165 High street, that city. He will manufacture watchmakers' lathes, chucks and attachments, slide rests, wheel cutters, jeweling rests, pivot polishers and special machinery, and will do renickeling.

The Hobach Aeroplane Company has been organized at Waltham, Mass., and is establishing a factory for the manufacture of aeroplanes to order. John Barrows, recently with the aeroplane department of the Metz Automobile Company, Waltham, is the president of the company.

Additions to general manufacturing industry of New England, include the following: Tallyho Knitting Company, East Douglas, Mass., organizing to build and equip a mill to manufacture knit goods; Day Building Trust, Worcester, Mass., five-story factory, 55 x 100 ft., to be occupied as an addition by the New England Envelope Company; Brockton Factory Association, Brockton, Mass., eight-story factory building for rental, to cost $120,000, with the prospect of a companion building in the near future, the first being already rented to a number of concerns; T. K. Earle Estate, Worcester, Mass., addition to building occupied by the American Card Clothing Company, and Bickford & Sweet, 44 x 80 ft., four stories; Hale Piano Company, East Douglas, Mass., to remodel and equip building just purchased of the American Axe & Tool Company in that town.

The fertilizer and shock plant of the Seacoast Canning Company, Eastport, Me., was burned October 20, with loss of $60,000. The plant of the Freiderichs Dyeing Company, Woonsocket, R. I., was damaged $50,000 by fire, October 24.

It is announced that the Matthews Mfg. Company, Seymour, Conn., manufacturer of hardware specialties, will rebuild that portion of its works recently destroyed by fire. One building will be 50 x 125 ft., and a smaller structure will be erected, both of concrete blocks and with steel truss roofs.

A committee of creditors is in possession of the affairs of the C. W. Kelsey Mfg. Company, Hartford, Conn., builder of a type of automobile known as the Motorette, and the effort is being made to reorganize and continue the business.

The Pratt Read Player Action Company, Deep River, Conn., has purchased the business of the Wasle Unique Player Action Company, and will carry on the business of manufacturing pneumatic player actions at Deep River. George L. Cheney is the president and treasurer; Anthony Doll, Jr., vice-president, and W. B. Stevens, secretary.

Philadelphia

PHILADELPHIA, PA., October 31, 1911.

One large list of tools, that of the Frick Company, which has been before the trade for some little time, was closed during the week, involving an aggregate of some $15,000. No other large lists are now reported as being openly before the trade, pending business being confined to small and moderate lots, principally single tools. Competition for such business as is offered is very sharp and in instances price concessions are reported as being made. The demand for metal working tools generally continues irregular, although occasional satisfactory orders for special equipment come out. Manufacturers of the standard types of machine tools report current business as being light, although makers of special machinery have been booking, in some cases, a very fair amount of new work. Builders of special paper mill machinery and equipment have been very busy and have a good volume of orders on their books. Railroad buying has been quiet, no fresh inquiries from the roads in this district being reported. No particular betterment in the demand for power equipment is observed, although a good volume of moderate power equipment is under negotiation. Few orders of importance have been placed with local merchants covering tools or equipment for export, although manufacturers transacting an established business abroad in power transmission equipment report an average volume of business. The second hand machinery trade reports continued dullness in practically all branches. Both iron and steel casting makers find business irregular, occasional betterments are noted, but, as a rule, foundries have but little work ahead and are still operating at an unsatisfactory basis.

The Lanston Monotype Machine Company, which has had the erection of its new plant at Twenty-fourth and Locust streets under consideration for some time, has awarded a contract for the construction of the building to the William Steele & Sons Company. Plans provide for a six-story brick and concrete factory building 176 x 268 ft.

The Hunsicker Engineering Company, Lebanon, Pa., has been organized with a capital stock of $50,000 and will engage in the general foundry and machine business, giving particular attention to car building, furnace and rolling mill work of all kinds. The company will occupy the plant heretofore used by the Lebanon Mfg. Company, operated by the Treadwell Company, now moving to Easton, Pa. The officers of the company are: Harry H. Boger, president; R. M. Rhodes, vice-president; John Hunsicker, Sr., treasurer, and John Hunsicker, Jr., secretary.

The Pennsylvania Street Railway Tie Company has been chartered under the laws of Delaware, with a capital stock of $10,000,000. It will engage in the manufacture and distribution of iron, steel and metal products. The incorporators are F. R. Hansel, Philadelphia, and George H. Martin and S. G. Seymour, Camden, N. J. The organization of the company has not yet been completed and plans regarding its future are not available.

THE MACHINERY MARKETS

The Philadelphia Roll & Machine Company reports some heavy shipment of rolls, both chilled and sand cast, with a large consignment of special machinery delivered to a Western buyer. A good demand for charcoal iron air furnace gray iron castings of a general nature, including considerable die work, has been reported.

The Webb Terminal Warehouse Company has awarded a contract to Irwin & Leighton, contractors, for a fireproof brick and concrete warehouse, nine stories, 150 x 160 ft., to be erected at Delaware avenue and Walnut streets. The cost of the building is estimated to be close to $600,000. Work is to be started at once.

The Baldwin Locomotive Works has received orders for 30 freight and 20 Pacific type passenger engines for the New York Central Railroad. Orders have also been received for three engines for the Nashville, Chattanooga & St. Louis Railroad, as well as from industrial concerns, which have been placing orders for single locomotives. The demand for locomotives is not reported as very promising, although this company has sufficient work on its books to keep it well engaged for several months. Plans regarding the addition to its erecting shop at Eddystone, Pa., have not yet been decided.

The Reading Crane & Hoist Works, Reading, Pa., is operating very close to full capacity and with full operating forces. A number of good orders have recently been received, including several from large pulp and paper mills in Canada. Among recent shipments were two 6-ton double I-beam cranes, 47 ft. 6 in. span and overhead tramways for the Crocker-Burbank Company, Fitchburg, Mass.; one 5-ton double I-beam crane for the Georgia Mfg. Campany, Binghamton, N. Y.; one 40-ft. span crane for the Compañia de Santa Gertmudis, S. A., Pachuca, Mexico; one 6-ton, double I-beam crane for the New York and Pennsylvania Company, Lock Haven, Pa.; one 10-ton double I-beam crane for the new power station of the Philadelphia & Reading Railway, St. Clair, Pa., and a braced girder crane 59 ft. 11 in. span. for the Hammerill Paper Company, Erie, Pa.

The Hyde Park Mfg. Company, Hyde Park, Berks County, Pa., has been formed, it is stated, to engage in the manufacture of ball bearing trip hammers and other classes of machinery. Abraham Schlegel, Charles H. Madeira and J. W. Miller, Muhlenberg, Pa., and Adam H. Schmeck, Reading, Pa., are named as directors.

Baltimore

BALTIMORE, MD., October 30, 1911.

Machine tool merchants report fair bookings, although orders have been largely confined to metal working machinery and to single tool propositions. Some few inquiries for moderate quantities of woodworking tools are in sight. A very fair volume of business continues to be taken by manufacturers of special tools and machinery. An increase in the demand for mill and machine shop supplies is pretty generally reported. Business in contractors' equipment shows a decline, due largely to the season. Power equipment has been in better demand, and some very fair orders covering both boiler and engine installations have been closed, with considerable business still under negotiation. Boiler and tank builders, are, for the most part, more actively engaged than they were in September. The local demand for structural material is chiefly for small propositions, although some fair-sized projects are under consideration in the South. Some of the local bridge builders have taken on considerable work for export. The demand for second-hand machinery, tools, etc., drags, and while metal working machine tools have been the most active in this department, transactions are far from being on a satisfactory basis. The railroads continue light buyers, few orders for machinery or tools coming out. The foundry trade is still on an irregular basis. The prospects for any material betterment in general business are not considered very promising, particularly as far as the near future is concerned. Many factors outside the trade still have an important bearing on general business and until these are removed no real improvement is booked for.

F. A. Lazenby & Co., manufacturers of cotton mill machinery, are now established in their recently completed machine shop on Wicomico street, near Beech street. The new building is 45 x 80 ft., two stories, and fully equipped. This concern is quite busy and has been so engaged for a long period.

Bartlett Hayward & Co. report business as being rather quiet, except in the stove department, which has been particularly active. The projected new machine shop is still being held in abeyance.

The Ellicott Machine Works has taken further orders for dredging machinery and is now operating its plant on comparatively full time. This company recently purchased a plot of ground 147 x 155 ft., ad joining its present plant, not with a view of immediately increasing its capacity, but rather of providing for its possible needs in the future.

The W. F. Assau Canning Company is building a new plant on Boston street, between Patuxent and Streeper streets. Plans are by F. C. Carstens and provide for a brick and stone building, 76 x 173 ft., entirely fireproof. No equipment will be required, as that now used at the company's present plant, 1715-1717 Thames street, which property has been acquired by the city for a recreation pier, will be moved to the new building on its completion.

The Aumen Machinery & Supply Company reports a fair demand for machinery and tools. Individual orders have not been as large as they were last month, sales being confined largely to single tools and more particularly to metal working machinery, although several fairly large inquiries for wood-working equipment are in sight. The supply trade has been particularly good of late and the month's business in that department will exceed that of September.

The Tube Bending & Polishing Machine Company is busily engaged in the manufacture of a number of machines for various customers. The installation of necessary equipment has delayed completion of these machines, but the company's shops are now supplied and will shortly be in full operation. The company also has numerous orders for special automobile parts, which it manufactures.

It is currently stated that the Zimmerman Ice Company, Arlington, Md., has had tentative plans prepared for a one and a half story ice-making plant, to be fully equipped with necessary machinery.

City permits have been granted for the erection of a garage at 1120 Cathedral street for James W. Bowers, from plans by Glidden & Fritz, architects. Plans provide for a reinforced concrete structure, 88 x 120 ft., three stories, entirely fireproof and heated by steam.

Chicago

CHICAGO, ILL., October 31, 1911.

The Chicago Steel Foundry Company, at present located at Nineteenth & Rockwell streets, Chicago, has acquired a piece of property 226 x 298 ft. at Thirty-seventh street and the Chicago & Alton Railway. At this location a one-story foundry building, 150 x 200 ft., and a two-story pattern shop and office building will be erected. David Evans, president, has offices in the Rookery Building.

The Chicago Iron Foundry Company has purchased a lot 121 x 125 ft., improved with a two-story brick building which the foundry company will enlarge.

The Rand-McNally Company, Chicago, has taken out a building permit for a ten-story factory and office building at Fifth avenue and Adams street, to cost $1,400,000.

Curt Teich, manufacturer of postal cards, has obtained manufacturing property with 250-ft. frontage on the northwest side, Chicago, on which a two-story factory building will be erected.

The Chicago & Alton Railroad is considering plans involving the building of a new boiler shop and machine shop and the enlargement of the present facilities at Bloomington, Ill. In connection with the machine tool list recently issued, an expenditure of approximately $200,000 is under consideration.

A. L. King, Chicago, is contemplating the location of a branch foundry at Denver, Colo., for the King Auxiliary Mfg. & Iron Foundry Company. The plans provide for a $150,000 plant, principally for the manufacture of malleable iron products.

The Illinois Watch Company, Springfield, Ill., is planning the erection of a $10.000 addition to its plant.

The Miller Machine Company, Bridgeport, Ill., has been incorporated with a capital stock of $6,000 to conduct a general oil and gas pipe line business, the

THE MACHINERY MARKETS

incorporators being Geo. D. Miller, Luella Miller, and R. D. Donnelly.

The Western Steel Car & Foundry Company, Hegewisch, Ill., has taken out a permit to cover the erection of a one-story machine shop, to cost approximately $31,350.

The North Star Machine Works, Crookston, Minn., has been organized with a capital stock of $25,000 by P. S. Houghton, A. P. Clifford, J. Bell De Remer, and M. Houghton, all of Grand Forks.

The Northern Welding & Galvanizing Company, Minneapolis, Minn., will spend $10,000 for a frame addition to its plant.

The R. Fehler Brush Company, Reed street, Milwaukee, Wis., has plans in preparation for the enlargement and remodeling of its factory.

The Rockwell Mfg. Co., Sixth avenue and Park street, Milwaukee, Wis., is planning the erection of an addition to its plant, 120 x 130 ft.

The H. C. Doman Company, manufacturer of gasoline engines at Oshkosh, Wis., has passed from the control of H. C. Doman to Edgar P. & Phil H. Sawyer.

The Gold Medal Camp Furniture Company, Racine, Wis., is taking figures on a new factory building to be 67 x 100 ft., two stories, to cost in the neighborhood of $10,000.

The C. H. Starke Dredge & Dock Company, Milwaukee, has taken out a permit covering the erection of a shop 59 x 72 ft., to cost $16,000.

At Menasha, Wis., a bond issue of $40,000 has been authorized to provide improvements for the city light and water plant.

B. W. King, formerly of Prentice, Wis., is establishing a machine shop at Sault Ste. Marie, Mich.

The Handy Wagon Company, Des Moines, Iowa, is planning an addition to its present plant, to be 300 ft. long.

Cleveland

CLEVELAND, OHIO, October 31, 1911.

While actual sales of machine tools have been light during the past few days inquiries have improved somewhat and a few orders for small lots of tools that have been pending for a short time appear about to be closed. Inquiries are mostly for from single tools to lots of four or five. Business is coming from manufacturers of various metal products who are adding a limited amount of equipment. There is practically no buying by the railroads. Not many orders and only for single tools or small lots are coming from the automobile manufacturers. The demand for second hand tools is rather light. Not many used tools are being offered to dealers.

The Cleveland Welding & Mfg. Company, Cleveland, has been incorporated with a capital stock of $150,000 to engage in the manufacture of automobile rims and various other welded products. The company has secured the plant formerly occupied by the Ohio Brass & Iron Company at 8205 Franklin avenue and expects to have it fitted up and ready to place in operation in 60 days. The company will buy quite a number of standard machine tools to equip a machine shop and will install welding and other special machinery. Officers have not yet been elected, but the company will be under the management of E. I. Heinsohn, who was until recently superintendent of the plant of the Standard Welding Company, Cleveland.

The Massillon Rolling Mill Company, Massillon, Ohio, will shortly begin the erction of a 60-ft. addition to its plant in order to provide additional room that is needed for the manufacture of high grade special sheets. The company is turning its attention more to special sheets and will increase its output of its specialties.

Hess, Snyder & Co., Massillon, Ohio, makers of stoves, ranges, furnaces, pumps, pulleys, etc., have just completed an addition to their foundry, 80 x 120 ft., and has made other extensions and improvements to its plant. A new cleaning department has been fitted up, equipped with a dust arrester built by the W. W. Sly Mfg. Company, Cleveland. Motor drive has been installed throughout the plant, power being furnished by a new 200-hp. generator.

The Massillon Bridge & Structural Company, Massillon, Ohio, which recently acquired a site for a new plant, expects to begin its erection during the coming winter. The plans provide for a fabricating shop 140 x 600 ft. and a power house and office building. Four 10 or 15-ton cranes will be required.

The Carolina Metal Products Company, recently organized at Wilmington, N. C., is erecting a plant for the manufacture of corrugated culverts, ceilings, roofing, shingles, eave trough and other sheet metal products. The officers are Theodore G. Empie, president and general manager; Mears Harriss, secretary, and John F. Kuck, treasurer.

G. F. Mitchell & Son, sheet metal workers, Cleveland, Ohio, will shortly begin the erection of a new plant at Cedar avenue and East Sixty-fifth street in that city. Their present plant is located at 1279 West Third street. The new plant will be 60 x 150 ft., two stories and basement, of brick and steel construction, with the largest amount of glass window surface possible to afford an abundance of light. The new plant will give the concern about three times its present capacity. Its products are dies and stampings and sheet metal parts, automobile parts and accessories. Some new equipment will be purchased, including an 8-ft. power shear, milling machines, shapers, lathes and possibly a generator.

The Rauch & Lang Carriage Company, Cleveland, will enlarge its electric automobile plant by the erection of a four-story brick building, 90 x 30 ft., contracts for which have been let.

The General Foundry Company, Warren, Ohio, has completed its new foundry for the manufacture of steel castings and expects soon to have it in full operation. The plant includes a main foundry building, 140 x 300 ft., an office building and chemical laboratory, pattern building, core room and warehouse.

The Grant-Lees Machine Company, Cleveland, has increased its capital stock from $200,000 to $400,000. Some extensions may be made a little later.

The Burke Machine Tool Company, Conneaut, Ohio, has been incorporated with a capital stock of $20,000 by G. H. Burke and others.

The MacLean Foundry Company, Upper Sandusky, Ohio, has been incorporated with a capital stock of $80,000 by L. H. Hull and others.

Cincinnati

CINCINNATI, OHIO, October 31, 191

It is estimated that there are over 40 railroad contractors at work in territory contributory to Cincinnati at the present time, and as a consequence dealers in new and second-hand contractors' equipment have been doing an excellent business. Most of the work being done is double tracking for railroads already in operation.

The situation with machine tool builders is unchanged, although the past week probably brought out a slightly larger number of inquiries. The export trade is reported to be lagging somewhat, but this particular branch of the business cannot be judged by one week's developments.

The steamfitters' strike is not yet settled, and this has affected the sale of small boilers for heating purposes in this territory, but the outside demand for the larger sizes is said to be fairly satisfactory.

The Pollak Steel Company, Cincinnati, recently mentioned as having been incorporated to take over the business of the Block-Pollak Iron Company, is planning a 400-ft. extension to its main shop in Carthage suburb. A number of new tools will be required, including lathes, boring mills, slotters, saws, etc., as well as traveling cranes and a large hydraulic press. The power plant will also have to be increased. A testing department is now being added to be equipped with annealing furnaces and all necessary apparatus for turning out a special brand of heat-treated steels intended particularly for locomotive driving axles and forgings and to meet the requirements of the new specifications adopted recently by the Master Car Builders' Association.

The large factory of J. F. Dietz & Co., Cincinnati, manufacturers of desks, was almost totally destroyed by fire last week. Plans for rebuilding are already under way. Considerable woodworking and other equipment will probably be needed for the new factory. The company's storage warehouse was not damaged.

The Cincinnati Patent Pulley Mfg. Company, Cincinnati, has been incorporated with $10,000 capital stock, by E. W. Kottusch, Adolph A. Gruber, George Berghausen and others. No manufacturing plans have yet been decided upon.

It is rumored that George C. Christlieb, of Wheeling, W. Va., has completed arrangements for the erection of a large brick manufacturing plant at Wells-

THE MACHINERY MARKETS

ville, Ohio. The Summit Brick Company, Summitville, Ohio, is also said to be interested in the project.

The H. C. Wood Company, Norwood, Ohio, a Cincinnati suburb, is understood to have plans under way for a $50,000 ice plant to be erected at Wyoming, Ohio.

The Wheeling Mould & Foundry Company, Wheeling, W. Va., has increased its capital stock from $250,000 to $750,000. No information has been given out as to any increase in the company's present facilities.

The Cincinnati Traction Company has taken out a permit to erect a one-story brick boiler house on Keck street, to cost $10,000.

Architects Bert L. Baldwin & Co., Perin Building, Cincinnati, are preparing plans for an addition to the power plant of the Point Pleasant Water & Light Company, Point Pleasant, W. Va. They have also just finished plans for a large factory to be erected by the United States Paper Company, Cincinnati. It is understood that contracts for the last-named job have not yet been placed.

The machine shop addition to the plant of the Bertsch Foundry & Machine Company, Cambridge City, Ind., is well under way, and it is understood that most of the necessary equipment has been purchased. Bert L. Baldwin & Co., Cincinnati architects, drew up the plans for the new structure, which is 100 x 240 ft., one-story, and of mill construction.

The Eddy Auto Company, Cincinnati, has taken out a permit for the erection of a one-story fireproof garage to cost $10,000. It is quite probable that a small repair shop will be installed.

On October 26 fire damaged the Cincinnati plant of the Pittsburgh Plate Glass Company to the extent of about $30,000. Repairs will be begun at once, and new equipment installed in part of the factory.

Hamilton

HAMILTON, OHIO, October 30, 1911.

Taking all of the manufacturing establishments in Hamilton into consideration, it is quite probable that they are ahead of those in other nearby cities, so far as present activity is concerned. Business is not normal by any means, but practically all plants are running full time, and in most lines the prospects are encouraging for the period intervening between the present date and the holiday season.

A report lately issued by the Government Census Bureau gives Hamilton 125 manufacturing establishments, valued at $24,629,000. while five years ago the total valuation was placed at $18,874,000, making an increase of about 30 per cent. during the period named.

The Hooven, Owens & Rentschler Company is now finishing what is claimed to be the largest internal combustion engine ever built. Producer gas will be the fuel used and the engine, which has tandem twin cylinders, 42 x 72 in., is expected to develop 6000 hp. It is to be shipped the Ford Motor Car Company, Detroit, Mich. A large cross-compound steam engine is also being built for the Goodyear Rubber Company, Akron, Ohio, now increasing its capacity.

The Republic Motor Car Company has completed foundations on two factory buildings that will measure respectively 60 x 300 ft. and 80 x 100 ft., both one story and of regular mill construction. Later on the company will be in the market for miscellaneous equipment, including some machine tools, but is not yet ready to consider propositions.

The American Foundry & Machine Company is building an addition to its foundry 100 x 118 ft., one story with monitor type roof, and a three-story pattern and storage shop 30 x 120 ft., all of reinforced concrete construction. All of the necessary equipment has been provided for.

The Mosler Safe Company has just completed a large addition to its plant and all of the equipment has been installed.

Shuler & Benninghofen, owners of the Hamilton Woolen Mills, are completing an addition to their plant in South Hamilton. It is not known whether any equipment will be needed.

The blast furnaces and other property of the Hamilton Iron & Steel Company, at Coke Otto, a Hamilton suburb, will be disposed of at a public sale at noon, December 14. Dudley V. Sutphen, Traction Building, Cincinnati, is trustee in charge of the property. The sale will take place at Coke Otto.

Detroit

DETROIT, MICH., October 31, 1911.

October was a fairly satisfactory month in the local machinery market and reports indicate a continuation of these satisfactory conditions during the coming month. It is thought that a number of automobile companies which have recently begun extensions to their plants will soon be in the market and this is attracting considerable attention from the trade. Inquiries under negotiation are averaging up well and while current business is confined principally to single tools and small lots there have been a few sales on a larger basis. Makers of special equipment are getting a good run of orders. While the demand for secondhand machinery is somewhat spotty, more life is being exhibited in this class of equipment than for some weeks past. Foundries supplying the automobile trade are busy and the demand for small castings is increasing. Sheet metal stamping concerns report an excellent volume of business.

A marked scarcity of small factory buildings has developed here and although the recent completion of two large power buildings has bettered conditions somewhat, still, new concerns desiring to locate in Detroit are experiencing considerable difficulty in securing quarters. Marked improvement in building lines is apparent.

The Boyer-Campbell Company, dealer in small tools, supplies and machinery, will soon occupy its new six-story building at Brush and Congress streets. The company handles the tools of the Brown & Sharpe Mfg. Company and the L. S. Sterrett Company, the taps and dies of the S. W. Card Mfg. Company, the vises of the Reed Mfg. Company, the drills of the Morse Twist Drill & Mfg. Company; reamers, cutters, electric tools, grinders, etc. The officers of the company are W. W. Campbell, president; F. H. Boyer, vice-president and W. C. Brown, secretary.

The Pennsylvania Salt Mfg. Company has announced that it will invest $2,000,000 in enlarging and improving its present plant at Wyandotte, one of Detroit's down river suburbs. The company manufactures chemicals and caustic soda and the new buildings will be equipped with the most modern machinery obtainable for this purpose. Contracts for the erection of the plant, which will be of entirely fireproof construction, have been let. The headquarters of the company are in Philadelphia.

Contracts have been awarded for the construction of a three-story brick addition to the present factory of the Buhl Stamping Company, on Third and Congress streets.

The Flat Rock Mfg. Company has filed articles of incorporation giving its capital stock at $200,000. Dayton Parker, P. F. Hasley and G. Retan are the principal stockholders of the new company, which will erect a plant for the refining of silica near Brownstown, Mich.

Albert I. Jacob and a group of capitalists including W. G. Emerick, Saginaw, and W. M. Durand of this city are reorganizing the defunct Saginaw Bay Southwestern Railway Company and will proceed at once with the construction of the road between Saginaw and Owosso. It is the intention of the company to operate gasoline cars on the new road.

The American Auto Trimming Company, operating three plants in Detroit, has begun construction work on a fourth plant at Walkerville, Ont., across the river from this city. The new factory will be of mill construction, three stories 81 x 252 ft and will be equipped with a sprinkler system.

The Michigan Central Railroad Company has practically completed plans for installing an electric line between Trenton and Grosse Ile, Mich. The plans call for the erection of a large power house and repair shops at Trenton.

The Michigan Steel Castings Company will build a two-story reinforced concrete foundry building and sand bins adjoining its present plant on Atwater street at a cost of $20,000.

The Rouge Valley Wine Company has completed plans for the erection of a brick wine factory on Fort street to cost $20,000 and will probably be in the market for some equipment.

The Excelsior Tool & Repair Company has been incorporated by B. A. Towar, R. H. Freer and H. D. Harley. The capital stock of the new company is given as $7,000.

E. C. Gushwa and E. Schermerhorn have completed

THE MACHINERY MARKETS

plans for the erection of an artificial ice plant at Sturgis, Mich. Work on the building, which will cost about $8,000, will be commenced at once.

The Escanaba Pulp & Paper Company has been organized at Escanaba, Mich., with a capital stock of $30,000. The incorporators are W. S. King, P. L. Utley and J. J. Cleary. A pulp mill is now being built and it is planned to eventually construct a paper mill also.

The shops of the Pere Marquette Railway Company at Ionia, Mich., will be extensively enlarged in the near future.

The Escanaba Mfg. Company, Escanaba, Mich., maker of woodenware, is having plans prepared for an addition to the present plant. The addition will be of brick 160 x 200 ft. in dimensions.

Herman A. Miller and I. J. Coffin are promoting the establishment of a flax mill at East Tawas, Mich.

The plant of the Stimpson Scale Company, Northville, Mich., has been sold at receiver's sale to a Toledo syndicate headed by J. W. McMahon. The new owners are not yet ready to announce their plans.

A new company has been organized at Lansing, Mich., under the style of the Auto Electric Gas Lighter Company. The capital stock is given at $3,000.

The Marquette Motor Company, Saginaw, Mich., is planning considerable improvements to its plant, including the installation of a heat-treating department and the purchase of a 200-hp. boiler. The company is now engaged in moving machinery into its new manufacturing building.

The Campbell-Wayant-Cannon Foundry Company, Muskegon Heights, Mich., has completed plans for the construction of a large addition to its foundry. The new building will be 65 x 196 ft. in size, and of brick construction. The company which makes motor castings and is a jobber in chilled iron and semi-steel reports an excellent volume of business.

The Welch Motor Car Company, Pontiac, Mich., will begin work at once on an addition to its factory 40 x 100 ft. to be used as an assembling room. A boiler house will also be erected and a number of other minor improvements made.

The Sanitary Slicing Machine Company has been organized at Grand Rapids, Mich., with a capital stock of $5,000 to manufacture meat-slicing machines and butchers' supplies. The stockholders include C. L. Rood, A. S. Davis and E. A. Rood.

The American Brass & Iron Company, Detroit, has under construction a new factory building at Crystal and Trombly avenues.

The Michigan Steel Casting Company, Detroit, is expending $20,000 for a reinforced concrete steel addition to its foundry.

Plans are being formulated looking to the consolidation of Gaar, Scott & Co., Richmond, Ind., and the Advance Thresher Co., Battle Creek, Mich., with the M. Rumely Co. of La Porte, Ind.

The Acme Electric Heater Company, Detroit, has been issued a permit for the erection of a $4,000 factory building in that city.

The Detroit Insulated Wire Company, Detroit, will build a factory building at a cost of $6,500.

The Home Interior Finish Company, Holland, Mich., has bought property adjacent to the Pere Marquette Railroad on which factory buildings are already erected but which will be greatly enlarged by the new company.

Indianapolis

INDIANAPOLIS, Ind., October 31, 1911.

The Indiana Gas Engine Company, Indianapolis, has been incorporated with a capital stock of $25,000 by G. G. Westerfield, I. W. Connaty, S. S. Brewer, Bernard Korbly and C. A. Korbly.

The Halton Powell Company, Indianapolis, has been incorporated with $20,000 capital stock, to manufacture furniture. The directors are E. W. Bassett, F. B. Moreland and B. Denny.

The Holland Specialty Company, Indianapolis, has been incorporated with $10,000 capital stock to manufacture medical and dental supplies. The directors are M. J. Holland, E. Mattingly and F. J. Carter.

The General Floor Dresser Patents Company, Indianapolis, has been incorporated with $10,000 capital stock to manufacture floor dressing machinery. The directors are A. A. Welsh, G. Dixon and J. N. Ward.

The Hose Lightener Company, Indianapolis, has been incorporated with $30,000 capital stock to manufacture hose lighteners, couplers and similar devices. The directors are J. L. Drake, F. L. Meier and B. M. Drake.

The Greeman Bros. Furniture Mfg. Company, Lawrenceburg, Ind., has increased its capital stock from $75,000 to $150,000 and has begun the enlargement of its plant.

The Kehoe Light & Power Company, Ft. Wayne, Ind., has been incorporated with $100,000 capital stock to furnish electric current. The directors are T. J. Kehoe, C. M. Niezer and M. J. Kehoe.

The Whitesides Commercial Car Company has been organized at New Castle, Ind., with $31,250 capital stock to manufacture auto trucks and auto parts. The directors are F. N. Whitesides, O. C. Saffert and O. O. Carpenter.

The American Bridge Company, now employing 1200 men at its plant at Gary, Ind., has received enough orders to make necessary the doubling of its present production.

The City Council of Sullivan, Ind., has granted a 25-year franchise for a waterworks system to E. M. Kerlin, of Vincennes, Ind.

The Kuhlman Electric Company, Elkhart, Ind., has increased its capital stock from $10,000 to $50,000 and has issued in addition $20,000 of preferred stock.

The Western Supply & Wrecking Company, Bluffton, Ind., has been incorporated with $35,000 to deal in oil and gas well supplies. The directors are J. F. Harris, T. R. Hoskins and T. Flynn.

The Kokomo Brass Works, Kokomo, Ind., has increased its capital stock from $50,000 to $100,000.

The Kokomo Electric Company has increased its capital stock from $25,000 to $150,000.

The Fort Wayne Auto-Motor Company, Fort Wayne, Ind., expects to increase its present plant and install additional machinery.

Plans are maturing for the incorporation of the Sibley Stove Company with a capital stock of $50,000. The company will locate in a plant already built at South Bend, Ind.

The La Porte Radiator Company, La Porte, Ind., is organized with a capital stock of $100,000 and has as directors A. J. Rumely, Emmet Scott and G. P. Wilkins.

The D. J. Jenkins Glass Company, formerly of Kokomo, Ind., is to be removed to Whiting, Ind., where employment will be given to 400 people.

The South

LOUISVILLE, KY., October 31, 1911.

Business with machinery manufacturers and dealers is improving. Definite reports from leading interests indicate that trade is considerably ahead of the record of this time last year. Prospects are encouraging, so that the rest of 1911 ought to continue to be above the 1910 standard. Power equipment, wood-working machinery and ice-making apparatus are among the leading items at present, with contractors' outfits in good demand.

In the farther south there is some dissatisfaction over the low price of cotton, which is causing growers to hold their crops. This naturally is tending to produce a sluggish state of affairs, which will not be relieved until the staple moves to market and money becomes plentiful. It is hoped that prices will soon be on a level which will justify the growers in selling.

The Kentucky Wagon Mfg. Company, Louisville, has purchased the Electric Vehicle Company, Louisville, and has moved the plant from Preston and College streets to Third and K streets, where the company has had a large farm wagon factory. The Kentucky company has been equipping a department for the manufacture of motor truck bodies, and will now undertake the production of electric trucks of the design of the Vehicle company, on a large scale. The extent of the development has not yet been determined. H. B. Hewett, president of the Electric Vehicle Company, and others of its officers have joined the Kentucky Wagon Mfg. Company.

The Shields Steam Specialty Company, Louisville, has been incorporated with a capital stock of $10,000, and George W. Shields, A. J. Breedlove and T. Q. Munce are the incorporators. The concern will equip a machine shop and later a foundry for the manufacture of boiler-room specialities, such as valves, joints

THE MACHINERY MARKETS

couplings, etc. Brass and iron castings will be required. George W. Shields will be president of the company, which has not yet decided upon a location.

L. R. Veatch & Co., Louisville, are gradually enlarging a shop at 110 West A street for the repair and remodeling of flour-milling machinery. A Universal wood-worker was recently installed, and other equipment will be bought later. The concern is working night shifts.

Work has begun on the five-story addition to the plant of the Louisville Lead & Color Company, Fifteenth street and Portland avenue. The concern will require milling machines, which will be operated by electric motors; a heating plant and an automatic sprinkler system. J. D. Cooper is superintendent.

It has been announced that the plant of the Milton-Peter Mfg. Company, Louisville, which was destroyed by fire last week, will be rebuilt. Power equipment, machine tools and wood-working machinery will be required. The company manufactures tables.

The Board of Public Safety of Louisville has recommended the equipment of an automobile repair shop to take care of the municipal motor cars which have been put in service within the past few years. The fire department is to be operated by motor trucks in the near future.

The Henry Vogt Machine Company, Louisville, reports the sale of an unusually large number of ice and refrigerating machines. The Standard Oil Company has made several large purchases of refrigerating equipment from this concern. The boiler demand is also good.

The Harlan-Lowe Milling Company, Bardwell, Ky., will erect an elevator.

The Warren County Loose Leaf Tobacco Warehouse Company, Bowling Green, Ky., will erect a plant for prizing tobacco for packing in hogsheads. Presses and power equipment will be required.

The Gibson-Carr Company, Middlesboro, Ky., is planning the development of 200 acres of coal land on Tye Fork near Anchor, Ky.

The Martin's Fork Coal Company, Harlan, Ky., has been organized with $40,000 capital stock for the purpose of opening coal mines in Harlan county. B. F. Unthank represents the company.

Huffman & Call have purchased a controlling interest in the Mountain Water Company, Pikeville, Ky., and are improving the system. New mains will be laid and the power plant will probably be enlarged.

The United Water & Light Company, Somerset, Ky., plans the installation of an additional engine in its electric light plant. The present plant, it is stated, is badly overloaded because of the rapid increase in business.

The Cincinnati Elevator Works, Covington, Ky., has filed articles of incorporation with $5,000 capital stock. Margaret J. Quigley, Fred N. Meyer and Harry C. Ahlers are the incorporators of the company.

The Tom Creek Oil & Gas Company, Paintsville, Ky., has been organized with $35,000 capital stock by John C. C. Mayo, Finley E. Fogg, George F. Copland and others.

C. V. Bartels, Louisa, Ky., has organized the Reuben Fork Oil Company with $6,000 capital stock, and plans immediate operations in the Big Sandy alley.

The Nicholasville Ice & Cold Storage Company, Nicholasville, Ky., has been organized by A. Kenney with $30,000 capital stock and a plant is to be erected.

Russell Birkeau, of Cumberland Gap, Tenn., is moving his wagon plant to Middlesboro, Ky., where he has been given a site by the Board of Trade of that city. Some enlargements probably will be made.

H. M. Byllesby & Co., Chicago, are having a survey made of the Cumberland Falls on the Cumberland River near Williamsburg, Ky., with a view to erecting a hydroelectric power plant, should the result of the survey be favorable. It is expected that this will be completed within a few weeks, and owing to the fact that a number of large cities, including Lexington, Ky., Knoxville, Tenn., and Cincinnati are within reaching distance, it is thought that the plant would be a feasible proposition. Cumberland Falls has a drop of 60 ft.

E. S. Hitchens, Olive Hill, Ky., is chairman of a committee of the Carter Fiscal Court which has been empowered to purchase a rock crusher and other machinery to be used in road-building.

The City Council of Covington, Ky., is contemplating the purchase and improvement of the plant of the Kenton Water Company. The council has rejected bids recently taken for a garbage reduction plant and new bids are to be advertised for.

The Chesapeake & Ohio Railroad has secured a permit for the erection of a powerhouse in Covington, Ky. It will furnish power for the operation of the telegraph lines along its lines, and will be equipped with a considerable amount of electrical apparatus.

The Henderson Brewing Company, Henderson, Ky., has let a contract for the installation of a new power plant to the Brownell Company, Dayton, O. Three 72 in. x 18 ft. boilers are to be installed, having an aggregate capacity of 600 hp. The battery of boilers, instead of being supported on brick walls, will be suspended by heavy steel beams, resting on iron columns, the idea being to permit free expansion and contraction. The company plans an increase in the capacity of its ice plant.

The Owensboro Buggy Company, Owensboro, Ky., has let a contract for the erection of a three-story addition to its plant. Contracts for the necessary woodworking machinery will be let in the near future.

Tyler Stone, Sturgis, Ky., is interested in the plan to establish a system of waterworks in that town.

It is reported that the McCowen-Probst-Menau Company, Salem, Ind., which manufactures plumbers' supplies, is contemplating a considerable addition to its plant. W. G. Probst is superintendent.

The Paxton Lumber Company, Bristol, Tenn., will erect a planing mill. It has a power plant at present and only woodworking equipment will be needed.

Andrew Smalling, Bristol, Tenn., plans the erection of a bandmill and the development of a tract of timber in the Holston mountains near Bristol.

Johnson City, Tenn., is completing plans for its proposed water system, and will be ready to begin construction work in a short time. Water will be piped from Big Blue Springs, a distance of 12 miles.

W. D. Frazier, Columbia, Ky., is planning the erection of a wood-working plant at Algood, Tenn. Columns will be the principal line manufactured.

The Anderson-Tully Company will erect a large addition to its box factory at Memphis, Tenn. The cost of the plant will be about $25,000. C. H. Allen is in charge.

W. C. Hunt, Tullahoma, Tenn., is organizing a company for the erection and operation of an ice factory with an initial capacity of 20 tons.

The Harris Municipal Incinerator Company will, it is reported, establish a plant for the manufacture of garbage incinerators at Nashville, Tenn. The Nashville Industrial Bureau is authority for the report.

Obion, Tenn., will build a waterworks system. Bids are to be received until November 21. C. H. Jenks, Union City, Tenn., is the engineer in charge.

The Imperial Realty Company, Knoxville, Tenn., has announced plans for the erection of a steel-frame hotel to cost $350,000. Work will begin January 1.

A central dairy plant, to cost $50,000, is to be built at Nashville, Tenn. A. P. Foster, Nashville Industrial Bureau, is interested.

The White Adding Machine Company, Nashville, Tenn., has filed articles of incorporation with $400,000 capital stock. Adding machines and other commercial devices will be manufactured. L. Allen Cook, H. B. Thomson, Sigfried Janson, Benjamin F. Barry and others are the incorporators.

The Bon Jellico Coal Company, Knoxville, Tenn., has been organized by Arthur Grozes, F. F. Floyd, W. J. Everett and others for the purpose of developing 1250 acres of coal lands in Whitley county, Ky.

The Severance Mfg. Company, Nashville, Tenn., which produces gas plants for private residences, is planning the erection of a branch plant at Jacksonville or Pensacola, Fla. V. J. Severance is head of the company.

The Columbian Paper Company, Bristol, Tenn., is planning the increase of the capacity of its mill. It is said that the defeat of reciprocity with Canada has strengthened the position of the producers of wood-pulp paper.

The Fayetteville Grain Company, Fayetteville, Tenn., has been organized with J. W. Hardin as manager. Conveying machinery operated by electricity will be installed in an elevator secured by the company

The Connor & Wallace Machine & Foundry Works is the name of a new corporation in Columbia, Miss. Claude Wallace is manager and M. W. Conner secretary and treasurer.

The South Atlantic Blow-Pipe & Sheet Metal Company has filed articles of incorporation at Atlanta, Ga. Its capital stock is $50,000 and the company will take over the plant of the Standard Blower & Metal Mfg Company. T. H. McMillan, Savannah, Ga., is one of those interested.

THE MACHINERY MARKETS

Manchester, Ga., contemplates issuing bonds for the erection of an electric light plant.

The Dominion Metal Products Corporation, Roanoke, Va., has been incorporated with a capital stock of $150,000 to make corrugated culverts and a general line of sheet metal products, including ceilings, roofing, shingles, eave trough, etc. A factory building, 50 x 200 ft., will be erected. J. B. Betts is president and general manager and P. H. Tucker is secretary and treasurer.

St. Louis

ST. LOUIS, Mo., October 28, 1911.

The machine tool business continues to show the order of improvement which has been noted recently, the new sales and inquiries being confined to single tools, the requirements of small establishments and some second-hand stuff. There is still a dearth of inquiries from the larger concerns and there is, apparently, little likelihood of their appearance in the market, except in some very special instances, until there is a more definite state of affairs generally.

The city of St. Louis is a prospective customer during the next year or two for some 68,000 water meters, it being the declared intention of the Water Commissioner, under authority already existing, to install meters for all consumers in the city with a view of economizing the consumption which has reached the emergency capacity of the pumping station. Arrangements are also under way for the immediate expenditure of $160,000 in improving and extending the 36-in. main service of the city. Additional 36-in. mains are also planned to cost in the vicinity of $1,000,000 during the next two years. The necessary funds are already in hand and only municipal legislative authorization is necessary for the work. The total water department extension expenditures of the next three or four years will run to $4,500,000, of which $1,000,000 will go to boiler and pumping equipment.

The city of Lamar, Mo., voted October 24 to issue $70,000 of bonds for the construction of a municipal light and water plant. The plans will not be completed until the legality of the election is fully established, to the satisfaction of the bond buyers.

The Prest-O-Lite Company, Indianapolis, Ind., has completed plans for the construction of a branch factory and charging station in St. Louis. The plant will be one of complete and independent equipment, apart from the Indianapolis factory. It will cost $50,000.

The city of Webster Groves, Mo., a suburb of St. Louis, voted October 28 to issue $75,000 of bonds for the completion of its water plant and system. The proposition was renewed from September 19, last, when it was defeated by 6 votes.

The Southern Railway has announced that it will build an 18-stall round house at East St. Louis and will also establish a repair plant which will require 200 skilled mechanics and twice as many laborers. The plant will cost about $200,000 with its mechanical equipment.

The LeSieur Vacuum Can Company, a $100,000 corporation, will erect at once a plant in East St. Louis for the manufacture of milk cans and similar receptacles under new patents.

The Morrison Milling Company, Morrison, Mo., has been incorporated with $100,000 capital stock by Arnold Hammert, Fred Toole, and August Wells and will erect a flour milling plant at once.

The Moore Continuous Safety Rail Company, with $20,000 capital stock has been incorporated at Galesburg, Ill., by R. D. Moore, L. W. Sanborn, E. R. Drake, W. E. Doyle and R C. Rice, and will equip a plant for the manufacture of a patented rail, switch and crossing.

The C. L. Clark Mfg. Company, Elgin, Ill., has been incorporated with $50,000 capital by C. L. Clark, W. H. Kimball and H. H. Simons and will equip a manufacturing plant at once.

The Berry-Reed-Summerlin Company, with $15,000 capital stock has been incorporated at Mattoon, Ill., and will at once equip a manufacturing plant.

The American Dartium Steel Castings Company, with $150,000 capital stock has been incorporated at St. Joseph, Mo., by Edward Richards, John Tompson and Eugene W. Colville and will equip a plant at once for the manufacture of steel castings

The Springer Elevator Company, with $50,000 capital stock, has been incorporated at Springertown, Ill., by C. R. Barton, R. Barton and G. M. Barton and will build and equip a grain elevator at once.

The Globe Furniture Mfg. Company, Kansas City, Mo., with $100,000 capital stock, has been incorporated by J. A. Dillon, L. F. McClure, J. A. Edwards and others and will build and equip a furniture manufacturing plant at once.

The Plantation Equipment Company, St. Louis, has been organized by Wm. C. Zelle and Wm. B. Brennecke of St. Louis, with a capital stock of $100,000 to engage in the manufacture of gasoline power, agricultural machinery and implements.

J. A. Schroer & Co., coopers, St. Joseph, Mo., have obtained a portion of the property of the Ambrose Foundry Company and will build a cooperage plant on the site.

The American Furnace Company, St. Louis, is about to erect a two-story factory building on Morgan street at a cost of $16,000.

The American Beet Sugar Company is preparing plans for the improvement of its Grand Island, Neb., plant, at an estimated cost of from $250,000 to $300,000.

The Union Pacific Railroad Company has let the contract for a nine-stall round house at Sidney, Neb., to replace the one recently destroyed by fire. A larger round house will be built later.

Texas

AUSTIN, Tex., October 28, 1911.

The machinery trade in Texas continues very satisfactory, according to statements of dealers, and the same is true in Arizona and New Mexico. In Mexico the situation continues to improve and there is a noticeable increase in the orders for mining machinery. The activity in the development of the oil fields of that country is also creating a very large demand for material for storage tanks and pipe lines.

Contract will soon be awarded for the construction of a complete sewer system for Celina, bonds for the purpose having been issued.

The Houston Ice & Brewing Company, Houston, will install a new ice factory at Bryan. It will also erect modern bottling works which will be operated in connection with the former plant. The cost of these improvements will be about $50,000.

The Farmers Broom Factory has been organized at Donna for the purpose of installing a broom manufacturing plant. The incorporators are O. L. Wilson, T. E. Delbridge and J. A. Collier.

The Giddings Creamery Company has been reorganized under the name of the Giddings Creamery-Ice Mfg. Company with a capital stock of $20,000. It will install an ice factory and cold storage plant at Giddings, Texas. It also contemplates putting in an electric light plant for furnishing the town with lights.

The Eagle Pass Ice Mfg. Company, which has been organized at Eagle Pass with a capital stock of $20,000, will install an ice plant.

The Balmorhea-Toyah Valley Irrigation Company is arranging to construct a system of irrigation in the Balmorhea section of the Toyah valley to cost about $300,000. The plans involve the erection of a dam which will cost about $200,000 and the construction of a large system of canals and laterals. The financial agents of the company are Cobe McKenna & Co, Chicago. Steps have been taken to form a water users' association, taking in all the land owners that are to be benefited by the reservoir and irrigation system. The lands are to be bonded for the payment of the cost of constructing the dam and equipping the system.

The Yoakum Improvement Company will install a new 500-hp. engine and a new 150-kw. 60-cycle dynamo in its electric light plant at Yoakum. It will also make improvements to its waterworks system. J. W. Greer is superintendent.

M. G. O'Neil, civil engineer of Dallas, will make a survey and estimate of the cost of constructing a new waterworks system for Mount Vernon. He will submit his report to the city council when the work is finished and further action towards consummating the proposed improvement will be taken.

The equipment for the proposed electric light, waterworks and ice plants that are to be installed by Geo. T. Clark, of Chicago, at Menard, has arrived on the ground. Improvements are in progress.

Paul Garrett and associates will install a flour mill and cotton gin at San Angelo, at a cost of about $35,000. The flour mill will be finished in time for operation when next season's wheat crop is harvested.

The People's Ginning Company has been formed at Falfurrias with a capital stock of $12,000. The in-

THE MACHINERY MARKETS

corporators are R. E. McBryde, J. H. Allen, H. L. Inselmann and others.

The Chamber of Commerce of Bowie is promoting the organization of a company that will install a large plant for the manufacture of roofing tile, vitrified and fire brick.

The Tamilina Milling Company has been formed at San Antonio with a capital stock of $60,000. Incorporators are B. M. Martinez, F. A. Chapa and others.

The Austin Corners Gin Company has been formed at Rockwall with a capital stock of $6,000. The incorporators are W. C. Bishop, I. J. Austin and T. B. Ridgell.

The Worth Oil Company has been formed at Fort Worth with a capital stock of $50,000 for the purpose of boring oil wells. The incorporators are A. H. Carrigan, Fred W. Householder and J. M. Clover.

Wade Herren will install an irrigation pump and 35-hp. engine at a well that he is putting down near Deming, N. M.

The Bordo Ice & Power Company will install a 75-ton ice factory at Tampico. C. C. Freston is chief engineer.

The development of the oil fields in the Tampico region of Mexico has created an enormous demand for iron storage tankage material. The Huasteco Petroleum Company is erecting 100 additional tanks, each of 55,000 barrels capacity.

The Mexican Eagle Petroleum Company is erecting 50 iron tanks, each of 55,000 barrels capacity, at the junction of the Tampico-Tuxpan canal, about three and a half miles from Tankville. The Tampico Petroleum Company, which is the Mexican organization of the Texas Company, is putting up a number of large tanks three miles up the Panuco River from the Mexican Eagle Petroleum Company's tank farm. There is much activity on the part of other companies in erecting oil storage tanks and laying pipe lines in the Tampico district.

The Ray Central Copper Company has definitely decided to install a 1500-ton mill at its property near Ray, Ariz.

C. W. Lerchin of Kelly, N. M., will install new machinery upon mines that he recently purchased in the Copper Basin district, Arizona.

The Inspiration Copper Company of Miami will soon have the plans finished for its proposed 5000-ton mill near Miami, Ariz.

The Treasure Mining & Reduction Company will install an aerial tramway at its property near Mogollon, N. M., and will double the capacity of its mill.

The El Carmen Mining Company of El Carmen, State of Durango, Mexico, will erect a mill at its property there. F. C. Alley, whose address is El Carmen, is manager.

The Esmeralda-Parral Mining Company will install air compressor, boilers, hoists and other equipment upon its property near Parral, Mexico. Wm. P. Fairman of Philadelphia is president. Wade Armstrong of Parral is superintendent.

The Veta Colorada Mining Company of Parral, Mexico, will install new machinery and double the capacity of its mill in that district. G. J. Ashe of Knoxville, Tenn., is president.

The Pacific Coast

PORTLAND, ORE., October 24, 1911.

The machine tool market appears to be in a little better shape than a year ago, though there is no general activity. Occasional orders of some importance are coming out, but most of the tools sold are small, and orders for more than two or three machines are infrequent. The situation in other lines shows little change, the demand keeping about up to the recent average. Little improvement is expected before the first of the year, but conditions are favorable for a general revival in the logging and woodworking departments during the late winter and spring. The lumber trade, which has been rather quiet for nearly a year past, has improved materially of late, with a heavy shipping movement both by rail and water. The shingle market is demoralized, but a good many manufacturers are still in the market for new equipment. Pumping plants and waterworks supplies, small electric generators, motors, etc., are all in steady demand.

The machine shop of Hathaway Bros. at Corvallis, Ore., was destroyed by fire October 17, the loss being estimated at $6,000. The old structure will be replaced by a concrete building, and new tools will be purchased immediately and set up in temporary quarters.

The Olympic Portland Cement Company, Bellingham, Wash., is expected to be in the market for tools shortly, the contract for the shop building having been let.

Contracts are expected shortly for the buildings to be erected in this city by the Berlin Machine Works, Beloit, Wis.

The Colombia Engineering Works, this city, has a contract for a lot of riveted steel pipe for the 7-mile aqueduct of the Hood River Irrigation Company.

The Moran Company, Seattle, Wash., is starting work on two steel whaling steamers for the Canadian North Pacific Fisheries, the contract amounting to about $130,000.

The Vulcan Industrial Engineering Works has been incorporated at Seattle, Wash., with a capital stock of $1,500,000, by Wm. A. McDonald, J. Ivey and J. Himill.

The Twin City Woodworking Company, whose plant at Chehalis, Wash., was recently destroyed by fire, announces that it will rebuild in the near future.

The Puyallup Mill & Veneer Company, Puyallup, Wash., has announced its intention to replace its planing mill which was recently burned. A new 12-ft. band saw will be installed in the mill, and the box factory will also be increased.

The Northwestern Smelting & Refining Company, Ltd., Nampa, Idaho, is preparing to install a new plant, and has called for bids on the excavation.

The Holland-Cook Mfg. Company is rebuilding its wood-working plant near Tacoma, Wash., which was recently destroyed by fire.

The Clark Bros Company, Belmont, N. Y., manufacturer of sawmill machinery, engines, etc., has about completed a large distributing warehouse at Seattle, Wash. E. F. Mitchell, Coast manager for this company, has resigned, and the business is temporarily in charge of J. O. Bradney.

The Booth-Kelly Lumber Company is preparing to install a new bandsaw mill with a daily capacity of 175,000 ft. at Springfield, Ore.

The Smith-Powers Logging Company, Marshfield, Ore., is making a test of electric power for logging work. If the experiment succeeds, a central power plant will be installed, furnishing power to all the company's camps.

The Shultz Belting Company, St. Louis, Mo., has established a permanent office at 49 First street, this city, covering the entire Pacific coast. C. E. Grigg is in charge.

Several new machines are being installed at the mill of the Coquille, Ore., Lumber Company.

Eastern Canada

TORONTO, October 28, 1911.

The currents of trade continue to run strong in all branches of enterprise. There is no unemployed force to speak of, and such men as are out of work are either incapable or lazy. The cry of most of the manufacturing industries is for more men. The puzzling discrepancy between the relatively small increase in population as indicated by the census and as foreshadowed by the immigration figures is causing a closer watch to be set upon the migratory population.

The Customs Department at Ottawa is receiving numerous requests from United States manufacturers for special valuations on articles made by them, the object being to fortify themselves with official information serviceable for the establishing of branch factories in Canada. Having the department's quotation of valuation, they know exactly what competitors shipping from the United States would have to overcome. Further, the valuations are important for American branch factories in Canada importing some of their material in a raw or more or less finished state from the other side of the border.

The census shows that the increase in population in Eastern Canada is wholly in the manufacturing centers.

Several towns and cities in Canada are acquiring large areas of land to dispose of in parcels large enough for manufacturing sites, which are to be given free in consideration of the putting up and operating of the factories. The City Council of Ottawa is now considering the question of acquiring land for this purpose. The town of Berlin, Ont., is also acquiring land for free factory sites.

Agents of the various shipbuilding companies that

THE MACHINERY MARKETS

tendered for the work of building vessels for the Canadian navy are impatient to know what the new government is going to do about the business. Each of the companies has $100,000 on deposit with the Government.

The works of the Canadian Car & Foundry Company at Turcot, near Montreal, are to have their capacity doubled so as to be able to turn out 125 passenger cars per annum. The shops for all-steel cars at Dominion, just outside Montreal, are also to be enlarged to 50 per cent. more capacity.

The plant that Canadian Steel Foundries, Ltd., is erecting at Longue Pointe, Montreal, will cost about $1,000,000. It will be ready for operation at the end of the year. The capacity of the plant will be 25,000 tons of steel castings per year.

Goold, Shapley & Muir, Brantford, Ont., are installing the water system for fire protection at the Jordan Sanitarium at River Glade, N. B.

Tenders will shortly be asked for the supplying of a fire pump, gasoline engine and a producer gas engine in connection with the water works of the municipality of Ridgetown, Ont.

Tenders will be received to November 16 for the putting in of sewers, pumping station, etc., for the town of Sudbury, Ont.

The London Street Railway Company, London, Ont., will take up the question of purchasing equipment for power house, extension of lines and building of cars.

Tenders are called to November 8 for the construction and erection of 150-hp. horizontal return tubular boilers at three points on the National Transcontinental Railway. Tenders are to be sent to the secretary, P. E. Ryan, Ottawa.

Plester & Parker, Galt, Ont., are enlarging their factory and will install additional machinery.

M. E. Blaiser Machine Company, Utica, N. Y., will establish a branch factory at Niagara Falls, Ont.

City Engineer Sifton, Hamilton, Ont., is preparing plans for two transformer stations, for municipal electrical system, one to cost $8,000, the other $10,000.

Tenders will be called shortly for the hydro-electric distribution system at the main transforming station, Hamilton, Ont., with heating system at the main transforming station, with heating, lighting and plumbing, about $16,000; station equipment, including transformers, switches, switchboards, indicating and recording instruments, about $40,000.

The Standard Silver Plate Company, Toronto, will build a factory to cost $75,000.

A branch factory of the Beaver Mfg. Company, Birmingham, Eng., is to be opened at Niagara Falls, Ont. Aluminum novelties will be turned out.

The nail and wire mill which the Dominion Steel Corporation is erecting at Sydney, N. S., is steadily progressing.

The Dominion Axle & Forge Works, Guelph, Ont., has begun the construction of its factory.

The Quebec Pulp & Paper Company, Montreal, has been formed with a capital stock of $15,000,000. It proposes to construct and operate large mills in the Province of Quebec.

It is reported that the Canadian Northern Railway Company will establish large repair shops in Ottawa.

The ratepayers of Dryden, Ont., have approved a by-law giving municipal privileges to the Dryden Timber & Power Company, in consideration of the latter's establishing a pulp mill and power plant there.

The Canada Cement Company, Montreal, will add a number of new plants at various points throughout the country.

The Hamilton Gaslight Mantle Company, Hamilton, Ont., has been incorporated with a capital stock of $40,000.

The M. E. Blazier Machine Company, Utica, N. Y., which manufactures steaming and pressing apparatus, has established a Canadian branch plant at Niagara Falls, Ont.

The Toronto Power Company is receiving bids for an extension of cut stone, to be made to its power house at Niagara Falls, Ont. Bids for equipment will be called for later.

The Burwill Works, Ltd., Brockville, Ont., manufacturers of cream separators, are erecting a factory addition.

The Cossitt Company, Brockville, Ont., manufacturer of scales, etc., is erecting a two-story addition to its plant.

Western Canada

WINNIPEG, MAN., October 28, 1911.

The Western coal strike which has lasted from early in April is now ended, as the result of the mediation of the new Minister of the Interior. It had a dragging effect upon industry, especially in the Far West, the lead smelters in Southern British Columbia being forced to close, and the silver-lead mines being likewise put out of operation. A strike that has been in progress for a fortnight in the West is that of the machinists in the shops of the Grand Trunk Pacific Railway Company. The general conditions of trade and industry in that part of the country are, however, excellent.

Tenders are to be called shortly for the supplying of gate valves for the water system of Point Grey, B. C.

The Canadian Pacific Railway Company is preparing to electrify the Rossland-Trail section of its line in British Columbia.

T. J. S. Skinner, Calgary, Alberta, will erect a large block there, to cost $500,000.

Up to November 15 tenders will be received by W. D. Spence, City Clerk, Calgary, Alberta, for the supplying of materials for street railway.

The City Commissioners of Saskatoon, Sask., will receive tenders up to November 17 for the furnishing and erecting of the superstructure over the Nineteenth street subway.

Up to December 15 tenders will be received by J. W. Bradley, Secretary-Treasurer of Neepawa, Man., for equipment and material for water works and sewage disposal plant.

The Agutter?Griswold Company, a large manufacturer of steel boxes, switch and panel boards and other electrical apparatus, proposes to start a factory in Vancouver, B. C.

G. M. Gibbs, Vancouver, B. C., is planning for the establishment of a rolling mill plant on the Fraser River.

The Massey-Harris Company, manufacturer of farm implements and machinery, Toronto, will erect a large warehouse at Swift Current, Sask.

It is stated that the Powell River Paper Company, whose head office is in Vancouver, B. C., will spend $1,000,000 to add to the capacity of its new plant on Powell River. It has already expended $2,500,000 on works and equipment.

The North Battleford Mfg. Company, North Battleford, Sask., is about to enlarge its plant.

The town of Vermilion, Alberta, has awarded the contract for the construction of its electric power house to Ferrell & Walker.

In the municipal elections of January the ratepayers of Vancouver, B. C., will be asked to approve money by-laws authorizing the raising and expenditure of $2,000,000. Of this sum $550,000 will be for a bridge across False Creek.

The Canada Iron Corporation will add to its works at Fort William, Ont., a gas-producing plant to facilitate the drying of the molds used in pipe making.

The Riverside Lumber Company, Calgary, Alberta, is about to erect a box factory as an addition to its plant. It is stated that the factory will employ about 100 men.

The Keizer Brick Machine & Mfg. Company has been formed in Winnipeg, with a capital stock of $200,000. The directors are Mayor Evans, J. W. Horne, D. A. Keizer, J. B. Stephens and H. A. Lightcap. Mr. Keizer is the inventor of the machine, which has a capacity of 21,600 pressed bricks per hour.

The Saskatchewan Bridge & Iron Company, Ltd., has been incorporated at Moose Jaw, Sask., with a capital stock of $250,000. It is practically a reorganization of the Moose Jaw Machine Company, Ltd.

Hoyme & Co. contemplate establishing a paint manufacturing plant at Camrose, Alberta.

The Hamilton Steel Company has secured options on a large waterfront site at New Westminster, B. C., for industrial purposes.

The planing mill and machinery of the Dryden Timber & Power Company, at Dryden, Ont., was burned October 20. Only a few days ago the ratepayers there passed by-laws granting certain privileges to the company, including exemption from taxation for ten years, and the fixing of the school assessment at $60,000 for ten years. A large pulp mill is being erected.

Government Purchases

WASHINGTON, D. C., October 30, 1911.

The Paymaster General, Navy Department, Washington, will receive bids until November 14, under schedule 4029, for turret turning equipment, one combined stake riveter and punch, one electrolytic oxygen-hydrogen generating plant, gun firing equipment and interior communication motor generators, and under schedule 4044 for furnishing and installing one steam pressure disinfector.

The United States Engineer Office, Memphis, Tenn., will open bids November 24 for one locomotive crane for the Mississippi River Commission.

The Isthmian Canal Commission, Washington, will open bids at an early date for furnishing spillway gate machines and pumps for all spillways for the Panama Canal, including gate machine complete, motors and pumps.

The Bureau of Yards and Docks, Navy Department, Washington, opened bids October 24 as follows:

Schedule 3946, class 41, one 21-in. turret lathe.—Bidder 53, Lunkenheimer Company, Cincinnati, Ohio, $3,145; 55, Manning, Maxwell & Moore, New York, $3,150; 61, Niles-Bement-Pond Company, New York, $3,485.

Schedule 3966, one die sinking machine.—Bidder 55, Manning, Maxwell & Moore, New York, $840; 65, Pratt & Whitney Company, Hartford, Conn., $1,174.

Schedule 3967, one anchor windlass with engine complete.—Bidder 60, Newport News Shipbuilding & Dry Dock Company, Newport News, Va., $18,795; 87, Williamson Bros. Company, Philadelphia, Pa., $18,250.

Schedule 3968, one steering gear.—Bidder 41, Hyde Windlass Company, Bath, Me., $33,280; 60, Newport News Shipbuilding & Dry Dock Company, Newport News, Va., $32,076 and $32,376; 87, Williamson Bros., Philadelphia, Pa., $28,275.

Schedule 3969, one direct-current motor, two hoisting and rotating equipment and five 3-hp. motors.—Bidder 35, General Electric Company, Schenectady, N. Y., $18,326; 60, Newport News Shipbuilding & Dry Dock Company, Newport News, Va., $18,040.

Schedule 3982, one double back geared lathe.—Bidder 10, Bradford Machine Tool Company, Cincinnati, Ohio, informal; 26, Frevert Machinery Company, New York, $668 and $718; 29, Fairbanks Company, Washington, D. C., $719; 36, Garvin Machine Company, New York, $800 and $823; 55, Manning, Maxwell & Moore, New York, $699; $1,181, $717, $908 and $895; 61, Niles-Bement-Pond Company, New York, $716, $778 and $838; 67, Prentiss Tool & Supply Company, New York, $1,049 and $1,124.

Class 42, one pipe threading machine.—Bidder 26, Frevert Machinery Company, New York, $664; 29, Fairbanks Company, Washington, D. C., $698.20; 46, Kemp Machinery Company, Baltimore, Md., $559.50 and $669.50; 55, Manning, Maxwell & Moore, New York, $699, $988, $1,734 and $1,220; 58, Manhattan Supply Company, New York, $1,345; 61, Niles-Bement-Pond Company, New York, $1100; 88, Vermilye & Power, New York, $451.25.

Schedule 3984, two 50-kw. turbo generating sets.—Bidder, 35, General Electric Company, Schenectady, N. Y., $8650; 47, Kerr Turbine Company, New York, $2,263.90; 7, Benedict & Burnham Mfg. Company, New York, $6,200; 92, De Laval Steam Turbine Company, Trenton, N. J., $2,815 and $3,375.

The Wheland Machine Works, Chattanooga, Tenn., which has been merged with the Chattanooga Machinery Company under the name of the Wheland Company, has been manufacturing sawmill equipment for many years. It was started at Athens, Tenn., in 1866, its plant being moved to Chattanooga in 1874. It was conducted as a partnership until 1900, when it was incorporated with $100,000 capital stock. This has been increased, with the change of name and the taking over of the Chattanooga concern, to $200,000, a petition for the amendment of its charter having been recently filed. The concern has been developing its foreign trade considerably of late, and is shipping sawmill equipment to the Argentine Republic, Brazil, South Africa and Australia. G. W. Wheland is at the head of the company.

The Atlas Car & Mfg. Company, Cleveland, has recently received the following orders for industrial cars and locomotives: Four 3-phase 20-ton locomotives for transferring coke quenching cars at the new coke plant of the Indiana Steel Company, Gary, Ind.; three 100-ton ore cars and one storage battery locomotive crane for subsidiaries of the United States Steel Corporation; 400 3-ton industrial cars for a manufacturing plant on the Western coast; 3 mining locomotives for a Western company, and several special electrically driven scale larry cars for traction companies. The company also reports that it is receiving a good volume of export business in mining cars for shipment to Mexico and Central America, and that a good volume of inquiries from various sources is pending.

Announcement is made that the annual convention of the American Boiler Manufacturers' Association will be held at the St. Charles Hotel, New Orleans, La., March 11 to 14, 1912.

Trade Publications

Grinding and Polishing Machinery.—Ransom Mfg. Company, Oshkosh, Wis. Catalogue J. Size, 6 x 9 in.; pages, 24. Devoted to a line of belt-driven grinders and buffers. For the most part two pages are given to each tool, the engraving being on the left-hand page with a brief description and specifications on the facing page. Among the tools described is the No. 6 buffing lathe which was illustrated in *The Iron Age*, June 15, 1911.

Sheet Metal Working Machinery.—Fred J. Swaine Mfg. Company, Seventh and O'Fallon streets, St. Louis, Mo. Catalogue. Size, 6 x 9 in.; pages 198. This is the company's 1911 catalogue describing and illustrating a line of machinery, presses and dies for working sheet metal. These include double crank straight sided, inclinable, punching, sliding, riveting, power and clutch presses. Other machines shown include double seaming and crimping machines, gang slitters, power rolls, rotary forming and punching machines and a machine for oiling metal sheets to prevent rusting. The various parts of the presses such as the automatic bolt clutch, the fly wheel, crankshaft, slide and slide connections, power lifter, counters and dies of various types are illustrated and briefly described. Eight pages are given over to half tone engravings showing parts produced on the various machines listed.

Turret Lathes.—Gisholt Machine Company, Madison Wis. Pamphlet, entitled "The Manufacturer and the Gisholt." Calls attention to the wide range of work which can be finished on the turret lathes of this company. An elevation and a plan view of one of these lathes is given and this is followed by a number of pages containing half tone reproductions of the various pieces that can be turned out in this machine. Mention is also made of the company's boring mills and its universal tool grinder.

Storage Batteries.—Gould Storage Battery Company, 341 Fifth avenue, New York, N. Y. Bulletin No. 12. Size, 8 x 10 in.; pages, 12. Describes the storage battery installation in the Detroit River tunnel and the auxiliary regulating apparatus used to supply current to the electric locomotives employed for hauling the Michigan Central trains through the tunnel. One of the especially interesting features of the installation is the wide fluctuation in the load and the heavy peaks.

Steam Turbines.—The Kerr Steam Turbine Company, Wellsville, N. Y. Catalogue No. 19, superseding bulletin No. 18. Size, 6 x 9 in.; pages, 48. Is a thorough treatise of the theory, construction, uses and advantages of small steam turbines for driving generators, pumps, blowers and other small high speed machines. Complete dimension tables of the various sizes are included.

Hoisting Engines.—Williamson Brothers Company, Cumberland street and Aramingo avenue, Philadelphia, Pa. Loose leaf catalogue. Illustrates and describes the various types of hoisting engines which this company builds. These include double-cylinder engines with one and two friction drums and also a derrick swinging attachment and with the boiler mounted on the same base as the engine or separately. Electric hoists with one and two friction drums and a belt hoist of the same type are also shown.

Lathes.—Niles-Bement-Pond Company, 111 Broadway, New York, N. Y. Pamphlet. Size, 9 x 12 in.; pages, 27. Devoted to the various styles of heavy engine and gun lathes built by this company. These include double and triple back-geared engine lathes with swings of from 24 to 36 in. for the double type and 36 in. for the latter style, geared head engine lathes with swings of from 42 to 72 in. and large engine lathes, the minimum swing of which is 84 in. Mention is also made of gun lathes having swings of from 53 to 108 in. The various groups of tools are briefly described and the text is followed by engravings of the different lathes making up the line.

Lathes.—The Acme Machine Tool Company, Cincinnati, Ohio. Loose leaf catalogue. Calls attention to a line of turret machinery which includes combination turret lathes having swings of 14, 16, 18 and 20 in. and equipped with plain and friction geared heads. In making up the catalogue one leaf is given to each tool with an engraving at the top followed by a condensed description and a brief table of specifications. Space is also given to two types of screw machines and a number of accessories such as boring, pointing and turning tools; tool, clamp and die holders and collets, bushings and rings. Among the various tools illustrated are a 2¼ x 11 in. screw machine with power feed to the cut-off cross slide and a 2¼ x 26 in. combination turret lathe, illustrated descriptions of which appeared in *The Iron Age*, May 19, 1910, and January 26, 1911, respectively.

Metal Working Machinery.—The Garvin Machine Company, Spring and Varick streets, New York City. Catalogue D A, superseding catalogue D. Size, 6 x 9 in.; pages, 92. Illustrates and describes a line of metal working machinery which includes profiling machines, duplex and vertical spindle millers, a universal cutter and surface grinder; vertical, horizontal and automatic tapping machines; drills of various types, cam millers, die slotters, a hole grinder and a rapid screw slotting machine. Illustrated descriptions of the No. 3 duplex miller and the No. 2 hole grinding machine appeared in *The Iron Age* July 21, 1910, and July 27, 1911, respectively. In describing the machines the text is supplemented by numerous illustrations showing various parts. A three-page telegraphic code completes the catalogue.

Current Metal Prices.

The following quotations are for small lots, New York. Wholesale prices, at which large lots only can be bought, are given elsewhere in our weekly market report

IRON AND STEEL—

Bar Iron from Store—

Refined iron.
1 to 1¾ in. round and square..... ₤ lb 1.70¢
1½ to 4 in. x ⅜ to 1 in..... ₤ lb 1.80¢
1½ to 4 in. x ¼ to 5-1 ..... ₤ lb 1.80¢
Rods ¼ and 11-16 round and square ₤ lb 1.80¢

Angles	Cts ₤ lb
3 in. x ¼ in. and larger	1.80¢
3 in. x 5-16 in. and ⅜ in.	2.20¢
1½ to 2½ in. x ⅜ in.	1.95¢
1½ to 2½ in. x 5-16 in. and thicker	1.85¢
1 to 1¼ in. x 5-16 in.	1.95¢
1 to 1¼ x ¼ in.	2.00¢
⅝ x ⅝ in.	2.10¢
½ x ½ in.	2.15¢
⅜ in. x ⅜ in.	3.55¢
¼ x 5-32 in.	4.40¢

Tees:

1 in.	2.25¢
1¼ in.	2.10¢
1½ to 2½ x ¼ in.	1.90¢
1½ to 2½ x 5-16 in.	2.00¢
3 in. and larger	1.85¢
Beams	1.80¢
Channels, 3 in. and larger	1.80¢
Bands, 1¼ to 6 x 6-16 to No. 8	2.00¢
Burden's "H. B. & S." iron, base price	2.95¢
"Burden's Best" iron, base price	3.15¢
Norway bars	3.60¢

Merchant Steel from Store—

per lb.
Bessemer machinery ..... 1.70¢
Toe calk, fire and sleigh shoe ..... 2.50@3.00¢
Best cast steel, base price in small lots..... 7¢

Sheets from Store—

Black	One pass, soft steel	C R annealed	R. G.
No. 16	₤ lb 2.35¢		2.75¢
Nos. 18 to 20	₤ lb 2.40¢		2.85¢
Nos. 22 and 24	₤ lb 2.45¢		2.95¢
No. 26	₤ lb 2.50¢		3.05¢
No. 28	₤ lb 2.85¢		3.30¢

Russia, Planished, &c.

Genuine Russia, according to assortment ..... ₤ lb 12 @14½
Patent planished, W. Dewees Wood ..... ₤ lb A, 10¢; B, 9¢ net

Galvanized

Nos. 12 and 14	₤ lb 2.65¢
No. 24	₤ lb 3.00¢
No. 26	₤ lb 3.20¢
No. 28	₤ lb 3.50¢

No. 20 and lighter 36 inches wide 25¢ higher

Genuine Iron Sheets—

Galvanized

Nos. 22 and 24	₤ lb 5.50¢
No. 26	₤ lb 6.00¢
No. 28	₤ lb 7.00¢

Corrugated Roofing—

2½ in. corrugated	Painted	Galvd
No. 24 ₤ 100 sq. ft	$3.75	$4.70
No. 26 ₤ 100 sq. ft	2.85	3.80
No. 28 ₤ 100 sq. ft	2.50	3.65

Tin Plates—

American Charcoal Plates (per box

A A A charcoal.
IC, 14 x 20 ..... $6.65
IX, 14 x 20 ..... 7.90
A charcoal:
IC, 14 x 20 ..... $5.60
IX, 14 x 20 ..... 5.70

American Coke Plates—Bessemer—

IC, 14 x 20, 107 lb. $4.50
IX, 14 x 20 ..... 5.50

American Terne Plates—

IC, 20 x 28 with an S lb. coating. $8.70
IX, 20 x 28 with an S lb. coating. 10.70

Seamless Brass Tubes—

List November 13, 1908. Base price, 18¢

Brass Tubes, Iron Pipe Sizes—

List November 13, 1908. Base price, 18¢

Copper Tubes—

List November 13, 1908 Base price, 21¢

Brazed Brass Tubes—

List February 1, 1911 19½¢ ₤ lb

High Brass Rods—

List February 1, 1911 14½¢ ₤ lb

Roll and Sheet Brass—

List February 1, 1911 14½¢ ₤ lb

Brass Wire—

List February 1 1911 14½¢ ₤ lb

Copper Wire—

Base price. Carload lots mill 13½¢

Copper Sheets—

Sheet copper hot rolled, 16 oz quantity lots ..... ₤ lb 17¢
Sheet copper cold rolled 1¢ ₤ lb advance over hot rolled
Sheet copper polished 20 in. wide and under, 1¢ ₤ square foot
Sheet copper polished over 20 in. wide, 2¢ ₤ square foot
Planished copper, 1¢ ₤ square foot more than polished

METALS—

Tin—

Straits pig ..... ₤ lb 44 @45 ¢

Copper—

Lake ingot ..... ₤ lb 14 @14¼¢
Electrolytic ..... ₤ lb 13¾@14 ¢
Casting ..... ₤ lb 13¾@14 ¢

Spelter—

Western ..... ₤ lb 6¾@ 7¼¢

Zinc—

No. 9, base, casks ... ₤ lb 5½c Open ... ₤ lb 9c

Lead—

American pig ..... ₤ lb 5 @5½c
Bar ..... ₤ lb 6⅜@6½c

Solder—

½ & ½ guaranteed ..... ₤ lb 25½@26c
No. 1 ..... ₤ lb 23½@24c
Refined ..... ₤ lb 22½@23c
Prices of solder indicated by private brand vary according to composition

Antimony—

Cookson ..... ₤ lb ..@19½c
Hallets ..... .@19 ¢
Other brands ..... .@9½c

Bismuth—

Per lb. $2.00@2.25

Aluminum—

No. 1 aluminum (guaranteed over 99% pure), in ingots for remelting 21¢ and 22¢
Rods and Wire ..... Base price 31¢
Sheets ..... Base price 35¢

Old Metals—

Dealers' Purchasing Prices Paid in New York.

	Cents.
Copper, heavy and crucible	10.50 to 10.75
Copper, heavy and wire	10.25 to 10.50
Copper, light and bottoms	9.25 to 9.50
Brass, heavy	7.00 to 7.25
Brass, light	5.50 to 5.75
Heavy machine composition	9.00 to 9.25
Clean brass turnings	6.75 to 7.00
Composition turnings	7.50 to 7.75
Lead, heavy	3.75
Lead, tea	3.50
Zinc, scrap	4.00

NICHOLSON





We have had over forty years' experience in making Files and Rasps; we not only know what KIND of steel to use, but HOW to use it.

If NICHOLSON FILES did not hold their CUTTING edge—our order books would not hold so many CUSTOMERS.

We make over 3,000 different styles and sizes.

NICHOLSON FILE COMPANY

PROVIDENCE, R. I., U. S. A.

THE IRON AGE

Established 1855 — New York, November 9, 1911 — Vol. 88: No. 19

Published Every Thursday by the

DAVID WILLIAMS COMPANY

239 West 39th Street, New York

Entered at the New York Post Office as Second Class Mail Matter.

Subscription Price, United States and Mexico, $5.00 per Annum; to Canada, $7.50 per Annum; to Other Foreign Countries, $10.00 per Annum. Unless receipt is requested, none will be sent. Credit for payment will be shown by extending the date on the wrapper of your paper.

W. H. Taylor, - - - - - - President and Treasurer
I. A. Mekeel, - - - - - - - First Vice-President

Geo. W. Cope, - - - - - }
A. I. Findley, - - - - - } Editors
W. W. Macon, - - - - - }

M. C. Robbins, - - - - Manager
Charles S. Baur, - - - Assistant Manager

Branch Offices

Philadelphia, Real Estate Trust Building
Pittsburgh, Park Building
Boston, Compton Building
Chicago, Fisher Building
Cleveland, American Trust Building
Cincinnati, 807 Andrews Building

CONTENTS.

Rail Buying for 1912 999
Some Iron Ore Fallacies 1000
Close Time Study of Factory Operations 1000
A Mammoth in Steam Power Generators 1001
Small Unit Producer Gas Engines 1001
Oxy-Acetylene Welding Menaced 1001
Correspondence 1002
German Steel Plant Construction 1002
The Steel Corporation Suit 1002
Manufacturers Contest Freight Advances 1003
Open Hearth Steel Works in Germany 1003
Pig Iron Production 1004
Heat-Treated Steel Axles 1006
The Iron and Metal Markets 1006
Iron and Industrial Stocks 1016
American Society for Testing Materials 1016
The American Steel Foundries Earnings 1016
Canadian Iron and Steel Output 1016
Federal Control of Large Business 1016
Revolving Grate Gas Producer 1017
Trade Publications 1017
Personal 1018
Obituary 1018
Pittsburgh and Vicinity Industrial Notes 1019
The Industrial Education Convention 1020
Two New Orders for Lake Vessels 1020
Woodward Buys Vanderbilt Furnaces 1020
The Connellsville Coke Trade 1020
September Iron and Steel Exports and Imports 1021
An Electric Generator of 30,000 Horse Power 1021
An Album on Concrete Engineering 1021
Scientific Management at United States Arsenals 1022
A Monumental Bridge Contract Let 1024
Swedish Steels 1025
The Sherman Law 1025
Committee on Steel Works Labor Conditions 1026
The Problem of the Trusts 1026
Taxable Valuation of Michigan Iron Mines 1028
A Better Feeling Toward Railroads 1029
Heavy German Tools for Turbine Building 1030
The Black Kevolving Steam Feed 1033
Iron Ore Rates from Lower Lake Ports 1033
New Water Cooler 1034
Exports of Manufacturers Approaching Billion-Dollar Line 1035
Power Squeezing with Molding Machine 1035
Oil-Fired Furnaces for Automobile Parts 1036
The Economy Welding Machine 1037
The Ransom Portable Grinder 1038
Bessemer Gas Engines 1038
A Blast Furnace Charging Car 1039
High Pressure Blower Set 1040
The Warrior Sight Feed 1041
The Wyoming Steam Trap 1041
New Concrete-Steel Ore Dock 1041
A New Electric Recording Instrument 1042
Temperature Pendants 1042
The Philadelphia Foundrymen's Association 1042
The American Foundry Foremen's Association 1042
The Machinery Markets 1043
Government Purchases 1051

Rail Buying for 1912

Several Contracts Already Placed

A Check to the Increase in Pig Iron Production, but Prices Are Lower in All Markets

Rail buying for 1912 has begun in earnest in the past week, and active contracting is expected to follow. The Louisville & Nashville has placed 50,000 tons with the Ensley mill and the Burlington has ordered 20,000 tons of open-hearth rails from Gary. The Norfolk & Western order, amounting to 25,000 tons, has been distributed among Pennsylvania and seaboard mills, about 10,000 tons going to Pittsburgh. It is reported that the Great Northern will buy 40,000 tons and, as heretofore, the order is expected to go to the Buffalo mill. The New York Central is figuring on its requirements, while the Pennsylvania is negotiating with the mills for a tonnage in excess of its contracts for this year. In the South a number of roads are about to buy, including the Georgia Central and the San Antonio & Aransas Pass. There appears to be no foundation for the recent rumor of a price below $28 for Bessemer rails.

The November 1 blast furnace returns indicate a slowing down in the latter part of October in the rate of increase in pig iron production—an increase that has been under way since July. The October output of coke and anthracite pig iron was 2,102,147 tons, or 67,811 tons a day, as compared with 65,903 tons a day in September, an increase of 1900 tons a day, whereas September showed 3800 tons a day more than August and August 4300 tons a day more than July. One less furnace was active on November 1 than on October 1, but, owing to the larger capacity of the furnaces blown out than of those blown in last month, the active capacity at the opening of this month was 66,818 tons a day, against 66,468 tons a day on October 1. The rate of production November 1 was thus 1000 tons a day less than the average for the month of October.

Accompanying the continued increase in pig iron production there has been a reduction in stocks, but contrary to the ordinary effect of such a proof of enlarged consumption the market for merchant iron has been steadily weaker. The increased consumption has been so largely on steel works account that buyers of foundry iron have interpreted the conditions as giving them license to put off buying. This decision the weak attitude of sellers, as much as anything else, has encouraged.

The Central West has been of late the center of disturbance in pig iron prices. Little has been done in steel-making iron, and foundry buying has been evidently affected by the anticipation of lower freight rates on ore, not only from mines to upper lake docks, but from Lake Erie ports to furnaces. The agitation for lower freight rates on coke is also a factor. In the Cleveland district $13 at furnace for No. 2 foundry

iron is reported, while at Chicago as low as $14 for local iron has been done.

Recent car orders have brought business to the plate and structural mills, and an Indiana car plant has been started up. Car builders look for a gradual improvement in their business.

For the New York Connecting Railroad bridge the arch and two approach spans have at last been let. They call for 36,000 tons. Other approach work will require 54,000 tons. Fabricators find encouragement in a total of 130,000 to 140,000 tons of steel work pending in New York and vicinity; for the most part in jobs running over 1000 tons.

About 8000 tons of plates and shapes for the four vessels recently placed with lake yards will be rolled at Pittsburgh. A central Pennsylvania mill will furnish the plates for the five American-Hawaiian vessels to be built at Sparrows Point, Md.

Low prices continue on bars, plates and shapes, with no indication and little prospect of a firmer stand by manufacturers. Wire products have developed fresh cutting, particularly south of the Ohio River, and sales of nails have been made at the equivalent of $1.55 at Pittsburgh mill and of plain wire at $1.35.

Though current prices have made painful inroads upon profits, cast iron pipe foundries hold up their operating rate. An inquiry for 12,000 tons of 40-in. pipe has come from the municipality of Quebec.

At 29,607,102 tons, the shipments of Lake Superior ore to November 1 this season were 10,371,206 tons less than in 1910 to that date. The 30,000,000-ton mark for the season will be considerably exceeded, but 32,000,000 tons is now the limit of estimates.

Some Iron Ore Fallacies

Government inquisitors into the status of the United States Steel Corporation have found the iron ore question a serious stumbling block. Commissioner of Corporations Smith, by a study of Lake Superior ore values, found that the effort to account for the corporation's enormous capitalization by a dollar-a-ton valuation on its ores was out of all reason. The Stanley committee, likewise, when inveighing against swollen capitalization, was quite ready to agree with Mr. Smith that the valuation put on the corporation's Lake ores was culpably excessive. But when the committee wanted to show that the Tennessee Company's enormously valuable ore deposits had been acquired by the corporation for only a tithe of their value, it was quite ready to believe that the 700,000,000 tons of Red Mountain ore were worth many times the purchase price. In the original Congressional investigation of the 1907 purchase it was very plainly charged that the corporation had secured a $700,000,000 property, measured by ore values alone, for approximately $30,000,000. In combatting the dollar-a-ton basis for Lake Superior iron ore valuation, Herbert Knox Smith cites the actual average royalty of 25.3 cents for Mesaba leases in the year 1903. Actual transactions in the Alabama field are even more damaging to the notion of the Stanley investigators that a property worth hundreds of millions was gathered in in 1907. The same syndicate which sold its Tennessee Company holding to the Steel Corporation had in the preceding year acquired a desirable ore deposit in the Birmingham district, known as the Potter property. In this transaction it paid $800,000 for lands estimated to contain 60,000,000 tons of ore, or on the basis of 1 1/3 cents a ton!

One of the most glaring misstatements of the Government's petition against the Steel Corporation is that referring to the desirability of the ores acquired by the Tennessee Company purchase. We are told that in view of the many accidents with Bessemer steel rails the railroads were demanding the better open-hearth rail, for which the ores of the Tennessee Company were suitable; also that the Tennessee Company, having taken a large order for rails from the Harriman lines, was about to become a powerful competitor of the Steel Corporation for the rail business of the country. Altogether misleading is the inference that these Southern ores were better for open-hearth rails than hundreds of millions of Lake Superior ores which the corporation already had. As is well known, the Alabama ores are much less economical for the open-hearth process than the Lake Superior ores, requiring the expensive plant necessary for the duplex process of steel making and the more expensive practice involved in that process. It may be added that no rail mill in the United States had a higher cost than had the Ensley mill when the Steel Corporation acquired it, and that the early experience of the Harriman lines with Alabama open-hearth rails was not such as to indicate that Ensley would be a particularly dangerous competitor of the other rail mills of the country.

One further ore fallacy may be cited in this connection; it is found in the portion of the Government's petition relating to the Great Northern lease. The Government admits that it has been informed of the corporation's decision to cancel the lease, but it hastens to say that three years must elapse before this can be done, and meantime the greedy corporation might set to work and take out millions upon millions of these precious ores. Hence, prompt action by the courts is invoked. In his muckraking ardor the Government's attorney had no room in his mind for the fact that the great difficulty the corporation has encountered in connection with operations under the Great Northern lease has been the physical impossibility of getting out of the ground and putting in shape for use in the blast furnace the minimum stipulated quantities of the Hill ores. Enormously expensive preliminary work has had to be done to open up these properties, and time and millions have been spent in installing plant for the concentration of the sandy ores of the western Mesaba. Quite otherwise than the hysterics of the Government's attorney would have it, the real situation is such that the Steel Corporation will have difficulty in getting out by January 1, 1915, the minimum amounts on which royalties must be paid.

Close Time Study of Factory Operations

To the uninitiated reader of scientific management literature there is one practical point commonly dispatched with a mere reference. That is the use of the stop watch in time studies. The fact that cost determinations of unit operations are largely dependent on the time element of given divisions of the work seems to have led to the error of overlooking everything else save the actual effect of the study on the human factor. It is probably safe to say that often in using the stop watch, the actual chances of error on the part of the observer are not apprehended, or a true knowledge of the time demands of the several steps into which any complete operation is divisible is not obtained. Cases are known of a series of time

readings all close enough to the average to encourage the adoption of the average figure, when an analysis by further subdivision would have shown one or two little steps on which there was loss of time to the operator.

There is a point beyond which it becomes unwise to carry the subdivision; yet sometimes one finds extended calculations on a unit carried to the third and fourth decimal places. One reason for the situation is that the observer does not realize how he may readily obtain knowledge of the accomplishments of small periods of time. It is not the purpose here to elaborate on this detail of studying plant-efficiency promotion nor even to outline any procedure, but to direct attention to a phase of plant study neglected except by leaders in the movement. It will probably be argued that the so-called hair-splitting study is not justifiable, but this is like the claim of the mediocre student who strives to excuse an antipathy to close application to the problems allotted to him. Were one to get records of a given cycle of operations from, say, operation 1 to operation 1, and then of other continuous operations, say from operation 2 through the cycle to operation 1 and so on, the actual time consumption and possible showing of irregularities and time waste could be obtained with a minimum of inaccuracy. There are variations which will occur to the observer, and the extra labor will generally not be serious. Such seeming refinements have led to the discovery of possible improvements not noted in the preliminary studies.

If proper care were always taken in fixing time rates, there would perhaps be less trouble in plants operated on a piece-work basis. The disrupting tendency of repeated changes of wage payments based on piece work is certainly to be avoided and the utmost care is warranted in establishing at the outset a stable unit.

A Mammoth in Steam Power Generators

When the vertical steam turbine was introduced, about eight years ago, the enthusiastic engineer was wont to rush into calculation to show what little sheds large power stations could hereafter be. Then had arrived a prime mover combining much in little. In comparison the steam engine was little in much. In the enthusiasm of the moment it was forgotten that the auxiliary apparatus—the condenser, the air and circulating water pumps, the hydraulic apparatus for the step bearing—would take up a great amount of space, sufficient, in fact, to accentuate the small proportions of the unit itself. The steam turbine has grown in capacity, and the bulk of the auxiliaries has not increased in proportion, or, what is a better description, the limited foundation area of the turbine allows for the use of decks under the main floor of the power house for the disposal of the auxiliaries.

The force of this fact was strongly felt last week by a visit to the Waterside station of the New York Edison Company. Here was put into operation a unit of no less than 20,000 kw. capacity. It is the first of a number being built by the General Electric Company for this station and also for Chicago. Under dramatic conditions it assumed its burden, and the occasion emphasized a step forward in the large scale of operations to which we have become accustomed. Business conditions warranted the single large unit, and engineering successfully supplied the machine. Engineering analysis doubtless pointed to the wisdom of the move and overcame the commercial obstacles which ordinarily restrict the development of new sizes and patterns of established articles. The spectacular features of the event and an explanation of the gigantic size of the power generator are mentioned elsewhere in this issue.

Small Unit Producer Gas Engines

The producer gas engine of small power promises to become one of the important factors in the field which is now practically controlled by the gasoline and kerosene types. A number of manufacturers are working out the problems of engine and producer; and while the work is by no means completed, experiments have progressed far enough to give ample assurance of success in the not very distant future. The field of the engine of small horse power is enormous. The economy of the gas producer engine is well established Its safety as compared with gasoline engines is self-evident and will appeal to many users, including the great class of owners of pleasure craft. If greater reliability could be secured than from liquid fuel engines, an important advance will have been made, for in spite of the developments of recent years much is still to be wished for on this score. This the manufacturers of producer gas engines expect to achieve They may live to compete with crude oil engines of an advanced design, and the exponents of the kerosene engine are confident of success, especially for commercial and industrial purposes. But an important place awaits the engine which will secure from small quantities of coal a new maximum of power.

Oxy-Acetylene Welding Menaced

The Massachusetts authorities are creating exceptional rules for the control of users of oxy-acetylene welding apparatus. The explosion of an acetylene generator, due to extraordinary carelessness, led to an investigation of the whole question, and the results promise to be ordinances so severe as to constitute a hardship in some cases. No manufacturer will criticise preventive measures against accident. More than ever before this is true, because Massachusetts, in common with many other States, will soon be paying accident claims under a workmen's compensation act. Small employers can least afford to take chances, for a serious accident may prove financially crippling. But a wise limit to precautions should be sought. In a general way the new rules will include an increased distance between the generator building and the plant; a limit to the number of oxygen flasks which may be stored in the building, and an insistence that the structure be of fireproof construction.

Co-operation between the authorities and the interested houses should always be sought in promulgating laws which are to govern the latter. Often a compromise can be worked out, to the benefit of everyone. On the other hand, in the case in question the police power of the State government is impregnable. Rules once established, no relief can be obtained by those who are adversely affected. In the present instance the manufacturers believe that they are being discriminated against, because the qualities of their welding agents constitute no greater menace than can be found in other business conditions, as, for instance,

in the ordinary soda fountain and in the use of gasoline. They complain not at the regulations but at what they term unreasonable and burdensome restrictions.

Referring to the action taken on the Great Northern ore lease, James J. Hill said recently: "I am not worried about the cancellation of the Steel Corporation ore contract. Iron ore does not go out of style, and it will not run away. If it lies in the ground for 25 years and the country grows, and the demand for iron and steel increases, it will not be worth any less than it is now." Mr. Hill may be right in the opinion that iron ore will not be worth any less 25 years hence than it is to-day. But that is not quite the same as establishing a high valuation by contract to-day—high in comparison with the average royalties of the past ten years' transfers—and then adding about 4 per cent. interest for every year a ton of ore remains in the ground. Mr. Hill's contract with the Steel Corporation meant that a ton of ore worth 85 cents in the ground to-day would bring $1.70 in royalty 25 years from now. Such a scaling up at the base of the steel industry would mean that the United States, instead of taking more of the world's steel trade, must accept an increasing handicap in international competition.

Correspondence

The First Steel Rails Rolled at Johnstown

To the Editor: In the report of the speech which I made to my old fellow workers of the Cambria Steel Works, which you published in your issue of October 5, I am quoted as saying that the first steel rails made at Johnstown were rolled on the 18-in. train. It should have been the 21-in. train. There were two trains of rolls on which iron rails were made, the older one 18 in. and the newer a 21-in. train, and it was upon the larger one that the steel made by the Pennsylvania Steel Company was rolled into rails. We had trouble from breaking the middle blooming roll, which was overcome by casting the roll around a forged steel center of about 6 in. in diameter.

ROBERT W. HUNT.

STEAMSHIP MANCHURIA, En Route to Japan, October 21, 1911.

German Steel Plant Construction

Under date of October 27, our Berlin correspondent makes the following statement regarding new plant construction in Germany:

"Some details were given in my report last week about the new plant of the Burbach-Esch-Düdelingen combination at Esch in Luxemburg. This week some information is available about the new Gelsenkirchen establishment at the same place and the Thyssens at Hagendingen, a little north of Metz on the Moselle. The Gelsenkirchen plant has six blast furnaces with a daily capacity of 1200 to 1300 tons of pig iron. Two of these have already been finished and are now filled with their first charges, to be blown in within a few days. Blooming and finishing mills connected with the steel plant will turn out annually about 400,000 tons of heavy rails, structural shapes and other products.

"The Thyssens plant, begun only within a year, is making very rapid progress, and is expected to go into operation by the middle of next year, which is also the date set for the beginning of full operations at the Gelsenkirchen plant. The Thyssens are also building six blast furnaces, but these are of larger size than those at Esch and will make about 600,000 tons a year. Steel plant and rolling mills will consume the entire product, making from 550,000 to 600,000 tons of crude steel a year. The Thyssens already rank among the iron and coal magnates of Germany, being owners of the great Gewerkschaft Deutscher Kaiser at Duisburg on the Rhine and Ruhr. Besides the new furnaces already mentioned, the Aumetz-Friede Company has been reconstructing and modernizing its furnaces for several years and adding new ones and has just started another of 220 to 240 tons capacity per day; when its present plans are completed it will have nine large furnaces. The de Wendel Company at Hayingen in Lorraine has completed the enlargement of two old furnaces and several smaller concerns are also building furnaces.

"It is estimated that, when all the new blast furnaces and steel plants now erecting in the Luxemburg-Lorraine district shall have been completed, the yearly production of that region will be increased by about 1,900,000 tons of pig iron and 1,700,000 tons of steel. This huge addition to the German yearly production, not to mention the increase in the Rhenish-Westphalian and other districts, will present a most difficult problem in the forthcoming negotiations for the prolongation of the Steel Works Union, which lapses at the end of next June. It will be a problem of no less difficulty to find a market for all this new addition to the steel production.

"It is reported unofficially that the Prussian Government is planning to buy or build a steel plant and mill for making its supply of rails for the state railroads. If this is true, it will be a heavy blow for the Steel Works Union."

The Steel Corporation Suit

The Attitude of Buyers of Steel and Independent Manufacturers

E. W. Edwards, president of the Edwards Mfg. Company, Cincinnati, has a communication in the Cincinnati *Enquirer,* in which, speaking from the standpoint of a buyer of steel sheets, he contends that the dissolution of the Steel Corporation would not be a benefit but an injury. He says in part:

The Government now asks that the Steel Corporation be dissolved, also the constituent companies, such as the American Sheet and Tin Plate Company, etc. In other words, the Government practically demands that the blast furnaces pay a profit on the ore, that the steel mills pay a profit on the pig iron, that the finishing mills pay a profit on the billets, that the jobbers pay a profit on the finished line and the dealer a profit to the jobber, all of which the people would pay, for the steel companies, whether they are independent or otherwise, are not in the habit of working for their health.

In the meantime many of the independent mills have been growing much faster in proportion than the Steel Corporation, and some of the independent finishing mills have put in blast furnaces and steel mills, so that in their particular field they are as strong as the Steel Corporation, making the steel from the ground up. Should the court grant the petition of the Government and dissolve not only the Steel Corporation but its subsidiaries, they would be absolutely at the mercy of the large independents unless they immediately proceeded to make miniature steel corporations of themselves by putting in blast furnaces, steel mills, etc., which would leave the public exactly where it is today.

Without knowing it the Government is practically insisting upon the public paying several profits rather than one, for if it forced the dissolution of all the constituent companies without permitting them immediately to fortify themselves, the independent buyers of steel like myself could not buy materials as low as they are to-day.

For instance, we were paying 50 per cent. more for sheet steel prior to the formation of the American Sheet Steel Company than we are today, and there is a profit in today's prices to the Steel Corporation if they figure from the ore to the finished product, but if the public is compelled to pay a profit on the ore, then a profit on the billets, and then a profit on the finished rolled products, the articles manufactured therefrom could not be sold at any such prices as are ruling today. My company buys steel from both the independents and the Steel Corporation, the majority from the independents. Chaos in the steel trade, I believe, would, temporarily at least, result to our particular advantage, but it certainly would hurt the country as a whole.

George E. Day, general sales manager of the Youngstown Sheet & Tube Company, Youngstown, Ohio, is quoted as follows by a local paper concerning the attitude of independent steel producers toward the Government suit against the Steel Corporation: "None of the independents favored the suit. Recently I attended a big meeting of the supply jobbers in Chicago. There was not a man among us who did not feel that the Steel Corporation had acted to the interest of the trade and to its benefit in general. Neither its consumers nor its competitors felt otherwise."

Manufacturers Contest Freight Advances

WASHINGTON, D. C., November 6, 1911.—The Cambria Steel Company protests, in a letter of recent date, to the Interstate Commerce Commission, against a proposed increase in rates by the Baltimore & Ohio and the Pennsylvania Railroad companies, of three cents per 100 lb. on iron and steel articles, carloads, from Johnstown, Pa., to Moline, Rock Island, Davenport and upper Mississippi River crossings. The company was notified that the new rate would go into effect November 1. The present rate of 24½ cents from Johnstown, the company asserts, has been in effect for a number of years and is regarded as a fair compensation for the service. In view of these circumstances the advance is characterized as unjust and unreasonable and the commissioners are asked to suspend the new rate pending an investigation as to its reasonableness. Referring to the existing rate of 24 cents from Johnstown to St. Louis and the lower Mississippi River crossings, the company says that this applies both by way of the direct lines and by way of Chicago, and that it is a half cent less than the present rate to the upper Mississippi River crossings, which rate applies both by way of the direct lines and Chicago, the distance to St. Louis by either the direct line or Chicago being greater than by way of Chicago to the upper Mississippi River crossings.

The Ironton Iron Company, Ironton, Ohio, directs the attention of the commission to a notification received by it that the rates on pig iron from southern Ohio furnaces to upper Mississippi River points will be increased from $3.10 to $3.75 a ton from and after November 1. The company regards this action as discriminatory against the furnaces of southern Ohio, and in favor of the Chicago and Milwaukee furnaces and asserts, also, that it would cause the consumers of pig iron in southern Ohio to pay the proposed advance in freight rates in excess of what they could purchase their material if allowed a competitive market based upon the present freight rates. It is further asserted that the proposed rate is in favor of iron from the Southern furnaces and that it also will be in favor of iron from the Virginia furnaces, inasmuch as shipments entering this territory from Southern furnaces pass through Peoria, Ill., and that the tariff is based on Peoria basis freight rates. Continuing the letter says:

> The Western roads' proportion of freight rates from Peoria to Moline and kindred points is forty cents a ton. Under the present tariff of $3.10 a ton from southern Ohio furnaces, they get as their proportion 50 cents a ton on the through rate already receiving an advantage on the southern Ohio irons over the Southern iron of 10 cents on the freight rate. Should they advance this rate as proposed, it would give them an additional 70 cents on southern Ohio iron. Our information, also, is that the rate now in effect from Virginia furnaces to East Burlington, Sterling, Moline, East Moline and Rock Island is $3.85 a ton, and should the freight rates from Southern Ohio furnaces be made $3.80 a ton it would be only 5 cents less than the rate from the Virginia furnaces, which, according to distance haul, would be manifestly unfair.

In view of these circumstances the Ironton Company look on the proposed advance as a studied effort on the part of the Western railroad companies and the Chicago and Milwaukee furnaces to drive it out of the market, not by competition in prices but by an uncalled-for and arbitrary advance in freight rates to these points. Furthermore, the company asserts, approximately 20,000 tons of Northern pig iron is consumed by the plants in the territory referred to and the proposed advance of 70 cents a ton would virtually drive it from that market to the benefit of the Chicago and Milwaukee plants. The company, in conclusion, says it understands that the proposed advance in rates is opposed by all the railroads in the Central Freight Association; that they all feel it to be an injustice and that they are unable, also, to compel the lines running west through their territory to continue the present basis of rates. They see no reason why the present rate should be disturbed as compared with the freight rate of $2.50 to St. Louis and other points.

The Lackawanna Steel Company directs the attention of the commission to an advance of from 3 to 4 cents per 100 lb. by various Buffalo railroads in rates on iron and steel articles from Buffalo to so-called upper Mississippi River points, including Moline, Rock Island and Davenport. This advance, it is contended, is unjust and unreasonable and the commission is asked to suspend the tariffs in question pending an investigation as to their reasonableness. The letter continues:

> The rate from Buffalo to St. Louis and lower Mississippi River points via direct lines or via Chicago, 22½ cents per 100 lb. on iron and steel articles, carloads, or one-half cent less than the present rate to the upper Mississippi River crossings, while the distance to St. Louis direct or via Chicago is greater than via Chicago to upper Mississippi River crossings.

The company believes, therefore, that the rate to the latter points should not exceed the rate to St. Louis.

The Washington representatives of the Tri-City Manufacturers' Association enter their protest against the increased rate on iron and steel articles from Pittsburgh to Davenport, Rock Island and Moline, or any other tariffs that name a rate on such articles from Pittsburgh to the foregoing cities in excess of 23 cents per 100 lb., as follows:

> It has been frequently stated that the intent of Congress, in all its legislation under the commerce clause of the constitution, has been to bring about equality and reasonableness—the reasonableness in every case being taken to mean the lowest possible rate at which a carrier can do business and keep out of the bankruptcy court, and we object to this contemplated advance, both on the ground of its inequality and its unreasonableness.
>
> As to its inequality, we would recite that our members are largely engaged in the manufacture of agricultural implements and that as such are in direct competition with manufacturers located at Rockford, Canton, Peoria and Sterling, whose rates on their raw material are not scheduled for a like advance, or, in fact, for any advance. Furthermore, the present rate on iron and steel articles from Pittsburgh to Rockford, Peoria and Sterling is 20½ cents, while to Canton it is 22½ cents, and the rate of 23 cents—which the Tri-Cities now enjoy and which the railroads are attempting to advance—represents about the same relative basis as has been in effect from Pittsburgh to these manufacturing points for years.
>
> As to its unreasonableness, we would recite that, since 1900, the 23-cent rate, which it is now proposed to advance, has been the maximum practically without interruption and that it affords the carriers a reasonable return for the service involved. Should the proposed advance to 26 cents become effective it would force the manufacturers of the Tri-Cities to assume a burden of approximately $100,000 per annum through the increased cost of transporting their cheap raw material, which burden they would be unable to pass along to the consumer by advances in prices of manufactured articles, because of the fact that rates on iron and steel to points where competitors are located had not been advanced in like manner.

The commission is asked, therefore, to suspend the 26 cent rate and to continue the present rate of 23 cents.

The De Forest Sheet & Tin Plate Company, Niles Ohio, writing under date of October 26, referring to the advance in rates on iron and steel articles by the Pittsburgh & Lake Erie, the Baltimore & Ohio, the Pennsylvania, the Erie and the Lake Shore & Michigan Southern, says:

> Inasmuch as these tariffs advance the rates to various points, including points of interest in this district, namely, Youngstown and Niles, to Rock Island, Moline and the upper Mississippi River crossings, from 3 cents to 5½ cents per 100 lb.; that inasmuch as the distance to these upper river crossings is less than it is to St. Louis, that notwithstanding this difference in distance the present rate to St. Louis is less than it is to Rock Island, Davenport, Moline, it is unreasonable to impose this advance rate which is also discriminatory.

The commission is asked, therefore, to suspend the new tariff until inquiries have been made as to the reasonableness of the advance. The commission has written the DeForest Company that the "effective dates" of these tariffs have been suspended for a period of 120 days. The Thomas Steel Company and the Empire Iron & Steel Company, Niles, Ohio, who have written substantially to the same effect, have been notified, also, that the rates have been thus suspended.

Open Hearth Steel Works in Germany.—A compilation of open hearth steel works in Germany made by Stahl und Eisen shows that in Germany and Luxemburg there are 115 which are equipped with 492 furnaces—104 acid and 358 basic. Of the total 28 furnaces have a capacity at each heat of from 1 to 5 tons; 47 from 5 to 10 tons; 144 from 10 to 20 tons; 121 from 20 to 31 tons; 63 from 30 to 40 tons; 38 from 40 to 50 tons; and 21 have a capacity of 50 tons and over. The average capacity of all the open-hearth furnaces per heat is 10,580 tons.

Pig Iron Production

October Shows Further Increase

Present Daily Active Capacity, However, Is Less than the Rate in October

Pig iron production in October was 2,102,147 tons of coke and anthracite iron, or 67,811 tons a day, as compared with 1,977,102 tons in September, or 65,903 tons a day. One more furnace was blown out last month, however, than the number blown in, so that active capacity November 1 differed little from that of October 1—66,818 tons a day against 66,468 tons—though it was about 1000 tons a day less than the rate of output in October. The increase in production which has been under way since July has thus apparently been checked.

At 50,351 tons a day, steel works furnaces made the largest output last month since May, 1910, while that of merchant furnaces, 17,460 tons a day, was the largest since May of this year.

Daily Rate of Production

The daily rate of production of coke and anthracite pig iron by months, beginning with October, 1910, is as follows:

Daily Rate of Pig Iron Production by Months—Gross Tons

	Steel works.	Merchant.	Total.
October, 1910	45,794	21,726	67,520
November	41,427	22,232	63,659
December	35,909	21,440	57,349
January, 1911	36,401	20,351	56,752
February	42,349	21,741	64,090
March	48,970	21,066	70,036
April	47,805	21,031	68,836
May	42,270	18,809	61,079
June	42,708	16,877	59,585
July	42,472	15,369	57,841
August	47,120	15,030	62,150
September	49,696	16,207	65,903
October	50,351	17,460	67,811

Output by Districts

The table below gives the production of all coke and anthracite furnaces in October and the four months preceding:

Monthly Pig Iron Production—Gross Tons.

	June. (30 days)	July. (31 days)	August. (31 days)	Sept. (30 days)	Oct. (31 days)
New York	130,395	124,347	118,145	114,418	122,686
New Jersey	3,600	1,386	.....	.....	.....
Lehigh Valley	72,787	66,404	77,021	81,528	85,958
Schuylkill Valley	44,039	45,859	53,397	52,546	55,716
Lower Susquehanna and Lebanon Val.	41,751	40,084	38,741	36,687	37,687
Pittsburgh district	415,519	419,248	469,012	482,013	529,872
Shenango Valley	78,196	79,571	84,884	82,879	92,997
West. Penn.	60,047	73,177	96,366	98,324	101,030
Maryland, Virginia and Kentucky	48,969	52,583	46,262	49,243	55,768
Wheeling district	93,617	93,973	94,476	92,130	100,529
Mahoning Valley	188,187	184,402	189,200	213,872	228,248
Central and North. Ohio	141,973	116,953	131,850	131,020	135,004
Hocking Valley, Hanging Rock and S. W. Ohio	20,245	11,321	7,262	16,785	24,750
Chicago district	249,666	272,817	287,875	289,198	288,581
Mich., Minn., Mo., Wis., Col., Wash.	54,391	57,661	63,114	61,276	68,064
Alabama	117,015	126,200	140,879	149,238	150,219
Tenn., Georgia and Texas	27,169	27,082	28,153	25,745	25,044
Total	1,787,566	1,793,068	1,926,637	1,977,102	2,102,147

Production of Steel Companies

Returns from all furnaces of the United States Steel Corporation and the various independent steel companies show the following totals of product month by month. Only steel making iron is included in these figures, together with ferromanganese, spiegeleisen and ferrosilicon. These last, while stated separately, are also included in the columns of "total production."

Production of Steel Companies—Gross Tons.

	Pig.—Total production—			Spiegeleisen and ferromanganese.	
	1909	1911	1911	1910	1911
January	1,117,823	1,773,201	1,128,448	19,538	19,360
February	1,073,363	1,620,539	1,185,782	21,396	12,821
March	1,140,553	1,739,212	1,518,063	25,591	11,784
April	1,093,092	1,669,898	1,434,142	22,304	10,657
May	1,356,448	1,619,283	1,310,378	26,529	13,641
June	1,365,527	1,549,112	1,281,241	27,680	22,611
July	1,508,762	1,462,689	1,316,646	22,924	17,067
August	1,591,991	1,442,572	1,460,610	25,756	14,570
September	1,660,839	1,410,221	1,490,898	15,151	17,757
October	1,769,094	1,419,624	1,560,884	8,500	19,695
November	1,689,994	1,242,804	.....	9,032	.....
December	1,768,799	1,113,174	.....	12.178	.....

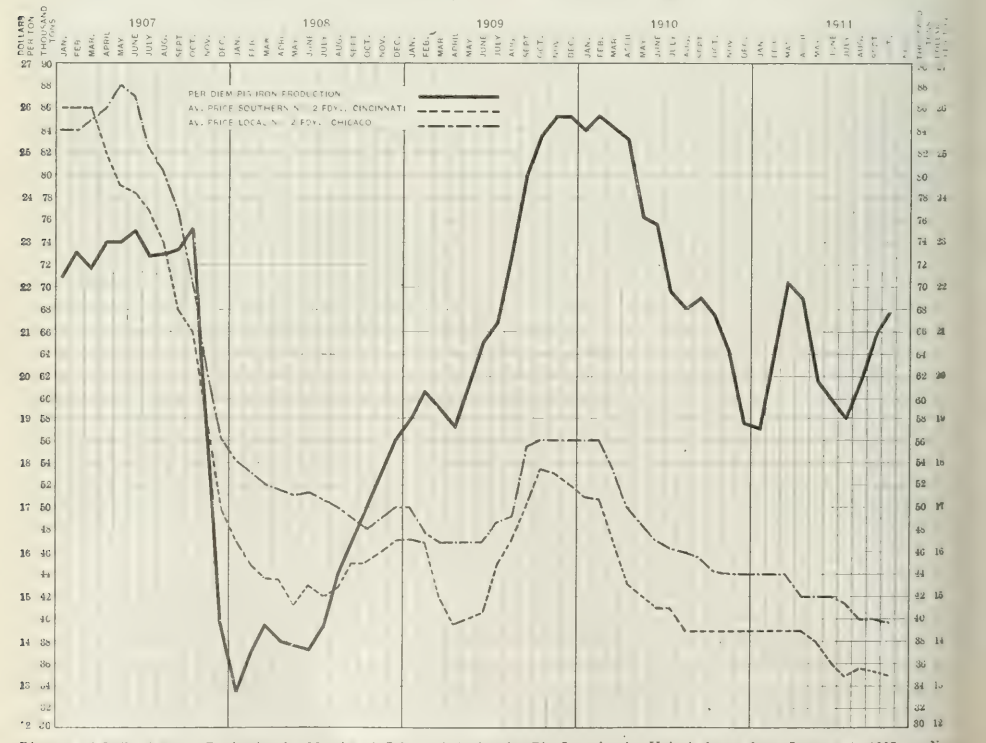


Diagram of Daily Average Production by Months of Coke and Anthracite Pig Iron in the United States from January 1, 1907, to November 1, 1911; Also of Monthly Average Prices of Southern No. 2 Foundry Iron at Cincinnati and Local No. 2 Foundry Iron at Chicago District Furnace.

Capacity in Blast November 1 and October 1

The following table shows the daily capacity of furnaces in blast November 1 and October 1:

Coke and Anthracite Furnaces in Blast

Location of furnaces	Total number of stacks	Number in blast,	Capacity per day	Number in blast	Capacity per day
New York:					
Buffalo	17	10	3,610	7	3,203
Other New York	7	3	626	3	611
New Jersey	7	0	0	0	0
Pennsylvania:					
Lehigh Valley	22	12	2,595	12	2,557
Spiegel	3	2	177	2	167
Schuylkill Valley	10	7	1,810	7	1,835
Lower Susquehanna	7	3	535	3	614
Lebanon Valley	10	5	742	4	604
Pittsburgh District	56	37	13,940	36	15,726
Spiegel	3	2	254	2	240
Shenango Valley	20	10	2,990	10	2,929
Western Pennsylvania	27	11	3,160	12	3,510
Maryland	4	1	550	3	727
Wheeling District	14	9	3,243	9	3,073
Ohio:					
Mahoning Valley	24	18	7,310	18	7,135
Central and Northern	33	17	4,455	17	4,367
Hocking Valley, Hanging Rock & S. W. Ohio	18	4	850	5	665
Illinois	31	21	9,093	21	9,532
Spiegel	2	2	216	1	185
Mich., Wis. and Minn.	10	3	1,027	3	1,020
Colorado, Missouri and Wash.	8	4	1,240	3	1,022
The South:					
Virginia	23	7	725	7	635
Kentucky	5	2	340	1	265
Alabama	46	19	4,846	19	4,950
Tennessee and Georgia	20	7	805	7	885
Total	414	212	66,818	213	66,468

The list of furnaces blown out in October includes Niagara B in the Buffalo district, one Steelton (banked) in the Susquehanna Valley, one Carrie and one Edgar Thomson in the Pittsburgh district, Scottdale in western Pennsylvania, Low Moor in Virginia, furnace D at Sparrows Point (banked) and one Ohio in the Mahoning Valley. Among furnaces blown in were one Wickwire and one Lackawanna in the Buffalo district, Robesonia in the Lebanon Valley. Radford Crane in Virginia, Marting in the Hanging Rock district, Cherry Valley in the Mahoning Valley and one Colorado.

Chart of Pig Iron Production and Prices

The fluctuations in pig iron production from January, 1907, to the present time are shown in the accompanying chart. The figures represented by the heavy line are those of daily average production, by months, of coke and anthracite iron. The two other curves on the chart represent monthly average prices of Southern No. 2 foundry pig iron at Cincinnati and of local No. 2 foundry iron at furnace at Chicago. They are based on the weekly market quotations of *The Iron Age*. The two sets of figures are as follows:

Daily Average Production of Coke and Anthracite Pig Iron in the United States by Months Since January 1, 1907—Gross Tons.

	1907.	1908.	1909.	1910.	1911.
January	71,149	33,918	57,975	84,148	56,752
February	73,038	37,163	60,976	85,616	64,090
March	71,821	39,619	59,232	84,459	70,036
April	73,885	38,289	57,962	82,792	68,836
May	74,048	37,603	60,753	77,102	61,079
June	74,486	36,444	64,656	75,516	59,585
July	72,763	39,487	67,793	69,305	57,841
August	72,594	43,851	72,546	67,963	62,150
September	72,583	47,340	70,507	68,476	63,903
October	72,350	51,554	68,856	67,520	67,811
November	69,937	51,595	84,017	63,659	.....
December	39,815	56,158	85,022	57,349	.....

Monthly Average Prices in Dollars of Southern No. 2 Foundry Iron at Cincinnati and Local No. 2 Foundry at Chicago District Furnace Since January, 1907.

	1907.		1908.		1909.		1910.		1911.	
	Sou. No.2, Cin.	Loc. No.2, Chi.	Sou. No.2, Cin.	Loc. No.2, Chi.	Sou. No.2, Cin.	Loc. No.2, Chi.	Sou. No.2, Cin.	Loc. No.2, Chi.	Sou. No.2, Cin.	Loc. No.2, Chi.
Jan.	26.00	25.00	16.15	18.10	16.26	17.00	17.25	18.50	14.25	15.00
Feb.	26.00	25.50	15.75	17.81	16.13	16.40	17.06	18.50	14.25	15.00
Mar.	26.00	25.75	15.50	17.50	15.05	16.15	16.30	17.80	14.25	15.00
Apr.	25.06	26.00	15.20	17.38	14.25	16.15	15.37	17.00	14.25	15.00
May	24.25	26.50	14.75	17.28	14.50	16.15	15.00	16.56	14.00	15.00
June	24.10	26.25	15.25	17.38	14.70	16.15	14.85	16.25	13.50	15.00
July	23.85	25.20	15.00	17.20	15.75	16.65	14.75	16.06	13.25	14.87
Aug.	23.00	24.50	15.25	17.00	16.38	16.78	14.31	16.00	13.45	14.50
Sept.	21.50	23.75	15.65	16.70	17.35	18.35	14.25	15.90	13.31	14.50
Oct.	20.05	22.30	15.75	16.50	17.88	18.75	14.25	15.56	13.25	14.46
Nov.	19.50	20.31	16.00	16.75	17.75	18.50	14.25	15.50	...	....
Dec.	17.00	18.55	16.25	17.00	17.45	18.50	14.25	15.50	....	....

The Record of Production

Production of Coke and Anthracite Pig Iron in the United States by Months Since January 1, 1907—Gross Tons.

	1907.	1908.	1909.	1910.	1911.
Jan.	2,205,607	1,045,250	1,797,560	2,608,605	1,759,326
Feb.	2,045,068	1,077,740	1,707,340	2,397,254	1,794,509
Mar.	2,226,457	1,228,204	1,832,194	2,617,949	2,171,111
Apr.	2,216,558	1,149,602	1,738,877	2,483,763	2,064,086
May	2,295,505	1,165,688	1,883,330	2,390,180	1,893,456
June	2,234,575	1,092,131	1,930,866	2,265,478	1,787,566
July	2,255,660	1,218,129	2,103,431	2,148,442	1,793,068
Aug.	2,250,410	1,359,831	2,248,930	2,106,847	1,926,637
Sept.	2,183,487	1,418,998	2,385,206	2,056,275	1,977,102
Oct.	2,336,972	1,567,198	2,599,541	2,093,121	2,102,147
Nov.	1,858,185	1,537,854	2,520,508	1,909,780	.....
Dec.	1,234,279	1,740,912	2,635,680	1,777,817	.....

Heat-Treated Steel Axles

A pamphlet of unusual interest because of the experimental data it presents has been prepared by the Carnegie Steel Company, Pittsburgh, with the title, "Heat-Treated Axles, Shafts and Similar Parts." It gives the average results of experimental tests made from finished axles, together with copies of the Carnegie specifications for various classes of axles. Those for the Carnegie heat-treated carbon steel axles are dated October 1, 1911. It is stated in the introduction to the reports of tests that since it was demonstrated that the breaking of axles was due as a rule not to lack of ductility, but to a too near approach of stresses to the elastic limit, axles have been made from a fairly hard grade of steel without special heat treatment, rather than from wrought iron and soft steel, as formerly. Increased loads and the very severe conditions imposed on motor axles have required material having higher resistance to stresses, yet sufficiently ductile to insure freedom from brittleness. The response of steel manufacturers has been the heat-treated axle.

Four different classes of product are referred to: Standard forged axles, which receive no special heat treatment subsequent to forging, this being the class most generally employed at present; annealed axles, which after forging and cooling are reheated to the proper temperature for refining the grain and then allowed to cool slowly; toughened axles, which after forging and cooling are reheated to approximately the same temperature as for annealing, quenched in some medium to refine the grain still further, and then reheated to a little lower temperature than before; high test axles, for which the treatment is similar to that employed for toughened axles except that the final "drawing back" or annealing temperature is slightly lower, giving elasticity and tensile strength considerably higher and ductility somewhat lower than in toughened axles. It is stated that in the experiments no difference was observed between large and small axles, disproving the theory that for axles of the larger sizes it is necessary to bore out the center to insure complete penetration of the effects of heating and cooling operations. The conclusions derived from the tests detailed in the pamphlet are stated as follows:

Any of the heat treatments employed is beneficial.

Owing to the lower carbon, the mild grade is not affected by heat treatment to the same extent as the others.

To assure material of the highest quality, the medium and the hard grades should be heat treated.

The tensile tests do not seem to give as good an idea of the quality of material as do the torsion tests. In comparing the tensile and the torsion specimens, the ultimate strengths are comparable, but the elongation of the tensile specimen is not comparable with the number of twists of the torsion specimens. A very close relation is noticeable between the reduction of area of the tensile specimens and the number of twists of the corresponding torsion specimen. These two properties seem to be the true measure of the ductility.

The use of a large number of specimens is of no advantage.

Equally good results can be obtained with different sizes of [illegible] provided the proper heat treatment attention are given.

On November 2 the No. 2 open hearth plant at the Homestead Steel Works of the Carnegie Steel Company, Homestead, Pa., made a new record, turning out 2474 tons of open-hearth steel in the 24 hours. On October 15, 1906, it turned out 2284 tons, which has been the record until now. The No. 2 plant has 16 50-ton furnaces and is under the direction of P. P. Rees, superintendent.

The Clinton Iron & Steel Company, Pittsburgh, started up its blast furnace November 4, making foundry pig iron.

The Iron and Metal Markets

A Comparison of Prices

Advances Over the Previous Week in Heavy Type. Declines in Italics.

At date, one week, one month and one year previous.

	Nov. 8, 1911.	Nov. 1, 1911.	Oct. 11, 1911.	Nov. 9, 1910.
PIG IRON, Per Gross Ton:				
Foundry No. 2 standard, Philadelphia	$15.00	$15.00	$15.00	$15.75
Foundry No. 2, Valley furnace	13.25	13.25	13.50	13.75
Foundry No. 2 Southern, Cincinnati	13.25	13.25	13.25	14.25
Foundry No. 2, Birmingham, Ala.	10.00	10.00	10.00	11.00
Foundry No. 2, at furnace Chicago*	*14.10*	14.35	14.50	16.00
Basic, delivered, eastern Pa.	14.50	14.50	14.50	14.75
Basic, Valley furnace	12.50	12.50	12.50	13.25
Bessemer, Pittsburgh	15.15	15.15	15.40	15.50
Gray forge, Pittsburgh	*13.40*	13.65	13.65	14.15
Lake Superior charcoal, Chicago	16.50	16.50	16.50	18.00
COKE, CONNELLSVILLE, Per Net Ton, at Oven:				
Furnace coke, prompt shipment	1.50	1.50	1.50	1.55
Furnace coke, future delivery	1.55	1.55	1.60	1.75
Foundry coke, prompt shipment	1.80	1.80	1.80	2.10
Foundry coke, future delivery	1.90	2.00	2.00	2.25
BILLETS, &c., Per Gross Ton:				
Bessemer billets, Pittsburgh	20.00	20.00	20.00	23.50
Open hearth billets, Pittsburgh	19.00	19.00	19.00	23.50
Forging billets, Pittsburgh	24.00	24.00	25.00	28.50
Open-hearth billets, Philadelphia	22.40	21.40	21.40	26.00
Wire rods, Pittsburgh	28.00	28.00	28.00	28.00
OLD MATERIAL, Per Gross Ton:				
Iron rails, Chicago	14.50	14.50	13.75	16.00
Iron rails, Philadelphia	15.50	15.50	16.50	18.00
Car wheels, Chicago	12.00	12.00	12.50	13.50
Car wheels, Philadelphia	*11.25*	11.50	11.75	13.75
Heavy steel scrap, Pittsburgh	12.00	12.00	12.00	14.25
Heavy steel scrap, Chicago	9.50	9.50	10.00	12.25
Heavy steel scrap, Philadelphia	*11.50*	11.75	12.00	13.50
FINISHED IRON AND STEEL, Per Pound to Largest Buyers:	Cents.	Cents.	Cents.	Cents.
Bessemer rails, heavy, at mill	1.25	1.25	1.25	1.25
Iron bars, Philadelphia	1.20	1.20	1.25	1.35
Iron bars, Pittsburgh	1.20	1.20	1.20	1.45
Iron bars, Chicago	1.15	1.15	1.20	1.35
Steel bars, Pittsburgh	1.10	1.10	1.15	1.40
Steel bars, tidewater, New York	1.26	1.26	1.31	1.56
Tank plates, Pittsburgh	1.15	1.15	1.20	1.40
Tank plates, tidewater, New York	1.31	1.31	1.36	1.56
Beams, Pittsburgh	1.15	1.15	1.20	1.40
Beams, tidewater, New York	1.31	1.31	1.36	1.56
Angles, Pittsburgh	1.15	1.15	1.20	1.40
Angles, tidewater, New York	1.31	1.31	1.36	1.56
Skelp, grooved steel, Pittsburgh	1.15	1.15	1.15	1.25
Skelp, sheared steel, Pittsburgh	1.25	1.25	1.25	1.35
SHEETS, NAILS AND WIRE, Per Pound to Largest Buyers:	Cents.	Cents.	Cents.	Cents.
Sheets, black, No. 28, Pittsburgh	1.85	1.85	1.85	2.20
Wire nails, Pittsburgh	1.55	1.60	1.65	1.70
Cut nails, Pittsburgh	1.50	1.50	1.50	1.60
Barb wire, galv., Pittsburgh	*1.85*	1.90	1.95	2.00
METALS, Per Pound:	Cents.	Cents.	Cents.	Cents.
Lake copper, New York	12.50	12.50	12.50	13.00
Electrolytic copper, New York	12.37½	12.37½	12.25	12.87½
Spelter, St. Louis	6.20	6.20	6.00	5.80
Spelter, New York	6.35	6.35	6.15	5.95
Lead, St. Louis	4.15	4.15	4.10	4.30
Lead, New York	4.25	4.25	4.25	4.40
Tin, New York	42.00	41.62½	41.25	36.25
Antimony, Hallett, New York	7.70	7.70	7.70	7.75
Tin plate, 100-lb. box, New York	$3.64	$3.64	$3.84	$3.64

*The average switching charge for delivery to foundries in the Chicago district is 50c. per ton.

Prices of Finished Iron and Steel f.o.b.

Freight rates from Pittsburgh in carloads, per 100 lb.: New York, 16c.; Philadelphia, 15c.; Boston, 18c.; Buffalo, 11c.; Cleveland, 10c.; Cincinnati, 15c.; Indianapolis, 17c.; Chicago, 18c.; St. Paul, 32c.; St. Louis, 22½c.; New Orleans, 30c.; Birmingham, Ala., 45c. Pacific coast, 80c. on plates, structural shapes and sheets Nos. 11 and heavier; 85c. on sheets Nos. 12 to 16; 95c. on sheets No. 16 and lighter; 65c. on wrought pipe and boiler tubes.

Plates.—Tank plates, ¼ in. thick, 6¼ in. up to 100 in. wide, 1.15c., base, net cash, 30 days. Following are stipulations prescribed by manufacturers, with extras:

Rectangular plates, tank steel or conforming to manufacturers' standard specifications for structural steel dated February 6, 1903, or equivalent, ¼ in. thick and over on thinnest edge, 100 in. wide and under, down to but not including 6 in. wide, are base.

Plates up to 72 in. wide, inclusive, ordered 10 lb. per square foot, are considered 14-in. plates. Plates over 72 in. wide must be ordered ¼ in. thick or edges, or not less than 11 lb. per square foot, to take base price. Plates over 72 in. wide ordered less than 11 lb. per square foot down to the weight of 3-16-in. take the price of 3-16-in.

Allowable overweight, whether plates are ordered to gauge or weight, to be governed by the standard specifications of the Association of American Steel Manufacturers.

Extras.	Cents per lb.
Gauges under ¼ in. to and including 3-16 in. on thinnest edge	.10
Gauges under 3-16 in. to and including No. 8	.15
Gauges under No. 8 to and including No. 9	.25
Gauges under No. 9 to and including No. 10	.30
Gauges under No. 10 to and including No. 12	.40
Sketches (including all straight taper plates) 3 ft. and over in length	.10
Complete circles, 3 ft. in diameter and over	.20
Boiler and flange steel	.10
"A. B. M. A." and ordinary firebox steel	.20
Still bottom steel	.30
Marine steel	.40
Locomotive firebox steel	.50
Widths over 100 in. up to 110 in., inclusive	.05
Widths over 110 in. up to 115 in., inclusive	.10
Widths over 115 in. up to 120 in., inclusive	.15
Widths over 120 in. up to 125 in., inclusive	.25
Widths over 125 in. up to 130 in., inclusive	.50
Widths over 130 in.	1.00
Cutting to lengths or diameters under 3 ft. to 2 ft., inclusive	.25
Cutting to lengths or diameters under 2 ft. to 1 ft., inclusive	.50
Cutting to lengths or diameters under 1 ft.	1.55

No charge for cutting rectangular plates to lengths 3 ft. and over.

Structural Material.—I-beams, 3 to 15 in.; channels, 3 to 15 in., and angles, 3 to 6 in. on one or both legs, ¼ in. and over, 1.15c. to 1.20c. Other shapes and sizes are quoted as follows:

	Cents per lb.
I-beams over 15 in.	1.20 to 1.25
H-beams over 18 in.	1.30 to 1.35
Angles over 6 in.	1.20 to 1.25
Angles, 3 in. on one or both legs, less than ¼ in. thick, plus full extras as per steel bar card Sept. 1, 1909	1.20 to 1.25
Tees, 3 in. and up	1.20 to 1.25
Zees, 3 in. and up	1.15 to 1.20
Angles, channels and tees, under 3 in., plus full extras as per steel bar card Sept. 1, 1909	1.20 to 1.25
Deck beams and bulb angles	1.45 to 1.50
Hand rail tees	2.00 to 2.15
Checkered and corrugated plates	2.00 to 2.15

Sheets.—Makers' prices for mill shipments on sheets of U. S. standard gauge, in carload and larger lots, on which jobbers charge the usual discounts for small lots from store, are as follows:

Blue Annealed Sheets

	Cents per lb.
Nos. 3 to 8	1.25 to 1.30
Nos. 9 and 10	1.35 to 1.40
Nos. 11 and 12	1.40 to 1.45
Nos. 13 and 14	1.45 to 1.50
Nos. 15 and 16	1.55 to 1.60

Box Annealed Sheets, Cold Rolled.

	One Pass.	Three Pass.
Nos. 10 to 12	1.50 to 1.55	
Nos. 13 and 14	1.55 to 1.60	
Nos. 15 and 16	1.60 to 1.65	1.70 to 1.75
Nos. 17 to 21	1.65 to 1.70	1.75 to 1.80
Nos. 22, 23 and 24	1.70 to 1.75	1.80 to 1.85
Nos. 25 and 26	1.75 to 1.80	1.85 to 1.90
No. 27	1.80 to 1.85	1.90 to 1.95
No. 28	1.85 to 1.90	1.95 to 2.00
No. 29	1.90 to 1.95	2.00 to 2.05
No. 30	2.00 to 2.05	2.10 to 2.15

Galvanized Sheets of Black Sheet Gauge.

Nos. 10 and 11	1.85 to 1.90
Nos. 12, 13 and 14	1.95 to 2.00
Nos. 15, 16 and 17	2.10 to 2.15
Nos. 18 to 22	2.25 to 2.30
Nos. 23 and 24	2.35 to 2.40
Nos. 25 and 26	2.55 to 2.60
No. 27	2.70 to 2.75
No. 28	2.85 to 2.90
No. 29	2.95 to 3.00
No. 30	3.15 to 3.20

All above rates on sheets are f.o.b. Pittsburgh, terms 30 days net, or 2 per cent. cash discount in 10 days from date of invoice, as also are the following base prices per square for painted and galvanized roofing sheets, with 2½-in. corrugations.

Corrugated Roofing Sheets, Per Square.

Gauge.	Painted.	Galvanized.	Gauge.	Painted.	Galvanized.
29		$2.30	23	$2.35	$3.45
28	$1.30	2.45	22	2.55	3.65
27	1.45	2.50	21	2.75	4.00
26	1.55	2.60	20	3.00	4.30
25	1.80	3.00	18	4.60	5.65
24	2.05	3.10	16	4.85	6.45

Wire Rods and Wire.—Bessemer, open hearth and chain rods, $25.50 to $26. Fence wire, Nos. 0 to 9, per 100 lb., terms 60 days, or 2 per cent. discount in 10 days,

THE IRON AND METAL MARKETS

carload lots, to jobbers, annealed, $1.35; galvanized, $1.65. Carload lots, to retailers, annealed, $1.45; galvanized, $1.75. Galvanized barb wire to jobbers, $1.85; painted, $1.55. Wire nails, to jobbers, $1.55.

The following table gives the price to retail merchants on wire in less than carloads, including the extras on Nos. 10 to 16, which are added to the base price:

Fence Base, Per 100 lb.

No.	0 to 9	10	11	12 & 12½	13	14	15	16
Annealed	$1.55	$1.60	$1.65	$1.70	$1.80	$1.90	$2.00	$2.10
Galvanized	1.85	1.90	1.95	2.00	2.10	2.20	2.60	2.70

Wrought Pipe.—The following are the jobbers' carload discounts on the Pittsburgh basing card on wrought pipe, in effect from October 2, 1911:

	Steel—Black.	Steel—Galv.	Iron—Black.	Iron—Galv.
Butt Weld.				
⅛ and ¼ in.	73	53	68	48
⅜ in.	74	64	69	59
½ in.	77	67	72	62
¾ in. to 1¼ in.	80	72	75	67
2 in. to 3 in.	81	74	76	69
Lap Weld.				
1¼ and 1½ in.	77		68	61
2 in.	77	70	72	65
2½ to 4 in.	79	72	74	67
4½ to 6 in.	78	70	73	65
7 to 12 in.	76	66	71	61
13 to 15 in.	52		47	
Butt Weld, extra strong, plain ends, card weight.				
⅛, ¼, ⅜ in.	70	60	68	55
½ in.	75	69	70	64
¾ to 1¼ in.	76	73	74	68
2 to 3 in.	80	74	75	69
Lap Weld, extra strong, plain ends, card weight.				
1½ in.			66	60
2 in.	76	70	71	65
2½ to 4 in.	78	72	73	67
4½ to 6 in.	77	71	72	66
7 to 8 in.	70	60	65	55
9 to 12 in.	65	55	60	50
Butt Weld, double extra strong, plain ends, card weight.				
⅜ in.	65	59	60	54
¾ to 1¼ in.	68	62	63	57
2 to 3 in.	70	64	65	59
Lap Weld, double extra strong, plain ends, card weight.				
2 in.	66	60	61	55
2½ to 4 in.	68	62	63	57
4½ to 6 in.	67	61	62	56
7 to 8 in.	60	50	55	45
Plugged and Reamed.				

1 to 1¼, 2 to 3 in. Butt Weld
2. 2½ to 4 in. ..... Lap Weld } will be sold at two (2) points lower basing (higher price) than merchants' or card weight pipe. Butt or lap weld, as specified.

The above discounts are for "card weight" subject to the usual variation of 5 per cent. Prices for less than carloads are three (3) points lower basing (higher price) than the above discounts.

Boiler Tubes.—Discounts on lap welded steel and charcoal iron boiler tubes to jobbers in carloads are as follows:

Steel		Charcoal Iron.	
1¼ to 2¼ in.	65	1½ in.	45
2½ in.	67½	1¾ to 2¼ in.	50
2¾ to 3½ in.	72½	2½ in.	55
3½ to 4 in.	75	2¾ to 3 in.	60
5 to 6 in.	67½		
7 to 13 in.	65		

2½ in. and smaller, over 18 ft., 10 per cent. net extra.
2¾ in. and larger, over 22 ft., 10 per cent. net extra.
Less than carloads will be sold at the delivered discounts for carloads, lowered by two points for lengths 22 ft. and under to destinations east of the Mississippi River; lengths over 22 ft. and all shipments going west of the Mississippi River must be sold f.o.b. mill at Pittsburgh basing discount, lowered by two points.

Pittsburgh

PITTSBURGH, PA., November 8, 1911.—(*By Telephone.*)

Pig Iron.—With the prospect of lower ore prices next year, and probably lower freight charges on ore and coke, consumers of pig iron figure that prices are not likely to be any higher in the near future and are confining their purchases to small lots to cover actual needs. A fairly heavy tonnage of foundry iron is moving to consumers and the foundry stocks held by the furnaces are light. No large inquiries for pig iron are in the market. Prices continue weak, and gray forge has further declined. We quote Bessemer iron $14.25; malleable Bessemer and basic, $13.50; No. 2 foundry, $13.25, and gray forge, $12.50, all at Valley furnace, the freight rate to the Pittsburgh district being 90c. a ton. We note a sale of 1500 tons of gray forge at $12.60, Valley, or $13.50 Pittsburgh, for forward delivery, and 250 tons of forge for prompt shipment at $12.50 Valley.

Steel.—Reports that contracts for Bessemer sheet bars have been adjusted to the basis of $20 Pittsburgh for October shipment are denied. New demand for steel is dull, but specifications against contracts for billets and sheet and tin bars are fairly heavy. We quote open hearth billets, $19; Bessemer billets, $20; open hearth sheet bars, $20; Bessemer sheet bars, $21; and forging billets, $24, f.o.b. at maker's mill.

Steel Rails.—We are advised that the Norfolk & Western Railroad has placed a contract for 25,000 tons of standard rails for 1912 delivery, a part of the tonnage to be rolled at the Edgar Thomson rail mills of the Carnegie Steel Company, at Bessemer, Pa.

(By Mail.)

The steel trade is simply marking time, consumers placing orders only for what they must have, but it is evident that when they feel that prices are as low as they will go there will be a heavy buying movement. Prices on pig iron have declined further and both open-hearth and Bessemer steel are slightly weaker. There is no doubt that the low prices ruling have materially increased the volume of new business, but the mills claim that they get little or no profit. The coke market is steady and so is scrap, with more moving from dealers to consumers than for some time. Prices on ferro-silicon continue to advance, having reached $64, Pittsburgh, or higher.

Ferromanganese.—Efforts made during the past week to shade $38, Baltimore, on 80 per cent. have not been successful. An open-hearth interest in the Wheeling district that came in the market about a week ago for 600 tons for delivery over all of 1912 found the market very strong and closed for about 300 tons at about $38.25, Baltimore. Another interest at Canton, Ohio, is in the market for 500 tons for delivery in the first half of 1912. For delivery in the first half of next year we quote $38.25 to $38.50, Baltimore, the freight rate for delivery in the Pittsburgh district being $1.95 a ton.

Ferrosilicon.—Prices on 50 per cent. continue to advance, the material being pretty well under control by two leading interests. It is now held at $64, Pittsburgh, or higher. We quote: 10 per cent., $22; 11 per cent., $23, and 12 per cent., $24, f.o.b. cars Jackson, Ohio, or Ashland, Ky.

Skelp.—A local mill reports a sale of about 1000 tons of narrow grooved steel skelp at 1.15c., and a mill outside the Pittsburgh district has made a sale of about 1500 tons of narrow grooved at 1.10c. at mill. We quote grooved steel skelp at 1.15c.; sheared steel skelp, 1.20c.; grooved iron skelp, 1.40c., and sheared iron skelp, 1.60c., all for delivery at consumers' mills in the Pittsburgh district.

Wire Rods.—The new demand is very dull, consumers being covered by contracts which in some cases run over the first half of next year. The market is weak and we quote Bessemer, open-hearth and chain rods at $25.50 to $26. f.o.b. Pittsburgh.

Steel Rails.—No important orders for standard sections have been placed, but the new demand for light rails is fairly active. The Carnegie Steel Company is receiving quite a good many orders for light rails for export. We quote light rails as follows: 8 and 10-lb. sections, 1.295c.; 12 and 14-lb., 1.205c.; 16, 20 and 25-lb., 1.16c.; 30 and 35-lb., 1.15c.; 40 and 45-lb., 1.105c.

Structural Material.—It is learned here that the order placed with the American Bridge Company for part of the Hell Gate Bridge, New York City, calls for about 36,000 tons. The same company has taken 365 tons for the Flannery Building in this city, and the Jones & Laughlin Steel Company has taken about 700 tons for New York Central terminals in New York City. The Penn Bridge Company, Beaver Falls, Pa., has taken about 200 tons for a new steel building for the Hazel-Atlas Glass Company, Washington, Pa. We continue to quote beams and channels up to 15 in. at 1.15c. to 1.20c., Pittsburgh, the lower price being named only on desirable orders.

Plates.—Orders for steel cars include 3000 steel underframe box cars for the Pittsburgh & Lake Erie, taken by the Pressed Steel Car Company, which has also received an order for 600 gondolas for the Southern. The Standard Steel Car Company has taken an order for 2000 steel hoppers for the Chesapeake & Ohio. The Big Four is reported to have placed 2000 steel underframe cars and the Canadian Northern 1000. The Jones & Laughlin Steel Company is making quite heavy

THE IRON AND METAL MARKETS

shipments of plates for Panama Canal work and reports that its plate mills are fairly busy. We quote wide and narrow plates at 1.15c. on ordinary orders and 1.20c. in small lots, f.o.b. at mill. On a very desirable contract for large tonnage and attractive rolling specifications it is probable that the lower price named might be slightly shaded by one or two mills.

Sheets.—Large consumers are now anxious to place contracts for long delivery at present prices, in some cases through the first half of next year. Some business of this nature has been taken from a few very large consumers, but as a rule the makers are not willing to sell at present low prices for longer than two or three months' delivery. The mills generally are operating to about 60 per cent. of capacity. Actual orders placed in the second half of October showed an increase over the first half. It is stated that quite a good tonnage is being sold for export. Prices are unchanged.

Tin Plate.—Leading consumers of tin plate are not showing much eagerness to place contracts for their requirements for delivery in the first quarter and first half of 1912, even at the lower price of $3.40 per base box. The feeling is that, under present conditions, nothing is to be gained by placing early contracts for long delivery. Some consumers, however, have placed fairly large orders for the first half. The mills will not start to run on these contracts until December or January, and, as business has been dull for some time, the natural result is that operations of the mills are on a steadily reducing rate. The leading mills are not operating at present to more than 50 per cent. of capacity. The Jones & Laughlin Steel Company expects to have its second unit of 12 mills ready for operation about December 1. Foundations are in for the third unit of 12 mills, which will not be completed until April or May. The American Sheet & Tin Plate Company is operating four sheet mills, one jobbing and one plate mill at its new works at Gary, Ind. We quote 100-lb. cokes, 14 x 20, at $3.40 per base box, f.o.b., Pittsburgh.

Bars.—Consumers are placing only such orders as are required to meet current needs. Specifications against contracts are coming in at a fairly satisfactory rate, but none of the leading steel bar makers is operating to full capacity. Prices on both iron and steel bars are lower than they have been in some years, but this has not stimulated the demand. We quote steel bars at 1.10c. for very desirable orders and 1.15c. in small lots. Iron bars continue to rule at 1.20c. to 1.25c. at maker's mill, depending on the order, freight added to point of delivery.

Merchant Steel.—Orders entered by the mills for shipment in the last half of October showed a slight increase as compared with the first half. Shipments by the mills are fairly heavy, but specifications against contracts are coming in at only a moderate rate.

Hoops and Bands.—The new demand is quiet, and specifications against contracts are unsatisfactory. We quote steel hoops at 1.30c. to 1.35c. and bands at 1.10c. to 1.15c., extras on the latter as per the steel bar card.

Rivets.—A slightly better demand is noted for both structural and boiler rivets and more actual business is reported than for some time. Specifications against contracts are not very satisfactory. We quote structural rivets at 1.50c. and boiler rivets at 1.60c. f.o.b., Pittsburgh, but on desirable orders these prices are shaded.

Wire Products.—Successive lower prices made on wire and wire nails do not stimulate the demand, jobbers and retailers still placing orders only for such quantities as are needed to maintain stocks or to meet the requirements of consumers. While the regular price of wire nails remains at $1.60 and barb wire at $1.40, the mills are accepting orders at $1.55 on wire nails and $1.35 on plain wire. Competition for delivery at Southern points is very keen, the mills located on the Ohio River quoting prices f.o.b. at mill plus freight to Southern points which represent, delivered, less than $1.60 on wire nails at Pittsburgh plus freight. We quote wire nails at $1.55 to $1.60; cut nails $1.50; galvanized barb wire $1.90; painted, $1.55 to $1.60; annealed fence wire $1.35 to $1.40, and galvanized fence wire $1.65 to $1.70, f.o.b. Pittsburgh, usual terms, freight added to point of delivery.

Spelter.—The market continues very firm, the demand being reported heavier than for some time. We quote prime grades of Western at 6.25c., East St. Louis, equal to 6.37½c., Pittsburgh. A local consumer bought last week about 100 tons for November and December shipment at 6.20c., East St. Louis.

Shafting.—Orders are reported slightly larger and specifications from the agricultural implement makers are coming in at a heavier rate. Consumers realize that present prices are extremely low, and in some cases are willing to contract into next year, but as a rule the makers are refusing to accept contracts for delivery through the first half at present prices and will only sell for delivery in this month and December. We quote cold-rolled shafting at 60 and 10 and 65 per cent. off in carload and larger lots delivered in base territory.

Iron and Steel Scrap.—The feeling in the scrap market is a little better. More material is moving from dealers to consumers, probably due to the low prices. The scrap list of the Pennsylvania Railroad issued last week asked for bids on about 18,000 tons, including 8000 tons of heavy melting steel. Some dealers believe that prices will improve toward the end of this year or very early next year and are not willing to make sales for extended delivery. We note sales of some 2000 tons of heavy steel scrap at about $12.10 delivered, also sales of 500 tons of borings at $8 delivered. Prices are perhaps a trifle firmer but are not any higher. Dealers are quoting as follows, per gross ton, f.o.b. Pittsburgh, unless otherwise noted:

Heavy steel scrap, Steubenville, Follansbee, Sharon, Monessen and Pittsburgh delivery		$12.00
No. 1 foundry cast	$12.50 to	12.75
No. 2 foundry cast	11.75 to	12.00
Bundled sheet scrap, f.o.b. consumers' mill, Pittsburgh district	10.25 to	10.50
Rerolling rails, Newark and Cambridge, Ohio, Cumberland, Md., and Franklin, Pa.	12.50 to	12.75
No. 1 railroad malleable stock	11.50 to	11.75
Grate bars	9.00 to	9.25
Low phosphorus melting stock	15.00 to	15.25
Iron car axles	20.50 to	21.00
Steel car axles	16.00 to	16.25
Locomotive axles	22.00 to	22.50
No. 1 busheling scrap	11.00 to	11.25
No. 2 busheling scrap	7.00 to	7.25
Old car wheels	12.00 to	12.25
*Cast iron borings	8.00 to	8.15
*Machine shop turnings		8.75
Short bar crop ends	13.75 to	14.00
Old iron rails	14.50 to	14.75
No. 1 wrought scrap	12.00 to	12.25
Heavy steel axle turnings	9.75 to	10.00
Stove plate	9.00 to	9.25

*These prices are f.o.b. cars at consumers' mills in the Pittsburgh district.
‡Shipping point.

Railroad Spikes.—The railroads are placing orders a little more freely in the desire to finish work before severe weather sets in. An Eastern line recently specified for 1500 kegs and a Western line for about 800 kegs. We quote railroad spikes at $1.40 in base sizes for carload and larger lots, f.o.b. Pittsburgh.

Merchant Pipe.—The Dohemy interests of Los Angeles, Cal., propose to take natural gas from the Santico fields and pipe it into the city of Mexico and adjoining centers of population. The scheme is to lay a screw line, which, after the gas is exhausted, can be used for oil. Only preliminary work has been done so far, but if the project should be successful it will require 250 miles or more of 6-in. and larger sizes of pipe. In the volume of new business the pipe trade is reported good, actual bookings by the leading mills in October showing an increase over September. One leading mill reports that it is operating to about 85 per cent. of capacity, and is pretty well fixed with orders for this and next month. New lists of discounts on oil country goods for the various oil fields and also for the California field have recently been issued. Present discounts on both iron and steel pipe are stated to be firmly held.

Boiler Tubes.—The new demand for locomotive tubes has been better, but for merchant tubes continues very dull. Regular discounts on both locomotives and merchant tubes are more or less shaded, and probably will continue to be until the volume of new business shows an increase.

Coke.—Some inquiries are out for furnace coke for delivery in the first half of next year and from $1.70 to $1.75 for standard grades, per net ton at oven, is being quoted on these inquiries, but so far little actual business has been closed. We note, however, that a local coke interest has taken a contract for about 9000 tons per month for all of 1912 at $1.80 at oven, and a contract for about 12,000 tons a month for delivery in the

THE IRON AND METAL MARKETS

first half at $1.75. These prices are regarded as being above what the actual coke market will be next year, but the buyers in both cases specified particular makes of furnace coke which have a very high reputation. Sales of 3500 to 4000 tons of spot furnace coke have been made at $1.50 per net ton at oven. We quote standard makes for furnace coke for spot shipment at $1.50 to $1.55 and for November and December shipment at $1.55 to $1.60, per net ton at oven. Standard makes of furnace coke for the first half are held at about $1.70 to $1.75. We quote standard makes of 72-hr. foundry coke for spot shipment at $1.85 to $2 and on contracts for first half at $2.10 to $2.40 per net ton at oven.

The Ohio Iron & Metal Company, whose main office is and will continue to be in the First National Bank Building, Chicago, Ill., corrects a statement made in the last issue of *The Iron Age*. It has discontinued its branch offices at Philadelphia and Cleveland but retains its office in the Farmers' Bank Building, Pittsburgh, in charge of H. D. and H. G. Stalnaker. It also continues its branch at 30 Church street, New York City, in charge of L. Deutsch. The publication of the erroneous statement is greatly regretted. The information came from what appeared to be an authentic source and, therefore, was not verified.

Chicago

CHICAGO, ILL., November 8, 1911.—(*By Telegraph*.)

From those sources to which the inquiries of railroads for cars and rails have gone a moderate feeling of encouragement has emanated. The general feeling among the manufacturers, however, reflects a disposition to reduce their operation to as light a schedule as possible. Buyers of steel and pig iron, while satisfied with the prices at which material can be bought, are reluctant to increase beyond their positive need either their stocks of raw material or manufactured products. The tonnage moving in the market, therefore, continues to be a hand-to-mouth business and insufficient in volume to establish any degree of firmness in the position of mills and furnaces. In this market the past week seems to have brought out an accentuating of local competition. As a result the decreasing margin which thus far has held the interest of Eastern shippers to this territory has been eliminated in certain instances, particularly as regards plates. While there has been no general decline from the prevailing level of prices, which may be considered as existing on the basis of 1.33c., Chicago, for plates and shapes and 1.28c., Chicago, for steel bars, the concessions from these prices have been frequent and irregular. Sheets have shared this general condition and wire products have yielded in many directions under pressure of competition. The market, as applied to pig iron, has lost most of its elasticity and local Northern iron can be purchased on the basis of $14, f.o.b. furnace. In general the low prices prevailing have brought out less tonnage in the West than is reported from Eastern points and railroad purchasing of equipment is limited to small lots.

Pig Iron.—The local pig iron market continues to sag under its own weight. Inquiry is very limited and sales are restricted to very small orders. It is now conceded that a price of $14, f.o.b. furnace, for No. 2 local iron can be obtained, although the asking price of $14.50 has not disappeared. For Southern iron the basis of $10, Birmingham, for No. 2 continues to rule, but the possibilities of obtaining a premium for forward delivery are increasingly weak. The fact that buying is almost entirely for the immediate needs of consumers is contributing to a uniformly prompt movement of iron on order which is perhaps the most favorable feature of the situation. We quote for Chicago delivery, except for local irons, which are f.o.b. furnace, the following prices on prompt shipments:

Lake Superior charcoal	$14.50 to $15.00
Northern coke foundry, No. 1	14.75 to 15.00
Northern coke foundry, No. 2	14.00 to 14.50
Northern coke foundry, No. 3	14.00 to 14.25
Northern Scotch, No. 1	16.00
Southern coke, No. 1 foundry and No. 1 soft	14.85 to 15.00
Southern coke, No. 2 foundry and No. 2 soft	14.35 to 14.60
Southern coke, No. 3	14.10 to 14.25
Southern coke, No. 4	13.85 to 14.10
Southern gray forge	13.85 to 13.85
Southern mottled	13.60 to 13.85
Malleable Bessemer	14.35 to 14.50
Standard Bessemer	17.00
Basic	14.75
Jackson Co. and Kentucky silvery, 6 per cent	16.90
Jackson Co. and Kentucky silvery, 8 per cent	17.40
Jackson Co. and Kentucky silvery, 10 per cent	18.40

(*By Mail.*)

Rails and Track Supplies.—While inquiries from the railroads for next year's requirements of rails were to be expected about this time, still the fact that such inquiries have been received has been taken as an occasion for more than usual encouragement. One sale of a round tonnage is reported to a Western trunk line and other purchases are under contemplation. Western mills are sorely in need of rail business and orders received at this time will be more than timely. Such orders are expected to carry corresponding contracts for track fastenings. We quote standard railroad spikes at 1.60c., base; track bolts with square nuts, 2c. to 2.10c., base, all in carload lots, Chicago; standard section Bessemer rails, 1.28c.; open hearth, 1.34c.; light rails, 40 to 45 lb., 1.16c. to 1.20½c.; 30 to 35 lb., 1.19½c. to 1.24c.; 16, 20 and 25 lb., 1.20½c. to 1.25c.; 12 lb., 1.25c. to 1.30½c.; angle bars, 1.50c., Chicago.

Structural Material.—The lettings of contracts for fabricated steel the past week aggregated 8281 tons and included 2400 tons for the Rice Hotel at Houston, Tex., taken by the Cambria Steel Company; a number of plate girder and I-beam spans for the Chicago, Burlington & Quincy Railroad awarded to the McClintic-Marshall Construction Company; 1112 tons for the Walker Building, Salt Lake City, to the Minneapolis Steel & Machinery Company; the McClurg apartments, Chicago, to the Holmes & Pyott Company, 1000 tons; the Merchants National Bank Building, Indianapolis, 2550 tons, to the Noelke-Richards Iron Works; buildings for the Conrad Schrier Company, Sheboygan, Wis., 355 tons, to the Worden-Allen Company; 240 tons for a highway at Gridley, Cal., to the American Bridge Company. Mills in this territory are engaged for the most part with the rolling of shapes for steel cars and architectural contracts, but to some extent with railroad bridge steel. This tonnage is considerably below capacity and low prices continue without bringing out evidences of firmer conditions ahead. We quote for plain shapes, Chicago delivery, mill shipment, 1.33c., and from store, 1.65c.

Plates.—Because of the keenly competitive situation which has developed in this market, Eastern plate mills have found prices too low to admit of taking much of the business offered. Two makers that are ordinarily strong factors are reported to have withdrawn temporarily. While this might give rise to a hope for firmer conditions, the local mills are still sufficiently keen in the pursuit of orders to keep prices at as low a level as at any time recently recorded. The lowest quotations are being made on narrower widths, for which prices equivalent to 1.10c., Pittsburgh, have been made. For ordinary specifications quotations $1 a ton higher are usual. We quote for Chicago delivery, mill shipment, 1.33c., and from store, 1.65c.

Sheets.—The available tonnage of sheets in this market, while sufficient to attract the lowest quotations from the mills, is not large enough to satisfy all of the capacity. As a result producers are still unable to find their firm footing upon which to resist the pressure to lower quotations and desirable offers of business bring out material concessions. We quote Chicago prices as follows: Carload lots, from mill, No. 28 black sheets, 2.03c. to 2.08c.; No. 28 galvanized, 3.03c. to 3.08c.; No. 10 blue annealed, 1.53c. to 1.58c. Prices from store, Chicago, are: No. 10, 1.90c. to 2c.; No. 12, 1.95c. to 2.05c.; No. 28 black, 2.30c.; No. 28 galvanized, 3.35c.

Bars.—Eastern competition apparently has been eliminated to a great extent as a factor in establishing the current local market. Any regularity which may have existed in prices for bars has disappeared and the quotation necessary to take spot shipment business is usually forthcoming. The market has apparently dropped below the level at which bar mills working from purchased billets can compete. We quote as follows, f.o.b. Chicago: Soft steels bars, 1.25c. to 1.33c.; bar iron, 1.15c. to 1.20c.; hard steel bars rolled from old rails, 1.17½c. to 1.20c. From store, soft steel bars, 1.55c. to 1.60c., Chicago.

Wire Products.—Pressure toward lower prices for wire products seems to be directed chiefly upon wire nails, the movement of which has been backward, and upon plain wire. For the former 1.78c. at Chicago is a quotation necessary to take ordinary business, and, in many directions, buyers are insisting on concessions from this quotation. The same is true of plain wire at 1.58c. Woven wire fence continues more active than other lines, although some slowing down in this direction is noticed. Jobbers' carload prices, which are also

THE IRON AND METAL MARKETS

quoted to manufacturing buyers, are as follows, per 100 lb.: Plain wire, No. 9 and coarser, base, $1.58 to $1.63; wire nails, $1.78 to $1.83; painted barb wire, $1.78 to $1.83; galvanized, $2.08 to $2.13; polished staples, $1.78 to $1.83; galvanized, $2.08 to $2.13, all Chicago.

Cast Iron Pipe.—The season, ordinarily quiet as regards cast iron pipe, is not an exception at this time. Prospects for the coming spring are, however, unusually bright, and among the cities already preparing for large pipe installations are Sioux Falls, Iowa, and Omaha, Neb. Current municipal lettings include 200 tons for Mound City and 300 tons for Hill City, Kan. We quote as follows, per net ton, Chicago: Water pipe, 4-in., $26.50; 6 to 12-in., $24.50; 16-in. and up, $24, with $1 extra for gas pipe.

Old Material.—Values of various grades of old materials, under the present market conditions, change with every sale. Melters who purchase a tonnage at one price, when they again enter the market usually do so with a lower offer. Practically no local consumer may be considered as continuously in the market. The movement of scrap is correspondingly limited and uncertain. Lower quotations than obtained a week ago are, at this writing, the top of the market. The railroad offerings of scrap advertised for closing during the present week include 6000 tons from the Atchison, Topeka & Santa Fé, 800 tons from the Wabash Railroad, 1600 tons from the Michigan Central and 250 tons from the Toledo, St. Louis & Western. We quote for delivery at buyers' works, Chicago and vicinity, all freight and transfer charges paid, per gross ton, as follows:

Old iron rails	$14.50 to $15.00
Old steel rails, relrolling	12.00 to 12.50
Old steel rails, less than 3 ft.	10.75 to 11.25
Relaying rails, standard section, subject to inspection	24.00
Old car wheels	12.00 to 12.50
Heavy melting steel scrap	9.50 to 10.00
Frogs, switches and guards, cut apart	9.75 to 10.25
Shoveling steel	9.00 to 9.50
Steel axle turnings	8.00 to 8.50

The following quotations are per net ton:

Iron angles and splice bars	$11.75 to $12.25
Iron arch bars and transoms	13.00 to 13.50
Steel angle bars	8.75 to 9.25
Iron car axles	16.75 to 17.25
Steel car axles	15.25 to 15.75
No. 1 railroad wrought	10.00 to 10.25
No. 2 railroad wrought	9.00 to 9.25
Steel knuckles and couplers	9.00 to 9.50
Steel springs	9.50 to 10.00
Locomotive tires, smooth	13.50 to 14.00
Machine shop turnings	5.75 to 6.25
Cast and mixed borings	5.00 to 5.50
No. 1 busheling	7.75 to 8.00
No. 2 busheling	5.75 to 6.25
No. 1 boilers, cut to sheets and rings	6.50 to 7.00
Boiler punchings	12.00 to 12.50
No. 1 cast scrap	10.00 to 10.50
Stove plate and light cast scrap	8.50 to 9.00
Railroad malleable	9.50 to 10.00
Agricultural malleable	8.50 to 9.00
Pipes and flues	7.00 to 7.50

Philadelphia

PHILADELPHIA, November 7, 1911.

Transactions have been comparatively light, although the sentiment of the trade is toward better conditions. The pig iron market continues to drag, although prompt foundry grades are scarce. While in finished products the volume of business taken has been smaller, sheets are an exception, aggregate orders having been heavier. Old material shows a trifle more movement, but usually at lower prices. Coke remains quiet.

Iron Ore.—Practically an entire absence of demand is reported. The disposition of consumers is to await further developments with the hope that conditions may lead to lower prices for next year's supply.

Pig Iron.—The bulk of the sales has consisted of small quantities for comparatively early shipment. A number of the producers in this district are now pretty well sold up for their output at the present productive rate for the next month or two, as a result of which moderate lots purchased are frequently divided among several makers. The most active inquiry in foundry grades comes from the cast iron pipe makers. Negotiations are still pending on the part of one interest for a large block of Southern iron, while a new inquiry from another maker has come out for 3000 tons, half No. 3 and half forge, for delivery early next year. Odd lots continue to be taken by most of the Delaware River Pipe foundries, one sale of 1000 tons being reported, but most of the transactions have been in small lots. The top price for off irons for pipe foundry use is now stated to be $14.25, delivered. Sales of moderate lots of low grade Virginia foundry iron to cast iron pipe makers in that district are reported at $12, furnace. The leading interest announces a change in quotations for foundry grades for delivery over the remainder of the year, $12.25 at furnace being now quoted, representing a reduction of 25 cents a ton for that delivery. A number of other sellers, however, maintain the $12.50 basis for deliveries extending over the next three months. Small sales of coke malleable for prompt delivery are reported to consumers in this district at close to $16.65, delivered. The demand for forge iron from rolling mills in this territory has been less pronounced. Steel making grades are in but little demand. It is interesting to note that, while foundries are urging deliveries on foundry grades, some steel makers are making efforts to defer deliveries of basic iron contracted for shipment this year. In some cases the quantities involved are of considerable size. Nevertheless negotiations are still pending for several blocks of basic iron, both for this year and early 1912. Small sales of standard analysis low phosphorus iron to consumers in this district are reported at $20, delivered. The general range of pig iron prices for delivery in buyers' yards in this vicinity shows practically no change, the following quotations being named for shipments covering the next 60 days or extending into or through the first quarter of next year.

Eastern Pennsylvania No. 2 X foundry	$15.00 to $15.25
Eastern Pennsylvania No. 2 plain	14.75 to 15.00
Virginia foundry	15.00 to 15.50
Gray forge	14.25 to 14.50
Basic	14.50
Standard low phosphorus	20.00

Ferroalloys.—Some little business is still before the trade in ferromanganese and, while $38.50, Baltimore, is named for 80 per cent., and firmly held by the majority of sellers, reports that concessions can be had are heard. Fifty per cent. ferrosilicon is firm at $62, delivered, with an upward tendency indicated. We quote furnace ferrosilicon, within Bessemer limits as to phosphorus and sulphur, at $27.30 to $28.30, delivered here.

Billets.—Makers in this district have firmed up somewhat on prices of basic open-hearth rolling billets, and now name $22.40, delivered here, for that grade. Concessions from this basis do not appear to be available, although the market has not been tested by any sizable inquiry. A small lot demand continues to be reported. There is no change in the forging billet situation, ordinary grades being quoted at $26.50 to $27.50, according to specifications, delivered in this district.

Plates.—Mills are able to maintain about an even rate of production, although orders and specifications against contracts come out irregularly. Some inquiry is noted for car material, while one for upward of 1000 tons of boat plates has just come out. Orders are usually for small lots, although some fair specifications for bridge, building and boiler plates have developed. Prices show a wider range, and not all makers will meet the low quotations named by some mills for desirable business. For delivery in this district ordinary plates range from 1.30c. to 1.40c., the inside figure representing the competitive price for attractive business, while the outside price is frequently obtained for small lots.

Structural Material.—Orders for plain shapes are reported less numerous. Contracts for fabricated work have also been less active. The contract for the new Municipal Convention Hall is held up pending argument for an injunction restraining the municipal authorities from proceeding with it. Spreckel's sugar refinery has an inquiry out for a new warehouse, which will require about 500 tons, while one of the local shipyards is asking for quotations on 400 tons of boat shapes. Several of the pending bridge contracts have been placed and some moderate business is still pending. Quotations on plain material vary from 1.30c. to 1.40c., the inside figure applying on sharply competitive business, while for ordinary current orders 1.35c. to 1.40c., delivered, about represents the market.

Sheets.—Mills report a better run of orders and are better fixed as to rolling schedules than for some time. Orders are not usually large, but buyers are looking farther ahead and ordering accordingly. Prices also show greater firmness, and while Western sheets are available at 2.05c. for No. 28 gauge, delivered here, Eastern mills making smooth loose rolled sheets easily

THE IRON AND METAL MARKETS

obtain an advance of ¼c. to ½c. per lb. for such material for prompt shipment.

Bars.—The demand for iron bars has been light, and while prices are reported weak insufficient inquiry is coming out to test prices. For the general run of business quotations for iron bars range from 1.20c. to 1.25c., delivered here. While specifications on steel bars are reported comparatively good new business is quiet, with 1.25c., delivered here, representing the market on ordinary local business.

Coke.—Moderate sales of foundry and heating coke are reported, together with some contracting for next year's supplies. As a rule, however, transactions are confined to small prompt lots. While some inquiry for furnace coke for 1912 shipment is reported the business closed has been closely confined to prompt lots. Quotations are practically unchanged, the following range, per net ton, delivered in buyers' yards in this district, representing the market:

Connellsville furnace coke	$3.65 to $4.05
Foundry coke	4.15 to 4.50
Mountain furnace coke	4.10 to 3.65
Foundry coke	3.95 to 4.40

Old Material.—While the market in the usually active grades has been quiet transactions in what are generally termed special grades, such as steel and iron axles and iron rails, have been more active, sales being in lots of a few hundred tons and usually at lower prices than recently quoted. A round lot purchase of wrought iron pipe is also reported. Heavy melting steel has developed an easier tendency, and while railroad steel commands $12, delivered, less desirable grades are available at $11.50. A sale of several hundred tons of No. 1 wrought scrap at $14, delivered, is also reported. Consumers and merchants are now busy figuring on the railroad lists, which are about the usual proportions. The following range of prices about represents quotations at which the ordinary current business for prompt shipment can be done for delivery in buyers' yards, eastern Pennsylvania and nearby points, taking a freight rate from Philadelphia varying from 35c. to $1.35c. per gross ton, for shipment ranging from prompt to the remainder of the year:

No. 1 heavy melting steel scrap	$11.50 to $12.00
Old steel rails, rerolling (nominal)	12.50 to 13.00
Low phosphorus heavy melting steel scrap	15.50 to 16.00
Old steel axles	17.00 to 17.50
Old iron axles	21.00 to 21.50
Old iron rails	15.50 to 16.00
Old car wheels	11.25 to 11.75
No. 1 railroad wrought	13.75 to 14.25
Wrought iron pipe	10.75 to 11.25
No. 1 forge fire	9.50 to 10.00
No. 2 light iron (nominal)	6.00 to 6.50
Wrought turnings	8.00 to 8.25
Cast borings	7.50 to 7.75
Machinery cast	12.25 to 12.75
Railroad malleable (nominal)	11.00 to 11.50
Grate bars, railroad	9.25 to 9.75
Stove plate	9.25 to 9.75

Birmingham

BIRMINGHAM, ALA., November 6, 1911.

Pig Iron.—A marked scarcity of No. 4 foundry and gray forge seems to have been an item of particular interest here this past week, these grades commanding a slight premium as compared with the prices of other grades. One interest reports the sale of approximately 3500 tons last week, while another reports the sale of 2000 tons, from which it will be seen that the business is mostly made up of small orders for nearby shipment. The buyers do not seem anxious to rush in and cover their requirements for the first half of next year, and it would appear that the sellers are not at all eager to book business for such delivery. It is not anticipated that any large buying movement will soon materialize. Prices remain quotable per ton of 2240 lb. f. o. b. cars, Birmingham furnace yards, as follows:

No. 1 foundry and No. 1 soft	$10.50
No. 2 foundry and No. 2 soft	10.00
No. 3 foundry	9.50
No. 4 foundry	9.00
Gray forge	9.00

Cast Iron Pipe.—The foundries now running are operating at a most satisfactory rate and with some margin of profit, considering the prices at which they can buy iron for prompt delivery. There is not a single inquiry of any moment before the trade this week, but the foundries seem very well satisfied with conditions. Prices on single car orders remain as follows, per net ton, f.o.b. cars at foundries in the Birmingham district: 4 to 6-in., $23; 8 to 12-in., $22; over 12-in., average, $21, with gas pipe taking its usual differential of $1 a ton higher.

Old Material.—There has been some little trading but not enough to materially change conditions. The dealers seem a little bit better satisfied, however, than they were some weeks ago, and there is some hope of an improvement in this trade. Prices are still quotable as follows f.o.b. dealers' yards, per gross ton:

Old iron axles (nominal)	$11.50 to $13.00
Old steel axles (light)	11.50 to 12.00
Old steel rails	11.00 to 12.00
No. 1 railroad wrought	9.00 to 10.50
No. 2 railroad wrought	8.50 to 9.00
No. 1 yard wrought	6.50 to 7.00
No. 2 yard wrought	5.00 to 6.50
No. 1 machinery cast	8.50 to 9.00
No. 1 stove	8.00 to 8.50
Iron car wheels	7.00 to 8.00
Steel car wheels	8.00 to 9.50
Light cast and stove plates	6.00 to 6.50

Coal and Coke.—Cooler weather has caused a marked increase in the demand for domestic coal, and this has been reflected slightly in the demand for steam coal. The movement is very satisfactory, with some scarcity of certain kinds of railroad equipment for coal. The New Orleans trade is again getting coal from this district, which is quite a help to the producers here. Coke prices are fairly firm, especially on the best brands, which are held at $3 to $3.50 for Alabama coke and $2 to $2.25 for the best brands of Virginia coke f.o.b. oven.

Cincinnati

CINCINNATI, OHIO, November 8, 1911.—*(By Telegraph.)*

Pig Iron.—So far as big business is concerned this is rather a lean market just now, although the usual number of small orders are being booked. The most encouraging feature to report is the general urgent demand for prompt shipments on contracts. As many of these contracts expire soon at least a temporary improvement may be expected before the end of the year. However, consumers will probably follow the present policy of buying only for immediate requirements, letting the future take care of itself. A central Indiana melter is asking for 500 tons of high silicon iron, for first half delivery, and for the same shipment a Michigan manufacturer wants 1000 tons of malleable. For first quarter shipment an eastern Ohio consumer is asking for 600 tons of No. 2 foundry. Several small sales of No. 4 Southern are reported at $9.25, Birmingham. A local agency also reports the sale in St. Louis territory of a special brand of Southern iron at $11 at furnace. About 200 tons of No. 2 Northern foundry went to a southern Ohio customer at $13, Ironton, for this year's shipment. We continue our quotations of $10, at furnace, for Southern No. 2 foundry, $13 for Northern No. 2 foundry and $13 for malleable. A pipe company has out an inquiry for 1000 tons of high manganese that is expected to be closed this week. Based on freight rates of $3.25 from Birmingham and $1.20 from Ironton we quote, f.o.b. Cincinnati, as follows, for prompt shipment:

Southern coke, No. 1 foundry and 1 soft	$14.00 to $14.25
Southern coke, No. 2 foundry and 2 soft	13.25 to 13.75
Southern coke, No. 3 foundry	12.75 to 13.25
Southern coke, No. 4 foundry	12.50 to 13.00
Southern gray forge	12.50 to 13.00
Ohio silvery, 8 per cent. silicon	16.95 to 17.20
Lake Superior coke, No. 1	14.70 to 14.95
Lake Superior coke, No. 2	14.20 to 14.45
Lake Superior coke, No. 3	13.70 to 13.95
Basic, Northern	13.00 to 14.25
Standard Southern car wheel	25.50 to 25.75
Lake Superior car wheel	19.00

(By Mail.)

Coke.—New business is very scarce, and as prices have been maintained lately on a uniform basis small quick shipment orders are frequently placed without asking for quotations. Furnace coke is quoted in the Connellsville field at $1.50 to $1.55 per net ton at oven, but Wise County and Pocahontas producers are asking from 10c. to 15c. per ton above those figures for this year's shipment. Foundry grades in all three districts are procurable between $1.85 and $2 for prompt movement. The usual premium of about 10 per cent. above prompt shipment quotations is asked on long time contract business.

Finished Material.—Reports from practically all centres indicate very little change in the volume of business. Orders are mainly small, although it is stated that structural material has shown a little improvement in the past few days. Steel bars do not appear to

THE IRON AND METAL MARKETS

be as weak in this territory as in other markets, and no business is reported below 1.10c., Pittsburgh, while a number of small orders have been placed at 1.15c. The local warehouse price on steel bars is from 1.55c. to 1.60c., and on structural material, cut to lengths, if desired, 1.65c. to 1.70c.

Old Material.—Reports from all sources show that the market is weaker and slower. No large amounts of scrap material are being contracted for by buyers, who do not look for much lower prices, but at the same time they cannot see any advantage in making future contracts and are simply buying to fill immediate requirements. The minimum figures given below represent about what buyers are willing to pay for delivery at their yards in southern Ohio and Cincinnati, and the maximum figures the average selling prices f.o.b. at yards:

No. 1 railroad wrought, net ton	$9.50 to	$10.25
Cast-iron borings, net ton	4.50 to	5.00
Steel turnings, net ton	5.50 to	6.00
No. 1 cast scrap, net ton	9.00 to	9.75
Burnt scrap, net ton	6.25 to	6.75
Old iron axles, net ton	16.25 to	16.75
Bundled sheet scrap, gross ton	5.75 to	6.50
Old iron rails, gross ton	13.00 to	13.75
Relaying rails, 50 lb. and up, gross ton	20.75 to	21.50
Old car wheels, gross ton	9.50 to	10.25
Heavy melting steel scrap	9.25 to	10.00

The German Iron Market.

BERLIN, October 27, 1911.

There is no check to the firm tendency of prices, and the works continue well employed in all lines of production. At the fortnightly trading of the Düsseldorf Exchange a week ago higher prices were noted for some forms of iron and steel. One of the sensations of this week, however, was the fact that unexpectedly low bids were handed in for public contracts on some 7700 tons of basic bars let out by the railroad authorities at Cologne. One firm of dealers offered to supply the bars at 92.70 to 95 marks, delivered at Diedenhofen (Lorraine), or at 100 marks at Oberhausen on the Rhine. Another firm of dealers also put in bids below 100 marks. The big manufacturers, however, did not bid lower than 102—105 marks. Krupp offered to supply heavy plates at 129.50 marks, this being the highest bid. The lowest was 117 marks, made by a dealer.

The Steel Works Union gave out its regular monthly market summary several days ago. It says that home consumers of half-rolled material are well supplied with orders, hence that the calls for material are brisk; also that rather large supplementary orders for the current quarter have been sent in. The foreign market keeps firm. The foreign demand for heavy rails continues quite good, and the union is well satisfied with the volume of orders and inquiries. Negotiations on further foreign orders for grooved rails have been begun. The business in rails for mines has latterly become more active; the calls for shipments on order have been more urgent this month than in the two previous months. The foreign demand for this class of rails has also improved somewhat. Business in structural forms remains good; specifications are coming in better than a year ago, and the foreign trade is calling for delivery at a satisfactory pace.

The current trade reports mention the fact that the demand for ores in the Siegerland district has slowed up somewhat, and supplies are accumulating at the mines. Nevertheless, it is expected that the Ore Association will raise prices by 0.75 or 1 mark for 1912 delivery. The market for foreign ores remains firm. It appears now that the Pig Iron Syndicate is holding back with sales for next year till about the end of the month, by which time it is hoped that certain arrangements with several big dealers shall have been completed.

The market for finished products is firm. Business in bars is very active, especially for the export trade; the mills are mostly supplied with orders for four to five months ahead, and some till about the end of March. The producers of iron bars, who are in a trade combination, are considering an advance of prices by 2 to 2.50 marks in view of the higher prices of pig iron. The present price is 133 marks for ordinary commercial shapes. Equal firmness is reported from the heavy plate trade, and some of the mills are already selling above the convention price. The organization itself is expected to adopt higher prices for 1911 delivery. Heavy plate mills continue to run under pressure, and there is no prospect that business will fall off soon. In thin plates an increase in the volume of orders is reported, but prices are still unsatisfactory; some of the mills have work till the end of March. The foreign market has increased its demand for plates, but export prices are not wholly satisfactory. The Band Iron Association has given out its price for 1911 at an unchanged level of 127.50 marks; but the mills are troubled with the competition of several southwestern concerns, and the convention price is not maintained in all cases. The foreign market is also taking considerable amounts of band iron.

The news from the Belgian market remains good. Several days ago the telegraph reported an advance of basic bars for export by 1 shilling to 96—98s., and iron bars to 97—98s. The French market remains firm, and the scale of production is still expanding. This is particularly true of the Briey district. A press report indicates that not less than 40 new blast furnaces are in course of construction in France, Luxemburg, and German Lorraine, to run chiefly on Briey ores. They will have a total capacity of about 2,800,000 tons per annum and consume about 8,500,000 tons of ores. These furnaces are all to be completed within two or three years, and a considerable number within one year. When they are all in operation it is expected that the demand for Briey ores will be doubled; but it is doubted whether the mines can be opened up fast enough to meet the demand for ores.

Buffalo

BUFFALO, N. Y., November 6, 1911.

Pig Iron.—The market is quiet with comparatively little new business placed in the week except for carload lots and small sized lots for immediate shipment. Shipments on contracts have been heavy and there has been a steady volume of requests for rush shipments by many of the larger melters on contracts placed some time ago. In some instances shipments on orders for forward deliveries are being anticipated, showing good current consumption. A considerable proportion of the new orders received for small lots of foundry grades are accompanied by requests for rush shipment, indicating that consumers' stocks in yards have been reduced to so low a point that immediate shipment is urgent. The same situation is also true as regards coke. It is estimated that a large proportion of the trade has not yet covered for early 1912 requirements. With consumption on the increase furnacemen are looking for a considerable acceleration in active demand before the close of the year, and it is stated by producers of foundry iron that furnaces now idle cannot afford to blow in until the market is at least a dollar a ton higher than at present. For current quarter and first quarter of next year we quote as follows, f.o.b., Buffalo:

No. 1 X foundry	$13.75 to	$14.00
No. 2 X foundry	13.25 to	13.75
No. 2 plain	13.00 to	13.50
No. 3 foundry	13.00 to	13.25
Gray forge		13.00
Malleable	13.75 to	14.25
Basic	13.75 to	14.25
Charcoal	16.50 to	17.25

Old Material.—The tone of the market has improved somewhat and a better feeling is in evidence among dealers, who anticipate an increase in business in the near future, although only a small volume of orders is reported. The price schedule remains unchanged: We quote as follows, per gross ton f.o.b. Buffalo:

Heavy melting steel	$12.50 to	$13.00
Low phosphorus steel	16.00 to	16.50
No. 1 railroad wrought	14.00 to	14.50
No. 1 railroad and machinery cast scrap	13.50 to	14.00
Old steel axles	18.50 to	19.00
Old iron axles	22.00 to	22.50
Old car wheels	13.00 to	13.50
Railroad malleable	12.75 to	13.00
Boiler plate	12.50 to	13.00
Locomotive grate bars	11.00 to	11.50
Pipe	9.25 to	9.50
Wrought iron and soft steel turnings	7.15 to	7.40
Clean cast borings	7.00 to	7.25

Finished Iron and Steel.—Specifications on contracts for bar products have been coming in quite freely during the week; but the volume of new orders has been rather less than a week ago. The continued rumors of lower quotations and unsettled conditions in prices have a tendency to hold back new work. Some agencies state that business is being refused in bar products at lower prices than 1.10c., Pittsburgh base, for desirable tonnage and 1.15c. for less than carload lots. The demand for plates and shapes has been light for the

THE IRON AND METAL MARKETS

week with prices still ruling at 1.20c. The volume of Canadian export trade is also held somewhat in check by the price uncertainty, but a 1400-ton order for reinforcing concrete bars to be used for construction work on the Ontario elevator at Toronto is noted. Most of the tin plate users in this market have covered their requirements for the first six months of next year. A number of the principal sheet buyers have also tried to cover for their first half requirements; but some of the larger mills are not inclined to entertain contracts for an extended period into next year at to-day's ruling prices. It is stated, however, some contracts have been closed on the present basis of prices. In structural lines no improvement in demand is noted over last week, but a moderate amount of new business is developing and all of the fabricating shops in the Buffalo district are well filled with orders. The Buffalo Structural Steel Company has been awarded the contract for fabrication and erection of the steel for the Gould Building on Washington street, Buffalo, 200 tons.

St. Louis

ST. LOUIS, MO., November 6, 1911.

Conditions in this market continue to have much the same aspect as reported a week ago, with this exception, that a little break in the clouds is seen through the tendency of the transportation interests to purchase equipment. The American Car & Foundry Company's plant at Madison started up to-day, employing about 2500 hands, the result of the placing of orders for 6000 cars, 2000 each by the Frisco, New York Central and Missouri Pacific. The material purchases, however, are expected to be made in Chicago.

Pig Iron.—Purchases of pig iron have been by the carload, as usual. The takings on contracts are continuing good and practically no consumers are behind on their specifications. The inquiries for future delivery are few and usually small. The inquiry for 1000 tons of car wheel iron, which was by the American Car & Foundry Company, has not been closed. Prices show no change, but there seems no pressure of moment to drive them lower.

Coke.—Specifications on contracts are about the only evidence of life in this market and the quantity going forward is up to the contract requirements, but not in excess thereof. There are no inquiries in the market of consequence, and no transactions other than minor deals of immediate shipment character are reported.

Old Material.—The Missouri Pacific lists and that of the Frisco which closed last week showed prices below those of the previous month. The new lists which came out during the week were the Vandalia, 300 tons; Wabash, 1400 tons; Mobile & Ohio, 400 tons, and the Southern, 800 tons. All these are expected to show the same conditions as the lists of last week. There has been a considerable decrease in the inquiry for relaying rails and such orders as are being considered are likely to go at some concession. Dealers' prices, f.o.b. St. Louis, per gross ton, are as follows:

Old iron rails	$12.00 to $12.50
Old steel rails, rerolling	11.50 to 12.00
Old steel rails, less than 3 ft.	10.00 to 10.50
Relaying rails, standard section, subject to inspection	22.50 to 23.00
Old car wheels	11.50 to 12.00
Heavy melting steel scrap	10.00 to 10.50
Frogs, switches and guards cut apart	10.00 to 10.50

The following prices are per net ton:

Iron fish plates	$10.00 to $10.50
Iron car axles	17.00 to 17.50
Steel car axles	15.00 to 15.50
No. 1 railroad wrought	10.25 to 10.75
No. 2 railroad wrought	9.25 to 9.75
Railroad springs	9.25 to 9.75
Locomotive tires, smooth	13.00 to 13.50
No. 1 dealers' forge	7.00 to 7.50
Mixed borings	5.00 to 5.50
No. 1 busheling	8.50 to 9.00
No. 1 boilers cut to sheets and rings	7.00 to 7.50
No. 1 cast scrap	8.50 to 9.00
Stove plate and light cast scrap	7.00 to 7.50
Railroad malleable	7.50 to 8.00
Agricultural malleable	6.50 to 7.00
Pipes and flues	7.50 to 8.00
Railroad sheet and tank scrap	7.00 to 7.50
Railroad grate bars	6.50 to 7.00
Machine shop turnings	6.50 to 7.00

Finished Iron and Steel.—The tonnage aggregate continues fair, but no new business of any size is going through. In structural material the orders are for immediate use. The prevailing price is 1.15c., Pittsburgh. Bars continue in fair demand at 1.10c. Plates show no movement of interest, though some orders are anticipated as a result of orders for cars by Southwestern railroads. In steel rails, standard section, two interurban lines are in the market, one from Iowa and the other from Kansas, the total requirements being about 3000 tons. Track fastenings are in fair request. Light rails show an improvement in activity in the coal mining districts, but the lumber roads are doing absolutely nothing.

Boston

BOSTON, MASS., November 7, 1911.

Old Material.—The monotonous dullness of the scrap market continues unbroken with no changes in prices. Few transactions are reported. The prices quoted below are those offered by the large dealers to the producers and to the smaller dealers and collectors, per gross ton, carload lots, f.o.b. Boston and other New England points, taking Boston rates from eastern Pennsylvania points. In comparison with Philadelphia prices the differential for freight of $2.30 a ton is included. Mill prices are approximately 50 cents a ton more than dealers' prices.

Heavy melting steel	$9.50 to $10.00
Low phosphorus steel	11.45 to 11.95
Old steel axles	14.00 to 14.50
Old iron axles	17.00 to 18.00
Mixed shafting	12.75 to 13.25
No. 1 wrought and soft steel	10.50 to 10.75
Wrought iron pipe	8.75 to 9.00
Skeleton (bundled)	7.00 to 7.50
Cotton ties	7.00 to 7.50
No. 2 light	4.50 to 5.00
Wrought turnings	5.00 to 5.50
Cast borings	4.50 to 5.00
Machinery, cast	12.50 to 13.00
Malleable	9.25 to 9.75
Grate bars	6.00 to 6.50
Stove plate	8.00 to 8.50

The Perry-Buxton-Doane Company has been incorporated under the laws of Massachusetts with a capital stock of $850,000. Wm. H. Perry is president; A. L. D. Buxton, vice-president; George B. Doane, treasurer, and W. Vernon Phillips, secretary. On January 1 the company will take over and continue the scrap iron and metal business of the Wm. H. Perry Company, Providence, R. I.; E. Buxton & Son Company, Worcester, Mass.; Buxton-Doane Company, Boston, Mass., and F. R. Phillips & Sons Company, Philadelphia, Pa. The main office will be located in Boston, with a branch office in the Pennsylvania Building, Philadelphia, and yards and offices in the several districts as now established. This arrangement will affect only the scrap iron business of the companies named, the other branches of their individual business being transacted as heretofore.

Cleveland

CLEVELAND, OHIO, November 6, 1911.

Iron Ore.—Ore shipments by water from the opening of navigation until November 1 were 29,607,102 tons. This is a decrease of 10,371,206 tons as compared with last year. October shipments were 4,769,965 tons, a falling off of 107,476 tons as compared with the same movement a year ago. Ore firms are now cleaning up on their shipments and the November movement will be very light, probably less than 2,000,000 tons, so that it is doubtful if the total lake movement for the season will reach 32,000,000 tons. Estimates made early in the season were that the movement would be 30,000,000 to 35,000,000 tons. An important factor in the general situation is the railroad rate readjustment question. Following the lowering of carrying charges 20 cents a ton on ore from the Mesaba and Vermillion ranges to Duluth, reports are being circulated that the carrying charges on ore from Lake Erie ports to the Valley will be reduced, and that a reduction will also be made in the freight rate on coke from Pennsylvania ovens to Valley points. The ore rate from Lake Erie ports to the Valley at present is 56 cents a ton for direct shipments and 64 cents a ton for dock shipments. The corresponding rates from Lake Erie ports to Pittsburgh are 96 cents and $1.04. We quote prices as follows: Old range Bessemer, $4.50; Mesaba Bessemer, $4.25; old range non-Bessemer, $3.70; Mesaba non-Bessemer, $3.50.

Pig Iron.—The lower prices that have been quoted on foundry grades during the past two weeks have brought no increase in the demand. While some iron

THE IRON AND METAL MARKETS

is being sold for delivery over the remainder of the year and for the first quarter, buyers generally are holding off, those needing iron placing orders only for their immediate requirements. They feel that prices may go still lower and that there is little possibility of their being higher for delivery during the early part of next year. We note the sale of two lots of 500 tons each of No. 2 foundry for delivery in Cleveland during the remainder of the year and the first quarter. A local manufacturer is in the market for 1000 tons of No. 1 foundry for early delivery. For delivery over the remainder of the year and through the first quarter No. 2 foundry is quoted at $13, Cleveland furnace. While this price has been shaded for outside shipment it is claimed that it is the minimum for local delivery. For the same delivery Valley furnaces quote No. 2 foundry at $13 to $13,25, at furnace. Shipments continue fairly good. Foundries generally are carrying low stocks and are ordering in small lots on contracts as needed. For Cleveland delivery we quote as follows for prompt shipment and for the first quarter:

Bessemer	$13.15
Basic	13.00
Northern foundry, No. 2	13.00
Gray forge	12.75
Southern foundry, No. 2	$14.35 to 14.60
Jackson County silvery, 8 per cent. silicon	17.08

Coke.—There is no inquiry for furnace grades but two or three interests are expected to be in the market for contracts on a sliding scale basis before the end of the year. There is little activity in foundry grades, sales being confined to small lots. We quote standard Connellsville furnace coke at $1.50 to $1.55 per net ton, at oven, for prompt shipment, and $1.60 for the remainder of the year. Connellsville 72-hr. foundry coke is held at $1.90 to $2.15 for prompt shipment and $2.15 to $2.35 for contract.

Old Material.—The market is practically lifeless. Heavy steel scrap is being sold in small lots as low as $10.75 to local consumers. Other grades are very weak but there is scarcely enough business going to clearly define prices. No round tonnages of scrap are being offered at present quotations and mills are not actively in the market, limiting their buying mostly to car lots that dealers want to dispose of quickly at low prices. The Michigan Central Railroad closed November 7 on about its usual list. Dealers' prices per gross ton, f.o.b. Cleveland, are as follows:

Old steel rails, rerolling	$12.25 to $12.75
Old iron rails	14.00 to 14.50
Steel car axles	17.00 to 17.50
Heavy melting steel	10.50 to 11.00
Old car wheels	11.50 to 12.00
Relaying rails, 50 lb. and over	22.50 to 23.50
No. 1 railroad malleable	10.50 to 11.00
Railroad wrought	11.00 to 11.25
Light iron (net ton)	9.50 to 10.00

The following prices are per net ton, f.o.b. Cleveland:

Low phos. axles	$18.50 to $19.00
Cast borings	6.00 to 6.25
Iron and steel turnings	6.50 to 6.75
Steel axle turnings	7.25 to 7.75
No. 1 busheling	9.00 to 9.50
No. 1 railroad wrought	11.00 to 11.50
No. 1 cast	11.00 to 11.50
Stove plate	9.00 to 9.50
Bundled tin scrap	11.00 to 11.50

Finished Iron and Steel.—Four lake boats ordered from the American Shipbuilding Company in the past ten days will require about 8000 tons of plates and structural material. The steel will be furnished by the Carnegie Steel Company. Generally the situation in regard to finished lines shows very little change either in regard to the demand or prices. Mill agencies are getting a good volume of orders for small lots, consumers as a rule buying only for their immediate requirements. There are still reports of steel bars being sold at 1.05c., Pittsburgh, but this price is not made by all of the mills and is for only very desirable orders. Steel bars are generally quoted at 1.10c. to 1.15c. Contracts for delivery through the first quarter can be had at the latter price. Not much business, however, in any line is being taken for delivery after the end of the year, neither the sellers nor buyers being eager to make contracts for that far ahead. The demand for structural material is moderate. No new building work requiring large lots is coming out and local fabricating shops have but a limited amount of work on hand. We quote structural material at 1.20c., Pittsburgh, but this price can probably be shaded on a desirable order. Plate mills are getting a good volume of small lot orders. The ruling quotations are from 1.15c. to 1.20c. Tank steel, however, appears fairly firm at the latter price. There is a fair demand for sheets. Sheet prices are steady, 1.85c. for No. 28 black and 2.85c. for No. 28 galvanized being the minimum quotations for car lots. The demand for iron bars is not active but the local mills are getting enough orders to keep running the most of the time. The price is firm at 1.20c., Cleveland.

New York

NEW YORK, November 6, 1911

Pig Iron.—The shrinkage in new business and in inquiry has been pronounced in the past week. A number of good inquiries were before the trade two weeks ago, but nearly all have been withdrawn. Buyers have been commenting on recent developments in the industry which in their opinion tend toward lower prices, though it is admited that the reductions in cost due to lower ore freights and to a downward tendency in ore royalties will not become operative for some time. The result is a general waiting and meantime a weaker market. The principal inquiry before local sellers is one for 5000 tons of high phosphorus iron for a Massachusetts foundry, action on which is not expected until the latter part of the month. While the pipe foundries bought freely last month there is still some inquiry for lower grade irons from that quarter. One Eastern Pennsylvania pipe foundry is in the market for 3000 tons for February delivery. The production of pig iron in the East remains about the same. In Virginia one furnace has been added to the active list in the past month. Virginia furnaces are still quoting $12.25 at furnace for No. 2 X foundry iron. Some of them have been asking $12.75 for shipment over the first half of 1912, but buyers have not been willing to pay this price. Buffalo iron has sold at $13 for No. 2 X, and there is just now some pretty active competition between Buffalo furnaces and Canadian furnaces for business that is about to be placed by Canadian foundries. Quotations are as follows for Northern iron at tidewater: No. 1 foundry, $13.25 to $13.50; No. 2 X, $14.75 to $15.25; No. 2 plain, $14.50 to $14.75. For Southern iron we quote $15 to $15.25 for No. 1 foundry and $14.50 to $14.75 for No. 2 foundry.

Finished Iron and Steel.—The New York finished iron and steel market has not yet responded to the activities in iron and steel purchases in other centers credited to the railroads nor has it met, or had to meet, low prices apparently obtaining elsewhere. Business continues dull, but there seems to be a firmer undertone in that a fair run of business continues at fair prices and in that a widespread notion exists that the conditions will at least be maintained, no sudden rise or sensational movement being looked for. Greater activity is reported in bar iron but other lines, including the structural, are disappointing in the absence of new inquiry. The most interesting development is the award of the principal portions of the bridge structure of the New York Connecting Railroad, 36,000 tons, given to the American Bridge Company, as announced at length elsewhere in this issue. The fact that the bids were submitted some months ago, that the project is one of some years standing and that the work is let at this time is taken to mean that those in charge regard the market as substantially at bottom. Other structural work contracted for includes: Bridge for the Pennsylvania Railroad at Williamsport, Pa., 2400 tons, to the Pennsylvania Steel Company; bridge for the city of Passaic, N. J., 1000 tons, to Snare & Triest; building for the Otis Elevator Company, New York, 1500 tons, to the American Bridge Company, which is also to erect a 200-ton structure for the Harrison, N. J., station of the Pennsylvania Railroad; structural work for the New York Central Railroad terminal, 700 tons, to the Jones & Laughlin Steel Company, and the structure for an apartment house at 116th street and Broadway, New York, 700 tons, to Milliken Brothers. Estimates are being made for the Emmett Building, Madison avenue Twenty-ninth street, New York, involving 600 or 700 tons. In addition to the 130,000 tons of structural work still pending in lots of 400 tons and larger, mostly above 1000 tons, may be added 800 tons for Queens Court Building, New York City. As regards prices, it is proper to quote for New York delivery what prices are admittedly made at the mills plus the freight charge, but a very large part of the business placed in this territory appears not to come under the designation of desirable and a higher scale

THE IRON AND METAL MARKETS

obtains as recorded in this column in recent issues. Plates are again being differentiated from structural shapes, lying generally in price between bars and beams. Quotations are: Steel bars, 1.26c. to 1.31c.; plates and plain structural material, 1.31c. to 1.41c.; bar iron, 1.20c. to 1.30c., all New York. Plain material and plates from store, New York, 1.65c. to 1.75c.

Cast Iron Pipe.—The most important business in sight is the expected purchase of 12,000 tons of 40-in. water pipe by Quebec, Canada. The date for opening the proposals has not yet been announced. The demand for small lots continues moderately active. Carload lots of 6 in. are still quoted at $21 to $22 per net ton, tidewater.

Old Material.—The market is persistently quiet. No transactions involving a considerable quantity are reported. Consumers have so far made no change in the long continued policy of buying in small quantities for immediate requirements. Dealers' prices per gross ton, New York and vicinity, are continued as follows:

Old girder and T rails for melting	$9.25 to $9.50
Heavy melting steel scrap	9.25 to 9.50
Relaying rails	20.00 to 21.00
Rerolling rails (nominal)	11.25 to 11.75
Old iron car axles	19.00 to 19.50
Old steel car axles	15.00 to 15.50
No. 1 railroad wrought	11.00 to 11.50
Wrought iron track scrap	10.50 to 11.00
No. 1 yard wrought, long	10.25 to 10.75
No. 1 yard wrought, short	9.25 to 9.75
Light iron	3.75 to 4.25
Cast borings, clean	5.50 to 6.00
Mixed borings and turnings	4.75 to 5.25
Wrought turnings	5.75 to 6.25
Wrought pipe	8.50 to 9.00
Old car wheels (nominal)	9.50 to 10.00
No. 1 heavy cast, broken up	10.00 to 10.50
Stove plate	7.75 to 8.25
Locomotive grate bars	7.75 to 8.25
Malleable cast	9.75 to 10.25

Metal Market

NEW YORK, November 8, 1911.

The Week's Prices

Cents Per Pound for Early Delivery.

	Copper, New York.			—Lead—		—Spelter—	
	Lake.	Electro-lytic.	Tin, New York.	New York.	St. Louis.	New York.	St. Louis.
Nov. 2	12.50	12.37½	41.15	4.25	4.15	6.35	6.20
3	12.50	12.37½	41.00	4.25	4.15	6.35	6.20
4	12.50	12.37½	.....	4.25	4.15	6.35	6.20
6	12.50	12.37½	41.70	4.25	4.15	6.35	6.20
8	12.50	12.37½	42.00	4.25	4.15	6.35	6.20

Tin is advancing in price but little actual business is being done. Copper is dull and quiet. Both lead and spelter are steady and stocks are scarce for early delivery.

Copper.—The copper market to-day is dull and quiet with no special movement on either side. The report of the Copper Producers' Association, which will be issued today, is expected to show a material increase in stocks over last month's report. Consumers, however, do not believe that this will have much effect on the general market. There has been no business of any size reported, and the general quotation for Lake copper is 12.50c., but desirable business could no doubt be placed at a few points lower. Electrolytic is quoted at 12.37½c. and is a little firmer than Lake. The exports of copper so far this month are reported as 6699 tons. The London market is steady and spot was selling this morning at £56 1s. 3d. and futures at £56 15s.

Pig Tin.—Pig tin has sold during the week at a wide range of prices, in sympathy no doubt with the manipulations in the London market and the intervening holiday. Sales were made in New York last Thursday as low as 41.10c. for spot and on Friday the market was very active on bids for future business with prices ranging from 41.05c. to 41.20c. and spot at 41c. Monday the market advanced sharply to 41.70c. The quotation for spot tin today is 42c., but this price is purely nominal, as there is very little business in sight at this figure. In the London market this morning spot tin was sold for £190 15s. and futures at £186. The arrivals of tin so far this month were 102 tons and there are 1200 tons reported afloat.

Tin Plates.—The price of tin plates at Swansea, Wales, is reported at 13s. 3d. The domestic demand is quiet and the quotation is nominal at $3.64 for 100 lb. coke plates.

Lead.—The market is steady today in New York and in St. Louis. Early deliveries are very scarce. The prices are quoted today at 4.15c. St. Louis, and 4.25c. New York, but there is every reason to believe that concessions of at least two points are being made on these figures.

Spelter.—The recent rumors of manipulations on the part of some of the leading producers and sellers were apparently well founded but stocks are extremely scarce for early delivery. The market for spelter is quiet and consumers are not attracted by the present quotations of 6.20c., St. Louis, and 6.35c., New York.

Antimony.—The market is very quiet and the quotations of last week are maintained with Hallett's selling at 7.70c. and Cookson's 8c. Chinese and Hungarian brands can be had at from 6.75c. up.

Old Metals.—Business is of a hand-to-mouth character. Dealers' selling prices are nominally as follows:

	Cents per lb.
Copper, heavy and crucible	11.75 to 12.00
Copper, heavy and wire	11.37½ to 11.50
Copper, light and bottoms	10.50 to 10.75
Brass, heavy	8.00 to 8.25
Brass, light	6.50 to 6.75
Heavy machine composition	10.25 to 10.50
Clean brass turnings	7.75 to 8.00
Composition turnings	8.50 to 9.00
Lead, heavy	4.15
Lead, tea	3.90
Zinc, scrap	4.50

Chicago

NOVEMBER 6.—While the current market activity in metals has shown no great increase in volume, a stronger tone is apparent. This is noteworthy as regards copper, on which higher prices have been considered imminent for some time. Tin prices have fluctuated considerably and show a net gain as compared with last week. The high value placed on spelter continues to hold. Other prices are maintained without change. We quote at Chicago: Casting copper, 12.37½c. to 12.50c.; Lake, 12.62½c. to 12.75c., in carloads, for prompt shipment; small lots, ¼c. to ⅜c. higher; pig tin, carloads, 42.50c.; small lots, 45.50c.; lead, desilverized, 4.25c. to 4.30c., for 50-ton lots; corroding, 4.50c. to 4.55c. for 50-ton lots; in carloads, 2½c. per 100 lb. higher; spelter, 6.30c. to 6.35c.; Cookson's antimony, 9.25c., and other grades, 8.25c. to 8.75c., in small lots; sheet zinc is $8, f.o.b. La Salle, in carloads of 600-lb. casks. On old metals we quote for less than carload lots: Copper wire, crucible shapes, 10.75c.; copper bottoms, 9.62½c.; copper clips, 10.25c.; red brass, 9.75c.; yellow brass, 7.75c.; lead pipe, 4c.; zinc, 4.25c.; pewter, No. 1, 26c.; tinfoil, 32c.; block tin pipe, 36c.

St. Louis

NOVEMBER 6.—Metals continue in reasonably good demand. Both lead and spelter are stronger than at last report, lead being quotable at 4.15c. to 4.175c. and spelter at 6.25c. to 6.275c. Tin is held at 41.40c. Lake copper is unchanged at 12.85c., while electrolytic is a little off at 12.725c. Cookson's antimony continues at 8.35c. In the Joplin market the past week the top price for zinc blende was $51 on a contract basis of $46.80. This is better by almost $2 than the best price reported in the open market, where the prices ranged from $45 down to $40. Calamine continues very firm, partly due to decrease in production. This ore comes from shallow workings which are affected by the cold weather. On a 40 per cent. basis it brought $23 to $25 per ton, with $32 being paid for choice lots. Lead ore continues unchanged at $55 to $57 per ton and the value of the sales during the week was the largest of the year's business. We quote miscellaneous scrap as follows: Light brass, 4c.; heavy brass and light copper, 8c.; heavy copper and copper wire, 9c.; zinc, 3c.; lead, 3.25c.; pewter, 20c.; tinfoil, 29c.; tea lead, 3c.

The question of freight rates on coke hauled into St Louis was considered in a hearing held in St. Louis last week by Special Examiner Smith, representing the Interstate Commerce Commission. The case was that of the St. Louis Blast Furnace Company, which is seeking $30,000 damages from different railroads on the allegation that there is discrimination against St. Louis in the coke rates as compared with coal, thus materially affecting the furnace company adversely. The testimony brought out was with relation to the shipping of coke from the West Virginia fields. The complaint is that a dual rate exists favoring Chicago, Milwaukee, Toledo, Detroit, Joliet and other cities as against St. Louis on blast furnace and foundry cokes. Railroad men were heard chiefly and admitted the statements of fact as to rates, but presented their reasons for the condition complained against.

Iron and Industrial Stocks

NEW YORK, November 8, 1911.

The stock market is acting like an individual who has been attacked by so many ailments that he finally becomes hardened to pain and pursues his ordinary vocation as though undisturbed by his afflictions. Notwithstanding the suits against corporations and intimations that others are coming, the values of stocks steadily appreciated the past week. Some quite notable advances were made. The range of prices on active iron and industrial stocks from Thursday of last week to Tuesday of this week was as follows:

Allis-Chalm., com.	3	3⅛	Pittsburgh St., pref.	100	101
Allis-Chalm., pref.	10⅝	11	Pressed Steel, com.	30⅝	31¾
Beth. Steel, com.	28½	30¼	Pressed Steel, pref.	96	
Beth. Steel, pref.	84	85⅝	Railway Spring, com.	27½	29⅜
Can. com.	100	112	Railway Springs, pref.	100	
Can. pref.	86	88½	Republic, com.	14½	15
Car & Fdry., com.	47¾	50⅞	Republic, pref.	78¾	80
Car & Fdry., pref.	114⅛	116	Sloss, com.	41	42
Steel Foundries	30	32	Pipe, com.		135
Colorado Fuel	26	27	Pipe, pref.		121
General Electric	150	154	U. S. Steel, com.	55⅛	56⅝
Gr. N. Ore Cert.	41½	42¼	U. S. Steel, pref.	106	110
Int. Harv., com.	100	108	Westinghouse Elec.	65½	68⅝
Int. Harv., pref.	120½	122½	Chic. Pneu. Tool	45⅛	46¾
Int. Pump, com.	25	30	Cambria Steel	42⅞	43⅞
Int. Pump, pref.	80	82	Lake Sup. Corp.	27⅜	28⅝
Lackawanna Steel	30		Warwick	10	
Locomotive, com.	32	35	Crucible Steel, com.	10	11
Locomotive, pref.	103	103½	Crucible Steel, pref.	75⅜	76⅛
Nat. Enl. & St., pref.	94		Harb. Wk. Ref., pref.	96	96½

Dividends Declared

The American Radiator Company, regular quarterly, 1¾ per cent. on the preferred stock, payable November 15, and 2 per cent. on the common stock, payable December 30.

The Pittsburgh Valve, Foundry & Construction Company, quarterly, 1½ per cent. on the common and preferred stock.

The Cleveland Cliffs Iron Company, quarterly, 2½ per cent., comparing with 3 per cent. and 2 per cent. extra quarterly, the reported rate for some years.

The Pittsburgh Steel Company, quarterly, 1¾ per cent. on the preferred stock, payable December 1.

American Society for Testing Materials

The last annual meeting of the American Society for Testing Materials adopted a resolution, subject to confirmation by letter ballot, providing that the next annual meeting be held in June, 1912, and be limited to the annual reports of standing technical committees and to administrative business. This action was taken in view of the sixth congress of the International Association for Testing Materials which will be held in this country in September, 1912. The Executive Committee of the society at a recent meeting decided that the holding of the next annual meeting as late as June of next year might affect the success of the International Congress and that it would be best to have the annual meeting prior to April 1, 1912. This amendment to the resolution passed at Atlantic City is now being submitted to the membership. It is probable, in case of its adoption, that the meeting for the hearing of committee reports and for other business will be held in New York City.

The Executive Committee announces that the vacancy in its membership occasioned by the death of James Christie was followed by the election of A. A. Stevenson, Standard Steel Company, Burnham, Pa., for the unexpired term. It was decided to enlarge the Committee on Publications. It is expected that a plan will be devised for a formal examination of the papers to be presented at the annual meetings and for putting such papers in type in advance of meetings. The Executive Committee decided to subscribe $5,000 to the International Association for Testing Materials so as to secure for every full member of the society a complete report of the proceedings of the 1912 congress of the International Association, a copy for every junior member on payment of $2.50, and the participation in the congress of every member of the American Society not holding membership in the International Association, on payment of the prescribed fee.

The three Pioneer furnaces of the Republic Iron & Steel Company at Thomas, Ala., exceeded their best previous month's record in October by 31 tons, producing a total of 24,694 tons. One day's product was 901 tons, which was a new 24-hour record.

The American Steel Foundries Earnings

The American Steel Foundries and its subsidiaries report for the 14 months ended September 30, 1911, as follows:

Earnings from operation of plants and net income of subsidiary companies (after deducting manufacturing, selling, administrative, head and district office expenses and before deducting depreciation)		$660,337
Other income:		
Interest, discount and exchange	$43,506	
Income from investments and loans	447	
Sinking fund profits	6,123	
Miscellaneous	5,840	
		55,917
Total income		$716,254
Deduct:		
Interest on borrowed money	$287	
Interest on debentures	160,384	
Interest on bonds outstanding	202,625	
Interest on bonds in sinking fund	68,390	
Bond sinking fund installment and profit	128,623	
Depreciation of buildings, plant and equipment (all properties)	273,075	
		833,386
Net loss		$117,132

Although this statement is anything but encouraging, an official of the company says that during October there was a marked betterment in orders and inquiries so that the outlook is a little brighter. Operations, however, continue at about 40 per cent. of capacity, the improvement not yet having affected plant activity. The odd period covered by the statement is the result of the change in the fiscal year from July 31 to December 31.

Canadian Iron and Steel Output

The Iron Trade Journal, Toronto, Canada, has published the statistics of the production of pig iron, steel ingots and steel rails in Canada in the first half of 1911 The figures show that the output of pig iron by the Canadian furnaces for the six months ended June 30 increased 16 per cent. over the same period of 1910. The increase in the production of steel ingots was not so large, being about 10½ per cent. The following table gives the production of pig iron, steel ingots and steel rails in the first half of 1911 and 1910 respectively, in gross tons:

	1911	1910
Pig iron	400,170	344,783
Steel ingots	374,793	338,960
Steel rails	161,635	174,592

It is significant that in spite of the keen competition from the United States the production of iron and steel in Canada in the first half of the year should have been so gratifying as far as tonnage is concerned.

Federal Control of Large Business.—Commissioner Lane of the Interstate Commerce Commission favors the creation of a national corporation commission with power of control and regulation of large business enterprises and corporations similar in character to that of the Interstate Commerce Commission. He says there should go with this a right on the part of small enterprises to agree together as to a minimum price to protect themselves against a cutthroat competition that would be ruinous. Commissioner Lane believes the Government should have power to decide where a new railroad should run. He thinks "it is only consistent with the theory upon which we are now proceeding that we should protect the railroad that is in existence against competition that may be ruinous to it: that we should guarantee in a sense a certain territory to a railroad whose rates and services are under control and regulation by the state."

Since the building of the new plant of the Anderson Forge & Machine Company, Detroit, Mich., the active organization has been entirely changed, with W. T. Howell as general manager. Mr. Howell, after 30 years in the drop forging business, went from the Bethlehem Steel Company three years ago to assume the factory management of the Anderson Forge & Machine Company. Since his advent the Detroit company has adopted a new policy and is now specializing in the production of alloy steel, brass and bronze forgings. Particular attention is given to heat treatment, this department being well equipped with the most recent appliances.

The Allegheny Ore & Iron Company on November 1 took over the Buena Vista furnace. The lease to the Oriskany Ore & Iron Company expired on that date.

Revolving Grate Gas Producer

Experience with It at German Works

K. Munzel, of the Peine Steel Works, Peine, North Germany, has recently given* the results of his long practical experience in the starting and operating of the Küppers gas producer. This producer was illustrated and described in *The Iron Age* of June 22, 1911, page 1534. In starting a revolving grate gas producer, the shaft is first filled with coal ash and clinker of average size to about 12 in. above the head of the grate. On this is laid a layer of dry wood from about 12 to 20 in. thick. On this is placed lump coal in a layer from about 20 to 31 in. deep

For even and quick combustion it is a good plan to throw two or three buckets of crude oil or thin liquid tar over the whole. The fire is best started by balls of used cotton waste, sometimes soaked in kerosene, thrown in various directions through the charging hopper. When the wood and coal are burning well from 650 to 1100 lb. of lump coal are charged. When this is kindled only coke of medium size is charged to prevent unnecessary smoke and caking of the charge. If the brick work of the producer was originally well air dried, then a weak blast can be used, and with continual charging a hight of about 40 in. is reached in from eight to ten hours. The producer is then ready, and if it is to be put in use the revolving of the grate and shaft is begun. The automatic ash shovel will not be needed for several hours.

For successful running, the following fundamental law must be observed, which applies to all producers: Uniform participation of the whole section of the producer in gasification. This is brought about when the contents of the producer are uniformly loosened, which is made known by the upper surface of the charge showing an even dark red color. The more the operation follows this law, the better is the quality of the gas and the greater is the amount of coal gasified.

If the upper surface shows parts that are yellow or white, and other parts that are very dark red or almost black, this is evidence of bad working. In the dark patches the coal is more or less caked together, and this "green" coal offers so much resistance to the ascending gases that there is defective gasification or sometimes none. The blast, that seeks the easiest path, consequently goes through the looser portions of the charge with greater velocity, because the "green" patches reduce the cross section of the producer. This brings about defective reduction of the carbondioxide made in the lower part of the producer and gives gas of lower quality.

Several factors must be considered, in a revolving grate producer, in order to obey the fundamental law, and avoid the practice outlined above.

1. Hight and Kind of Ash

Experience has shown that the best results are obtained if the ash reaches at least to the top of the revolving grate. This prevents injury to the grate and also prevents any unburned fuel passing from the producer. The hight of the ash can be found out best by sticking several pokers into the column of charge, and leaving them there for two or three minutes. When withdrawn they show by the color how deep the fuel bed is. Very often it is found that the ash is higher around the walls than near the grate This is mistakenly said to be due to a more thorough loosening of the ash near the grate and a pressing of the ash toward the sides.

If the difference in hight is considerable, it has an important influence on the quality of the gas, because the reduction zone near the walls is too thin. To help this condition, the grate is stopped and the ashes in the ash pit removed by hand. The ash near the walls is then knocked down from above with pokers until the hight is about uniform.

At Peine a special attachment to the revolving grate is used, which loosens the ash near the walls and brings about automatically a constant hight of ash. The ash is held at a fixed level in the producer by arranging the right number of revolutions and by proper placing of the automatic ash remover, depending on the ash of the fuel used. Steam is used with the air that is blown into the producer, to prevent too much clinkering. Less is needed than with the old style producer, the proper amount in each case depending on the fuel. In any case it is advantageous to use steam at high pressure, not lower than 60 lb. per sq. in., for the low pressure steam is mostly condensed in the lower zone of ash and is without influence.

2. Hight of the Charge

The greatest hight of charge possible is used in every producer in order to give as much carbon monoxide, and as little carbondioxide as possible. The fuel used, however, limits the hight according to its size and caking properties. In many cases the fuel available does not possess the desirable properties to any large degree, and the producer must be able to make good gas from unsuitable fuel. The choice of the best depth of the fuel depends, before anything else, on the law mentioned previously. Figures are given showing suitable depths of charge for various fuels. Thus with a Westphalian coal, that is more or less strongly caking, a fuel bed of about 20 in. gives the best results. With English or Upper Silesian coals, which do not cake so readily, the depth can be increased from about 31 to 39 in. without danger of "green" coal. With brown coal briquettes, that show no caking and have just the right size, the depth can be increased to about 80 in. in the newest type of Küppers oven.

3. The Poker Work

Notwithstanding the advances brought about by the revolving grate, the total avoidance of the help of hand poking is not possible. The amount of work necessary, however, is greatly reduced, and is restricted to the upper layer of the freshly charged coal. The clever construction of the revolving grate brings about such a loosening of the whole charge that, notwithstanding its hight, there is no great resistance to the ascending gases.

4. The Charging Arrangement

The workman can be greatly helped by a suitable charging device. It should be so constructed that the coal can be charged either around the edge of the producer or in the middle. Then the fresh coal can be charged almost at the place where the color is brightest, and the ascending gas stream has, therefore, the least resistance to overcome. For a producer of from 9 ft. 4 in. to 9 ft. 10 in. diameter, a charging bell of 3 ft. 3 in. is necessary. Only with this size can the charge be delivered with certainty at the edge, especially when working with a low fuel bed. If the opening in the roof of the producer is made of 3 ft. 11 in. diameter, and the position of the bell when closed raised about 6 in. above the curve of the roof, there will then exist a ring shaped space of suitable size around the bell.

If it is desired to place the charge in the middle, then the bell is only partly lowered. The coal will strike against the brick work and be deflected to the middle. If the bell is opened completely and quickly, the charge will fall around the edge of the producer. Through proper raising and lowering of the bell the whole section can be covered.

The article closes with a reference to the importance of proper poker holes and covers and a prevailing low pressure in that part of the producer above the charge.

G. B. W.

*Stahl und Eisen, June 22, 1911.

Trade Publications

Sheet Metal Flumes.—The Hess Flume Company, 685 First National Bank Building, Denver, Colo. Pamphlet. Calls attention to the line of flumes for irrigation, power, mining, ditch lining, intakes, outlets and substructures which is made in all sizes and capacities with interlocking water-tight joints without solder or rivets of Toncan metal. The uses of the flumes and the advantages of this metal for their construction are touched upon followed by a description showing the various kinds of the flumes. A specification table for carrier beams, rods, etc., and a velocity and discharge table for this flume complete the pamphlet.

Fans.—B. F. Sturtevant Company, Hyde Park, Mass. Mailing card. Calls attention to the Monogram fan designed for drying [illegible] coverings, [illegible] and other materials; blowing chips and dust from machinery, furnishing blast for forges and furnaces, and cooling materials, motors and workmen. These fans are built to meet all conditions and in a number of sizes, [illegible] in capacities from [illegible] to 1,000,000 cu. ft. per minute.

Gasoline Motors.—The Roberts Motor Company, Sandusky, Ohio. Pamphlet. Calls attention to a line of motors for aeroplanes [illegible] weighing about 2½ lb. per horsepower. The construction of these motors is described at length and the [illegible]

Personal

Adrian H. Lazare, for the past two years advertising representative of *The Iron Age* in the Central West, with headquarters at Cleveland, Ohio, has resigned for the purpose of engaging in other business. He has severed the connection voluntarily, and has the best wishes of his former associates for his success in his new field of endeavor.

The Secretary of the Interior announces the appointment of Waldemar Lindgren as chief geologist of the United States Geological Survey. Mr. Lindgren joined the Geological Survey as assistant geologist in 1884, since which time he has been continuously connected with the organization. Director George Otis Smith of the survey, states that Mr. Lindgren's record as a working geologist is best indicated by the fact that some 50 reports of which he is author are included in the list of publications of the survey. In addition to his survey publications he has contributed not less than three score articles to the various technical and scientific journals. He is a trained mining engineer, having received his degree at the Freiberg School of Mines.

Frank L. Session has been appointed superintendent of the Standard Welding Company, Cleveland, Ohio. He is a graduate of Worcester Polytechnic Institute, 1889, and his experience with complicated manufacturing problems has been extensive and successful, making him thoroughly equipped to handle his present duties. F. H. Meyers, for many years in the employ of this company, has been appointed assistant superintendent.

Percy A. Ware, who for nearly seven years has been a member of the editorial staff of *The Iron Age*, paying special attention to machinery news, has been appointed Central Western manager of this journal, and will have his headquarters in the American Trust Building, Cleveland, Ohio. His wide knowledge of machinery matters should be most helpful to the interests of our friends in the important section of the country which has been confided to his keeping.

W. T. Johnston, president of the W. T. Johnston Company, Cincinnati, Ohio, has been elected a member of the board of directors of the Cincinnati Commercial Association, to succeed E. R. Blaine, recently deceased.

P. H. Biggs has been appointed manager of the Cleveland, Ohio, sales office of Manning, Maxwell & Moore, being transferred from the Detroit office of that company to succeed O. P. Stehn, resigned.

Philip Frankel, who for the past nine years has been secretary of a number of associations of manufacturers in the metal working trades at Cleveland, Ohio, announces that he will engage in the practice of law with Frederick Frankel, under the firm name of Frankel & Frankel. He will still retain his official connection, however, with the various manufacturers' associations.

L. G. Milne, of the American Mill Supplies Company, London, England, dealing in American mill supplies, pulleys, shafting, hangers, etc., is now in this country for the purpose of looking up additional American goods to sell in Great Britain. He will be located at the office of the George V. Cresson Company 90 West street, New York.

M. A. Hanna & Co., Cleveland, announce the admission on November 1 of H. M. Hanna, Jr., to membership in that firm.

W. H. Worrilow, sales manager of the steel casting department of the Treadwell Engineering Company, Easton, Pa., and who previously served in the same capacity with the Lebanon Steel Castings Company, Lebanon, Pa., has resigned and will be associated with T. S Quinn, formerly superintendent of the steel casting department, in the manufacture of crucible steel castings, occupying the plant formerly used by the Lebanon Steel Castings Company. The name of the new company to be formed has not yet been decided upon.

D. B. Meacham, of Rogers Brown Company, Cincinnati, Ohio, was elected November 6 president of the Arbitration and Peace Society of Cincinnati, a branch of the International Society.

Willard H. Hunt, who for a number of years was connected with William Adams & Co., iron founders, Philadelphia, Pa., is now general manager of the Coatesville Foundry & Machine Company, Coatesville, Pa.

D. R. Wilson, vice-president and general manager of the Diamond Forging & Mfg. Company, Pittsburgh, has resigned.

President Clarence M. Woolley, of the American Radiator Company, who has just returned to Chicago from Europe, says: "The foreign business of our company is showing a steady growth and the outlook for continued gains is good. Our first work there is educating the people to the superior comfort and convenience of American methods of heating."

Kern Dodge, formerly of the firm of Dodge, Day & Zimmerman, engineers, Philadelphia, Pa., will sail for Europe November 18. He expects to be abroad the entire winter.

Dr. F. Schniewind, of the United Coke & Gas Company, New York, returned from Europe last week.

Obituary

Charles H. Phillips

Charles H. Phillips, for the past 24 years a familiar figure in the machinery trade of the East as a representative of the Brown & Sharpe Mfg. Company, died at his home in Providence, R. I., November 3, aged 79 years. Although he had been in failing health for some years, Mr. Phillips made his last trip through his territory, central New York, about two years ago and at that time was cordially received by many of his old business friends. A thorough mechanic and of an extremely amiable disposition, he was always well received by the men with whom he had dealings.

Born in Taunton, Mass., Mr. Phillips became an apprentice of the Mason Machine Company in 1845. After 11 years, he left that company to enter the employ of J. R. Brown & Sharpe, as the Browne & Sharpe Mfg. Company, was then known. After a year and a half with this firm, he became a contract foreman in the old Burnside Rifle Works, a position which he held for nine years, leaving there 43 years ago to become a contract foreman for Brown & Sharpe. While still a foreman, he began to represent the firm on the road and his popularity soon became such that he was placed on the permanent traveling staff. He leaves two sons and two daughters.

PLINY JEWELL, for many years identified with the Jewell Belting Company, Hartford, Conn., died in that city October 31, aged 84 years. He was the son of Pliny Jewell, founder of the house of P. Jewell & Co., which in 1883 was incorporated as the Jewell Belting Company. Pliny Jewell was born at Winchester, N. H., and was reared in the business, which, upon the death of the founder in 1869, was carried on by his sons. From it were established the Jewell Belt Hook Company, the Jewell Pad Company and the Jewell Pin Company, in all of which Pliny Jewell was a director. He was a director of the Hartford National Bank and the Travelers Insurance Company, and a trustee of the Hartford Trust Company. His life was closely and actively identified with important interests of his city and State. He leaves a son, Edward Jewell, Boston, Mass., and a daughter.

DANIEL F. DRAWBAUGH, who unsuccessfully contested the telephone patents granted to Alexander Graham Bell, died at his home near Harrisburg, Pa., November 3, aged 84 years. He was the inventor of one of the earliest telephones, pneumatic tools, hydraulic rams, folding lunch boxes, barrel faucets, measuring machines to be used in wrapping goods, and coin separators. He experimented for years with wireless telephones. For the last month he had been at work on a wireless burglar alarm, and was seized with an attack of apoplexy while in his laboratory.

JOHN L. LEWIS, of Pittsburgh, founder and a former president of the Lewis Foundry & Machine Company, died November 6 at his home in Erie, Pa., of penumonia, aged 73 years. He was born in Pittsburgh and was educated in the public schools. About 1870, with Mr. Rossiter and a few others, he organized the firm bearing their name, which, after the retirement

of Mr. Rossiter, became the Lewis Foundry & Machine Company. Mr. Lewis was at the time of his death the principal owner. He was an able writer, having contributed many articles on iron and steel to *The Iron Age* and other periodicals. He leaves a widow, three daughters and two sons, E. K. and J. L. Lewis, Jr.

FRANCIS B. WILSON, treasurer of the Jewell Belt Hook Company, Hartford, Conn., died November 6, aged 56 years. A native of New Britain, Conn., his early life was passed in the dry goods business, from which he went to the Jewell Pin Company as its secretary, and in 1908 assumed the treasurership of the Jewell Belt Hook Company.

T. F. SALTER, manager of sales and engineering with the Standard Roller Bearing Company, Philadelphia, Pa., died suddenly at his home in that city October 25, aged 35 years. He was a member of the American Society of Mechanical Engineers and the Society of Automobile Engineers.

AARON F. STOWE, Worcester, Mass., widely known as an inventor and manufacturer of boot and shoe machinery, died October 30, aged 78 years. He sold out his business seven years ago to the United Shoe Machinery Company.

Pittsburgh and Vicinity Industrial Notes

The Indiana County Street Railway Company, Indiana, Pa., is enlarging its power plant by installing 625 kva. additional capacity. It has placed an order with the Westinghouse Machine Company, East Pittsburgh, for one Westinghouse-Parsons turbo generator unit and one No. 5 Westinghouse Leblanc condenser which will be used to supplement the present station at Two Lick, which consists of a 1000 kva Allis-Chalmers turbine and Phoenix engine.

The Westinghouse Machine Company has also received a contract from the Isthmian Canal Commission, amounting in all to about $158,000, which involves the manufacture of certain roller trains, roller train tracks and sealing devices, all to the drawings supplied by the commission. The contract constitutes simply a fractional part of the general scheme of lock gates, valves, spillway gates, and the materials involved are as largely as possible drawn from the immediate vicinity of Pittsburgh, the largest purchases outside being certain bronze shapes which are not regularly made in the Pittsburgh district.

The De Bats Crucible Steel Company, Zelienople, Pa., has taken out a West Virginia charter with a capital stock of $125,000, of which $100,000 is common stock reported to be subscribed and paid for, while the other $25,000 is to be preferred stock, and will not be placed on the open market. It has about finished the building of a plant at Zelienople to manufacture crucible tool steels. The incorporators are Louis De Bats, Alfred G. Zehner, F. Edwin Zehner and J. Rader of Zelienople, Pa., and W. H. Shaffer of Harmony, Pa.

Among the recent important orders received by the Westinghouse Electric & Mfg. Company, East Pittsburgh, is a contract from the Northern Ohio Traction & Light Company, Cleveland, which covers the complete electrical equipment of the generating and sub-stations for its lines, extending from Cleveland to Akron, Bedford, Canton, Massillon, Wadsworth, and several smaller cities. The main generating station will be located near Akron, and will contain three 10,000 hp. steam turbine electric generators and three Leblanc condensers. The company has also received the contracts for furnishing the electric locomotives and the electrical equipment for the motor cars, which will be used for propelling traffic on the New York, Westchester & Boston, a subsidiary of the New York, New Haven & Hartford Railroad. The Pressed Steel Car Company, McKees Rocks, is building 30 of these motor cars, and the Westinghouse Company is equipping them with electric motors and control systems. The same railroad has also ordered one 80-ton electric locomotive for switching purposes.

The Wellston Steel & Iron Company, Wellston, Ohio, will light up one of its blast furnaces this month. Both of its stacks have been idle for some time.

The Pittsburgh Emery Wheel Company, Pittsburgh, works at Rochester, Pa., reports a notable increase in its orders, and expects to operate its works to fuller capacity for the balance of this year than for some months.

The Wheeling Mold & Foundry Company, Wheeling, W. Va., has increased its capital stock from $500,000 to $750,000. No material improvements or extensions to the plant are contemplated at this time, the increase in capital being to take care of growing business. The company recently received a contract from the Isthmian Canal Commission for copper conduit work, amounting to $165,000. As it does not make this class of work, the contract was turned over to another company.

The Gealy Wrench & Mfg. Company, Grove City, Pa., is making a complete line of Gealy pipe wrenches for steam and gas fitting, contracting, mine and other uses. The wrenches have drop forged steel handles, drop forged high carbon steel jaws, teeth carefully tempered, and are made in sizes to take in pipe from ½ in. up. A. S. White is secretary.

The offices of H. V. Jamison, manager advertising department of the American Sheet & Tin Plate Company, have been removed from the Imperial Power Building to the Frick Building, Pittsburgh. Hereafter all mail intended for the advertisement department should be addressed to advertising department, American Sheet & Tin Plate Company, Frick Building. The remainder of the equipment of the advertising department remains in the Imperial Power Building as heretofore.

The contract for the blooming mill and engine for the new open hearth steel plant of the Youngstown Sheet & Tube Company, Youngstown, Ohio, has not yet been placed. The contract for the cranes was given out last week. The Whiting Foundry Equipment Company, Harvey, Ill., through its Pittsburgh office, of which Paul Hay is manager, received a contract for six one-motor jib cranes for handling spouts at the open hearth furnaces, which makes a total of 89 cranes of this type sold by that office. The Morgan Engineering Company, Alliance, Ohio, received the contract for the special ladle cranes, stripping cranes, ingot cranes and charging cranes. The Alliance Machine Company, Alliance, Ohio, received the contract for the clam-shell bucket cranes and also for seven standard traveling cranes of 10 to 60 tons capacity each.

Mackintosh, Hemphill & Co., Pittsburgh, builders of heavy rolling machinery of all kinds, have bought the office building formerly occupied by the Zug Iron & Steel Company at Thirteenth and Pike streets. It will probably be razed and a new office building erected to be occupied by the purchasers.

The Erie City Iron Works, Erie, Pa., through its Pittsburgh office, of which T. H. McGraw, Jr., is manager, has sold a repeat order to the Standard Sanitary Mfg. Company, New Brighton, Pa., for a 400 hp. Erie City horizontal water-tube boiler, equipped with Green chain grate stoker.

The eight Stirling boilers referred to in the description of the Upson Nut Company's new steel plant at Cleveland, Ohio, given in *The Iron Age* of November 2, are equipped with Williams feed water regulators, supplied by the Willams Gauge Company, Pittsburgh.

A non-oxidizing electrically-heated soldering copper has been announced by the General Electric Company. The research laboratories of the company, it is stated, have discovered a process of treating the copper, making it non-oxidizable under high temperatures and non-corrodible by the acids used in soldering. The colorizing process, so called, actually changes the characteristics of the copper to an appreciable depth, it is urged, and does not merely coat the surface. The discovery thus offers a soldering copper which may be kept hot continuously and resists rapid wasting of the copper.

The Canadian Pacific Railway Company, P. B. Motley, engineer of bridges, Montreal, has adopted the design of the Strauss Bascule Bridge Company, Chicago, for a 336-ft. double leaf, single track bascule over the United States Ship Canal at Sault Ste. Marie, Mich.

The Toledo Bridge & Crane Company, Toledo, Ohio, has completed arrangements whereby A. W. Wyckoff & Co., 2219 Farmers Bank Building, Pittsburgh, Pa., will represent it in the sale of cranes in the Pittsburgh district.

The Industrial Education Convention

The fifth annual convention of the Society for the Promotion of Industrial Education, held in Cincinnati last week, was said to be the most successful meeting in the history of the organization. Many from distant points were present, and at all the meetings there was a large attendance of enthusiastic local supporters. The visitors were very much interested in the different educational institutions of Cincinnati, and among those inspected were the University of Cincinnati, Ohio Mechanics Institute, Continuation School and the Woodward High School. The local manufacturing plants also came in for a share of attention.

At the final meeting Fred A. Geier, president Cincinnati Milling Machine Company, was elected president of the society, but he declined the honor, stating that more effective attention could be paid to the movement by an Eastern man. W. C. Redfield, Congressman from the Sixth District of New York, who is also vice-president of the American Blower Company, was then selected as president for the coming year. The other officers chosen are as follows: Vice-president, Howell Cheney, Cheney Silk Company, South Manchester, Conn.; treasurer, Frederic B. Pratt, Pratt Institute, Brooklyn, N. Y. J. Henry Cone, of Cincinnati, now secretary of the society, will doubtless be re-elected by the executive committee.

For a term of three years the following new members were elected to the board of managers: James P. Munroe, Boston, retiring president; Fred A. Geier, Cincinnati; Miss Jane Addams, Chicago; F. J. McNulty, Springfield, Ill.; W. A. Laymen, St. Louis; Louis Rouillion, New York; H. E. Miles, Racine, Wis.; Howard P. Eells, Cleveland; Walter Laidlaw, New York, and Charles A. Bookwalter, Indianapolis.

Fred A. Geier, on behalf of the National Metal Trades Association, tendered the society a check for $1,000, which was accepted with thanks.

The executive committee will select a meeting place for next year at some future date.

Two New Orders for Lake Vessels.—The American Shipbuilding Company has taken two orders in the past week, one for the largest hopper, self-unloading conveyor steamer ever built in the United States and the other for a Welland Canal sized package freight steamer 257 ft. over all. The latter will be built at the Port Arthur, Ont., yard of the shipbuilding company. The conveyor steamer will engage in the ore, coal and stone trade. Her keel will be 416 ft. long and she will be 439 ft. overall, 54 ft. beam and 29 ft. deep. Power will be furnished by a quadruple expansion engine with 19-in. high pressure, 27½-in. first intermediate, 40-in. second intermediate and 58-in. low pressure cylinder with 42-in. stroke. Three Scotch boilers 11 ft. 6 in. in diameter and 11 ft. 6 in. long, built for 210 lb. pressure. A second package freighter is under consideration and if the oil burner Toiler, now running between Montreal and Port Colborne, is as successful as expected, this second vessel will be equipped with Diesel engines. This would be the first ship on this side the Atlantic to be driven by internal combustion engines.

Woodward Buys Vanderbilt Furnaces.—Formal announcement is made of the sale of the properties of the Birmingham Coal & Iron Company to the Woodward Iron Company. The properties mentioned consist of two blast furnaces and 51 coke ovens at Vanderbilt, Ala., an aggregate of 160 additional ovens at Blossburg and Shortcreek, Ala., approximately 40,000 acres of coal land and 2500 acres of red and brown ore land. It is understood that the Woodward Company will extend and develop the properties acquired and continue all operations as at present.

The American Society of Engineer Draftsmen will hold its regular monthly meeting in the Engineering Societies Building, 29 West Thirty-ninth street, New York, at 8.15 p. m. November 16. The programme provides for a paper by Walter Dalton on "Construction Work West of the Missouri River" and a lecture by Charles W. Reinhardt, chief draftsman Engineering News Publishing Company, on "Comprehensive Drafting and Lettering."

The Connellsville Coke Trade

The condition of the Connellsville coke trade is set forth as follows by the Weekly Courier, Connellsville, Pa.:

The Connellsville coke trade is practically stationary. The figures show a gain in production and in shipments, but the increased production was confined to the furnace interests and will not affect the merchant trade. It indicates, however, that the furnace interests are stocking coke again. These interests have recently been shipping their stock coke to their various consuming points and clearing their coke yards. The reason or purpose of the present policy is not announced, but it is probable that it is merely a reasonable safeguard against the uncertainties of production during the winter season. The merchant operators have 68 per cent. of their ovens in blast, but they are being operated practically full.

Production made a gain last week of 9535 tons as compared with the week before, the total being 320,301 tons as against 310,766 tons. The gain was entirely with the furnace interests.

The number of ovens in operation in the region was increased by the firing of 40 ovens at Davidson, and decreased by the blowing out of 28 at Clarissa, making a net increase of 12 ovens.

The American Chemical Society, New York Section, announces that its second regular meeting of the session of 1911-12 will be held in conjunction with the Society of Chemical Industry and the American Electrochemical Society, in Rumford Hall, 50 East Forty-first street, New York, at 8 p. m., Friday, November 10, with a symposium on fuel economy as follows: J. W. Loveland, B. T. Babbitt, Inc., "Some Attempts at Economy in Steam Making;" Prof. Chas. E. Lucke, Columbia University, "Fuel Gasification for Industrial Purposes;" Ed. A. Uehling, Uehling Instrument Company, "A Continuous Carbon Dioxide and Temperature Recorder and Its Application to Combustion Efficiency;" Charles A. Davis, Bureau of Mines, Washington, "Is Peat an Important Fuel in America?" Horace C. Porter and F. K. Ovitz, Bureau of Mines, Pittsburgh, "Deterioration and Spontaneous Heating of Coal in Storage;" Perry Barker, A. D. Little, Inc., "The Distribution of Heat in Boiler Plant Operation."

The C. O. Bartlett & Snow Company, Cleveland, Ohio, reports the receipt recently of the following orders: A sand crushing and drying plant, including a boiler and engine house, for the Warren-Silica Company, Torpedo, Pa.; a 4-roll coal crusher for the National Starch Company, Oswego, N. Y.; a sand and gravel washing plant for the Greenville Gravel Company, Greenville, Ohio; a fuller's earth dryer for G. D. Robbins for shipment to Texas; coal tipple and mine cars for the W. K. Steele Coal Company, Mossy Bottom, Ky.; coal conveyor for the Cleveland Electric Illuminating Company; two barrel elevators for the New Jersey Zinc Company; coal weighing larries for the Consolidated Gas & Electric Company, Baltimore, Md., and a truck haul and retarder for the Stow-Fuller Company, Cleveland.

Autogenous and electric welding is to be made the subject of the November meeting of the American Society of Mechanical Engineers to be held at 8.15 p. m., November 14, in the Engineering Societies Building, 29 West Thirty-ninth street, New York City. Three papers are to be presented. One is to deal with the general aspect of the subject, the origin and principles of each process and the apparatus used in each, by H. R. Cobleigh, International Steam Pump Company; and two on special phases, thermit welding, by G. E. Pelissier, superintendent Goldschmidt Thermit Company, and electric welding by C. B. Auel, assistant manager of works, Westinghouse Electric & Mfg. Company.

The partnership between Kern Dodge, Charles Day and John Zimmerman, doing business under the name of Dodge, Day & Zimmerman, engineers, Philadelphia, Pa., has been dissolved by mutual consent. Charles Day and John Zimmerman will continue the business under the name of Day & Zimmerman.

September Iron and Steel Exports and Imports

The report of the Bureau of Statistics of the Department of Commerce and Labor for September shows a decrease in both the exports and imports of iron and steel as compared with the figures for August. The total value of the exports of iron and steel and manufactures thereof, not including iron ore, was $20,534,139 in September as compared with $20,704,154 in August, while the value of similar imports in September was $1,996,288 against $2,282,466 in August.

The exports of commodities for which quantities are given totaled 179,859 gross tons in September against 176,269 tons in August. The details of the exports of such commodities for September and for nine months of the fiscal year ended with September, compared with the corresponding period of the previous year, were as follows:

Exports of Iron and Steel.

	—September—		—Nine months—	
	1911.	1910.	1911.	1910.
Commodities.	Gross tons.	Gross tons.	Gross tons.	Gross tons.
Pig iron	10,258	12,967	95,636	83,862
Scrap	4,105	1,915	61,701	16,867
Bar iron	1,578	1,665	13,879	14,928
Wire rods	1,734	1,044	12,829	16,897
Steel bars	10,919	10,397	93,716	78,934
Billets, ingots and blooms	19,754	4,480	181,178	14,162
Steel rails	38,210	20,538	349,942	263,782
Iron sheets and plates	12,030	7,877	85,058	77,008
Steel sheets and plates	21,040	16,615	167,223	1,322,583
Tin and terne plates	6,461	808	42,656	8,594
Structural iron and steel	16,284	10,333	158,457	114,552
Barb wire	8,412	5,953	63,140	54,635
All other wire	10,107	6,801	95,460	67,750
Wire nails	2,095	2,597	35,156	32,283
Cut nails	1,130	661	8,285	5,371
All other nails, including tacks	1,972	1,136	9,584	7,408
Pipe and fittings	14,670	12,960	144,818	118,100
Totals	179,859	118,777	1,618,618	2,297,516

The imports of commodities for which quantities are given totaled 13,534 gross tons in September as compared with 19,685 tons in August and 30,969 tons in September, 1910. The details of such imports for September and for nine months of the fiscal year ended with September, as compared with corresponding periods of the previous year, are as follows:

Imports of Iron and Steel.

	—September—		—Nine months—	
	1911.	1910.	1911.	1910.
Commodities.	Gross tons.	Gross tons.	Gross tons.	Gross tons.
Pig iron	7,875	16,668	115,874	126,615
Scrap	948	3,186	14,371	65,457
Bar iron	1,644	2,508	20,839	31,211
Billets, bars and steel plates, n.e.s.	1,877	3,918	23,244	36,026
Sheets and plates	130	704	1,688	5,465
Tin and terne plates	206	2,720	12,868	53,802
Wire rods	845	1,265	12,128	15,781
Totals	13,534	30,969	201,012	384,357

It will be observed that comparatively large exports and quite small imports continue to characterize the tin plate movement.

The imports of iron ore in September were 184,456 gross tons against 175,183 tons in August and 208,892 tons in the month of September, 1910. The total importations of iron ore for nine months of the fiscal year ended with September were 1,362,352 gross tons against 1,999,917 tons in the corresponding period of 1910. Of the September imports of iron ore 112,889 tons came from Cuba, 26,487 tons from Spain, 25,200 tons from Newfoundland, 6830 tons from Canada, 6545 tons from Sweden and 6505 tons from other countries.

The total value of exports of iron and steel and manufactures thereof, not including iron ore, for nine months of the fiscal year ended with September was $185,118,660 against $146,924,302 in the corresponding period of 1910. The total value of the imports of iron and steel and manufactures thereof, exclusive of ore, for nine months of the fiscal year ended with September was $22,220,521 against $30,439,998 in the similar period of 1910.

An Electric Generator of 30,000 Horse Power

The spectacle of the successive stopping of seven large vertical steam engines, each connected to an electric generator of no less than 3500 kw. capacity, and the assumption by a single generating unit of the load of each engine as it was put out of commission inaugurated the operation of a steam-turbine electric generating unit of 20,000 kw. capacity at the Waterside station of the New York Edison Company in New York City on October 3 To get the full effect of the picture, one must realize that the seven engine units occupied one side of the station from end to end, while the steam turbine unit, which was built by the General Electric Company, rose to a modest height above the floor on the opposite side of the generator room in the shape of a smooth cylindrical steel casting. To lend added interest to the occasion, the turbine was started on the task which it is to perform indefinitely by former Secretary of the Treasury George B. Cortelyou, now president of the Consolidated Gas Company of New York, who while in the act of turning the throttle wheel was photographed by the camera. A large number of guests had the opportunity also of noting the additional 20,000-kw. steam-turbine units in process of erection, and a buffet luncheon brought the ceremonies to a close.

While the unit is technically known as one of 20,000 kw. capacity, from information given out by the New York Edison Company, the generator may be regarded as one of 30,000 hp., or sufficient to supply all the current needed for the city of Providence, R. I., or any other city of about 250,000 population. It had been calculated also that the generator would supply a chain of cities such as Albany, Syracuse and Utica. Another interesting way of indicating its power is that it is equal to that of the largest ocean liner, or equal to 30 of the largest express locomotives or to a line of horses six abreast and 10 miles long, all of the horses, it is presumed, pulling equally well and none of them fractious.

In more technical language the prime mover is credited with a steam consumption of 14.4 lb. of steam per kilowatthour when the load is 15,000 kw., and 15 lb. per kilowatthour when the load is 10,000 or 20,000 kw., the pressure being 175 lb. gauge, the vacuum 28½ in. and the superheat of the steam 100 deg. The machine is 17 ft. 6 in. x 17 ft in plan; its hight above the base is 35 ft. 7 in.; the weight, 420 tons, and the weight of the heaviest piece 110 tons. The generator is a 4-pole machine, giving three-phase 25-cycle 6600-volt current at a speed of 750 r.p.m. The total number of wheel buckets is 7200, and the velocity of the buckets is roughly 6 miles per minute, or a travel of over 8000 miles per day.

An Album on Concrete Engineering

A remarkable publication has been issued by the Consolidated Expanded Metal Companies, Pittsburgh, Pa., illustrating in part the Xpantrus system of reinforced concrete and incorporating at length the theories and methods of design of reinforced concrete structures. The special bar of the Xpantrus system is shown in relation to fractures or failures to which concrete beams have shown themselves heir, to indicate how the design of the bar has had in mind overcoming the inherent weakness of the concrete portion of beams. There are no less than 53 pages given over largely to both the practical and theoretical sides of the problem, and the remainder of the 102 pages of the album comprises extended tables of loads which different sizes of beams for different spans and other requirements will sustain. The handbook is of the loose leaf form, bound in flexible covers and has the merit of being convenient as well as valuable. The publication, which can without doubt be had by those interested in the subject, is a commentary on the special engineering service often obtainable from manufacturers of what may be called engineering materials.

The United States District Court has dismissed the application for the appointment of a receiver for the St Louis Blast Furnace Company. It also denied a petition for an injunction to prevent the holders of the company's $200,000 bonds from foreclosing the mortgage on the realty and plant. Most of the bonds are held by the State National Bank of St. Louis and the petitioners for a receiver represent four bondholders. In denying the petitions Judge Dyer said that the affidavits in the case show that the property of the company is valued at from $300,000 to $400,000 and that an effort is now on foot to reorganize the company. He held that the majority of the bondholders appeared to be in favor of this reorganization. The plant has been closed down since last July. The reorganization plan is being worked out by Eastern capitalists

Scientific Management at United States Arsenals

Results Accomplished at Watertown

About three years ago the Ordnance Department of the United States Army began to devote attention to the subject of scientific management as applied to its manufacturing operations. Previously to the last fiscal year the subject had been considered more as an experimental detail of shop management, but it has now assumed sufficient importance to justify a reference to it in the annual report of the Chief of Ordnance, General William Crozier, of which an abstract is presented below:

The Object of Scientific Management

It is unnecessary here to attempt any detailed description of the principles of scientific management, or the particular application of those principles which constitute the Taylor system, since both have been the subject of extensive discussion in the public prints and have been very fully described in various treatises. It may be said, however, that the principles are no new discovery nor are they claimed to be such by the advocates, and that the many details have been the subject of special and laborious attention for many years. The basic idea is the application of educated and scientifically trained intelligence to those operations of manufacture which were formerly considered either as of too small importance to attract much attention or as belonging entirely to the practice of a trade, and were therefore left to the judgment or choice of those immediately and practically connected with the operations. The best method of doing certain work has to be determined by careful and scientific consideration of a number of variable elements, whose successful combination is a matter of high skill and careful observation. Efficient work requires that the workman must be given the elements of speed of running the machine, feed, depth of cut, and a cutting tool by some one who knows what the combination ought to be.

Methods at Arsenals and Outside Compared

When the claims made by the advocates of scientific management first attracted the attention of the War Department, the question of the efficiency of existing shop methods was naturally raised in order to estimate the probable value of a change. It is believed that the shop methods in effect at the different arsenals were fully abreast of the best general practice in private industries of the same nature.

While, therefore, the general conditions would compare favorably with commercial practice, and while in those arsenal shops engaged in turning out large quantities of small arms, ammunition, etc., the successive operations had been co-ordinated and delays eliminated so that such shops did not afford as wide a field for improvement, it was concluded that the general machine shop and job work practice in the arsenal shops might be materially improved by the methods of scientific management.

Installation at the Watertown Arsenal of Some of the Elementary Features of Scientific Management

With this object, something over two years ago, the trial, at the Watertown Arsenal, of some of the elementary features of what is known as the Taylor system was authorized, with the intention of testing out these features thoroughly and determining their value before proceeding further.

An expert in shop management was employed, and under his guidance the method of putting work into shops was so systematized that orders for manufacture now go from the office to the shops with a much more complete arrangement and supply than formerly of drawings, specifications, lists of parts, bills of material and orders relating to particular parts of the structure to be produced, so that the foremen are relieved from much of the semi-clerical and other office work which they used to have to do, and for which they are not well qualified and can not attend to without a neglect of other more appropriate duties.

The work of planning the course of component parts of the structures to be manufactured through the shops of the arsenal has been systematized so that this course shall be regular and orderly, and the work shall at no time be held through the lack of some component which is not at hand when needed, and that no wasteful effects shall arise through congestion of work at particular machines, or the idleness of other machines, or workmen while waiting for the assignment of operations which should have been planned for them in advance.

Planning Room

For this purpose there has been installed a planning room equipped with personnel and appliances for the regular production of what might be called the time tables of the thousands of pieces which must travel through the various shops on their way from the stage of raw material to that of finished product, without collisions or unnecessary delays. The issue of material from the storehouses to the shops has been systematized, and the task of estimating the amount of material required placed among the duties of persons other than those who are to make use of the materials in manufacture, so as to reduce the likelihood of overestimates; to insure the possession of the material at the time when it is needed, prevent the disappearance of material while awaiting use, and the duplication of issues, and to insure the return to the storehouse of surplus material; with the result of a useful reduction of the amount of material issued, and supposedly used for particular fabrications.

The care of material in store and the accountability for it have been systematized so as to insure more frequent and accurate check of the material on hand with the clerical statement of what ought to be on hand. The method of caring for machines and tools has also been systematized so as to preserve their efficiency; for example, the proper maintenance of the condition and tightness of the extensive system of belting, and the systematic tempering and grinding of cutting tools. Such improvements have been made in the efficiency of certain machines as to greatly increase their output.

Reduction in Cost of Production

The practical effect of these methods at the Watertown Arsenal has been a material reduction in the cost of general manufacture at that place. The most important manufactures at this arsenal are seacoast gun carriages, which are large structures with hundreds of parts, requiring many months for their completion. It is therefore difficult to give at this time many examples of the decrease of cost of production due to the improvements which have thus far been made, but the following are illustrative:

Five different orders, each for 40 sets of parts for the alteration of 12-in. mortar carriages, have been given in comparatively recent years. The direct labor cost per set under the old methods was $180, which was reduced to $275 per set as a result of the improved methods introduced, while the cost of indirect labor and other shop expenses was reduced from $335 to $332 per set. Similarly, the direct labor cost of 6-in. disappearing gun carriages was reduced from $10,220 to $6,500 per carriage, and that of indirect labor from $10,263 to $8,956. These satisfactory results have been attained without affecting the pay of the employees or requiring special exertion by them.

The previous practice at the Watertown Arsenal was the same as that still followed in practically all machine shops the management of which has not yet appreciated the wastage that scientific study of the usual practice is claimed to reveal. The principal elements of this wastage include failure to appreciate and to utilize the full and

efficient power of machine tools, lack of planning by which machines are frequently without work, the employment of skilled workmen to bring work to machines or to procure and grind their cutting tools, etc. By the establishment of specified feeds and cuts, the work done by the machines is increased, and by regulating the flow of the work so that it shall be even and continuous, and employing laborers and messengers to supply the work and tools to the skilled workmen, the latter are able to devote the time and labor which they previously expended in other ways to work proper for their grade.

In view of the successful results obtained, a board of officers assembled at the Watertown Arsenal recommended the adoption of those methods for similar work at other manufacturing arsenals, with such changes in details as local conditions seemed to require. In accordance with this recommendation, preliminary steps toward introducing the methods, so far as they are applicable, have been taken at several other arsenals. Due, it is believed, to an erroneous conception of the purposes which it is intended to accomplish by these methods, the employees at one of the other arsenals to which the changes are to be applied have protested against the installation. They have been assured that this department does not contemplate the introduction of any system, or any features of a system, which is oppressive or unjust. As stated above, the features which have been in effect at the Watertown Arsenal for about two years, and which are all which it is intended to introduce at the other arsenals at the present time, do not affect the wages to be paid to employees or the exertions to be made by them.

The employees have been fully informed as to the department's intentions in this matter. The explanations given them should suffice to allay any apprehension that may have been aroused by a misunderstanding of the matter, and induce them to await the result of the practical trial of the methods in question with confidence that their proper interests are not endangered.

Economy for the Government and Increased Wages for the Employees

In addition to the study of methods, scientific management usually includes some plan for demonstrating to the workman that he can increase his production without unduly exerting himself, and for stimulating him to do so by offering him increased pay for such increase in output. The advocates of the Taylor system claim with great positiveness that the features of that system which do affect the employees' pay, if applied, will result in further very marked economies to the government, accompanied by increased pay and conditions generally satisfactory to the employees. These claims they base upon the result of actual experience in shops in which the system has been put in operation. The confirmation of the claims as to the advantages of the features first installed, which the practical test at Watertown afforded, lends such force to these further claims that, in the absence of any positive evidence to the contrary, they can not be disregarded by an administrative officer honestly desirous of serving the interests of the government.

Briefly stated, these features contemplate offering additional pay to workmen for work performed in the manner and sequence selected from the results of careful study and completed within the time which that study indicates as sufficient for the purpose. The saving in time results, aside from any increased efficiency of machines, chiefly from the effect of the instructions given the workmen, by which their effort is more advantageously applied, and will involve no exhausting exertion on their part, nor such as should be disagreeable. If the work is not performed within this given time the workman receives his regular daily pay; never less than his regular pay. The proposition is simply that if he follows his instructions, and by so doing saves time, his pay will increase in proportion to the time saved. For example, a workman has been doing a piece of work in 190 minutes. After painstaking study of the job and of all the means of saving time the man is carefully instructed as to these means, and is told that for every minute saved, within, say, 120 minutes, he will be paid for half a minute at his regular rate, in addition to his regular daily pay; and that it is thought that he can do the work in 72 minutes, in which time the increase over his regular pay will amount to 33⅓ per cent.

The average premium of all machinists who have been placed on premium work in the machine shop at the Watertown Arsenal has been 25 per cent. of their wages.

The real point in the matter, however, is the determination, by a method of scientific common sense, of the time within which the work can and should be done, and the particular method of compensation as a stimulus for meeting this time is not important.

Strike of Molders at Watertown Arsenal

Following the successful installation of the system in the machine shop of the arsenal, an attempt was made to extend the improvement in methods to the foundry, where there was thought to be still greater opportunity for economies which would result advantageously both to the employees and to the government. There has been no opportunity for making a time study, such as had preceded the placing of some mechanics under the premium system in the machine shop, but the advantages in that shop had been so great that it was concluded that part of them could be had by placing some of the molders under the premium system, while basing the time within which premiums might be earned upon the record of previous production. It was well known that this time was greater than it should be, but, as it was intended at this time to apply it only to certain work which was not to be repeated, it was considered wise to allow the workmen the advantage of this liberal time for the sake of the economies which would also result to the government.

Several molders were given jobs under this plan, but it was not successful in getting any material reduction of the time occupied in doing the jobs or in producing premiums for the men. A time study was therefore made on a mold for the pommel of a pack saddle, of which a considerable number were required. Under the day-wage system, a molder had been making these molds in about 53 minutes each. The time study showed that they ought to be made in 24 minutes each, and, in accordance with the usual rule, premiums were to commence to be earned after the time represented by the 24 minutes plus two-thirds of the 24 minutes, or 40 minutes. Both the molder and the foreman, however, thought that this time was too short, and the officer in charge of the shop therefore increased it arbitrarily to 50 minutes.

However, although no objection to the time study was made at the time, on the same evening a meeting of the molders was held, and it was decided that they would not submit to the process, and when, on the following day, attempt was made to carry it on with reference to another man on another job, the molders all struck, leaving their work. Their places were being filled by other men employed when, after a few days, they returned to work under the same conditions as those for which they had left, with the information that the whole matter would be made the subject of an investigation.

After the return of the striking molders to work, the man who had been on the pommel job was again put at it, and occupied the same time as before, about 53 minutes each. One of the new men who had been taken on was, therefore, assigned to this job, when he made the molds at an average of 20 minutes each, the castings from them not being distinguishable from those made by the former molder. That this time of 20 minutes each was not difficult of accomplishment is shown by the fact that this man on one occasion did a whole day's work at the rate of 16 minutes each, and on one occasion was observed to make one of the molds in 10 minutes; also, one of the striking molders after his return made them in 28 minutes each.

When these molds were produced in 53 minutes each their labor cost, including helper and all the direct and overhead charges, was $1.17 each. When they were made in 20 minutes each, this cost was reduced to 54 cents; there was thus a saving of 63 cents on each mold, and as, at the 20-minute rate, 24 molds were made per day, the net daily saving to the government on this one molder's job was $15.10. The pay of the time-study man, a high-priced specialist, was $15 a day; so that his entire day's pay was saved on this one job. When the molds were made at the rate of 53 minutes each, under day wages, the molder earned $3.28 per day; when they were made in 20 minutes each, under the premium system, the molder earned $5.74 per day.

During the month of September last 29 men, in the foundry and machine shop, were working more or less time under the premium system. Their total pay for the

time that they were so working, at their regular rate, was $2,121.10; the premiums which they earned amounted to $279.19. They thus increased their regular daily pay by an average of something over 13 per cent. It is a pertinent inquiry who was hurt by this process? The men were certainly benefited in their compensation. They were not required to overexert themselves, nor directed to speed up, and the best evidence obtainable is to the effect that the rate at which they worked was not such as ought to have been other than pleasant.

Misapprehension of the System

After the return of the molders to work, Lieut.-Col. John T. Thompson, from the office of the Chief of Ordnance, was directed to proceed to the Watertown Arsenal and make an investigation of the strike and the events preceding it. From his report, it appears that the objection on the part of the dissatisfied workmen is to the process of making time study, which generally precedes the setting of a premium time on a new job; and the underlying cause of this objection appears to be an apprehension that advantage will be taken of the knowledge gained by the time study to speed up the workmen with a temporary incentive to work fast, and then to use the knowledge thus gained to require the increased rate of production at the same old pay.

It seems quite probable that men might be influenced by arguments of an agitative nature to such an extent as to cause them to lose sight of the fact that the government is not in the "sweat-shop" business, and that there are plenty of instances in the Ordinance Department itself in which employees are continuously earning, by stimulated efforts under the piece-work system, wages very considerably in excess of those paid to persons of the same degree of skill under the day-wage method. A little inquiry would show that there are many employees in the department working at employment which can be readily learned in time very much less than that required for the apprenticeship of a machinist, for instance, who are regularly earning the wages of a good machinist, paid by the day.

If the employees of the Ordnance Department were left to the guidance of their own experience in the government employ, it is believed that such experiments as the one now making at the Watertown Arsenal would be given a fair chance. The theory under which the trial is being made at the Watertown Arsenal is that the current rate of wages is not just compensation for the employees' best production, but that it is compensation for the character of production under which the rate has grown up, which is very far from the best. It is believed that better production can be had by proper care on the part of the management, but that continued high production is impossible without correspondingly high wages. It is also considered that there are differences between men which should be taken account of in their compensation.

Conclusion

The department has not yet reached a conclusion as to the extension to other arsenals of the part of the Taylor system of shop management which affects the workmen, and it is not intended to do so in advance of further trial at the Watertown Arsenal, but it seems certain that, either by this system or by some other, it ought to be possible to secure better co-operation of the employees among themselves and between them and the management than has been had in the past.

Statement by Secretary Stimson

Following is a statement by Secretary Stimson in regard to the War Department's experiments with the theory of scientific management, made in explanation of his personal position and the attitude of the department:

"The War Department has given considerable attention to the utilization of the methods of scientific management in the various arsenal shops of the government. The Watertown Arsenal has been used practically as an experiment station, with a view to trying out the theory before applying it generally. The results thus far are highly gratifying and full of promise. There has been an undoubted increase in the efficiency of manufacture at the shop and a material reduction in the cost of manufacture, but at the same time, and to my mind of even more importance, these results have been obtained without in any wise endangering the interests of the workingmen, either by decreasing their pay or requiring unpleasant exertion of speeding up. On the contrary, any increase in real efficiency must inure to the benefit of the workingmen.

"I have been too long and too vitally interested in and active in movements which make for the advancement of the conditions of labor for me now to lend even the slightest encouragement to any theories which work counter to the true interests of labor. To my mind, scientific management can and deserves to prevail only where increased efficiency means increased human efficiency and the workingmen's participation in the rewards resulting from efficiency. It means a betterment and in no wise impairment of the conditions of labor. A change for that kind of betterment is the only kind of change which the government will permit through the installation of any scientific management. We are still very much in the experimental stage, but I have strong hopes that, by co-operation and a willingness to see the facts fairly, economies will result to the government, betterment to workingmen and a more satisfactory and more human relation between the two in the future than in the past."

Denouncing the indorsement of the Taylor system of scientific shop management by the government as unjust and predicting a general walkout of the 7000 or 8000 machinists employed by the War Department should it be adopted, James O'Connor, president of the International Association of Machinists, issued a statement at Washington, D. C., November 3, in which he said the machinists are unalterably opposed to the system. He added: "If the Taylor system is put into operation in government shops by Secretary Stimson, as he has stated, one of two things will result—either Congress will enact legislation relieving machinists of the unjust rigors of the so-called 'scientific shop management' or there will be a cessation of work."

A Monumental Bridge Contract Let

The 3½ miles of steel bridges, including an arch span which will be the longest in the world, projected some years ago as the New York Connecting Railroad for closely joining New England to the South and West by the way of Brooklyn, have taken definite shape by the award announced last week for some of the structural work. The American Bridge Company has been given the contract for the arch span and the two adjacent or approach spans, totaling 36,000 tons of material. The viaducts remaining have not yet been placed.

The structure is one of great importance from the commercial standpoint, and also one of monumental character, partaking of the nature of a gateway to Long Island Sound. In fact, it was about five years ago that plans for the structure were presented by the chief engineer, Gustav Lindenthal, and his associated architect to the Municipal Art Commission of New York. The bridge is substantially a connecting link between the systems of the New York, New Haven & Hartford Railroad and the Pennsylvania Railroad, with its systems on Long Island operated by the Long Island Railroad.

From the northern part of New York City the bridge is to span the strait known as the Bronx Kills, then cross in succession Randall's Island, the strait known as Little Hell Gate, next Ward's Island, and finally the Hell Gate channel, over which will be the arch span leading into Long Island. The trackage system is planned to allow for passenger service from this portion of Long Island through the tunnels under the East and North rivers, thereby communicating with the Pennsylvania station in New York, and for freight to South Brooklyn, where by ferry transfers car floats may reach Greenville, N. J., for distribution over the lines of the Pennsylvania system.

The connecting railroad will be about 12 miles in length and the steel viaduct forming the bridge part is to provide for four tracks with the rails laid on a stone ballast to diminish noise. The total amount of steel involved is between 80,000 and 90,000 tons. The arch span itself will measure 1000 ft. between abutments, and thus exceed in clear span by 160 ft. the longest arch span now in existence, that of the steel bridge immediately below Niagara Falls. Like other bridge structures span-

ning national waterways, the bridge must have a clear hight above mean high tide of 135 ft. The crown of the steel work of the arch will, however, extend about 130 ft. above that level, making the topmost point about 265 ft. above mean high tide. The tracks will pass through the arch perhaps 140 ft. above the water. The towers erected above the abutments of the span are to have a granite base and a molded concrete superstructure, this designed with a special reference to the monumental character of the bridge. The early plans comprehended the use in part of the tower for accommodating offices for the bridge operation. Some of the steel members measure in cross-section probably as much as 9 ft. in the extreme and weigh 100 tons each. The work contracted for at the present time must be completed within 30 months.

Swedish Steels

An interesting paper on the above subject was read before the New York Railroad Club, October 20, by A. R. Roy of the Swedish Iron & Steel Corporation, 12 Platt street, New York City. Mr. Roy introduced his paper with considerable historical data regarding the use of iron by the ancients, leading up to the fact that Swedish iron came to be recognized as the best base for making the highest grade of steel. He then gave the following reasons for the superiority of Swedish iron:

"1. Because nature gave Sweden the best iron ore in the world. Examining this fact, it is noticeable that the best quality of Swedish ore is dependent largely on the environment that it is buried in. It would appear that the chemical amalgams inherent in the ore in the state of nature are such that when the ore is worked it imparts to the final product qualities not to be found in other irons, although much of this amalgam is apparently eliminated in the process of manufacture. The most recent discovery appears to be that vanadium is found present in the natural ore. Analysis of Swedish iron shows no trace of vanadium. It is possible that in the furnace the heat eliminates all trace of vanadium, but not before it has imparted to the iron the purity that makes the ore of Sweden so famous.

"2. Charcoal, the purest fuel, is used in Sweden of necessity, as Sweden has no coal beds of her own. It may be unfortunate for the wealth of Sweden's ironmasters that there is no coal handy for use, but it is a decided advantage to the world in general. Could Sweden use coal in her furnaces, the chances are that the quality of her iron would deteriorate. Charcoal is practically the only fuel that is used. In fact, the laws of Sweden allow no mines to be opened unless there is a forest in the neighborhood large enough to supply the charcoal required for manufacture. The laws further protect the manufacturer by giving him the sole right to a certain amount of sylvan fuel in proportion to the size of the mine he operates. To make this clearer, suppose a family with the right to the charcoal supply of a forest is divided by any contingency, the law gives to the man who operates the mine, although he might have only a small interest in the whole property, the sole right to all the fuel of the forest assigned to his mine. These laws insure the use of charcoal for the making of iron. By using charcoal, the gases that are impregnated into the molten fluid steel by the employment of coal or coke are completely avoided. Naturally, a steel is produced that is much purer than any that can be made with coke or coal, as is the custom in other countries. Further, large quantities of iron are never produced at a time. The consequence of this is that greater care is taken in the manufacture, and there is a more even quality and homogeneity in the steel produced for the simple reason that it is easier to boil more thoroughly a small quantity of matter than a larger one—and boil it evenly through and through.

"3. Because greater care is taken in Sweden in manufacturing. The use of charcoal necessarily prohibits production on a large scale; therefore, quality, not quantity, is Sweden's principal aim. It has just been mentioned above that Sweden manufactures in small quantities and here is the reason for it. It is not possible to produce very large quantities of charcoal because the forests are naturally limited, so they are obliged to use small quantities and with great care. They have to make the most of what they have got. It is the law of self-preservation. Not only have they to make the most of the little they possess, but they have to be economical. Charcoal is not so cheap as coal. A few blasts down in the cavities of the earth will produce a few hundredweights of coal, but it means much more labor in producing a basketful of charcoal. A tree has to be cut, the wood has to be dried, and then it has to be burned with care by men skilled in the making of charcoal, for the wood must not be burned too much, before a basketful of charcoal can be put on the market. All this means time and labor, and the two together make capital."

Mr. Roy explained that Sweden long allowed other countries to use its ore or iron in the manufacture of steel, making but little steel herself, because it was found more profitable to sell the iron than to make steel which, on account of the limited supply of fuel, would compete unfavorably in price with the steel of other countries. But Sweden is now beginning to exploit her products of steel in countries hitherto untouched. She has found a large market in America. He then made the following statement:

"One of the greatest disadvantages of using Swedish steel in America has been the difficulty of getting large quantities of steel from that country in a hurry, on account of the unfavorable transport facilities. The steel from Sweden has to be shipped to some foreign port from where it is forwarded to American ports. It will be readily seen that manufacturers requiring large quantities of steel for immediate use cannot afford to wait two or three months to get the steel which, they may be convinced, is the best for their purpose. One of the officers of a manufacturing firm of national reputation, a short time ago, at a discussion for the adoption of Swedish steel in the factory, made the following remark:

"'You know what it means to buy imported steels, and you know what happens when you are held up three or four months because they run short of a certain size of steel. If you can get nearly as good results from some steel you can depend upon obtaining when you want it, buy that particular steel, but don't get tied up with a source of supply 3000 or 4000 miles away and lose business because you cannot build machinery.'"

"But in America we have progressive men whose minds are capable of undertaking daring enterprises, and a company has been formed which carries, in the port of New York, a stock of 4000 tons of Swedish steel ready for shipment at any moment. None will deny that this, perhaps, is the largest stock carried by any individual firm in any part of the world. In this way one of the chief objections against Swedish steel in America has been removed."

The Sherman Law

Unfamiliar Text of the Anti-Trust Statute

Much as has been written about the Sherman law and as familiar as the average reader is with the purport of its provisions, probably few laymen have ever read it. Albert H. Walker, the New York attorney who is the author of "The History of the Sherman Law," suggests that the newspapers can throw more light upon the subject to which it relates by printing the statute itself than in any other way. As the readers of *The Iron Age* have had occasion, and will have, to think much of the practical effect on business of the enforcement of this law, we present its full text below. Its brevity will be seen to be in inverse ratio to the importance it has assumed as a factor in the business world:

Be it enacted by the Senate and House of Representatives of the United States of America in Congress assembled:

Section 1—Every contract, combination in the form of trust or otherwise, or conspiracy, in restraint of trade or commerce among the several states, or with foreign nations, is hereby declared to be illegal. Every person who shall make any such contract, or engage in any such combination or conspiracy, shall be deemed guilty of a misdemeanor, and, on conviction thereof, shall be punished by a fine not exceeding $5,000, or by imprisonment not exceeding one year, or by both said punishments, in the discretion of the court.

Section 2—Every person who shall monopolize, or attempt to monopolize, or combine or conspire with any other person or persons to monopolize any part of

the trade or commerce among the several states, or with foreign nations, shall be deemed guilty of a misdemeanor, and, on conviction thereof, shall be punished by fine not exceeding $5,000, or by imprisonment not exceeding one year, or by both said punishments, in the discretion of the court.

Section 3—Every contract, combination in form of trust or otherwise, or conspiracy, in restraint of trade or commerce in any territory of the United States, or the District of Columbia, or in restraint of trade or commerce between any such territory and another, or between any such territory or territories and state or states or the District of Columbia, or with foreign nations, or between the District of Columbia and any state or states or foreign nations, is hereby declared illegal. Every person who shall make any such contract or engage in any such combination or conspiracy, shall be deemed guilty of a misdemeanor, and, on conviction thereof, shall be punished by fine not exceeding $5,000, or by imprisonment not exceeding one year, or by both said punishments, in the discretion of the court.

Section 4—The several Circuit Courts of the United States are hereby invested with jurisdiction to prevent and restrain violations of this act; and it shall be the duty of the several district attorneys of the United States, in their respective districts, under the direction of the Attorney General, to institute proceedings in equity to prevent and restrain such violations. Such proceedings may be by way of petition setting forth the case and praying that such violation shall be enjoined or otherwise prohibited. When the parties complained of shall have been duly notified of such petition the court shall proceed, as soon as may be, to the hearing and determination of the case; and pending such petition and before final decree, the court may at any time make such temporary restraining order or prohibition as shall be deemed just in the premises.

Section 5—Whenever it shall appear to the court before which any proceeding under section 4 of this act may be pending, that the ends of justice require that other parties should be brought before the court, the court may cause them to be summoned, whether they reside in the district in which the court is held or not; and subpœnas to that end may be served in any district by the marshal thereof.

Section 6—Any property owned under any contract or by any combination, or pursuant to any conspiracy (and being the subject thereof) mentioned in section 1 of this act, and being in the course of transportation from one state to another, or to a foreign country, shall be forfeited to the United States, and may be seized and condemned by like proceedings as those provided by law for the forfeiture, seizure and condemnation of property imported into the United States contrary to law.

Section 7—Any person who shall be injured in his business or property by any other person or corporation by reason of anything forbidden or declared to be unlawful by this act may sue therefor in any Circuit Court of the United States in the district in which the defendant resides or is found, without respect to the amount in controversy, and shall recover threefold the damages by him sustained, and the costs of suit, including a reasonable attorney's fee.

Section 8—That the word "person" or "persons" wherever used in this act shall be deemed to include corporations and associations existing under or authorized by the laws of either the United States, the laws of any of the territories, the laws of any state or the laws of any foreign country.

Approved July 2, 1890.

Committee on Steel Works Labor Conditions.—Chairman Gary of the United States Steel Corporation has announced in the past week the names of the committee provided for at the last annual meeting of the corporation to investigate labor conditions in the steel industry. Stuyvesant Fish, formerly president of the Illinois Central Railroad, is chairman of the committee, and the other members are T. De Witt Cuyler, Darius Miller, Charles L. Taylor and Charles A. Painter. Mr. Cuyler is a director in the Atchison, Pennsylvania and New Haven railroads. Mr. Miller is president of the Burlington. Mr. Taylor was formerly a partner in the Carnegie Steel Company and for a number of years has been one of the trustees of Andrew Carnegie's pension and benefit funds. Mr. Painter is a Pittsburgh banker. The committee will take up its work at once and sessions will be held in New York, Pittsburgh, and possibly at other places. The announcement of the personnel of the committee was delayed because some of those whom Chairman Gary asked to serve were unable to do so.

The Problem of the Trusts*

BY RICHARD OLNEY†

It is axiomatic that the law invariably lags behind the conditions and needs of progressive communities. Nothing more strikingly illustrates the rule than what has taken place in this country in respect to what are called the trusts. Under the statute of 1890 trusts, big and little, were outlawed. The executive department was required to exterminate them through the courts, their promoters and officers were put in the criminal class, and all persons injured by their operation were given claims for damages.

What has been the result of this 20 years' war upon the trusts—a war waged with the emphatic approval of the general public? So far from being eliminated, they have persistently grown in number and scope, and, economically speaking, have vindicated their economic right to exist and to stay.

Even the most ardent and eminent trust busters—among whom can be included an ex-President—have begun to perceive that the trusts are only a phase of financial development, and to realize that the relentless and indiscriminate assaults upon them are a serious menace to the country's commercial development and progress.

Even the United States Supreme Court shows the influence of the spreading of the reaction in favor of big business, and, recalling its original decision against it, now holds that there are good trusts and bad trusts, and that it is for it to determine which are good and which are bad—which shall live and which shall perish.

The Crucial Question

The Supreme Court is, of course, to be credited with good intentions, and by its latest decision in the trust cases unquestionably meant to come to the relief of the business of the country. But the crucial question is, Has it done so? In recanting and denying all combinations restraining trade in any degree to be unlawful, has it cleared up the situation or made confusion worse confounded?

The situation it dealt with was one in which the law was clear, but its enforcement so impracticable and repugnant to common sense that, as a rule, business thrived, or at least got along somehow by evading or defying the law at the practical connivance of its officers.

The situation the court has substituted is one in which the law is no longer clear—in which combinations must be adjudicated legal before there can be certainty as to the lawfulness of their organization of large enterprises; must always be effectually discouraged and repressed by the menace of litigation over their reasonableness with all the amending and inevitable uncertainties.

It will be conceded that big business is with us to stay. The financial chaos, the industrial and commercial stagnation and disaster that must ensue from reversion to the day of small things—to railroads 40 or 50 miles long, to factories and farms dependent for their operation upon the resources of some one individual, to independence and isolation among the captains of industry in place of interdependence and co-operation—are too glaring and too appalling to be welcomed by the sturdiest enemy of the present order of things.

Surely, if before the latest trust decisions big business was handicapped because it knew it to be carried on against the law, it is now none the less severely handicapped because, until the court gives it its benediction, it can never know whether its status is legal or illegal.

What business most craves of all things, however, is certainty, and certainty before it embarks upon an enterprise, and not merely afterward.

It cannot be gainsaid that large combinations of capital, for the financing of which every case must be a law unto itself and unto itself alone, and in which reasonableness, the supreme test of the validity of combinations and of the non-guiltiness of the combiners is a highly fluctuating factor, necessarily varying with the kind of business, with the time and place where carried on, with the indispensableness of the business in its relation to other businesses and the general welfare, with the extent of domestic and

*From the New York Times, October 28, 1911.
†Secretary of State in President Cleveland's Second Administration.

foreign competition, and with a multitude of other circumstances, chief among which will always be found to be the length of the Chancellor's foot.

The Supreme Court's Burden

If big business is to continue, though, as also the relations to it of the national judiciary, as defined in the latest trust decision, the result is that the national Supreme Court has taken upon itself practical charge of the business of the country. Nine-tenths of it will be done by the combinations, which will effectually control the other one-tenth, and the existence, character and proceedings of all will be dependent upon edicts of the Supreme Court. Was ever a country's judiciary in that position before?

Two things, it is believed, may be confidently asserted. In point of law the present position of the court is not tenable unless the constitution is to be regarded as obsolete and the national judiciary has become clothed with legislative and administrative as well as judicial functions.

In point of fact, the task of supervising the business combinations of 90,000,000 people, of passing judgment upon the reasonableness of the innumerable partnerships, firms, associations and corporations by which that business is done, is a task incapable of real performance by the national courts, because reasonableness is never the same in two cases, but in each must be separately investigated and determined.

Did the rule justify or call for any such application? Did it authorize or require the court to evolve out of its own inner consciousness a standard by which the reasonableness of business corporations should be determined?

The Supreme Court and the Constitution

In undertaking to settle such a standard without any guidance or clew from Congress as to the elements or requirements of the public policy involved did not the Supreme Court trespass upon a field committed by the constitution to the possession of Congress exclusively? And did not the rule of reason demand that the court should hold the statute to be altogether and incurably defective on the court's first version of it for the reasons the court set forth and on the second and only alternative version because that would enable and require the court to make its views of public policy the law of the land instead of the view of Congress?

These are the questions now being put by statesmen and lawyers and captains of industry and being more and more uniformly answered in the affirmative.

It is being more and more completely and generally realized that only the legislative department of the National Government is competent to determine what business combinations should or should not be permitted to carry on interstate and foreign trade, and that the question of public policy involved is not for the national judiciary, either as qualified by having power over the subject matter or as well fitted to make such pertinent investigations and obtain such pertinent data as are easily made by and easily accessible to Congress and its committees.

Lawyers in particular are impressed with the unfortunate consequences to the national courts likely to ensue from their undertaking the duties required of them by the late decisions of the trust cases. It is only too true that no uniform rule touching the reasonableness of the business combinations is likely to be found in the decisions of the various national courts of the country, that reasonableness in one district is likely to wear a wholly different aspect from reasonableness in another, that in the nature of things no consistent principle covering all such cases can be formulated by the Supreme Court, and that the result to be expected is not merely confusion and perplexity in business circles but great loss of prestige by the national judiciary.

Restraint of Trade

What must happen, perhaps, will be better realized if we assume the doctrine laid down in the recent trust cases to apply to restraints of trade other than those arising from business combinations.

Duties on imports, for instance, operate to restrain trade in the most effective manner. Suppose Congress, after giving a list of dutiable articles, should enact that the rate of duty in each case should be a reasonable rate as determined by the national courts, or should be a fixed rate, or such other rate as the courts might find reasonable. The result would be that a crowd of tariff cases would be likely to occupy those courts to the exclusion or detriment of all other cases and to produce such a congestion of business as to practically stop the wheels of justice.

Similar results are to be expected from the national courts undertaking to sit in judgment upon the reasonableness of all business combinations. Not only are the suits likely to be as numerous as they would be if the courts were to attempt to make reasonable tariff schedules; they necessitate investigations of a great variety of subjects, each requiring the ascertainment and analysis of masses of facts and the weighing of a great body of conflicting expert opinions.

By the way of illustration there could be nothing better than what the Tobacco and Oil cases have furnished.

The record in each is enormous. There are volumes of evidence, and the rise, progress and development of each industry to date are set forth at full length with all accompanying facts respecting foreign and domestic markets and foreign and domestic consumption and competition.

When it is remembered that every industry of the country and every business combination carrying it on may be subjected to the same ordeal, the wonder will be not that the mills of the national judiciary grind slowly, but that they do not cease grinding altogether.

The Supreme Court Made No New Rule

When the decision in the trust cases was first announced there was a general sigh of relief on the part of the American business world. Lawyers, statesmen and captains of industry joined in the chorus of praise for the judgment of the court. They were seemingly captivated by what struck them, or what they chose to treat, as a new discovery—namely, the existence of a rule of reason in accordance with which the courts discharged their functions.

They did not know, or ignored the fact, that there was nothing new about the rule; that the Supreme Court had not invented it for use in the trust cases, and that English jurists and English courts had acted upon it for centuries to the great advantage both of society at large and of the law itself.

Of late, however, praise of the court and of its adjudication have rather abruptly ceased and have given place to general skepticism, not as to the existence of the rule of reason and its value, but as to the justness of the application of the rule.

The President's Former Position

President Taft in his present record traveling and speechifying trip is vigorously lauding the Supreme Court's changed attitude on the trust question, and is vigorously assailing the views and motives of its critics. But it is clear that he once deprecated any such change, and was particularly alarmed by its probable effects upon the prestige and usefulness of the court.

In a special message to Congress in January, 1910, noticing the contention that "reasonable" should be a part of the statute, and that it should be left to the court to say what is a reasonable restraint of trade and what is a reasonable monopoly, he used this language:

> I venture to think that this is to put into the hands of the court a power impossible to exercise on any consistent principle which will insure the uniformity of decision essential to just judgment. It is to thrust upon the courts a burden that they have no precedents to enable them to carry and to give them a power approaching the arbitrary, the abuse of which might involve our whole judicial system in disaster.

It is quite impossible to believe that the law respecting big business will permanently stay in the condition in which the latest trust decisions of the court have landed it. Congress, and Congress alone, can effectually and permanently lift business out of the slough of despond in which it is now plunged.

It is its plain duty to vindicate its jurisdiction over the subject matter—to get all possible light upon it by proper investigations and by study of the experience of other countries; and, being thus informed and guided, to determine what are the conditions under which big business can be and ought to be carried on without loss of its advantages, but with practical elimination of possible dangers to the public welfare.

Taxable Valuation of Michigan Iron Mines

The Methods Followed in Making 400 Per Cent Increases—Profits Were Not Large, Yet They Were Realized in the Best Five Years the Iron Trade Has Known

BY DWIGHT E. WOODBRIDGE

Acting in general accord with a recent investigation conducted by J. R. Finlay, the State Tax Commission of Michigan has increased the taxable valuation of iron mines in the counties of Gogebic, Marquette, Dickinson and Iron—the entire Michigan part of the Lake Superior iron mining region—from $19,626,000, which was the return of the local assessors, to $85,637,500. This latter figure compares with the estimate of $119,500,000 which was given by Mr. Finlay as the total worth of these mines. As a result the iron mines will bear practically all the cost of maintenance of government in the respective communities where they are represented. At Negaunee, for example, the remainder of the city property will pay but 20 per cent. of the total sums raised by taxation.

High Valuations and Low Tax Rate

It is contended by members of the State Commission that it is their duty to assess all properties at actual cash value, meaning what the lands will sell for, and they did not believe that mines which, according to the statement of Mr. Finlay, had earned net some $57,000,000 in the past five years, were assessed too high at $85,000,000. They admit that the mines are now assessed at a higher rate than that applying to other properties, and expect to equalize this by raising other properties, which will reduce the share of taxes now to be paid by the mines. If everything is equally assessed, either at 33 or 66 per cent. or on some other basis, the result in collections will be the same. But if one class of property is assessed according to the law and other classes or other portions of the commonwealth at reduced rates, there is injustice.

One point is generally overlooked in this question of taxation; that is, that the amount to be raised for all purposes, local, municipal and State, is theoretically fixed and stationary, and if the valuation is high the rate will be low, and vice versa. Applying this to the mining districts of northern Michigan, it means that for all purposes, other than the trifling proportion of the total raised that is paid over to the State for general State expenses, the mining companies should pay little more on a high valuation than on a low one. Practically, there are two objections to this view. One is that while mining properties may be assessed at full value the property of the individual taxpayer is passed over more lightly, and he does not stand his due share. That the State Commission recognizes this fact is shown by its statement that other properties will probably be equalized somewhat. The other objection is that with a low tax rate and an opportunity to collect more money, the authorities usually succumb to the temptation to carry out improvements that may not be necessary, and that they could not initiate were the valuation less and the rate higher. This tends to force the mining companies to go into local politics for self-protection—something they should not be compelled to do.

The Minnesota Tax Commission's Method

For the past four years the State Tax Commission of Minnesota has controlled the taxation of all State properties, including the iron mines of the Mesaba, Vermilion and other districts. This commission is a permanent court, in continuous session, is the State board of equalization, and has complete powers covering all matters of taxation. It has spent much time in the consideration of mine taxation, and has scientifically evolved a method of mine tax valuation that, when introduced, was a rather radical departure; that is the plan of placing an ad valorem value and of taxing iron ore in the ground and by the ton. Recognizing the infinite variety of conditions covering mines, especially when some of them are open pit and some very deep, some of unprecedented tonnage and others quite small, with every variety of hematite ore, grading from the purest known to material that could only be utilized under exceptional conditions, the commission set up a system of classification comprising six varieties, and assessed active mine, reserves and sub-reserves under each, making in reality a total of 18 classes. The largest, highest grade and cheapest mined ore bodies paid in 1910 a tax upon a valuation of a trifle under 35 cents a ton; the lowest grade of reserves had a valuation of 8 cents a ton.

Michigan Valuation Increased 400 Per Cent

The Michigan Tax Commission, upon an investigation carried out as thoroughly as possible by Mr. Finlay and his associates, and upon its own cursory review of that investigation, has placed upon Michigan iron mines a valuation running up to more than 60 cents a ton, not alone on the amount of ore in sight, but also on that which is classed by Mr. Finlay as probable; that is, which may subsequently be found beneath the present bottoms of the mines and which is beyond any exploration or drilling that has been done. By so doing it has increased the taxable value of these mines by more than 400 per cent. A tabular statement of the valuations returned by the assessors and that fixed by the board will be of interest and follows:

	Assessed Value.	State Comn. Value.
Gogebic County:		
Oliver Iron Mining Company:		
at Wakefield	$15,000	$67,500
at Ironwood	1,800,900	14,591,000
at Bessemer	230,720	200,000
Newport Mining Company:		
at Bessemer	75,000	398,700
at Ironwood	1,471,061	8,535,000
at Erwin	120,000	610,000
Corrigan, McKinney & Co., at Bessemer	467,971	954,500
Brotherton Mining Co., at Wakefield	100,000	954,000
Sunday Lake Iron Co., at Wakefield	65,000	1,071,000
Verona Mining Co., at Wakefield	50,000	135,000
Keweenaw Assn., at Bessemer	165,000	234,400
Cleveland Cliffs Iron Co., at Ironwood	155,452	162,000
Ashland Iron Co., at Bessemer	277,054	432,000
Total	$4,913,158	$28,343,100
Dickinson County:		
Oliver Iron Mining Company:		
at Iron Mountain	$2,015,000	$4,988,000
at Norway	261,000	578,000
Penn Iron Mining Company, at Norway	586,700	1,200,000
Dessau Mining Company, at Iron Mountain	30,000	56,000
Pewabic Mining Company, at Iron Mountain	745,000	300,000
Monroe Mining Company, at Norway	12,000	20,000
Verona Mining Company, at Breitung	34,000	20,000
Loretto Mining Company, at Waucedah	52,500	269,000
Mineral Mining Company, at Waucedah	1,500	16,500
Total	$3,738,300	$7,447,500
Iron County:		
Corrigan, McKinney & Co.:		
at Bates	$10,000	$121,500
at Stambaugh	45,000	704,000
at Crystal Falls	311,500	1,919,600
at Mastodon	40,000	108,000
Oliver Iron Mining Company:		
at Stambaugh	110,000	632,000
at Hematite	27,000	63,000
at Mansfield	80,000	216,000
Munro Iron Mining Company:		
at Bates	25,000	471,600
at Stambaugh	84,500	127,000
Verona Mining Company:		
at Stambaugh	536,000	6,469,000
at Hematite	1,000	30,000
Bates Iron Company, at Bates	3,600	45,000
Davidson Ore Company, at Iron River	20,000	346,000
Mineral Mining Company, at Iron River	90,000	675,200
Jones & Laughlins, at Iron River	300	450,000
Niagara Iron Mining Company, at Iron River	20,000	195,000
Huron Iron Mining Company, at Stambaugh	86,000	375,000
Spring Valley Iron Company, at Stambaugh	60,000	481,000
Brule Mining Company, at Stambaugh	98,500	261,000
F. I. Carpenter, at Crystal Falls	1,350	50,000
Crystal Falls Iron Mining Company, at Crystal Falls	45,000	75,000
Neeley Exploration, at Crystal Falls	750	25,000
Amasa Porter Exploration, at Crystal Falls	500	45,000
Hemlock River Company, at Hematite	68,000	68,000
Bristol Mining Company, at Crystal Falls	143,750	865,000
Illinois Steel Company, at Crystal Falls	87,500	150,000
Cleveland-Cliffs Iron Company, at Bates	200	81,000
Total	$1,993,500	$15,046,900

Marquette County.	Assessed Value.	State Comm. Value.
Cleveland Cliffs Iron Company:		
at Ishpeming	$1,976,000	$6,490,500
at Negaunee	1,633,950	11,179,000
at Forsyth	594,100	2,039,000
at Ely	50,000	90,000
Oliver Iron Mining Company:		
at Ishpeming	600,000	4,050,000
at Negaunee	704,500	1,218,000
at Tilden	25,000	110,500
Jones & Laughlins:		
at Ishpeming	835,000	994,000
at Negaunee	200,000	900,000
at Tilden	8,000	10,000
Brotung Interests, at Negaunee	730,500	2,975,000
Republic Iron & Steel Company, at Negaunee	408,000	585,000
Winthrop Iron Company, at Tilden	310,000	1,870,000
Richmond Iron Company, at Richmond	15,000	179,000
Oliver Iron Mining Company, at Champion	300,000	652,000
Republic Iron Company, at Republic	351,000	942,000
Am-Boston Iron Company, at Ely	150,000	115,000
Excelsior Iron Company, at Ely	150,000	402,000
Total	$8,951,050	$34,800,000

It must be admitted that gross inequalities existed in an assessment that permitted one property to be increased 400 fold, while it reduced another. Many of the larger mines are increased tenfold. It is not improbable that serious efforts will be made to overturn the final figures of the State Tax Commission, and to bring in a valuation more closely approximating the opinions of mining men interested. Unless there is a decided advance in the valuations placed by the State on other classes of property this is reasonably sure to take the form of efforts at law.

Cost and Profits of Michigan Iron Ore

In this connection a summary of some of the figures in the extensive report of Mr. Finlay will be of general interest to mining men. The figures of costs and probable profits are of special importance. For purposes of comparison Mr. Finlay divided the iron ores of Michigan, not into ranges as they are geographically separated, but into classification by groups, based on essential uniformity of geological occurrence, which occurrence is the basis of and determines economical factors of costs and value. These groups are: First, the Gogebic range as a whole; second, what is known as the Iron River region, a part of the Menominee range; third, the Crystal Falls section; fourth, the Menominee district at and near Iron Mountain; fifth, the western Marquette range, Baraga County and vicinity; sixth, hard ore mines in and near Ishpeming and Negaunee; seventh, soft ore mines of the same region; eighth, the Swanzey district, Marquette range; ninth, various siliceous and other mines producing low grade ores and operating occasionally.

The following tables, based on returns for five years, give essential information as to these groups, and, while not precisely comparable on account of variations of accounting methods, are near enough to serve as a most interesting comparison:

Summary of Figures in the Report on Michigan Iron Mines.

Groups.	1	2	3	4	5	6	7	8	9
No. mines reported	20	29	25	12	3	11	20	13	11
Tons shipped*	54,480	6,160	13,000	41,600	1,180	46,000	35,000	2,400	1,200
Demonstrated reserves*	28,400	20,500	2,570	9,000	1,860	11,000	36,000	6,900	1,300
Probable extensions below bottoms*	18,000	45,000	7,000	9,000	200	21,700	17,000	4,100	none
Total mine cost per ton (items below)	$1.72	$2.28	$1.28	$1.42	$1.56	$2.10	$1.64	$1.81	$0.92
General exp., excl. taxes	.10	.09	.06	.10	.07	.14	.12	.08	.04
Const., devel. and explor	.27	.86	.26	.19	.21	.29	.19	.15	.22
Mining	1.35	1.30	.96	1.13	1.28	1.67	1.33	1.58	.66
Cost, f.o.b., Lake Erie	2.88	3.29	2.34	2.48	2.58	3.12	2.62	2.78	2.02
Av. expected value, per year	4.33	3.23	3.52	3.46	2.98	4.30	3.77	3.60	†
Expected cost per year	2.87	2.65	2.36	2.64	2.61	3.32	2.69	2.94	†
Expected profit per year	1.35	.58	1.16	.82	.37	.98	1.08	.66	†
Expected tonnage per year*	2,875	1,290	880	1,540	75	1,224	2,363	456	†

*In thousands. †No expectations given.

The Smallness of Profits

The one startling fact that shows throughout this table is the slight annual profit per ton, averaging but 86.5 cents for the Michigan region, considered in connection with the tonnage mined from each group. That this small profit has been secured in the five years admittedly more profitable than any similar period for a generation, only adds to the significance of the figures. In the face of this showing one will scarcely contend that mining companies are earning an exorbitant and extravagant profit. These figures of Mr. Finlay's thus analyzed, seem to indicate that the State Tax Commission was unjust in raising the tax value so sharply.

Mining Companies Not Tax Dodgers

If the mining companies of Michigan were as a rule tax dodgers, or if they were not continually taking thought of the communities in which they operate, to the improvement of those communities, if they were not steadily paying out large sums for the betterment of the towns—sums that should rightly be paid by general taxation—the feeling that they are being unjustly dealt with would not be quite so strong or so general. But of all the mining enterprises in the United States the iron and copper companies of Michigan, Minnesota and Wisconsin stand, if not pre-eminent, then in the very front rank of those whose care for their employees and whose interest in the communities in which they are located, is dictated by a higher policy than that of mere selfish business interests, however broadly one may construe the term business interest.

A Better Feeling Toward Railroads

Reports to the Railway Business Association, 2 Rector street, New York, from the 40 states whose legislatures met in 1911 show that a marked tendency, already widespread, has developed in the direction of a constructive policy affecting railroads, and in many instances affecting industry and business as well. The year's record is set forth in the association's Bulletin No. 9. President George A. Post says the association deems it "of high value that the experience of states long given to much regulation and now turning to a period of legislative rest should be made known in the language of the representatives of those states to their fellow-citizens throughout the nation." The Bulletin says that a number of states not hitherto active in adopting railroad restrictions enacted this year regulatory statutes, but viewing the whole country the most far-reaching tendency is a diminution or complete cessation of law-making affecting the carriers. No less than 24 states passed little or nothing. "Most striking of all, the states which have been pioneers in regulation and have up to a recent period done most in that direction seem to have nearly or quite given up the quest for further restrictions, and are now evincing anxiety to attract capital for the development of transportation and business." A constructive policy was urged by Governors whose messages are quoted at length in the text of the Bulletin, which consists of 32 pages.

Riggs, Distler & Stringer, Inc., 7 East German street, Baltimore, Md., have been awarded the contract for installing the heating and other apparatus for the new tower building of the Maryland Casualty Company. They are just beginning the work on their contract for the Springfield State Hospital, Sykesville, Md., to install one 75-kw., one 125-kw. and one 150-kw. Ames engines directly connected to three Fort Wayne generators of the same capacity; also two 400-hp. Edge Moor boilers with Wetzel stokers, together with pump, accumulator, piping and other accessories for the complete power plant and the tunnel work for the heating distribution system. The amount of this contract is $60,000. Their work on the Homewood and Latrobe apartment houses and Maryland Asylum and Training School for the Feeble Minded is nearing completion.

The M. Rumely Company, La Porte, Ind., is about to purchase for cash the assets and other property of the Advance Thresher Company, Battle Creek, Mich., and the Gaar-Scott Company, Richmond, Ind., for the purpose of rounding out its own line. Rapidly increasing sales of Oil-Pull engines have created a demand for other power-driven machinery.

Heavy German Tools for Turbine Building

Experience in Equipping Ordnance Works Applied to a New Industrial Field and Its Suggestions to American Tool Builders

BY C. A. TUPPER, MILWAUKEE

In the writer's recent tour of European shops one of the most interesting of the observations made—and one pregnant with suggestion for machinery manufacturers in this country—concerned the influence upon machine-tool construction of the enormous development abroad in the building of steam turbines, particularly marine turbines. At the outset, the work of machining turbine parts for the small units then placed in service offered no especial difficulties, and ordinary tools were used; but with the rapidly increasing dimensions of shafts, rotors, cylinders and outercasings it became necessary to build lathes, boring mills, etc., of corresponding capacity.

At the present time such concerns on the Continent as the Turbinia Deutsche Parsons Marine Aktien-Gesellschaft and the Allegemeine Elektricitäts Gesellschaft, Berlin; Gutehoffnungshutte, Oberhausen; J. A. Maffei, München-Hirschau; Sächsische Maschinenfabrik, Chemnitz; Maschinenfabrik Augsburg-Nurnberg, Nuremburg; F. Schichau, Elbing; Brown-Boveri & Cie., Baden and Mannheim; Escher-Wyss & Cie., Zurich and Ravensburg; Maschinenfabrik Oerlikon, Zurich; Franco Tosi, Legnano; Elektricitäts and Maschinenbau Akt. Ges., Prague; Erste Brünner Maschinen-Fabriks Ges., Brünn, and the Osterreichische Dampf-Turbinen Ges., Vienna, have installations for turbine construction which, in many of their details, rival the equipment in the great Krupp shops at Essen for the manufacture of heavy armor plate and ordnance.

German tool builders, having followed very closely the development of this new industry, were the first to take advantage of the opportunities thus afforded, and their continued specialization in this line, as contrasted with the relatively slower progress made in most other fields of machine-tool production, has attained unusual proportions.

Among the leaders in responding to the demand for tools to be used in heavy turbine work has been the Ernst Schiess Werkzeugmaschinenfabrik Akt. Ges., at Düsseldorf, by whose courtesy the writer was enabled to obtain the accompanying illustrations. These are from photographs of installations made for turbine manufacturers in the list above mentioned.

Some Gigantic Lathes

Fig. 1 shows a special lathe for turning the shafts and other rotating parts of large turbines. The distance between centers is 29 ft. 6 in. and the height of centers 5 ft. 4 in., giving a swing of 132 in. The swing over the carriage is 120 in. The face plate is 8 ft. 2 in. in diameter. As will be observed from the illustration, there is a massive double bed, which has a length of approximately 49 ft. and a width of 10 ft. 2 in. The bed has a continuous bearing surface and is provided with two carriages. These have both hand and power feed by means of the splined shaft, with cross-feed by screw. There is also a rapid-power traverse. The tail-stock has all of the characteristics and adjustments usual in large lathes. Each carriage carries the necessary mechanism for changing and reversing the feed. The near one also has a special arrangement for thread cutting, which can be done in lengths up to 32 in. There are four face-plate jaws. The main spindle, 16 in. in diameter, runs in adjustable bronze boxes and is driven from an Allegemeine 35-hp. motor at constant speed, which is 650 r.p.m. Twenty different speeds for cutting are obtained through gearing, which is readily manipulated by the operator. As a safeguard against overloading, the motor is provided with a slip coupling. All of the gears are made of special alloy steel and adjusted to insure long wear. The highest speed steel can be used with this lathe, and the work done is very

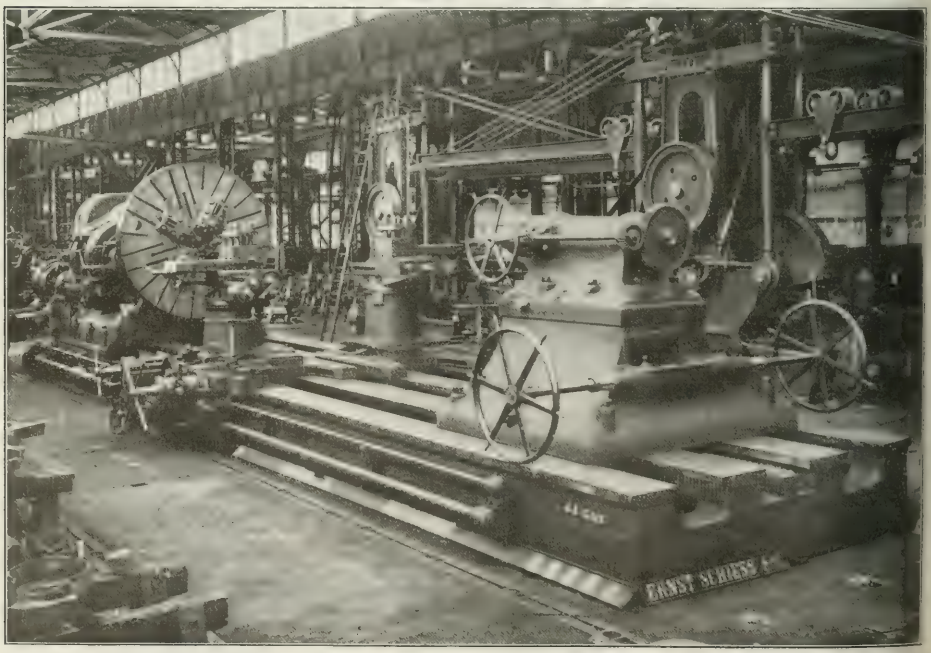


Fig. 1.—Lathe with 132-in. Swing and Weighing 209,437 lb., Built by the Ernst Schiess Werkzeugmaschinenfabrik.

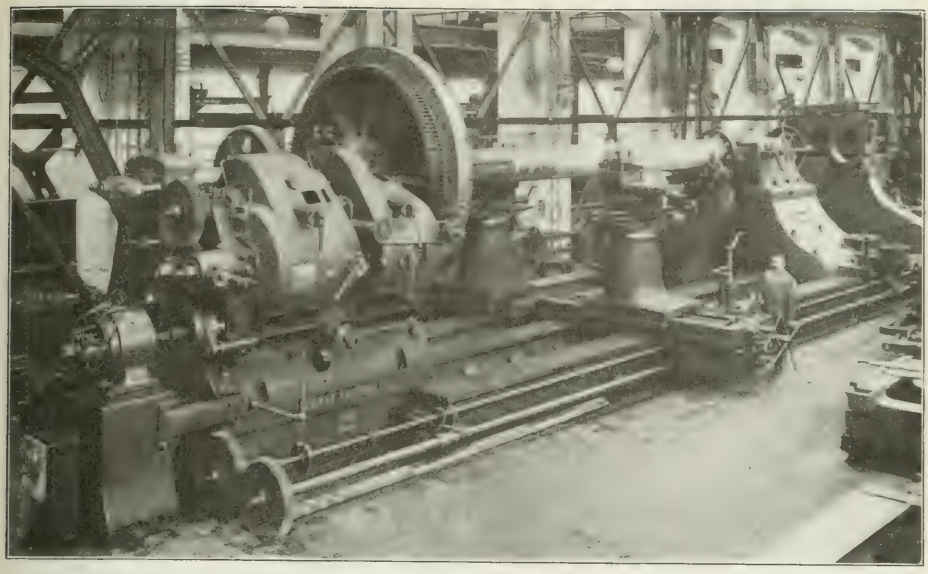


Fig. 2.—Lathe, 45 ft. 9 in. Between Centers and Weighing 418,874 lb. Adapted to Work 13 ft. 10 in. in Diameter

rapid for a machine so large in size. When fully fitted it weighs 209,437 lb.

In Fig. 2 may be seen a lathe similar to that shown by Fig. 1, but adapted to much larger work, up to 13 ft. 10 in. diameter. The hight of the centers is 7 ft. 10 in. and the distance between centers 45 ft. 9 in. The bed is 67 ft. long and 15 ft. 1 in. wide. Threads up to 39-in. lengths can be cut. The face plate is 11 ft. 2 in. in diameter. This machine is driven from a Brown-Boveri constant-speed motor of 60 hp. The weight is 418,874 lb.

Fig. 3 shows a still larger lathe of the same general description, which will take turbine parts up to 18 ft. in diameter. Normally the swing is 190 in., but by means of enlarging pieces this can be increased to 228 in. The drive of the main spindle is through gearing from a 90-hp Felten & Guilleaume-Lahmeyerwerke motor for variable speed, permitting 16 8/9 different speeds in combination. The bed, 85 ft. by 18 ft. 4 in., carries five slide rests, which can be independently adjusted. Two of the three front rests are arranged for thread cutting by means of a lead screw placed between the ways. The weight of the lathe is 717,495 lb.

This line of large lathes, which shows progressive development in size, will give the reader an idea of the increasing requirements of turbine-building shops, and in the space allotted to the present article there will hardly be opportunity to show more than one additional illustration. Hence for Fig. 4 the writer has selected the horizontal boring and milling machine shown. The standard of this is carried on a bed 67 ft. 7 in. long and 6 ft. 7 in. wide. The boring bar, of 10 in. diameter, is adjustable in the direction of its axis, can be used either one way or the other and given 24 speeds. The vertical adjustment of the milling saddle is 11 ft. 6 in. This tool is used for

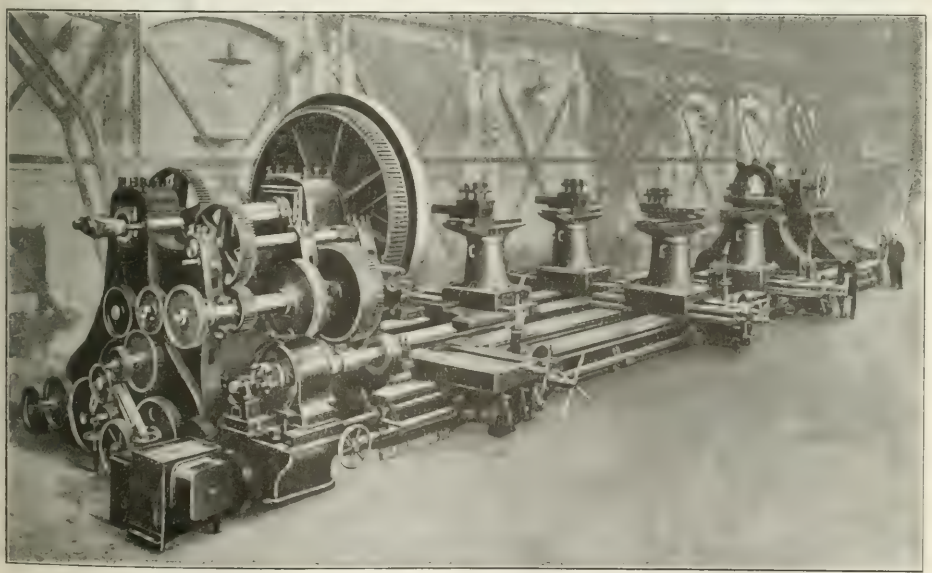


Fig. 3.—Lathe for Turbine Parts, 18 ft. in Diameter and Weighing 717,495 lb.

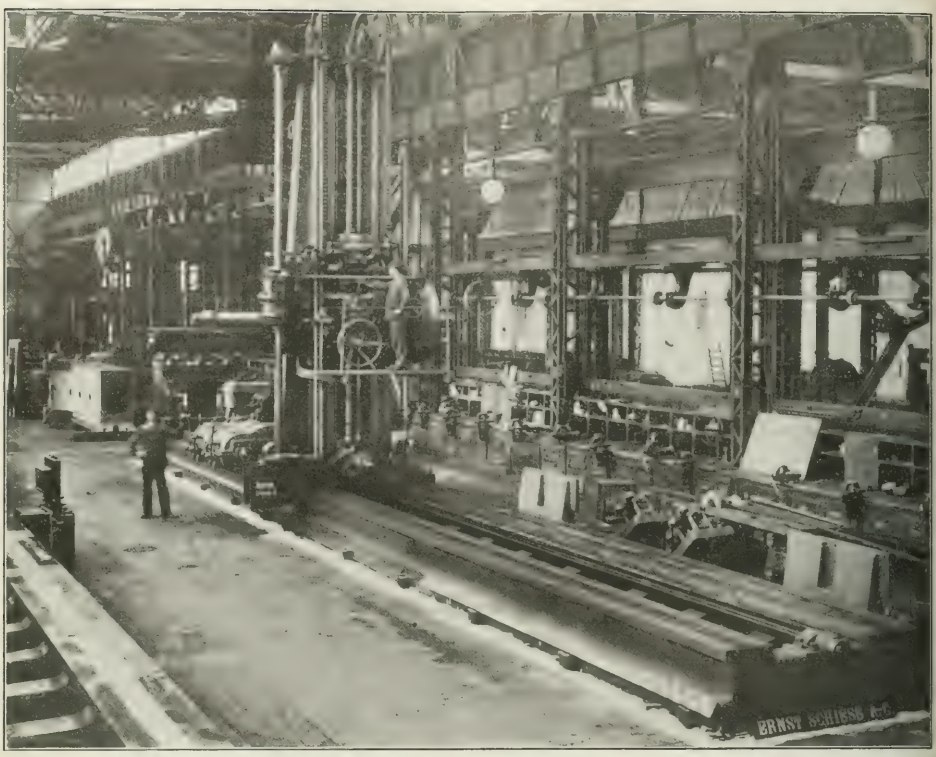


Fig. 4.—Horizontal Boring and Milling Machine with a 67 ft. 7 in. x 6 ft. 7 in. Bed.

boring and milling steam-turbine cylinders. It is driven from an Oerlikon induction motor, variation of speed being effected in the gear box.

Keeping Works Capacity Close to Developments

The works where these machines are built offer, in themselves, many features of interest to an American. They were establishd in 1866 by Dr. Ing. Ernst Schiess, and since the year 1869, when the manufacture of machine tools was first entered upon, they have built nearly 12,000. This, considering the fact that for many years past the machines have been largely of unusual size, is a remarkable achievement. Dr. Schiess and his associates have been "opportunists" in the highest sense of that word, and the course which they have taken to develop their business is, in many of its features, worthy of emulation by machine-tool manufacturers in this country. When the building of ironclad navies assumed large proportions, and heavy armor plates and guns began to be called for to provide the armament of both these and coast fortresses, Dr. Schiess kept pace with the requirements of the ordnance manufacturers, arsenals, shipyards, etc., until to-day his company is in a position to supply tools which will handle the largest, heaviest pieces. This experience was at once utilized when it became apparent that turbine building was tending towards sizes which would require similar equipment. A new line of machines has accordingly been developed, as illustrated in part herewith.

During the period mentioned Dr. Schiess has taken a very active interest in the commercial growth of the German Empire, including its merchant marine, and he has given particular attention to the extension of export trade, not merely what would have a direct effect upon his own business, but in its relation to the progress of the Empire as a whole. He bears the official title of Geheimer Kommerzienrat, or confidential counselor to the government in matters pertaining to commerce, and the writer understands that in this position he has rendered very efficient service. American manufacturers could well afford to devote some of their thought and energy in a similar manner to the general upbuilding of the trade of the country.

The Schiess Works at Düsseldorf

Although the Schiess works are located in the heart of Düsseldorf, close to the main railway station, where ground is very valuable, additions have had to be almost constantly in progress to provide the increased capacity needed, and the present area is about 14 acres, evenly divided between buildings and storage and switch yards. The pattern shop is unusually well equipped for a German establishment of this character, but is also one in which improved tools might be introduced to advantage from the United States and England. Some very large work is turned out here. The iron foundry, with cupola furnaces, drying ovens, large molding machines and very efficient cleaning apparatus, presents an appearance of great activity for the space. Castings up to 50 or 60 tons are produced. The forging department has a full complement of steam hammers and auxiliary appliances.

In the machine shops there are upwards of 500 tools, some of them being very large in size. The lathe shown by Fig. 1 has, for example, been adapted, with some changes, to the requirements of the builder's own work, and advantage has been taken of every possible facility for finishing heavy parts at high speed. A special feature is made of prompt delivery. The assembling department is provided with a shop 512 ft. long and 65½ ft. wide, having a clearance of about 40 ft. beneath the craneways. Industrial tracks and a system of large and small cranes play, of course, a very important part in handling material, and in general the plant presents features similar to one of the same class in this country. There is a central power and compressor station, and all tools are driven either in groups or singly from electric motors, with the exception of pneumatic appliances. The generator station has a capacity of about 1000 kw. These shops contain a smaller percentage of American tools than most of the larger plants in the Düsseldorf district, due mainly to the fact that the company can supply such a variety of its own equipment. It is questionable, however, whether this has been to its advantage, for the benefit to be derived from the experience and specialization of others has thereby been lost.

The company's products, which include lathes, planers, shapers, slotters, drilling, boring and milling machines, punches and shears, bending and straightening rolls, cold and hot cutting saws, threaders and cutters, grinding machines, hydraulic and power presses, wheel-molding machines, and special equipment for iron and steel works, ordnance plants, gun shops, engine and turbine-building plants, boiler shops, iron and steel fabricating, steel-ship building, rolling and tube mills, locomotive, axle and wheel shops, electrical works, railroad shops, etc., bear the impress of the large and almost continuous orders turned out for the various Krupp plants, where probably a majority of the heaviest tools are of Schiess design. The influence of the new industrial development of Germany, including the requirements of steam and hydraulic turbine and gas-engine construction, as well as the growing opportunities for railroad and other government work, is leading tool designers into new fields which in time will be greater than the old. In its adaptation to these modern needs the Schiess organization is again playing the role of pioneer, just as in the case of armor plate and ordnance, and it represents to-day the independent order of German machine-tool building which, far from imitating American models, is making a distinct contribution to the world's progress in efficient methods of metal working.

The Wiener Machinery Company, 50 Church street, New York City, is the representative in the United States and Canada of the Ernst Schiess establishment.

The Black Revolving Steam Feed

Under a patent recently granted to L. J. Black, the Beaumont Iron Works Company, Beaumont, Texas, is manufacturing a new type of revolving shot gun feed for steam saw mills. The special advantage claimed for this feed is that it is designed so that it can be turned at regular intervals, thus preventing the bottom of the gun from dragging out by the rod and head. This arrangement, it is pointed out, enables the user to keep the gun round and have the rings fit at all times with a corresponding increase in efficiency due to the elimination of steam leakage past the piston.

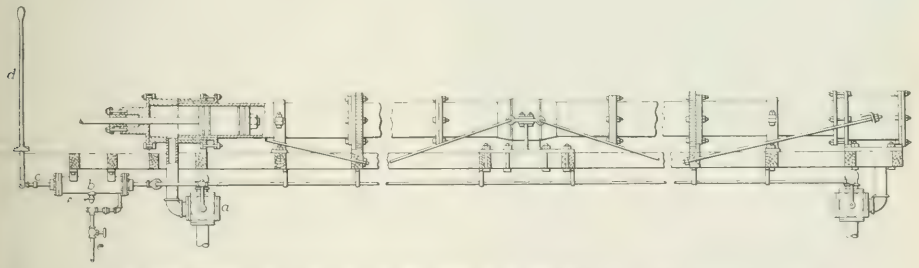
These results are secured by a special design of stuffing box at each end of the gun, which is built upon the principle of the ordinary piston rod stuffing box. The two end sections of the gun have no flanges on one end and are turned on the outside for a distance of 18 in. from this point. The turned part is inserted in the stuffing box, which is fitted with a brass ring 6 in. wide and having room for four rings of 5/8-in. packing and a gland. These sections at each end are bolted securely to the floor by four bolts in each side of the foot, which is 24 in. long. The general construction of the gun is the same as the older type, but in the center, one joint is cast with two bosses, 1½ in. high and 8 in. apart, around which are fitted clamps made in two sections with a foot 40 in. long, which is bolted to the timbers. The clamp is held together at the center by bolts and the special arrangement of the wrought-iron lugs to which are attached two rods running in each direction toward the ends of the gun and fastened to the timber on which it is mounted. The end stuffing boxes are anchored in the same way, each intermediate section of the gun having a 4-in. clamp which forms a cradle for it.

The center bearings or clamps have a machine fit between the bosses which takes up the thrust of the gun in either direction. The intermediate bearings are a loose rolling fit which permits the gun to expand from the center into the stuffing boxes on either end, thus caring for the expansion or contraction of the gun. Bearings are provided for each intermediate section so that there is a rest in the center of each section of the gun.

The gun is fitted with two gears, one near each end and bolted on the flange with the same bolts that hold the joints of the gun together. A small ratchet arrangement meshes with these gears and enables the gun to be turned sufficiently with one stroke of the lever to move the center enough to prevent the rod dragging in the same place.

The special type of valve controller known as the Martin valve controller is used with this feed. In installing this controller the steam feed valve *a* is placed on center and the controller *b* is conveniently located with reference to the steam line and in line with the rod *c* leading from the steam feed valves to the sawyer's lever *d*. The controller is then bolted securely to the timber and placed on center so that the stroke each way is divided in half. The stubs are attached to the pipe which makes the rod that pulls the steam feed valve and to the rod leading to the lever. In making this connection care must be taken that both steam feed valves and the controller are exactly on centers. The ½-in. steam line *e* is connected to the controller by two ¼-in. pipe branches, and it is recommended by the builder that valves be placed in each connection close to the controller as well as a valve in the main steam line near the point where it branches. The ¾-in. pipe *f* is the exhaust and can be turned in the most convenient direction. This controller is so constructed that the mere moving of a piston inside of a larger valve causes the steam to work at either end of the cylinder, thus pulling the valves open and closing them at will. It is emphasized that the controller, which is in reality a little engine, is positive in action, and is so arranged that if the steam is shut off the operator still retains control of the steam-feed valves in the same way as is the case with the rig ordinarily used.

The steam-feed valves employed are of the rotary or rocking type and are so constructed that they can be used either in a single or a double valve as illustrated. It is claimed for this valve that there are no loose bolts, nuts or rings on the inside to get out of order or cause trouble; while in action the valve is quick and positive and will handle steam having a high percentage of moisture.



The Black Revolving Steam Feed for Saw Mills Made by the Beaumont Iron Works, Beaumont, Texas

Iron Ore Rates from Lower Lake Ports.—A conference between representatives of railroads handling iron ore at Lake Erie ports and Commissioner Lane of the Interstate Commerce Commission was held at Washington last week. Commissioner Lane desired to discuss the different phases of ore handling from vessels to furnace yards and the conditions governing rates, so that uniform methods could be adopted which would be reasonable and legal. The practice of the railroads for a number of years of making rebates to shippers on ore loaded direct from vessels into cars, as distinguished from ore placed on dock, was gone into. The railroads explained that these rebates were open to all shippers and were a method of readjusting the freight charges of previous years which were found to be excessive. The question was raised whether any preferential rates were made in the form of prorating to terminal railroads. It was agreed that the railroads should appoint a committee to consider the questions involved and submit a plan that will properly meet the present situation.

New Water Cooler

Details of a Device Brought Out by the Power Specialty Company

For cooling circulating water for gas and oil engines, air compressors and steam and ammonia condensers; for treating air requiring heating, cooling, washing, humidifying or dehumidifying, and for concentrating liquid solutions of all kinds, the Power Specialty Company, 111 Broadway, New York, N. Y., has placed on the market the Power water cooler. The device can be located wherever desired, either in the engine room upon the floor or upon a shelf, or if there is no space available in the engine room, it can be placed in the basement or an adjoining room. When, however, the coolers are aranged for use in connection with an engine employing suction gas it is especially desirable that they be located in the engine room and arranged to thoroughly ventilate it on account of the poisonous properties of the fuel. Views of the cooler from the driving and the discharge ends are given in Figs. 1 and 2 respectively, while Fig. 3 illustrates a typical installation.

As will be noticed from Figs. 1 and 2, the cooler consists of a horizontal, cylindrical chamber or casing through which air is passed, a rotor within the chamber forming

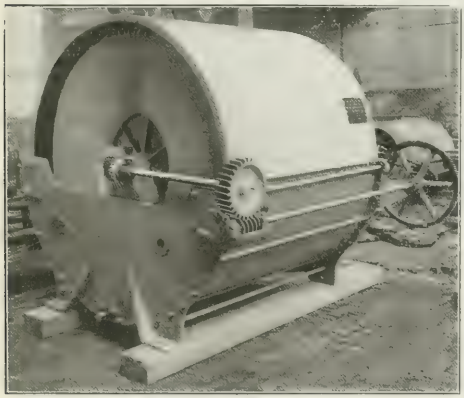


Fig. 1. The Driving End of a New Type of Water Cooler Built by the Power Specialty Company, New York, N. Y.

the moving cooling surface, a fan for circulating air and a pump, when needed, for circulating water. Sheet or cast iron or concrete is used for the casing according to the size of the machine, and the lower part of the casing

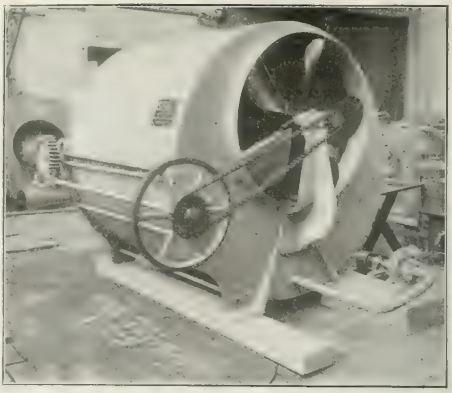


Fig. 2.—The Discharge End.

forms a trough in which water circulates. The rotor, which is made up of thin annular plates nested concentrically and supported from a central shaft that revolves slowly in outside bearings, completely fills the casing. The fan is mounted at the end of the casing and blows air between these plates.

In operation for cooling water the air and the water are passed through the machine in opposite directions, thus forming counter currents. The slowly revolving plates pass through the water in the trough in the lower part of the casing and through the air in the upper portion of the chamber. In this way the freshly wetted surfaces are brought into contact with the air current at each revolution and the thin film of water on the surface of the plates is partly evaporated by the air passing over them. This causes the heat given to the plates by the warm water to be rendered latent, while additional heat is extracted from the water by conduction so that the cylinders are continually cooling the water. Under ordinary atmospheric conditions from 1½ to 2½ per cent. of water is evaporated and this is made up automatically by connecting the cooler to any ordinary source of fresh water supply. The power required to operate the cooler, including the fan and the circulating pump, is said to be approximately ½ per cent. of that developed by the engine being cooled.

As will be noticed from Fig. 3, which shows one of the coolers installed in an engine room for cooling gas engine jacket water, the machine is very compact and occupies small space and requires no storage tank. As compared with the cost of the water storage tanks required by large engines, with the necessary heavy walls and steel supports, it is claimed that the cost of a complete instal-

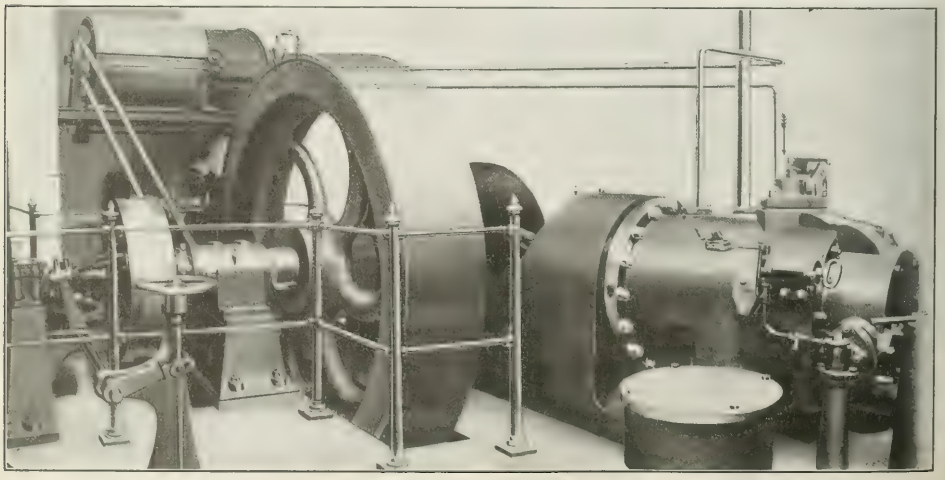


Fig. 3. The Power Water Cooler Installed in an Engine Room for Cooling Gas Engine Jacket Water.

lation of the cooler is frequently less, and at the same time the work is said to be done continuously and better than the storage tanks can do it. Installed in connection with a gas engine, the cooler extracts the heat from the water leaving the cylinder jacket as rapidly as it is made and returning the water to the engine cooled to the proper temperature. In this way it is claimed that troubles from carbonization, back-firing, etc., are eliminated. When installed in connection with suction gas plants the cooler eliminates the necessity frequently resulting of running the water supply continuously through the cylinder jacket, owing to lack of space for the large storage tanks required, with the result that the cost of water might equal the cost of the fuel. Since the cooler takes up much less space than the tanks and can be located in any convenient place, it is possible to utilize suction gas for fuel where it otherwise might not be possible. The engine works under the same jacket water temperature throughout the entire run, while the heat is dissipated by the cooler as fast as it is made and not stored.

In addition to being used in connection with the cooling of jacket water, the cooler can also be used for cooling air, and as cold water is circulated through it the temperature of the air can be reduced to within a few degrees of that of the water. In connection with refrigerating machinery the device may be employed to bring the air down to 10 or 15 deg. F. When installed for this purpose two-stage coolers are used, the first employing cold water at about 40 deg. F., and the second stage making use of brine at about 5 deg. F. The moisture in the air is deposited on the plates of the cylinders as the air is cooled down, and there is no trace of free moisture leaving the cooler. The cold air may be used for cold storage or other purposes. Other applications of the cooler are as an after cooler to supply cool compressed air to air locks and for cooling air in connection with the dry blast of blast furnaces. When used in connection with one of these installations all the brine piping is eliminated with a corresponding reduction of the cost of the installation and the buildings required to house it. Two-stage cooling is used in this case, which results in a considerable saving in the amount of power required to operate the plant. All trouble from frosting is said to be eliminated when the cooler is used for this purpose, as no frost forms on the surface of the apparatus, and at the same time a uniform volume of air can be delivered to the furnace continuously.

Exports of Manufactures Approaching Billion-Dollar Line

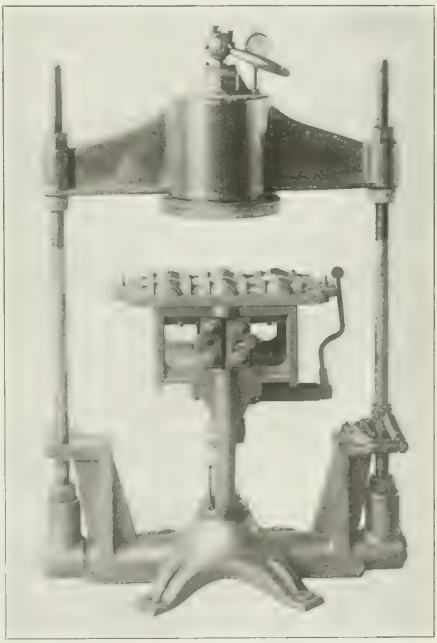
The value of manufactures passing out of the United States in the calendar year 1911 may exceed one billion dollars. This estimate is based upon figures of the Bureau of Statistics, Department of Commerce and Labor, covering the exports of manufactures in the nine months ended with September, 1911, which amount to 478½ million dollars for finished manufactures and 240½ million for manufactures for further use in manufacturing, making the total exports of manufactures in the period named 719 million dollars, against 612 million in the like period of 1910. The increase in the nine months of 1911 over the like period of 1910 is 17.48 per cent, and in case the increase during the remainder of the year continues at the same rate the total value of manufactures passing to foreign countries in 1911 will be about 970 million dollars. When to this is added the value of manufactures going to Alaska, Porto Rico and Hawaii, not included in the exports to foreign countries, the total outward movement of manufactures from continental United States in 1911 will pass the billion-dollar line. This will bring the total value of manufactures exported in 1911 to more than twice that of 10 years ago and more than five times that of 20 years ago, the exports of manufactures in 1901 having been 447½ million, and in 1891 about 185 million dollars.

Practically all the leading articles of domestic manufacture show increased exports when compared with the preceding year, many of them making new high records in the year now approaching its close. Iron and steel manufactures, which head the list of domestic manufactures exported, give promise of a total of 250 million dollars in the calendar year 1911, compared with 201 million in 1910 and 102½ million in 1901, a decade earlier. Copper manufactures, including pigs, bars, etc., will approximate 100 million dollars in the year's exports, compared with 94 million in 1910 and 33½ million in 1901.

Power Squeezing with Molding Machine

Arrangement of Drop Plate and Stripping Plate Molding Machines

Following four years of development and testing under working conditions, Henry E. Pridmore, Nineteenth and Rockwell streets, Chicago, has placed on the market an arrangement of its standard drop plate and stripping plate molding machines which offers the added advantage of a power squeezing attachment. The accompanying illustration presents a view of this machine upon which a valve body pattern is mounted. The device consists of the standard type Pridmore machine to which has been added suitable standards and swinging uprights for carrying an air cylinder. The cylinder is cast integrally in a heavy ribbed frame, which is adjustable on the uprights for flasks of varying heights. Air of 70 lb. pressure is most satisfactory for the operation of the machine. The cylinder is provided with a guide for the piston to prevent its turning. The space between the uprights has been made sufficient to keep the draw lever close to the flask and in a position where it may be operated by the workman's knee. Flasks up to 18 in. square or 20 in. diameter can be accommodated.



Molding Machine, Made by Henry E. Pridmore with Power Squeezing Attachment.

The spring and balancing attachment, controlling the uprights, are placed at a point well above any piles of sand on the foundry floor, to obviate the possibility of accumulations in the mechanism which would tend to clog the operation of the uprights. The stock machine has a draw of 4⅝ in., which may be increased to 6 in. A number of machines have been installed at the plant of the Pratt & Cady Company, Hartford, Conn., where they are used for making valve molds, and there unusually favorable records have been made. Using a standard square machine with the power squeezing attachment on 1-in. valve patterns, one man put up 310 flasks per day, the work incidentally requiring the setting of twelve cores. Working on 1½-in. valves, one man put up 260 flasks per day.

Oil-Fired Furnaces for Automobile Parts

A Recent Installation of Buckeye Furnaces for Case Hardening and Heat Treating Gears

An interesting Buckeye oil furnace equipment was recently built by Walter MacLeod & Co., 213 East Pearl street, Cincinnati, Ohio, for the Warner Mfg. Company, Toledo, Ohio. It is to be used for case hardening and heat treating the automobile transmission and steering gears made in the Warner Company's plant, and consists of five case-hardening furnaces and two heat-treating furnaces, together with the various auxiliaries, such as a blower, oil pump, pyrometer equipment, oil storage tank, air and oil piping and pressure gauges and a meter for determining the consumption of fuel. The heating chamber of each case-hardening furnace is 54 in. wide and 72 in. long, the five being combined in one battery, as shown in Fig. 1. Fig. 2 illustrates the two heat-treating furnaces, each of which has a heating chamber 32 in. in width and 49 in. in length, together with an A.B.C. steel fan pressure blower, which is driven by a direct-connected motor.

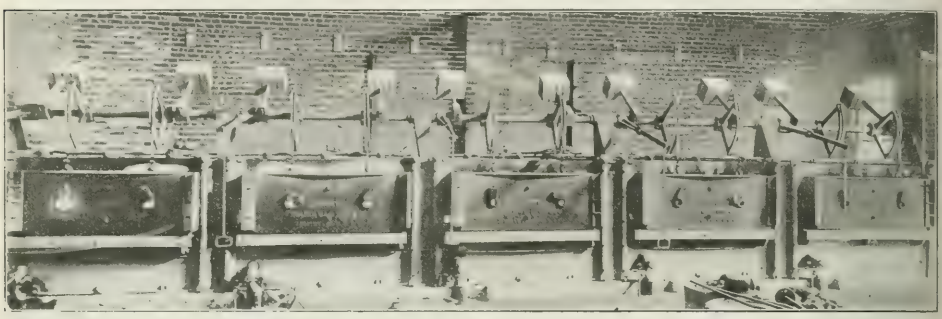


Fig. 1.—A Battery of Five Case-Hardening Furnaces for Automobile Parts Made by Walter MacLeod & Co., Cincinnati, Ohio.

The furnaces are of the semi-muffle type, the combustion chamber occupying a position adjacent to the heating chamber. This construction, it is pointed out, causes the gases to be carried to the arch of the heating chamber, and after heating the material they pass out and into flues in the side walls leading under the hearth to the top of the chamber. This construction also takes advantage of the natural tendency of the hot gases to rise, and it is emphasized that in this furnace but little expense for the renewal of the hearth and the baffle blocks is incurred, since the former is practically a solid foundation built of ordinary firebrick, the top course of which alone requires renewal due to the constant wear of the boxes. Common fire brick is used to form the pockets, and these can be removed in a few minutes while the furnace is hot if necessary.

One oil burner suffices for each furnace, and this is placed in front of the furnace and parallel with the combustion chamber, an auxiliary air blast entering at the opposite end and taking the place of a baffle. The burners used are of the builder's standard pressure blower type and are operated with an air pressure of 9 ounces. The auxiliary air blast is controlled by a valve located just below the oil burner, thus enabling the operator to fire and regulate the furnace easily.

A uniform distribution and maintenance of a temperature of 1560 deg. F., it is stated, is secured with a variation of not more than 20 deg. throughout the hearth. The case-hardening furnaces also operate at this temperature, but at the discharging periods this is lowered 250 deg., the loss being made up in 30 min. The capacity of the case-hardening furnaces at this temperature is 190 sets of transmission gears per 24-hour day, with an average penetration of 1/32 in. The carbonizing material used is granulated raw bone, and the work is done with an oil consumption of 840 gal., which is equal to 4.4 gal per set, which at a cost of 2¼ cents per gallon for oil makes the cost of the hardening operation 9.94 cents per set; the oil consumption of the heat-treating furnaces which are used for various classes of work is 4 gal. per hour on an average.

The supplies of oil and air are furnished by an electrically-driven unit consisting of a No. 8 steel pressure Type P blower built by the American Blower Company, Detroit, Mich., connected by a flanged coupling to a 15-hp motor mounted on a pedestal attached to the side of the blower and a No. 1 Buckeye rotary oil pump that is mounted on the blower pedestal and driven from the blower shaft by gearing. The capacity of the blower installed, it is explained, is in excess of the present requirements, but was adopted with a view to taking care of additional furnaces to be installed at a later date. When this installation is made to take care of future requirements it will only be necessary to increase the speed of the fan and the horsepower of the driving motor, as the piping has been arranged for the maximum capacity of the fan. At present

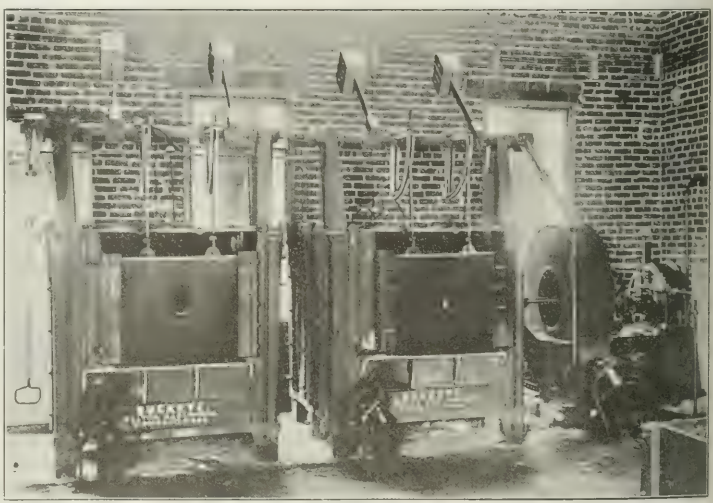


Fig. 2.—Two Oil-Fired Heat-Treating Furnaces.

the fan is driven at a speed of 1460 r.p.m and approximately a 20 per cent. ratio opening is used which supplies 2830 cu. ft. of free air at a pressure of 9 oz. per minute. The oil pump is fitted with check and relief valves, pressure gauge, primer and the other necessary auxiliaries for a suction return system drawing oil from a central storage supply. The pump draws a supply from an oil storage tank having a capacity of 12,000 gal., and when operating at a speed of 180 r.p.m. will deliver 9 gal. per minute at a pressure of 40 lb.

The pyrometer employed is of the Taylor multiple indicator wall type, with base metal thermo-couples, one for each chamber being located in the center of the rear wall.

The Economy Welding Machine

Both large and small repair shops have been considered in the design of a new portable welding machine that has been placed on the market by the Economy Welding Machine Company, Kansas City, Mo. The special features of the machine are a new type of carbide to water feed and the adaptability of the welder for small shops. Fig. 1 is a general view of the machine, while Fig. 2 shows an enlargement of the upper portion of the acetylene generator and the feeding device.

As will be noticed from Fig. 1, the machine is of the portable type and is entirely self-contained. The oxygen is stored in the large tank at the left after being generated in the small retort shown in the lower left corner which is filled with a mixture of potassium chlorate and black oxide of manganese in the proportion of 112 to 18. These chemicals are placed in a pan which is inserted in the retort after the burners which heat the welder have been lighted about 20 min. The gas passes off into the tank at the left, where it bubbles through water to which a little caustic soda has been added. The gasoline for heating the burners is supplied from the small elevated tank located directly over the retort. In generating

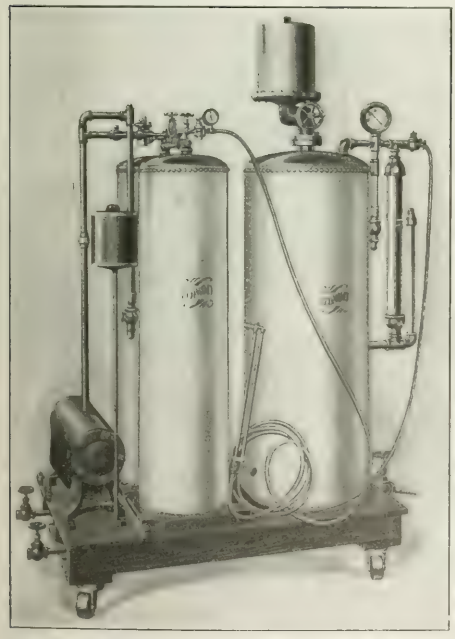


Fig. 1.—A New Portable Welding Machine Built by the Economy Welding Machine Company, Kansas City, Mo.

the gas care must be taken not to produce too much heat, as, otherwise, fusing of the iron in the retort might occur. To prevent this the builder recommends that in using a machine equipped with three burners the middle one be turned out as soon as the gas begins to pass into the tank if work is being done indoors, but if working in the open air this precaution need not be taken.

In generating the acetylene the calcium carbide which is placed in the small hopper tank shown above the large tank at the right of Fig. 1 and at the top of Fig. 2. The hand wheel which is shown back of the horizontal pipe

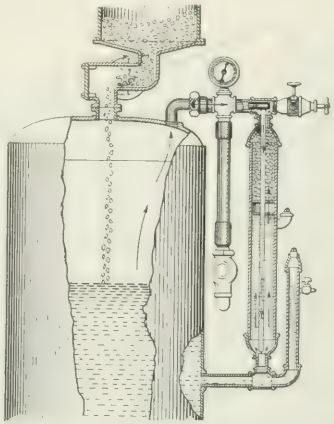


Fig. 2.—View Showing the Upper Portion of the Acetylene Generator and the Feed.

connecting the hopper with the large tank in Fig. 2 is turned until the pressure gauge at the right of the large tank registers 10 lb. This hand wheel operates the small star wheel shown in the horizontal pipe and feeds the required amount of calcium carbide into the large lower tank where acetylene gas is generated. This small star wheel rotates and feeds the carbide until sufficient acetylene gas has been generated.

The two gases are led through lines of rubber hose to the torch which is shown on the base of the machine leaning against the acetylene tank. This torch is of the medium pressure injector type and uses acetylene at a medium pressure. In this way it is pointed out that a surplus of acetylene is forced into the torch. Back-firing is said to be avoided in this torch since the gases are mixed approximately 1 in. from the nozzle in a specially designed mixing chamber. In use this torch is said to be very economical since it does not blow out and waste gas while the torch is being readjusted.

This machine is used for repairing castings of various metals which have become broken, drop forgings or combinations of metals; building up worn parts of machinery, such as lugs, bosses, etc.; adding teeth to gear wheels and for cutting boilers, I-beams and other parts that are to be junked.

Automobiles have played a large part in the country's export trade in the past six months, an average of 150 machines a week having been shipped from the port of New York alone in that time. As a climax of this movement, the New York Central, October 31, brought to New York a special train of 40 cars, all loaded with automobiles from Detroit for export. The contents of the train consisted of 160 machines from the E-M-F factory, of which 80 are for London and the remainder for Australia. The United States is shipping motor cars to countries which not very long ago were sending some of their output here. The durability and lower prices of American cars are held to be the chief causes of their popularity abroad.

At a meeting of the Executive Committee of the Master Boiler Makers' Association, held at the Fort Pitt Hotel, Pittsburgh, October 28, it was unanimously decided to hold the sixth annual convention of the association in Pittsburgh May 14 to 17, 1912, with headquarters at the Fort Pitt Hotel. George N. Riley, National Tube Company, was made chairman of the General Committee of Arrangements and Roger T. Flannery, Flannery Bolt Company, secretary and treasurer.

The Ransom Portable Grinder

A portable motor-driven grinder has been recently brought out by the Ransom Mfg. Company, Oshkosh, Wis., and the accompanying engravings show it in use at the plant of the Price Steel Company, Milwaukee, Wis. Fig. 1 shows the grinder in some detail, while Fig. 2 illustrates its use for grinding the interior surface of a large casting.

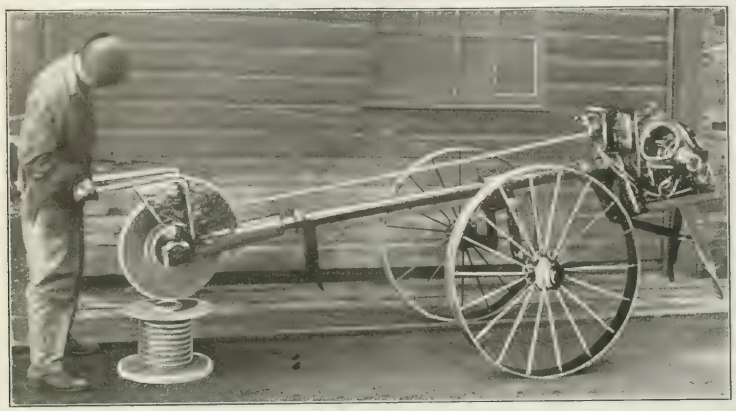


Fig. 1.—The New Portable Motor-Driven Grinder Built by the Ransom Mfg. Company, Oshkosh, Wis.

In the construction of the machine steel castings have been employed throughout. A 5-hp. motor supplies the power for driving the grinding wheels which can have a maximum diameter of 24 in. and a maximum face width of 3 in. The motor plate is connected to the arbor yoke by a 2½-in. gas pipe which telescopes to permit the tension of the belt to be adjusted. The diameter of the arbor is 2 in. The grinder is mounted on a truck having two 42-in. wheels which are set so that the distance between them is equal to their diameter. The weight of the machine exclusive of the driving motor and the grinding wheel is approximately 600 lb.

Bessemer Gas Engines.—Four attractive pamphlets have been recently issued by the Bessemer Gas Engine Company, Grove City, Pa., relating to its line of gas engines and their applications. The first of these presents illustrations and a brief description of the engines, which are of the single-acting type and are characterized by a compact construction, having few parts. These parts are all illustrated and briefly described. The various types of engines are shown, together with compressors, gasoline plants, engine-driven pumps and gas producers. The second pamphlet, which is known as Bulletin B, deals with the Bessemer direct-driven gas and air compressors. The construction of these compressors is described at some length, and a partial list of users is given, together with half-tone engravings of several installations. The third pamphlet, which is entitled, "The Production of Gasoline from Natural Gas," is a reprint of an article appearing in the company's house organ and shows how a large percentage of the gas burning waste product of oil operations can be utilized. The last pamphlet is termed "The Blue Book of Bessemer Buyers" and contains a partial list of users, together with views of installations and a number of testimonial letters.

Due to the fast increasing business in Birmingham, Ala., the H. W. Johns-Manville Company has found it necessary to remove its office from 1220 Empire Building to 606 Chamber of Commerce Building, this latter location being better adapted for its requirements. The Birmingham office will continue under the management of W. H. Fleming, who is well and favorably known throughout that section of the country, having been connected with the New Orleans branch of the company for a considerable time. A complete line of J-M products, electrical supplies, packings, etc., will be handled from that office.

Some interesting facts regarding the Atlantic fleet mobilized recently in New York have been collected by the International Steam Pump Company and not the least interesting fact to the company is the finding that of the 102 vessels comprising the fleet Blake & Knowles pumping equipments were provided on 65 of the 93 vessels carrying steam pumps. The fleet had a combined displacement of 577,285 tons, not including eight submarines, exceeding the San Francisco mobilization in 1908 by 169,361 tons; the total horsepower of the vessels, exclusive of submarines, was 946,811; all but the Iowa have water tube boilers; the average speed of the vessels is 21.6 knots.



Fig. 2.—The Grinder In Use on the Interior of a Large Casting.

The Stanley Steel Corporation investigating committee adjourned November 2, subject to the call of Mr. Stanley, who is in Kentucky in connection with the political campaign. The committee will reconvene November 20.

A Blast Furnace Charging Car

In the past 12 years a number of charging cars have been built, and from time to time improvements have been made in an effort to simplify the system, reduce operating cost and to cut down repairs to a minimum. A 5-ton electrically operated charging car, the invention of George K. Hamfelt, is shown in the illustration, applicable to an overhead, parabolic-shaped bin system and so designed that one man can weigh and charge all the material required, except the coke, for a modern blast furnace of 600 tons daily capacity. The car is mounted on four wheels for standard gauge track and is movable on the track along the bin by means of an electric motor geared to the traction wheels, in a way similar to that employed in street car service. For the purpose of weighing the materials the charging car is also provided with a Fairbanks 8-lever suspension scale, arranged so that the receiver is always suspended on the pivots of the scale, and easily accessible for inspection and cleaning.

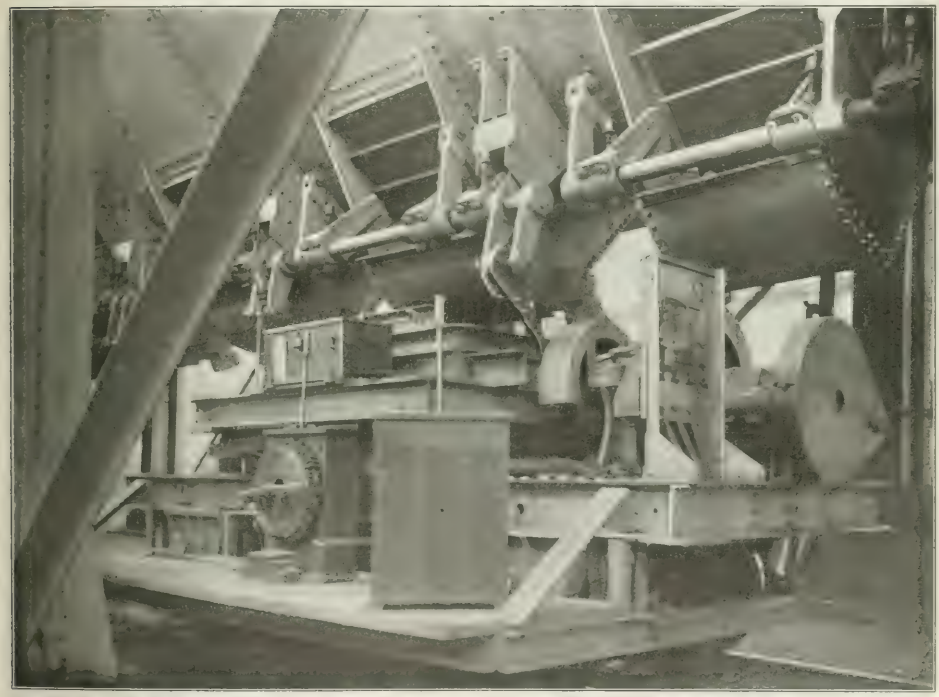
The special feature of the Hamfelt charging car is the quickly made and foolproof connection between it and the bin chutes or swinging gates; also the oscillating movement of this connection and the gates whereby the discharge of the material is effectually regulated, so that either a large or a small quantity can be weighed with accuracy.

The chutes are provided with a set of bearings, a shaft and a double set of levers, one engaging the swinging gate, and the other connected with a pin which is given an oscillating movement from the counterbalanced hook arm on the charging car. The counterweight is not visible in the illustration. To obtain this motion, the charging car is provided with a variable speed electric motor, which drives a train of gears so as to regulate the movement of the hook arm to a suitable number of strokes per minute. A variation in the speed is desirable for opening and closing the gate as well as for the discharge of a larger or a smaller quantity of material.

The counterbalanced hook arm is pivoted to a rotary disc driven by the gear train. On one end of this arm is the counterweight and on the other end the hook, so balanced as to make the work of lifting the hook arm and engaging it with the connecting pin an easy task for the operator. The hook itself is provided with a latch, so as to hold the connecting pin, and the latch is constructed so as to be used as a handle for the operator in engaging and disengaging the connecting pin. If the hook happens to be placed in a suitable position, it can be engaged by lifting the hook arm; otherwise the motor can be started slowly and then the hook engaged. When disengaged, the motor can also be started without any accident, as the hook arm is then resting on a projection of the charging car.

Both the electric motors are controlled by Dinkey controllers placed on the operator's platform, and are so arranged that the operator with a slight movement can reach them, as well as the scale and the hook arm and also see the switchboard. The electric power is 240 volt D. C. and is taken by an overhead trolley system. The total weight of the empty car is such as to prevent shaking of the car or even the slightest disturbance of the scale during the discharge and weighing of the materials.

Five of these charging cars are now in operation. A patent has been allowed in the United States and has been applied for in various other countries. Mr. Hamfelt, the inventor, has offices at No. 1 Strandvagen, Stockholm, Sweden. He was formerly blast furnace manager of the electric furnaces of the Carnegie Steel Company and later was connected in a similar capacity with the Midland Steel Company, Midland, Pa.



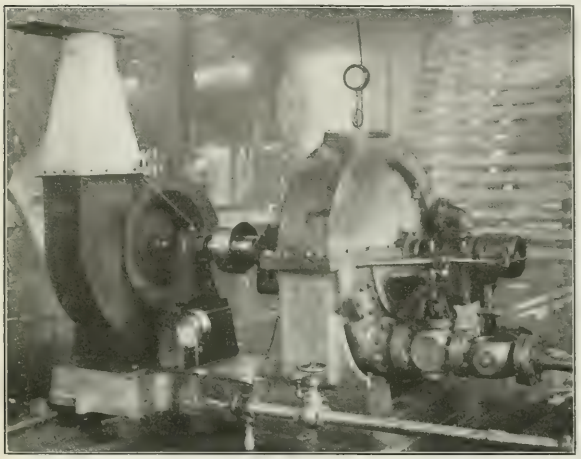
The Hamfelt Charging Car for Blast Furnaces

Col. A. Grenfell, chairman of the committee of the merger between the Alabama Consolidated Coal & Iron Company and the Southern Iron & Steel Company, in speaking of the meeting in Baltimore of preferred stockholders, says that there is already enough of the preferred and common stock of the companies either deposited or agreed to be deposited by a signed statement to secure control of the company and complete the merger. This, of course, means that meetings of the minority stockholders will have no effect on the success of the merger plan.

High Pressure Blower Set

Tests of a Notable Steam-Turbine-Driven Centrifugal Blower

A centrifugal blower delivering air at over 40 in. of water pressure, or nearly 1½ lb. per square inch, is a new idea to those familiar with centrifugal blowers, which are seldom operated at more than 25 in. of water. At the works of the Terry Steam Turbine Company a new turbo-blower set was recently tested to see if it would meet the guarantees. The tests of this new design were naturally exhaustive and conducted with great care. The blower set, which consisted of a double-inlet Sturtevant multivane



Sturtevant Blower Connected to Terry Steam Turbine.

centrifugal blower mounted on same cast-iron bed with a Terry turbine, and direct-connected by flanged couplings, was to deliver 14,000 cu. ft. of air per minute against a pressure of 40-in. water gauge. This test was to determine the water rate of the turbine and the closeness of the speed regulation as well as the volume and pressure of air. During the test pressure, temperature and calorimeter measurements were made of the steam just before the governor valve, and the exhaust pressure was measured in the exhaust pipe just beyond the outlet of the turbine. The exhaust steam was taken to a surface condenser and the discharge water from the hot well was weighed. The condenser was vented at the top so that it would not allow a vacuum at the exhaust of the turbine, which was run non-condensing.

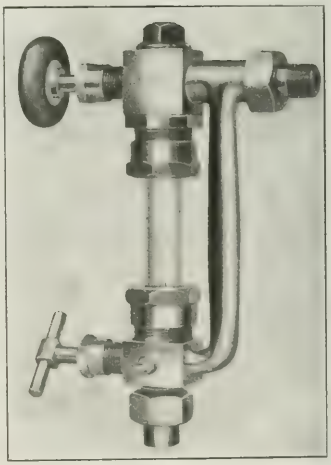
To measure the volume of air discharged by the blower a long tapered cone having a coefficient of discharge of 0.94 was attached to the outlet, the pressures being taken with a mercury U-tube. The blower was to deliver 14,000 cu. ft. of air per minute, but averaged 15,169 cu. ft. for nearly an hour. The steam required for the turbine was not to exceed 7600 lb. per hour, but during this test steam was used at the rate of 6587 lb. per hour, or 13.35 per cent. less than the guaranteed maximum. The air pressure maintained was to be 40 in. of water, but for nearly an hour this blower averaged 47.3 in., or over 1½ lb. per square inch. It reached a maximum during a portion of the test of 51.7 in. Considering the excess in both volume of air and the pressure at which it was discharged, the blower set delivered 27.5 per cent. more work than was called for. Reducing the guaranteed conditions to steam consumption per air horsepower gave a result of 58.5 lb., as against the guarantee of 86.13 lb.

The average of the observations made in the tests were: steam at nozzle throttle, 145 lb.; steam pressure at nozzle inlets, 102.5 lb.; total water rate corrected to saturated steam, 6587 lb.; speed, 2463 r.p.m.; velocity pressure reduced to inches of water, 47.3; volume of air delivered, 15,169 cu. ft. per minute; air horsepower, actual, 112.6. A separate test to determine the speed variation gave the following results: The turbine was operated at 2490 r.p.m. without load; with full load thrown on momentarily the speed was 2400 r.p.m., and with the full load soon settled to 2460 r.p.m. This shows that the momentary speed drop was 3.6 per cent. and the settled drop only 1.2 per cent. While the blower was running under full load at 2460 r.p.m. the gate was closed suddenly; the speed momentarily jumped to 2575 r.p.m., or 4.7 per cent., but it quickly settled to 2490 r.p.m., or an increase of 1.22 per cent. over that at full load.

The Warrior Sight Feed

For use wherever it is desired to lubricate the cylinders of several engines from a large and conveniently located central tank the D. T. Williams Valve Company, Cincinnati, Ohio, has placed on the market an independent sight feed to which the trade name Warrior has been given. The system with which this feed is intended to be used consists of a tank of ample proportions to hold the cylinder oil with piping to transmit hydrostatic pressure to the tank. This pressure forces the oil to the top of the tank and out through the various supply pipes and finally through the sight feeds into the steam pipes above the cylinder. The special advantages claimed for this method of lubrication are economy, since the time and loss of oil occasioned by the constant refilling of small individual lubricators is saved.

This feed is intended for use either on simple or compound engines, and when furnished for the latter it is equipped with an equalizing attachment to prevent the oil from siphoning. The construction of this device is heavy and a large sight feed space, which is a desirable feature, is provided. The oil supply pipe is connected to the union at the bottom and the lubricant passes up through the nozzle inside the glass to the engine, the amount being regulated by the T handle valve at the bottom. A small drain plug provides a means for draining the feed when it becomes necessary. The glass if broken can be easily replaced by unscrewing the stuffing boxes at the top and



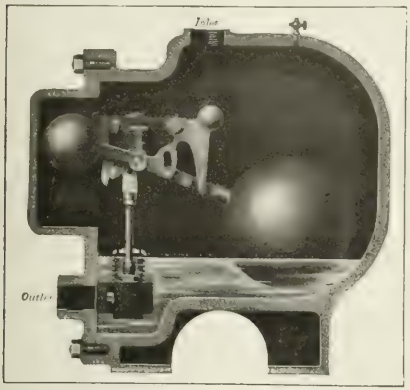
The Warrior Independent Sight Feed Made by the D. T. Williams Valve Company, Cincinnati, Ohio.

the bottom of the glass. The oil supply connections are ¼-in. pipe while that to the steam pipe is ⅜ in. and the equalizing connection is a piece of ⅛-in. pipe.

The W. W. Sly Mfg. Company, Cleveland, Ohio, maker of foundry supplies, has increased its capitalization from $25,000 to $35,000.

The Wyoming Steam Trap

In addition to the piston-operated steam trap used in connection with automatic eliminator which was illustrated in *The Iron Age*, April 13, 1911, W. H. Nicholson & Co., Wilkes-Barre, Pa., manufacture a weight-operated trap for



The Wyoming Weight-Operated Steam Trap Manufactured by W. H. Nicholson & Co., Wilkes-Barre, Pa.

use with pressures ranging from 0 to 150 lb. It is pointed out that, while a float is employed and is necessary in the action of the trap, it nevertheless does not come under the head known as the float-operated type. The float is only instrumental in releasing the valve weight, which in dropping lifts the discharge valve. Reliance is not placed upon the buoyancy or weight of the float to unseat the discharge valve and lift it. One of the special advantages of this trap due to this feature is that by the instantaneous opening and closing of the discharge valve wire drawing is prevented. The valve weight is a levered cast-iron ball moving in the recess at the left of the accompanying engraving. The weight of this part governs the capacity or size of the hole through the discharge valve seat and it is thus possible to operate a discharge valve of any practical size by increasing the mass of the valve weight.

In operation the water enters the trap, raising the float to its highest point of travel when it releases the weight latch and allows the valve weight to fall. The action of the valve weight in falling in conjunction with the crank opens the discharge valve to its fullest extent at once. It is kept in this position by the rod latch until the float, following the water as it empties from the trap, reaches the lowest point of its travel, which is shown in the accompanying engraving. The movement of the float in falling raises the valve weight and when the former has reached its lowest position the weight latch is again engaged and the rod latch disengaged, thus permitting the discharge valve to close instantaneously.

Another special feature of the trap is that a waste of steam due to leaks can be readily detected, since the valve is entirely open or closed at all times. The instantaneous valve movement and intermittent discharge is another advantage claimed for the trap since sudden discharging causes a syphonic action in the pipe line which draws the water from all the pockets along its line.

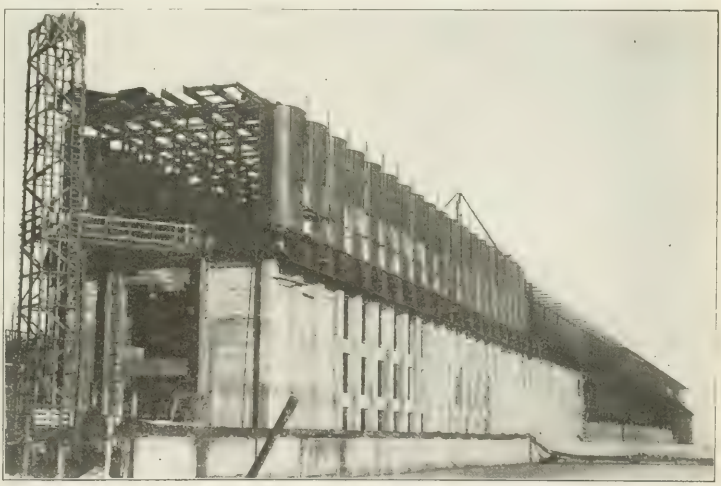
The working parts of the trap are attached to the cover, which can be easily removed by loosening two bolts. Six sizes of traps capable of draining from 3500 to 35,000 lineal feet of 1-in. pipe are made. These traps will discharge from 350 to 3100 gal. per hour at 5-lb. pressure and from 275 to 1200 gal. in the same time at a 100-lb. pressure.

The Double Truss Cornice Brake Company, 33-39 Chandler street, Buffalo, N. Y., has shipped more machines to foreign countries this year than in any three previous years. The company has not only sold machines to go to Alaska, Mexico, the Philippine Islands and Porto Rico, but to Australia, New Zealand, South Africa, Russia, Italy and the British Isles.

The world's record in plowing was eclipsed at Purdue University, Lafayette, Ind., on October 14, according to the Lafayette Courier of that date. The information came shortly after the publication of the articles in our issues of October 26 and November 2, describing the foundry and machine shops of the M. Rumely Company, LaPorte, Ind., which made the traction engines used in the test. There were three Oil-Pull tractors which hauled a unit of 50 plows fixed together side by side. A stubble field was turned over at the rate of an acre every 4 min. and 15 sec.

New Concrete-Steel Ore Dock

An iron-ore dock of novel construction is being built at Marquette, Mich., for the Lake Superior & Ishpeming Railway Company by the Wisconsin Bridge & Iron Company, Milwaukee, Wis. It will be noticed from the engraving that the lower portion is of concrete with a light



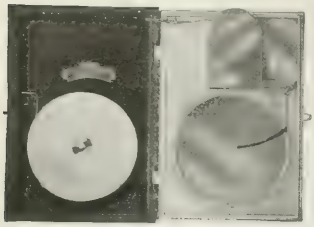
A New Concrete-Steel Ore Dock Built for the Lake Superior and Ishpeming Railway Company by the Wisconsin Bridge & Iron Company, Milwaukee, Wis.

reinforcement of structural steel, while the bin construction and railroad tracks are of steel. As compared with the older type of wooden ore dock and the newer form where steel is employed throughout, this type of construction lies between the two as regards cost, being more expensive than the former and much cheaper than the latter. It is expected that in service the dock will prove more durable and that the maintenance cost will be very much lower than that of the wooden dock.

The dock, which is 75 ft. high and 60 ft. wide, will provide storage capacity for 60,000 tons of iron ore. The length of the dock proper is 1200 ft., while the total length of the steel structure, including the approaches and the tail trestle, is approximately 700 ft. more. There are four railroad tracks on the top of the dock. The machinery and the chutes, of which there are 200 sets, are operated by electricity.

A New Electric Recording Instrument

A new type of electric recording instrument particularly adaptable for use as a recording electric pyrometer, recording voltmeter or ammeter has been designed by the Brown Instrument Company, Philadelphia.



Brown Electric Recorder with Pointer on Door.

It is for use on the wall or switchboard and by the inexperienced workmen. To overcome the danger of bending the recording-pen arm when the chart which receives the record is changed, the essential parts of the instrument are mounted on the door instead of in the case. The clock mechanism and chart alone remain in the case when the door is opened. Consequently there is no possibility of bending the pen because there is no occasion to handle it for any reason whatever. As soon as the door is thrown open the entire voltmeter system and the inking device is swung aside automatically, permitting the old chart to be easily removed and a new one substituted.

Temperature Pendants

For measuring the temperature of flue gases cheaply and efficiently the Green Fuel Economizer Company, Matteawan, N. Y., has devised a set of temperature pendants. These consist of fusible alloys of the proper composition to indicate the desired temperatures which are 425, 500 and 550 deg. F. In designing these pendants it was found that the melting points of the metals were too uncertain and evasive to be used as temperature tests since it was difficult to tell the exact point at which the metal melted and even after it did a hard skin of oxide was generally formed on the surface which prevented the metal from running easily and was thus likely to confuse the determination of the exact temperature. In this case the tensile strength of the metal is used instead of the melting point to give the true indication of the temperature. The pendants are made with a large body, having a certain definite weight, suspended from a narrow neck, and the composition of the metal and cross section of the neck are adjusted until the body of the pendant will pull the neck in two and fall at some desired temperature.

In actual use the pendants are hung upon a small hook made at the end of a long wire which is introduced into the flue so that the pendant will be at the point where it is desired to measure the temperature of the gases passing up the flue. The way in which it is intended that these pendants be used is to begin with the lowest one and proceed until the one is found which will not fall off after 5 or 10 min. exposure. The temperature will then lie somewhere between that marked on the last pendant and the one used just prior to it. The maker recommends that in using these pendants several different points in the flue be tried, as it frequently happens that one part of the flue is occupied by gases which are much hotter than those in the adjacent parts.

An international machinery and engineering exhibition will be held at Olympia, London, from October 4 to 26, 1912, inclusive. This exhibition is organized by the Machine, Tool and Engineering Association, Ltd., and the exhibition offices are at 104 High Holborn, London, W. C. The projectors of the exhibition state that it is their purpose to secure, if possible, so comprehensive a display that it will be really representative of the engineering trades throughout the world. Copies of the prospectus, etc., will be furnished to those addressing the Bureau of Manufactures, Washington, D. C.

The American Railway Association's returns of idle freight cars in the United States and Canada showed a total of 20,532 on October 25, or a decrease of 15,365 from the number reported two weeks before.

The Philadelphia Foundrymen's Association

The Philadelphia Foundrymen's Association held its regular monthly meeting at the Manufacturers' Club, Philadelphia, on the evening of November 1. Josiah Thompson acted as presiding officer. C. F. Grimes, who, with Thomas Devlin and Charles James, represented the association at the convention of the Atlantic Deeper Waterways Association, held in Richmond, Va., last month, made a brief but interesting report of the convention work. Secretary Evans read a communication from the Foundry Foremen's Association announcing that at its regular meeting November 14, at the Manufacturers' Club, Dr. Richard Moldenke would deliver an address on "The Use of Briquettes in the Cupola."

The paper for the evening's discussion was on "The Thermit Process," by W. R. Hulbert, Goldschmidt Thermit Company, New York. He reviewed briefly the application and function of thermit in metallurgical work, illustrating the method of procedure in its use by motion pictures showing the welding of a broken locomotive frame without detaching it from the locomotive and the operation of welding trolley rails in position in the street. Numerous lantern slides giving various stages of the process of thermit welding of crank shafts, stern frames and other steel castings and forgings were shown. He also referred briefly to the various metals and alloys, free from carbon, produced by the thermit process, which his company is supplying. Its titanium alloy is now being extensively used for the purification of iron and steel. The best results are obtained from placing it in the spout of the cupola, permitting the iron to wash over it, rather than by introducing it in the ladle or in the cupola or furnace itself. The absence of carbon in this alloy was alluded to as particularly beneficial, as it avoided the formation of titanium carbon compounds, which are a drawback rather than an aid to the reaction. Considerable discussion followed Mr. Hulbert's address, after which luncheon was served in the dining room of the club.

The American Foundry Foremen's Association

At the monthly meeting of the American Foundry Foremen's Association on the evening of October 28, at the Grand Union Hotel, New York City, a very interesting talk was delivered by E. Raven Rosen-Baum, consulting engineer of the Ashton Laird Company and Cooper Hewitt Electric Company, on "Oxy-Acetylene Welding."

Mr. Rosen-Baum opened his remarks by speaking of the wide use of this process in Germany and France, and predicted that in a few years it would be as widely used in this country. He dwelt at some length on the advantages of the storage system over the generator system, especially for use in foundries. The storage system, he explained, is ready for use at an instant's notice; and as in foundries it is only an occasional casting that requires treatment the saving in cost is material. All foundrymen, he thought, could readily become expert with the oxy-acetylene flame, from their experience with molten metals, and from the use of the foundryman's "burn", but few of them could spare the time to become expert in producing the gases required—especially since they would only be called for occasionally.

He enlarged on the better work produced from storage gases, through the more constant and higher pressures, and the fact that both oxygen and acetylene could be bought so cheaply, and of such a degree of purity as could not be attained by the ordinary producer of his own gas. He then showed by actual demonstration how useful a storage plant could be, by treating, in the hotel parlor, with a miniature outfit, a number of samples of pin holes, chill holes and sand holes, which he rectified in a few minutes. He also "built up" broken corners and bosses, to show the readiness with which even lost parts could be added.

Great interest was displayed in the actual working of the process, and considerable "quizzing" of the speaker was indulged in by the members. On a call by the president for a show of hands from those who made bad castings, not a hand was raised; but it is rumored that several members interviewed Mr. Rosen-Baum *sub rosa*, when the meeting adjourned.

The Machinery Markets

Business in most machinery selling centers is considerably better than it was a year ago. The railroads are inactive, except in New York, where the trade is looking to some good business for shop equipment from two important roads. Textile machinery is in better demand in New England and there are many signs there of increasing business in other lines. Orders for small tools and milling machines are more active and second-hand equipment is in good demand in the Ohio markets. Electrical equipment and other power plant are in exceptionally good demand in the South. Trade is strengthening in the Southwest and Texas. In the latter market there is an unusual number of industrial projects involving large machinery requirements. Mining equipment continues to be the mainstay of the dealers on the Pacific coast and in Mexico. In other markets business continues about the same but there are encouraging reports based on increased inquiries.

New York

NEW YORK, November 8, 1911

The Pennsylvania Railroad has issued a small list of requirements for machine tools and automatics to be installed in its shops at Trenton, N. J., and the Delaware, Lackawanna & Western is doing some buying for shops near New York, presumably at Kingsland, N. J. The New York, New Haven & Hartford has bids in on the list mentioned in these columns a week ago, but from all accounts has not closed out for the material as yet. The New York Central is still placing an order here and there against its old list, but is apparently moving cautiously in its purchasing and a great deal of buying is believed to be yet done to fill all the requirements of its original list. Beyond this railroad business there is little new of interest. Power equipment for lighting and heating for office and loft buildings is in good demand and some new inquiries are coming forward in good volume, but they generally call for small lots of tools. The export trade continues good and the principal demand is for metal working machinery. The subway contractors in New York are good customers just now for excavating machinery, including drills, air compressors, power plant and metal working equipment for temporary repair shops. Jobbing foundries report a somewhat better demand for machine castings and general machine shops are fairly busy with repair work.

The Gallagher-Tompkins Company has been incorporated with $175,000 capital stock to take over the patents and business of the G. & H. Mfg. Company, 270 Mulberry street, New York. The company has established temporary works at 1876 Broadway and will soon be in the market for metal working equipment for the manufacture of carbureters. Richard W. Gallagher, George D. Zahm and F. B. Tompkins, all of New York, are the incorporators.

The Thermodyne Engine Company has been incorporated with $30,000 capital stock to manufacture machinery, engines, etc. The company will have manufacturing details ready in about 60 days. The incorporators are William Essen, W. H. Fritchman and L. T. Fitzer, 44 Pine street, who has the affairs of the company in charge.

The Genesee Pure Food Company, Le Roy, N. Y., is contemplating the erection of a new factory building at that place to be built in the spring of 1912.

The Granville Improvement Company, Granville, N. Y., is taking bids for a silk glove factory 41 x 140 ft., one story, which it will erect there.

The Pioneer Broom Company, Amsterdam, N. Y., is erecting a five-story addition 62 x 92 ft. to its factory at West Main and Pine streets to cost $32,000.

The Thomas Motor Cab Company, Buffalo, which recently moved its plant to enlarged quarters at West Mohawk and State streets, has increased its capital stock from $50,000 to $100,000.

The Hoosier Sales Company, Jamestown, N. Y., recently incorporated, will not build a manufacturing plant at present but will market the Nelson system of individual electric lighting plants manufactured by the Greenville Metal Products Company, Greenville, Pa. The Metal Products company is at present equipped for its requirements, but expects to be in the market for more machinery within a short time. It is inquiring for a gas engine of from 2 to 5 hp. to be used in connection with its lighting plant, in quantities, also in storage batteries.

The Southern Paper Company, Tully, Onondaga County, N. Y., has been incorporated to manufacture pulp, paper and its products. A. Faunce and J. Siebert, New York, and E. J. Page, Syracuse, N. Y., are the incorporators.

The Whyland-Nelson Motor Car Caompony, Buffalo, N. Y., recently organized, has established its plant at 49-53 Illinois street, where it will manufacture lightweight passenger automobiles with convertible light delivery car attachment. Frank V. Whyland, formerly with the Superior Motor Truck Company, is president and manager.

The Frontier Specialty Company, Buffalo, has been incorporated with a capital stock of $30,000 to manufacture specialties for motor driven vehicles.

The Elaborated Ready Roofing Company, 693 Broadway, Buffalo, R. G. Weaver, manager, has purchased a site on Chandler street and the New York Central Railroad belt line, near Manton place, and will build a plant for the manufacture of roofing materials.

The Fonda Glove Lining Company, Fonda, N. Y., is taking bids for a one-story warehouse addition to be made to its factory.

The Weymer Company, Syracuse, N. Y., will build and equip a three-story brick factory 40 x 102 ft. at Division and Solar streets for the manufacture of brooms.

The Board of Water and Light Commissioners, Groton, N. Y., E. A. Hayden, secretary, is asking bids for a 100 to 150-kw. direct connected 250-volt steam unit and generating set for a three-wire system.

The Lakeside Forge Company, Erie, Pa., recently incorporated to take over the business and plant of the Lakeside Forge & Wrench Company, manufacturer of drop forges and wrenches, will add some drop hammers, medium sizes, die sinking machines and an engine and generator to the equipment of the plant.

New England

BOSTON, MASS., November 6, 1911.

Evidences of a slight improvement in business conditions continue to multiply and there seems to be promise that a somewhat higher level of business will be established, with the probability of continuing until the expected good times which should follow the close of the presidential campaign. Business houses will be satisfied for the present with a moderate increase in orders, for in a great number of cases no great improvement would be needed to create a comfortable condition. In not a few works manufacturing is being carried on at the maximum; a still greater number are very well off in the way of orders; and the class below that is diminishing in number on the one hand, and is receiving recruits from those whose business has been flat. The textile machinery people are already feeling the effects of a better demand for textile products.

The Meriden Press & Drop Company, 153 State street, Meriden, Conn., has taken over the business of A. H. Merriman, and will continue the line of draw presses and drop hammers. Mr. Merriman has retired from the business. The new corporation has a Connecticut charter, and Henry M. Doolittle is the president, Herman Hess the treasurer and Raymond P. Hess the secretary. The business is an old one, having been established by Mr. Merriman some forty years ago, and its products are widely known. It is the intention of the new management to develop the product along the most modern lines. Mr. Doolitle is a practical press and drop man, and will be the manager. No immediate addition will be made to the company's manufacturing equipment.

The business of the Brosnihan Wrench Company, Worcester, Mass., has gone out of existence, the manu-

THE MACHINERY MARKETS

facturing equipment having been acquired by the Prentiss Tool & Supply Company which is disposing of it.

The Waterbury Brass Company, Waterbury, Conn., is preparing plans for a new casting shop 65 x 160 ft., one story, of brick and steel construction.

The Underwood Typewriter Company, Hartford, Conn., is about to erect a building 50 x 217 ft., five stories and basement, which will replace an old two-story structure. The company has just completed a large factory building which has been occupied.

The Bryant Electric Company Bridgeport, Conn., will erect a one story brick manufacturing building, 40 x 150 ft.

The committee of the Chamber of Commerce of Hartford, Conn., having in charge the establishment of an additional industrial building in that city, has made its report, and the work of financing the plan will proceed immediately. An option on the land has already been procured, the site being bounded by the New York, New Haven & Hartford Railroad, with a frontage of 600 ft. on Hawthorne, Laurel and Forest streets. The building plans call for a structure 50 x 316 ft., four stories, with a basement under 60 ft. of the length, the estimated cost of the building being about $109,000. The building will be of mill construction. Provision is made in the plans for a power plant and blacksmith shop. The committee, in arguing the undoubted success of the project, points out that the great typewriter industry of Hartford had its beginning in a building erected under similar auspices and occupied by the Underwood Typewriter Company, which now employs 3000 hands, and the presence of which was largely responsible for the location of other units of the industry in the city. There is a dearth of ready-made homes for industries in Hartford.

The Union Mfg. Company, New Britain, Conn., manufacturer of chucks and castings, is erecting a concrete and steel building, which will be used for sandblasting castings and to admit of the installation of a larger compressor. New equipment will not be needed.

Philadelphia

PHILADELPHIA, PA., November 6, 1911.

Merchants and a number of manufacturers report the volume of business transacted during October as being slightly in excess of that for the previous month. A few fairly good sized orders booked by some merchants had a strong bearing on the aggregate business, but as a rule the improvement has been due to slightly better buying in single tool lots. A somewhat better tone is therefore noticeable in the trade, and as the small lot movement appears to be holding up comparatively well the trade anticipates at least as good a month during November, although there is less sizable business under negotiation than was the case early in October. There is still a pronounced absence of any tool inquiry on the part of the railroads and but few of the pending inquiries have developed into orders. In the majority of cases tool builders maintain a fairly even operating rate. Locomotive builders have been taking additional orders, the local plant booking one this week for 40 engines for a Western road. The outlook, however, is not considered particularly promising. Second hand machinery merchants report business during October to have been fairly satisfactory, considering the general demand. Sales have mostly been small individually, but the aggregate reaches, in some cases, a very fair total. The boiler and engine trade continues rather irregular. Contracts for considerable moderate capacity equipment have been closed recently and a good volume of business is still under negotiation. The foundry trade continues to operate on an irregular basis. The demand for castings for machinery parts is still comparatively light.

The Glen Willow Ice Mfg. Company is having plans prepared for an addition to its ice plant and a one-story addition to its power house at its plant in Manayunk. David E. Haire, Land Title Building, is understood to be the engineer. Particulars regarding the proposed extensions are not available.

The American Pulley Company reports business during October as being somewhat in excess of that for the previous month. There has been a better run of small orders and the plant has been operating at full time. The export trade has been steadily increasing and extensive shipments have been made to a number of Continental countries. The home demand continues largely of the small lot variety, customers buying conservatively rather than with a view of stocking up.

The Board of Prison Inspectors will receive proposals until November 15 for supplies for the Holmesburg and Reed street prisons, to be furnished during the year 1912. Among materials required are electrical and plumbing supplies, pipe, valves and fittings, iron, steel, sheet iron, tinners' supplies, packing, belting, oils, hardware and tools. Specifications may be had and samples seen at the office of the prison, Tenth and Reed streets, Frederick A. Cooke, superintendent. Under the terms of the proposals quantities required may be increased or decreased as the inspectors may desire.

The Baldwin Locomotive Works has booked an order for 40 Mikado type freight engines from the Illinois Central Railroad. Several small orders have also been recently booked. The company has not yet decided to build the superstructure of the addition to its erecting shop at Eddystone, Pa., although the contract for the foundations has been given out. Sufficient work to keep the plant engaged at the present basis for several months is now on hand.

Reports that the Hellwig Silk Dyeing Company had purchased a large tract of land near Lardners Point and would erect a large plant on the site have been denied by that concern.

The Energy Elevator Company continues operating its plant to full capacity. Orders for a large number of electric hoists have been taken both for local and out of town work. A particularly heavy demand for carriage and wagon lifts is also reported. Inquiries are being freely received and for some classes of equipment this company finds it quite difficult to make early deliveries.

The League Island Navy Yard is in the market for a riveter and punch and for galvanized steel angles under schedules 4030 and 4036 respectively. Specifications and proposal blanks may be obtained from the navy pay office, this city, or on application to the Bureau of Supplies and Accounts, Washington, D. C. Proposals will be received until November 14.

The A. P. Wittiman Company is building a 30 x 120-ft. addition to its plant at Chester, Pa., to be used as an addition to its finishing and grinding department. An extension 785 ft. long is being made to its forging shop to accommodate a new 1200-ton steam and hydraulic forging press to be installed. The equipment for this addition as well as to that for its finishing and grinding shop have already been provided for. This company reports orders to keep it engaged for several months.

City permits have been taken out by Fels & Co. for the erection of a warehouse 89 x 146 ft., five stories, to be built of concrete at Woodland avenue and Island road.

Chicago

CHICAGO, ILL., November 6, 1911.

Sales of machine tools during the past month, while showing some improvement, were not heavy enough to make any change in the policy of manufacturers in reducing their stocks as low as possible. Dealers in machine shop supplies, such as drills and reamers, have enjoyed a very satisfactory volume of business. For heavier tools the inquiry has been fairly good from miscellaneous manufacturing plants as the result of an increase in the extension of manufacturing capacities in this territory. There remains, however, a reluctance to purchase and sales have been confined for the most part to a movement of individual machines.

The Chicago Oyster Pail Company, Joseph J. Lanzit, president, is preparing plans for the erection of a four-story factory building at Ogden boulevard and Washtenaw avenue to cost $125,000.

The Chicago-Riverdale Iron & Steel Company, organized to engage in the manufacture of iron and steel products, has been incorporated by Thatcher W. Hoyt, Wendell S. Merrick and James W. Mitchell with a capital stock of $100,000.

The Newbury Sales Company has an authorized capital stock of $45,000 and will handle a general line of machinery appliances. Incorporators are Edward J. McCarty, Nathan Bartelstein and Nathan Jacobs.

The C. D. Osborn Glove Mfg. Company has had plans prepared for a three-story building to cost about $50,000 and to be erected at the corner of Leavitt and Wabasania avenue. The building will be of heavy mill construction.

The National Brass Foundry Company, with a capital stock of $20,000, has been organized to do gen-

THE MACHINERY MARKETS

eral foundry work in babbitt metals and metal castings, the incorporators being John Prince, Harry G. Dekker and George McGuire.

The F. E. Newbury Electric Company has been incorporated by F. E. Newbury, B. H. Bendheim and Francis Adams, Jr., all of Chicago, with a capital stock of $26,000, to manufacture electrical supplies and appliances.

The Halldow Mfg. Company has been incorporated for the manufacture of electrical appliances by Charles M. Mudge, H. U. Mudge and L. C. Seward with a capital stock of $10,000.

The Illinois Malleable Iron Company has taken out a permit to erect a one-story brick foundry on North Paulina street to cost $3,000.

The Gordon Electric & Mfg. Company has been incorporated with a capital stock of $15,000 to promote the sale of patented electrical devices and apparatus. The incorporators are Max W. Zabel, Otto M. Wermich and Hazel Jones.

The Newman Electric Light Company, Newman, Ill., has decided upon the immediate installation of a new lighting plant to be followed by a refrigerating station and a public heating plant.

The Kehoe Light & Power Company, Ft. Wayne, Ind., has been incorporated with a capital stock of $100,000 to furnish light and power to suburban towns.

The John Wahl Candy Company, Duluth, Minn., has plans in preparation for the erection of a $50,000 factory; three stories.

The Keokuk Brick & Tile Company, Keokuk, Iowa, has been incorporated with a capital stock of $50,000 by Frank W. Sawn, William Scott, Paul S. Peckstein, Frank L. Griffey, P. S. Hentel and J. N. D. Dickensen.

The Matthews Bros., Mfg. Company will occupy a new factory building now being erected for its use at the corner of Clybourne and Fowler streets, Milwaukee, Wis., at a cost of $28,000.

The Aurora Automatic Machinery Company, Aurora, Ill., contemplates the expenditure of about $75,000 on its plant with the erection of three additional buildings. The general offices of the company, now in Chicago, will be moved to Aurora.

The Bessolo Wrench Mfg. Company, Spring Valley, Ill., is about to let contracts for the construction of a plant consisting of a machine shop, 50 x 140 ft., and a boiler house, 40 ft. square. Complete machinery equipment will be required.

The Brillion Mfg. Company, Brillion, Wis., whose plant was recently destroyed by fire, is proceeding with its rebuilding.

The Brown Portable Elevator Company, with plants at Portland, Ore., and Saginaw, Mich., has arranged for the erection of a new plant at North Chicago, Ill.

The Aurora, Elgin & Chicago Railroad will install a new turbo-generator unit at its Batavia, Ill., power plant to have a capacity of 2500 kw.

The Oliver Concrete Machinery Company, Des Moines, Iowa, has been incorporated with a capital stock of $100,000 by C. Dooersmith, E. D. Francesco and F. E. Neis.

The Pressed Steel Tank Company, Milwaukee, Wis., has acquired additional property adjoining its present site upon which an extension of its present plant is contemplated.

Cleveland

CLEVELAND, OHIO, November 6, 1911.

Business with the local machine tool dealers has improved somewhat during the week. While no large orders or inquiries are coming out, several sales have been made in lots of 3 or 4 tools. Outside of orders for two good sized boring mills sales for the most part have been in rather small tools. The demand for milling machines is more active than for other lines. Inquiries for second-hand tools are more numerous than they have been for some time. The demand for turret lathes has picked up considerably and there is more activity in drill presses. There is little call for some lines of heavy handling machinery but the demand for handling equipment for coal and other commodities in connection with industrial plants has improved materially during the past few weeks. Makers are doing a good business in locomotive cranes.

The Superior Drop Forge & Mfg. Company, Cleveland, has completed an addition to its boiler house in which two 250-hp. boilers have been installed. Other extensions to its plant have been made and some new machinery will be installed shortly, including a 2000 and 4000-lb. hammer. The company started in business about a year ago and has increased its capacity considerably during the past year. In addition to an up-to-date forging plant it has a fully equipped machine shop.

The Sterling Brass Company, Cleveland, has been incorporated with a capital stock of $35,000 to manufacture plumbers' brass goods. The names of those back of the enterprise are being withheld for the present. A plant for the company is being erected at Forty-seventh street and St. Clair avenue.

The Buckeye Twist Drill Company, recently organized at Alliance, Ohio, expects to have its new plant now under construction ready for operation December 15. The company will succeed the Michigan Twist Drill Company, Detroit, Mich., which will be dissolved and its equipment moved to Alliance. E. D. Rogers, 802 Citizens' Building, Cleveland, is president of both companies The Alliance plant will be under the management of M. F. Crawmers, who is now connected with the Detroit plant in a similar capacity.

The Warren City Tank & Boiler Company, Warren, Ohio, will shortly begin the erection of an addition to its plant, 50 x 100 ft., to be used for warehouse purposes. The company will also erect a steel crane runway to accommodate a large crane for convenient handling of supplies and finished products.

The City Council, Toledo, Ohio, has authorized Service Director Cowell to advertise for bids for a new bascule lift for the Cherry street bridge in that city. Former plans were rejected, new plans having been prepared for a lift that is estimated to cost $142,000.

The Strong Mfg. Company will erect a pottery in Sebring, Ohio, for the manufacture of kitchen ware. The building will be about 600 x 300 ft.

The Trenkamp Stove & Mfg. Company, Cleveland, has let a contract for the erection of a two-story brick addition to its plant. It will be used for mounting gas ranges.

The Toledo Sugar Company, Toledo, Ohio, in which Cleveland, Toledo and Detroit men are interested, has been incorporated with a capital stock of $1,000,000 to build a beet sugar refinery at Rossford, near Toledo. Judge John H. Doyle and R. S. Woodrow, of Toledo, J. F. Kilby, Cleveland, and others are named as the incorporators.

The Atlantic Foundry Company, Akron, Ohio, has increased its capital stock from $10,000 to $60,000.

The Xcelda Specialties Company, Cleveland, has been incorporated with a capital stock of $15,000 by H. E. Davis and others to manufacture hardware specialties.

A company, not yet incorporated, is being formed in Alliance, Ohio, to build a plant for the manufacture of chain. A building 150 x 60 ft. is planned. Offices will shortly be opened in the Lindesmith block on Main street.

The Canton Porcelain Company, Canton, Ohio, has commenced the erection of a plant for the manufacture of brick, tile and other products. The company has been incorporated with a capital stock of $25,000 by Fred Fenton and others.

The F. B. Stearns Company, Cleveland, maker of automobiles, has commenced the erection of an extensive addition to its plant.

The Toledo Metal Spinning Company, Toledo, Ohio, has been incorporated with a capital stock of $10,000 by Charles E. Holt and others.

The American Concrete Metal Flange Pipe Company, recently organized at Mt. Gilead, Ohio, has decided to purchase a site and build a plant for the manufacture of its products.

Cincinnati

CINCINNATI, OHIO, November 6, 1911.

The machine tool trade is jogging along at about the same pace as for the past six weeks. One feature of the business is that orders are principally coming from nearby customers and are not so well scattered. The Southern demand is not as encouraging as was anticipated some time ago, but it may develop into better business before the close of the year, although this field is never a very prolific one for machine tool builders.

The steamfitters' strike is now practically settled and the work of installing heating plants in several large buildings now under construction has been resumed.

THE MACHINERY MARKETS

H. E. Kennedy & Co., architects, Second National Bank Building, Cincinnati, have awarded contract to the H. C. Hazen Contracting Company for a large three-story brick and steel building to be erected on Race street for the United States Tire Company. The new building will not be used for manufacturing purposes.

The Wheeling Metal & Mfg. Company, Moundsville, W. Va., has started work on an addition to its factory that will considerably increase its present capacity when completed.

It is reported that the Dayton-Xenia Traction Company is making arrangements to rebuild its power house at Dayton, Ohio, recently destroyed by fire. The name of the designing architect has not yet been given out.

Architect Harry Hake, Provident Bank Building, Cincinnati, will soon be ready to receive estimates for a large storage addition to the plant of the Blackburn Varnish Company, Cincinnati. The new structure will be of reinforced concrete construction.

It is announced that the Ohio Products Company, Cincinnati, whose incorporation was recently noted, will build its proposed distilling plant in Alabama. Arrangements were recently made with the Vinegar Bend Lumber Company, Vinegar Bend, Ala., for its refuse timber, including stumps on cut-over ground. The new company will make turpentine, wood alcohol and other similar by-products.

The Columbus Fence Company, Columbus, Ohio, has been incorporated with $10,000 capital stock by R. F. Fisher and others. No manufacturing plans have yet been given out.

A five-story brick and steel building for storing beer will soon be constructed by the Wetterer Brewing Company, Cincinnati. E. F. Glaser is the architect in charge of the plans.

It is rumored that the Columbus Wire & Iron Works, Columbus, Ohio, wil soon make a large addition to its plant that will nearly double its capacity.

The Kelly Road Roller Company, Springfield, Ohio, is said to have plans under way for an addition to its plant, but no details have yet been made public.

The King Machine Tool Company, Winton place, Cincinnati, intends to erect a pattern storage shop addition to its plant, and is in the market for second-hand structural material for a building to measure about 30 x 90 ft.

The Southern Collieries Company, Charleston, W. Va., has been incorporated with $100,000 capital stock for the purpose of mining coal and manufacturing coke. W. G. MacCorkle, S. B. Chilton, S. Hess and T. S. Clark, all of Charleston, are named among the incorporators.

The Spring Hub Automobile Wheel Company is a new Cincinnati incorporation with $10,000 capital stock. The new company will put on the market a new automobile wheel that will probably be manufactured under contract at the start. Edgar N. Woolley, Johnston Building, is secretary.

The Dayton Turbine Pump Company, Dayton, Ohio, has been incorporated with $100,000 capital stock. Manufacturing plans have not yet been made public. Among the incorporators are Edward R. Kirby, Arthur J. Stevens, Nelson Emmons, Jr., and others, all of Dayton.

The Wilbern Oil Works, Cincinnati, has completed plans for additions to its plant, including an annex to the power building that will be 13 x 22 ft.

Detroit

DETROIT, MICH., November 6, 1911.

Current orders for machine tools and shop supplies show a slight increase in volume and several sales of from three to five tools are reported. Inquiries, however, are not such as to make the outlook encouraging and no very great activity is looked for until after the holidays. The automobile trade is confining itself strictly to purchases for necessary replacement and concerns which are known to have future machinery requirements are holding back. Buying of second-hand machinery is light and widely diversified in character. Small machine shops making jigs, tools and patterns are in general finding business poor, although some special equipment is being built. Dealers in electrical equipment report a fair demand for generators. The market for boilers and engines shows an improvement, but no large installations are reported. Foundries continue to operate on an even basis. The week in building circles was quiet, little new work of importance coming out.

Work has been started on the manufacturing building to be occupied by the Quinn Mfg. Company, of Kalamazoo, Mich., which is removing to this city. The factory will be located on Division street and will be of brick and mill construction, 70 x 150 ft., four stories. The company manufactures steam, mill and plumbing supplies.

Fire caused damage estimated at $30,000 to the plant of the Phipps-Grinnell Company, manufacturer of electric automobiles at 14-16 Atwater street. E. W. Grinnell, secretary of the company, states that steps will be taken at once to resume operations.

Dodge Bros., brass founders and makers of automobile parts, who recently sold the buildings comprising their foundry department, are having tentative plans prepared for a new plant for which a large mechanical equipment will be required.

The Detroit Excelsior Company, maker of excelsior products, will build a two-story brick factory on Richmond avenue. George V. Pottle is the architect.

The Mechanics Motor Car Company has been incorporated with a capital stock of $10,000 to manufacture and deal in motor vehicles and equipment. Paul Kuehn and G. L. Gast are the principal stockholders.

The Cudahy Bros. Company, packer, has awarded the contract for the erection of a large fireproof packing and storage house to Max Bartholomaei & Co.

The Detroit Graphite Paint Company is erecting a five-story factory, 50 x 50 ft., in Walkerville, Ont., across the river from Detroit, for use as a branch plant. The Winchester Construction Company of this city has the contract.

The Hallock Chemical Company will establish a plant within the Pennsylvania Salt Company's property in Wyandotte, Mich., to manufacture various by-products of that company's output.

The Cass Automobile & Repair Company has been organized with $10,000 capital stock by E. C. Jacques, C. C. Rock and H. Knowlton.

The Grand Rapids Lumber Company, Grand Rapids, Mich., has been organized with a capital stock of $250,000 and into it will be merged the Fuller & Rice Lumber Mfg. Company and the Mercer & Ferdon Lumber Company. The new company, in addition to operating the present plants, will build a large factory for the manufacture of interior finishes at an estimated cost of $100,000.

John W. Wells and M. B. Lloyd, Menominee, Mich., have purchased a site of two acres in that city and will erect a large factory for the manufacture of an automatic coiled wire weaving machine, patented by Mr. Lloyd. It is understood that orders for $25,000 worth of machinery for the new plant have already been placed and that the plant will be in operation by February 1.

Work has been started on extensive additions to the furniture factory of Aulsbrook & Jones, Sturgis, Mich. The new buildings will include a manufacturing building, 60 x 220 ft., three stories, an engine house 35 x 72 ft., and drying sheds, 40 x 72 ft. The capacity of the machine department will be doubled.

The Bay City Rendering Company, Bay City, Mich., is preparing plans for the erection of a modern abattoir, with a daily capacity of 50 head of cattle. The buildings will include a refrigerating plant, a rendering plant and a department for the manufacture of fertilizers.

Cooney & Smith, Saginaw, Mich., mattress manufacturers, have plans under way for an addition to their present plant, 30 x 120 ft., three stories.

The Ohio Dairy Company, Morenci, Mich., operating a milk condensary, is planning the erection of an addition which will practically double the capacity of its plant.

The Belcarmo Nut Butter Company, Grand Rapids, Mich., has incorporated with a capital stock of $50,000 by J. T. Carpenter, A. A. Flory and D. S. Conover. It is planned to erect a factory, about 40 x 100 ft., for the manufacture of peanut butter.

Fire, which caused a loss of $40,000, destroyed the salt block of the Crystal Flake Salt Company, Marine City. It is understood that operations will be resumed at an early date.

The Owosso Motor Company, Owosso, Mich., capitalized at $100,000, has discontinued operations and a

THE MACHINERY MARKETS

receiver has been asked for. The company manufactured motor trucks.

The Crawford Chair Company, Grand Ledge, Mich., is contemplating the removal of its plant to Grand Rapids, Mich., with the view of increasing the capacity of the factory.

The factory of the Newberry Float Company, Newberry, Mich., has been sold and the business reorganized under the style of the Eureka Float Company. Considerable improvements are contemplated.

The Little Motor Car Company, Flint, Mich., has been organized with a capital stock of $1,200,000. The incorporators are W. H. Little, of Detroit, W. C. Durant, formerly general manager of the Buick Motor Company, and C. M. Begole and W. S. Ballenger, officers of the Flint Wagon Works, whose plant becomes the property of the new concern through the deal just closed.

The plant of the Michigan Fiber Box Company, Battle Creek, Mich., is being enlarged by the building of an addition which will double its former capacity.

The city of Greenville, Mich., has awarded the contract for the construction of a high school to cost $75,000. A complete manual training department will be equipped.

The Grand Rapids Machine Tool Company, Grand Rapids, Mich., builder of milling machines, etc., reports an excellent volume of orders. The company is operating both a day and a night shift.

The capital stock of the Brooks Mfg. Company, Saginaw, Mich., manufacturer of knockdown furniture, has been increased from $100,000 to $140,000.

The Robeson Preserve Products Company, Port Huron, Mich., with $100,000 capital stock, has been organized to manufacture chemical and preservative products for wood, iron and steel.

The Aten Mfg. Company, Jackson, Mich., has been incorporated with a capital stock of $25,000 and will engage in the manufacture of sporting goods.

The Upton Machine Company, Benton Harbor, Mich., has filed articles of incorporation with the Secretary of State, giving its capital stock at $30,000.

The Michigan Box Board Company, White Pigeon, Mich., has been adjudged bankrupt, with liabilities of over $300,000. B. Gates, of White Pigeon, has been appointed receiver.

Detroit Insulated Wire Company has let contracts for the construction work on its new one-story brick factory on Wesson avenue, Detroit.

The Summers Fibre Company, Port Huron, Mich., is preparing plans for the expenditure of $50,000 in the enlargement of its plant.

The Keeler Brass Company, Grand Rapids, Mich., is about to build a two-story brick factory at a cost of $8,000.

Indianapolis

INDIANAPOLIS, IND., November 6, 1911.

The plant belonging to the Shelby Foundry & Machinery Company, Shelbyville, Ind., has passed into the control of Henry Jones, of Waldron, Ind.; R. D. Thornton, of Anderson, and A. H. Schaitter and William Fretchling, of Shelbyville. It will be reorganized under the name of the Shelby Gas Engine Company.

The Sibley Stove Company, South Bend, Ind., has been organized with $50,000 capital stock to manufacture gas stoves of a new pattern. The directors are Irving A. Sibley and Horace L. Greene, of South Bend, and N. C. Sprague, of Minneapolis, Minn.

The Salem Electric Light & Artificial Ice Company, Salem, Ind., has increased its capital stock from $15,000 to $30,000.

The Indiana Canning Company, Evansville, Ind., has purchased a site for a new and modern canning plant. The company employs over 400 people.

The Modern Specialties Mfg. Company, Goshen, Ind., has been incorporated with $20,000 capital stock to manufacture machinery. The directors are C. C. Tiedermann, John Winter, E. E. Ash and J. A. Snapp.

The Letz Mfg. Company, Crown Point, Ind., has been incorporated with $20,000 capital stock to manufacture feed grinding machinery. The directors are George Holland-Letz, John Holland-Letz, E. Holland-Letz, Otto Holland-Letz and William Holland-Letz.

The Auto Machine Company, Marion, Ind., has been incorporated with $10,000 capital stock to operate a machine shop. The directors are George D. Lindsay, B. A. Tong and R. E. Breed.

The Morocco Water Company, Morocco, Ind., has been incorporated with $50,000 capital stock to supply water. The directors are C. E. Zollars, C. R. Blakesless and W. B. Bauer.

H. Clay Raymond, receiver for the Muncie Chair Company, Muncie, Ind., will sell the company's extensive property, November 14.

The Gary & Southern Traction Company, Gary, Ind., has increased its capital stock from $10,000 to $300,000 for the purpose of beginning construction work and installing its power plant.

The South

LOUISVILLE, KY., November 6, 1911.

Business in this market continues to be satisfactory. Nearly everybody in the trade reported that October showed a good increase over the corresponding month of last year and that the outlook for the remainder of 1911 is excellent. There is a good demand for electrical and other power equipment, though it is stated that boilers are not in as brisk demand at present as they were a short time ago. Trade in the East, as far as local manufacturers are concerned, is dull, but the South and Central West are coming along in good shape. Manufacturers of electrical apparatus report that they are getting a good deal of business as the result of the success of central stations in inducing manufacturers to install their service, this usually resulting in considerable purchases of motors and other equipment. On the other hand, if the user had decided to continue making his own power the electrical manufacturer might have sold generating equipment as well. So there are two sides to the story.

The Kentucky Gear & Machinery Company, Ninth and Jefferson streets, Louisville, is contemplating enlarging its plant.

The Hillen Mfg. Company, Louisville, has purchased a Warner & Swasey cock grinder.

The Abell Elevator Company, Louisville, bought through E. D. Morton & Co. a drill press of the Rockford Lathe & Drill Company.

W. J. O'Leary, Louisville, is in the market for a boiler to be installed in his dry cleaning plant.

The Asher Coal Company, Louisville, is erecting an addition to its elevator at 115 Charlton street and is preparing to increase the capacity of its coal-handling plant considerably. Power and conveying equipment will probably be purchased. Details as to the equipment wanted can be secured from T. J. Asher, Wasioto, Ky.

Plans have been completed for the power and steam heating plant for the 18-story Inter-Southern Life Building, Louisville. The contract for the boilers, heaters and other apparatus will be let by the general contractor, the Selden-Breck Construction Company, from its headquarters in St. Louis. Brinton B. Davis, Louisville, is the architect for the building.

The Globe Casket Company, Louisville, Edward Riess, manager, is equipping a plant for the manufacture of coffins at Preston and Burnett streets. It is installing wood working and other equipment. A St. Louis grinder was one of the items purchased.

The Railroad Metallic Tie Company, Princeton, Ky., John W. Hollowell, president, has filed articles of incorporation. Capitalization of $1,000,000 is authorized and the company plans to manufacture a metallic cross-tie.

The Bon Jellico Coal Company, Knoxville, Tenn., which was recently organized for the development of coal lands near Williamsburg, Ky., will purchase equipment for the operation of its mines within the next 60 days. E. B. Taylor, Williamsburg, Ky., is manager. Capacity of 400 tons a day is to be provided for.

The Bowling Green Ice & Cold Storage Company, Bowling Green, Ky., is erecting a large addition to its cold storage plant on the Barren River.

The Eagle Casting Company, Winchester, Ky., has been given the contract for the erection of a large number of ornamental iron standards used in the new lighting system in the business district of Louisville.

New Orleans capitalists, including Joseph Toro, A. Monteleon and Charles Karst, are planning the purchase of the plant of the Southern Canning Company, Bowling Green, Ky., to operate it on a larger scale.

James B. Haggin, who operates Elmendorf, a large dairy farm near Lexington, Ky., will erect a four-story building for the handling of dairy products. Refrigerating machinery and power equipment will be required.

THE MACHINERY MARKETS

C. H. Berryman, manager of the farm, will have charge of the purchase of the equipment.

The Evansville, Henderson & Owensboro Traction Company, which plans the operation of electric lines between Evansville, Ind., and Kentucky cities on the other side of the Ohio River, has purchased the tracks of the Illinois Central between Evansville and Henderson and will begin at once the work of converting it into a traction line.

The Bowles Photograph & Engraving Lamp Company, Evansville, Ind., has been incorporated with $50,000 capital stock for the purpose of erecting a plant for the manufacture of lamps for photograph and engraving work. W. R. Bowles and Luther Hayden, of Hopkinsville, Ky., are among the organizers.

The Loomis & Hart Furniture Company, Chattanooga, Tenn., is erecting a furniture factory to take the place of one destroyed by fire several months ago. The company is in the market for boilers, electrical equipment, including motors, and wood-working machinery. J. D. Gahagan, factory manager, will purchase the equipment.

The Carthage Hickory Spoke Works, Carthage, Tenn., will erect a plant for the manufacture of spokes and hubs. The company has been incorporated with $10,000 capital stock by J. C. Bilbry, J. A. Hargrove and Roscoe McGinnis.

The Herb Mfg. Company, Bristol, Tenn., has purchased the plant of the Ordway Mfg. Company and will manufacture bank, store and office fixtures. The company is a Texas corporation and is capitalized at $50,000. H. J. Herb, president.

Samuel Cabot, Inc., Boston, Mass., will probably establish a plant in Harriman, Tenn., for the creosoting of railroad ties and other timber products.

Jellico, Tenn., will purchase 1160 tons of cast iron pipe for installation in connection with its new water system. A. B. Mahan is secretary of the Water Works Commission.

The Cumberland Cedar Mills, Chapel Hill, Tenn., will erect a mill for the manufacture of cedar lumber. Power and wood working machinery will be purchased about January 1. H. L. Woosley is general manager of the company, which has a capital stock of $50,000.

The Chatttanooga Traction Company, Chattanooga, Tenn., has been incorporated with $100,000 capital stock by C. E. James and others for the construction of a street railway system in accordance with franchise privileges recently granted by the City Council. The company is also to build interurban lines to Dalton, Ga.; Dayton, Tenn., and other points. The company plans to get its power from a hydroelectric plant at Hale's Bar, Tenn.

A flour mill will be erected at Hohenwald, Tenn., by S. H. Hinson, J. W. Perry and others.

The plant of the Strickland Pattern Works, Chattanooga, Tenn., which was recently burned, is to be rebuilt. An 85 x 30-ft. building is to be erected.

The Rhea Springs, Tenn., Light & Power Company has been incorporated with $1,000 capital stock by D. W. Hughes, J. C. Wasson and P. C. Chadwick.

Trenton, Tenn., has issued $12,000 of bonds for the erection of an electric light plant.

The John G. Duncan Company, Knoxville, Tenn., is inquiring for prices on a second-hand, three-drum hoist with a lifting capacity of 30 tons.

The White Adding Machine Company, Nashville, Tenn., which, as reported in last week's *The Iron Age*, was incorporated with $400,000 capital stock, has secured a factory site of four acres in South Nashville and will proceed with the erection of a building in the near future.

The Fidelity Investment Company, Nashville, Tenn., which is constructing an electric line from Nashville to Gallatin, Tenn., has let contracts for the electrical equipment to the General Electric Company.

The Hice Mfg. Company, Johnson City, Tenn., is building a new power plant for the operation of its lumber mill. A system for the removal of sawdust and shavings is to be installed. An addition to the mill will also be built.

The Tri-State Towing Company, Memphis, Tenn., has purchased a 100-hp. heavy-duty marine engine from Fairbanks, Morse & Co.

The Decatur Cornice & Roofing Company, Decatur, Ala., is adding to its plant.

M. E. Thornton, Hickory, N. C., is reported to be interested in the establishment of a furnace which will be operated electrically. Mr. Thornton expects to secure power from a hydroelectric plant in which he is interested.

LaGrange, Ga., is considering the erection of a municipal gas plant.

The Barbour Buggy Company, South Boston, Va., is planning to equip a department for the manufacture of buggy bodies.

The Choopee Power & Mfg. Company, Darien, Ga., has been incorporated with $5,000 capital stock by A. De Sola Mendes and Wyatt de R. Barchy to generate and transmit electric power.

The forging room and foundry departments of the Harriman, Tenn., Mfg. Company, which were recently burned, have about been rebuilt.

Improvement in the pumping station of the water works plant of Union, S. C., is to be made in the immediate future. Electricity will supersede the steam power now being generated.

The Atlanta Mfg. Company, Atlanta, Ga., has been incorporated with $100,000 capital stock by Joseph O. Bailey, A. B. Kennedy and others for the manufacture of oil mill, fertilizer factory, cement, milling, cotton mill and other manufacturing equipment machinery. Mill supplies will also be made.

A steel standpipe will be erected by the city of Union Springs, Ala., if a bond issue for $5,000 is approved.

Chipley, Ga., will erect a water system at a cost of $20,000. Plans are being drawn by the J. B. McCrary Company, Atlanta.

J. C. Walker, Marshallville, Ga., is organizing a company with $40,000 capital stock for the erection of a water works system and an electric light plant.

The Niagara Sprayer Company is planning the erection of a plant at Roanoke, Va. The company will manufacture spraying machines and solutions.

The Johnson-Fitzgerald-Sweeney Lumber Mfg. & Railway Company is planning the development of 154,000 acres of timber lands near Jackson, Miss. The company has been capitalized at $5,000,000 and three mills are to be erected. The company intends to do a good deal of railroad building and other construction work. P. H. Fitzgerald is one of the principal organizers of the company.

The Ohio River Contract Company, Evansville, Ind., is in the market for a locomotive crane.

The W. E. Small Spoke Mfg. Company, Corinth, Miss., is asking for prices on a short log sawmill, spoke lathes and two 25-hp. engines.

The Arkansas Natural Gas Company, Little Rock, Ark., is contemplating the extension of its pipe line from Little Rock to Memphis, Tenn. W. J. Diehl is secretary of the company.

Hewell Bros., Washington, Ga., are in the market for a considerable amount of second-hand machine shop equipment, including lathes, shapers, planers, drills, etc.

St. Louis

ST. LOUIS, MO., November 4, 1911.

The conditions in the machine tool market continue to show a better feeling and the business being done presents a reasonably satisfactory aggregate. The purchases continue to be in small lots and of single tools, but dealers express themselves as reasonably well satisfied with the developments in the light of general conditions. The October improvement, as a whole, was not fully up to past records, but the continuing betterment makes for a good feeling for the future.

The Chester Knitting Mills, with plants in Chester, Collinsville and Binkneyville, Ill., has completed arrangements to consolidate its plants in St. Louis and install enough new machinery to double its present total capacity.

The adoption of Webster Groves, Mo., of a $75,000 bond issue for water works has been followed by immediate preparations to begin the work of installation of the new plant.

The Continuous Frog & Crossing Company has been formed in St. Louis by W. J. Holbrook, H. F. Roach, G. F. Tower, Jr., W. G. Brown and others to manufacture and distribute a newly invented manganese steel frog which has been undergoing tests on some 20 railroads. It is stated that the new device presents a continuous rail and therefore the shock of crossings, etc., is eliminated.

The South St. Louis Foundry Company, of St. Louis, has obtained $25,000 additional capital which will be utilized in enlarging the mechanical capacity of the plant.

The J. G. Massie Mfg. Company, with $50,000 capital stock, has completed its organization and incorpora-

THE MACHINERY MARKETS

tion, the first board of directors being John G. Massie, John G. Smith and Frank D. Wyant.

The Retail Liquor Dealers' Association of St. Louis has completed the financing of a $150,000 brewery plant to be operated on a co-operative basis. The mechanical equipment wil be bought within the next 90 days.

The St. Francois Oil Company, St. Louis, with $150,000 capital stock, has been incorporated by H. J. Cantwell, Thomas H. Stamm and H. M. Beer to operate oil leases and well machinery on lands owned by the company.

The Big Muddy Coal Company, with headquarters offices in New York, but operating chiefly in the Illinois fields, has completed the purchase of 7000 acres of coal land in Jefferson County, Illinois, and will proceed at once to install equipment and sink shafts to operate. The chief holders of the company are Edmund Converse, Ambrose Monell, Albert W. Johnson.

The Farmers' Elevator Company, Morrison, Mo., has been incorporated with $100,000 capital stock by Joseph A. Speckhals, John H. Starke and W. S. Toedman and will build and equip a grain elevator at once.

The Deft Adding Machine Company, Kansas City, Mo., with $50,000 capital stock, has been incorporated by W. C. Renfrow, L. A. Robertson and H. B. Renfrow and will equip a plant for the manufacture of a new adding machine.

The Monarch Metal Weather Strip Company has bought a new site for a factory, and will build and equip with machinery a new plant tripling the capacity of its present establishment which will be abandoned when the new plant is completed.

The Roth Tool Company, incorporated with $20,000 capital stock by John O. Wilson, E. W. Roth and E. B. Roth, has taken over the plant of the old B. Roth Tool Company and will enlarge and equip it with modern machinery and place it again in operation.

The National Light & Power Company, with a nominal capital stock of $2,000, has been incorporated here by W. C. Morehead, Judson H. Boughton and A. B. Ewing, Jr., to build and equip a plant for a general lighting and power business under a city franchise which has recently been declared valid. The capital will be made commensurate with the enterprise later.

The Brookport Pearl Button Company, Brookport, Ill., has been incorporated with $20,000 capital stock by J. M. Mitchell, M. J. White and L. E. Mitchell to build a factory for the manufacture of pearl buttons.

The Maule Mining & Coal Company, Belleville, Ill., with $40,000 capital stock, has been incorporated to equip a coal property owned by Alexander Maule, Nicholas Hagan, Jr., and W. C. Schnell.

The franchise for a municipal gas plant at Edwardsville, Ill., has been accepted by Paul J. Scheller and H. J. Peckinpaugh, of Evansville, Ind., who have formed a company to put in the equipment.

The Imperial Clock Company, which was held up in its removal plans from Granite City, Ill., to St. Louis, by minority stockholders' action in court, has settled its difficulties and will proceed at once to equip its St. Louis manufacturing plant.

The Light & Development Company, St. Louis, has increased its capital stock from $100,000 to $200,000 for the purpose of increasing its mechanical equipment.

The Southern Railway Company is preparing a site at East St. Louis, Ill., upon which it will erect an 18-stall round house, machine shop, and coal handling equipment, representing an aggregate outlay of $150,000.

Texas

AUSTIN, TEX., November 4, 1911.

An unusual number of industrial projects involving large machinery requirements have come to light during the last week. There is more activity in the establishment of manufacturing plants in Texas at this time than has ever been known. Much attention is also being given to the improvement of municipal public utility plants. The demand for mining machinery in Arizona, New Mexico and Mexico shows a good increase.

The Medina Irrigation Company has in contemplation the erection of a large canning factory and pickling works upon its 60,000-acre tract of land that it is placing under irrigation near San Antonio.

The Cuero Packing Company has increased its capital stock from $10,000 to $20,000. It will make improvements to its plant at Cuero.

The Alvin Gin Company has been formed at Alvin with a capital stock of $4,000. The incorporators are W. L. Browning, S. Jones, E. L. Long and others.

The San Benito Sugar Mfg. Company has increased its capital stock from $150,000 to $225,000. It is erecting a large sugar mill at San Benito.

The Stone-Webster Engineering Corporation, Boston, Mass., has closed its option on the property of the Beaumont Ice, Light & Refrigerating Company, Beaumont, Texas. This transaction does not embrace the refrigerating plant, but involves the electric light and power plant. Important improvements will be made to the light and power plant.

Isidore Newman & Son, New Orleans, have purchased a controlling interest in the Brush Electric Light & Power Company, of Galveston, and a new company will be formed to take over and operate the plant. It is announced that about $300,000 will be expended in improvements. The power plant will be enlarged and the lighting system extended. Fred M. Lege, Jr., is general manager.

The Marfa Mfg. Company will install a gas plant and distributing system at Marfa.

The city of Brownsville has sold $50,000 worth of bonds that were recently voted and will use the proceeds for enlarging the municipal electric light plant and extending the water works system.

The Waco Sash & Door Company has adopted plans for the erection of a factory at Waco that will cost about $500,000. It will be devoted to wood working of various kinds.

Sterling & Sheffield will install a large plant at Newton for the manufacture of spokes and handles.

The electric light and power plant at Cuero is to be enlarged. The proposed improvement will cost about $25,000.

C. H. Lennox, of Chicago, has under consideration the installation of a large plant at Orange for the manufacture of boilers.

The Blumenstein Chemical Works, Pottsville, Pa., will establish a factory at El Paso for the manufacture of powder and cartridges to supply the Southwestern and Mexican trade. The plant will cost about $100,000.

B. O. McWhorter will install a pumping plant near Lubbock for the purpose of irrigating 200 acres of land. A number of other similar plants will be installed in that section. The water supply is obtained from shallow wells.

The Attorney General's department has approved an issue of $67,000 of bonds of New Braunfels, the proceeds of which will be used to extend and improve the municipal water works plant and distributing system.

H. P. Holt, of Grand Junction, Col., and M. M. Brunk, of Roswell, will erect a factory at Roswell, N. M., for manufacturing an orchard heater.

The Kansas Ice Company, of Newton, Kan., will install an ice factory at Belen, N. M., to cost about $100,000. It will have a daily capacity of 100 tons of ice and will be used primarily to supply the fruit cars of the Atchison, Topeka & Santa Fé Railroad.

The Eagle Milling Company, Tucson, will erect a large flour mill at Safford, Ariz. The site for the proposed plant has been purchased.

Benjamin Revilla and associates will install an ice factory at Chihuahua, Mexico, at a cost of $20,000.

The city of Nuevo Laredo, Mexico, has just issued bonds in the sum of $300,000 for the installation of a new water works plant and distributing system and a sewer system.

The Lotowana Placer Mining Company has adopted plans for the construction of two dams near Parker, Ariz., which will conserve 150,000,000 gal. of water, the laying of a pipe line and the installation of considerable machinery, all for the purpose of operating their placer mines.

The Compania Exploradora de Minas, of Pachuca, will install a reduction mill and cyanide plant and lay a pipe line to connect the two at its mines near Pachuca, Mexico.

C. W. Phillips and associates will install a 100-ton electrostatic plant and a power transmission line at its Penn-Sonora mine at Agua Caliente, Sonora, Mexico.

The Real del Monte y Pachuca Mining Company, of Pachuca, Mexico, will enlarge the capacity of its two mills at that place by installing additional equipment.

The Esmeralda-Parral Mining Company will install a large air compressor, a double drum and new boilers at its Esmeralda mine near Parral, Mexico.

The Float Gold Amalgamated Company will install a 50-ton cyanide plant at its mines near Nogales, Ariz. F. Hartman is superintendent.

THE MACHINERY MARKETS

The Coronado Gold Mining Company will install a 20-stamp mill at its mines near Congress, Ariz.

The Philadelphia Mining Company will install a reduction mill at its mine near Organ, N. M.

The Bennet-Stevenson Mining & Milling Company will enlarge its reduction mill and install other machinery at its mine near Organ, N. M. The mill at present has a capacity of 300 tons.

The Donna Dora Mining Company, Kent, will install a reduction mill at its mine near Kent, N. M. George S. Courtney is general manager.

W. B. Bates, of Oro Grande, will install considerable new machinery upon his mine near Oro Grande, N. M.

The Reliable Machine Works, Harrisburg, Texas, is building an addition to its plant.

The Pacific Coast

SAN FRANCISCO, CAL., November 2, 1911.

Machine tool business continues to drag. The volume of small sales keeps up fairly well, showing little change from week to week, but no large orders have been placed for some time, and those who are usually the principal buyers are keeping out of the market almost entirely. The number of new inquiries shows some increase this week, but they are in nearly all cases for single tools. According to the representative of a leading manufacturer, there is little demand for tools of standard design, but local machine shop operators are beginning to show considerable interest in special labor-saving devices, and during the coming year will probably install many improvements in this line.

The Southern Pacific Railroad appears to have the strike situation well in hand, but is still cutting down its purchases of tools, the only recent order from this source being for a 30-ton Shaw gantry crane for use at Los Angeles. The Western Pacific is concentrating its machine shop equipment in Oakland, dismantling several shops in the interior of the State, but as far as can be learned here no new equipment is being purchased.

California and Nevada mining interests are coming out for a good many small air compressor outfits, stamp mills, etc., but little large work is being undertaken in this line. Small contractors' equipment is in fair demand, and there is some inquiry for the heavier lines, which have been quiet for some time. The outlook in this department has been greatly improved by the renewal of construction on interurban railroads, and the beginning of work on several large hydroelectric projects, which will require a great deal of excavation and tunnel work in the next few years. Aside from a few sawmill inquiries, woodworking machinery is quiet. Plans are about complete for the expenditure of $18,000,000 on State highway work, in connection with which it is expected that the State will install several quarry outfits.

The Columbia Steel Company's plant, at the new town of Pittsburgh, Cal., is now using titanium alloys quite extensively in its castings, and the management expresses great satisfaction with the results.

The board of public works of Los Angeles will receive bids November 6 for a pneumatic drilling outfit.

New figures will be received November 10 for an electric generating plant on the Los Angeles municipal aqueduct. The cost of the entire plant is estimated at $500,000.

New figures are to be taken on boilers for the State hospital plant on the Los Angeles municipal aqueduct. The cost of the entire plant is estimated at $500,000.

The Oakland Elevator Company has been incorporated in Oakland, with a capital stock of $100,000, by W. J. Wigmore, A. R. Hanson and W. H. Buttner, with the intention of establishing an elevator plant.

L. Demartini, head of the largest nut shelling concern on the coast, will go to the East shortly to purchase new machinery.

The Horse Mountain Copper Mining Company, operating near Eureka, Cal., is installing a concentrating plant, and has under consideration plans for a 15-mile tramway.

The San Joaquin Light & Power Company is installing an automobile repair shop at Bakersfield, Cal.

The Southern Pacific Railroad has accepted plans for an electric substation at its Melrose station in Oakland. The operation of electric trains over the Oakland line will be started within a few weeks.

C. H. L. Ghriest is working on a project to establish an electric lighting plant at Beaumont, Cal.

The Tulare County Power Company has closed a contract for the installation of a 300-hp. auxiliary steam turbine generating plant, to be erected at Tulare, Cal.

The city of San Francisco has called for bids, to be received November 15, for 43 electric motor cars for the Geary street municipal railroad.

Bids will be received December 4 for condensers, pumps, feed water heaters, etc., for the defensive works at Manila, P. I.

The Northern California Power Company is starting work on its new hydroelectric development at the big bend of the Pitt River. The work will include the construction of a large dam, ditches and tunnels, aside from the installation of generating equipment.

The Oro Electric Corporation is preparing to install a large power plant on the Feather River north of Oroville, Cal.

The Hammel Oil Burner Company, Los Angeles, has purchased a building, and will install equipment for the manufacture of fuel oil burners.

The Atlas Auto Machine Shop has been incorporated in San Francisco, with a capital stock of $10,000, by J. B. Dalziell, H. D. and N. F. Pressey.

San Francisco parties are considering the installation of a sash and door factory at Dorris, Cal.

The Reuben mine in Placer County, Cal., has been purchased by Chicago parties, who intend to install a new quartz mill and other machinery.

It is reported that the American Beet Sugar Company will increase the capacity of its mill at Chino, Cal., from 700 to 1000 tons daily.

The owners of the Jack Pot mine, Wonder, Nev., are planning to install a 20-stamp ore mill.

The Standard Lumber Company, operating several sawmills near Sonora, Cal., plans to add another mill before next summer.

The Gorham Engineering Works, Oakland, Cal., has taken up the manufacture of automobile fire engines, turning out 125-hp., 6-cylinder model, with turbine pumps. Orders have been booked for a large number of these machines.

Eastern Canada

TORONTO, ONT., November 4, 1911.

New industries are being established, in some branches amalgamation is proceeding, enlargements of plant in a number of cases are planned or in progress, and developments in the industrial field generally indicate great faith in the future and a desire to get into a state of preparedness for larger business. There is no sign that the short-coming of the census has given any setback to the sanguine spirit of the country. Financial interests are hopeful that the present movement will continue. There is scarcely room for doubt that the change of government has been reassuring, inasmuch as the men now in office are committed to the policy of protection. Further, a programme of reforms—such as the regulating of freight rates in some measure, the checking of the combination tendency, the fostering of the agricultural industry, the aiding of the good roads movement, etc.—is regarded as auspicious for industrial and commercial enterprise. Reports of current business are very favorable. The weather and the roads are in a state conducive to trade.

The mayor and the majority of the aldermen of London, Ont., have expressed their willingness to submit at the municipal elections in January a by-law to raise $100,000, to be applied for the purpose of attracting industries to the city.

When the tenders for the construction of Toronto's tube railroad course were opened two days ago they were found to be 14 in number. These tenders are for the work of excavating and concreting only. Laying the track, providing the cars, installing the electrical equipment, etc., will cost nearly as much as this construction. The lowest tender received was $2,800,000. Three of the 14 companies tendering are Canadian, the rest are of the United States—New York, Boston, Lowell.

The City Council of Hamilton, Ont., has adopted the recommendation of the Board of Control to enter into a co-operative contract with the Hydro-Electric Commission of Ontario for the supply of 2000 hp. and to place an order for an additional 1000 hp. to be delivered by November 1, 1912.

The Ontario Power Company, from which the Hydro-Electric Commission of Ontario obtains all the power it is supplying by its transmission system to

THE MACHINERY MARKETS

municipalities in the southwestern part of the province, has begun the construction of an addition to its plant below the river bank at the foot of the Horseshoe Falls of the Niagara. Two units of 12,000 hp. each will be provided for. The company's total generating capacity will thereby be raised to about 148,000 hp. The work is to be pushed forward during the winter and the units are to be installed by the opening of spring.

It is said that the Canadian Northern Railway Company's new car shops will be located near Hog's Back, about four miles from Ottawa, and will be built on a scale like that of the Canadian Pacific's Angus shops in Montreal.

D. McNichol, vice-president of the Canadian Pacific, says that his company will erect at Ottawa a new station just opposite that which the Grand Trunk is erecting there. It is expected to equal the latter in dimensions and elegance.

Nine hundred men are now at work on the construction of the pulp and paper mills which Price Bros., Ltd., are building at Jonquières, Que. The mills will cost about $2,000,000. When in operation they will employ 1500 men. A model town is being built up. A very large power house will be required. It is expected that the whole plant will be in operation by next September.

The Bronson Company, Ottawa, has taken out a permit for a pulp mill to be erected on Amelia Island at the Chaudière.

It is reported that a million dollar pulp and paper plant will be established at Thorold, Ont., the output to be sold in the United States.

The Temiskaming & Northern Ontario Railway Commissioners have placed with the Canadian Locomotive Company, Kingston, Ont., an order for four engines of the consolidated type to be ready for service in April.

The Canadian Locomotive Company has received the contract for the building of 30 locomotives for the Canadian Northern. They are of the heavy consolidation type and are to be delivered for the season of 1912. Up to date the Kingston plant has received orders this year for 100 locomotives. It turned out its thousandth engine a few days ago.

The Commercial Envelope & Box Company, Binghamton, N. Y., is in negotiation with the municipal corporation of Kingston, Ont., for terms to establish its plant there.

McGregor & McIntyre, a steel construction firm, have purchased 10 acres in the vicinity of Toronto as the site of a plant.

The Dominion Government's peat plant at Alfred, near Ottawa, is to be closed down. It was put up for demonstration purposes, and having to such good purposes shown what can be done as to lead a private company to arrange for the establishment of a 15,000-ton peat plant near Ottawa the government sees no need for continuing its object lesson.

The ratepayers of Windsor, Ont., voted on November 2 in favor of the by-laws submitted to them to give municipal privileges to the Hupp Motor Car Company and the White Machine Works. The latter is a branch of a company at Eau Claire, Wis. The two companies will now proceed to erect factories.

Western Canada

WINNIPEG, MAN., November 4, 1911.

In the West there is great building activity, and on this account there is considerable demand for equipment and structural material. The large building operations of the railroad companies make business for manufacturing plants and thus help to make the renewal demand for machinery brisker than it would otherwise be. The opening of the 70-mile transmission line of the city of Winnipeg's power plant is expected to be followed by the establishing and installing of new industries. The Canadian West is making progress in industrial enterprise, being marked in Alberta and British Columbia.

E. H. Patterson, of Rochester, and F. H. Keifer, of Port Arthur, Ont., have been negotiating with the Board of Control of the latter named city to obtain 15 acres of land at Bare Point upon which to locate several manufacturing industries.

A company is in negotiation with the municipal authorities of Ft. William for the establishing there of an industry, of which no particulars are published save that the company will apply $500,000 capital to the undertaking if an agreement is reached.

The Great Northern Tannery Company is building a large factory at Edmonton, Alberta. The bulk of the hides used will be obtained from the packing plants of the Swift Canadian Company and P. Burns & Co., both of which are very close to the new tannery.

The Canadian Coal & Chemical Company, Winnipeg, has been incorporated by Dominion authority with a capital stock of $10,000,000. It is said to be the purpose of this Winnipeg corporation to establish an industry at Brazeau mines in Alberta, where coal would be reduced to tar and by-products.

Skene & Christie, contractors, Vancouver, B. C., are to construct the new Hotel Vancouver at Vancouver, B. C., for the Canadian Pacific Railway Company, the cost to be $1,000,000.

Government Purchases

WASHINGTON, D. C., November 6, 1911.

The purchasing officer of the Isthmian Canal Commission will open bids November 22, under canal circular 662, for furnishing a construction plant to be used chiefly in the erection of machinery and electrical equipment at the locks of the Panama Canal. Proposals submitted are to provide for complete machines and appliances. All parts and appurtenances essential to complete installation shall be provided by the contractor. The project is divided into three classes as follows:

Class 1, for four 15-ton locomotive cranes having a maximum radius of 40 ft. and 12,000 lb. capacity; class 2, for four 11-ton steel stiff-leg type derricks, having a maximum swinging capacity of 22,000 lb. at a 40-ft. radius; class 3, for four hoisting engines, vertical boiler double engine and two drum type with one reversible drum swinging gear.

In addition to alternate proposals for standard equipment bids are requested upon an electric hoist, the driving motor to operate upon a 3-phase, 25-cycle, 200-volt secondary circuit.

The Paymaster General, Navy Department, Washington, will open bids November 14 for furnishing and installing one motor generator set at Norfolk, Va., under schedule 4051, class 211.

The Bureau of Supplies and Accounts, Navy Department, Washington, opened bids October 31 for material and supplies for the navy yards as follows:

Schedule 3947, class 1, two engine lathes for Mare Island—Bidder 50, Compressed Air Machinery Company, San Francisco, Cal., $808; 69, Eccles & Smith Company, San Francisco, Cal., $871; 95, Harron, Ricard & McCone, San Francisco, Cal., $976.50; 142, Niles-Bement-Pond Company, New York, $840; 155, Pacific Tool & Supply Company, San Francisco, Cal., $1,000; 164, Joseph T. Ryerson & Son, Chicago, Ill., $925 and $845; 167, Rex Compressed Air & Drill Company, San Francisco, Cal., $892, $916 and $962; 184, Springfield Machine Tool Company, Springfield, Ohio, $975.

Schedule 3973, class 21, one electrically operated dough mixing machine—Bidder 22, Charles Brown & Son, San Francisco, Cal., $853.30; 28, Berger & Carter Company, San Francisco, Cal., $535; 46, Champion Machinery Company, Joliet, Ill., $430; 62, J. H. Dey Company, Cincinnati, Ohio, $850; 120, Lynn Superior Company, Cincinnati, Ohio, $630; 151, Pacific Motor & Engine Company, San Francisco, Cal., $535.

Class 22, one vertical single-barrel steam capstan—Bidder 94, Hyde Windlass Company, Bath, Me., $395; 211, Williamson Bros. Company, Philadelphia, Pa., $405.

Class 23, one sand-blasting apparatus—Bidder 61, N. K. Davis Machine Works, San Francisco, Cal., $850.

Schedule 3998, class 91, two electric hoists for Philadelphia—Bidder 15, Alfred Box & Co., Philadelphia, Pa., $1,200; 26, Brown Hoisting Machinery Company, Cleveland, Ohio, $760; 98 Hoisting Machinery Company, New York, $540; 142, Niles-Bement-Pond Company, New York, $570.

Class 92, one band self-feeding, ripping and re-sawing machine—Bidder 9, Alco Mfg. Company, New York, $620 and $725; 31, Berlin Machine Works, Beloit, Wis., $1,175.39; 72, J. A. Fay & Egan Company, Cincinnati, Ohio, $1,439; 133, Manning, Maxwell & Moore, New York, $1,121 and $1,277.

Class 94, one double cylinder four-roll surfacer—Bidder 9, Alco Mfg. Company, New York, $2,650 and $2,350; 31, Berlin Machine Works, Beloit, Wis., $1,989 and $2,089; 72, J. A. Fay & Egan Company, Cincinnati, Ohio, $2,278 and $2,378; 133, Manning, Maxwell & Moore, New York, $1,497 and $2,123.

Schedule 4003, class 102, three four-spindle drill presses for Washington—Bidder 58, De Zaucke Hanson & Co., Philadelphia, Pa., $430; 75, Prevost Machinery Company, New York, $238, 77, General Machine Company, New York, $240; 109, E. F. Kerwan & Bro., New York, $360; 111, Kemp Machinery Company, Baltimore, Md., $450.50 and $672; 133, Manning, Maxwell & Moore, New York, $465 and $611.

Schedule 4005, class 123, one lower press and brake for Norfolk—Bidder 74, Ferracute Machinery Company, Bridgeton, N. J., $2,585; 105, A. Garrison Foundry Company, Pittsburgh, Pa., $2,694; 133, Manning, Maxwell & Moore, New York, $2,014 and $2,200; 135, George A. Old & Co., Newark, N. J., $2,021.60; 160, Lowis Iron & Steel Company, New York, $2,060; 160, Lowis Machine Tool Company, Chicago, Ill., $1,662; 188, Tiffin Machine Company, Tiffin, Ohio, $2,050.50.

Class 124, one shearing and punching machine—Bidder 51, Pittsburgh Punching & Shearing Company, Pittsburgh, Pa., $8,175; 133, Manning, Maxwell & Moore, New York, $6,700; 145, George A. Old & Co., Newark, N. J., $680.

Current Metal Prices.

The following quotations are for small lots, New York. Wholesale prices, at which large lots only can be bought, are given elsewhere in our weekly market report

IRON AND STEEL—

Bar Iron from Store—

Refined iron
1 to 1½ in. round and square . . . . ₤ lb 1.70c
1½ to 4 in. x ⅛ to 1 in. . . . . ₤ lb 1.80c
1½ to 4 in. x ¼ to 1 in. . . . . ₤ lb 1.80c
Rods, ⅜ and 11/16 in. dia. and square, ₤ lb 2.00c
Angles
3 in. x ¼ in. and larger 1.80c
2 in. x 5/16 in. and ⅜ in. . . . 2.00c
1½ to 2½ in. x ⅜ in. . . . 1.90c
1½ to 2½ in. x 5/16 in. and thicker 1.85c
1 to 1¼ in. x 5/16 in. . . . 1.95c
1 to 1¼ in. x ¼ in. . . . 2.00c
5 in. x ⅜ in. . . . 2.10c
3 in. x ⅜ in. . . . 2.15c
3 in. x ⅜ in. . . . 2.35c
12 x 6.92 lb. . . . 4.10c
Tees
3 in. . . . 2.25c
1½ in. . . . 2.10c
1½ to 2½ x ¼ to ⅜ in. . . . 1.95c
1½ to 2½ x 5/16 in. . . . 2.00c
2 in. and larger, ¼ in. . . . 1.85c
Beams . . . 1.80c
Channels 3 in. and larger . . . 1.80c
Bands, 1¼ to 6 x 5/16 to No. 8 . . . 2.00c
Bolt ends, ½ in. & S. B. B. iron, base price 2.95c
Bolt ends, Best refined iron base price . . . 4.00c
Nut sizes . . . 3.00c

Merchant Steel from Store—

Base, lb.
Bessemer machinery 1.70c
Toe calk, file and sleigh shoe . . . 2.50@3.00c
Best cast steel, base price in small lots . . . 7

Sheets from Store—

Black

	One pass C R soft steel	R R annealed
No. 16	₤ lb 2.35c	2.75c
Nos. 18 to 20	₤ lb 2.40c	2.85c
Nos. 22 and 24	₤ lb 2.45c	2.95c
No. 26	₤ lb 2.50c	3.05c
No. 28	₤ lb 2.85c	3.20c

Russia, Planished, &c.

Genuine Russia, according to assortment . . . ₤ lb 12 @14c
Patent planished W Dewees . . . 9c net
Wood . . . ₤ lb A 10c B 9c net

Galvanized

Nos. 12 and 14	₤ lb 2.55c
No. 24	₤ lb 2.60c
No. 26	₤ lb 2.70c
No. 28	₤ lb 2.80c

No 20 and lighter 36 inches wide 25c higher

Genuine Iron Sheets—

Galvanized

Nos. 22 and 24	₤ lb 5.00c
No. 26	₤ lb 6.00c
No. 28	₤ lb 7.00c

Corrugated Roofing—

	Painted	Galv.
2½ in. corrugated		
No. 24, 100 sq. ft.	$4.50	$5.50
No. 26, 100 sq. ft.	3.80	4.80
No. 28, 100 sq. ft.	3.00	4.00

Tin Plates—

American Charcoal Plates per box

A A A	
IC, 14 x 20	$6.65
IX, 14 x 20	7.90
A	
IC, 14 x 20	$5.60
IX, 14 x 20	5.70

American Coke Plates Bessemer

IC 14 x 20	$4.50
IX, 14 x 20	5.50

American Terne Plates

IC, 20 x 28 with 8½ x 14	$8.70
IX, 20 x 28 with 8½ x 14	10.70

Seamless Brass Tubes—

Last November 15, 1909 Base price, 18c

Brass Tubes, Iron Pipe Sizes—

Last November 15, 1909 Base price, 18c

Copper Tubes—

Last November 15, 1909 Base price, 21c

Brazed Brass Tubes—

Last February 1, 1911 18½c ₤ lb

High Brass Rods—

Last February 1, 1911 14½c ₤ lb

Roll and Sheet Brass—

Last February 1, 1911 14½c ₤ lb

Brass Wire—

Last February 1, 1911 14½c ₤ lb

Copper Wire—

Base price, Carload lots mill 13½c

Copper Sheets—

Sheet copper hot rolled, 16 oz. quantity asked . . . ₤ lb 17c
Sheet copper cold rolled, 16 oz. advance over hot, 1c ₤ lb
Sheet copper 10 oz. sheet 20 in. wide and under, 1c ₤ square foot
Sheet copper polished over 20 in. wide 2c ₤ square foot
Planished copper, 1c ₤ square foot more than polished

METALS—

Tin—

Straits pig . . . ₤ lb 45 @46 c

Copper—

Lake, large . . . ₤ lb 14 @14¼c
Electrolytic . . . ₤ lb 13¾@14 c
Castings . . . ₤ lb 13¾@14 c

Spelter—

Western . . . ₤ lb 6¾@ 7¼c

Zinc—

No. 9, base, casks . . . ₤ lb 5¼c Open . . . ₤ lb 9c

Lead—

American pig . . . ₤ lb 5 @5¼c
Bar . . . ₤ lb 6¾@6¾c

Solder—

½ & ½ guaranteed . . . ₤ lb 25½@26c
No. 1 . . . ₤ lb 23½@24c
Refined . . . ₤ lb 22½@23c
Prices of solder indicated by private brand vary according to composition

Antimony—

Cookson . . . ₤ lb . . @10¾c
Hallett's . . . @10 c
Other brands . . . 10@ 10½

Bismuth—

Per lb $2.00@$2.25

Aluminum—

No. 1 aluminum, guaranteed over 99% pure, in ingots for remelting . . . 21c and 22c
Rods and Wire . . . Base price 35c
Sheets . . . Base price 40c

Old Metals—

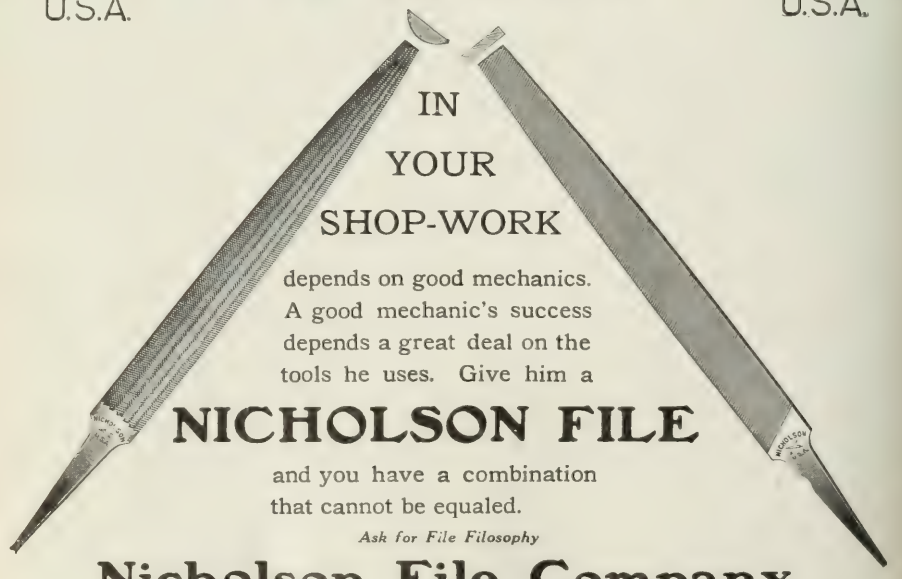
Dealers' Purchasing Prices Paid in New York.

	Cents.
Copper, heavy and crucible	10 50 to 10 75
Copper, heavy and wire	10 25 to 10 50
Copper, light and bottoms	9 25 to 9 50
Brass, heavy	7.00 to 7.25
Brass, light	5.50 to 5.75
Heavy machine composition	9.00 to 9.25
Clean brass turnings	6.75 to 7.00
Composition turnings	7.50 to 7.75
Lead, heavy	4
Lead, tea	3½
Zinc, scrap	4.00

NICHOLSON U.S.A.

SUCCESS

NICHOLSON U.S.A.



IN YOUR SHOP-WORK

depends on good mechanics. A good mechanic's success depends a great deal on the tools he uses. Give him a

NICHOLSON FILE

and you have a combination that cannot be equaled.

Ask for File Filosophy

Nicholson File Company

PROVIDENCE, R. I.

THE IRON AGE

Established 1855 — New York, November 16, 1911 — Vol. 88: No. 20

Published Every Thursday by the
DAVID WILLIAMS COMPANY
239 West 39th Street, New York

Entered at the New York Post Office as Second-Class Mail Matter.

Subscription Price, United States and Mexico, $5 00 per Annum; to Canada, $7.50 per Annum; to Other Foreign Countries, $10.00 per Annum. Unless receipt is requested, none will be sent. Credit for payment will be shown by extending the date on the wrapper of your paper.

W. H. Taylor, - - - - - - President and Treasurer
I. A. Mekeel, - - - - - - - First Vice-President

Geo. W. Cope, - - - - }
A. I. Findley, - - - - } Editors
W. W. Macon, - - - - }

M. C. Robbins, - - - - Manager
Charles S. Baur, - - - Assistant Manager

Branch Offices

Philadelphia, Real Estate Trust Building
Pittsburgh, Park Building
Boston, Compton Building
Chicago, Fisher Building
Cleveland, American Trust Building
Cincinnati, 807 Andrews Building

CONTENTS.

An Increase in Forward Buying....1053
Iron and Steel Works Improvements....1054
The Trust Prosecutions....1055
Commercialized Engineering....1055
Inspecting Fire Equipment....1056
Correspondence....1056
The Tobacco Trust Decision....1057
The Stanley Investigating Committee....1057
The Woodward Iron Company's Purchase....1057
The Iron and Metal Markets....1058
Iron and Industrial Stocks....1068
National Founders' Meeting....1068
October Copper Production and Stocks....1068
Isthmian Canal Commission Bids....1069
The "Steel Wire Gauge"....1069
The Steel Corporation's Unfilled Orders....1069
Personal....1070
Obituary....1070
Pittsburgh and Vicinity Industrial Notes....1071
Standardizing Factory Expense and Cost....1072
Lake Iron Ore Shipments in October....1073
Alliance Crane Contracts....1073
An Analysis of Factory Work....1074
The Canadian Sirocco Company, Ltd....1076
The Canadian Duty on Wrought Pipes or Tubes....1076
A New Carnegie Shape Book....1076
The Physical Properties of Cast Iron....1077
New Single-Phase Electric Motors....1080
The Sauer Transmission Gear....1081
New Cutler-Hammer Crane Panel....1081
New Wire and Rod Machines....1082
American Ironmasters Safeguarding Their Men....1082
Internal Cold Metal Saw....1083
The Chronograph....1084
An Exceptionally Large Tank Car....1085
Notable Departure in Relief valves....1085
Carborundum for Special Steels....1086
The Gardner Ring Wheel Chuck....1087
The Knox Pressed & Welded Steel Company....1087
The Colorado Fuel & Iron Company....1088
The Detroit Return Trap....1088
Mechanical Engineers' Annual Meeting....1089
Hauck Changeable Forge....1089
Time Study Observations....1090
A 35-Ton Shipbuilding Crane....1092
Judicial Decisions of Interest to Manufacturers....1093
The Le Blond Combination Miller....1094
Prize Contest of the Society of German Foundrymen....1094
The Machinery Markets....1095
Government Purchases....1103
New Tools and Appliances....1103

An Increase in Forward Buying

Consumers Would Contract More Freely

Railroad Demand Keeps Up—Round Sales of Basic Iron for Western Delivery

Summed up, the latest developments in finished steel products are these: A larger business in some of the heavier lines, a continuance of the better buying by the railroads, lower prices where there has been any change and more offers from consumers to place long-time contracts at present levels. This last is the most significant feature of the situation. There are also offers to take and pay for, as soon as the mills can ship, rolled steel in various forms sufficient to last the would-be buyers for months. While some mills are resisting the effort to carry present prices far into next year, there is evidently an increase in forward selling. The whole price situation turns on the amount of backlog accumulated under this movement.

Attention is still focused on the railroads. Car buying last week made a larger week's total than in months and other good-sized orders are yet to be given out. The New York Central added 5350 to its previous total, and the B. & O. gave out three orders calling for 2000, 1000 and 1500 cars, respectively. In the Pittsburgh district the plate and structural tonnage resulting from car orders placed with local builders amounts to 60,000 tons and Chicago district mills have booked 40,000 tons of plates and shapes for Western car shops.

The Atlantic Coast Line has bought 12,000 tons of rails from the Carnegie Steel Company and 7000 tons from the Maryland Steel Company. The Reading and the Central of New Jersey have placed 18,000 to 20,000 tons with the Pennsylvania Steel Company and the Bethlehem Steel Company. In addition to the 21,000-ton order which went to Gary, the Burlington road has bought 40,000 tons of open-hearth rails from the Colorado mill. The New Haven is added to the list of roads figuring on next year's requirements. Arrangements may be made that will bring some 1912 rail rolling to the mills for December, filling gaps that have been giving some concern.

There is larger buying of steel bars and July 1, 1912, is, as a rule, the limit on contracts. Two sellers are reported to be holding to 1.10c., Pittsburgh, as a minimum, but it is known that on some large lots, of small range in sizes, the price has gone to 1.05c. In the Chicago district sales have been made which on a Pittsburgh basing would figure even lower.

In plates, structural shapes and bars, the products on which the mills in different districts come into sharpest competition, the week's prices have shown

variations of $1 to $3 a ton, when reduced to a Pittsburgh basis, the differences being largely a matter of freight rates.

In the lighter products conditions are not uniform. Sheet prices are so low that buyers are trying to place large orders, but the mills would rather travel closer to actual consumptive needs, believing that the market is scraping bottom. Tin-plate mills are down to 45 per cent. of capacity in current operations. In wire the deeper cuts in prices have not produced more business.

Eastern cast iron pipe makers have an inquiry from a gas company for nearly 15,000 tons of pipe for next year—a larger tonnage than any single interest has ever called for at this time of year for spring delivery. Low prices are stimulating demand in this industry, as in others.

Foundry pig iron buying has increased somewhat in nearly all districts. At Chicago local foundry iron at $14 for No. 2 is crowding out Southern iron on a $10, Birmingham, basis. Cincinnati, Buffalo and Cleveland report better buying by foundries, but the uncertainty about raw material prices for 1912 is still a factor.

In basic iron several large lots have been closed. At St. Louis over 15,000 tons was taken by Chicago district and Central Western furnaces, and more business is pending there. A northern Ohio steel plant bought 10,000 tons at a new low price for this year, reported at $12.35 at Valley furnace. The Eastern steel works have been holding up shipments of basic iron lately and the prospects are that several more blast furnaces in that section will go out.

Iron and Steel Works Improvements

Periods of stationary or decreased demand for iron and steel products operate to decrease but not to stop the flow of capital into improvements. They do alter in a fundamental way the channels through which the capital flows and the use to which it is put. In a period of increasing demand additional capacity is to be provided, and the manufacturer thinks chiefly of how cheaply the output may be increased. The opportunity is embraced, of course, to adopt new methods and devices, but the chief desideratum is the increased output. In periods of slackened demand, by which we mean periods in which there is either an absolute decrease in the demand or such a decline in the relative rate of increase as brings about a condition of surplus capacity, the flow of capital continues, though perhaps in smaller volume; but the capital is used chiefly to reduce cost of manufacture, the necessity for which is particularly pressing at such times.

From a period of slackened demand the iron trade always emerges with its average costs reduced and with the general standard elevated. This improvement in the average is brought about partly by the investment of new capital and partly by the elimination of unfit plant, which has been below the average and the withdrawal of which serves to improve the general average by leaving the field exclusively to the more fit.

The blast furnace is by far the oldest of our iron and steel manufacturing institutions, the Bessemer and open-hearth steel processes, with their attendant equipment and the rolling facilities adapted to them, being comparatively new. The history of the blast furnace industry is one of wholesale elimination in every period of depression. The period of depression in the nineties marked as unfit dozens and dozens of blast furnaces. Mr. Swank's compilation in the 1892 directory showed a total of 14,550,708 gross tons of blast furnace capacity for January, 1892. The best production in a half year was the 4,911,763 tons in the preceding six months, at the rate of 9,823,000 tons a year, and three years intervened before that half-year record was broken. From January, 1892, to January, 1899, blast furnace erection did not cease. Many new furnaces were built and many others were improved so as to have much larger annual output, yet the boom of 1899, with the very high prices attendant, found the blast furnace industry unable to produce more than 13,620,703 tons, which was almost a million tons less than the claimed capacity of seven years earlier. There is no question that a great many furnaces, assumed in January, 1892, to be fit were shown by the hard times of 1893-8 to be wholly out of the running. In the intervening years they were either actually dismantled or marked as impossible, so that they were not a factor in 1899. The average standard of blast furnace operation was raised by the elimination of these unfit furnaces.

Outside of the raising of the general standard by the elimination of the unfit there has been the factor of actual improvement in methods and devices during periods of relative depression. Some of the most important developments of the past quarter century occurred during the depression of the nineties, the pioneer work or the extensive adoption occurring in that period. The Duquesne blast furnaces, for instance, were blown in, two in 1895 and two in 1897, and marked a distinctly new type, with much greater blowing capacity than had theretofore been provided, while in the handling of material they also constituted a distinct step forward.

The basic open-hearth steel process as a tonnage proposition in the United States had its birth in the depression referred to, and the conditions which favored its adoption were distinctly those of hard times. Three factors dictated its adoption: Very cheap scrap, which had previously been absorbed on fair terms by the iron mills; very cheap pig iron from furnaces in Alabama, where the development had been overdone, and very low transportation rates from Birmingham to Pittsburgh because the railroads stood badly in need of business.

The modern continuous merchant bar mill was distinctly the child of the 1893-8 depression. It gave wonderful promise of economy in manufacture, and without such promise it would not have been adopted at the time. The first steel interests which installed it fully recognized the lessened manufacturing cost assured, and adopted it although they had no assurance that they could find tonnage for full operation. Indeed, it was stated frankly on behalf of the first two installations that the mills would save their owners money even if only enough orders could be found to operate them at an average of one-half capacity.

A large part of the pioneer work and the epoch-making expansion in capacity in the tin plate industry occurred in the depression. Those who urged the imposition of a protective duty in the McKinley law of 1890 claimed that a rate of 2.5 cents per pound was needed, and no serious claim was ever made that tin plate manufacture was a possibility in the United States under the previous duty of 1 cent a pound. The 2.2-cent duty which was actually incorporated in the McKinley law was regarded as not more than sufficient, yet times had so changed, as to the cost of steel in

the open market and as to the manufacture of tin plate itself, that when the Wilson-Gorman law of 1894 reduced the duty to 1.2 cents the industry continued to grow, and indeed grew faster than before, not because the duty was reduced, but because conditions made the reduced duty sufficient.

In the expansion in iron and steel demand since 1898 an enormous amount of capital has been invested in iron and steel making, and much of it has been spent upon new methods and apparatus; but in the spending of by far the major part of this capital increase in capacity was the chief aim, the adoption of new processes and equipment being simply incidental. New plant was being built, and naturally the most modern ideas were adopted. Of construction for the purpose of replacing old plant with newer and more modern there has been considerable, but this has constituted a relatively small proportion of the total outlay.

The prospect is that the next half dozen years will see a change in the direction of the flow of capital, whereby the major portion will be expended for the purpose of reducing cost of manufacture rather than for the purpose of increasing output. There are many promising fields, and as producers are having a respite from the task of striving for larger outputs per unit of equipment in order to keep pace with the activities of sales departments, there will be ample time for thorough study. From the by-product coke oven and thin-wall blast furnace clear through to the steam exhaust of the rolling mill, where a turbine may be attached, there are opportunities for study and the adoption of ideas which such study may approve. Whatever may be the steel prices and wage rates of five years hence, there is no question that measuring the quality of finished steel produced in terms of mental and manual labor expended, the average cost of production will be very materially reduced.

The Trust Prosecutions

The stock market last week took on the appearance of a jubilation after the announcement of the United States Circuit Court's decision regarding the disintegration of the American Tobacco Company. The decision was much more favorable to those holding the securities of the company than had been expected. The properties of the company were not divided among a large number of small interests, but were separated into four leading parts. Under this arrangement the interests of the stockholders and of the various classes of bondholders appear to have been amply protected

The announcement of such a result of the proceedings by the Department of Justice against this great corporation was immediately taken as a message of reassurance to other great corporations which are either the subject of government prosecution or are likely to be. The assumption was drawn that the courts are inclined to be tender in handling the great interests coming under their care and not to enforce the drastic division of the property of such corporations into either their original components or into very small units incapable of wielding an important part in their respective branches of trade. It was taken as proof that the United States courts will be conservative in handling matters of this kind. The fear had prevailed that the ferocity of certain of the government prosecutors would be imparted to some extent to the judges and that a decision would be rendered that would work considerable financial loss to the holders of the company's securities.

While the stock market has acted as though the skies had cleared for great corporations, and that hereafter no serious harm is to be expected to them, a sober contemplation of the situation hardly seems to warrant extravagance of delight at what has so far occurred. The decision is not necessarily final, but can be appealed to the Supreme Court, and the views of the Department of Justice may there be received with more consideration. Nor will the result in the case of this particular company measure what may be meted out to a company in a different branch of trade, as it seems necessary from the position taken by the courts that each case shall be considered on its own merits.

Beyond this, however, comes the even more serious consideration that leaders of public opinion and of political action in Congress may now be spurred to greater activity in endeavoring to curb the power of corporations. Indications are not wanting that measures of this character are likely to be brought forward by leaders of radical legislation. On the other hand, equally strong indications appear that a great part of the public, probably more than ever before, is tired of the baiting of corporations, and that an effort will be made, not only to shelve any further proceedings in that direction, but probably to amend the Sherman act so as to make it less injurious to business interests. It may be possible that in this great conflict of public opinion and of political turmoil the climax of interference with large business may be reached, toward which the business world has long been looking.

Commercialized Engineering

To say that engineering is becoming commercialized may arouse a combative spirit in the engineer. It is not intended to intimate that engineering is necessarily being subjected to opprobrium, nor to announce a discovery of a present tendency. Engineering is rapidly being recognized as a profession, notwithstanding a not infrequent claim that fees for engineering service are far below comparison with fees for other professional service. Signs have been apparent, however, to those stopping long enough to consider that untrammeled expression to the initiative, originality and resourcefulness of the engineer is not always allowed. This statement takes the term engineering in its broad sense, variously defined by authorities, in which the intimate relation is maintained between, say, the scientific and the financial.

It may be well to particularize. The engineer develops an article which is meritorious from the economy or comfort which it will contribute to mankind. It is calculated to replace an article which is itself satisfactorily filling a mission, in the light of common knowledge. The investment in the article of current use is large; the demand has not yet been fully met; so long as it remains profitable to maintain and supply the market the newer device remains hidden from general knowledge. Finally at the propitious moment from the commercial standpoint the invention, design or discovery of the new article is heralded; a demand for it is created, and the older article, even if recently purchased, becomes obsolete over night. It is a question if mankind has not lost a little to the advantage of those in control of the two articles.

Justification for the procedure may be claimed on the same basis as that on which the development of standards rests. If carried to the limit it would mean ultimately little or slow progress. The difficulty of securing an engineering structure of any sort along lines meeting strictly in the best manner the special problem involved is serious in considering, for example, international commerce. Great freedom seems to be given to the Continental engineer. Yet it may be that the situation abroad is as unsatisfactory in this respect as it is in the other respect in this country. Certainly in some lines of engineering one finds as much difference in Europe among what might well be substantially identical plants as there once was among equal priced watches of Swiss manufacture. It is of great economic importance to have interchangeability, but universal application should not be attempted. Definite differences meeting special engineering demands tend to encourage similar endeavor in later problems. It would seem that engineering in this country is very much subservient to business. It is a question, moreover, if this subordinate position is not working harm.

Inspecting Fire Equipment

As an annual reminder to the manufacturer, few are more important than the word of caution against neglect of fire protection at the beginning of cold weather. The number of fires, including those of the conflagration class, is most numerous when artificial heat has become necessary and when men are housed in works during their idle minutes, especially at noon. Every plant has more or less of a system with which to fight fires in their incipiency, but during the warm months neglect is apt to creep in, until emergency apparatus has become to some extent inefficient. A detailed inspection in the autumn will reduce the danger, and the placing of responsibility for a continuance of efficiency may bring large results as a preventive.

Correspondence

Titanium Alloys With and Without Aluminum

To the Editor: I have read with great interest the long letter written by Mr. Hulbert, of the Goldschmidt Thermit Company on the subject of "Ferrotitanium and Its Use." This letter is published in your issue of October 12, and is in reply to one of mine on the same subject published July 27.

The question of the condition of the carbon in the so-called 10 per cent and 15 per cent alloys, made by the Titanium Alloys Mfg. Company was considered rather fully in my previous letter and need not be dwelt upon now. Mr. Hulbert's statement that all ferroalloys should be free from carbon is altogether too sweeping. Since the time of Mushet steelmakers have used spiegeleisen and ferromanganese in increasingly large amounts when making both crucible and the large tonnage steels, with splendid results. By the latter I mean Bessemer and open hearth steels. All the manganese alloys classed under the heads of spiegeleisen and ferromanganese contain a large percentage of carbon, the presence of which is a disadvantage only in very rare cases, such as the making of low carbon steels for experimental purposes or for special uses.

One of the special advantages of the 10 per cent and 15 per cent ferrotitanium alloys is that they are so cheap, and so little is needed to bring about good results, that they are not restricted to special steels made only in small quantities, but are also applicable to the large tonnage steels. It is a matter of great interest to all those who were fortunate enough to be engaged in the pioneer experimental work with these alloys, to see them being used more and more extensively in this latter field. Ferrochromium is another ferroalloy that is largely used with excellent results, and it contains considerable carbon. There is no question of the fact that a good deal of the manganese and chromium in the ferroalloys mentioned is combined with carbon in the form of double carbides, but this does not prevent the metal bath taking up the full amount of chromium or manganese added, less the part oxidized.

SOLUBILITY AND MELTING POINT.

With regard to the subjects of solubility and melting point, Mr. Hulbert is quite right in saying that they are two entirely different things. His, or rather Dr. Goldschmidt's, illustrations from the domain of nonferrous metallurgy are not, however, directly applicable to the question of the solubility of ferrotitanium in a bath of molten steel. In the latter case there is no question in my mind that a comparatively low melting point will greatly assist solubility. The proper place to test theories regarding steel making is in the steel mill and the various laboratories. After several years' experience with the 10 per cent and 15 per cent titanium alloys, covering the making of thousands of tons of steel, I can say that when added properly they are readily taken up by both acid Bessemer and basic open hearth steel, at ordinary casting temperatures.

LADLE ADDITIONS NOT BEST.

I must take exception to the dogmatic character of another of Mr. Hulbert's statements, namely, that the best way to use any deoxidizing ferroalloy is in the ladle or runner. The greatest deoxidizing ferroalloys in use today, with regard to the work done and the amount used, are those of manganese and silicon. In acid Bessemer practice, when making rail steel, experience at more than one mill has shown that much better results are obtained when the spiegel mixture is added to the converter and not to the ladle. This spiegel mixture contains large amounts of both manganese and silicon. The reasons for this practice are very interesting, but will not be gone into now. Also in open hearth practice the best results, with regard to the quality of the steel, are obtained when the whole or part of the manganese and silicon alloys necessary are added in the furnace.

ALUMINUM IN THE TITANIUM ALLOY.

Mr. Hulbert's next argument is with regard to the aluminum in the Goldschmidt titanium alloy, which is unavoidably present in considerable amount. His contention is that this aluminum is beneficial for several reasons which he quotes from a recent letter by Dr. Goldschmidt. The main point is that after solution of the alloy in a molten bath of steel the titanium is changed to TiO_2, which oxide separates from the steel only with difficulty. if, however, aluminum is present with the titanium then Al_2O_3 is also produced which unites with the TiO_2, forming titanate of aluminum, more easily fusible than TiO_2. In other words, the mental picture produced is that the TiO_2 has to separate from the steel as TiO_2 unless aluminum is also present in the alloy, when the Al_2O_3 produced helps it by forming titanate of aluminum. Other paragraphs, however, say that aluminum is a much stronger deoxidizing agent than titanium, and that when this alloy is used the aluminum first reduces all the oxides and impurities present. This, therefore, will remove the oxides and it will be impossible for any TiO_2 to form.

Some of the chemical physics involved when ferrotitanium is added to a bath of molten steel are unknown, and concerning them only theories can be made. One thing, however, is definitely known, and has been proved through several years' experience. It is that the use of titanium alloys containing no aluminum gives steels that are remarkably clean, solid, and free from slag-like materials. This is so noticeable that it constitutes one of the chief advantages of using ferrotitanium.

The explanation is probably as follows: The oxygen present in the bath of steel exists, not as oxygen, but as various oxides. Of these the most harmful is ferrous oxide, FeO existing in solution in the metal. At the same time considerable amounts of silica, SiO_2, and oxide of manganese, MnO, are undoubtedly present as the addition of ferrotitanium generally closely follows that of the manganese and silicon alloys used. Smaller or larger

amounts of intermingled slag are also probably present. The titanium of the ferrotitanium decomposes the FeO, setting free iron and forming TiO_2, which does further very useful work by uniting with the other oxides and impurities, giving a fluid slag that separates readily from the metal. The great value of the TiO_2 in helping to produce such a slag is recognized, and its importance has been pointed out by such well known metallurgists as Professors Howe and Stoughton. If Al_2O_3 is present, or is formed intentionally, there is then so much the more harmful material for the TiO_2 to help to slag off.

In other words, the Al_2O_3 will prevent a large amount of the TiO_2 from uniting with, and helping to remove as slag, the oxides and impurities already present in the liquid steel.

G. B. WATERHOUSE.

BUFFALO, N. Y., November 6, 1911.

The Tobacco Trust Decision

The United States Circuit Court, New York, handed down opinions November 8, approving the plan of the American Tobacco Company for its division into 4 companies. Some conditions suggested by Attorney-General Wickersham were adopted, but these do not materially change the plan suggested by the company. His request that the new companies be kept under the jurisdiction of the court for five years, so that a try-out of the plan may be made with a reservation of the government privilege of re-opening the subject in case competition is not restored, is denied. The question of a possible appeal to the Supreme Court will rest with the Attorney-General, as the government is the only party to the suit aside from the defendants, who are not expected to object to the minor changes specified by the court. The independent tobacco interests were not able to impress their views on the court sufficiently to secure the more complete disintegration of the company.

Judge Lacombe, who wrote the principal opinion, holds broadly that the court would have no power to order the substitution of a different plan for that submitted and that even the changes which are approved can be made only with the consent of the defendants. He says:

> It would be sheer waste of time, therefore, to consider any plan radically different from the one now before us; if we find this plan would not create the condition defined in the opinion of the Supreme Court, or if such modifications as we may require as a condition of giving our approval are not accepted by defendants, we must obey the mandate of that court; must seize the property and sell it at public auction in appropriate and convenient lots, applying the proceeds of the sale to the payment of the debts (including the mortgages) or of such dividend thereon as the proceeds may allow, turning over the surplus, if any, to the owners of the equity.

The contention that no dissolution plan would be effective and that a receiver should be appointed is dismissed with the remark that "evidently the Supreme Court believed some plan was practicable or it would not have directed this court to inquire into the matter." Other plans of dissolution, differing widely in form and scope, are dismissed because "there is no suggestion that the defendants will adopt them," Judge Lacombe arguing that the plan of the defendant must either be approved or rejected, and not changed in character.

Judge Lacombe stands on the decisions of the Supreme Court in the Northern Securities and Standard Oil cases, wherein the same situation was created as to whether the present owners would continue to be the owners of the new companies. He says that since this method of disintegration was acquiesced in by the Supreme Court it would seem that the question has been settled for the Circuit Court by the controlling authority.

Judge Noyes, in his opinion, says that "the successful reconstruction of this organization should teach that the effect of enforcing the statute against industrial combinations is not to destroy but to reconstruct; not to demolish but to re-create in accordance with the conditions which Congress has declared shall exist among the people of the United States."

Judge Coxe, in his opinion, says he approves the plan not because he thinks it perfect, but because it is the best obtainable. He says: "The plan which we have sanctioned eliminates the objectionable features and permits no unreasonable or unlawful restraint of trade."

The court has laid some prohibitions upon the new companies to be formed and upon the interests affected by the decree. The companies shall have no officers or directors in common; they shall not hold each other's stocks; they shall not have the same purchasing and selling agents or officers. Also, they are enjoined from the doing of the things enumerated in the court's opinion as being in violation of the law.

The Stanley Investigating Committee

WASHINGTON, D. C., November 13, 1911.—The Stanley Investigating Committee will resume its hearings on Monday, November 20. These hearings, like those of the last session, will be held by the full committee, which consists, in addition to the chairman, of Representatives Beall, of Texas; Bartlett, of Georgia; Littleton, of New York; McGillicuddy, of Maine; Young, of Michigan; Danforth, of New York; Gardner, of Massachusetts, and Sterling, of Illinois.

No definite programme has been arranged by the chairman, nor is one likely to be. The investigation will probably begin with a thorough inquiry into the transportation question and all the related subjects, which will include also those of the Minnesota ore fields and their operations. With these exceptions the hearings will be governed largely by the developments from day to day. Before adjournment the entire field of inquiry will be fully covered and the widest latitude consistent with a proper regard for time will be permitted both the individual members of the committee and those appearing before it.

Mr. Stanley finds from his correspondence and other sources that interest in the hearings is quite as keen as it was when recess was taken a few months ago. This is no less true of the general public than it is of his committee associates, all of whom have announced their intention to be present at the opening day, and this includes one member who it was thought until a few days ago would be unable, by reason of illness, to reach Washington until the regular Congressional session had begun.

It is not Mr. Stanley's intention to subpœna witnesses but to invite certain gentlemen to appear and give the committee the benefit of their views. He does not doubt that in every case those who are so invited will promptly accept. It is not unlikely that Andrew Carnegie and J. P. Morgan will be among the gentlemen of distinction in the financial and industrial world who will appear before the committee. The hearings are expected to last a month, everything depending on the volume of testimony brought out and its relative importance. That the hearings will be quite as interesting from a popular standpoint as were those of last session is quite evident from Mr. Stanley's observation that "the best is still to come." J. G.

The Woodward Iron Company's Purchase.—By the purchase of the Birmingham Coal & Iron Company by the Woodward Iron Company of Birmingham, Ala., the latter company acquires 37,000 acres of coal lands, with a coal mine at Mulga, Ala., 2400 acres of ore lands, two blast furnaces and a coke plant. The purchase gives the Woodward interests important coal reserves, a direction in which their mineral holdings needed reinforcement. It is reported that the Woodward Iron Company will soon contract for a duplicate of its Koppers by-product coke plant at Woodward, erected last year. The report is also revived that the company will build a steel plant, but no definite announcement of plans is made. The authorized capital stock of the Birmingham Coal & Iron Company is $5,000,000. The bonded debt consists of $2,159,000 first consolidated gold 5's, due in 1927, and $2,000,000 of Birmingham Iron Company general gold 5's, due in 1926. The two Vanderbilt blast furnaces of the company are located just east of Birmingham.

The question of hours of labor in shops in San Francisco, Cal., which has been under discussion between the California Metal Trades Association and the Iron Trades Council for several weeks, has been referred to the San Francisco Industrial Conciliation Board for arbitration. Pending a decision, the eight-hour day will be continued.

The Iron and Metal Markets

A Comparison of Prices

Advances Over the Previous Week in Heavy Type. Declines in Italics.

At date, one week, one month and one year previous.

	Nov. 15, 1911.	Nov. 8, 1911.	Oct. 18, 1911.	Nov. 16, 1910.
PIG IRON, Per Gross Ton:				
Foundry No. 2 standard, Philadelphia	$15.00	$15.00	$15.00	$15.75
Foundry No. 2, Valley furnace	13.25	13.25	13.50	13.75
Foundry No. 2 Southern, Cincinnati	13.25	13.25	13.25	14.25
Foundry No. 2, Birmingham, Ala.	10.00	10.00	10.00	11.00
Foundry No. 2, at furnace, Chicago*	*14.00*	14.10	14.50	16.00
Basic, delivered, eastern Pa.	14.50	14.50	14.50	14.75
Basic, Valley furnace	*12.35*	12.50	12.50	13.25
Bessemer, Pittsburgh	*14.90*	15.15	15.40	15.90
Gray forge, Pittsburgh	13.40	13.40	13.65	14.15
Lake Superior charcoal, Chicago	16.50	16.50	16.50	18.00
COKE, CONNELLSVILLE, Per Net Ton, at Oven:				
Furnace coke, prompt shipment	**1.55**	1.50	1.50	1.50
Furnace coke, future delivery	**1.65**	1.55	1.55	1.75
Foundry coke, prompt shipment	**1.90**	1.80	1.80	2.00
Foundry coke, future delivery	**2.10**	2.00	2.00	2.25
BILLETS, &c., Per Gross Ton:				
Bessemer billets, Pittsburgh	*19.50*	20.00	20.00	23.50
Open hearth billets, Pittsburgh	19.00	19.00	19.00	23.50
Forging billets, Pittsburgh	24.00	24.00	24.00	28.50
Open hearth billets, Philadelphia	*21.40*	22.40	21.40	25.50
Wire rods, Pittsburgh	*25.00*	25.50	26.00	28.00
OLD MATERIAL, Per Gross Ton:				
Iron rails, Chicago	14.50	14.50	13.50	16.00
Iron rails, Philadelphia	15.50	15.50	16.50	18.00
Car wheels, Chicago	12.00	12.00	12.50	13.50
Car wheels, Philadelphia	11.25	11.25	11.75	13.75
Heavy steel scrap, Pittsburgh	12.00	12.00	12.00	14.25
Heavy steel scrap, Chicago	9.50	9.50	9.75	12.25
Heavy steel scrap, Philadelphia	11.50	11.50	12.00	13.50
FINISHED IRON AND STEEL, Per Pound to Largest Buyers:	Cents.	Cents.	Cents.	Cents.
Bessemer rails, heavy, at mill	1.25	1.25	1.25	1.25
Iron bars, Philadelphia	1.20	1.20	1.22	1.37
Iron bars, Pittsburgh	1.20	1.20	1.20	1.45
Iron bars, Chicago	1.15	1.15	1.17½	1.35
Steel bars, Pittsburgh	1.10	1.10	1.10	1.40
Steel bars, tidewater, New York	1.26	1.26	1.26	1.56
Tank plates, Pittsburgh	1.15	1.15	1.15	1.40
Tank plates, tidewater, New York	1.31	1.31	1.31	1.56
Beams, Pittsburgh	1.15	1.15	1.20	1.40
Beams, tidewater, New York	1.31	1.31	1.36	1.56
Angles, Pittsburgh	1.15	1.15	1.20	1.40
Angles, tidewater, New York	1.31	1.31	1.36	1.56
Skelp, grooved steel, Pittsburgh	*1.12½*	1.15	1.15	1.25
Skelp, sheared steel, Pittsburgh	*1.20*	1.25	1.25	1.35
SHEETS, NAILS AND WIRE, Per Pound to Largest Buyers:	Cents.	Cents.	Cents.	Cents.
Sheets, black, No. 28, Pittsburgh	1.85	1.85	1.85	2.20
Wire nails, Pittsburgh	1.55	1.55	1.65	1.70
Cut nails, Pittsburgh	1.50	1.50	1.50	1.60
Barb wire, galv., Pittsburgh	1.85	1.85	1.95	2.00
METALS, Per Pound:	Cents.	Cents.	Cents.	Cents.
Lake copper, New York	**12.75**	12.50	12.50	13.00
Electrolytic copper, New York	**12.62½**	12.37½	12.25	12.87½
Spelter, St. Louis	**6.45**	6.20	6.10	5.80
Spelter, New York	**6.60**	6.35	6.30	5.95
Lead, St. Louis	4.15	4.15	4.15	4.30
Lead, New York	4.25	4.25	4.25	4.40
Tin, New York	**43.15**	42.00	41.45	36.50
Antimony, Hallett, New York	*7.65*	7.70	7.70	7.75
Tin plate, 100-lb. box, New York	$3.64	$3.64	$3.64	$3.84

*The average switching charge for delivery to foundries in the Chicago district is 50c. per ton.

Prices of Finished Iron and Steel f.o.b. Pittsburgh

Freight rates from Pittsburgh in carloads, per 100 lb.: New York, 16c.; Philadelphia, 15c.; Boston, 18c.; Buffalo, 11c.; Cleveland, 10c.; Cincinnati, 15c.; Indianapolis, 17c.; Chicago, 18c.; St. Paul, 32c.; St. Louis, 22½c.; New Orleans, 30c.; Birmingham, Ala., 45c. Pacific coast, 80c. on plates, structural shapes and sheets No. 11 and heavier; 85c. on sheets Nos. 12 to 16; 95c. on sheets No. 16 and lighter; 65c. on wrought pipe and boiler tubes.

Plates.—Tank plates, ¼ in. thick, 6½ in. up to 100 in. wide, 1.15c., base, net cash, 30 days. Following are stipulations prescribed by manufacturers, with extras:

Rectangular plates, tank steel or conforming to manufacturers' standard specifications for structural steel dated February 6, 1903, or equivalent, ¼ in. thick and over on thinnest edge, 100 in. wide and under, down to but not including 6 in. wide, are base.

Plates up to 72 in. wide, inclusive, ordered 10.2 lb. per square foot, are considered ¼-in. plates. Plates over 72 in. wide must be ordered ¼ in. thick on edge, or not less than 11 lb. per square foot, to take base price. Plates over 72 in. wide ordered less than 11 lb. per square foot down to the weight of 3-16-in. take the price of 3-16-in.

Allowable overweight, whether plates are ordered to gauge or weight, to be governed by the standard specifications of the Association of American Steel Manufacturers.

Extras.	Cents per lb.
Gauges under ¼ in. to and including 3-16 in. on thinnest edge	.10
Gauges under 3-16 in. to and including No. 8	.15
Gauges under No. 8 to and including No. 9	.25
Gauges under No. 9 to and including No. 10	.30
Gauges under No. 10 to and including No. 12	.40
Sketches (including all straight taper plates) 3 ft. and over in length	.10
Complete circles, 3 ft. in diameter and over	.20
Boiler and flange steel	.10
"A. B. M. A." and ordinary firebox steel	.20
Still bottom steel	.30
Marine steel	.40
Locomotive firebox steel	.50
Widths over 100 in. up to 110 in., inclusive	.05
Widths over 110 in. up to 115 in., inclusive	.10
Widths over 115 in. up to 120 in., inclusive	.15
Widths over 120 in. up to 125 in., inclusive	.25
Widths over 125 in. up to 130 in., inclusive	.50
Widths over 130 in.	1.00
Cutting to lengths or diameters under 3 ft. to 2 ft., inclusive	.25
Cutting to lengths or diameters under 2 ft. to 1 ft., inclusive	.50
Cutting to lengths or diameters under 1 ft.	1.55

No charge for cutting rectangular plates to lengths 3 ft and over.

Structural Material.—I-beams, 3 to 15 in.; channels, 3 to 15 in., and angles, 3 to 6 in. on one or both legs, ¼ in. and over, 1.15c. to 1.20c. Other shapes and sizes are quoted as follows:

	Cents per lb.
I-beams over 15 in.	1.20 to 1.25
H beams over 18 in.	1.30 to 1.35
Angles over 6 in.	1.20 to 1.25
Angles, 3 in. on one or both legs, less than ¼ in. thick, plus full extras as per steel bar card Sept. 1, 1909	1.20 to 1.25
Tees, 3 in. and up	1.20 to 1.25
Zees, 3 in. and up	1.15 to 1.20
Angles, channels and tees, under 3 in., plus full extras as per steel bar card Sept. 1, 1909	1.20 to 1.25
Deck beams and bulb angles	1.45 to 1.50
Hand rail tees	2.00 to 2.15
Checkered and corrugated plates	2.00 to 2.15

Sheets.—Makers' prices for mill shipments on sheets of U. S. standard gauge, in carload and larger lots, on which jobbers charge the usual discounts for small lots from store, are as follows:

Base Annealed Sheets.

	Cents per lb.
Nos. 3 to 8	1.25 to 1.30
Nos. 9 and 10	1.35 to 1.40
Nos. 11 and 12	1.40 to 1.45
Nos. 13 and 14	1.45 to 1.50
Nos. 15 and 16	1.55 to 1.60

Box Annealed Sheets, Cold Rolled.

	One Pass.	Three Pass
Nos. 10 to 12	1.50 to 1.55	.....
Nos. 13 and 14	1.55 to 1.60	.....
Nos. 15 and 16	1.60 to 1.65	1.70 to 1.75
Nos. 17 to 21	1.65 to 1.70	1.75 to 1.80
Nos. 22, 23 and 24	1.70 to 1.75	1.80 to 1.85
Nos. 25 and 26	1.75 to 1.80	1.85 to 1.90
No. 27	1.80 to 1.85	1.90 to 1.95
No. 28	1.85 to 1.90	1.95 to 2.00
No. 29	1.90 to 1.95	2.00 to 2.05
No. 30	2.00 to 2.05	2.10 to 2.15

Galvanized Sheets, of Black Sheet Gauge.

Nos. 10 and 11	1.85 to 1.90
Nos. 12, 13 and 14	1.95 to 2.00
Nos. 15, 16 and 17	2.10 to 2.15
Nos. 18 to 22	2.25 to 2.30
Nos. 23 and 24	2.35 to 2.40
Nos. 25 and 26	2.55 to 2.60
No. 27	2.70 to 2.75
No. 28	2.85 to 2.90
No. 29	2.95 to 3.00
No. 30	3.15 to 3.20

All above rates on sheets are f.o.b. Pittsburgh, terms 30 days net, or 2 per cent. cash discount in 10 days from date of invoice, as also are the following base prices per square for painted and galvanized roofing sheets, with 2½-in. corrugations.

Corrugated Roofing Sheets, Per Square.

Gauge.	Painted.	Galvanized.	Gauge.	Painted.	Galvanized.
29	.....	$2.30	23	$3.35	$3.45
28	$1.30	2.45	22	2.55	3.65
27	1.45	2.50	21	2.75	4.00
26	1.55	2.60	20	3.00	4.30
25	1.80	3.00	18	4.00	5.65
24	2.05	3.10	16	4.85	6.45

Wire Rods and Wire.—Bessemer, open hearth and chain rods, $25 to $25.50. Fence wire, Nos. 0 to 9, per 100 lb., terms 60 days, or 2 per cent. discount in 10 days, carload lots, to jobbers, annealed, $1.35; galvanized, $1.65. Carload lots, to retailers, annealed, $1.45; galvanized, $1.75. Galvanized bar wire to jobbers, $1.85; painted, $1.55. Wire nails, to jobbers, $1.55.

The following table gives the price to retail merchants on wire in less than carloads, including the extras on Nos. 10 to 16, which are added to the base price:

Fence Wire, Per 100 lb.

Nos.	0 to 9	10	11	12 & 12½	13	14	15	16
Annealed	$1.55	$1.60	$1.65	$1.70	$1.80	$1.90	$2.00	$2.10
Galvanized	1.85	1.90	1.95	2.00	2.10	2.20	2.60	2.70

Wrought Pipe.—The following are the jobbers' carload discounts on the Pittsburgh basing card on wrought pipe, in effect from October 2, 1911:

Butt Weld.

	Steel		Iron	
	Black.	Galv.	Black.	Galv.
⅛ and ¼ in.	73	53	68	48
⅜ in.	74	64	69	59
½ in.	77	67	72	62
¾ in. to 1¼ in.	80	72	75	67
2 in. to 3 in.	81	74	76	69

Lap Weld.

1¼ and 1½ in.	..	..	68	61
2 in.	77	70	72	65
2½ to 4 in.	79	72	74	67
4½ to 6 in.	78	70	73	65
7 to 12 in.	76	66	71	61
13 to 15 in.	52	..	47	..

Butt Weld, extra strong, plain ends, card weight.

⅛, ¼, ⅜ in.	70	60	65	55
½ in.	75	69	70	64
¾ to 1½ in.	79	73	74	68
2 to 3 in.	80	74	75	69

Lap Weld, extra strong, plain ends, card weight.

1¼ in.	..	..	66	60
2 in.	76	70	71	65
2½ to 4 in.	78	72	73	67
4½ to 6 in.	77	71	72	66
7 to 8 in.	70	60	65	55
9 to 12 in.	65	55	60	50

Butt Weld, double extra strong, plain ends, card weight.

¼ in.	65	59	60	54
¾ to 1½ in.	68	62	63	57
2 to 3 in.	70	64	65	59

Lap Weld, double extra strong, plain ends, card weight.

2 in.	66	60	61	55
2½ to 4 in.	68	62	63	57
4½ to 6 in.	67	61	62	56
7 to 8 in.	60	50	55	45

Plugged and Reamed.

1 to 1½, 2 to 3 in. Butt Weld
2, 2½ to 4 in. ..... Lap Weld

} will be sold at two (2) points lower basing (higher price) than merchants' or card weight pipe. Butt or lap weld, as specified.

The above discounts are for "card weight," subject to the usual variation of 5 per cent. Prices for less than carloads are three (3) points lower basing (higher price) than the above discounts.

Boiler Tubes.—Discounts on lap welded steel and charcoal iron boiler tubes to jobbers in carloads are as follows:

Steel.		*Charcoal Iron.*	
1¾ to 2¼ in.	65	1½ in.	48
2½ in.	67½	1¾ to 2¼ in.	50
2¾ to 3¼ in.	72½	2½ in.	55
3½ to 4 in.	75	2¾ to 5 in.	60
5 to 6 in.	67½		
7 to 13 in.	65		

2½ in. and smaller, over 18 ft., 10 per cent. net extra.
2¾ in. and larger, over 22 ft., 10 per cent. net extra.
Less than carloads will be sold at the delivered discounts for carloads, lowered by two points for lengths 22 ft. and under to destinations east of the Mississippi River; lengths over 22 ft. and all shipments going west of the Mississippi River must be sold f.o.b. mill at Pittsburgh basing discount, lowered by two points.

Pittsburgh

PITTSBURGH, PA., November 15, 1911.—*(By Telephone.)*

Pig Iron.—The American Steel Foundries, which recently bought a large tonnage of basic iron from Western furnaces for its plant at St. Louis, has also bought within the past week 10,000 tons or more from Mahoning Valley furnaces, for its Alliance Works, at a price said to be about $12.35 at furnace, for delivery in first quarter. The Westinghouse Air Brake Company is in the market for 1000 to 2000 tons each of forge and foundry iron for first quarter. The wide spread between prices of Bessemer and basic iron is being diminished. In the past week several small sales of Bessemer have been made at $14, Valley furnace, and one sale is recorded at $13.75, and a further decline in prices is expected. We quote Bessemer iron at $14; malleable Bessemer, $12.50; basic, $12.35; No. 2 foundry, $13.25, and gray forge, $12.75, all at Valley furnace, the freight rate to the Pittsburgh district being 90c. a ton. Foundry iron seems to be firmer in the Valley than in the Cleveland and other districts. We note a sale of 200 tons of Bessemer iron for prompt shipment at $14, and 100 tons of No. 2 foundry at $13.25, Valley furnace.

Steel.—Prices on Bessemer steel are weaker, billets having been sold at $20.50 or less, and sheet bars being offered at less than $21, Pittsburgh or Youngstown mill. New inquiries for steel are very light, but consumers are specifying in a moderate way against contracts. We quote open hearth billets at $19; Bessemer billets, $19.50; open hearth bars, $20; Bessemer bars, $20.50 to $21, and forging billets, $24, all at mill, Pittsburgh or Youngstown district.

Ferromanganese.—Reports are that an important Ohio consumer has closed for about 600 tons of foreign 80 per cent. ferromanganese for next year's delivery at slightly under $38, Baltimore.

(By Mail.)

As far as volume of new business in concerned, the condition of the iron trade is fairly satisfactory, but in the matter of prices there is a good deal of complaint, with no indications of betterment in the near future. The encouraging feature of the week is the placing of further car orders by the New York Central (which has now bought upward of 12,000), the Baltimore & Ohio and several other roads. A large business is being placed in structural material and plates, and specifications and orders for sheets are also heavier, but tin plate continues very dull. New business in steel bars is steadily growing and two important mills have pegged their prices at 1.10c. In the wire trade, with prices $3 or $4 a ton lower than a month ago, demand is no greater. There is a better feeling in scrap. Some heavy inquiries have come up for furnace coke for first half and for all of next year, and prospects are that a very large tonnage will be closed in the next two or three weeks. The Carnegie Steel Company is operating at a little above 80 per cent. of ingot capacity and other leading steel companies report some increase in operations.

Ferromanganese.—A sale of 300 tons of foreign 80 per cent. ferromanganese for delivery in the first half of next year is reported at a price of about $38, Baltimore. We quote 80 per cent. ferromanganese for delivery in first half of next year at $38.25 to $38.50, Baltimore, the freight rate for delivery in the Pittsburgh district being $1.95 a ton. On small lots for shipment this year probably about $37.50, Baltimore, could be done.

Ferrosilicon.—Prices continue to advance and sales of several carloads of 50 per cent. have been made at $65, Pittsburgh, the market being very strong at that figure. We quote: 10 per cent., $22; 11 per cent., $23, and 12 per cent., $24, f.o.b. cars Jackson, Ohio, or Ashland, Ky.

Skelp.—Prices are slightly weaker and a sale of 1000 tons of grooved steel skelp in narrow sizes has been made at slightly under 1.15c., delivered, Pittsburgh. We also note a sale of 500 tons of sheared iron plates at about 1.65c., Pittsburgh. We quote grooved steel skelp at 1.12½c. to 1.15c.; sheared steel skelp, 1.17½c. to 1.20c.; grooved iron skelp, 1.40c. to 1.45c., and sheared iron skelp, 1.60c. to 1.65c., all for delivery at consumers' mills in the Pittsburgh district.

Wire Rods.—The market continues dull with prices lower. Nearly all consumers are covered by contracts against which specifications are not satisfactory. We quote Bessemer, open hearth and chain rods at $25 to $25.50, Pittsburgh.

Steel Rails.—Of the order for 25,000 tons of standard sections for next year, placed by the Norfolk & Western Railroad, the Carnegie Steel Company will roll 12,000 tons and the balance of the order will be filled by the Cambria and Maryland Steel companies. It is stated that the orders for steel rails to be placed by the Pennsylvania, Baltimore & Ohio and other leading roads for next year will be heavier than for this year, and the rail mills look for some of these contracts to be given out in the near future. In the past week the Carnegie Steel Company received new orders and specifications against contracts for about 2500 tons of light rails. We quote standard sections at 1.25c. per lb. and light rails as follows: 8 and 10-lb. sections, 1.295c.; 12 and 14-lb., 1.205c.; 16, 20 and 25-lb., 1.16c.; 30 and 35-lb., 1.15c.; 40 and 45-lb., 1.105c.

Structural Material.—The local market has been very quiet in the past week and no important contracts have been taken by the structural interests in this district. The American Bridge Company has taken upward of 5000 tons of bridge work for two Western roads and a large job for Canada is in the market, on which local concerns are figuring. We quote beams and channels up to 15 in. at 1.15c. to 1.20c., Pittsburgh, the lower price being named on large orders.

Plates.—Some large contracts for steel cars have been placed in the past week and more are pending. The New York Central has placed 1500 steel hoppers with the American Car & Foundry Company, 1500 steel gondolas and 4000 box cars with the American Car & Foundry Company, 1000 with the Pullman Company and 500 with the Barney & Smith Car Company, making 11,500 cars placed by this road. The Buffalo, Rochester & Pittsburgh has placed 1000 steel centers for underframes with the Pressed Steel Car Company, while the Baltimore & Ohio Railroad has bought 2000 steel gondolas from the Cambria Steel Company, 1000 steel underframe cars from the Standard Steel Car Company and 1500 composite steel gondolas from the Pressed Steel Car Company. The Southern Railway has placed 1200 steel gondolas with the Pressed Steel Car Company, in addition to the 600 noted last week. The Carnegie Steel Company will roll the plates and shapes for all the cars to be built by the Pressed Steel Car Company and this will amount to 60,000 tons or more. Demand for plates from boiler shops and other consumers is only fair, and some low prices are being made on desirable orders coming up. The Jones & Laughlin Steel Company is furnishing 4000 tons of steel plate caissons, 4 ft. and 6 ft. in diameter, for the wharves and docks at Colon for the Panama Canal. We quote wide and narrow plates at 1.15c. on ordinary orders and 1.20c. in small lots, f.o.b. at mill. On a very desirable contract for large tonnage and attractive rolling specifications it is probable that the lower price named might be slightly shaded.

Sheets.—The low prices ruling for some months on black, galvanized and roofing sheets are certainly bringing out a heavier volume of business. Several of the larger mills report that actual orders booked in the past week, together with specifications received against contracts, have been larger than in any one week for some months. Some of the very large consumers are trying to cover their requirements through the first half of next year at to-day's prices. A few such contracts have been made, but as a rule the sheet mills are not willing to sell very far ahead, believing the market will improve after the first of the year. Prices of galvanized sheets are firmer than they have been for some time, due to dearer spelter. As a rule the sheet mills are operating at 60 to 65 per cent. of capacity. The full schedule of prices on black, galvanized and roofing sheets is given on a previous page.

Tin Plate.—The tin plate trade is not in very satisfactory condition. The mills have pretty well cleaned up old contracts, and consumers have not begun to specify against contracts placed in the past month or so for delivery in first quarter and first half of next year. At present the mills are not operating to more than about 45 per cent. of capacity, and this rate will not likely be increased until after the first of the year, when the mills will start to run on stock to fill contracts of the meat packers and can makers for next year. We continue to quote $3.40 per base box, 14 x 20, for coke plates, f.o.b. at mill.

Bars.—Specifications against contracts for merchant steel bars are fairly heavy at present and shipments by the mills are larger than for several months. A little more firmness is shown by the mills. One local producer turned down an order for 1000 tons of steel bars at 1.05c., stating that the very lowest price it could make on the contract would be 1.10c. at mill. The actual orders sent to the mills in October for rolling were heavier than in any previous month this year. As yet there is no indication of a higher price, but the fact is pretty well settled that bottom of the market has been reached. New demand and specifications for iron bars are only fair, consumers still taking in only such quantities of iron bars as are wanted to meet current needs. We quote merchant steel bars at 1.10c. on desirable orders and 1.15c. for small lots. In very exceptional cases and for favorable specifications 1.05c. on steel bars at mill has been done, but some makers of steel bars state they have not gone below 1.10c. at mill. We quote common iron bars at 1.20c. to 1.25c., f.o.b. cars at mill.

Merchant Steel.—New orders and specifications received so far this month are fully as heavy as in the first half of October. Specifications against contracts are reported by the mills as only fair. Quotations, which are more or less shaded, are as follows: Iron finished tire, ¾ and ⅞ in. and heavier, 1.40c.; under these sizes, 1.45c.; planished tire, 1.50c.; channel tire, 1.70c., base; toe calk, 1.80c.; flat sleigh shoe, 1.45c.; concave or convex, 1.60c.; cutter shoe, tapered or bent, 2.15c.; spring steel, 1.85c.; machinery steel, smooth finish, 1.75c.

Railroad Spikes.—A leading Eastern railroad has placed a contract with a local maker for upward of 10,000 kegs of spikes, and the Great Northern Railroad is reported to be in the market for 7000 to 8000 kegs. Orders are coming in a little more freely. We quote railroad spikes at $1.40 in base sizes for carload and larger lots, f.o.b. Pittsburgh.

Rivets.—The demand for both boiler and structural rivets is reported slightly better, while specifications are coming in a little more freely, probably due to the low prices ruling. We quote structural rivets at 1.50c. and boiler rivets at 1.60c., f.o.b. Pittsburgh; but on desirable orders these prices are shaded $1 a ton.

Shafting.—Makers report that specifications against contracts for shafting from the implement makers and the automobile builders are heavier, while current orders are also showing a slight increase. We quote cold rolled shafting at 60 and 10 and 65 per cent. off in carload and larger lots, delivered in base territory.

Spelter.—Prices have advanced sharply in the past week and prime grades of Western spelter are now held at 6.40c., East St. Louis, equal to 6.52½c., Pittsburgh. A sale of about 100 tons was made early last week at 6.30c., East St. Louis, equal to 6.42½c., Pittsburgh.

Wire Products.—The wire trade is in very unsatisfactory condition. Jobbers and retailers are placing orders for wire and wire nails for only such quantities as are absolutely needed to cover current needs. There is no disposition on the part of the trade to contract ahead, owing to the weakness in the market. Low prices continue on wire and wire nails for delivery at Southern points which are reached by mills which have low rates of freight to such territory. We quote wire nails at $1.55 to $1.60; cut nails, $1.50; galvanized barb wire, $1.90; painted, $1.55 to $1.60; annealed fence wire, $1.35 to $1.40, and galvanized fence wire, $1.65 to $1.70, f.o.b. Pittsburgh, usual terms, freight added to point of delivery.

Merchant Pipe.—A local oil company has contracted for 30 to 35 miles of 6-in. line pipe with one of the independent mills. The report of an inquiry for 100 miles of 12-in. pipe is not confirmed. The High Grade Oil Company has placed 20 miles of 2-in. iron pipe and five miles of 3-in. iron pipe with a local mill, and the Philadelphia Company has placed three miles of 4-in. iron pipe with an Eastern mill. The H. C. Fry Glass Company, of Rochester, Pa., has placed five miles of 6-in. iron pipe with A. M. Byers & Company, Inc., of this city; the Ohio Fuel Supply Company, four miles of 6 in. with the Mark Manufacturing Company, and the Arkansas Natural Gas Company, five to six miles of 3 in. The new demand for merchant pipe is holding up very well, several local pipe mills reporting that shipments in October were the heaviest for some time. It is stated that prices on merchant iron and steel pipe are being maintained. The new lists of discounts on oil country goods recently issued covering the Eastern Oil Country, the Mid-Continent Oil Country, Illinois and Kentucky and the California Oil Country show an average reduction of about 5 per cent. from former prices.

Boiler Tubes.—Several local mills report increasing activity in boiler tubes in the last week or two. A local mill has taken a contract for the boiler tubes for 75 locomotives to be built by one of the Eastern roads. In merchant tubes prices are more or less shaded.

Coke.—Some heavy inquiries have come up for furnace coke for first half of 1912, and also for all of next year, and indications are that a very large tonnage will be closed up in the next week or two. A Mahoning Valley interest is in the market for 35,000 tons of blast furnace coke per month for all of next year, another Valley furnace interest for 12,000 tons per month, another for 25,000 to 30,000 tons per month for all of next year, and there is also a further inquiry from a Valley blast furnace interest for 12,000 to 14,000 tons of blast furnace coke per month. Two Eastern furnace companies are in the market for upward of 30,000 tons of coke per month, and it is likely a good part of this business will be closed in the near future. An Eastern steel company has bought a round tonnage of furnace coke for first half of next year at the reported price of about $1.65 per ton at oven. A Valley furnace interest has practically closed for its requirements for next year, which will represent about 18,000 tons per month. Prices on standard grades of furnace coke for first half are about $1.65 per net ton at oven, and for delivery through all of next year from $1.70 to $1.75 per net ton at oven is being quoted. There is also some inquiry for foundry coke, and the whole coke trade is more satisfactory as regards inquiries than for some time. We quote standard makes for furnace coke for spot shipment at $1.55 and for November and December

shipment $1.55 to $1.60, per net ton, at oven. Standard makes of furnace coke for the first half are held at about $1.65 to $1.70. We quote standard makes of 72-hr. foundry coke for spot shipment at $1.85 to $2 and on contracts for first half at $2.10 to $2.40, per net ton at oven.

Iron and Steel Scrap.—It is stated that more scrap is moving from dealers to consumers than for some time. Bids are going in on the Pennsylvania and Baltimore & Ohio lists, and in some cases as high as $12.25 on steel scrap is being quoted on these lists. We note sales of 3000 to 4000 tons of heavy steel scrap at prices ranging from $12.10 to $12.25, delivered. The sale of 500 tons of borings at $8, noted last week, should have read $8.50 per ton, delivered, borings being firm at this price. Dealers are quoting as follows, per gross ton, f.o.b. Pittsburgh, unless otherwise noted:

Heavy steel scrap, Steubenville, Follansbee, Sharon, Monessen and Pittsburgh delivery	$12.00 to $12.25
No. 1 foundry cast	12.25 to 12.50
No. 2 foundry cast	11.25 to 11.50
Bundled sheet scrap, f.o.b. consumers' mill, Pittsburgh district	10.25 to 10.50
Rerolling rails, Newark and Cambridge, Ohio, Cumberland, Md., and Franklin, Pa.	12.50 to 12.75
No. 1 railroad malleable stock	11.25 to 11.50
Grate bars	9.00 to 9.25
Low phosphorus melting stock	15.25 to 15.50
Iron car axles	20.50 to 21.00
Steel car axles	16.00 to 16.25
Locomotive axles	22.00 to 22.50
No. 1 busheling scrap	11.00 to 11.25
No. 2 busheling scrap	7.00 to 7.25
Old car wheels	12.00 to 12.25
*Cast iron borings	8.50
*Machine shop turnings	9.00
†Sheet bar crop ends	13.75 to 14.00
Old iron rails	14.50 to 14.75
No. 1 wrought scrap	12.00 to 12.25
Heavy steel axle turnings	9.75 to 10.00
Stove plate	9.00 to 9.25

*These prices are f.o.b. cars at consumers' mills in the Pittsburgh district.
†Shipping point.

Chicago

CHICAGO, ILL., November 14, 1911.

A more cheerful tone has developed as a result of the placing of car orders by a number of the railroads. The American Car & Foundry Company has orders for about 4000 cars to be built at its Western plant; the Pullman Company received of the New York Central order 2000 steel underframe box cars; the Haskell-Barker Car Company and the Western Steel Car & Foundry Company are understood to be engaged with substantial orders; the Chicago, Milwaukee & St. Paul has placed an order with the Bettendorf Axle Company for 500 steel underframes and the Armour Car Line is building 400 refrigerator cars at its own shops. It is estimated that as many more car orders are likely to be placed. It is accepted as significant of the extremes to which railroads have gone in delaying purchases that the promptest possible shipment is being urged in every instance. Some steel manufacturers are disposed to predict that the market will benefit not only by the actual tonnage of material required for the manufacture of the cars in question but that a general increasing of their own stocks by those who are furnishing any of the materials will add considerably to the business the mills will receive. Aside from car business the market shows no general improvement; in fact, prices in some instances are less firm. The placing of an order for 40,000 tons of rails with the Colorado Fuel & Iron Company by the Chicago, Burlington & Quincy is noted. Specifications for railroad bridge structural shapes are reported as being received in good volume.

Pig Iron.—The price at which Northern iron is being sold has established a rather sharp line between the activity in Northern and Southern irons. Southern iron continues to be held uniformly at $10, Birmingham, for No. 2 for delivery into next year with all of the regular brands of iron available at that price. On this basis Southern iron delivered in Chicago and to points north of it is at a disadvantage and very little interest is being displayed, with correspondingly light sales. On the other hand, the inquiries for local iron and sales during the past week, particularly at Milwaukee and in the Northwest, have aggregated a fair tonnage. Sales have been made at Minneapolis on a basis of $15.50 for iron delivered from Duluth, and sales of charcoal iron from Ashland are also noted. The price of $14, f.o.b. furnace at Chicago, is now generally established. The business tentatively in sight has lent some encouragement to local furnaces and the opinion is expressed that the average selling price of pig iron has now been brought so low as to necessitate a firmer attitude on the part of furnaces in declining tonnage at lower quotations. We quote for Chicago delivery, except for local irons, which are f.o.b. furnace, the following prices on prompt shipments:

Lake Superior charcoal	$16.50 to $17.00
Northern coke foundry, No. 1	14.50 to 15.00
Northern coke foundry, No. 2	14.00 to 14.50
Northern coke foundry, No. 3	13.50 to 14.00
Northern Scotch, No. 1	16.00
Southern coke, No. 1 foundry and No. 1 soft	14.85
Southern coke, No. 2 foundry and No. 2 soft	14.35
Southern coke, No. 3	14.10 to 14.35
Southern coke, No. 4	13.85 to 14.10
Southern gray forge	13.85 to 13.85
Southern mottled	13.60 to 13.85
Malleable Bessemer	14.35 to 14.50
Standard Bessemer	17.00
Basic	14.75
Jackson Co. and Kentucky silvery, 6 per cent	16.40
Jackson Co. and Kentucky silvery, 8 per cent	17.40
Jackson Co. and Kentucky silvery, 10 per cent	18.40

Rails and Track Supplies.—In addition to the 20,000 tons of rails which the Chicago, Burlington & Quincy placed with the Illinois Steel Company, an order for 40,000 tons was awarded to the Colorado Fuel & Iron Company. Other Western roads have under consideration an aggregate tonnage which, if placed, will materially improve the mills' positions. Many thousands of kegs of track bolts and spikes are under contract, but specifications have been rather slow. We quote standard railroad spikes at 1.50c. to 1.55c., base; track bolts, with square nuts, 2c. to 2.10c., base, all in carload lots, Chicago; standard section Bessemer rails, 1.28c.; open hearth, 1.34c.; light rails, 40 to 45 lb., 1.16c. to 1.20½c.; 30 to 35 lb., 1.19½c. to 1.24c.; 16, 20 and 25 lb., 1.20½c. to 1.25c; 12 lb., 1.25c. to 1.30½c.; angle bars, 1.50c., Chicago.

Structural Material.—The demand for architectural purposes is slowing down, as is to be expected at this season. The only contract for fabricated steel reported the past week was for 286 tons for the Victoria Theatre, Chicago, to be furnished by the Geo. E. Laubenheimer Company. The principal support of current mill tonnage is from the specifications for bridge structural material and for shapes to apply on recent car orders. We quote for plain shapes, Chicago delivery, mill shipment, 1.33c. for the average carload business, and from store, 1.60c.

Plates.—With one exception, Western steel car plants have received orders which will provide for their capacity for 60 to 90 days. The plain material for these cars ordered from the mill totals above 50,000 tons. While the tonnage placed is not large, compared with the capacity of the mills, the requirement of immediate shipment is making the question of deliveries something of an issue. It is estimated that approximately one-half of the car orders in prospect have been placed. A continuance of the car-buying movement will undoubtedly strengthen the plate situation, in connection with which the market has thus far been pronouncedly weak. While prices varying widely, depending upon the desirability of the business offered, are current in this market, 1.33c., Chicago, continues to be the market level for carload business. This price we quote for Chicago delivery, mill shipment, and from store 1.60c.

Sheets.—A willingness on the part of local mills to meet prices emanating from Eastern points has brought a somewhat increased tonnage to this market. No betterment in the price situation can, therefore, be noted, and what the buyer is willing to pay continues to be a determining factor in the market. We quote Chicago prices as follows: Carload lots, from mill, No. 28 black sheets, 2.03c. to 2.08c.; No. 28 galvanized, 3.03c. to 3.08c.; No. 10 blue annealed, 1.53c. to 1.58c. Prices from store, Chicago, are: No. 10, 1.90c.; No. 12, 1.95c.; No. 28 black, 2.30c.; No. 28 galvanized, 3.35c.

Bars.—A slight increase in the tonnage of steel bars received by Western mills is noted. At the same time, prices, if anything, are softer. For ordinary business 1.28c., Chicago, will be done and where the business available is sufficiently desirable to establish a pressure of competition, concessions of $1 a ton and over have been made. The low price of steel has undoubtedly resulted in the diverting of a portion of the bar iron tonnage to steel. We quote as follows, f.o.b. Chicago: Soft steel bars, 1.18c. to 1.33c.; bar iron, 1.15c. to 1.20c.; hard steel bars rolled from old rails, 1.15c. to 1.20c. From store: Soft steel bars, 1.55c. to 1.60c., Chicago.

Wire Products.—Wire nails and plain wire continue to be subject to the general market depression. Prices on wire nails as low as $1.73 are reported and have been made in certain instances, but the average carload orders are being placed on the basis of $1.78, Chicago. The demand for barb wire has fallen off somewhat and the rush in the fence wire trade has diminished. Jobbers' carload prices, which are also quoted to manufacturing buyers, are as follows, per

100 lb.: Plain wire, No. 9 and coarser, base, $1.58; wire nails, $1.78; painted barb wire, $1.78 to $1.83; galvanized, $2.08 to $2.13; polished staples, $1.78 to $1.83; galvanized, $2.08 to $2.13, all Chicago.

Cast Iron Pipe.—The lettings of cast iron pipe noted at Mound City and Hill City, Kan., have been placed with contractors but the orders for pipe have not yet been received. At Valley Falls, Kan., 300 tons is to be placed this week. We quote as follows, per net ton, Chicago: Water pipe, 4-in., $26.50; 6 to 12-in., $24.50; 16-in. and up, $24, with $1 extra for gas pipe.

Old Material.—Most consumers continue willing to buy occasionally in small quantities but not in sufficient volume to add any strength to the market. There is an increasing disposition to accept current quotations as the lowest ebb of the market and in this connection it may be noted that there has been little change the past week as compared with a continued decline through several weeks preceding. The principal scrap list now in the market is one from the Illinois Central Railroad offering 5000 tons; a small list carrying 300 tons from the Soo Line and one of 100 tons from the Chicago & Alton. We quote for delivery at buyers' works, Chicago and vicinity, all freight and transfer charges paid, per gross ton, as follows:

Old iron rails	$14.50 to $15.00
Old steel rails, rerolling	12.00 to 12.50
Old steel rails, less than 3 ft.	10.75 to 11.25
Relaying rails, standard section, subject to inspection	24.00
Old car wheels	12.00 to 12.50
Heavy melting steel scrap	9.50 to 10.00
Frogs, switches and guards, cut apart	9.75 to 10.25
Shoveling steel	9.00 to 9.50
Steel axle turnings	8.00 to 8.50

The following quotations are per net ton:

Iron angles and splice bars	$11.75 to $12.25
Iron arch bars and transoms	13.00 to 13.50
Steel angle bars	8.75 to 9.25
Iron car axles	16.75 to 17.25
Steel car axles	15.00 to 15.50
No. 1 railroad wrought	10.00 to 10.25
No. 2 railroad wrought	9.00 to 9.25
Steel knuckles and couplers	9.25 to 9.75
Steel springs	9.50 to 10.00
Locomotive tires, smooth	13.50 to 14.00
Machine shop turnings	5.75 to 6.25
Cast and mixed borings	5.00 to 5.50
No. 1 busheling	7.75 to 8.00
No. 2 busheling	5.75 to 6.25
No. 1 boilers, cut to sheets and rings	6.50 to 7.00
Boiler punchings	12.00 to 12.50
No. 1 cast scrap	10.00 to 10.50
Stove plate and light cast scrap	8.50 to 9.00
Railroad malleable	9.50 to 10.00
Agricultural malleable	8.50 to 9.00
Pipes and flues	7.00 to 7.50

Philadelphia

PHILADELPHIA, PA., November 14, 1911.

Pig iron purchases have been light. While the volume of business coming to Eastern finishing mills has not made any marked change in the productive rate, a fair business is moving. Some further rail orders have been placed, and car and ship work have been more active. Eastern mills are resisting, quite strongly in instances, any further price concessions. Sheets have been in active demand and mills are fully engaged. Billets are quiet and less strength in prices is noted. Old material is practically at a standstill. Coke has been in better demand, particularly furnace coke for next year's delivery, but no large contracts have been reported closed.

Iron Ore.—Consumers hold off pending developments in connection with lower freights. Importations during the week included 9555 tons of Swedish and 4600 tons of New Brunswick ore.

Pig Iron.—From data gathered for the monthly meeting of the Eastern Pig Iron Association, it is reported that stocks on hand November 1 were about even with those of the previous month, a slight increase being noted on the yards of some consumers making their own pig iron. Orders aggregated slightly less in October than in September. The lack of any improvement in prices, notwithstanding the low stocks and urgent demand from some consumers, is considered rather discouraging, and it would not be surprising to hear of the blowing out of several merchant furnaces in this district by makers who contend that they are selling at a loss. A further factor in the possible blowing out of several stacks is the effort of consumers to have deliveries of basic iron deferred, some desiring this done into next year. Recent buying has been confined closely to small lots, with the same urgency for delivery as has prevailed in the past few weeks. Eastern Pennsylvania No. 2 X foundry of standard analysis moves freely at $15, delivered, and in instances continues to be shaded a few cents a ton. The bulk of the inquiry for larger quantities comes from the cast iron pipe interests, but a difference in views as to prices has restricted the placing of orders. Small lots of off grade irons continue to be moved at prices governed entirely by the class of material under negotiation. Few producers are willing to load up their order books for forward delivery at current prices, while consumers hold off hoping that some readjustment of ore prices will result in lower prices. Very little demand for forge iron comes from the rolling mills. There has been a material reduction in prices of standard analysis low phosphorus pig iron, small sales of which have been made at $19.50, delivered, with $19.25 acceptable for a round lot. Recent inquiries for basic are still pending, while no fresh demand is reported. The nominal price for basic is $14.50, delivered, but this could, no doubt, be shaded. The following range is named for standard analysis irons, delivered in buyers' yards in this district, for shipment over the remainder of the year and extending into and through the first quarter of 1912:

Eastern Pennsylvania No. 2 X foundry	$15.00 to $15.25
Eastern Pennsylvania No. 2 plain	14.75 to 15.00
Virginia foundry	15.00 to 15.50
Gray forge	14.25
Basic	14.50
Standard low phosphorus	19.25 to 19.50

Ferroalloys.—Little movement in ferromanganese is reported. One small sale of German at a price slightly above $38, delivered here, is reported. English is still pretty generally held at $38.50, Baltimore, although small sales of speculative material are still heard of at concessions. Fifty per cent. ferrosilicon is quoted at $63 to $64, delivered here, but no sales are reported. Furnace ferrosilicon, with Bessemer limits as to phosphorus and sulphur, is quoted at $27.30 to $28.30, delivered here.

Billets.—The market is not as strong as appears on the surface. Business continues of the small lot order and while the larger producers name $22.40, delivered, for basic open hearth rolling billets they are forced to meet competition from some of the smaller mills, who quote $21.40, or lose the order. Forging billets, which have been in fair demand in small lots, are quoted at $26.50 to $27.50, delivered, according to specification.

Plates.—Mills are encouraged by the volume of business in sight for car work and boat building. An order for a large vessel has been placed with one of the Eastern yards, which will require 3000 to 4000 tons of plates and shapes. Builders are figuring on some 8 or 10 additional vessels, while the demand for car work continues to increase. Current orders do not show much change. Some consumers are endeavoring to place business for extended delivery at to-day's prices, but the mills in this district refuse to meet their views, nor will they generally sell at the low prices named by some makers. Prices for ordinary plates, delivered in this territory, range from 1.30c. to 1.40c., the inside figure, however, applying only to particularly desirable business.

Structural Material.—While actual orders recently placed have not been large more prospective work in buildings has developed in this territory. It is now stated that the new Stock Exchange building, for which plans are out, will require 2000 tons of material. The Dock street pier, now being estimated on, will take 1000 tons. Independent sectional bids, each requiring about 500 tons, are being taken for the proposed new erecting shop for the Baldwin Locomotive Works, at Eddystone. Eight units or sections are included under revised plans and one or more sections may be erected as required. No final decisions on this contract are expected until early in December. Several small bridges have come up for estimate, while bids are going in for a 2100-ton bridge for the Pennsylvania Railroad to span the Susquehanna River. The recent placing of several large contracts for structural work has had a tendency to strengthen the market and reports indicate less cutting of prices. Quotations are unchanged, 1.30c. to 1.40c. representing the full range of the market for plain shapes, delivered in buyers' yards in this district.

Sheets.—Eastern mills note an increasing tendency by consumers to place orders covering extended requirements, but sellers refuse to take business other than for early delivery. Current orders have been larger and mills are more fully engaged, some operating at full capacity. Western sheets are quoted on ordinary lots at 2.05c., delivered, for No. 28 gauge, while Eastern mills making smooth, loose rolled sheets easily obtain an advance of ¼c. to ½c. per lb. for such material for prompt shipment.

Bars.—New business of any marked proportion de-

velops slowly. The general demand appears to be confined to small lots for early delivery, for which current quotations are easily obtained. Prices of iron bars, delivered in this district, range from 1.20c. to 1.25c., while for the ordinary run of local business steel bars are quoted at 1.25c., delivered.

Coke.—Increased inquiry for furnace coke for the first half, as well as the entire year 1912, is noted. Buyers and sellers are, however, somewhat apart on their ideas of prices, and while $1.65 to $1.75 at oven is named by producers, sellers' ideas are around $1.55 to $1.60 for contract coke. Meanwhile spot sales are made at $1.50 to $1.55. Some little contracting for foundry coke, at $2.15 to $2.30, oven, is reported, but the quantities involved are not large. Spot foundry coke is available at $2 at oven. The following range of prices, per net ton, is named for deliveries in this district:

Connellsville furnace coke	$3.65 to $4.05
Foundry coke	4.15 to 4.50
Mountain furnace coke	3.40 to 3.65
Foundry coke	3.95 to 4.40

Old Material.—Little business has been transacted. Mills take on only small lots, moving largely at bargain prices. Merchants who are filling in against short orders, placed at higher prices, frequently pay better prices for material than will consumers. Some small lots of heavy melting steel have been moved at $11.50, delivered, although some mills are still willing to pay $12 for strictly railroad steel. Occasional inquiry develops for No. 1 wrought scrap, better grades of which are held at $14, delivered. The following range of prices about represents quotations at which the ordinary current business for prompt shipment can be done for delivery in buyers' yards, eastern Pennsylvania and nearby points, taking a freight rate from Philadelphia varying from 35c. to $1.35, per gross ton, for shipment ranging from prompt to the remainder of the year:

No. 1 heavy melting steel scrap	$11.50 to $12.00
Old steel rails, rerolling (nominal)	12.50 to 13.00
Low phosphorus heavy melting steel scrap	15.50 to 16.00
Old steel axles	17.00 to 17.50
Old iron axles	21.00 to 21.50
Old iron rails	15.50 to 16.00
Old car wheels	11.25 to 11.75
No. 1 railroad wrought	13.75 to 14.25
Wrought iron pipe	10.75 to 11.25
No. 1 forge fire	9.50 to 10.00
No. 2 light iron (nominal)	6.00 to 6.50
Wrought turnings	8.00 to 8.25
Cast borings	7.50 to 7.75
Machinery cast	12.25 to 12.75
Railroad malleable (nominal)	11.00 to 11.50
Grate bars, railroad	9.25 to 9.75
Stove plate	9.25 to 9.75

Cleveland

CLEVELAND, OHIO, November 14, 1911.

Iron Ore.—The ore shipping season is being brought rapidly to a close and very little will be sent from the head of the Lakes after this week. All boats of the Pittsburgh Steamship Company that are to take on ore cargoes this season are now on their way up and that company expects to ship its last cargoes not later than Saturday. The merchant ore firms have but a few more cargoes in odds and ends to bring down. We quote prices as follows: Old range Bessemer, $4.50; Mesaba Bessemer, $4.25; old range non-Bessemer, $3.70; Mesaba non-Bessemer, $3.50.

Pig Iron.—There is somewhat better inquiry for foundry grades in lots of 500 tons and under for delivery in the remainder of the year and in the first quarter. Quotations show no change. Several producers are not meeting the present low prices. Northern foundry No. 2 is quoted at $12.75, Cleveland furnace, for outside shipment. In the Valley $13 at furnace is the minimum quotation for No. 2 but sales of small lots are being made at $13.25 to $13.50. We note the sale of 1000 tons of No. 2 foundry to a northern Ohio consumer at $12.75 for the remainder of the year and first quarter delivery. There are two inquiries from a nearby point, each for 500 tons of Nos. 1 and 2 for the first half delivery. An inquiry from Jackson, Mich., is for 300 tons of Nos. 1 and 2 for the same delivery. A few small sales of No. 2 Southern are reported at $10, Birmingham, for delivery through the first quarter. An Ohio stove manufacturer is in the market for 1000 tons of No. 2 Southern for first half. An Ohio pipe manufacturer is understood to be picking up considerable low grade iron. Ohio silvery is in fair demand, but is being sold at lower prices for early delivery, being quoted at $15 at furnace, for 8 per cent. silicon, for the remainder of the year. We quote as follows for prompt shipment and for the first quarter:

Bessemer	$15.15
Basic	13.40
Northern foundry, No. 2	13.25
Gray forge	12.50
Southern foundry, No. 2	14.35
Jackson County silvery, 8 per cent. silicon	$16.55 to 17.05

Coke.—The market is very dull in both foundry and furnace grades. Foundries are well covered for their requirements for the remainder of the year and there is practically no inquiry for contracts for the first half. Sales are mostly in carload lots. We quote standard Connellsville furnace coke at $1.50 to $1.55, per net ton, at oven, for prompt shipment and $1.55 to $1.60 for the remainder of the year. Connellsville 72-hr. foundry coke is held at $1.90 to $2.15 for prompt shipment and $2.15 to $2.35 for contract.

Finished Iron and Steel.—Mill agencies are doing a fairly good business in finished lines. While most orders are for small lots for immediate requirements, more disposition is being shown by some consumers to place small stock orders. Some consumers are beginning to feel that prices will go no lower and for that reason they are willing to add somewhat to their depleted stocks. While some of the steel bar mills seem more inclined to maintain 1.10c., Pittsburgh, as the minimum price on steel bars, the 1.05c. price is still being quoted for round lots with particularly desirable specifications. We note the sale of one 1000 ton lot at the latter price. The demand for plates has improved, mills getting a good tonnage from tank shops. Plate prices are weaker, the ruling quotations being from 1.10c. to 1.15c., Pittsburgh. The former price is for desirable orders. The demand for structural material is not active. While a fair volume of new building is in prospect, it is slow in coming out. The only new inquiry of any size is from the Cleveland Construction Company for 540 tons for a new power house in Ft. Worth, Tex. We quote structural material at 1.15c. to 1.20c., Pittsburgh. Sheets continue in fair demand. Sheet prices are steady, the minimum quotations being 1.85c. for No. 28 black and 2.85c. for No. 28 galvanized. The demand for hard steel bars is holding up well and the minimum quotation is 1.08c., Pittsburgh. Some orders for forging billets are being taken in one and two carload lots at $26, Cleveland. Orders for iron bars are light and both local bar iron mills are shut down this week. We quote iron bars at 1.20c., Cleveland mill.

Old Material.—Little is being done in the scrap market. Consumers seem fairly well supplied for the present and are not looking for tonnage, although they are willing to buy what is offered them at attractive prices. Dealers are unwilling to sell at present prices except small lots that they are anxious to move. A local consumer is offering $10.50 for heavy steel scrap but has secured only a small quantity at that price. The Norfolk & Western Railroad will close November 22 on about its usual tonnage. Dealers' prices per gross ton, f.o.b. Cleveland, are as follows:

Old steel rails, rerolling	$12.25 to $12.75
Old iron rails	14.00 to 14.50
Steel car axles	17.00 to 17.50
Heavy melting steel	10.75 to 11.00
Old car wheels	11.50 to 12.00
Relaying rails, 50 lb. and over	22.50 to 23.50
Agricultural malleable	10.50 to 11.00
Railroad malleable	11.00 to 11.25
Light bundled sheet scrap	9.50 to 10.00

The following prices are per net ton, f.o.b. Cleveland:

Iron car axles	$18.50 to $19.00
Cast borings	6.00 to 6.25
Iron and steel turnings and drillings	6.50 to 6.75
Steel axle turnings	7.25 to 7.75
No. 1 machinery	9.00 to 9.50
No. 1 railroad wrought	11.00 to 11.25
No. 1 cast	11.00 to 11.50
Stove plate	9.00 to 9.25
Bundled tin scrap	11.00 to 11.50

Cincinnati

CINCINNATI, OHIO, November 15, 1911.—*(By Telegraph.)*

Pig Iron.—There is a slightly better inquiry, and it is also reported that considerable small business has been booked under cover. As many contracts expire soon, it is quite probable that there will be a spurt of activity between now and January 1. Consumers' stocks are comparatively low and the furnaces are receiving more small prompt shipment orders than for some time. A local manufacturer will purchase soon about 600 tons of mixed foundry grades, and for first quarter shipment a central Ohio firm wants 1000 tons of No. 2 foundry. Michigan is furnishing more than the usual number of inquiries for small lots of both foundry and malleable, and from the St. Louis district is a request for 1000 tons of malleable that is expected to be placed with Ironton producers. For No-

vember shipment 1000 tons of No. 2 Southern foundry was taken by a southern Ohio melter at $10, Birmingham. At this same price quite a number of smaller sales have been recorded, although in several instances deliveries were extended through the first half of next year. Southern No. 4 foundry and gray forge are very scarce and $9.25 at furnace is the minimum quotation on these grades. While malleable is in better demand, the price remains at $13, Ironton, for any shipment until April 1. Northern No. 2 foundry is stationary at $13 at furnace, and a number of producers are booking first half business at this price. The most encouraging feature now is the increased railroad buying of both raw and finished materials. Based on freight rates of $3.25 from Birmingham and $1.20 from Ironton, we quote, f.o.b. Cincinnati, as follows, for prompt shipment:

Southern coke, No. 1 foundry and 1 soft	$14.00 to $14.25
Southern coke, No. 2 foundry and 2 soft	13.25 to 13.75
Southern coke, No. 3 foundry	12.75 to 13.25
Southern coke, No. 4 foundry	12.50 to 13.00
Southern gray forge	12.50 to 13.00
Ohio silvery, 8 per cent. silicon	16.95 to 17.20
Lake Superior coke, No. 1	14.70 to 14.95
Lake Superior coke, No. 2	14.20 to 14.45
Lake Superior coke, No. 3	13.70 to 13.95
Basic, Northern	14.20 to 14.45
Standard Southern car wheel	25.50 to 25.75
Lake Superior car wheel	19.00

(By Mail.)

Coke.—There is no new furnace coke business and orders for foundry coke are confined to small quantities. The movement on contracts already made is excellent and there are practically no requests to hold up shipments. Connellsville furnace coke is obtainable around $1.50 per net ton at oven for prompt shipment, with the Pocahontas and Wise County brands generally bringing 10c. to 15c. above this price. Contract figures range from $1.60 to $1.75 in all three fields. Foundry coke remains between $1.90 to $2 per net ton at furnace for prompt or nearby movement, with some producers asking as high as $2.40 for special grades for shipment during 1912. From $2.15 to $2.25 more nearly represents the average quotations on future business.

Finished Material.—Steel bars appear to be on the mend, and while orders continue to be for comparatively small tonnages the price is firmer at 1.10c., Pittsburgh, and where the specifications are not so desirable 1.15c. is asked in this territory. The local warehouse price on steel bars remains around 1.55c to 1.60c. Wire nails and sheets also show a slight improvement in the demand, but structural material is just holding its own. The local warehouse quotation on beams and channels, cut to lengths, is around 1.60c. to 1.70c.

Old Material.—The situation can best be expressed in the language of a local merchant who says: "The low prices prevailing on finished material will not allow the manufacturers to pay much for scrap at the present time. There may be a sentimental improvement in market conditions before the end of the year, but I am afraid that it will only be temporary and that present conditions will not improve for some time to come." What he says fairly represents the feeling among all local dealers. The minimum figures given below about represent what buyers are willing to pay for delivery at their yards in southern Ohio and Cincinnati, and the maximum figures the selling prices f.o.b. at yards:

No. 1 railroad wrought, net ton	$9.50 to $10.25
Casting borings, net ton	4.50 to 5.00
Steel turnings, net ton	5.50 to 6.00
No. 1 cast scrap, net ton	9.00 to 9.75
Burnt scrap, net ton	6.25 to 6.75
Old iron axles, net ton	16.25 to 16.75
Bundled sheet scrap, gross ton	5.75 to 6.50
Old iron rails, gross ton	13.00 to 13.75
Relaying rails, 50 lb. and up, gross ton	20.75 to 21.50
Old car wheels, gross ton	9.50 to 10.25
Heavy melting steel scrap	9.25 to 10.00

Birmingham

BIRMINGHAM, ALA., November 13, 1911.

Pig Iron.—Sales in the past week are reported as follows: A lot of 1000 tons of 1.75 to 2.25 per cent. silicon iron for shipment through the remainder of this year at $9.50, Birmingham; 800 tons of 2.75 per cent. to 3.25 per cent. silicon iron for delivery extending into the first quarter at $10.50, Birmingham; an aggregate of 2000 tons of Nos. 2 and 3 foundry iron for shipment covering the first quarter at a basis of $10, Birmingham, for No. 2 foundry, and 1000 tons of high manganese iron with a high silicon content, at $11, Birmingham. Negotiations for 1500 tons of No. 4 foundry and gray forge were also closed during the week, and, as a result, one of the leading producing interests now quotes $9.50, Birmingham, for No. 3 foundry or any lower grades. Another large interest adheres to $9.25 for forge and mottled, but the majority of producers are willing to accept a differential of 25c. per ton on a No. 3 foundry price for those grades. There has been no change in quotations on first half deliveries, and certain of the producers still insist that no contracts would be made for deliveries further advanced than the first quarter. For shipments to be made into strictly Southern territory, it is believed that a $10, Birmingham, basis for advanced deliveries is firm, but in competitive territory it is very difficult to say just what can be done. The inquiry for all grades pending at this time is very light, yet, as is shown above, the aggregate of sales, though covering a wide range of territory, is fairly satisfactory. The stock returns as of November 1, which have just been compiled, show the aggregate accumulation in this State to have been decreased some 11,000 tons in the month of October. Of the total of approximately 211,000 tons now on hand, 132,000 tons is free foundry iron, 62,000 tons is covered by warrants, and 17,000 tons is basic iron. The number of active furnaces was the same November 1 as on October 1, and out of the 19 stacks in blast only 4 were producing basic iron. An additional stack has been blown in on basic since November 1 and 2 stacks will be blown in on charcoal iron before December 15. There is practically no complaint of the rate at which tonnage contracted for is being taken in, and stocks should be further reduced this month.

Cast Iron Pipe.—It has not been learned here to whom the requirement of some 5000 tons of water pipe for Colon, Panama, was awarded by the United States Government, but it is understood that such an award has been made. With this exception, no mention is made of any large contracts offering, and the requirement for maintenance work is comparatively light. However, the plants in operation continue to produce at the normal rate and prices have not been lowered. An aggregate of 1200 tons of water pipe, consisting of several small lots, was placed in this market during the week, and an equal tonnage is now under consideration. We continue to quote water pipe as follows, per net ton, f.o.b. cars here: 4 to 6 in., $23; 8 to 12 in., $22; over 12 in., average $21, with $1 per ton extra for gas pipe. These prices are subject to shading for large municipal contracts but are firm for such small orders as are now being placed.

Old Material.—The trading is light. Prices are weaker and we revise quotations as below, with the demand principally for light cast and steel grades. There has been but little interest manifested in old rails and axles for some months, while the old car wheels offered have been sold in the majority of cases direct to the car-wheel manufacturers, thereby eliminating the handling by dealers. We quote dealers' revised asking prices as follows, per gross ton, f.o.b. cars here:

Old iron axles (light)	$12.00 to $12.50
Old steel axles (light)	11.00 to 11.50
Old iron rails	11.00 to 11.50
No. 1 railroad wrought	9.50 to 10.00
No. 2 railroad wrought	8.00 to 8.50
No. 1 country wrought	6.00 to 6.50
No. 2 country wrought	5.50 to 6.00
No. 1 machinery cast	8.00 to 8.50
No. 1 steel	7.50 to 8.00
Tram car wheels	7.00 to 7.50
Standard car wheels	9.00 to 9.50
Light cast and stove plate	5.50 to 6.00

Coal and Coke.—With seasonable weather, the steam and domestic coal market has improved materially. The movement from all mine operations is considerably larger than for some months and prices being received are very satisfactory. There have been no transactions recently to affect the rate of production of foundry coke, but with the increase in active furnaces since November 1 additional ovens are producing 48-hour or furnace coke.

Finished Material.—The demand for round and bar iron continues very satisfactory and shipments against contracts are sufficient to keep all local mills in full operation. There is also a very heavy movement of wire products, especially nails and fencing. The business being placed in all these lines consists principally of small lots and considerable territory is being covered. Aside from the low level of prices, the general condition of the market is fairly satisfactory.

As a result of the bi-monthly settlement of the bar iron scale, the wages of Western puddlers for the next two months will remain the same as under the present schedule, $5.50 a ton on a 1.2 cent card rate. The finishers' wages also remain unchanged. The mills of the Republic Iron & Steel Company and the Western Bar Association are affected.

Buffalo

BUFFALO, N. Y., November 14, 1911.

Pig Iron.—Indications point to a slight improvement of conditions in the pig iron market. More consumers are becoming interested and producers believe that there will be a steady though probably slow gain in tone and in volume of business. Large buyers are still very conservative, although some 500, 1000 and 2000-ton lots have been placed during the week. Orders entered by local furnaces aggregated 10,000 to 12,000 tons of foundry and malleable with a number of inquiries for good sized tonnages pending. The low prices that obtained three weeks or a month ago are not now being entertained by furnaces. Shipments on contracts are heavy and stocks on hand in local furnace yards have been steadily depleted during the past few weeks. More iron was shipped out in the first ten days of November than for any like period since July. The loading of Erie Canal shipments has been rushed to insure the movement of cargoes before the close of canal navigation for the season on November 15. For current and first quarter delivery we quote as follows, f.o.b. Buffalo:

No. 1 X foundry	$13.75 to $14.00
No. 2 X foundry	13.25 to 13.75
No. 2 plain	13.00 to 13.50
No. 3 foundry	13.00 to 13.25
Gray forge	13.00
Malleable	13.50 to 14.00
Basic	14.00 to 14.25
Charcoal	16.00 to 17.25.

Finished Iron and Steel.—There has been a perceptible change in sentiment, the general tone of the market being slightly better all along the line, with an increasing feeling among buyers that the bottom in prices has been reached. A fair volume of business is reported for prompt shipment. Prices are practically unchanged. Among the specialties there is an increase in the demand for chain. Business in fabricated structural lines is well maintained. Bids for steel for the Lawrence Hotel, Erie, Pa., are to be taken November 27, about 1200 tons being required. Bids are also to be received this week for steel called for by the revised plans for the City Convention Hall, Buffalo, and for the power house for the University of Michigan at Ann Arbor, about 1000 tons; also for about 100 tons for the Main Street Realty Company's building, Buffalo. The Lackawanna Bridge Company has been awarded contract for fabrication and erection of the steel for the theater and office building for the Shea Amusement Company, Buffalo, 350 tons. Bids for a number of other building projects have been submitted and are under consideration, including 2000 tons for the 15-story Buffalo central exchange and office building for the New York Telephone Company and 200 tons for the Elmwood avenue substation exchange building for the same company at Buffalo.

Old Material.—A better feeling is observable among the dealers, who foresee larger business in the near future on account of the greater buying by railroad interests. Mills are now more inclined to take on stock, although shipments have not yet increased much in volume. Prices remain practically the same as quoted last week, but are being more firmly held by dealers. We quote as follows, per gross ton, f.o.b. Buffalo:

Heavy melting steel	$12.50 to $13.00
Low phosphorus steel	16.00 to 16.50
No. 1 railroad wrought	14.00 to 14.50
No. 1 railroad and machinery cast scrap	13.50 to 14.00
Old steel axles	18.50 to 19.00
Old iron axles	22.00 to 22.50
Old car wheels	13.00 to 13.50
Railroad malleable	12.75 to 13.00
Boiler plate	12.50 to 13.00
Locomotive grate bars	11.00 to 11.50
Pipe	9.25 to 9.50
Wrought iron and soft steel turnings	7.15 to 7.40
Clean cast borings	7.00 to 7.25

St. Louis

ST. LOUIS, Mo., November 13, 1911.

Decided optimism seems to rule the pig iron, coke and finished steel markets here and the suddenness of the transition from gravity to gayety is almost startling. Prices have not been advanced, but there is a steadiness of figures and a confidence in the future that will not be denied. The fact seems to be that buyers accept present prices as the lowest likely to be seen.

Pig Iron.—Although few sales are openly reported for the past week, it is positive that large interests are in the market and are taking considerable quantities for delivery through the first quarter and in some instances the first half. The quotations for No. 2 remain at $10 to $10.50, Birmingham, and it cannot be had for anything below. Some producers refuse to sell at less than $10.50 under any consideration. Sales reported include 800 tons of No. 2 soft for delivery through the first quarter. A malleable iron company is in the market for 1000 tons of malleable pig iron.

Coke.—While the total of sales runs into considerable figures, the quantities and the buyers are being withheld for the present. There is a firmness in prices which promises an advance from those now quoted, which are $1.50 for 48-hr., $1.90 to $2.15 for 72-hr. prompt and $2.10 to $2.35 for first half delivery.

Finished Iron and Steel.—The better feeling in finished products is very great as a result of the orders which are being placed or are in prospect, though the requirements of immediate shipment continue as pressing as ever. There is practically no buying for stock, in spite of the increase in the total, but there is a belief that such buying will begin before long. Structural tonnage is growing larger every day, but every ton is going forward under high pressure for delivery. The bar and plate demand is fairly good and is participating to a measurable extent in the activity noted in other lines. Steel rails present no new orders of moment, but there are inquiries in the market for interurban purposes. Light rails continue to show improvement from the mining interests. Track fastenings are in good request for the season at firm prices.

Old Material.—An improved tone is observed in the scrap market, partly due to the optimism in new products and partly to the fact that cold weather is likely to cut off the supply somewhat. The Wabash, Vandalia, Mobile & Ohio and Southern lists reported last week were closed at prices which showed no improvement over previous figures. This week's lists include 300 tons by the Mobile & Ohio and 200 tons by the Chicago & Eastern Illinois. In general the outlook for better prices before long seems to be fairly good. Dealers' prices, f.o.b. St. Louis, per gross ton, we quote as follows:

Old iron rails	$12.00 to $12.50
Old steel rails, rerolling	11.50 to 12.00
Old steel rails, less than 3 ft.	10.00 to 10.50
Relaying rails, standard section, subject to inspection	22.50 to 23.00
Old car wheels	11.50 to 12.00
Heavy melting steel scrap	10.00 to 10.50
Frogs, switches and guards cut apart	10.00 to 10.50

The following prices are per net ton:

Iron fish plates	$10.00 to $10.50
Iron car axles	17.00 to 17.50
Steel car axles	15.00 to 15.50
No. 1 railroad wrought	10.25 to 10.75
No. 1 railroad wrought	9.25 to 9.75
Railroad springs	9.25 to 9.75
Locomotive tires, smooth	13.00 to 13.50
No. 1 dealers' forge	7.00 to 7.50
Mixed irons	5.00 to 5.50
No. 1 machinery	8.50 to 9.00
No. 1 boilers cut to sheets and rings	7.00 to 7.50
No. 1 cast scrap	8.50 to 9.00
Stove plate and light cast scrap	7.00 to 7.50
Railroad malleable	7.50 to 8.00
Agricultural malleable	6.50 to 7.00
Pipes and flues	7.50 to 8.00
Railroad sheet and tank scrap	7.00 to 7.50
Railroad grate bars	6.50 to 7.00
Machine shop turnings	6.50 to 7.00

The German Iron Market

BERLIN, November 3, 1911.

Prices are firmly held, and a higher tendency is noted in a few cases. The Siegerland Ore Syndicate several days ago raised the price of specular and brown iron ores, and is expected to advance other grades in a few days. The advances already made range between 7 and 23 cents a ton. The plate convention is also expected to advance prices 2 to 3 marks at an early date and at the same time a proposal will be made to prolong the convention to June 30, 1912. The new Pig Iron Syndicate has now given out its prices for the different sections of the country. For North Germany the following prices will prevail: Luxemburg foundry 49 to 50 marks; hematite, 78.50; foundry No. 1, 75.50; foundry No. 3, 73.50. Scrap iron has risen a little, as the steel mills are laying in their winter supply.

German Works Well Employed

The works are well employed and new business continues to come in at a good pace. Orders for semi-manufactured products are still received steadily from both the home and the foreign market and calls for delivery are coming in rapidly. The demand for structural shapes shows little or no let-up upon the approach of winter, inasmuch as building operations continue active.

Bar mills are quite busy and have work till the opening of the spring season. Prices have further hardened, and it is said to be difficult to place orders under 105 marks. The foreign market is taking large amounts of band iron; prices have improved a little, but are still unsatisfactory. The plate market continues active. From the Silesian district it is reported that the volume of business in construction-shop plates and heavy commercial grades is steadily increasing, and in many cases it is difficult for buyers to get accommodation. Many shipyards and manufacturers of locomotives and other machinery have already sent in orders that they had been preparing for next spring's business. Works in that district running on armor plates are getting considerably more to do.

Manufacturers of gas and boiler tubes continue busy, but at very low prices. For export, prices are better than for the home market. Recent yearly reports of tube companies show unsatisfactory results. Somewhat similar conditions prevail with respect to wire rods—plenty to do, but at low prices; in this case foreign prices are actually unremunerative. In drawn wire and wire nails there is no complaint as to orders, but prices remain at or near the cost of production. In most branches of the hardware trade business is good. The export trade with Turkey and Italy has been sharply cut down by the war.

The Steel Works Union has just published the statistics of production of Class B products for September. The figures are the largest ever recorded for any one month. Shipments of bars scored a new record with 324,166 tons, which was 44,000 tons more than for September, 1910. The movement of plates reached 93,060 tons, a figure exceeded by only two previous months, namely, May and August. Shipments of wire rods amounted to 68,924 tons, again almost a record, only May having exceeded it by about 2,370 tons. Tubes made a new record with 17,700 tons and the shipments of castings and forgings were also the highest ever known, having reached 49,785 tons.

The Steel Syndicate Arranging to Continue

It now appears that the Steel Works Union, contrary to the first reports, did take action regarding its renewal at its meeting of about ten days ago. It appointed various committees to prepare the different sections of the work for submission to a general meeting to be held later in the month. The committee on allotments has asked the different works to hand in their demands by the 10th, and then the committee will begin work on its extremely difficult task about the middle of the month. A foretaste of what difficulties lie before it is afforded by the news that the Gelsenkirchen Company and the Thyssens are asking for new allotments of 1,000,000 tons of steel for their new works in Luxemburg and Lorraine. It is understood that a number of establishments are not yet in a position to formulate their demands for allotments, inasmuch as they are still negotiating with other concerns about fusions or community-of-interest arrangements, and their demands will depend upon the outcome of these operations. It is said that at least a dozen companies are thus situated. At this meeting of the Union a general talk on the question of prolonging the organization showed that all the members are most anxious to have it continued, and most of them want a renewal to 1920. It has been variously assumed that the Union would be renewed only to the time when the Coal Syndicate expires, that is, to 1915; but at this meeting nobody seemed to demand such a provisional prolongation. At another point this meeting also showed different results than had been looked for. It had been often said in the trade press that many important works would demand, as an essential condition for the renewal of the Union, that Class B products be fully syndicated. At present allotments are made in these, but prices are not fixed by the Union and the mills do their own marketing. It appears that the informal talk at the meeting in question convinced the members that there was no prospect whatever for the full syndication of these products, and that idea has apparently been dropped.

The Belgian market continues strong. According to a dispatch of yesterday from Brussels, the price of foundry iron has been marked up two francs and steelmaking qualities one franc. The export market also continues to register rising prices. It is expected that the export price of bars will soon reach 98 to 100 shillings. There is a big demand for plates and the export price has risen to 106 shillings for steel and 108 for iron plates. The mills are very busy in most forms of steel and orders are coming in so briskly that not a few of them can accommodate no more till after the end of the year.

Boston

BOSTON, MASS., November 14, 1911.

Old Metals.—No change of any sort is noted in the scrap metal market. Buying is from hand to mouth, in small quantities. The prices quoted below are those offered by the large dealers to the producers and to the smaller dealers and collectors, per gross ton, carload lots, f.o.b. Boston and other New England points, taking Boston rates from eastern Pennsylvania points. In comparison with Philadelphia prices the differential for freight of $2.30 a ton is included. Mill prices are approximately 50 cents a ton more than dealers' prices.

Heavy melting steel	$9.50 to $10.00
Low phosphorus steel	11.45 to 11.95
Old steel axles	14.00 to 14.50
Old iron axles	17.00 to 18.00
Mixed shafting	12.75 to 13.25
No. 1 wrought and soft steel	10.50 to 10.75
Wrought iron pipes	8.75 to 9.00
Skeleton (bundled)	7.00 to 7.50
Cotton ties	7.00 to 7.50
No. 2 light	4.50 to 5.00
Wrought turnings	5.00 to 5.50
Cast borings	4.50 to 5.00
Machinery, cast	12.50 to 13.00
Malleable iron	9.25 to 9.75
Grate bars	6.00 to 6.50
Stove plate	8.00 to 8.50

New York

NEW YORK, November 15, 1911.

Pig Iron.—Several transactions of considerable size are reported for the past week, Eastern Pennsylvania and Buffalo furnaces securing the major part. There has been also a good aggregate of small orders. Pipe foundries have been buyers of both Northern and Southern irons, one lot of 5000 tons being taken by the largest interest, while another company bought several thousand tons. On Southern pipe iron a delivered price of about $14 on the Delaware River is reported. A New England foundry that has been in the market for high phosphorus iron closed for 3500 tons, the business going to a Lehigh Valley producer. Deliveries on most of the business recently closed extend over the first quarter of 1912. A 2000-ton contract for malleabling iron for delivery at a New York State plant was taken by a Buffalo furnace company. In Connecticut a machinery foundry is in the market for 1000 tons and one plant of a large pump interest is about to buy several hundred tons. The scale of foundry operations in this district remains around 60 per cent. and there is little disposition on the part of melters to cover far ahead. Contracts running over the first half of next year are exceptional. Production in Eastern Pennsylvania has been reduced by the blowing out of one furnace—No. 2 Crane at Catasauqua—but in Virginia Buena Vista furnace has blown in. Quotations are as follows for Northern iron at tidewater: No. 1 foundry, $15.25 to $15.50; No. 2 X, $14.75 to $15.25; No. 2 plain, $14.50 to $14.75. For Southern iron we quote $15 to $15.25 for No. 1 foundry and $14.50 to $14.75 for No. 2 foundry.

Finished Iron and Steel.—The scarcity of inquiries of some size for finished material and the low scale of prices continue to be absorbing topics. Claims of lower prices than have hitherto been ruling are made but it is probable that in a number of cases contributing circumstances are overlooked. For example, if a fabrication price for structural material of $34 per ton were quoted at a point where the freight rate from Pittsburgh is say $2 per ton, it is figured that the fabrication itself may be placed at $10 per ton, thus making the plain material $22 per ton or 1.10c. per pound at mill. Rumors that steel bars are 1.05c. at mill could not be substantiated, and as a matter of fact emphatic statements were forthcoming from reliable sources that no quotations below 1.10c., Pittsburgh, are being made for bars. The market for plates and shapes seems to be 1.15c., with most of the business placed at 1.20c. and higher. The volume of business has not been reduced. In view of the statement some weeks ago that $38 for some 2000 tons of fabricated material was very low, it is interesting to record the purchase late last week of about 550 tons of shapes at $37.75 per ton, New York. Plate mills have more business than a week or two ago. Some of the structural work on which decision is expected in the early future is the following: Addition to Cooper Union School, Third avenue, 1200 tons; Wyckoff Building, 12 stories, 600 tons, Fifty-fourth street and Park avenue; Taylor Building, Eighty-third street, 1500 tons; two bridges for the Erie Railroad, Western division, 400 tons; an apartment house being built, it is stated, by the Car-

negie Construction Company, 800 tons, and for three sections of the New York subway, 18,500 tons of riveted steel and shapes and 3300 tons of rods and bars for reinforced concrete. Some of the structural awards since last week's report are: Seamen's Church Institute, Coenties slip, 1500 tons, to the Eastern Steel Company; two bridges at Elizabethport, N. J., for the Central Railroad of New Jersey, 400 tons, to the Phoenix Bridge Company. New York Central so-called suburban area, 300 tons, to the McClintic-Marshall Construction Company; building for a glass factory at Washington, Pa., 200 tons, understood to have been given to the Penn Bridge Company, and Public School No. 61, New York City, 500 tons, is announced as going to the American Bridge Company. Quotations are: Steel bars, 1.26c. to 1.31c.; plates and plain structural material, 1.31c. to 1.36c.; bar iron, 1.20c. to 1.25c., all New York. Plain material and plates from store, New York, 1.60c. to 1.70c.

Cast Iron Pipe.—Private buyers are showing more interest in the market. A large gas company has submitted specifications, on which bids are being asked, for nearly 15,000 tons of pipe for next year's delivery, which is asserted to be a larger quantity than has ever before come out for spring delivery in this locality at this time of the year. Glens Falls, N. Y., is asking for prices on 550 tons of Class B water pipe, 4 to 10 in., mostly 10-in. Carload lots of 6-in. continue to be quoted at $21 to $22 per net ton, tidewater.

Old Material.—Although so few transactions are reported that the market is practically at a standstill, the sentiment is better. The feeling strongly prevails that prices are at bottom and that even a moderate demand would be likely to bring about some advance. Dealers' prices, per gross ton, New York and vicinity, are continued as follows:

Old girder and T rails for melting	$9.25 to $9.50
Heavy melting steel scrap	9.25 to 9.50
Relaying rails	20.00 to 21.00
Rerolling rails (nominal)	11.25 to 11.75
Old iron car axles	19.00 to 19.50
Old steel car axles	15.00 to 15.50
No. 1 railroad wrought	11.00 to 11.50
Wrought iron track scrap	10.50 to 11.00
No. 1 yard wrought, long	10.25 to 10.75
No. 1 yard wrought, short	9.25 to 9.75
Light iron	3.75 to 4.25
Cast borings, clean	5.50 to 6.00
Mixed borings and turnings	4.75 to 5.25
Wrought turnings	5.75 to 6.25
Wrought pipe	8.50 to 9.00
Old car wheels (nominal)	9.50 to 10.00
No. 1 heavy cast, broken up	10.00 to 10.50
Stove plate	7.75 to 8.25
Locomotive grate bars	7.75 to 8.25
Malleable cast	9.75 to 10.25

Ferroalloys.—The ferromanganese market is quiet, though a little stronger, the price asked for 80 per cent. going to $38.50, Baltimore, with confidence that it would be obtained. There was inquiry for spot delivery at $37.75 to $38.25, Baltimore, while for forward delivery from $38.25 to $38.50 is quoted. For ferrosilicon some little inquiry is in hand for 50 per cent. for delivery over the remainder of the year and for about 400 tons for use in Pittsburgh next year. One seller placed the price flatly at $66, Pittsburgh, while others quoted from $64 to $65. Indications are that the market will hold the present price and possibly become stronger.

Metal Market

NEW YORK, November 15, 1911.

The Week's Prices

Cents Per Pound for Early Delivery.

	Copper, New York.			Lead		Spelter	
Nov.	Lake.	Electrolytic.	Tin, New York.	New York.	St. Louis.	New York.	St. Louis.
9	12.60	12.50	42.10	4.25	4.15	6.40	6.25
10	12.75	12.60	41.90	4.25	4.15	6.45	6.30
11	12.75	12.62½	.....	4.25	4.15	6.45	6.30
13	12.75	12.62½	42.45	4.25	4.15	6.50	6.30
14	12.75	12.62½	42.65	4.25	4.15	6.60	6.45
15	12.75	12.62½	43.15	4.25	4.15	6.60	6.45

All nonferrous metals except lead have advanced. Copper is very firm. Spelter has advanced 20 points and is scarce for prompt delivery. An excellent demand for pig tin for future delivery has developed.

Copper.—The copper market is very firm as the result of the statement of the Copper Producers' Association, which showed a decrease instead of an expected increase of stocks. The report strengthened the feeling here and abroad among dealers, producers and consumers. For two or three days after the appearance of the report the market was unsettled but with a decided tendency upward. To-day it is quieter, the demand apparently being pretty well satisfied. Prices to-day are 12.62½c. for electrolytic and 12.75c. for Lake copper. Exports of copper for the month to date total 12,131 tons. In London to-day the price for spot is £56 16s. 3d. and for three months £57 11s. 3d.

Pig Tin.—For pig tin a very fair demand has developed, more especially for future delivery. There is some inquiry for spot. Consumers are beginning to take a more lively interest in the situation, largely because of being disturbed over the report from the other side that the syndicate may send the price higher. Tin to-day stood at 43.15c., having advanced steadily during the week from 42.10c. on November 8. The London market quoted tin to-day at £197 5s. for spot tin and £188 15s. for futures. The arrivals so far this month have been 1383 tons with 1090 tons reported afloat.

Tin Plates.—A livelier interest in tin plates is reported with news of importance in the statement that the large manufacturers of tin cans are making known their specifications for next year. A general improvement in the market for tin plates is imminent in the opinion of authorities, consumers inquiring freely. The price of tin plates laid down at Swansea, Wales, is reported as 13s. 3d. The price in New York for 100 lb. coke plates remains the same at $3.64.

Lead.—The lead market is very firm, the prices remaining unchanged at 4.15c. in St. Louis and 4.25c. New York. A week ago concessions could be obtained but none were given at the close of this week.

Spelter.—The scarcity of spelter has become greater than ever, various reasons being ascribed for the scarcity. The supply is said to be affected by a strike in the ore district, as there are hints of manipulation. Whatever the cause, it contributes to a scarcity which already existed. There was little spelter offered in the New York market and those who had it asked 6.60c. In St. Louis 6.45c. was asked.

Antimony.—Dull and stagnant describes the antimony situation. Hallett's is a little lower at 7.65c.; Cookson's is 8c. Chinese and Hungarian grades are weak from 6.75c. up.

Old Metals.—The demand is improving and dealers' selling prices are hardening, but nominally unchanged as follows:

	Cents per lb.
Copper, heavy and crucible	11.75 to 12.00
Copper, heavy and wire	11.37½ to 11.50
Copper, light and bottoms	10.50 to 10.75
Brass, heavy	8.00 to 8.25
Brass, light	6.50 to 6.75
Heavy machine composition	10.25 to 10.50
Clean brass turnings	7.75 to 8.00
Composition turnings	8.50 to 9.00
Lead, heavy	4.15
Lead, tea	3.90
Zinc, scrap	4.50

Chicago

NOVEMBER 13.—The past week has developed a slightly better tone in the metal market, and copper and tin prices are fractionally higher. Spelter continues to be strongly supported and producers are slow to quote on orders. We quote at Chicago: Casting copper, 12.37½c. to 12.50c.; Lake, 12.62½c. to 12.75c., in carloads, for prompt shipment; small lots, ¼c. to ⅜c. higher; pig tin, carloads, 42.50c.; small lots, 45.50c.; lead, desilverized, 4.25c. to 4.30c., for 50-ton lots; corroding, 4.50c. to 4.55c. for 50-ton lots; in carloads, 2½c. per 100 lb. higher; spelter, 6.30c. to 6.35c.; Cookson's antimony, 9.25c., and other grades, 8.25c. to 8.75c., in small lots; sheet zinc is $8, f.o.b. La Salle, in carloads of 600-lb. casks. On old metals we quote buying prices for less than carload lots: Copper wire, crucible shapes, 10.75c.; copper bottoms, 9.62½c.; copper clips, 10.50c.; red brass, 9.75c.; yellow brass, 7.50c.; lead pipe, 3.85c.; zinc, 4.50c.; pewter, No. 1, 26c.; tinfoil, 32c.; block tin pipe, 36c.

St. Louis

NOVEMBER 13.—There is decisive firmness as compared with last week. Spelter, after a slight recession, firmed up again and to-day was steady at 6.40c. Lead is firm at 4.15c., with some sellers asking 4.20c. Tin is higher at 42.35c. Lake copper shows up strong at 13.05c., while electrolytic has advanced to 13c. Cookson's antimony is quotable at 8.35c. In the Joplin district zinc blende, selling on the contract basis fixed on the previous week's East St. Louis spelter average, brought $52.05. The basis price for 60 per cent. metallic content grades was $47.79. The top price in the open market was $49, which is higher than any price paid before this year. Calamine prices were the strongest of the year, ranging from $24 to $27 basis of 40 per cent. metallic zinc. The top price paid was $33. Lead

ore was unchanged at $56 to $57 per ton. Zinc producers are considering strongly the further curtailment of the output and will reach a decision during the week. On old metals we quote: Light brass, 4c.; heavy brass and light copper, 8c.; heavy copper and copper wire, 9c.; zinc, 3c.; lead, 3.25c.; pewter, 20c.; tinfoil, 29c.; tea lead, 3c.

Iron and Industrial Stocks

NEW YORK, November 15, 1911.

The announcement of the United States Circuit Court's plan for the disintegration of the American Tobacco Company was received with so much satisfaction by financial interests that a strong upward movement was immediately inaugurated on the stock market. Quite a number of iron and industrial stocks showed sharp advances during the week. Steel common rose from 58⅜ to a maximum of 65⅜ and the preferred from 107¼ to 110½; Car & Foundry common from 50½ to 54⅞; Allis-Chalmers preferred from 11 to 14. American Can preferred made a notable gain, advancing to the highest price ever recorded for this stock, with reports that plans are being considered for the payment of part of the accumulated dividends. The range of prices on active iron and industrial stocks from Wednesday of last week to Tuesday of this week was as follows:

Allis-Chalm., com...	3¼ - 3¾	Pressed Steel, com..	31½ - 33
Allis-Chalm., pref...	11 - 14	Pressed Steel, pref..	96½ - 98
Beth. Steel, com....	26 - 31	Railway Steering, com.	26½ - 32⅜
Beth. Steel, pref....	57 - 58⅞	Railway Spring, pref.....	101
Can. Com.....	10⅜ - 12⅜	Republic, com.....	20¼ - 23
Can. pref.	88 - 92¼	Republic, pref.....	79⅜ - 80
Car & Foundry, com.	50 - 54⅞	Sloss, com.....	41 - 43
Car & Foundry, pref.	116 - 116¼	Pipe, com.....	12⅜ - 13⅝
Steel Foundries....	32 - 33¾	Pipe, pref.....	42½ - 43½
Colorado Fuel.....	27¼ - 29	U. S. Steel, com....	58⅛ - 65
General Electric....	152⅜ - 155¾	U. S. Steel, pref....	107¼ - 110½
Gt. N. Ore Cert....	42 - 43¾	Westinghouse Elec.	65 - 67¼
Int. Harv., com....	102⅜ - 112	Va. I. C. & C.....	61½
Int. Harv., pref.....	121 - 122	Am. Ship. com.....	48
Int. Pump, com.....	30 - 34½	Chic. Pneu. Tool...	45 - 46
Int. Pump, pref.....	82 - 83	Cambria Steel.....	43 - 44
Lackawanna Steel.....	37	Lake Sup. Corp....	27⅛ - 28⅜
Locomotive, com....	35 - 37	Crucible Steel, com.	103⅜ - 115⅝
Locomotive, pref....	102 - 103½	Crucible Steel, pref.	75¼ - 80⅜
Nat. En. & St., com.	15 - 16¼	Harb. Wk. Ref., pref....	96¼
Nat. En. & St., pref.	94½ - 96		

Dividends Declared

The Ashton Valve Company, regular quarterly, 1½ per cent., payable November 15.

The Niles-Bement-Pond Company, regular quarterly, 1½ per cent. on the common and preferred stocks; the dividend on the preferred stock, payable December 15 and on the common December 20.

The Pratt & Whitney Company, regular quarterly, 1½ per cent., payable December 15.

The Studebaker Corporation, regular quarterly, 1¾ per cent. on preferred stock, payable December 1.

The Harbison-Walker Refractories Company, ½ per cent. on the common stock, payable December 1.

National Founders' Meeting

The present condition of business and the relation of government to business operation are leading topics before the fifteenth annual meeting of the National Founders' Association in session, as this issue goes to press, in the Hotel Astor, New York City. The liability of employees for industrial accidents promises also to be discussed at length and a paper is scheduled on molding machines and automobile castings. The deliberations of the administrative council on Tuesday and the report of the Wednesday morning session will be withheld so that the meeting may be treated as a whole next week. Mention may, however, be made of the unusual progress made by the association as indicated in an addition of 61 members in the past year. Forty covers were placed for the "alumni" dinner Tuesday evening and at this writing President O. P. Briggs' address is being listened to by a large audience. The feature of the alumni dinner was the presentation to C. Bermingham, Canadian Locomotive Company, Ltd., of a large silver punch bowl.

The Crane Iron Works, which operates a railroad between blast furnaces in Lehigh County, Pa., has appealed to the Commerce Court to set aside an order of the Interstate Commerce Commission refusing application to have the road recognized as a common carrier and entitled to through rates and joint routes over the Jersey Central and other railroads. The company is a subsidiary of the Empire Steel & Iron Company.

October Copper Production and Stocks

The report of the Copper Producers' Association for October has surprised the trade. It shows a decrease during the month of 5,897,214 lb. in the stocks of copper held in this country, whereas a substantial increase had been expected. Following is the statement:

	Pounds.
Stock of marketable copper of all kinds on hand at all points in the United States, October 1.....	140,894,856
Production of marketable copper in the United States from all domestic and foreign sources in October....	118,255,442
Deliveries of marketable copper during October:	
For domestic consumption..... 64,068,307	
For export 60,084,349	
Total	124,152,656
Stock of marketable copper of all kinds on hand at all points in the United States, November 1.....	134,997,642

The reduction in stocks was caused by an increase in domestic consumption of 6,756,723 lb. and an increase in foreign consumption of 9,260,338 lb., while the increase in production was but 2,666,492 lb. The increase in stocks in September was 7,453,355 lb.

Bankruptcy for some railroads and a deterioration in the efficiency of others were forecasted at Washington, November 9, before the Employers' Liability and Workmen's Compensation Committee by Gardiner Lathrop, counsel for the Atchison, Topeka & Santa Fé Railroad. He expressed grave doubt as to the probability of obtaining authority from the Interstate Commerce Commission to make increases in rates, which, he said, would be imperative to meet the cost of the proposed insurance fund to compensate employees. Mr. Moon of the committee said that the committee could make such recommendations that would force the commission to take into account the added burden upon the roads.

The ratification of the merger of the Southern Iron & Steel Company and the Alabama Consolidated Coal & Iron Company which was expected last week was postponed owing to a complication. The organized Dutch bondholders of the Southern Iron & Steel Company, at a meeting held October 30, rejected the plan of reorganization. A member of the reorganization committee, who is now abroad, is expected to confer with the bondholders at Amsterdam. The committee says that it has deposits of 60 to 70 per cent. of the securities of the two companies and that the carrying out of the merger is assured.

The Anniston Iron Corporation, Anniston, Ala., as the result of action advised by the board of directors, has been placed in the hands of M. H. Maury, its general manager, and J. P. Carrington, vice-president Woodstock Iron Company, as receivers. The plant will be kept in operation. The total liabilities are placed at $60,000. The Lynchburg interest in the ownership of the corporation is not involved other than to the extent of stock holdings.

The Alleghany Ore & Iron Company, Iron Gate, Va., which on November 1 took over Buena Vista furnace from the lessee, the Oriskany Ore & Iron Corporation, put it in blast on November 8. It will be operated on car wheel, high manganese foundry and other special irons. The company's Iron Gate furnace will be blown out for repairs in the latter part of November and will remain idle for about two months.

On November 13 fire caused a loss of about $3000 to the plant of the Tudor Boiler Mfg. Company, on East Second street, Cincinnati. The press reports as to the extent of the damage are somewhat exaggerated, as it was not sufficient to cause any material delay in shipments.

Henry R. Merton & Co., Ltd., London, England, in their circular giving the statistics of copper stocks in England and France, note a decline from 67,340 tons September 30 to 61,836 tons October 31. This is the heaviest reduction in any month for several years.

The National Association of Brass Manufacturers will hold its annual meeting at Hotel Astor, New York City, on Wednesday and Thursday, December 13 and 14. Commissioner William M. Webster, 64 Randolph street, Chicago, believes, from present indications, that it will be a well attended meeting.

Isthmian Canal Commission Bids

WASHINGTON, D. C., November 13, 1911.—Bids were opened by the Isthmian Canal Commission to-day to furnish material parts for snubbing posts and springs, anchors, etc., for buffers on the lock walls. There were 30 bidders as follows:

American Car & Foundry Company, New York: Class 1, $8,597.76, 50 to 180. Class 2, $6,257.02, 50 to 100 days. Class 3, $19,206, unit 75 cents each, 50 to 100 days.

American Steel Foundries, Chicago: Class 3, $128,040, $5 each, 90 to 200 days.

W. Bingham Company, Cleveland, Ohio: Class 2, item 11, mild steel, galvanized, $1,892, 90 days; black, $1,628. Vanadium steel, galvanized, $2,442; black $2,178.

Buffalo Foundry & Machine Company, Buffalo, N. Y.: Class 1, $6,608.22, delivery not stated.

Crucible Steel Company of America, Pittsburgh, Pa.: Class 3, 90 to 365 days. Class A, $41,484.96, $1.62 each. Class B, $54,288.96, $2.12 each. Class C, $83,226, $3.25 each.

Farist Steel Company, Bridgeport, Conn.: Class 3, $14,084.40, 30 to 90 days if shipped in bundles; $15,364.80 if boxed.

Fawcus Machine Company, Pittsburgh, Pa.: Class 1, $647.45, 45 to 100 days.

R. C. Hoffman & Co., Baltimore, Md.: Class 1, $6,999.98, 40 to 65 days; if castings are painted, $7,119.98.

Illinois Bolt, Nut & Forge Company, Chicago: Class 2, items 7 and 8, $1,112.63.

Marshall Foundry Company, Pittsburgh, Pa.: Class 1, $7783.56, 45 to 135 days.

Minneapolis Steel & Machinery Company, Minneapolis, Minn.: Class 1, $7,039.69, 100 to 200 days. Class 2, $7,458.12, 90 to 180 days.

New Jersey Foundry & Machine Company, New York: Class 1, $5,725.43, 60 to 140 days. Class 2, $6,712.83, 60 to 120 days.

Oliver Iron & Steel Company, Pittsburgh, Pa.: Class 2, all items except 10, 11 and 12, $1,957.95, 60 to 90 days.

Pittsburgh Rivet Company, Pittsburgh, Pa.: Class 2, items 7, 8, 9, 13 and 14, $2,134.64, 50 to 75 days.

Pittsburgh Screw & Bolt Company, Pittsburgh, Pa.: Items 7, 8, 9, 10, 11, 12, 13 and 14, $2,051.65.

Power & Mining Machine Company, New York: Class 1, $7,111.76, 56 to 112 days. Class 2, $6,548.36, delivery not given.

Railway Steel Spring Company, New York; Class 3, item 15, regular bid, $15,876.96. Four alternative bids, designs 1, 2, 3 and 4: 1, $14,084.40; 2, $13,572.24, unit 53; 3, $13,316.16, unit 52; 4, $13,828.32, unit 54, 30 to 185 days.

Richard Mfg. Company, Bloomsburg, Pa.: Class 1, $8,070.48, 60 to 120 days. Class 2, $8,612.78, 60 to 120 days. Class 3, alternative bid, $23,047.20, 60 to 150 days, unit 90 cents.

Julian Richmond, New York: This bid was too complicated to be abstracted.

Rosedale Foundry & Machine Company, Pittsburgh, Pa.: Class 1, $8,730.46, 60 to 120 days. Class 2, $7,516.88, 60 to 120 days.

Ross-Meehan Foundry Company, Chattanooga, Tenn.: Class 1, $6,875.59, 10 to 50 days.

Standard Foundry Company, Buffalo, N. Y.: Class 1, $5,518.09, 60 to 150 days.

Sterritt, Thomas Company, Pittsburgh, Pa.: Class 1, $6,328.88, 60 to 90 days.

Union Foundry & Machine Company, Pittsburgh, Pa.: Class 1, $10,093.42, 60 to 120 days. Class 2, $7,909.89, 60 to 80 days.

Union Spring & Mfg. Company, Pittsburgh, Pa. Regular, Class 3, $14,084.40, unit 55, 25 to 40 days. Alternative, $15,364.80, unit 60, 25 to 40 days.

United States Steel Products Company, New York: Class 3, alternative bid, $15,620.88, unit 61.

Weatherly Foundry & Machine Company, Weatherly, Pa.: Class 1, $6,516.71, 60 to 300 days.

Wheeling Mold & Foundry Company, Wheeling, W. Va.: Class 1, $8,520, 30 to 60 days.

Lynchburg Foundry Company, Washington, D. C.: Class 1, $7,381.18, 60 to 150 days.

Trenton Foundry & Machine Company, New York: Class 1, $6,278.44, 45 to 90 days.

Three papers on autogenous and electric welding were presented before the New York meeting of the American Society of Mechanical Engineers, on the evening of November 14, at the Engineering Societies Building, New York City. Much new data were contributed and it is hoped later to present them in these pages. A noteworthy feature of the evening was the generous use of the lantern photograph, including motion pictures. The first paper was by H. R. Cobleigh, of the International Steam Pump Company, formerly mechanical editor of *The Iron Age*, dealing with the apparatus used in the different processes; the second, by G. E. Pelissier, superintendent of the Goldschmidt Thermit Company, and the third by C. B. Auel, assistant manager of works of the Westinghouse Electric & Mfg. Company.

The "Steel Wire Gauge"

The American Steel & Wire Company makes the following announcement of a decision concerning the wire gauge arrived at by a number of manufacturers and consumers in compliance with a suggestion from the Bureau of Standards:

The wire gauge for which sizes were shown heretofore in this company's publications, under the title of "American Steel & Wire Company's Gauge," was the same as the Washburn & Moen gauge, and also the same as that used by practically all of the steel wire manufacturers of the United States, under various names. It results from this fact that there is really a standard steel wire gauge in the United States, although this has not been formally recognized.

Upon the recommendation of the Bureau of Standards at Washington, a number of the principal wire manufacturers and important consumers have agreed that it would be well to designate this gauge as the "Steel Wire Gauge"; in cases where it becomes necessary to distinguish it from the British Standard Wire Gauge, it may be called the "United States Steel Wire Gauge." The name thus adopted has official sanction, although without legal effect.

The only wire gauge which has been recognized in Acts of Congress is the Birmingham gauge. The Treasury Department has for many years used this gauge in connection with importations of wire, and the adoption of succeeding tariff acts with provisions for the assessment of duty according to gauge numbers gives legislative sanction to the gauge. Until certain provisions of the tariff act are amended the Treasury Department probably cannot discontinue the use of the Birmingham gauge. It should, however, be abandoned by all other users, since the gauge itself is radically defective, and it is nearly obsolete, both in the United States and in Great Britain, where it originated.

For copper wires and wires of other metals the gauge universally recognized in the United States is the "American Wire Gauge," also known as the Brown & Sharpe. No confusion need arise between the Steel Wire Gauge and the American Wire Gauge, because the fields covered by the two gauges are distinct and definite.

The Steel Corporation's Unfilled Orders

The statement of unfilled orders of the United States Steel Corporation on October 31 given out for publication on Nov. 10, showed a total of 3,694,328 tons, as compared with 3,611,317 tons on Sept. 30, an increase of 83,011 tons. The statement of Sept. 30 showed a decrease of 84,668 tons from the total on the books August 31. The statements for the last days of June, July and August had all shown increases. Low point in the tonnage records of the Steel Corporation was touched at 2,674,757 tons on December 31, 1910. The amounts reported for the various months of this year are as below, in tons:

Oct. 31, 1911	3,694,328	May 31, 1911	3,113,187
Sept. 30, 1911	3,611,317	April 30, 1911	3,218,704
Aug. 31, 1911	3,695,983	Mar. 31, 1911	3,447,301
July 31, 1911	3,584,085	Feb. 28, 1911	3,400,543
June 30, 1911	3,361,058	Jan. 31, 1911	3,110,919

It will be seen that the increase in unfilled orders in October practically brings the total back to what it was at the close of August. The totals at the close of the various years have been as follows: 1902, $5,347,523 tons; 1903, 3,215,123 tons; 1904, 4,666,203 tons; 1905, 7,605,086 tons; 1906, 8,498,719 tons (the high record); 1907,4,624,552 tons; 1908, 3,603,527 tons; 1909, 5,927,031 tons.

The Commerce Court has granted a temporary injunction against the order of the Interstate Commerce Commission in the long and short haul cases, known as the Intermountain cases. While agreeing with the commission that the fourth section (long and short haul) is constitutional, the Commerce Court holds that the commission has no right to make blanket rates, nor to make rates on percentages, and, therefore, no right to establish zones in which one rate is a percentage of another.

The No. 2 Crane furnace of the Empire Steel & Iron Company at Catasauqua, Pa., was blown out for relining November 13 and will be idle for about two months. In October the furnace made a record with an output of 8386 tons of foundry iron, or a daily average of over 270 tons.

Personal

A. P. Scott, who for the past three years has been connected with the Allegheny Steel Company, Pittsburgh and Brackenridge, Pa., as metallurgist, has just resigned that position and goes to the Dominion Iron & Steel Company, Sydney, Nova Scotia, in the same capacity, his duties in the latter place to begin December 1, 1911. On the evening of Saturday, November 11, Mr. and Mrs. Scott were entertained by the officials of the Allegheny Steel Company and their wives at a farewell dinner at the Fort Pitt Hotel.

Harry W. Frister, who has been associated with Rogers, Brown & Co., New York, has resigned to take a similar position with the Pyrene Fire Extinguisher Company, New York.

R. A. Wilson, formerly with the Snow Steam Pump Works, Buffalo, N. Y., has been appointed gas expert for the Carnegie Steel Company at Youngstown, Ohio.

A. M. Welch, for about eight years with the Studebaker Company and for the past year manager of the commercial car department of the Franklin Works at Syracuse, N. Y., has now taken up territorial work with the Stevens-Duryea Company, Chicopee Falls, Mass.

F. A. Deichen, a machine tool builder of Berlin, who had been in this country for five weeks, sailed on Tuesday for the other side of the Atlantic.

Paul Vogel, of the machinery house of Alfred H. Schutte, 90 West street, New York, sailed for Europe on Tuesday.

Carl Humperdinck, of the Badische Maschinenfabrik & Eisengiesserei, Durlach, Germany, and G. E. Niemczik, of Gans & Co., Budapest, Austria-Hungary, who have for some time been studying American methods at numerous foundries, return home this week.

O. D. Hogue has been appointed vice-president and treasurer of the Goulds Mfg. Company, of Illinois.

W. J. Brand, Empire Building, Pittsburgh, dealer in foundry supplies, has been elected treasurer of the Pittsburgh Foundrymen's Association, succeeding John McLaren, deceased.

Peter Donaldson, of James Watson & Co., Glasgow, Scotland, arrived in New York this week on business connected with the Dayton Coal & Iron Company, Ltd., Dayton, Tenn., of which he is president.

P. D. McLaren, P. O. Box 1835, Calgary, Canada, has severed his connection with the Canadian Fairbanks-Morse Company and has established himself in that city as a manufacturer's agent.

J. C. Ward, resident director and general manager of the Edgar-Allen Company, Ltd., Chicago, has just returned from a trip around the world taking about nine months, in the course of which he visited all of the agencies of the company.

Otto Faulenbach, representing the well known iron mining and selling firm of W. H. Mueller & Co., The Hague, Holland, is now in the United States.

Obituary

August Marx

August Marx, general manager of the Philadelphia Roll & Machine Company, died November 6 at his home in Philadelphia, Pa., aged 54 years. He had been in poor health for some time but his death was unexpected. He was born at Bad Homburg, Germany, and left home at the age of 13 as cabin boy on a sailing vessel. After three years of that experience he landed in New York, whence he drifted to Philadelphia where he made his home. In 1880 he became connected with the Lombard & South Streets Passenger Railway Company, where his ability resulted in his advancement to superintendent of the Passyunk Division of that system. On consolidation of that company with the Frankford & Southwark Company in 1891, he resigned his position and toured the Continent. In 1892 he became connected with William Wharton, Jr., & Co., Inc., assuming the superintendence of materials for the construction of the Third Avenue Railroad Company, New York City. At the time of the formation in 1895 of the Philadelphia Roll & Machine Company, a subsidiary of the Wharton Company, he severed his connection with the parent company and joined the new one, and his unusual business ability and qualifications, coupled with his able leadership and exceptional capabilities for organization, soon won for him the active management of affairs, holding the position of general manager until his death.

Mr. Marx was a self-made man in every sense of the term, whose business life exemplified the Golden Rule, and who applied to an extraordinary degree the principles of integrity to all his transactions. He was interested in the Hebrew Charities as well as prominently connected with a number of building and social societies. He leaves a widow, a daughter and a son, Joseph Marx.

C. L. Rice, a pioneer in the mill supply business and one of the oldest members of the Dodge selling family, is dead. According to the Chicago branch of the Dodge Mfg. Company, where Mr. Rice was identified, he was crossing a down-town street at noon on November 2, when a team of draft horses knocked him down. Picked up in an unconscious condition, he was hurried by ambulance to a Chicago hospital, where examination by physicians showed only several severe bruises on the face and head and no internal injuries. He failed rapidly, however, and passed away November 3, without regaining consciousness. He was 89 years old, and had been more or less connected with the Dodge people since the introduction of the wood split pulley 40 years ago. Engaged then in the general machinery business and carrying about the only stock of wood and iron working machinery in Chicago, under the name of Rice Machinery Company, he took the first agency for the sale of Dodge Independence wood split pulleys.

Albert Benton Reeves, Columbus, Ind., one of the founders of Reeves & Co., agricultural implement makers, died November 5, aged 72 years. He had gone to a local hospital to undergo an operation. He was born in Rush County, Ind., and was a farmer until he invented a plow. The manufacture of this plow was begun in Columbus 35 years ago, and the business grew until it has become one of the largest agricultural and threshing machinery interests in the Middle West.

John McMurdie Warner, Philadelphia, Pa., died suddenly November 11 from heart disease, aged 53 years. He was a member of the old pig-iron firm of Rogers, Brown & Warner, retiring from business about eight years ago. He had since then traveled extensively and became the possessor of a famous art collection. He was a member of many historical organizations. He was born in Chillicothe, Ohio. He leaves a widow.

Edward Pohl, formerly president of the Pohl Iron Works, Louisville, Ky., died in that city last week at the age of 75 years. He retired from business several years ago. He was born in Austria, and had made his home in Louisville for 50 years.

Charles Rea, Pittsburgh, Pa., one of the founders of Robinson, Rea & Co., builders of rolling mill machinery, whose business was some years ago taken over by the Mesta Machine Company, died November 9, aged 88 years.

The new Court of Commerce on November 9 granted the prayer of transcontinental railroad companies for injunctions in the important intermountain rate cases. The injunctions will hold up the recent decisions in the Spokane and other cases regarding railroad rates. The order under consideration established rate zones for the benefit of interior towns west of the Missouri River, which heretofore have been charged the full rate to the Pacific coast, plus the local haul back. Complaint was brought under the long and short haul clause by Reno and other towns, intermediate points in Nevada, Arizona, Utah, Washington and California being affected. The order was to have gone into effect November 15.

The Ingersoll-Rand Company, 11 Broadway, New York, authorizes the statement that it has purchased the rights to manufacture the line of drills formerly built by the J. George Leyman Engine Company, Denver, Col. The plant of the Denver company, which made drills for rock, mining and tunnel work, was not acquired.

Pittsburgh and Vicinity Industrial Notes

Francis V. Kemble of New York City, who bought the property of the Vulcan Foundry & Machine Company at New Castle, Pa., at sheriff's sale, has sold it to the Adrian Realty Company, a New York corporation, for $46,084.98. The Adrian Realty Company is composed of persons largely interested in the Buffalo, Rochester & Pittsburgh Railroad. What disposition will ultimately be made of the plant is not known at this time.

The Standard Steel Car Company recently shipped from its works at New Castle, Pa., 11 passenger cars designed and built especially for the Boston Subway. The cars are of all-steel construction, extra length, and equipped with the most modern electric appliances and motors.

The Pittsburgh Armature Works, West End, Pittsburgh, manufacturer of armatures, coils and commutators and making a specialty of electrical repairs, has purchased a plot of ground, 60 x 150 ft., on which it will erect a two-story steel and concrete building. Ground will be broken in the spring, and it is expected that the building will be ready for occupancy by August 1. The first floor will be used for storage and for making repairs to automobiles, which is a new departure, while the second will be devoted to the company's present business. J. J. Kossler is manager.

The Pennsylvania Tank Car Company, Pittsburgh, recently incorporated, will build a plant on the property of the Petroleum Iron Works Company, adjoining its plant at Sharon, Pa. The company will manufacture tank cars and repair old cars. G. F. Woodsmith is president and general manager, and work has been started on the construction of 1700 ft. of switches for storing cars.

A Mallet simplex locomotive, the largest mogul ever built, now being tested by the Pennsylvania Railroad on the mountain grades, performed the remarkable feat on November 3 of pushing 46 loaded cars up the grade of the Alleghenies between Cresson and Gallitzin. The engine in front, for the purpose of the test, did not pull a pound, the power being cut off. The Mallet performed the work of two of the most powerful locomotives in service.

The Jamison Coal & Coke Company, Pittsburgh, reports that its shipments of foundry coke in October were 969 cars, aggregating about 25,000 tons, showing an increase over September of about 7,500 tons.

The Pittsburgh office of the Babcock & Wilcox Company, Farmers' Bank Building, has received an order from the Pittsburgh Crucible Steel Company for 8000 h.p. horizontal water-tube boilers of the Stirling and Rust types, to be installed in the new open-hearth steel plant at Midland, Pa. The design of stoker with which these boilers will be equipped has not yet been settled. The Babcock & Wilcox Company has also received orders from the Consolidation Coal & Coke Company, Fairmont, W. Va., for 2500 h.p. Rust water-tube boilers; American Sheet & Tin Plate Company, for 1500 Stirling horizontal water-tube boilers for delivery at Cleveland, Ohio, Gary, Ind., Scottdale, Pa., and Canton, Ohio; H. C. Frick Coke Company, Pittsburgh, for 500 h.p. Stirling boilers; Standard Oil Company, Cleveland, Ohio, for 700 h.p. Stirling boilers and Keystone Coal & Coke Company, Pittsburgh, for 500 h.p. Stirling boilers.

At a meeting of directors of the Oil Well Supply Company, Pittsburgh, held November 6, Louis Brown was elected president, to succeed John Eaton, deceased; L. C. Sands, vice-president; Grant Hubley, secretary; D. J. Brown, treasurer. W. H. Spain was added to the board of directors.

The Bessemer & Lake Erie Railroad, owned and operated by the Carnegie Steel Company, has made a new traffic record in the past three months, hauling upward of 3,000,000 gross tons of ore, namely, 1,500,000 tons in August, 1,000,000 tons in September, and 950,000 tons in October.

The Westinghouse Electric & Mfg. Company, East Pittsburgh, has received as sub-contractor, through the John W. Danforth Company, Buffalo, N. Y., an order from the Navy Department for additional electrical equipment for the central power plant at the Mare Island Navy Yard, San Francisco, comprising six induction motors with a double equipment of 142½ h.p., both single and double speed motors, for driving circulating and condensing pumps; three 50 Kva. transformers for reducing the voltage of the generators, one 20 kw. motor-driven exciter set, two 25 kw. turbo-generator exciter sets, one 13 panel station switchboard, and one distributing panel. The generating equipment for this station was purchased some time ago and includes one Westinghouse-Parsons 1000 kw. 2200 volt turbo-generator.

Frank B. Ward, dealer in machinery, machine tools and foundry, mill and shop equipment, has removed from the Machesney Building to 1401-1402 Park Building, Pittsburgh. He represents in the Pittsburgh district Henry Pels & Co., of New York and Berlin, the Central Machine & Foundry Company, Marion, Ind., and other machine tool makers, and in connection with F. B. Hurlbut will hereafter look after the interests of the Cleveland Crane & Engineering Company in Wickliffe, Ohio, in the Pittsburgh district.

The Riter-Conley Mfg. Company, Pittsburgh, has received a contract for the building of a gas holder for Detroit, Mich., to take 2700 tons of plates, which will be rolled by the Carnegie Steel Company.

Tate, Jones & Co., Inc., Empire Building, Pittsburgh, report that orders for their heat treating furnaces are increasing. Contracts were recently received for these furnaces from the Autocar Company, Ardmore, Pa.; Alloy Steel Forging Company, New York City; Carnegie Technical Schools, Pittsburgh; Chalmers Motor Company, Detroit, Mich.; Mason-Seamon Transportation Company, New York City; Remington Arms Company, Ilion, N. Y.; Monarch Metal Mfg. Company, Kansas City, Mo.; B. C. Ames Company, Waltham, Mass.; Windsor Machine Company, Windsor, Vt.

The Best Mfg. Company, Pittsburgh, maker of valve fittings, etc., has appointed Charles E. Hague as its Philadelphia representative with headquarters in room 1510 Land Title Building. He will have charge of eastern Pennsylvania, Baltimore and Washington. It has also appointed C. L. Stickney & Co. as its representative in Washington and Oregon, with headquarters at 108 White building, Seattle.

The Fort Pitt Spring & Mfg. Company, McKees Rocks, Pittsburgh, in addition to making coil and elliptic springs, including vanadium steel springs, will manufacture all forms of bars for concrete reinforcing. It has appointed the Fitzhugh-Luther Company, Monadnock Block, Chicago, Ill., its Western sales representative.

Through the efforts of the Board of Trade and the Petroleum Iron Works Company, Sharon, Pa., the Pennsylvania Tank Car Company, recently organized with a capital stock of $50,000, will build a plant in Sharon for the manufacture and repair of tank cars. Its capacity will be the manufacture of 100 cars per month and the repair of a similar number. G. F. Woodsmith is president and general manager of the company.

The Standard Steel Tank & Mfg. Company, Pittsburgh, which recently took over the plant formerly operated by the McAllister & Byrne Construction Company at Girard, Ohio, is making a line of pneumatic pressure tanks, air receivers, freezing tanks for ice plants, oil storage tanks, etc. James T. McLaughlin, Cleveland, Ohio, is president; F. M. Stricker is vice-president and general manager, and Joseph L. Kountz, formerly president of the Columbia Steel & Shafting Company, Pittsburgh, is secretary and treasurer, and has charge of the offices in the Oliver Building, Pittsburgh. The company is rearranging its power system from steam to motor drive and is taking estimates on new equipment, including an oxy-acetylene welding plant, a 14-ft. gap riveter, etc.

Reports that Max Solomon, Oliver Building, Pittsburgh, who recently purchased the plant of the Shenango Iron & Steel Company at Wheatland, Pa., would equip it for the manufacture of wrought iron pipe are untrue. He has not yet decided what he will do with it.

The Youngstown Sheet & Tube Company, Youngstown, Ohio, has placed a contract with the William Tod Company of that city for a blooming mill and blooming mill tables. The pinions will be 44 in. and the size of the rolls 36 x 92 in. The company first named has also placed a contract for a 44 in. and 76 in. x 60 in. twin tandem compound engine with the Mesta Machine Company, Pittsburgh. These contracts, with spares for engine and mill, will amount to over $200,000 and call for deliveries by [illegible]

Standardizing Factory Expense and Cost

It Largely Eliminates Chance Variations and Aids in Locating Those Due to Carelessness or to Increased Efficiency

BY STERLING H. BUNNELL.

Too much attention is concentrated by men interested in cost keeping, on the building up and distributing of an expense account by some system which shall dispose of it in the easiest possible way for the bookkeeping department. Expense burden is an element in factory accounting, which occupies a place similar to the surplus reserved against future lean periods. An organization which divides up its profits each month to the last cent, retaining nothing for a surplus, would soon be in a bad way. The surplus account is comparable to what engineers term stored energy; it acts like a storage battery on an electric service system, taking up the excess of one interval to give it back when required at another. No wise stockholder objects because the dividends are maintained at a uniform figure year after year and the fluctuations of net income turned into the surplus account. But the same man looking at the cost accounts of the factory generally believes that fluctuations of cost due to temporary conditions of factory operation, are indications of correct cost-keeping.

Cost and Expenditure in a Given Period

The idea is very commonly held among manufacturers, that the cost of manufactured product in a given period is the sum of expenditures of the factory in that period. Although the fallacy of this belief is apparent to most men upon consideration, there are yet some manufacturers and bookkeepers who insist upon their belief in the truth of the principle as stated. If the rule were rigidly applied, the payment of a power service bill in May rather than April would increase the cost of goods in May and decrease the cost in April. If the bill was one of a monthly series, almost any bookkeeper would enter it in the account of the month in which the service was rendered, whether paid then or later. He would, however, question whether a bill paid in the month of May, for repairs to a machine which broke down on the 29th of April, should go to increase the cost of goods turned out in April or in May.

The fact is that the items which go to make up the cost of a manufactured product often have little to do with times and seasons. Machines break indiscriminately in any month of the year, and are repaired at once or later as is most convenient. Coal bills are larger in winter than in summer, yet no greater amount of factory product is turned out to correspond to the increased fuel cost. Even the payroll is subject to seasonable fluctuations caused by snow shoveling in winter, cleaning the yard in spring, and occasional rearrangement of materials in storage. It is true, in many cases, that the fluctuations in one account balance those in another, so that the well run factory shows a uniformity in expense burden, which with uniformity in direct cost presents a very attractive appearance of efficiency. There is nothing more deceptive than such a condition. Where costs of similar parts happen to come out alike, for successive lots, due to the fact that gross irregularities are checked off against each other, the only effect of cost-keeping is to hide and cover up errors of the management.

Relation of Stored Energy to Indirect Expense

A well managed factory presents a striking instance of stored energy in the organization as well as in the moving machines. In the projection of the factory, a considerable amount of money becomes "latent," as it were, in the form of organization expenses. For the first few months of operation, expenses are sure to exceed income. Gradually a smooth-working force of men is brought together, a routine becomes established and the product begins to come out of the works at a rate which approaches the expected normal. By this time the factory organization has become a "going concern." Like all moving objects, it has stored a quantity of energy by virtue of which it will continue to operate smoothly unless the organization is seriously disturbed. The factory is worth more money as a going concern than it would be as an idle, closed shop, even though the equipment in each case were the same.

Of the two general divisions of factory cost, direct and indirect, the latter is the one in which the cost of the stored energy is principally located. In this account are carried the salaries of the management, the engineering force, the clerical department and the foremen; the cost of power, and the cost of depreciation, taxes, insurance and repairs, all of which are expenses by virtue of which the organization is kept together and in running order. An insurance premium is paid covering a term of one or more years to come, and the accountant immediately divides the premium into portions, one for each month of the term of the policy, thus equalizing the expense of insurance over the coming months. Interest on the capital invested in the plant is similarly arranged in monthly installments. Salaries are handled uniformly in the same way. It would appear to require no wrench of the imagination to apply the same sensible plan to the other items of expense, depreciation, repairs, cost of power, general labor and the rest.

The Handling of Depreciation

Depreciation is computed in either of two ways, as a uniform percentage on the original cost of the equipment, or as a uniform percentage on the decreasing value of the equipment. In the first case, the reserve for depreciation is built up like a sinking fund by uniform payments, so that at the end of the life of the equipment a fund is at hand with which to replace it. In the second case, the annual charge for depreciation decreases year by year. The theory advanced for depreciating on the decreasing balance is that the concern is better able to stand a large reduction for depreciation in the early years than later, when the tools are becoming old. There is little of good logic in this argument. Quite as many organizations could stand a large loss better in later years than when they are new and without established strength. Further, the equipment does not wear out all at once, even though purchased at the same time. When one item is ready for the scrap heap, another may yet have a long period of usefulness, and any attempt to arrange depreciation rates so as to reduce the book assets down to the exact scrap heap value of each machine is based on little else than pure guesswork.

Other items of the expense account are governed by no fixed rules. Repairs to machinery occur on one or the other of the machines by chance. Of the machines running in a large factory, some will operate for years without repairs; others will break down early in their career, and give good service for long years after repairs are made. Repair cost is likely to fluctuate accordingly; through a wide range. The cost of heat and light has a periodical rise and fall, due to the seasons. More coal is burned in winter than in summer, and the expense account varies accordingly. All these fluctuations are by many manufacturers thrown directly into the cost of product. If the detailed costs are comparatively uniform from month to month, it is merely because one variation cancels another.

The manager of a factory is accordingly not justified in satisfaction with every slight reduction in the expense account, the result of one or more causes unknown. If department B has made a saving, that department should receive the credit; while if department A has wasted money, its fault should not be concealed by the superior virtue of department B. It is not necessarily a mark of good management to increase the repair force in the summer because at that time power cost is low and the total expense account will not be raised by the increase in wages. With limited financial resources it may be neces-

sary to suit the schedule to the funds available; but this may be done at the expense of operating requirements. The equalization of burden from period to period, or the variation of burden, to keep it in uniform ratio to the value of product, is rather an accounting proposition than a matter of good shop management. The desired result is better obtained by accounting methods, with the aid and advice of the construction department, than by distorting the shop operating schedule with the advice of the financial head.

Value of a Standardized Expense Account

In these days of standardization of work there is nothing revolutionary in the suggestion that shop expense be standardized as well. There is no virtue in throwing fluctuations in the expense account into costs. A man could enter into a contract to insure his neighbor's barn, carrying the insurance himself, and this would be nothing more than betting. A corporation can enter into contracts to insure buildings over a wide area of country, and the transactions form a legitimate business operation. In the factory, it is impossible to foretell how many days will be spent for repairs on a given 16-in. lathe, but it is not particularly difficult to estimate the total amount that may be expected to be spent for repairs for all the machines together for a year. The same arrangement can be made for the cost of power, and for all the other details of the factory burden.

The broad conception of standardized expense burden is that the factory production is a task for the factory management, just as the machining of a piece of steel is a task for a workman. The manager undertakes to operate his factory with a certain force of men, supervised by certain foremen at expected salaries, and at a cost for repairs, power, supplies and all the rest, or a reasonable and known amount. A schedule can be prepared covering the details of expense of the factory. This schedule forms the basis of the expense burden distribution. Each scheduled expense is to be credited on the books to an account on the debit side of which appear the items actually expended for the account in question. The balance in each of these expense accounts then forms a definite measure of the performance of the person or department in whose charge this detail of the expense burden is placed. The total burden of the factory is uniform from month to month, subject only to variation in accordance with definite conditions which warrant a change.

The control which a standardized expense account gives over the operation of the factory is a powerful instrument in the hands of the management. In the power plant operation, for instance, the annual expense for power is determined from records and data, and an expense account entitled "Power Plant" is opened. This account is debited with the wages of engineers and firemen, with the cost of fuel and supplies, repairs, depreciation and interest on the capital value of the power plant, the latter in monthly installments. If the cost of power increases, the effect is at once shown by the debit balance in the account. If it decreases, a credit balance appears. The conditions underlying any considerable balance can be investigated whenever the balance is observed, and the work of the chief engineer compared with the balance accordingly.

The same principle can be applied to all the details of the expense account. The cost of repairs to small tools in a machine shop, of wages paid to laborers, and other expenses which are likely to fluctuate may be controlled to advantage if constantly compared with a definite schedule. Depreciation and repairs in particular are usefully handled in this way. The depreciation loss is arranged for in equal monthly installments building up a sinking fund from which renewals to machinery can be made as required. Some tools will unexpectedly become obsolete in five years, while others will far outlast their expected lives. The standardized depreciation account takes care of these various conditions by balancing one against another. Repairs may vary from month to month, but the variations spread over a term of years tell the truthful story of conditions. Three machines may break in the same month, but this is rarely an indication that the goods made in that month cost more than in the next month when no breakage occurs. A lower repair cost in a given month occurs because the plant has borrowed from the past or from the future; sooner or later, the difference will be equalized by a swing of the pendulum the other way.

Causes of Increased Cost Located

A uniform burden, distributed by uniform methods to the manufactured product, provides a condition by which chance variation in cost of product is largely eliminated. It is rarely possible to sell one article at a higher price than the same article made at another time, to cover a difference in cost. Selling prices are made by lists and remain more or less uniform. Variation in cost tells a salesman little or nothing; it may, however, tell the manager very much. With a uniform burden, an increase in factory cost of a given item is caused by nothing else but an increase in labor or material. It is impossible to hide such a condition, or to pass it by with the suggestion that an extra bill or two was paid during the past month and the burden increased accordingly.

Uniformity can be secured only by working to definite standards. Thousands of parts are made closely alike by comparison with standard gauges and jigs. Costs of the same parts may be made closely alike by the application of standard efficiency, standardized operating plans and uniform payments for the work. It only remains to control the operation of each department and detail of the factory, by gauging its efficiency against a standard expense account, definitely detailed and scheduled, so that variations due either to carelessness or to increased efficiency may be recognized and dealt with accordingly.

Lake Iron Ore Shipments in October

The comparison between October shipments of Lake Superior ores this year and those of October, 1910, is closer than for any other month of the season, the October total being 4,769,965 gross tons, or 107,476 tons less than for October of last year. The total to November 1 this year was 29,607,102 tons, against 39,978,308 tons to November 1, 1910, or a falling off of 10,371,206 tons. The shipments by ports for the two years in gross tons were as follows:

	Oct., 1911.	Oct., 1910.	To Nov. 1 1911.	To Nov. 1 1910.
Escanaba	622,807	639,444	3,764,654	4,597,517
Marquette	387,436	309,282	1,986,147	2,968,503
Ashland	381,565	380,539	2,301,387	3,887,669
Superior	1,368,893	1,317,402	9,345,[illegible]	7,892,254
Duluth	956,342	1,223,710	6,157,[illegible]	13,689,262
Two Harbors	997,892	1,006,263	5,853,212	7,763,103
Total	4,769,965	4,877,441	29,607,102	39,978,308
1911 decrease	107,476	. . .	10,371,206	. . .

Water shipments for the season of 1910 were 42,611,191 tons. They will probably fall about 11,000,000 tons short this year.

Alliance Crane Contracts.—The Alliance Machine Company, Alliance, Ohio, last week closed crane contracts as follows: Seven for the Youngstown Sheet & Tube Company, covering one 60-ton, one 40-ton, one 25-ton, one 15-ton, three 10-ton; two 150-ton four girder ladle, one 75-ton four girder ladle, one 40-ton special revolving trolley forge, and one 25-ton mixer trolley for the Pittsburgh Crucible Steel Company. In addition to the above, orders recently taken by the company include a 25-ton, Harlan & Hollingsworth Corporation; 10-ton, Canton Sheet Steel Company; 150-ton stripper, Nova Scotia Steel & Coal Company; 5-ton crane, Inland Steel Company; 5-ton, Portsmouth Steel Company; 5-ton wall, Pennsylvania Steel Company; 5-ton, Wright Wire Company; 10-ton, Carnegie Steel Company; one 10-ton and two 5-ton, Republic Rubber Company; one 30-ton and one 5-ton, Scullin-Gallagher Iron & Steel Company; 6-ton, Pittsburgh Plate Glass Company; 10-ton, National Tube Company. Shipments made in November covered a wide range of customers and localities among them having been the following: A 75-ton four-girder ladle crane, National Tube Company, Lorain Works; floor type Bessemer charging machine, Dominion Iron & Steel Company; two 10-ton coke hoists, Tennessee Coal, Iron & Railroad Company; 24-in. I-beam shear, Eastern Steel Company; 50-ton four-girder ladle crane and a 10-ton crane, National Malleable Castings Company; gantry bucket crane, Delaware, Lackawanna & Western Railroad; 15-ton crane, Inland Steel Company; seven 5-ton cranes, Gary Screw & Bolt Company; five 6-ton jib cranes, Indiana Steel Company; one I-beam hoist, American Conduit Mfg. Company.

An Analysis of Factory Work

The Problem Created by the Increase in Enervating Tasks and the Decrease in Those That Energize

At a dinner of the Chicago Commercial Club at the Blackstone Hotel, Chicago, Saturday evening, November 11, Dean Herman Schneider, of the University of Cincinnati, gave an address on "An Analysis of Work," in which some very interesting propositions were developed. During the past five years, under Dean Schneider, a course of co-operative industrial education has been followed at Cincinnati, the unique feature of which is (as heretofore explained in these columns) that during alternate weeks students are in the classroom and in the shops of the various manufacturing concerns in Cincinnati, the shop work being laid out for them by the directors in the same manner as the balance of the curriculum. Contemporaneous with the development of this course, an opportunity has been presented to Dean Schneider for an investigation of the psychological effect of various kinds of work upon the operator. Some classes of work, it has been found, tend to the stunting of the mind, while other forms energize the thinking faculties.

If the processes of industry and the mechanical operations they involved provided within themselves reactions from the routine of various kinds, they would, as did the old time guild system, develop the workman's mentality as well as his manual skill. On the contrary, division of labor and automatic operations have so greatly increased that many of the conditions and a large proportion of the work now done in mill and shop tend directly to mental retrogression. It becomes, therefore, distinctly an educational work to supply and direct counteracting influences. To establish the correct premise upon which to base a prescription for these ills, an analysis of work has been made. The cure is not intended simply to better manufacturing conditions as an ultimate end, but by modifications in industrial operations to contribute to the betterment of the civic community. Concerning this analysis, Dean Schneider spoke, in part, as follows:

Changes in Conditions of Work

In the first place, it is only within the past two generations that mankind has worked in masses within walls. For centuries men did individual, self-directed work almost entirely in the open. The change has come, of course, through the development of power devices, and dates from the invention of the steam engine.

In the second place, the industrial worker formerly knew a whole job, rather than a part of it; he performed a great variety of functions in the completion of his task, instead of endlessly repeating the same operation. The clockmaker made a whole clock, working individually, and the necessity of working out every part's relation to every other part gave the worker a mental stimulus and therefore a higher mental development. The finished product was all his own; the desire for self-expression which every man has found an outlet through his work; and once having served thorough apprenticeship he worked largely by self-direction. Under our present highly organized industrial conditions, the making of a clock is subdivided into a large number of operations. Each workman in a clock factory makes piece after piece of the same kind, principally by feeding material into a machine, and why he does it he need not know, and usually is not told. We are putting the brains into the machine and into the management office, and making the workman a purely automatic adjunct. It is unquestionable that much of the present spirit of industrial unrest is Nature's protest against work without light, physical and mental.

The Great Drawback of Automatic Work

It is this purely automatic, high-pressure work in closely crowded rooms which is the most ominous feature of modern industrialism, its most serious aspect being the effect upon the mental development. Scientific research has shown us that the monotonous rhythmic repetitions of the machine's motion and the monotonous rhythmic motion of feeding the machine produce a hypnotic, deadening influence on the mind. The lower brain centers, controlling habits, are developed at the expense of the higher thinking centers. As the habit becomes ingrained, the worker becomes more lethargic and automatic, and almost as incapable of independent, intelligent action as the machine itself. Research further shows that the higher centers in the brain of such a worker are in danger of getting into a permanent, inelastic, hopeless set, if a lively stimulus is not supplied.

Further, there is in every individual a desire for self-expression, and if this cannot be had in one's daily work Nature will force an outlet for it. It cannot be dammed up very long; and since there is no outlet in the worker's daily task, it must come during his idle hours, and sometimes takes a form which leads to many of our most vexing sociological problems.

Enervating vs. Energizing Work

The situation, then, sifts down to this: Energizing work is decreasing; enervating work is increasing. In spite of the warnings of history, we are rapidly dividing mankind into a staff of mental workers and an army of purely physical workers. The physical workers are becoming more and more automatic, with the sure result that their minds are becoming more and more lethargic The work itself is not character-building; on the contrary, it is repressive, and when self-expression comes it is hardly energizing mentally. The real menace lies in the fact that in a self-governing industrial community the minds of the majority are in danger of becoming atrophied, or at best of becoming trifling and superficial, because of lack of continuous exercise in conjunction with the earning of a livelihood. The kind of citizenship that a republic needs cannot be built on sixty hours per week of automatic work. But we cannot reverse our present economic order of things. Automatic work is increasing and will continue to increase for a long time to come. The condition is here and philosophical discussion will not remove it.

It is evident then that the law of physical labor must be divided into two laws, namely, the law of energizing work, which makes for progress, and the law of enervating work, which makes for retrogression. Nearly all the work still done in the open air, where there is a dependent sequence of operation, involving planning on the part of the worker, is energizing work. Specific examples may be cited in farm work, railroad work and the building trades. Certain work done indoors, under good conditions of light and air, is also energizing; for example, the work of a tool-maker, a locomotive assembler and a cabinet maker. The enervating work has come through the subdivision of labor in factories, so that each worker does one thing over and over in the smallest number of cubic feet of space. This type is recognizable at once in the routine of the garment worker, the punch press operator, the paper box maker, the shoe worker, etc.

Factory Town Morals

Aside from the broader factors, such as climatic conditions and racial characteristics, it is safe to say that the morals of a community depend upon the kind of work it does. A rural community of about twelve thousand people, having clean political conditions, a high moral tone, few jarring families, well kept gardens and a good average of intelligence, is a desirable place from the manufacturer's viewpoint in which to locate a factory. If a manufacturer locates in such a place and employs three thousand of the men, women and children in purely automatic, noisy, high-speed work, the town will change very materially in one generation. Its politics will become corrupt and its morals lax; its citizenship will lose its former mental stability and fly eagerly and earnestly from one

spectacular "ism" to another; its families will be on nervous edge, with family discipline gone; its yards and houses will lose their tidiness; saloons will increase. In a word, it will become "a factory town." And what was once a good community, with a high community efficiency, and therefore a safe place in which to invest money, becomes a town of low community efficiency and a constant menace to the industry itself. Every detail of the town's life is affected. Religion lags, while the amusement parks thrive on Sunday; for since the week-day work is repressive, an outlet for pronounced self-expression is demanded in the idle hour. Or, to put it in another way, Nature goes on the defensive. The slowly upbuilt appreciation of the fine arts is quickly destroyed, for this cannot grow without harmony, orderly thought and the desire to express ideals. Respect for law diminishes, for the law is put in the same class as an electrically wired strike fence. These significant changes are not the fault of the people who work; they are logical, natural products of the work itself.

The Grading of Energizing Work

For the purpose of analyzing work, a scale has been devised, in which the most energizing work is at the 100 per cent. point, and the most enervating at the zero point. The 100 per cent. work is that of the locomotive engineer. This has been selected because his work has the following elements:

(a) It is done in the open air.

(b) It provides a well-rounded physical development.

(c) The constant improvements in locomotive design and in railroad appliances require continuous mental development.

(d) Mental alertness is constantly required for emergencies.

(e) A comprehensive grasp of the whole interdependent scheme of production (a railroad produces transportation) is essential.

(f) The conditions under which the same run is made are never alike.

(g) The work itself—not lectures or preachments or popular acclaim—breeds in the engineer the highest quality of good citizenship, namely, an instant willingness to sacrifice himself for the lives in the train behind him.

The zero point on the scale, or the most enervating work, is the work of a girl in her formative years in a steam laundry, when the following elements prevail:

(a) Supersaturated, vitiated air.

(b) Standing in a strained position.

(c) The work consisting of feeding one piece after another of the same kind at high speed into a machine.

(d) The hours of work being so long that fatigue poisons accumulate in the blood.

The scale is crude and lacks scientific accuracy. A statement, for example, that the work of a laster in a shoe factory is 40 per cent. energizing would be a guess. But the purpose of the scale is not so much to arrive at a percentage as to establish some standard of actual work for the purpose of diagnosis and treatment. Three investigators, analyzing the work of a laster, might classify it as 30 per cent., 40 per cent. and 50 per cent. energizing. The difference in their classifications would lead to a closer analysis and hence to a surer treatment.

The Contrast of Two Shops

To take a specific analysis, consider two adjoining weave sheds of a silk mill. Going first to mill A, you find a long room with an aisle down the center, on each side of which are the machines. Between the machines there is ample space for the operative (nearly always a girl) to go up and down tying the broken threads. In the main aisle and adjacent to each machine is a chair. When the girl has finished one round of her machines, she rests for a short period of time, and in this way fatigue is prevented. The two girls of adjoining machines usually time their rounds so that their rests come simultaneously. The noise in the mill is so slight that they can converse without any effort. The light is good, the air is not vitiated, the rest periods are sufficient and there is no nervous tension from noise or speed. The work is not monotonously automatic, the position of the body is not strained; but, on the contrary, many muscles are lightly brought into play. However, the work itself does not stimulate any mental activity nor develop any of the finer and higher mental qualities. It can be classed as about 70 per cent. energizing.

The silk after leaving this mill is sent to mill B, where a number of strands are woven into a single strong strand. Since the silk is strengthened, the machine can be run at a higher speed. On entering mill B you are confronted with a noise so great that talking is entirely out of the question. The layout at mill B is precisely the same as at mill A, except that there are no chairs in the aisle. There are no rests between the rounds which the operator makes of the machines, since the speed does not permit. Talking is utterly impossible because of the noise. This mill is at once diagnosed as the sore spot of the concern. The investigator is enabled to say to the owner: "This is your trouble center; here is where agitation begins. More operatives leave this mill per year than leave mill A. These workers are suspicious of each other's actions, particularly of the foreman's. They feel that you are their natural enemy. The foreman himself is a grouch. More jarring families, more unkempt back yards are represented here than in mill A, and finally the actual efficiency of this mill is less than in mill A, and the work more strenuous." The work is classified as low as 10 per cent., and yet the only difference between the two mills is in noise, speed and lack of rest. The noise is a mechanical engineer's problem, possible of solution. The speed and the fatigue are within the owner's control. With these three factors eliminated, the work would go up to 70 per cent. energizing; as much work would be produced under the better conditions, since the force could be kept as intact in mill B as in mill A.

Diverse Treatments of Industrial Doctors

Two doctors of industry would treat mill B in opposite ways. In order to increase the production, one would increase speed, ignore the noise, study the motions to eliminate waste moments and by the unanswerable argument of figures show you that production must go up. This is the headache powder method and leads to a constantly broken, shifting, dissatisfied working force. The second doctor would decrease the speed and cut down the noise, insist on carefully determined rest periods and thereby maintain a sound organization of skilled workers. Equally important, he would raise the general efficiency and hence the economic efficiency of the community. Nor would he stop at that, for he would further strive by known methods to introduce additional conditions, so that the work in both mills would be brought to about 80 per cent., which would probably be the limit for this class of work.

It should be noted that where the work is done under conditions which permit the operatives to talk, without interference to their work, the rating is much higher than where such is not the case. When we walk out, habit cells control the action, but we can walk and think at the same time. The same principle holds in automatic occupations. If the motions are not too rhythmic, both of the hand and of the machine, and conversation is permitted and encouraged, the work is not nearly so repressive. In a certain mill, employing girls at strictly automatic work, the employees were placed facing one way, so that one operative looked upon the back of another; between adjacent operatives was a small partition. This mill had to replenish its entire force each year, until the scheme was changed to a round table plan, which encouraged conversation. After this the losses were normal.

An Example of Shop Psychology

An interesting case of shop psychology is the following: In a certain piano factory a number of girls were employed to assemble the mechanism which transmits the action when the key is struck to the strings. Each girl attached a piece with a limited number of motions, and was paid on the piece-work plan. These employees were the most discontented in the firm, and were constantly shifting to other occupations. Various means, such as rest rooms and decorated surroundings, were tried without success. As a last resort, the foreman got a fine big Maltese cat and placed it in the room one morning before the girls arrived. This solved the trouble completely. The cat compelled rest periods, for every now and then it would jump into a girl's lap and take her attention from her work for a few moments, and in this way relieved the tension of the high speed and permitted the elimination

of fatigue poisons at irregular but sufficient intervals. Every girl planned at home to bring something in her lunch basket for the cat to eat, whereas attempts to get them interested in the decorating of rooms failed. When girls left this firm and went elsewhere, where there was no cat, they quickly returned. Production increased and peace reigned. The commercializing of a woman's instinct for a cat probably energized the work 10 per cent. It was found also that the introduction of the cat began to arouse an interest in the other betterment plans, which had originally failed. This particular case is worthy of a very careful psychological analysis.

Work Must Be Stimulating

The details just stated are cited not so much to show specific methods of procedure as to emphasize the basic fact that we are, individually and collectively, human units, towns, states and, as a nation, what our work makes us. We have just pulled out of a thousand-year swamp up to firmer ground, and whether we go higher or begin to slide back depends upon how energizing our work is.

It is fundamental that mankind must do stimulating work or retrogress. This is the bedrock upon which our constructive programs of education, industry, sociology, of living, must rest. Fortunately we are now far enough away from the thousand-year swamp so that one may safely propose, as a thesis, that only that civilization will prevail whose laws and life conform most nearly to natural law. The spirit of unrest, whether it be evidenced by the spontaneous and seemingly unaccountable strike of automatic workers, the questioning introspection of university faculties, the open defiance of law or the cry for the doctor of industry, is the headache giving warning of deeper seated organic trouble.

The worth of education, our laws, our scientific management will be determined by the extent to which they make clear, conform with and supplement the laws of work. Their test will lie in the degree to which they are useful in leading us safely forward to better, brighter conditions of work, and their basic idea must be service to the mass.

I like to think we are coming to a time when the great march forward of civilization will not be largely a matter of chance, with the blind often leading the blind, but more an organized, orderly movement in conformity to the laws of nature. In that day the opportunist will not vault into the saddle of leadership when humanity, having been badly led, cries out for a leader. Instead, he will be a part of history with the medicine man of the savage, for at the bottom both of these in their creation and in their haphazard panaceas are the same. On the contrary, humanity will send out a well trained, well equipped vanguard of research men—physicists, bacteriologists, chemists, psychologists, biologists—to explore beyond ranges of the known. It will send its historians back over the line of march to learn the lessons of past successes and failures; it will establish outposts where the facts uncovered will be formulated into laws; and from the outpost to the last mite of humanity will be an established way for the application of the law to the need.

The Standard Machinery Company, Mystic, Conn., has been obliged to increase its plant materially in the last six months on account of the growth of its business. The company manufactures bookbinders' machinery, embossing presses, paper-cutting machines, ball-bearing drill chucks, etc. Contracts have recently been received for the building of several new machines which are to be placed on the market. One is a 16-ton machine for making steel barrel staves; another is for making muslin bags, which takes the material from a roll and prints, cuts and sews the bag at the rate of 75,000 to 100,000 a day; another is for a machine to color and print tubes; another is for a machine to make egg-case compartments. The company takes special pride in the high character of the gray iron castings produced in its foundry.

The Stephens-Adamson Mfg. Company, Aurora, Ill., has received the order for the unloading and conveying apparatus for the equipment of the hopper self-unloading conveyor boat referred to on page 1020 of *The Iron Age* of November 9 as under contract to be built by the American Shipbuilding Company, Cleveland, Ohio.

The Canadian Sirocco Company, Ltd.

The American Blower Company, Detroit, Mich., with a factory also at Troy, N. Y., and branch offices throughout the world, has at last come to realize the importance of the Dominion of Canada, as evidenced by the application just filed for a charter for a company to be known as the Canadian Sirocco Company, Ltd., to be located at Windsor, Ontario. This company has acquired from the city of Windsor a tract of land, centrally located, comprising about four and one-half acres, situated on the Essex Terminal Railway, and will erect a plant which will doubtless be one of the most complete of its kind on this continent.

The company is proceeding at once with the construction of the erecting shop, 50 x 200 ft., to be of steel and concrete construction, also the office building. This is about all that it seems possible to complete for occupancy this winter. In all probability the foundry building will come next and will be started in the spring.

The Canadian Sirocco Company, Ltd., will hold the exclusive patent rights for the manufacture in Canada of Sirocco fans and blowers, which have won a high place in the trade of the world by their space and power saving features. These patents are controlled in the United States, the United States possessions, Mexico, Central America, South America and Japan by the American Blower Company and in Europe by Davidson & Co.'s Sirocco Engineering Works, at Belfast, Ireland, the home of S. C. Davidson, the inventor. Sirocco fans are now being specified and used all over the world for mechanical draft on boilers, mine ventilation, heating and ventilating plants, for public buildings, school houses, factories and stores, and are used exclusively in the British Navy.

The Canadian Company will also manufacture the full line of the American Blower Company products, consisting of fans, blowers, heating, ventilating and drying apparatus, steam engines, steam traps, etc.

The blower business is so interwoven with the science of pneumatics, thermo-dynamics and electricity that it is essentially an engineering industry, the expert knowledge of how to apply such special apparatus for producing efficient results almost predominating the apparatus manufactured and employed. The claim is made that no company in the world is better equipped in this line than the American Blower Company, and the Canadian Sirocco Company, Ltd., enters the Dominion of Canada with this most complete engineering staff at its disposal, establishing at the outset a unique position.

The Canadian Duty on Wrought Pipes or Tubes

The Customs Department of Canada has issued an order regarding the application of the special or anti-dumping duty to wrought pipes or tubes. It provides that this special duty shall not apply under certain circumstances, as given below:

"In respect of iron and steel tubing, threaded and coupled or not, 4 in. or less in diameter, when the difference between the fair market value and the selling price of such tubing to the importer in Canada does not exceed 5 per cent. of its fair market value; provided, that the whole difference shall be taken into account for special duty purposes when exceeding 5 per cent.; provided, further, that the special duty shall, without exemption allowance, apply to iron and steel tubing, threaded and coupled or not, over 4 in. and not exceeding 8 in. in diameter, such tubing being of a class or kind made in Canada."

A New Carnegie Shape Book

Users of structural shapes will be gratified at the appearance of a 256-page "Shape" book superseding the book of shapes issued in 1903 by the Carnegie Steel Company. It contains profiles, tables and data pertaining to shapes, plates, bars, rails and track accessories. It is a character of book too well known to require extended description. It is indexed at length, generously illustrated, and, of course, given up to a large number of tables of weights and the like. A copy of the publication, it is stated, may be had by engineers on application to any of the district offices of the company.

The Physical Properties of Cast Iron*

Their Independence of the Chemical Composition of Pig Iron and Their Relation to Methods of Blast Furnace Operation

BY JOHN JERMAIN PORTER.†

It is perhaps not too much to say that the adoption of chemistry by the foundry has been responsible for a large part of the amazing advance of this industry durthe past decade. Within this period mixing by analysis has become the rule rather than the exception, and so much has been published and is now available along this line that further discussion seems superfluous. There is, however, a related point in connection with the selection of pig iron for the mixture, which has thus far received scant attention, but which is, in my opinion, worthy of most earnest consideration by foundrymen, and perhaps even more so by iron merchants and manufacturers. I refer to the great difference which exists in the behavior of many brands of pig iron and which apparently cannot be accounted for on the basis of chemical composition as ordinarily determined.

In former days, now happily past, the old time founder, innocent of chemistry, swore by brands and possessed as part of his stock in trade a list of such as had proved in his experience satisfactory and unsatisfactory. To the chemist this was ridiculous. From his standpoint two irons having the same composition must have the same properties and give the same results, irrespective of brand name or anything else, and so earnestly has this doctrine been preached that his theory has won very general acceptance. It is far from my intention to belittle the value of chemistry in the foundry or to deny the utility of analysis as a means of judging of the quality and fitness of an iron. Nevertheless, I must take exception to the view still held by many chemists that analysis is everything, and maintain that there is something to be said for the arbitrary preferences of the older generation of founders. I believe it to be the case that there are many irons which have practically identical analyses and yet show marked differences in such important properties as strength and shrinkage, and I will now offer what evidence I have to support my views on this point.

Evidence as to Pig Iron Differences

Perhaps the most convincing evidence that has come to my notice is contained in a paper entitled "An Introduction to the Effect of Structure Upon the Physical Properties of Cast Iron," presented by F. J. Cook and G. Hailstone before the British Foundrymen's Association in 1909. In this paper it is recorded that of two mixtures practically identical in chemical composition the one was invariably much lower in tensile strength than the other, and this difference persisted through a great many heats and over a long period of time. The poorer mixture averaged about one-half of the strength of the better mixture, and in none of the 60 cases given is the strongest bar of the poor iron equal to the weakest bar of the good iron. The following analysis and tests are given as typical of the series, and in view of the exceedingly close agreement of these analyses it is evident that we must look elsewhere for the cause of the very great difference in strength.

	A.	B.
Tensile strength, tons per sq. in.	9.1	18.3
Total carbon	3.250	3.092
Graphitic carbon	2.397	2.289
Combined carbon	0.853	0.903
Silicon	1.328	1.314
Sulphur	0.098	0.101
Phosphorus	0.923	0.909
Manganese	0.290	0.335
Iron, by difference	94.114	94.149

A few years ago I was called into consultation by a certain foundry regarding a persistent case of trouble with shrink holes in small chunky castings. It had been found by the foundry superintendent that the extent of the trouble apparently bore some relation to the mixture used, and hence experiments were carried out to determine what constituent or constituents were responsible for the difficulty. I am not at liberty to give full details of the results of these tests, but an outline of the experiments is as follows:

There were six brands of pig iron on the yard at the time, representing both Northern and Southern irons. Each of these irons was melted separately by using it alone in the first charge and separating the rest of the day's heat by a blank of coke. Working in this way some 20 of the small castings which had given the greatest trouble were poured from each kind of iron. All conditions were kept as uniform as possible and the experiments were repeated several times with different lots of the various irons to minimize the danger of accidental interference of other factors. Finally, the castings were examined for shrinkage cavities, with the following results:

Brand No. 1.—Castings all good; not a shrink hole in the lot.

Brand No. 2.—Fifty per cent. perfect castings, 50 per cent. with small trace of shrinkage.

Brand No. 3.—Ten per cent. perfect castings, 90 per cent. with small trace of shrinkage.

Brand No. 4.—None perfect; all showed a little shrinkage.

Brand No. 5.—All castings with small shrinkage cavities.

Brand No. 6.—All castings very bad, with large shrink holes.

All of these irons were the ordinary No. 2 and No. 3 foundry grades, and while there was some variation in the analyses there is absolutely no traceable connection between the percentage of any element or combination of elements and the results as to shrinkage. Moreover, the irons were each completely analyzed by a competent chemist and it was determined that the differences in behavior could not be attributed to the presence of any unusual elements or to unusual variations in the proportions of the carbons. Since these original experiments were carried out, others have been made on various mixtures of these brands, and it has been shown that the behavior of any mixture is approximately proportional to the behavior of its constituents, so that with equal parts of Nos. 1 and 6 most of the castings will show just a little shrinkage It has also been found that the remelt from these irons affects the shrinkage in much the same way as the original pig.

It is quite well known among both foundrymen and blast furnacemen that pig iron made in whole or in part from "mill cinder" is less desirable than that made entirely from ore, although the use of the mill cinder will not as a rule change materially the composition of the pig. The points of inferiority of cinder pig do not seem to be very clearly defined and have probably never been scientifically investigated. Nevertheless they are real enough to affect its sales value, and in England are recognized by the creation of the grades of "cinder pig" as opposed to "all mine pig." I have had some experience in the use of mill cinder in the blast furnace and have noticed that when using a considerable proportion of it the iron was noticeably easier to break on the blocks, and there was invariably a decided increase in the unreduced iron in the slag

Charcoal and Coke Pig Iron

Again we have the case of charcoal iron, which in spite of the threats of foundry chemists to drive it from the field, is still produced in this country to the extent of some 400,000 tons per year, and is still regarded as indispensable for many classes of work. As far as analysis goes there is but little average difference and no essential difference between charcoal and coke iron. Char-

*A paper read at the meeting of the Pittsburgh Foundrymen's Association, November 6, 1911.

†Metallurgical Engineer, University of Cincinnati.

OVER

coal iron averages lower in sulphur, but any coke furnace can and often does produce iron with the sulphur down under 0.01 per cent., which is as good as is expected from charcoal iron. Again charcoal iron averages somewhat lower in total carbon than most coke irons, but here again the difference is not universal, and, if we should judge by analysis only, many coke irons could easily pass as the product of the charcoal furnace.

Coming to the properties of the two kinds of iron, however, it is within the experience of almost every foundryman that there is a difference. This is perhaps most generally noticed in the matter of toughness or strength, which in charcoal iron is much greater, the grains having a tenacity which causes the iron to tear to a marked degree rather than breaking off short. It is also noticed, however, in the properties of shrinkage, tensile strength and depth and character of chill, and since there is such a difference in properties and such a similarity in composition I think it safe to say that we have here a notable example of that elusive difference which escapes the arts of the chemist.

Finally, I might cite the experience and opinions of many competent foundrymen who have found the facts to be as I have stated. One authority in particular, Dr. R. Moldenke, has repeatedly called attention to these conditions, and if time permitted I might read many quotations from his papers confirming the facts which I have just brought out.

Theories in Explanation

Although we may recognize the fact that differences in pig iron may exist which cannot be accounted for by analysis, the explanation of these differences is another and a very difficult matter. It is true that, as in the case of steel, the methods of metallography furnish a clue, and under the microscope the structure of cast iron often shows remarkable variations. Cook in the example first cited found that his strong iron showed under the microscope a peculiar net work structure of the phosphide eutectis combined with much finer graphite than existed in the weak mixture. It is well known that charcoal iron is finer in grain than coke iron of similar composition and that this closer grain is an almost invariable accompaniment of strong iron. Hence we may assume that a part at least of the differences in pig iron is due to the variations in size, shape and arrangement of the graphite flakes. This is all right as far as it goes, but is only pushing the matter back one step and is not satisfactory as an ultimate explanation. In seeking the real explanation five possible theories have suggested themselves, and these I will take up in order.

1. THE MANNER OF COOLING.

It has been known for many years that the rate of cooling is an important factor in determining the percentage of combined carbon, and lately it has become appreciated that it may also affect iron in other ways than through the combined carbon. For example, Custer, in his work with permanent molds, has shown that graphite size may be controlled without change in ultimate composition by varying the rate of cooling through the solidifying range; and others have found that hardness and electrical properties may be varied through quite wide limits by controlling the rate of cooling through a much lower range and without appreciably affecting the carbons. In my opinion this possibility is due to a change in the allotropic state of the iron which takes place at about 1400 deg. F. and which is not made evident by chemical analysis.

However, though granting that the manner of cooling may produce many important changes, I still cannot believe that this theory is competent to account for the examples previously given. In the case of both Cook's experiments and those coming within my own experience, rate and manner of cooling were as nearly similar as it was possible to make them, and the number of pieces tested was too great to permit of the possibility of a coincidence of accidental variations in this factor. Moreover, the persistence of the differences after the remelting of the irons cannot be explained on this basis.

2. FORM OF COMBINATION OF CONSTITUENT ELEMENTS.

Another theory which may possibly be thought by some to afford an explanation is the manner in which the elements of the pig iron are combined. There are six elements present in cast iron and some 12 or 15 constituents are possible through the different forms of combination of these elements. There is, however, nothing to indicate that there is anything in this theory, and even if we could account for it on this basis there would still be the question why two brands of the same elementary composition should have their elements combined in such different ways as to produce different properties.

3. DISSOLVED NITROGEN.

Of late years considerable attention has been given to the gaseous impurities of steel, and it has been found that nitrogen is a rather common and a very detrimental impurity. May it not be the case that the presence of more or less of this element (which is not determined in the ordinary analysis) explains the differences which I have described? This appears a more likely explanation than any of those thus far cited. I do not, however, regard it as the right one, or at least the chief one. There is very little evidence either for or against it, but such as there is appears to be against it. The well-known experiments of Braune (Stahl und Eisen, 1906), seem to indicate that nitrogen is seldom or never an important factor in gray cast iron, although it may be sometimes in white or chilled iron; and Gayley (Trans. A. I. M. E., 35, 986) has described some tests made on the nitrogen content of different classes of pig iron in which he found that there was apparently no relation whatever between the amount of nitrogen and the quality.

4. DISSOLVED OXYGEN OR OXIDES.

Perhaps the most generally accepted theory to account for otherwise unexplainable differences in cast iron is to assume the presence of variable amounts of oxygen in the metal. This theory is due more especially to Dr. Moldenke, who in several papers has cited considerable evidence in its support. Perhaps the most conclusive evidence is the actual isolation of magnetic oxide, Fe_3O_4, from samples of iron which have been badly burnt on the hearth of an air furnace and which are known to have had the characteristics commonly attributed to oxidized metal. This theory fits in well with all that is known regarding the relation between blast furnace practice and the properties of the iron made. For example, mill cinder is a particularly difficult material to reduce, and, as before mentioned, it has a well marked detrimental effect on the quality of the pig iron produced. Still another example mentioned by Dr. Moldenke is the difference in quality between malleable Bessemer made in a lightly blown furnace and regular Bessemer made in a furnace driven to the limit.

5. OXYSULPHIDES.

While accepting as probably substantially correct this last theory, I would suggest that possibly a modification of it may be still nearer the truth. It is generally assumed that the oxygen is present as dissolved oxide of iron, but it seems to me possible if not probable that it may be rather in the form of an oxysulphide of iron. This compound has been shown by Campbell (Iron and Steel Inst. Jour., 1903) to be capable of existing in iron and steel at high temperatures and to have remarkable powers of diffusing through the solid metal. LeChatelier has also proved its existence.

The evidence as to its presence and influence in commercial iron and steel is only indirect, but there is some circumstantial evidence pointing in that direction. It is quite noticeable in blast furnace practice that following a slip bringing unreduced ore into the hearth there is a most evident association of badly oxidized iron and very high sulphur. It is also well known that it is particularly difficult to keep the sulphur down when smelting mill cinder.

In Lake's "Composition and Heat Treatment of Steel," page 82, I find the statement that steel which has been completely freed from gaseous impurities can be quite high in sulphur without its quality being apparently injured. Again in a paper by Herbert Pilkington on "Cast Irons for Foundry Purposes," read before the British Foundrymen's Association in 1911, it is stated that many of the best cold blast charcoal irons contain 0.10 per cent. sulphur and up, and that this quantity, which would be ruinous to ordinary pig, does not in this case produce unsoundness or other bad effects. Finally, I know of several observant foundrymen who are quite certain that sulphur is sometimes much more injurious than at others.

and this fact, if such it be, may or may not be caused by its association with variable amounts of oxygen in the form of oxysulphide.

The Effect of Varying Blast Furnace Practice

Thus far my discussion has been largely academic. A more practical question is the relation between blast furnace practice and the presence in the pig iron of these injurious properties, however they may be caused. Unfortunately we have not enough data to draw exact conclusions, or, indeed, any conclusions. My observations have led me to accept as a tentative theory the rule that the less oxidizing the conditions under which the iron is made the better will be its quality. In other words, satisfactory iron should be made from easily reducible ores, with a moderate rate of driving and with not too much economy of fuel. These conditions, if correct, are rather hard on the furnaceman and it is to be hoped that further information may modify them somewhat. It is a significant fact, however, that in a large number of cases the irons having the highest reputation for low shrinkage and general good casting properties are made in small furnaces inadequately provided with blowing capacity and hence lightly driven, and using brown hematite or other easily reducible ore.

I have thus far been unable to determine whether those factors in the operation of the furnace which are within the control of the furnace manager have any important effect upon these properties of pig iron, but it is probable that to some extent they have. It is a well known fact that the grain of the pigs may be varied within wide limits without regard to composition by varying the basicity of the slag and the temperature of the hearth. It is also well known, however, that upon remelting the character of the grain is changed and becomes normal, and so far as I know it has never been shown that the size of the grain in the original pig bears any relation to the properties of the iron after remelting—at least none which cannot be explained on the basis of composition.

On the other hand, I have noticed certain indications which lead me to believe that it is possible to accomplish something by the way the furnace is handled. For example, it appears that the bad effects of mill cinder may be at least partly nullified by slow driving and the use of some excess of fuel. Again, magnetic ore appears to make a satisfactory foundry iron, although it is very hard to reduce, but furnaces using it are generally driven rather slowly. Reasoning entirely from theory, it seems likely that the presence of ferrous silicate in the ore, the formation temperature of the slag (not the melting point), the temperature of the hearth and the freedom from slips may all have something to do with the quality of the iron. It would be interesting to follow up some of these points: for example to compare the iron made by the use of dry blast with that made under otherwise similar conditions but using moist blast. Dry blast greatly increases the hearth temperature, thus producing conditions identically opposite to those under which cold blast charcoal iron is made; yet it is quite possible that it may produce an effect of the same kind on the pig, although less in degree.

Practical Applications

The practical application of the facts which I have here tried to bring out may not seem to be of any great importance, but I am not so sure that this is the case. Some time ago I had a talk with a foundry superintendent of very broad experience, and in discussing the experiments on fluid shrinkage previously described he insisted that to many foundries this property is one of the most important and difficult problems and is responsible for a much larger number of defects than is generally supposed. According to this gentleman, the question of the influence of brands upon this property is well worth the study of the practical foundryman. There are, of course, many foundries where neither fluid shrinkage nor high strength is of any particular importance; but on the other hand there are some classes of work where one or both of these properties is of very great importance, and in such cases it appears to me that a knowledge of brand characteristics is almost indispensable.

As there is no published and very little privately held information along these lines, it is necessary for each founder to gather his own data, and the procedure which I recommend is as follows:

1. A fluid shrinkage and transverse strength test from each heat.

2. A continuous record of the results of these tests and the mixtures used.

3. Occasional tests of the different brands melted separately.

In regard to the test for fluid shrinkage I have found that originally recommended by Cook and consisting of a casting in the shape of a K with the legs about 1 in. square in section to be very satisfactory. When this casting is broken at the junction of the legs any tendency towards fluid shrinkage will be evident there. In using this test it is convenient to construct a scale consisting of a series of from four to eight broken K castings of varying degrees of badness. These are mounted in a box and given suitable numbers. Thereafter, it is sufficient to compare any test piece with this scale and record as its shrinkage the number on the scale most nearly resembling it.

It will be evident that obtaining these data need not be at all burdensome to the foundry undertaking it, since no special apparatus is called for, except a transverse testing machine, and the extra work involved will hardly amount to 20 minutes per day of a helper's time. Even the special tests of separate brands need not interfere with ordinary foundry routine since they can be run as the first charge in a regular heat.

Another conclusion which might be drawn from the facts brought out is that there is a great opportunity for some of the manufacturers and sellers of foundry pig iron to make strong selling points of these special virtues, once they have found them in their brands. I am quite convinced that the larger commission firms would find it very much to their advantage to have the properties of the brands they handle thoroughly tested so that they could sell them more intelligently. A pig iron salesman armed with this information and some foundry lore would indeed deserve a better name than the now sometimes given title of "hot air artist."

Finally it appears to me that the recognition of the injurious effects of the gaseous impurities in cast iron will give a fresh argument to the electric furnace man. I have long thought that it should be practicable to use an electrically heated receiving ladle or mixer in connection with either a blast furnace or cupola. Here the iron could be partly refined, treated with deoxidizing alloys, adjusted in composition and brought to any desired casting temperature. And since there would be no melting to do, the amount of electrical energy needed would be relatively small. Operated on a sufficiently large scale to take care of the fixed charges, it appears to me that this combination could be made profitable for some lines of work.

The Cleveland-Cliffs Iron Company, Cleveland, Ohio, is issuing $2,500,000 in 6 per cent. collateral trust bonds, dated November 1, 1911, and secured by the entire capital stock of the Cleveland Iron Mining Company, $2,500,000, and the entire capital stock of the Iron Cliffs Company, $1,000,000. A part of this issue has been placed at par and interest by the Citizens Savings & Trust Company, Cleveland, and a part of it was set aside to be allotted to the stockholders of the Cleveland-Cliffs Iron Company, provided they subscribed for it on or before November 15. These notes will mature $500,000 semi-annually, beginning November 1, 1913, but are subject to call on any interest date up to and including November 1, 1913, at 101; after November 1, 1913, up to and including November 1, 1914, at 100½; after November 1, 1914, at par. Each of the iron companies whose stock is pledged for this issue owns its property in fee, and the combined properties have an assessed valuation for taxes of over $6,000,000.

The following changes in the sales organization of the Wheeler Condenser & Engineering Company, Carteret, N. J., relating to the Philadelphia and Cleveland territories have been announced: George Franklin Pond has been appointed manager for the former district, with an office in the Commonwealth Trust Building, Philadelphia, while the interests of the Cleveland section will be looked after by Walter G. Stephan, who has an office at 1325 Citizens Building, Cleveland.

New Single-Phase Electric Motors

Unity Power Factor a Special Feature of a Recent Wagner Development

Ability to operate at unity power factor at full load is the special feature ascribed to a new line of single-phase motors that have been designed by the Wagner Electric Mfg. Company, 6400 Plymouth avenue, St. Louis, Mo. In general the construction and design of

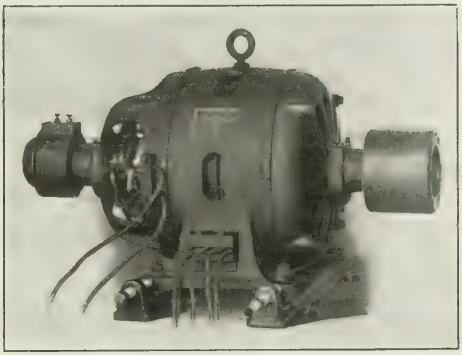


Fig. 1.—The Type B K Unity Power Factor Single-Phase Electric Motor Built by the Wagner Electric Mfg. Company, St. Louis, Mo.

the motor follow the company's standard line with the exception that two windings are used on the stator instead of one. Fig. 1 is a view of the motor, while Fig. 2 gives details of the stator windings and a section through one slot of the rotor showing its construction. The application of this new motor to machine tools is brought out in Fig. 3, which shows a milling machine driven by one of them.

Referring to left portion of Fig. 2 it will be noticed that the stator or field construction employs two windings instead of one. The main winding *a* produces the initial field magnetization in the regular way, while the auxiliary winding *b* controls the power factor or compensates the motor. The main departure is in the rotor, the construction of which is indicated at the right of Fig. 2. Two windings are employed in this part, the main or principal winding *c* being of the customary squirrel cage type and occupying the bottom of the rotor slots. The auxiliary winding *d* is of the regular commuted type and occupies the upper portion of the slot, the two windings being kept apart by a magnetic separator, *e*, which is a rolled steel bar. The auxiliary winding is connected to the standard type of horizontal commutator.

Two sets of brushes are employed, as indicated in the diagram of connections at the left of Fig 2. The main pair

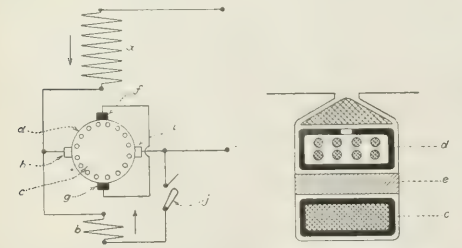


Fig. 2.—Details of the Stator Winding and the Rotor Construction.

of brushes *f* and *g* is placed in the axis of the main stator winding and is short-circuited, while the auxiliary pair of brushes *h* and *i* is placed at right angles to the axis of this winding and is connected in series with it at starting. The auxiliary winding of the stator is connected permanently to the brush *h* and can be connected to the other auxiliary brush *i* through the switch *j*.

The object of the employment of this peculiar rotor construction and arrangement of brushes and connections is to accentuate at starting the effect of the squirrel cage along the axis of the main stator winding while suppressing it as far as possible along the axis which is at right angles to the winding. The magnetic separator has a tendency to suppress the effect of the main rotor winding along all axes by making it less responsive to outside inductive effects. The influence of this separator is however nullified along the axis of the main stator winding by the employment of the short-circuited brushes *f* and *g* while no means are provided for nullifying its effect along the axis at right angles to that of the main stator winding. In this way the main stator winding *a* induces heavy currents in both rotor windings because of the short-circuited brushes and in spite of the magnetic separator, while the auxiliary rotor winding connected in series with the main winding of the stator will not be able to produce heavy current in the other rotor winding along the axis *h-i* because the magnetic separator between the two rotor windings shunts the inducing magnetic flux.

The mechanical structure of the new motor gives practically no outward evidence of its unique construction. In place of the switch *j* a small automatic centrifugal switch located on the outer extension of the rotor shaft serves

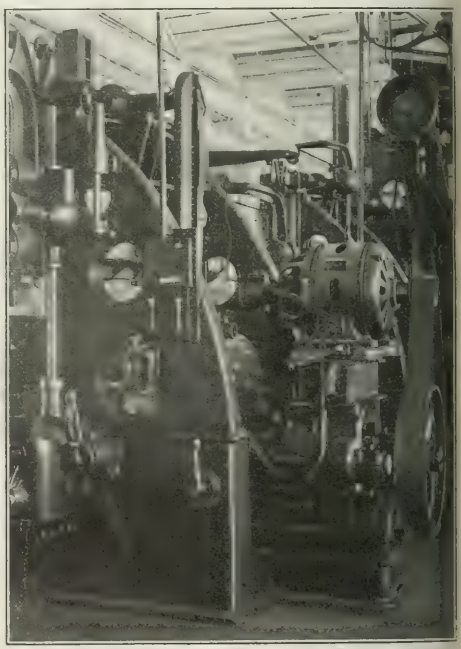


Fig. 3.—One of These Motors Driving a Milling Machine.

to connect the compensating winding to the auxiliary brushes after the motor has been brought up to speed. Other special features of the motor are that a large portion of the rotor currents are carried by the squirrel cage winding in normal operation, thus imposing light load service on the commutator, which is also lightened by the suppression to a large extent of the short circuit currents which tend to flow in the individual coils of the commutated winding as they pass under the brushes, due to the close proximity of the two rotor windings.

The employment of the squirrel cage winding it is pointed out secures a remarkably constant speed at all loads, the speed variation curve obtained from a test showing a drop of approximately 50 r.p.m. while the load was increased from 0 to 9 hp. Another advantage of the squirrel cage is that racing of the motor is eliminated.

In general the method of operation is as follows: In

starting the switch *f* is open and the auxiliary rotor winding is connected in series with the main stator winding and across the supply mains. The latter winding induces a large current in both rotor windings along its axis and the auxiliary rotor winding produces a large flux along the axis at right angles to this. The rotor currents in the main axis, operating in conjunction with the flux threading the rotor along the right angle axis, yield the greater part of the starting torque. As the motor speed is increased the squirrel cage gradually assumes the functions which it performs in the ordinary single-phase squirrel cage motor, developing a magnetic field of its own along the axis *h-i* and a correspondingly powerful torque which increases rapidly as synchronism is approached but falls suddenly to zero at or near the point of actual synchronism.

The magnetizing currents circulating in the bars of the squirrel cage of a single-phase motor have double the frequency of the stator currents with the result that the fluxes they produce are of double frequency. The solid steel magnetic separator forms a shunt for the fluxes of line frequency induced from the stator that is fairly effective but which cannot shunt the double frequency fluxes produced by the rotor. As far as the squirrel cage is concerned, the effect of the magnetic separator diminishes as the speed increases, and at synchronism the machine operates practically in the same manner as if this separator did not exist at all.

The Sauer Transmission Gear

For varying the speed of turbines, motors, propellers on ships, and practically all machinery where an increase or decrease of speed is required, the Sauer Power Generating Company, 5115 Rosetta street, Pittsburgh, Pa., has

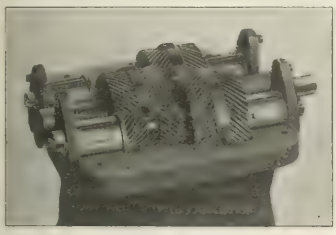


Fig. 1.—A New Transmission Gear for Varying the Speed of Turbines and Machinery Built by the Sauer Power Generating Company, Pittsburgh, Pa.

placed on the market a transmission gear by which the speed can be changed easily while the gears are running. The device consists of a high and a low speed shaft and one or two countershafts, the two former being in one straight line but disconnected. Fig. 1 is a view of the complete gear with the cover and the lever attachment removed, while in Fig. 2 the gear is shown partly dismantled and the removed countershaft illustrates the maker's adjustable eccentric bearings with arms and link pins for the lever attachment.

The employment of two countershafts with eccentric bearings so arranged that when one pair is above the center the other is below is said to enable the gear to be thrown out of motion by a single movement of the lever with the result that the gear meshes easily while running. In a unit installed in the builder's plant and operating at a speed of 9000 r. p. m. the gears have been thrown out of motion or brought into engagement with little trouble and practically no noise. The tongues in the center of the larger gears regulate the side motion and help to keep the gears in mesh and reduce the friction. The adjustable bearing is of the same general type as the one illustrated in *The Iron Age*, August 25, 1910, and compensates for wear, thus keeping the shafts in line.

It is claimed that the gear will transmit twice as much power as another gear of the same width and strength, since the power is transmitted on two sides and by twice as many teeth. As the high and low speed shafts are in the same line it is possible to install this gear on ships already equipped with turbines without removing them from their foundations by simply cutting the propeller shaft and inserting the gear. Among the special features of the gear are that side and end thrust are eliminated from both the driving and the driven shafts and the gears are very compact, requiring only a small amount of space in proportion to the power transmitted.

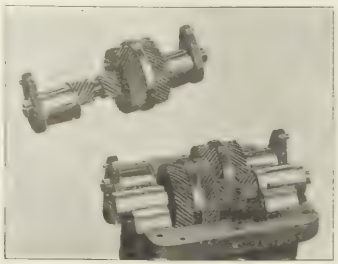


Fig. 2.—The Gear Partly Dismantled, Showing the Eccentric Bearings Employed.

There is said to be very little or no oil leakage, since the main shafts have stuffing boxes and the countershafts are equipped with caps. The circulating oil system can be used to supply any number of bearings. The oil runs from a tank to the lower portion of the gear case and the gear acts as a pump to force the oil to the different bearings through pipes which have valves inserted in them to control the flow. After leaving the bearings the oil passes through an oil separator and flows back to the tank.

New Cutler-Hammer Crane Panel

A switchboard panel for the cage or cab of the electric crane, to overcome the scattered arrangement of knife switches, fuses, circuit breakers and other controlling devices common to cranes of three, four or five motors, has been designed by the Cutler-Hammer Mfg. Company, Milwaukee. The panel shown in the accompanying illustration is intended for a three-motor crane, and combines all necessary switches and protective devices, giving protection against overload, short circuit and failure of voltage. A panel of this kind reduces the amount of wiring in the crane cab, makes installation easy and eliminates the cost, inconvenience and time required in renewing fuses. Connections are only required to the line, controllers and fuses.

The two single-pole magnetically operated switches of the standard contractor mill type, one in each side of the main line, and the "overloads" are the essential features on the panel. The contactor switches have copper and carbon auxiliary arcing contacts and blowouts, and laminated copper brushes for carrying the current. Two single-pole switches are used because of their several advantages over the double-pole type. They provide two chances of opening the circuit on overload or short circuit. If a double-pole switch should stick, the circuit would not be opened, whereas if either single-pole switch sticks the other will open the circuit, and again, if the overload remains on the line the one switch will be tripped as soon as the other is closed, thus protecting the motor.



Cutler-Hammer Crane Panel.

The small knife switch handles the control circuit for the above switches and provision is made so that any

number of these safety switches connected in series can be installed in various convenient locations. The operator can then, from any of the points, open the magnetic switch circuits which in turn open the feeds to all motors on the crane. This safety feature is to prevent accidental starting of the motors when inspection or repairs are being made. There are two main overloads and three motor feed overloads, one for each motor on the crane.

With the main line switch and all safety switches closed the operator throws the reset master to position No. 1. This closes one of the magnetic switches and establishes the feed to the second switch. Throwing the master to position 2 closes this second switch. On grounded circuits two "overloads" for each motor on the crane are sometimes provided, and where desired with enclosing cases. These cases can be provided with means for operating the main knife switch without opening the case.

New Wire and Rod Machines

Two specially designed wire and rod machines were recently built by the Philadelphia Roll & Machine Company, Philadelphia, from designs of William P. McGlynn, of Shimer, McGlynn & Co., in whose plant, in that city, they have been installed. The back-pointing and cold-rolling mill, shown in Fig. 1, was designed to point or cold roll rods 3/4 to 3/16 in. in diameter, and is of especially heavy and strong construction to roll Monel metal. The housings and all cast-iron parts are made of charcoal air-furnace iron; the rollers are of high carbon cast steel, and the gearing is of cast steel and bronze, all being cut from the solid. The machine is belt driven and is fitted with a duplex reversing friction clutch, which can be operated either by means of the foot treadle or by an automatic stop device at the rear of the mill. The rolls run at 75 r.p.m. in the regular operating direction and 100 r.p.m. in the reverse direction when operating on ordinary material. Shields, not shown in the reproduction, are provided to encase the gears, so that workmen are fully safeguarded.

The wire drawing machine, shown in Fig. 2, was designed to draw rods from ¼ to ¾ in. in diameter. It is a triple-geared machine and has a ratio of 20 to 1. The wire block, which is 14 in. in diameter, is designed to operate at 20 r.p.m. when ordinary material is being drawn, but the speed can be varied to suit the class of work. All the spur gearing in connection with this machine has cut teeth and the bevel gears cast teeth. All the cast iron working parts are of charcoal air-furnace iron.

As will be noted, the machine is compact and self-contained. It is belt driven and provided with a friction clutch and also has special cut-off pins, which connect the wire block to a large coupling which is secured to the vertical shaft, the wire block being loose and free

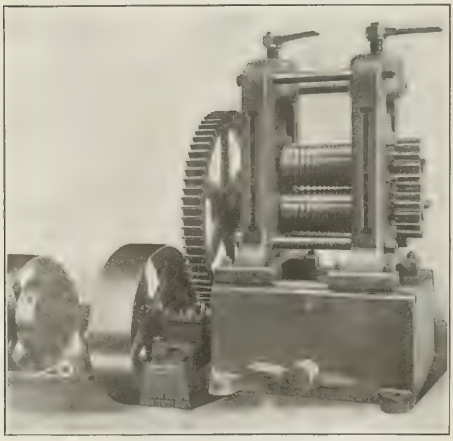


Fig. 1.—Back-Pointing and Cold-Rolling Mill.

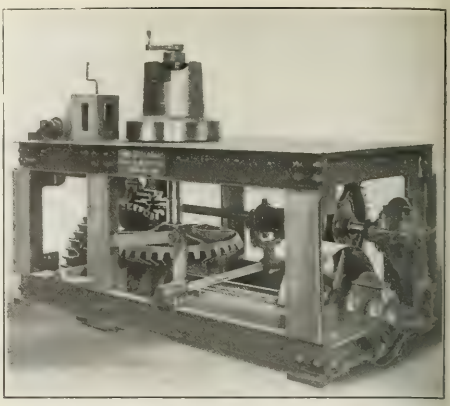


Fig. 2.—Wire Drawing Machine Built by Philadelphia Roll & Machine Company.

to revolve as desired when the pins are withdrawn. In accordance with the latest tendency to provide safeguards wherever possible, the gearing and all mechanism both on the front and back of the machine have been completely encased. Fig. 2 shows the machine with panels removed and the gearing exposed. The panels are flush with the posts and fit between the top and bottom channels of the machine frame, giving the machine as a whole a box-like appearance devoid of moving parts.

Particular attention is directed to the substantial construction of the center frame which supports the wire block and the vertical shaft with its gear. The vise on the wire block is cast steel with tool steel jaws and is not rigidly secured to the block. The arrangement permits a worn or disabled vise to be removed and a new one inserted in a few moments without interfering with the block.

American Ironmasters Safeguarding Their Men

"What took Germany 25 years to accomplish in the prevention of industrial accidents has been effected by the iron and steel industry in the United States within the last three years," said Charles Kirchhoff of the American Museum of Safety, in addressing an audience of iron and steel men at Catasauqua, Pa., last week, under the auspices of the Empire Steel & Iron Company and the Bryden Horseshoe Company.

"This conservation of human life is characteristic, not alone of a few mills and plants," continued Mr. Kirchhoff, "but is quite general. Our iron and steel industry to-day, generally speaking, can come into the court of public opinion with clean hands. From my personal knowledge of some of the largest plants in England and on the Continent, I can affirm that many of our plants from the viewpoint of safeguarding their employees are equal to, and in some cases superior to the transatlantic mills. These facts refute the slanders that are heaped upon our ironmasters, in charging them with indifference to the sanctity of the lives of their operatives. It now rests largely upon the workmen themselves to maintain this standard of safety, by doing all in their power to make continuous use of safeguards and constantly practice safety and caution at their work."

Dr. William H. Tolman, director of the museum, illuminated this philosophy with about 150 lantern slides, showing conditions in the iron and steel trades.

J. H. Plummer, president of the Dominion Steel Corporation, Sydney, Nova Scotia, is reported as stating that the wire and nail plants which the corporation is erecting and equipping will be ready to turn out product by the spring. He further says that the materials for the two new open-hearth furnaces, for a blast furnace and for a bar mill are now assembled, and these additions will be completed next year.

Internal Cold Metal Saw

A Recent Development of the Newton Machine Tool Works

Improvements have been recently made by the Newton Machine Tool Works, Inc., Twenty-fourth and Vine streets, Philadelphia, Pa., in its internal cold metal sawing machine. Among these are the attachment of the feed trolley for adjusting the stock and the use of air clamps which reduce the idle time of the machine to a minimum. Views of the machine from opposite sides are given in Figs. 1 and 2.

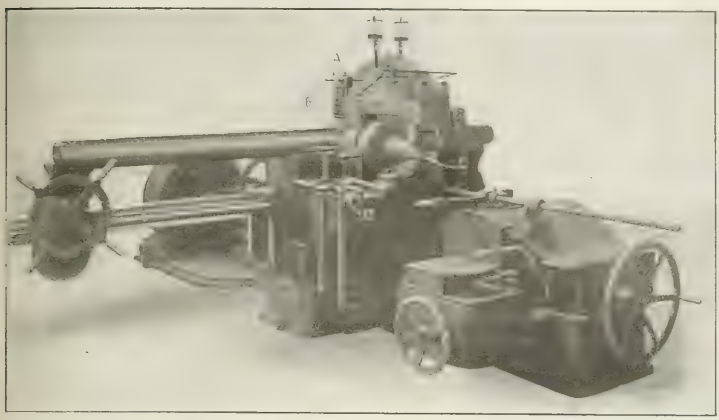


Fig. 1.—The Operating Side of a New Internal Cold Metal Sawing Machine Built by the Newton Machine Tool Works, Inc., Philadelphia, Pa.

The saw blade which is 28 in. in diameter is fitted to the barrel with which it revolves, being fastened thereto by bolts. The gap in the center of the blade is 8 in. in diameter, and eight high-speed removable teeth are inserted on the machine illustrated which has a capacity of 6 in. The barrel to which the blade is attached revolves in large diameter bearings of ample proportions. It is driven by a worm and worm wheel, the teeth of the latter which has an over-all diameter of approximately 28 in. being cut from this barrel. The driving worm, which is of hardened steel, has roller thrust bearings and is fitted to the saddle and travels with it. The drive is entirely incased so that the gears revolve in an oil bath and special provision is made with felt pads to prevent any of the lubricant coming in contact with the bearing surfaces. The machine is driven by a 30-hp motor through one gear connection in addition to the worm and worm wheel connection for the saw blade. The saddle has reversing fast power traverse and six changes of geared feed are available. Hand adjustment is also provided and the driving gears with the exception of the worm wheel on the saw barrel are of either steel or bronze.

In operation the feed trolley is located at the extreme end of the guide and a 16-ft. bar of stock lifted into place. After the first cut the bar is adjusted and the clamping screw A, Fig. 1, is adjusted by hand until the V-block having a toothed face comes in contact with the work. The lever B is then operated to admit air to the clamping device, and this forces the wedge C into position. This part is said to be so positive in action that it is necessary to admit air in the reverse direction to release the clamp. The lever D controls the operation of the cylinder E, Fig. 2. An arm connected to this cylinder holds the metal that has been cut from the bar at F and prevents it from falling into the saw blade when the saddle is returned by the fast power traverse for the succeeding cut. It will be noticed from Fig. 2 that the support G is designed to come within ⅛ in. of the side of the blade, and also that the saddle is of heavy box construction. This part has a square locked bearing on the base and side adjustment to take care of wear is made by a taper shoe and by removable clamps for the top bearing.

The machine is shown equipped with a blade for cutting 6-in. stock, and in a recent test extending over several days, pieces were cut from bars of 5½ and 6 in. steel having from 0.40 to 0.45 per cent. carbon, in about 1 min. While these tests show what it is possible for the machine to do at the same time the builder does not recommend that the machine be used for handling such heavy stock as the teeth of the saw blade would not be able to stand the strain of taking such heavy cuts if regularly used on this class of work for any considerable period. The machine is, however, guaranteed for feeds of from 2 to 3 in. per minute on stock having a carbon content of from 0.40 to 0.45 per cent. One of the features of this test was that while it was being conducted the machine was placed on the builder's erecting floor and was not supported by a foundation or foundation bolts, its bulk being sufficient to overcome all vibration.

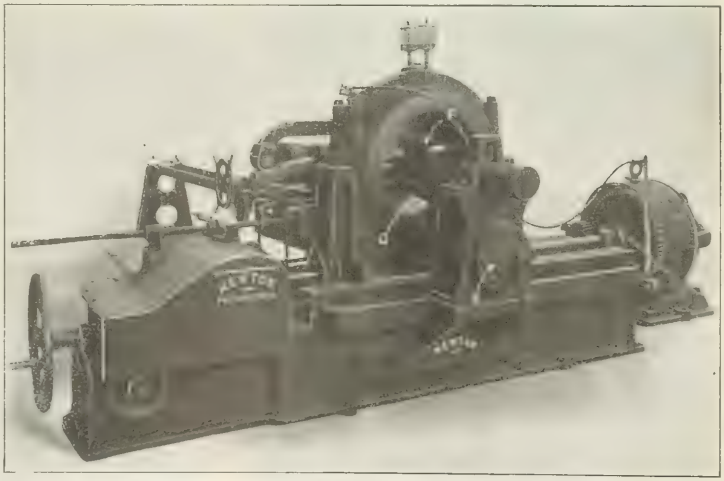


Fig. 2.—Rear View Showing Attachment for Keeping the Cut Pieces from Falling Into the Saw.

The construction of the new machine follows the builder's line in general. The floor space occupied by the machine is approximately 14 by 20 ft. and the net weight is about 23,000 lb.

The Chronograph

Details of an Electrically Controlled Recorder

A time recorder controlled electrically by a master clock for use in manufacturing establishments and business houses has been brought out by the Stromberg Electric Company, 1252 Marianna street, Chicago, Ill. The mechanism has no pawls, springs nor dogs to get out of order and the action is positive. The printing wheels are locked, thus preventing their movement except by the elec tric impulse. There are also no clock works in the Chronograph, the printing wheels and the hands of the dial being moved by a simple magnetic action, which receives the impulse from an electric current that is controlled by an automatic contact attached to a master clock. It is possible to operate any number of clocks from 1 to 100, which can be located at different places and controlled by the one master. The master clocks are furnished in two types, one for key winding and the other self-winding. Either 110 or 220 volt direct current or a storage battery is used to operate the Chronograph. Three different styles are illustrated, Fig. 1 showing the in-and-out recorder for time card use, while Figs. 2 and 3 illustrate the cost and labor keeping styles respectively.

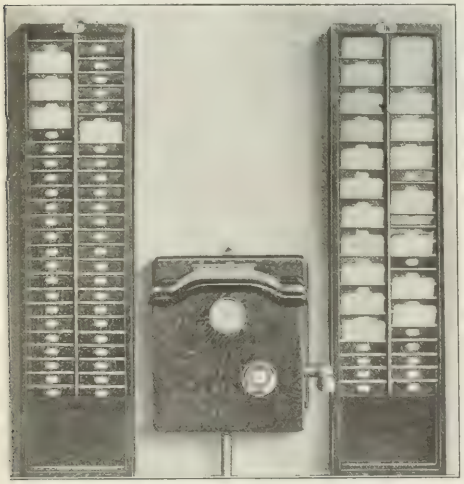


Fig. 1—The In-and-Out Card Time Recorder, Made by the Stromberg Electric Company, Chicago, Ill.

The Various Types of Machines

The in-and-out time recorder illustrated in Fig. 1 does not differ very materially in principle from the other card recorders now on the market. There is, however, this advantage in employing the Chronograph for recording the arrival and departure of employees as the clock mechanism is taken out of the machine itself. In this way it is possible to secure accurate records since the constant pounding and jarring of making registrations that occur in the case of self-contained recorder and affect the delicate clock work are eliminated. It is also possible to have the master clock located in the office away from the dirt, dust and vibration of the factory and install as many stations as may be needed in the various departments of the plant since the cost is not excessive. The advantages of this system as compared with other time recording systems are a cost of approximately one-half, simple operation and rapid recording. This instrument is made in two types, one with a hand shift recorder, where the change for registering from day to day is made by hand and the other where this change is done automatically at midnight. Both recorders are fitted with movable funnels which receive the cards for registering and which are moved for in and out, afternoon and overtime, the location for registering being shown by an indicator which is in plain sight, as well as the date or the day of the week for registering. If desired these funnels can be locked in position.

For keeping a record of the cost of producing various

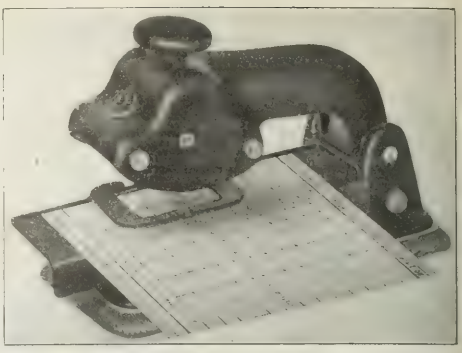


Fig. 2.—The Model No. 4 Chronograph Intended for Cost-Keeping Work.

parts, the Chronograph is provided with a stationary gauge so that the employee simply inserts his time card under the indicator, which shows at once just where the registration is being made. This instrument prints in plain legible type the month, the date, the meridian, the hour and the minute. As the records are registered one above the other, the computation of elapsed time is a comparatively simple proposition. The Chronograph will register in minutes or in tenths or hundredths of an hour as may be desired. These instruments are made in two styles for recording costs, one for use with an individual job ticket and the other where a single daily time ticket for a workman handling a number of different jobs during the day is employed.

Where the daily time card is used the recorder is equipped with a non-adjustable gauge and is illustrated in Fig. 2. With this type the card is shifted by the workman to the proper place for registry and the indicator shows plainly just where the registration is being made. The card is slipped under the indicator and the correct position for printing "started" or "finished" is shown. For the individual job ticket the model No. 3 Chronograph illustrated in Fig. 3 is used. This type has an adjustable gauge insuring the record being stamped upon the card in the proper place. All the operator has to do is to see the gauge is set to print in the correct place, insert the card in the chute and register the time.

In addition to these uses the Chronograph is adaptable for work in an office where correspondence, orders and other similar matter must pass though various hands and it is essential that the time they are received by each person be recorded on them to guard against delays or to locate delays when they do occur. When employed in this way any desired inscription can be placed upon the printing plate. The entire printing line is automatic with the exception of the month, which is changed in about a second by a key. The impression is made through a ribbon, which, like those on the other models, moves and reverses automatically and will print from 150,000 to 250,000 impressions without change.

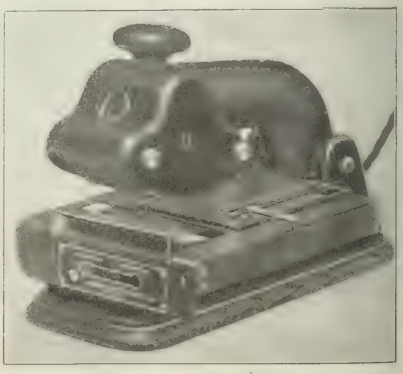


Fig. 3.—Another Type, the No. 3 Machine, for Keeping Track of Labor Costs.

Typical Installations

Some of the installations of the Chronograph include the main office of the Western Union Telegraph Company, Chicago, Ill., where a recorder is used on the receiving clerk's desk to stamp the time every telegram handed in for transmission is received. This service requires between 3000 and 4000 impressions per day. The recorder installed in the parcel room of the Union Station at Chicago, Ill., probably receives as severe service as any instrument in use. This station is used by four of the largest railroads entering that city and it is no uncommon thing to check between 3000 and 4000 parcels every day, and in checking each of them the Chronograph is used four times, twice when the check is delivered and twice when it is returned. The in-and-out model is used in one of the navy yards where 50 instruments distributed over a distance of 1½ miles are employed, all being run from one centrally located master clock. Another installation is in the factory of one of the largest automobile concerts in the country, where there are 25 recorders covering a distance of more than ½ mile. This instrument is also used by the Commonwealth Edison Company, Chicago, Ill., for keeping a record of documents passing from one department to another.

An Exceptionally Large Tank Car

A successful solution of the problem of the safe conveyance of liquid commodities in large volumes has been apparently discovered by the Chicago Steel Car Company, Chicago, Ill., in the construction of what is claimed to be the largest oil tank car ever built. The car is built strictly in accordance with the latest safety appliance standards and its construction is along original lines. These are a marked departure from the present accepted standards and combine simplicity and a minimum number of parts in such a way as to insure durability and low maintenance cost. The capacity of this car is 14,650 gal. but on account of the novel design an ordinary 50-ton M. C. B. truck is able to support the structure and the load. A casual examination of the car does not reveal its extraordinary size, the hight being only a few inches more than the standard 8000-gal. car, while the over-all length has not been increased to any great extent.

One of the special features of the car is the light weight for the great capacity, practically 72 per cent. of the gross weight being paying freight. The center of gravity of the car is low, which enables it to ride easily on rough and uneven track. It is estimated that the car will withstand a buffing force greater than that which any other car is capable of resisting. The heavy bottom sheet receiving the major portion of the impact has a sectional area of more than double the M. C. B. requirements for an underframe car and lies far below the line of draft. The front section of this sheet, which acts as a tension member to the section between the body bolsters, has a special arrangement of rivets so that those which hold the bottom center sheet to the body bolster and receive the main buffing shock are protected from the contents of the tank so that if any rivets work loose they cannot produce leakage at this point. Another advantage of the increased capacity without a material increase in the over-all dimensions is that the switching charges, cost of repairs, and track room in congested terminals and sidings are reduced approximately one-half.

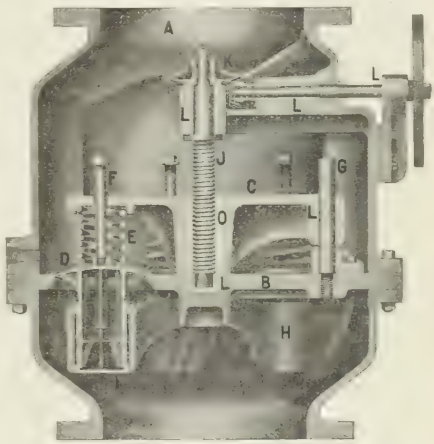
Work has begun on the addition to the power plant of the Ontario Power Company, located underneath the bank of the river, at the foot of the falls, Niagara Falls, Ont., to provide for the installation of two additional turbine generators of 12,000 h.p. capacity each. The completion of these extra generating units will bring the total capacity of the plant up to 148,000 h.p.

The Panama Canal, according to the annual report of the Isthmian Canal Commission, has so far received appropriations from Congress aggregating $293,561,486, these appropriations leaving $81,639,531 of the estimated cost of the canal yet to be provided for. The famous Culebra cut, which is 10 miles long, is three-fourths completed. The mechanical problems connected with the work of construction are discussed in considerable detail.

Notable Departure in Relief Valves

A notable departure in relief valve construction for use with steam-heating systems and with steam prime movers operated condensing has been made by the Harrison Safety Boiler Works, North Philadelphia Station, Philadelphia, Pa. The valve, an idea of the construction of which may be gained by the accompanying illustration, consists of a valve deck, on which are placed a multitude of small valve disks, each small disk having a spring to keep it closed; a water cushion or dash-pot to arrest the motion of the disk and to prevent damage to it or its seat; and a stem by means of which the valve disks may be lifted free of the seat when desired. The tension of the spring is determined by the position of the pressure plate shown, adjustable by means of a vertical screw. This may be turned one way or the other by means of bevel gears connected with a horizontal shaft which extends to the exterior of the valve casing as indicated.

The design and development of the valve has progressed in intimate relation to the engineering or physics of the flow of vapor through openings and orifices. The design of the present valve, for example, is to eliminate the necessity of depending upon the force of the impulse of an escaping jet of steam to hold the valve open to the proper amount. The valve disks and the lining of the dash-pots are of bronze, and this fact, together with their large number, is naturally regarded as practically elimi-



Harrison Multiport Safety Exhaust Outlet Valve

nating the probability of sticking. It is also emphasized that the effective discharge area through the use of the small disks represents a large gain. The individual disks are small and light and have only a small lift, and are held to their seats by springs instead of weights. The total mass in motion is thus comparatively small, with quick responses and little force in striking the seat. By the use of the dash-pot, the seating of the disk is retarded by cushions of water, which are, of course, automatically kept filled through the condensation of steam.

Some of the uses of the pressure plate should also be emphasized. By lifting or lowering it in the manner indictated, the tension of the spring acting on each disk may be changed at will and the back pressure can be adjusted without requiring the shifting of weights on a lever as in the ordinary case. When the valve is to be used for a vacuum heating service, lighter springs are ordinarily employed and provision is made for a water seal. The valve is known as the Cochrane Multiport Safety Exhaust Outlet Valve.

The Craig Foundry Company, which recently secured the Bucyrus Foundry, Bucyrus, Ohio, has placed the plant in operation, doing a general foundry business but making a specialty of hot air registers for furnace heating and radiators for hot water and steam heating.

Carborundum for Special Steels

Results of Its Use for the Raising of the Silicon Content and for Adding Chromium to the Steel

In the Revue de Metallurgie for September, 1911, is a long paper on the above subject by Dr. L. Baraduc-Muller. It gives the results of his very interesting experiments in the basic open-hearth plant of Ougrée-Marihaye in Belgium.

Following the first laboratory tests, the first trial was made on a 15-ton heat, the final composition aimed at being 0.50 per cent. carbon and 0.50 per cent. silicon. Briquettes were made from the following mixture, measuring about 8.7 x 4.3 x 2 in. The total weight added was about 400 kg. (882 lb.).

Carborundum, 94.5 per cent. pure	141.0 parts
Red oxide of iron, 95 per cent.	214.0 parts
Carbon, 94 per cent. pure	14.8 parts
Lime	5.2 parts
Anhydrous silicate of soda	6.0 parts
	384.3 parts

The bricks, dry but not heated, were charged into the furnace before tapping. They floated in the slag, about two-thirds of their thickness being submerged. They did not break up, notwithstanding the great change in temperature. Their upper surface was soon covered with little jets of burning carbon monoxide and small incandescent globules of metal formed that trickled down and through the slag. After being charged for 22 minutes they had all disappeared. At the end of the reaction the slag was frothy. When casting the steel, the ingots did not show much silicon. The analyses of a test taken before adding the bricks and an average of three tests taken while pouring are given below. The increase of silicon is not 10 per cent. of that hoped for.

	1st Test	2d Test
Carbon	0.44	0.54
Manganese	0.766	1.19
Sulphur	...	0.059
Phosphorus	...	0.064
Silicon	0.018	0.051

Calculation shows that only 8.1 per cent. of the silicon charged has entered the steel, after allowing for a normal loss of 30 per cent. The great loss is brought about by the silicide of iron produced trickling in small drops through a basic slag, which also contains considerable oxide of iron. The bricks are also evidently too large, because of the long time it takes for their melting.

A second test was made on a 15-ton heat, the final analysis wished for being 0.2 per cent. silicon, 0.25 per cent. chromium and 0.45 per cent. carbon. Forty-five bricks were taken of the same size as before, but each one was cut into four parts. The total weight was about 251 lb. (114 kg.). The mixture used was:

Carborundum, 94.5 per cent. pure	33.7 parts
Sesquioxide of chromium, 98 per cent. pure	60.6 parts
Carbon, 94 per cent. pure	7.3 parts
Lime	1.2 parts
Anhydrous silicate of soda	3.0 parts
	96.8 parts

These briquettes were charged as before, and had all disappeared in 15 minutes. The slag was slightly foamy. The chief point of interest was to see how much chromium would be introduced. A tapping test gave 0.02 per cent. silicon, and the final steel gave:

Carbon	0.450 per cent.
Sulphur	0.064 per cent.
Phosphorus	0.027 per cent.
Manganese	0.630 per cent.
Silicon	0.225 per cent.
Chromium	0.220 per cent.

The result was therefore very satisfactory. Allowing for a normal loss of 30 per cent., calculation shows that 93.7 per cent. of the chromium charged has entered the steel. The high silicon in the steel was obtained by the use of ferrosilicon.

Further tests were made with practical considerations in mind. In order to obtain silicon, it was evidently necessary to add the mixture either in the tapping spout or the ladle. This made necessary a speed of reaction such as would be complete before the slag came. The minerals and other materials to be used were crushed very finely, thoroughly mixed, and thin cakes made about 4.3 x 0.08 x 0.39 in. The proper weight of cakes was placed in a conical heap at the bottom of the ladle, in such position that the jet of steel would strike it. The first test under the new conditions was made on a 15-ton heat, the final analysis wished for being 0.6 per cent. carbon and 0.25 per cent. silicon. About 550 lb. (250 kg.) of the following mixture was used:

Roll scale	100 parts
Carborundum, 94.5 per cent. pure	53.3 parts
Carbon, 90 per cent. pure	4.5 parts
Cement	10.0 parts
Silicate of soda	3.0 parts
	170.8 parts

The analysis of the roll scale gave:

Fe_2O_3	65.10 per cent.
FeO	26.20 per cent.
P	5.30 per cent.
Mn	0.60 per cent.
SiO_2 (and)	1.60 per cent.
Not determined	0.50 per cent.
	99.30 per cent.

The cakes were previously heated in a small reverberatory furnace, and were probably at 600 deg. C. when the steel fell on them. (It was hoped that this would be hot enough.) This was done as a precaution, for all that the steel had to do was to heat them to 1350 deg. C. The reaction would then commence and being slightly exothermic would have no tendency to chill the steel and make a skull in the ladle. Very few cakes floated to the surface of the metal and the reaction was apparently over in 1 min. 23 sec. The results of a final furnace test and of a ladle test were as follows:

	Furnace Test Per cent.	Ladle Test Per cent.
Carbon	0.62	0.65
Sulphur	...	0.030
Phosphorus	...	0.023
Manganese	...	0.650
Silicon	0.018	0.169

Calculation shows that 66 per cent. of the silicon available has been taken up by the steel, after allowing for a normal loss of 30 per cent. This is considerably better than before, but it is not yet entirely satisfactory.

A second experiment was made with the small cakes, except that they were not heated before using, and after allowing for the normal loss, only 47 per cent. of the silicon in the mixture entered the steel. Tests also showed that the silicon was not uniformly distributed in the ladle of steel, the part poured the last being much higher in silicon than the first. This would indicate that not enough time was available for the reaction, and the tests also show that the silicon is produced toward the top of the ladle and not rapidly and completely at the bottom as it should be.

The next experiment was made on a 15-ton heat which was desired to be 0.45 per cent. carbon, 0.25 per cent. chromium and 0.2 per cent. silicon. The little cakes were made of the following mixture:

Chromite	93.5 parts
Carborundum, 94.5 per cent. pure	32.6 parts
Carbon, 90 per cent. pure	6.0 parts
Silica, 95.0 per cent. pure	10.5 parts
Cement	7.0 parts
Silicate of soda	3.0 parts
	153.4 parts

The silica was added to make a slag with the lime, magnesia and alumina of the chromite, that would melt between 1350 and 1380 deg. C. The chromite contained 58.8 per cent. Cr_2O_3, 18.8 per cent. FeO, 8.7 per cent. Fe_2O_3, 10.2 per cent. MgO, 1.16 per cent. CaO and 2.46 per cent. SiO_2. About 595 lb. (270 kg.) of the mixture was put in the bottom of the ladle. The steel was poured hotter than usual, and the reaction was over in 1 min. 40 sec. The analyses of the final tapping test and of an average of three tests taken while pouring the steel into ingots were as follows:

	Furnace Test.	Ladle Test.
Carbon	0.39	0.48
Sulphur	0.058	0.058
Phosphorus	0.019	0.034
Manganese	0.745	0.734
Silicon	0.0094	0.136
Chromium	...	0.196

The three ladle tests showed a very uniform material. Calculations show that 65.4 per cent. of the silicon and 85.3 per cent. of the chromium entered the steel, after allowing for the normal loss. The aim of the experiment was to find out if natural oxides could be used with the carborundum.

The experiment tried with the next heat was to see whether chromium alone could be introduced and no silicon. In other words it was hoped that both the carbon and silicon of the carborundum would reduce chromium. The addition was made in the furnace as the basic slag could not affect the silicon of the mixture, and the usual amounts of ferrosilicon were added in the furnace and ladle. The 15-ton heat was desired to finish 0.50 per cent. carbon, 0.20 per cent. silicon and 0.25 per cent. chromium. The mixture was made into bricks about 8.7 x 4.3 x 2 in., which were cut into three parts. They were composed of:

Chromite, with 58.8 per cent. Cr	100 parts
Carborundum, 94.5 per cent. pure	20.2 parts
Cement	12 parts
Silicate of soda	3.5 parts
	135.7 parts

Ten minutes before tapping about 397 lb. (180 kg.) of the briquettes was charged, after taking the last furnace test. The reaction was over in 7 min. 35 sec. The slag was a little frothy and the casting temperature was normal. The analyses were as follows:

	Furnace test	Ladle test
Carbon	0.51	0.53
Sulphur		0.050
Phosphorus	0.049	0.050
Manganese	0.648	0.609
Silicon	0.028	0.136
Chromium		0.200

The ladle test result is the average obtained on three samples taken at the beginning, middle and end of pouring. They agreed very closely, showing good uniformity. After allowing for normal loss it is found that 79.3 per cent. of the chromium was obtained. The amount of ferrosilicon added was unfortunately forgotten so no calculations could be made in regard to silicon.

Many pages are then devoted to the question of the comparative cost of the carborundum method, and the use of ferrosilicon and ferrochromium for adding the required chromium and silicon to the steel. Under the conditions existing in Belgium the addition of silicon alone by this method is not so cheap as the use of ferrosilicon. When chromium and silicon are to be added, however, the saving in cost varies from 23.3 per cent. to 45.5 per cent. Laboratory tests show that nickel-chromium steels can be also made by this method, and it would be interesting to see what results would follow the use of mixtures of carborundum with tungsten, molybdenum and vanadium minerals.

As a consequence of the experiments outlined above the method has been adopted by the Ougrée-Marihaye works.

G. B. W.

The Gardner Ring Wheel Chuck

For use on all types of disk, vertical, edge, face and knife grinders, the Gardner Machine Company, Beloit, Wis., has recently placed on the market a new type of ring wheel chuck. Some of the special features claimed for the chuck are lightness, simplicity of construction, perfect running balance, a minimum overhang and safety in operation. A view of the chuck is given in Fig. 1, while Fig. 2 illustrates some details of its construction, being an end view and an axial section.

The chuck body or shell *a*, Fig. 2, is a one-piece steel casting that is machine finished all over. The outside or clamping ring *b* is a special steel forging also machine finished, threaded, and having a taper seat for contracting the periphery of the chuck body. It is pointed out that further strength is added to the chuck by this ring, which is prevented from turning by the locking screw *e*. The outside of the chuck body is tapered and threaded to conform to that in the clamping ring, and this portion of the chuck body is slotted in a number of places so that the clamping ring acts on the principle of a spring collet, gripping the abrasive ring *c* solidly and evenly at all points. A simple spanner wrench is the only tool that is required for this operation and it is emphasized that in this way the danger of breaking the abrasive ring due to hasty adjustment of the drawback screws sometimes employed for this purpose is eliminated.

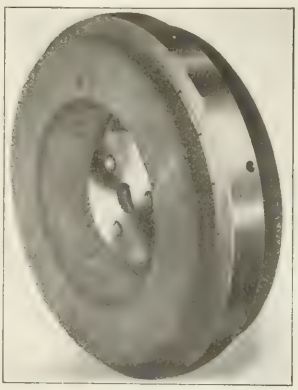


Fig. 1—A New Type of Ring Wheel Chuck for Grinding Machinery Made by the Gardner Machine Company, Beloit, Wis.

When a new abrasive ring is placed in the chuck it extends 1 in. beyond the face of the chuck body. As the ring becomes worn it is removed and the short backing plugs *d* put in place. The abrasive ring is then replaced in the chuck and worn down to the body a second time. Then it can be removed and a longer set of plugs inserted as two sets are furnished with each chuck. In this way it is possible to use a ring which has been worn down to a thickness of 1 in., which is the minimum thickness sanctioned by good practice and considerations of safety.

To reduce the overhang to a minimum, the chuck body is recessed in back. If desired center holes of various sizes can be drilled to fit these chucks to arbors and spindles of various sizes and types of grinding machines. Six sizes of chucks for mounting abrasive rings from 12 in. to 24 in. in diameter are made, and these chucks can be interchanged with the disk wheels of any disk grinder easily.

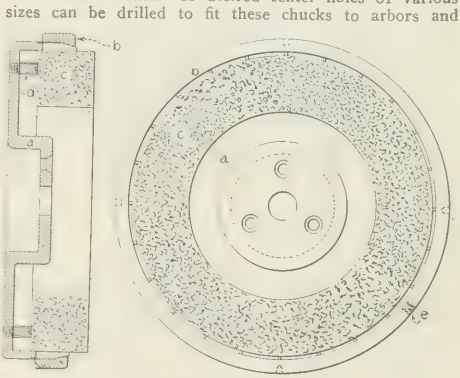


Fig. 2.—Details of the Chuck.

The Knox Pressed & Welded Steel Company

Steel plate makers are said to be taking much interest in the business of the Knox Pressed & Welded Steel Company, Niles, Ohio, manufacturer of water-cooling devices for open-hearth furnaces. In the past such equipment was wholly made from castings. Luther L. Knox, vice-president of the company, has perfected and patented doors and frames for open-hearth furnaces composed of steel plates, cut to size, fitted and welded together to hold the circulating water. Steel manufacturers who have tried the new type of doors and frames have placed orders for others. The new and increased business of the Knox Company helps to enlarge the consumption of steel plates. In a recent week the company was awarded contracts for its equipment for six plants, located in different sections of the country. It has bids out for the installation of the necessary devices for an entire plant, and expects to secure the order. It also has on its books contracts for pressed, welded and riveted steel work, its equipment, which was described in a recent issue of *The Iron Age*, being well adapted to anything of this character.

The Colorado Fuel & Iron Company

Report for the Year Ended June 30, 1911.

The report of the Colorado Fuel & Iron Company, covering operations for the fiscal year ended June 30, 1911, shows the following earnings as compared with the previous year:

	1910-11.	1909-10.
Gross earnings:		
Iron department	$13,775,664	$13,604,832
Industrial department (fuel)	9,159,021	10,034,981
Total gross earnings	$22,934,685	$23,639,813
Net earnings:		
Iron department	$2,502,566	$2,492,136
Industrial department (fuel)	975,783	1,250,479
Total net earnings	$3,478,349	$3,742,615
Add—income from securities	535,672	499,980
Interest and exchange	135,927	127,840
Total net income	$4,149,948	$4,369,535
Deduct:		
Bond interest	$2,091,610	$2,097,692
Taxes	214,785	218,765
Real estate	151,263	171,458
Insurance, sociological, personal injury, etc.	233,602	154,908
Equipment renewal	128,106	164,945
Loss on Col. & Wyo. Railroad	10,005	
Loss on Crystal River Railroad	36,000	36,000
Prospecting	24,904	18,948
Total deductions	$2,890,276	$2,862,716
Balance, surplus	$1,259,672	$1,506,819

The balance sheet of the Colorado Fuel & Iron Company as of June 30 compares as follows:

Assets.

	1910-1911.	1909-1910.
Properties and securities	$15,742,701	$15,711,875
Equipment	27,078,135	27,053,647
Cash on hand	3,590,120	2,426,254
Stocks and bonds	6,215,220	6,056,719
Accounts and bills receivable	3,306,639	3,579,295
Subsidiary companies	2,586,331	2,255,929
Manufactured stocks, etc.	3,175,304	3,368,918
Stripping, etc.	328,785	355,141
Accrued dividends and interest	78,576	154,096
Miscellaneous	152,195	144,352
Total	$62,254,006	$61,106,226

Liabilities.

	1910-1911	1909-1910.
Common stock	$34,235,500	$34,235,500
Preferred stock	2,000,000	2,000,000
Funded debt	20,816,000	20,822,000
Accounts and bills payable	889,245	1,025,746
Hospital	8,558	2,730
Accrued bond interest	857,515	858,130
Tax payment fund	100,000	100,000
Sinking fund—real estate	873,124	873,634
Miscellaneous funds	177,912	204,932
Profit and loss	2,237,152	983,554
Total	$62,254,006	$61,106,226

The consolidated balance sheet of the company and all its subsidiaries shows total assets of $102,832,608, with an excess of assets over liabilities of $21,346,159.

Following is a statement of production in the past three fiscal years, in tons of 2000 lb.:

	1910-11.	1909-10.	1908-09.
Coal	4,233,756	4,722,832	4,094,352
Coke	753,192	905,599	645,545
Iron ore	841,699	879,630	580,784
Limestone	425,704	407,817	363,975
Pig iron	397,701	385,602	295,534
Finished iron and steel	424,421	412,749	359,793

President J. F. Welborn makes the following accompanying statement:

"The year commenced with promise of better coal business than had previously been enjoyed by the company, but an unusually mild winter and the extreme drought in the agricultural states west of the Missouri River during the season of 1911 caused a lighter demand for Colorado domestic coal in the first half of that calendar year than has been known in a similar period in the last decade, with the result that our coal production fell off 489,076 tons, and earnings from fuel sales decreased $274,696. This decrease in earnings would have been overcome by the more efficient management that ruled in both producing and selling divisions of the fuel department, but for the disastrous coal mine explosions that occurred in January, 1910, and October, 1910, most of the expense of which was borne by last year's business, and all of which had been paid and charged to operating expenses prior to July 1, 1911.

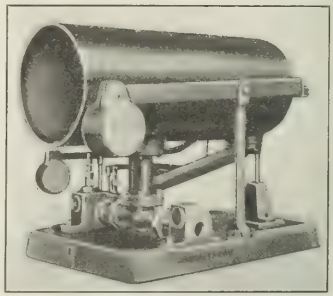
"The iron department shows an increase of $170,832 in gross and $10,430 in net earnings, with prices on all products except rails much lower than for many years. Had the higher prices of the previous year been secured, the net earnings from the sale of iron and steel would have shown an increase of at least $250,000, due to lower costs of ore and steel; or, with selling prices that obtained prior to the panic of 1907, an additional $1,000,000 would have been earned.

"Had we escaped the two coal mine explosions, and in other respects experienced as favorable conditions as during the previous year, the surplus might well have been $2,000,000. It may, therefore, be said that considering the unfavorable conditions, which the management could neither have foreseen nor prevented the results from the year's operations were more favorable than in any previous year of the company's history.

"The expenditures for maintenance have been on as liberal a basis as heretofore, and the physical condition of the property has been improved during the year."

The Detroit Return Trap

For automatically returning condensation to boilers without pumping in steam systems used for either heating or power and also where the water is used for boiler feed purposes, the American Blower Company, Detroit, Mich., has brought out a new type of its Detroit tilting return steam trap. No new principles have been adopted in the construction of this trap as compared with others, but several improvements in design and construction are embodied which it is claimed make the new trap superior in several important features of the one that it supersedes. Simplicity in construction and durability are two important features of the trap.



The Detroit Tilting Return Trap Made by the American Blower Company, Detroit, Mich.

The trap consists of a steel tank swung on a trunnion between two supports, which consist of a valve connection on one side and a water connection on the other. The water of condensation is admitted and discharged at the water end of the trunnion, while the valve end is where the live steam is admitted. The photograph from which the accompanying engraving was reproduced was taken looking at the water side of the trap. A weighted lever normally maintains the tank in a horizontal position, as is the case with other tilting traps. When enough water has entered the condensation tank to overcome the weight of the counterbalance the tank tilts downward and automatically opens the lever-actuated steam and relief valves. This admits steam at boiler pressure above the water of condensation in the tank, thus equalizing the pressure in the tank and boiler and causing the water to flow back by gravity from the tank to the boiler.

The steam valves are of the iron body type with brass mountings and have renewable seats and disks. As the valve disks are standard and are readily renewable and interchangeable they can be replaced at small expense by a plumber or steam fitter. Another important feature in the construction of the trap is the use of flanged semi-steel castings similar to those used in high pressure power and heating practice instead of screwed pipe fittings. The relief valve is made an integral part of the trunnion bearing, thus doing away with flexible tubing for the discharge and other movable attachments. The counterbalance weight is placed on the side of the tank instead of above it, thus giving additional head room above the boiler. A screw adjustment in connection with the lever that actuates the relief valve enables the size of the opening to be varied to suit the operating conditions best, depending on whether the system is running on high or low pressure.

A novel bumper cushioning device is employed in which only one compression spring is required. It is claimed that this device has eliminated much of the noise caused by the rocking of the tank. A solid gas welded tank is used and is galvanized after being welded. The trap is mounted on a new type of base, having rolled edges to form a drip pan with a bleeder tapping and large enough to cover all of the fittings.

In operation the trap, which is made in seven sizes, ranging from 10 to 800 hp., is installed level with the pipe connections at a minimum distance above the water level in the boiler of 4 ft. The water supply and discharge are controlled by swinging check valves in the inlet and discharge pipes.

Mechanical Engineers' Annual Meeting

The annual meeting of the American Society of Mechanical Engineers will be held as usual in the Engineering Societies Building, New York. The opening session is scheduled for Tuesday, December 5, and the closing session will occur Friday, December 8. The programme of the meeting has not yet been issued, but one session is to be devoted to foundry practice, another to steam boiler performance, and the gas power section will have a session. At this, oil engines, at present a subject of importance, will be discussed. The president's reception will occur Tuesday evening in the rooms of the society, George J. Foran in charge as chairman of the sub-committee. The annual reunion will take place at the Hotel Astor on Thursday evening, and F. A. Scheffler is chairman of the sub-committee for that occasion. As usual, luncheon will be served on Wednesday and Thursday during the convention. Among the excursions planned is one to inspect the steamship Olympic. There will also be trips to the Brooklyn Navy Yard, the Sims Magneto Company in Bloomfield, N. J., the Bush terminal buildings in Brooklyn, the E. W. Bliss Company, Brooklyn.

The Power Specialty Company, 111 Broadway, New York, reports that among recent contracts received for Foster superheaters are the following: New York, New Haven & Hartford Railroad, at Cos Cob and Bridgeport plants, 10,620 hp. in Bigelow-Hornsby and Babcock & Wilcox boilers; Delaware, Lackawanna & Western Railroad, at Loomis Colliery, 900 hp. in Erie City boilers; International Harvester Company, at Plano and Weber plants, 2800 hp. in Edge Moor boilers; Associated Pipe Lines, 3000 hp. in Edge Moor boilers; Haskell-Barker Car Company, 3200 hp. in McNaull and Babcock & Wilcox boilers; J. R. Nutt, Ft. Worth, Texas, 4000 hp. in Edge Moor boilers: Clark Thread Company, 1000 hp. in Stirling boilers; Indiana & Michigan Traction Company, 3200 hp. in Wickes boilers; Wilmington & Philadelphia Traction Company, 2400 hp. in Edge Moor boilers; Penn Central Light & Power Company, 2400 hp. in Edge Moor boilers; Citizens Light & Power Company, Montgomery, Ala., 3200 hp. in Stirling boilers.

A conference on car wheels was held in New York on November 10, at the Waldorf-Astoria Hotel, and the following were among those representing the Master Car Builders' Association: W. Garstang, superintendent of motor power, Big Four Railroad, Indianapolis, Ind.; C. A. Brandt, mechanical engineer, Big Four Railroad, Indianapolis; R. L. Ettenger, consulting mechanical engineer, Southern Railroad, Washington, D. C.; J. M. Henry, master mechanic, Pennsylvania Railroad, Sunbury, Pa.

Hauck Changeable Forge

Brazing operations and preheating cast iron, brass and other metals are the special fields intended to be covered by a patent changeable forge developed by the Hauck Mfg. Company, 140 Livingston street, Brooklyn, N. Y. These forges use kerosine as fuel and are designed for machine and repair shops. Fig. 1 is a view of the forge arranged for brazing, while Fig. 2 shows the changes made in the arrangement of the tiles for the performing of various other operations. From left to right of Fig. 2 the operations are heating soldering irons; melting brass, aluminum and other metals in crucibles; melting soft metals; dressing and tempering tools and blacksmithing and annealing.

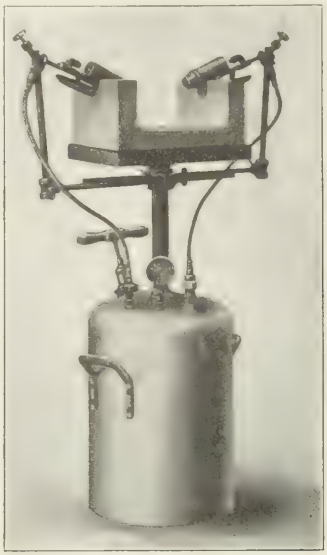


Fig. 1. The New Changeable Forge Built by the Hauck Mfg. Company, Brooklyn, N. Y.

While in a large establishment separate forges are used for each of the foregoing heating operations as a general thing, to meet the requirement of the average repair shop, the changeable forge has been developed. The changes necessary in the furnace to enable it to perform the different classes of work requiring heat treatment can be made very quickly. The forge or brazing table, as will be seen by referring to Fig. 1, consists of a 12-gal. seamless tank with a hand pump placed inside, two burners connected with hose and mounted on brackets so that their position can be changed instantly, a table extending from the top of the tank lined with fire brick tiles and four extra tiles to meet the requirements of ordinary repair shops.

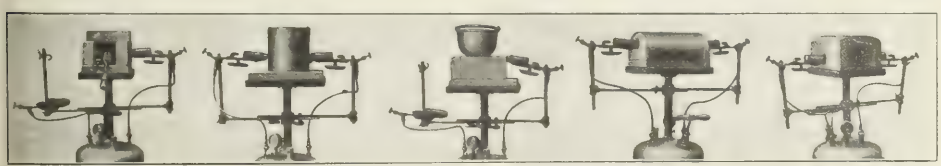


Fig. 2.—Views of the Forge Arranged for Different Operations.

A saving of from 30 to 50 per cent. or more over gasoline, gas or coal fires is claimed for the new forge. One gallon of kerosene contains approximately 116,000 B.t.u. or approximately 28 per cent. more than is contained in the same quantity of gasoline. In addition to this increase in the number of heat units available, other advantages are the absence of smoke and gases produced with other fuels as well as the absence of ashes.

Time Study Observations

Different Methods of Discovering Faults in Machine Operation and Manual Labor

BY N. E. ADAMSON, JR.

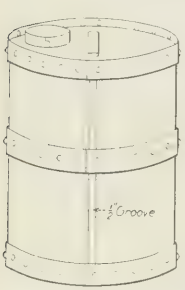
The numerous recent magazine articles and books dealing with the subject of "Time Study" have been filled with data showing benefits derived through the application of scientific management, and have described fully the principles observed in the installation and maintenance of scientific methods in various industries. Little has been written that describes definitely the proper procedure to obtain a correct, and therefore useful, observation of a process, which observation is the basis of any system of scientific investigation. By the term observation is meant a written record of a definite process as it occurs in practice. All writers advocate the use of a stop watch to determine the duration of each elementary movement, but my experience has taught that "the use of a stop watch" is a broad term, and unless it is used scientifically it is of little value.

When entering a shop to make observations I carry with me a stop watch which has an hour hand, a minute hand, a second hand, a sweep-hand and a small hand showing the number of minutes since the sweep hand was started. I also carry a revolution counter, a counting machine about the size of a watch and a note book. The counting machine may seem quite unnecessary to some who are not acquainted with the frequent interferences that occur while attempting to count operations which are taking place several yards away. One's attention is often taken from these operations, and the mind is apt to forget the count, but the counting machine does not forget and thus time is saved by not having to repeat the observation.

In discussing this subject I shall confine my remarks to observations in manufacturing articles, and will not enter the field of repair work, where the scarcity of useful information is deploring. The first logical division of observations is

1. Short observations.
2. Long observations.

Short observations include all those covering operations requiring for performance ½ hr. or less. A good field for short observations occurs in the manufacture of 10-gal. paint drums. It has been the writer's privilege to observe the manufacture of these drums and to study in detail the various stages of their production. The cut shows the type of drum. It is 20½ in. high and 13¾ in. in diameter. The opening at the top is fitted with a circular collar, to receive a wooden plug to be driven in, and a tin disk is soldered over the plug, thus making an air-tight receptacle. The top, bottom, centerband and collar are made from No. 20 U. S. gauge galvanized iron. The top and bottom bands and handles are made from No. 14 U. S. gauge galvanized iron. No. 11 wire is inserted around the edge of the collar.



The Object in the Time Study Observations.

As this drum is manufactured by the thousand, it is quite essential that a minimum cost should be realized. With this object in view, the first step of standardizing its manufacture was made in April, 1911. At that time the direct labor cost per drum was $0.466. There is no operation in the manufacture of this drum which requires more than one-half hour for performance, and therefore all observations of its manufacture will be in the first division as given above.

The first observations were for the information of the shop superintendent to give him a general idea of the various operations and their costs. They were observations of type *a*, as follows:

Type (*a*) Record starting and stopping time and the number of complete operations performed by the employee during that time. Also record the working speed of the machine, its inventory number, the name, rate and pay of the operator. From these data can be determined the average cost of one operation and the average output per hour.

On April 26, 1911, I recorded that Mr. Jackson, third class galvanized iron worker, $2.64 per diem, was punching end bands in machine No. 156-38, which is a gang punch.

Started observation 1:30:00 p. m.

Stopped observation 2:30:00 p. m.

Number of bands punched, 251.

After returning to the office I added to the record the following: Time 1 hr.; average output per hour, 251; average direct labor cost per band, $0.001315.

This information was all right for the purpose intended. The operator had remained at his work during the entire time. Apparently it was just to both the employer and the operator to say that 251 was a fair standard output per hour because every moment of this time had been used to punch bands. But I did not record the consecutive movements necessary to punch a band, and, therefore, the observation is worthless when it comes to determining what the actual waste of time was. I failed to record the position of the supply of bands relative to the working position of the operator. Probably a pile of them had been placed behind him so that it was necessary to turn around in order to pick up each band before putting it in the machine. Such conditions are not unusual. If the time to punch a band seems excessive, there are no data from which we can determine what the time should be. Sometimes this difficulty is sidestepped by saying offhand that the output should be 50 per cent. more than 251 and thus setting the standard output at 376. Such standards are of little value, and the manager who permits such practice has missed, by a large margin, the common sense principles of scientific shop management.

Exhibit A—Record of Type b Observations.

July 18, 1911.

Soldering around collars and rivets of handles.
Mr. James, second classs galvanized iron worker, $3.04 per diem.
(Type *a*) Soldering 5 tops in 10 min. 31 sec.

1.	Throwing aside completed top and picking up a top to be soldered	8	121		332
2.	Fluxing	22	133	237	347
3.	Soldering	110	219	325	437

Type (*b*). Watch the operator for a short while. Analyze the whole operation into its parts or elements. Write down the elements in order of their occurrence. When the operator starts on element No. 1 start the stop watch. When element No. 1 is complete read the number of seconds that have elapsed, but do not stop the watch. After element No. 1 write the time it took to perform it. When element No. 2 is finished again read the watch, and record the number of seconds since the watch started. Continue this until several complete operations are recorded. On July 18, 1911, notes were made on an observation of this kind, as shown in Exhibit A.

The observation card contained data when the above information had been recorded thereon as shown in Exhibit B. The description of the method used by the operator is written on the back of the card. It is as follows: *Method:* The tops to be soldered were piled to the right of

Exhibit B—Type b Observations as Recorded on Shop Observation Card.

Character of work: Soldering around collars and rivets of handles—Manufacture of 10-gal. paint drums.
Workman, Mr. James, $3.04 per diem.

Operation.	Description of Operation.	Sec.	Sec.	Sec.	Sec.	Average.
A	Throwing aside finished top and picking up another top	8	11	7		8¾
B	Fluxing	14	12	26	15	13¾
C	Soldering	88	96	88	90	90½
	Total average					112⅝

Average of 5 tops, type *a* observation = 126.2 sec.
Direct labor cost per top = $0.0133.
Standard output per hour = 28.
Standard cost = $0.01485.
Remarks: Tops were piled under bench, thus making it difficult for operator to reach them.

the operator beneath the bench at which he worked. The forge was behind him and slightly to his right. The acid was on the bench directly in front of operator. After completing, the top was dropped beneath the bench to operator's left.

What does this card show? Operations B and C seem to be about constant. When working at normal speed their variation should be slight, for they consist of almost identically the same movements. Operation A shows wide fluctuations. Why? Because one time the top was easy to reach and another time the operator had to strain to reach under the bench for a top. The first step in order to standardize this operation is to have the tops placed in a position where they can be most easily reached. By putting them on the bench the duration of the operation would possibly drop to 4 sec. We further notice that the difference between the average of four complete operations when divided into elements and the average of five operations (which is an observation of type *a*) is 13 1/3 sec. Why? It is but a fulfillment of the above statement that observations of type *a* do not show where the wastes enter but cover all wastes. During the observance of the five, the operator probably cleaned his irons once or stopped to exchange a word with a fellow workman. At any rate the standard should be set from the observation which is divided into its elements, where all irregularities are plainly shown. In this case the standards are entered with a pencil, for it is the opinion of the time study man that changes will soon be made which will change this standard. The object of letting the watch run throughout the entire duration of several complete operations is to diminish the error due to time lost in stopping, reading and restarting watch.

Differential Type of Observations

There is one feature about this type of observation that is detrimental. Even though one is skilled in the use of a stop watch, there is a lapse of ½ to 2½ sec. between the time when one realizes that an elementary movement is complete and another movement has been started and the time when his eyes have been turned from the operator to his watch and the sweep hand located. A constant elementary observation may therefore appear to fluctuate due to an unavoidable error of the observer. This error is eliminated in observations of type *c*.

Type (*c*).—The complete operation is divided into its elements. These divisions consist, so far as practicable, of a single motion of the operator. Each motion is given a symbol letter. By properly grouping these motions and by timing each group separately and solving simultaneously the equations obtained, the duration of each element is obtained. Exhibit C shows the notes taken in the shop and Exhibit D relates to the observation card made from the notes.

Here the time for each element is almost constant. There are absolutely no irregularities in the operations which are timed for this record. If the stripper fails to pull the scrap from the punch, if the operator stops to

Exhibit C—Record of Type c Observations.

July 17, 1911.

Punching out collars. Machine, 156-65.
T. N. Jones, $2.00 per diem.
Type *a*, 100 collars in 12 min. 53 sec.
a = sliding in for first punch.
b = making first punch.
c = sliding in for second punch
d = making second punch.
e = knocking out scrap.

	Seconds		
$a + b + c + d + e$	13⅗	12	13⅗
$a + b + c + d$	11	10	11⅗
$a + b + c$	8⅘	23⅖	7⅗
$d + e + a + b$	10	10⅘	9⅘
$c + d + e + a$	8	6⅘	6⅘
$b + c + d + e$	11	9	9⅘

count the number of pieces punched or if any element occurs which is not in the regular routine, the observation is discarded. In column 4 of Fig. 5 the average of 1, 2 and 3 is recorded. The sum of column 4 in this case, and almost invariably, is greater than the average sum of all the elements as given in the notes. This is due to the fact that an observer in getting the total time of an operation (the first tabular line in the notes) will time from a definite sound until that sound again occurs. In this case, time is recorded from the time of the click of the punch when it makes its first cut until the click is made with the next first cut.

In the following observations there are usually no definite signals for starting and stopping the watch. The operator will then not start the watch until he is certain that the elementary motion is started. In the effort not to time a complete set of elements, he is often too hasty in stopping the watch. Due to these two tendencies an average error of 0.3 sec. was made on this record. The corrections made use of the following proportion: Total average: observed total:: recorded average elementary time: corrected elementary time.

This type is an improvement on type *b*. The watch is started and stopped while the observer's eyes are fixed on the operator, and thus the error due to reading the sweep hand while it is in operation is eliminated. By using in connection with this observation an observation of type *a*, it is possible to determine the efficiency of the operator. This efficiency is based upon the standard as set by observation of type *c*. The bad features of type *c* observa-

Exhibit D—Type c Observations as Recorded in Shop Observation Book.

Character of work: Punching out collars on machine 156-65—
Workman, T. N. Jones, $2.00 per diem.

Description of Operations	Sec.	Sec.	Sec.	Sec.	Average.	Correct Average.
A. Sliding in for first punch	2⅘	3	2⅘	2.8	2.91	
B. Making first punch	5⅗	5⅕	6⅗	5.8	4.16	
C. Sliding in for second punch	3⅗	1⅗	3⅗	2.8	2.00	
D. Making second punch	4⅘	4⅗	4⅘	4.66	3.34	
E. Knocking out scrap	2⅗	2	1⅘	2.07	1.48	
Total average						12.98

Average time of 50 complete operations = 15.46 sec.
Average time for 100 collars = 7.73 min.
Direct labor cost per collar = $.00375.
Standard output per hour = 556.
Standard cost = $.00045.
Remarks: In one complete operation two collars are made.

tion are: 1, the extra long time required to make an observation; 2, the increased amount of clerical work necessary to make records from the notes. The second defect is partially overcome by using a slide rule.

In my work I use all three types of observations. The nature of the operation determines the type used. When I can divide an operation into its elements, each one of which is so large that one or two seconds is immaterial, I use type *b*. If the operation consists of a series of distinct elements, one or more of which does not exceed 3 or 4 sec., I use type *c*. Having set the standard through the use of type *b* or *c*, I use a type *a* observation to determine the efficiency of the operation as performed under present methods. Of course a change in method necessitates a change in standard output and cost. The words "Standard output per hour" and "Standard cost" are written with red ink so as to be quickly found on the card. The "Standard Cost" includes only the cost of the direct labor; i. e., the cost of operator's time for one unit or one complete operation. In event of there being two methods of performing an operation, each method, according to a type *b* observation, appearing to require the same time for its performance as does the other, I find type *c* very effective because of the intensity with which it shows up an element foreign to the regular routine of performance.

Long Observations

A long observation is made up of elements which can be subdivided into elements, so that we may consider a long observation as a series of short observations of type *a*, where the number of units performed in each case is, as a general rule, one. Upon the introduction of time study into any branch of industry, common sense is more desirable than the juggling of theories. More results in the form of dollars saved can be realized by applying to practice the information as it is gathered than can be obtained by accumulating a mass of closely figured observations, and then attempting to enforce the minute changes at the same time when the radical changes are made. In other words: eliminate the gross errors and wastes first; then attack the minute wastes.

Considering this doctrine I began the study of a long process. The observation card is the same as is used for short observations. If one card will not hold all the operations, the observations may be continued on a second card, and, if necessary, on a third card. It is often a good idea to make a rough sketch of the article worked on, so that one will be able to ascertain quickly the nature of the work on glancing at the card. The operation to which I shall refer is a typical one; i.e., the manufacture of a sprinkler ring, which is a part of a stationary fire extinguishing apparatus. An order for six such rings had been issued. By observing the first ones made I was able to

point out definitely where the waste occurred and the cost of each waste. Special attention is invited to the observation of drilling these rings, shown in Exhibit E. Operation A was performed on only one ring, for having once determined the position for the holes, the operator could transfer the marks from the first ring to the subsequent rings. Operation D is itemized on the back of the card as follows:

Wasted Time.

Observation No. 1:	Min.
Looking for leading man	7
Idle, waiting for 12 o'clock whistle	5
Getting drill, pneumatic machine, hose, etc., from tool room	14
Other workman attempting to take hose	2
Breaking drill	3
Breaking drill	5
Another drill broke as observation closed.	
Total observed waste, min.	40
Observation No. 2:	
Going to office for instructions	4½
Idle, talking to helper	11
Other workman stops to speak	13
Other workman takes away hose (by order of leading man)	4
Drill breaks, going to tool room for another	6½
Total observed waste, min.	48
Observation No. 3:	
Away from work (by order of leading man)	3½
By leading man, to punch card	1½
Total observed waste, min.	4¾

During observation No. 1 a Little Giant pneumatic drilling machine was used. It was too heavy for a ⅝-in. drill and, as seen, caused excessive breakage. The drills broken had taper shanks. During observations No. 2 and No. 3 the machine was replaced by a small pneumatic buzz breast drill. The drills herein used had straight shanks, thus reducing the loss in case of breakage. The decrease in weight of machine used eliminates the waste due to breaking drills.

From the note it is seen that the operator, when left to select his own tools, was satisfied with a drilling machine which was entirely too heavy for the drill. In case a drill should break with the small machine the cost would be small in comparison with the cost of a taper shank drill. The test referred to in operation E was made to determine whether the holes were properly placed and the drill held at

Exhibit E—Record of Observations on a Time Process.

Character of work: Drilling 1¼-in. brass pipe sprinkler rings. Workmen: White, $3.76 per diem, J. King, pipe fitter and helper, $2.00 per diem.

Operation	Description of Operations	Min.	Min.	Min.
A.	Setting ring in working position and locating marks	15¾		
B.	Marking off	70	71¾	48½
C.	Drilling	114½	261¾	318¾
D.	Wasted time (see back of card)	40	483¾	44¾
E.	Testing	45		
	Total time, omitting A and E	224½	1463¾	85

Average time of 1, 2 and 3 (including A and E) = 172¼.
Average direct labor cost = $2.07.

the proper angle in order to make the streams of water impinge at certain points. This position and angle having proved to be right on the first ring, further tests were not needed. Should the shop be called on to manufacture sprinkler rings in large quantities, the record now held will furnish valuable information. The time study man will then begin to divide the long operations into shorter ones, carrying the division to that point where the cost of further divisions would exceed the saving realized by use of the observation.

The handling of package freight has been studied at length by M. B. Waterman, engineer for the J. M. Dodge Company, Philadelphia. A monograph on the subject, written by him, has been published by the company in pamphlet form and illustrates at length the design of freight stations for different sorts of service, like handling outbound freight, for example, or transferring freight and caring for both inbound and outbound merchandise. The plans cover also steamship terminals and in all cases involve the use of the telpher for transportation about the terminals. The author mentions that the mechanical system in freight handling problems is recognized, but the attempt at the present time is to hide the mechanical work just as for some time automobiles were given the appearance of the horse-drawn vehicle.

The Pennsylvania Steel Company banked the No. 4 furnace of its Steelton, Pa., group on October 20 for the purpose of making some connections. Blast was put on again November 3.

A 35-Ton Shipbuilding Crane

At the plant of the New York Shipbuilding Company, Camden, N. J., a new type of shipbuilding crane has been installed. The machine is of the revolving locomotive type, mounted on a gantry, and was designed and built by the McMyler Interstate Company, Bedford, Ohio. Although cranes similar to this one have been used before and especially at the plant of the Maryland Steel Company, the one installed at Camden is novel since it is arranged to travel backward and forward on the gantry and serve both sides of the pier on which it is located.

Among the various things which this crane can do are to hoist a load at two different speeds, to revolve, to move backward and forward on the gantry and to travel along the dock by its own power. The capacity of the machine is 35 tons at a 20-ft. radius and 15 tons at a radius of 68 ft. The crane is moved backward and forward on the gantry by a wire rope which is attached to each end of the gantry and is wound around a worm-driven drum under the center of the machine. In this way the crane is always locked, thus preventing it from being moved across the gantry by the wind. A motor which is placed in the center of the gantry and transmits power to one truck on either side of the dock through steel shafts and gears, propels the machine along the dock.

Two other motors are used, one for hoisting the load



A New Crane Built for the New York Shipbuilding Company by the McMyler Interstate Company, Bedford, Ohio.

and the other for rotating, raising and lowering the boom and moving the machine backward and forward across the gantry. The hoisting speed is 15 ft. per minute with a 35-ton load and double that figure for a 15-ton load. Two complete revolutions of the machine can be made in 1 min. The movement across the gantry is 25 ft. per minute, and the rate of travel along the dock is 150 ft. per minute. While higher speeds were first contemplated, on account of the lack of sufficient driving power these speeds had to be used. Direct current at a potential of 220 volts is supplied to the machine from a third rail along the dock, across the gantry and below the rotating frame.

Crusher Litigation.—To correct a misapprehension existing in some quarters regarding the extent of a court decision in a litigation which was recently had with the Williams Crusher Company, the Pennsylvania Crusher Company, Stephen Girard Building, Philadelphia, Pa., announces that it is still in a position to make hammer crushers. In this action it was the wear adjustment device that was adjudged to be an infringement and not the loose arm or swing-hammer principle which has been public property for many years. The infringing device has been improved and it is claimed that it does not now infringe on any patents, while at the same time the machine has been much improved.

Judicial Decisions of Interest to Manufacturers

ABSTRACTED BY A. L. H. STREET.

Implied Warranty of Manufactured Articles.—A manufacturer, in offering articles for sale to one who has no opportunity to inspect before buying, impliedly warrants that they are reasonably fit for the purpose for which they are intended. (Arkansas Supreme Court, S. F. Bowser & Co. vs. Kilgore, 139 Southwestern Reporter, 541.)

Partnership Name as Good Will.—The name and style under which partnership business has been conducted is a part of the firm's good will, and transferable as such to the purchaser of the business in bankruptcy. (New York Supreme Court, New York County Special Term, James Van Dyck Company vs. F. V. Reilly Company, 130 New York Supplement, 755.)

Buyer Entitled to Rescind Contract for Delay in Delivery or Change in Method of Shipment.—One may repudiate his contract to buy on the seller failing to deliver within the time fixed, or may refuse to receive goods sent by express which were to be sent by freight. (Alabama Appellate Court, Clauss Shear Company vs. Alabama Barber Supply Company, 56 Southern Reporter, 401.)

When Articles Sold Are Not Impliedly Warranted.—Under a contract to manufacture specific articles of given weight, size and materials, according to plans—in this case track, grip cars, etc.—there is no implied warranty of the articles by the seller, though they are intended to be marshaled together as machinery. (Pennsylvania Supreme Court, John A. Roebling's Sons Company vs. American Amusement & Construction Company, 80 Atlantic Reporter, 647.)

Liability of Carriers of Freight or Express on Changing Route or Method of Shipment.—A carrier of freight or express becomes liable as an insurer by altering the route or manner of shipment from that required by the contract for carriage, even as against a particular cause of loss or damage to the shipment for which he would not have been liable had the contract not been departed from by him. (Massachusetts Supreme Judicial Court, McKahan vs. American Express Company, 95 Northeastern Reporter, 785.)

Necessity for Tender of Price by Buyer on Seller's Default.—If one contracting to sell articles breaks the agreement by delivering them to a third person, the buyer need not tender the price to the seller as a condition precedent to his right to sue the seller for resulting damages. (New Jersey Court of Errors and Appeals, Gruen vs. George A. Ohl & Co., 80 Atlantic Reporter, 547.)

Liability for Injury to Teamster.—An employer is not liable for the death of an experienced teamster, caused by a heavy casting which he was hauling rolling to the rear of the wagon bed and tipping the wagon, on the theory that the employer was negligent in not having the bed secured to the front bolster or axle. (New York Supreme Court, Fourth Appellate Division, Kalbach vs. Ross, 129 New York Supplement, 243.)

Revocation of Rescission of Contract to Buy.—A buyer's acceptance and payment for goods after notifying the seller that he would not accept delivery amounts to a revocation of the buyer's rescission, equally binding upon both parties. (New York Supreme Court, Third Appellate Division, Sturges & Burn Mfg. Company vs. American Separator Company, 129 New York Supplement, 210.)

Right of Railroad Company to Make Freight Delivery Charge.—Railroad companies are entitled to make a reasonable charge for delivering freight to and receiving it from industrial plants located on spur tracks upward of one-fifth of a mile from the companies' yards or main lines. (United States Commerce Court, Atchison, Topeka & Santa Fé Railway Company vs. Interstate Commerce Commission, 188 Federal Reporter, 229.)

Right to Rescind Contract to Buy Machinery and to Recover Damages for Breach of Warranty.—The fact that a buyer of machinery retains it beyond the time for trial fixed by the contract of sale does not show waiver of his right to rescind the contract for breach of warranty of the machinery if the retention is at the seller's request to enable him to remedy defects. If the machinery is bought for a particular purpose and the buyer elects to retain it and sue for breach of warranty, he can recover not only the difference between the value of the machinery as warranted and its actual value but also any other damages which are direct and probable results of the breach. (California District Court of Appeal, Luitweiler Pumping Engine Company vs. Ukiah Water & Improvement Company, 116 Pacific Reporter, 707.)

Liability for Injury at Steam Hammer.—An employer is liable for injury to a blacksmith's helper at a steam hammer caused by the blacksmith, who was given sole charge of the hammer, negligently placing it in motion. (Washington Supreme Court, Dyer vs. Union Iron Works, 117 Pacific Reporter, 387.)

When Employee Does Not Assume Risk of Unguarded Machinery.—In a suit for personal injury to an employee, based on the employer's failure to guard machinery, the defense of assumption of the risk is not available. (Pennsylvania Supreme Court, Fegley vs. Lycoming Rubber Company, 80 Atlantic Reporter, 870.)

Liability for Injury to Employee Riding Free on Private Railroad.—An iron company is not liable for the death of a miner while riding home on a short railroad operated by the company, on the theory that he was a passenger; no passengers being carried over the road and the employees being carried free as a matter of accommodation. (United States Circuit Court of Appeals, Sixth Circuit, Dodd vs. Dayton Coal & Iron Company, 188 Federal Reporter, 597.)

Duty to Warn Employee of Dangers.—An employer's duty to warn his workmen against dangers extends only to appliances used by them and to hidden dangers to which they are subjected and which the employer can reasonably foresee. (Washington Supreme Court, Ponelli vs. Seattle Steel Company, 116 Pacific Reporter, 864.)

Risk of Injury Through Unguarded Set Screw on Revolving Shaft Not Assumed.—A steel company's foreman did not assume the risk of being caught by an unguarded set screw on a revolving shaft while working near it, where notice of the defect had been given the company as required by the New York laws. (New York Supreme Court, Fourth Appellate Division, Larsen vs. Lackawanna Steel Company, 130 New York Supplement, 887.)

Liability for Injury to Structural Ironworker.—A building contractor is liable for negligent injury to a structural ironworker employed by the subcontractor for the construction of the iron work, where the contractor furnished the machinery used and paid the employee. (Washington Supreme Court, James vs. Pearson, 116 Pacific Reporter, 852.)

Liability of Seller of Structural Steel for Delay in Delivery.—A seller of steel for a bridge is liable for damages caused by his failure to deliver it on time, including loss to the buyer through suspension of the work, and loss of false work through a flood, where such damages were within contemplation of the parties when the contract was made. (Washington Supreme Court, Interstate Engineering Company vs. Archer, 117 Pacific Reporter, 470.)

Rights of Seller on Buyer's Breach of Contract to Buy Machinery.—Where machinery was sold on an agreement requiring the buyer to order shipment by a specified time, and giving him the right of inspection on delivery, and he broke the contract by failing to order shipment, the seller was not required to tender delivery and opportunity for inspection at the destination before suing on the agreement. His measure of damages was the difference between the cost of manufacturing the machinery and its value at the time and place of delivery. (United States Circuit Court, Northern District of New York, Fisher Hydraulic & Machinery Company vs. Warner, 188 Federal Reporter, 465.)

Liability for Breaking Contract to Buy.—On breach of a contract to buy manufactured articles the manufacturer can recover the difference between the cost of manufacture and the contract price. Though a contract of sale requires the articles sold to be "satisfactory" to the buyer, he may not unreasonably refuse to receive them. (New York Supreme Court, Fourth Appellate Division, Oswego Falls Pulp & Paper Company vs. Stecher Lithographic Company, 130 New York Supplement, 897.)

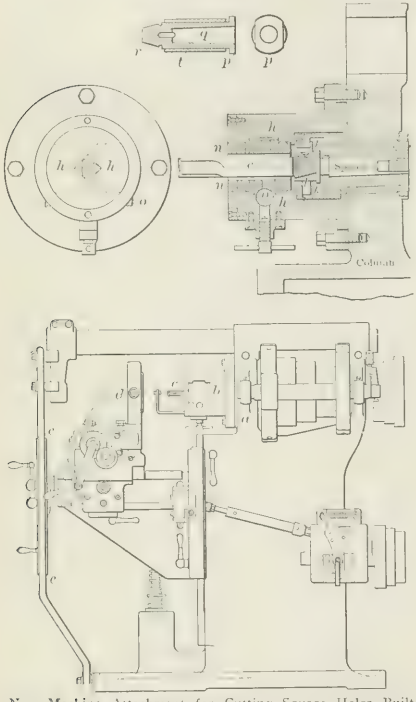
Liability of Transfer Companies.—A transfer company which undertakes to receive freight from a railroad company and deliver it to the consignee is liable as an insurer for the loss of the property through fire while in its possession. (Arkansas Supreme Court, Arkadelphia Milling Company vs. Smoker Merchandise Company, 139 Southwestern Reporter, 681.)

Scope of Authority of Collection Agents.—Unless otherwise specially authorized, a collection agent is not empowered to receive payment in any other medium than money; and his receipt of checks does not bind his employer, in the absence of ratification by the latter. Nor is the employer liable for other acts or declarations by the agent in the absence of authorization or ratification. (Nevada Supreme Court, Roberts, Johnson & Rand Shoe Company vs. McKim, 117 Pacific Reporter, 13.)

The Le Blond Combination Miller

Many attempts have been made to produce a practical tool for boring square holes and among the most recent developments in this line is a new one designed by the R. K. Le Blond Machine Tool Company, Cincinnati, Ohio, for the Niles-Bement-Pond Company, 111 Broadway, New York, N. Y. The tool is a special combination one that is not only adapted for milling square holes but also possesses all the features of a standard milling machine. The design of this machine in general follows that of the maker's No. 2, plain miller with such changes as it was thought would prove advantageous in the operation of the square hole cutters.

The principle used in this work is the same as that employed in other devices, namely the revolution of a triangular-shaped bit similar in construction to an end mill in a stationary master guide, having the same general appearance as a regular drill chuck. One important change, however, is the fastening of this stationary guiding chuck directly to the column of the machine by a flange, an arrangement which it is claimed eliminates the lost motion troubles formerly encountered. The cutter receives its motion from a special driving member fastened to the spindle nose, and this member not only causes the cutter to rotate, but at the same time gives it sufficient freedom to travel eccentrically in the master guide.



A New Machine Attachment for Cutting Square Holes Built for the Niles-Bement-Pond Company by the R. K. Le Blond Machine Tool Company, Cincinnati, Ohio.

Referring to the accompanying engraving, *a* is the column of the machine with the main spindle bearing, while *b* is the detachable chuck for cutting square holes. The cutter, a special vise for holding the work and a special brace connecting the knee with the overhanging arm and the base are indicated by *c*, *d* and *e* respectively. The square hole arrangement shown in the cross section in the upper right portion of the cut consists essentially of two separate bodies. The first of these is the driving member *k*, which is fastened to the spindle nose and the upper is the stationary guiding chuck *h*, which is bolted to the column over main bearing. The driving member contains a floating driving dog *l* with which the cutters *c* engage by a taper thread. A floating thrust plate located behind this dog takes up the end thrust of the drills. The stationary driving chuck contains the master guide, which consists of two jaws *n-n* forming an adjustable square guiding hole in which the cutter is forced to describe its particular cam motion. The space between these two guiding jaws is controlled by the right and left hand screw *o* which opens and closes them according to the size of drill used.

The entire arrangement for cutting square holes can be easily detached in a very little time and the machine is ready for regular milling work or vice versa. When it is desired to cut square holes in tough material the maker recommends that a round hole be previously drilled and for this reason the machine is furnished with an appliance for operating ordinary twist drills which engages in the arrangement for boring square holes. In this way it is possible to perform both operations successively in the same work piece. The attachment used in connection for boring round holes is shown in section at the top of the engraving and consists of a round bushing, *t*, which is inserted in the square guiding hole. This serves as a bearing for the shank *p*, which contains a standard Morse taper, *q*. This shank is fastened in the driving member by the taper thread *r* and makes a complete revolution inside the bushing *t*. Any size of twist drill can be inserted in the Morse cone, and like the square hole attachment this twist drill arrangement can be easily removed.

As the attachment for cutting square holes projects considerably beyond the spindle nose, the working space in front of the cutter would thus be decreased on a standard machine. To overcome this difficulty the column bearing of the main spindle has been set back a distance equal to the projection of the attachment, thus maintaining the full working range of the table. In order to secure absolute rigidity of the work pieces on the table a special brace, *e*, is provided which connects the knee with the overhanging arm as well as with the base of the machine. Two separate cross feeds are provided for the machine, one for regular milling work and the other which has a very fine feed starting from 0.001 in. per revolution of the spindle for the cutting of the square holes which requires a fine feed. A special vise, *d*, is used for holding the work absolutely rigid while cutting square holes. The machine is furnished with a complete equipment for handling regular plain milling work and the range for boring square holes is from ¼ to 2 in.

Prize Contest of the Society of German Foundrymen

The Society of German Foundrymen (Vereins Deutscher Giessereifachleute) will award three prizes—1,000, 500 and 300 marks, respectively—to any person giving the best answer to the following question: "Has there been made any decided progress in the last 20 years in the construction and running of cupola furnaces?" Special value is put on the economy of the furnaces and the quality of the molten metal. The hygienic point should also be defined. The judges are: F. Wust, Aachen; W. Schlenker, Berlin; A. Nachtweh, Hanover; C. Gilles, Berlin; F. Meyer, Wintherthur; C. Henning, Mannheim; H. Adammer, Hengelo; C. Humperdinck, Durlach; H. Dahl, Berlin; F. Bock, Berlin. The conditions governing the contest can be obtained from the office of the society, 60 Sybel street, Berlin-Charlottenburg, Germany.

The Crawford Locomotive & Car Company, Streator, Ill., recently received a large contract from the Detroit, Toledo & Ironton Railway Company, through its representative, the New York Trust Company, 26 Broad street, New York, for the reinforcing and repairing of freight equipment. These cars will be shipped on their own wheels from the railroad company's terminal at Leipsic, Ohio. About two years ago the Crawford Company repaired a lot of cars for this road, which have proved eminently satisfactory, the cost of maintenance for running repairs to the rebuilt cars having been reduced to almost nothing. The company has a large plant and is now making extensive improvements, and is in position to build all classes of new freight cars, furnish steel underframes, and do general repairs to cars.

The Machinery Markets

The prospect of business with the railroads continues to be awaited with expectancy. General trade conditions are good and expected to improve. From Chicago the Illinois Central Railroad calls for $20,000 to $25,000 worth of machinery. The New York market has received a list from the Lehigh Coal & Navigation Company, Lansford, Pa., calling for an expenditure of about $20,000. Cincinnati conditions also indicate that the railroads are to be an active factor at no distant date. General inquiries there are few, although the usual number of single tool orders are being booked, a portion of the business coming from auto truck builders. Cleveland notes an improvement in the demand for small lots of machinery. Most of the activity is in auto parts. Attention has been called also in Cleveland to an inquiry for ore-handling machinery. Small equipment is being called for on the Pacific coast and the demand for logging, saw mill and wood-working machinery continues fairly good. From Philadelphia comes word that trade is quiet, with not much of note aside from inquiries for crane equipment. Detroit trade shows an improvement in the demand for wood-working machinery. Reports from St. Louis and the Southwest are satisfactory. The South appears to be awaiting the advent of the new year.

New York

NEW YORK, November 15, 1911.

While no big business is reported in the New York machinery market an optimistic feeling prevails and predictions are general that conditions are improving and that really good business is on the way, unless favorable indications fail. Several sales of individual machine tools are reported. The Delaware, Lackawanna & Western Railroad has been doing some buying and the Pennsylvania Railroad is in the market for several machine tools for its Trenton shops. Bids are in on the New York, New Haven & Hartford list but the business has not been let. Tangible news of interest is a list issued by the Lehigh Coal & Navigation Company, Lansford, Pa., for a fair sized lot of requirements which will call for an expenditure of about $20,000. Export conditions continue good. Information received by New York machinery houses is to the effect that the recent defeat of reciprocity in Canada will lead to the erection and extension of plants owned by American manufacturers in the Dominion. The B. F. Sturtevant Company, Hyde Park, Mass., it is reported, has taken the initial steps toward the erection of a plant in Canada. A number of other American companies now manufacturing in Canada are planning extensions to their present facilities.

The Lehigh Coal & Navigation Company, Lansford, Pa., has issued a small list of machine shop requirements which may later on be followed by other purchases. The list includes one 18-in. double traveling-head shaping machine, one heavy floor grinder with two wheels, 4-in. face and 24 or 36-in. diameter, one 48 x 48 in. x 10-ft. planer, one 90-in. standard double head driving wheel lathe, and other tools. All these machines are to be motor driven and designed for 250-volt direct current.

The Pioneer Broom Company, Amsterdam, N. Y., is inquiring for an engine and elevator to be installed in the addition it is erecting to its plant.

The Buffalo-Dehn Company, Buffalo, N. Y., manufacturer of wire and sheet metal ware, will soon be in the market for wire bending and forming machines and desires information along those lines. The company recently announced plans for a new building, but has not as yet decided upon the location.

The extensive new plant of the Victor Motor Truck Company, Buffalo, N. Y., now building at Military and Beaver roads and the New York Central Railroad, North Buffalo, is nearing completion and will soon be in readiness for the installation of machinery and equipment.

The Water Power Vacuum Cleaner Company, with offices at 730 Main street, Buffalo, has established its manufacturing plant at 80-82 West Mohawk street.

The Niagara Gasoline Motor Company, Buffalo, is building a one-story brick addition to its plant at Breckenridge and Barton streets.

Weaver, Naylor & Co., Buffalo, will build a plant for the manufacture of roofing on Chandler street and the New York Central Railroad belt line, near Military road.

G. Elias & Bro., Buffalo, are building a two-story brick and steel wood working factory and box factory at Elk and Peabody streets and the Buffalo Creek Terminal Railroad.

The Strong Steel Foundry Company, Main and Amherst streets, Buffalo, which has purchased a site at Hertel avenue and the Erie Railroad, will erect a pattern building there at once. The remaining buildings of its proposed plant will not be constructed until next year.

The James H. Gray Milling Company has been incorporated at Springville, N. Y., where it will operate a flouring mill and feed mill. The incorporators are James H., Edwin A. and B. S. Gray.

The Endicott-Johnson Company is having plans prepared for a shoe factory to be erected at Lestershire, N. Y. Geo. F. Johnson is general manager.

The auxiliary pumping station and electric lighting plant to be built by the city of Oswego, N. Y., will be 50 x 325 ft. and one story with concrete floor and roof and interior finish.

The S. R. Mfg. Company has been incorporated at Schenectady, N. Y., with a capital stock of $50,000, to manufacture motors, engines, motor vehicles, etc. Christian Steenstrup, Karl M. Rossi and Ralph J. Ury, of Schenectady, are the incorporators.

The Morrow Mfg. Company, Elmira, N. Y., manufacturer of automobile parts, is equipping its plant with considerable new machinery, for which orders were recently placed, including a screw machine and a number of shapers, gear cutters and grinding machines.

The Lock City Laundry Company, Lockport, N. Y., is erecting a two-story structural steel and brick laundry building, for which considerable laundry machinery will be required.

The Delaware & Hudson Railroad Company is completing plans for additions and improvements to its shops and yards at Oneonta, N. Y., calling for an expenditure of about $250,000. Geo. H. Burgess, Albany, N. Y., is chief engineer.

The World's Dispensary Medical Association, 663 Main street, Buffalo, Dr. Ray V. Pierce, president, is completing and equipping a chemical laboratory factory and box and bottling works at Hamburg, N. Y.

The Commissioners of Water Works, Erie, Pa., are receiving bids until December 6 for the designing, constructing and erecting of a 20,000,000-gal. triple expansion, crank and fly-wheel condensing pumping engine. Chester & Fleming, Pittsburgh, Pa., are the consulting engineers.

New England

BOSTON, MASS., November 14, 1911.

The dealers have experienced some improvement in orders for machine tools and their reports from other centers and from some of the manufacturers whom they represent tend to show that a better condition prevails generally.

An analysis of answers to confidential inquiries to manufacturers engaged in metal industries in New England as to the condition of their business reveals a more encouraging condition than many observers are willing to accept. Out of 20 answers which discussed the situation frankly, these including all that have been received, 12 report business good, five find it fairly good, one dull but with prospects which appear hopeful, and two put it as bad. Only two machine tool builders are included; one of them has a poor domestic trade but a satisfactory foreign business. The machinery business as a whole is dullest of all, which is always the case under conditions as they now exist.

There are exceptions, however, a marked improvement having been experienced in some cases. A common report from many lines of trade is that collections are unsatisfactory. Orders are usually smaller than normal and are for immediate shipment. Prices are not what they should be, for competition is unusually keen. One large house makes a statement of what is rather a common experience, as follows: "We have not considered any extensive improvement in the plant, in general, but have found it necessary to contract for a few machines to keep abreast of our competitors. Our replacement account is a little larger than usual at this time of the year, owing, no doubt, to the fact that we have put off from time to time the expenditures on account of the uncertainty of the business outlook."

C. B. Hershey, Detroit, Mich., has been made sales manager of the Bath Grinder Company, Fitchburg, Mass., manufacturer of grinding machines.

The Geometric Tool Company, New Haven, Conn., manufacturer of special machinery and tools, is considering the erection of an additional building in the near future, and plans are now being made for the structure. Additional manufacturing equipment will be required after the completion of the building, which will probably not be before next spring. The company states that business is good and has been right along, with a marked improvement in the last month or six weeks.

A dispatch from New Bedford, Mass., states that the Taunton-New Bedford Copper Company will build a new rolling mill at its works on North Front street, New Bedford, which will double the capacity of the plant. The mill will be 100 x 350 ft., of brick, steel and concrete. The work of construction will begin about December 1.

The new building of the Bryant Electric Company, Bridgeport, Conn., will be used for plating and polishing, and the equipment has been purchased.

The Underwood Typewriter Company, Hartford, Conn., has purchased the equipment for the additional large factory building which is about to be erected.

The New Haven Boiler Works, New Haven, Conn., will erect a one-story building, 48 x 136 ft., of brick and steel construction.

The Worcester Pressed Steel Company, Worcester, Mass., will erect a foundry building which will be devoted to the manufacture of special semi-steel castings for dies for the company's own use. A large office building in process of construction will relieve a considerable amount of space in the main building. The company has plans, which are not settled, for the building of a large rolling mill for cold rolling equipment. At present there are two stands in the works which are producing cold-rolled steel for the company's product.

The New York, New Haven & Hartford Railroad will build an addition to its power plant on Grand avenue, New Haven, Conn., 32 x 70 ft., in order to increase boiler and engine capacity.

The Swanton & Alburg Railway Company, which will be a part of the New Haven system, has been incorporated under Vermont laws to construct and operate a railroad from Swanton to Alburg, a distance of 10 miles, constituting a connection between the St. Johnsbury and Lake Champlain and the Rutland railroads.

The Merrick Horseshoe Calk Company, Hartford, Conn., has organized with P. S. Ney, president; William Merrick, vice-president, and M. J. Black, treasurer. Manufacturing has already begun.

Philadelphia

PHILADELPHIA, PA., November 14, 1911.

A bitterly contested municipal election has had some influence on local trade, although the general out-of-town demand is reported as being less active. Few propositions of any size are under negotiation and little business involving the purchase of more than a few tools by any one concern is to be noted. While business is light, competition for such inquiries as have developed has been keen and sellers are more reticent regarding information in connection with pending negotiations. Considerable instability of prices is reported and concessions are frequently made, if necessary to obtain an order. Some little business is pending in crane equipment and conveying machinery but the demand for power transmission equipment has been lighter. While a fair amount of business in boilers and engines is still under negotiation, orders in this field develop but slowly. Secondhand machinery merchants report a moderate demand for metal working machine tools and a small amount of general machinery and electrical equipment, but the aggregate business is still comparatively small. There is no change in the general foundry situation; steel casting plants have, in instances booked a better volume of orders for early delivery but are not very well fixed for forward business. Gray iron foundries report unchanged conditions. Builders of machinery and tools do not report any material gain in orders, bookings are as a rule, confined to single tools. Special tool builders are generally in better shape as far as orders on hand are concerned than are makers of the standard type of metal working equipment.

E. T. & F. E. Mathewson, 929 Real Estate Trust Building, have been appointed direct representatives of Charles H. Besly & Co., Chicago, Ill., manufacturers of disk grinders for metal work and pattern making purposes, in the Philadelphia territory.

R. H. Comey & Co., dyers and bleachers, Camden, N. J., are having plans prepared for a brick and iron boiler house, 40 x 60 ft., to be erected at their South Camden plant. Two 150 hp. boilers, for which orders have already been placed, will be installed.

Frank Toomey, secondhand machinery, reports a very fair business in both new and secondhand machinery and electrical equipment. The demand has not been confined to any particular line but covers pretty generally the full range of metal-working machinery and tools.

The Waynesboro Metal & Foundry Company, Waynesboro, Pa., has been incorporated with a capital stock of $50,000. Incorporators named include F. D. Miller, C. V. Moore, George H. Armacast and John C. Benedict, of Westminster, Md., and George B. Beaver, of Waynesboro, Pa. George H. Armacast is named as treasurer. While no particulars are available, it is said that the company will engage in the manufacture of iron, steel and brass castings.

A number of local builders are estimating on the construction of a pump house 22 x 38 ft., to be erected in Miller, W. Va., for the Baltimore & Ohio Railroad.

Plans and specifications have been posted for estimate for a nine-story reinforced concrete manufacturing building, from plans by Carl P. Berger, to be erected at 506-512 Race street for A. Hartung. The building will be 79 x 130 ft., open on all sides, with metal window frames, and modern safety appliances are to be installed. Plans for the power plant are expected to be ready for estimate in the near future.

The Goeringer Carpet Sweeper Company has been incorporated at Wilkes-Barre, Pa., to manufacture carpet sweepers, etc. The company has procured a plot of land in the east end and is having plans prepared for a factory building. The directors are Frederick Goeringer, Dr. O. K. Grier, L. Siegfried, C. W. Beckley and F. R. Stokes.

Chicago

CHICAGO, ILL., November 14, 1911.

The past week has shown a very fair record of machinery sales, both in the aggregate of miscellaneous orders for one and two machines and of a number of larger inquiries. At present the most interesting inquiry in the market is that of the Illinois Central Railroad, which has out a list of machines totaling in value between $20,000 and $25,000. It is understood that this list will be closed the coming week. The demand for second-hand machinery is very quiet.

The Concrete Mixing & Conveying Company, Chicago, has been incorporated with a capital stock of $10,000 for the purpose of manufacturing and dealing in machinery, apparatus, building material, etc. The incorporators are George Gillette, R. T. Elwell and Russell P. Fischer.

The United States Steel Tank & Pipe Company, incorporated for $10,000 by Henry N. Miller, S. M. Schall and A. C. Meyer, will manufacture and erect ventilating and power saving systems.

The Chicago Railway & Mill Supply Company, incorporated with a capital stock of $5,000, will manufacture and deal in railroad machinery and equipment. The incorporators are A. W. Gillespie, C. B. Royal and J. S. Seely.

The National Spring Tire Company has been incorporated with a capital stock of $125,000 by Charles L. Sigman, Jr., Louise Valance and Charles H. Jackson. It will manufacture and deal in automobiles, bicycles and accessories.

The Federal Motor Car Company has been incorporated to manufacture and deal in automobiles, vehicles, trucks, etc. The incorporators are Carey W. Rhodes, David F. Rosenthal and Leo S. Kositchek, and the capital stock is $10,000.

The Reddick Mfg. Company has secured a permit for the erection of a three-story brick factory at 647

West Oak street, the cost of which is estimated at $20,000.

The Hart Foundry Company, Peoria, Ill., is acquiring property adjoining its present plant to be used in connection with the extension of its capacity.

The Joliet Forge Company, Joliet, Ill., has been incorporated by J. J., H. H. and E. F. Sharpe, to continue, under corporate form, their business of manufacturing iron and steel forgings.

The Buchanan Mfg. Company, Eldorado, Ill., has been incorporated with a capital stock of $15,000 for the manufacture of woven wire fence stretchers. The incorporators are C. C. Buchanan, J. M. Buchanan and Roy Gregg.

The H. L. E. Peterson Mfg. Company, Elgin, Ill., has been incorporated with a capital stock of $25,000 to engage in a general foundry and manufacturing business. The incorporators are H. L. E. Peterson, Albert Fehrman and Julius G. Peterson.

The W. F. Hallett Boiler Company, Elgin, Ill., has been incorporated with a capital stock of $5,000 for the purpose of manufacturing and dealing in boilers, engines and general machinery, by William S. Hallett, Ernestine C. Hallett and D. B. Ellis.

The Lavine Gear Company has transferred a portion of its activities to Corliss, Wis., where the erection of a $100,000 factory is contemplated for next year. The incorporators in Wisconsin are George Uhlein, C. E. Albright and N. L. Baker.

The Commissioner of Public Works, Milwaukee, Wis., has been authorized to purchase machinery for a municipal lighting plant.

The Harmon Feed Water Purifier Company, Duluth, Minn., has been incorporated with a capital stock of $25,000 by F. M. Harmon, of Cleveland, Ohio, and J. H. Upperman and John St. Clair, of Duluth.

The Winona Heating & Ventilating Company, Winona, Minn., is about to increase its capital stock and will enlarge its plant by the addition of a one-story brick and concrete building 36 x 100 ft.

The Des Moines Street Railway Company, Des Moines, Iowa, is planning the expenditure of $150,000 in the improvement of its power plant.

The Baker Mfg. Company, Fort Dodge, Iowa, has purchased property on Eighteenth street, where a four-story concrete fireproof building will be erected for the manufacture of windmills.

Clinton Bridge & Iron Works, Clinton, Iowa, [illegible] result of a fire, received damage to its machinery to the amount of $7,000.

The Beatrice Steel Tank Mfg. Company, Beatrice, Neb., has been organized with T. E. Adams president and Clarence S. Warren secretary and treasurer. New machinery will be installed.

Henry, S. D., has voted to issue bonds providing for the construction of a municipal water works system.

Ponca City, Okla., has authorized bonds to the amount of $30,000 to provide for the erection of an electric light and power plant.

The Kenton Iron & Steel Company, South Charlestown, W. Va., by its manager, J. W. Arnold, has contracted to establish a plant at Guthrie, Okla., the main building of which will be 100 x 250 ft. and which, when equipped, will represent an expenditure of about $60,000.

Cleveland

CLEVELAND, OHIO, November 14, 1911.

While machine tool orders were rather light during the week the situation has improved, as is shown by a good volume of prospective business in small lots. Buyers are slow in placing orders, but dealers expect that much of the pending business will be placed shortly. Orders are scattered among manufacturers of various products, but the demand is most active from the makers of automobile parts and accessories, many of whom are adding to their equipment. Local manufacturers are figuring on an attractive inquiry for ore handling equipment, the order for which is expected to be placed very shortly. The demand for waterwheel equipment continues active. In addition to large orders from the Youngstown Sheet & Tube Company and the Pittsburgh Crucible Steel Company northern Ohio crane builders have recently taken a good volume of other crane orders. The demand for second hand machinery is fairly active.

The Chisholm & Moore Mfg. Company, Cleveland, has commenced the enlargement of its plant by fitting up for manufacturing purposes an adjoining building that it acquired some time ago, formerly occupied by the Garry Iron & Steel Company. When the extensions are completed the capacity of its malleable iron foundry will be increased 50 per cent. and the capacity of its hoist department will be doubled. Sand blast machinery and some tumbling barrels will be purchased. The company is getting a good volume of orders in both departments and reports that its business this year will equal that of 1910, which was a very satisfactory year.

The Concheno Mining Company, controlled by Corrigan, McKinney & Co., Cleveland, will electrify its gold and silver mining property in the state of Chihuahua, Mexico. A large power plant with long distance transmission will be erected 10 miles from the mine. The property is now operated by a steam power plant, but the supply of wood, which is used for fuel, has been exhausted in the immediate vicinity and the new plant will be built where there is still plenty of wood for fuel. The capacity of the plant will be about 1000 kva. In addition to boilers and electrical equipment the company will purchase compressors, pumps, hoists, etc. The plant will be located about 90 miles from a railroad.

The city of Cleveland was authorized by the voters in the election Novemebr 7 to build a new municipal lighting plant, a proposal to issue $2,000,000 in bonds to build a plant being approved. At the same election amendments to the franchise of the Cleveland Railway Company were approved. As a part of the agreement between the city and the railway company the latter is to expend $2,500,000 in such improvements as the City Council shall designate. These will include extensions to its power plants, the adding of new cars and track extensions.

The Standard Steel Company, maker of polished sheets, is planning an extension to its plant and the installation of some new equipment. Additional space will be provided by the building of a 35-ft. lean-to on the main building. The company intends to install a double annealing furnace with a capacity of 40 tons a day, a 4-armed mechanical pickler, another mill, an electric crane of about 35 tons capacity, 126 or 132-in. power sheet shears, a roller leveler and three or four small motors. Its capital stock was recently increased from $40,000 to $100,000 to provide for the extensions. The company has opened offices in the Rockefeller Building, Cleveland.

The Director of Public Safety, Cleveland, will receive bids November 27 for a new engine and boiler room and machine shop for the Cleveland Boys' Home at Hudson, Ohio. Briggs & Nelson, Rose Building, are the architects. A 50-kw. generator will be purchased shortly. It is expected that some machine shop equipment will be needed a little later.

The Champion Spark Plug Company, Toledo, Ohio, has broken ground for a plant of steel and glass construction 72 x 102 ft. at Upton and Avondale avenues. The present location is on Jefferson avenue. The company, which is controlled by R. A. and F. D. Stranahan, plans to double its present machinery capacity.

The Advance Machinery Company, Toledo, Ohio, maker of ball bearing shapers and glue heaters, is putting in new machine shop equipment and making other improvements to its plant.

The Home Power Company, Ashtabula, Ohio, is expected to be in the market shortly for equipment for a plant for making power washing machines.

The Attwood Wrench, Tool & Stamping Company, Conneaut, Ohio, has been reorganized as the Attwood Mfg. Company and has taken over the business of the McLean Separator Company. The company has a capital stock of $150,000 and will manufacture a self-adjusting pipe wrench and other products.

The Great Lakes Engineering Works, Detroit, Mich., has an inquiry out for several wood-working tools for its new plant at Ashtabula, Ohio.

The Toledo Machine & Tool Company, Toledo, Ohio, has received an order through the Lake Erie Nail & Supply Company, Cleveland, for five large motor driven forging presses for the Superior Drop Forge & Mfg. Company, Cleveland.

The new addition to the plant to be erected by the F. B. Stearns Company, Cleveland, will be 80 x 165 ft. four stories high, of mill construction. It will be used as an addition to the machine shop. The company is expected to buy some additional machine tool equipment.

The Winchester D handle factory will be removed from Attica to Bellevue, Ohio, where a new plant will be erected 120 x 40 ft. two stories. Corrugated sheet steel will be used in its construction.

The Trion Horn Mfg Company, Conneaut, Ohio, has been incorporated with a capital stock of $25,000 by Ira E. Stump and others to manufacture automobile horns.

The Swinehart Tire & Rubber Company, Akron, Ohio, is planning the erection of a large addition to its plant 50 x 200 ft.

The Ohio Steel & Wire Company, Warren, Ohio, has awarded a contract to the McClintic-Marshall Construction Company, Pittsburgh, for the erection of its new plant, which it is planned to have in operation in four months. E. A. Henry is general manager.

Detroit

DETROIT, MICH., November 14, 1911.

The past week showed no material increase in sales of machine tools and business continues below normal, but the number of inquiries has improved and dealers now anticipate a better business toward the end of the month, with a prospect that totals will fall but slightly below those of October. Mill and shop supplies show an increased demand and makers of special equipment are generally booking a very fair business. Some very fair inquiries for woodworking machinery are being negotiated, the demand for this class of equipment showing a decided improvement. Contractors' outfits and supplies are moving briskly. The second hand machinery trade is rather dull, metal working tools being relatively the best sellers. Reports from Kalamazoo and vicinity indicate that the paper industry is purchasing considerable machinery, the bulk of the business going to Eastern manufacturers. Outside of the automobile trade the demand for castings is rather satisfactory. Contractors are being asked to figure on considerable new work, indicating that activity in construction will continue to near the close of the year.

The Detroit Edison Illuminating Company is making extensive additions to its properties in Detroit, including the erection of a 7-story office building and a new substation on Grand River avenue. The company is also completing the building of a new battery station.

Fire destroyed the plant of the American Wood Grain Company, manufacturer of imitation wood covering for floors, causing a loss of $60,000. General Manager T. A. Flockert states that the plant will be rebuilt at once. A large amount of valuable machinery will be replaced.

Arrangements have been completed for bringing the Victor Broom Company, of Grand Rapids, to this city. The company has purchased the buildings formerly occupied by the Dutton Flour Mills at 1026 Scotten avenue. Thomas F. Meek is general manager.

The Detroit Electric Appliance Company has incorporated with a capital stock of $100,000 to engage in the manufacture of electrical and mechanical specialties. George C. Edmunds, W. T. Jones and G. M. McFedries are the principal stockholders.

The Fisher Body Company, manufacturer of automobile bodies, has taken out a permit for the erection of a five-story $20,000 addition to its present plant.

Smith, Hinchman & Grylls, of this city, are taking figures on a large heating plant for the University of Michigan at Ann Arbor. A steel and concrete building 200 x 100 ft. will be erected, and the work includes water softening and coaling plants and a power plant which will be equipped with boilers of 4000 hp. and a 1000-hp. turbine to supply water power. The estimated cost of the improvements is $280,000.

H. C. Hawk, Edward Branson and A. Williams, of Battle Creek, Mich., have organized a company with $5,000 capital stock under the style of the Krinkle Company. Breakfast foods will be manufactured and the factory will be at Walkerville, Ont., across the river from Detroit.

The Aluminum Castings Company has started work on an addition to its present plant on Campau avenue, to cost about $10,000.

The Detroit Creamery Company has increased its capital stock from $600,000 to $800,000. No extensions to the company's plant are contemplated at present, but it is probable that some additions to equipment may be made.

The Detroit Bi-Kar Company has incorporated with a capital stock of $10,000 to manufacture and deal in motorcycles. A. Roseroot, J. J. Berkery and J. J. Chapin are the principal stockholders.

Preparations are being made by the Skalla Furniture Company, Niles, Mich., to rebuild its plant which was almost totally destroyed by fire.

Charles H. Bradford, Armada, Mich., is interested in the establishment of a hoop and stave mill at Port Huron, Mich.

The large power house of the Rapid Motor Vehicle Company at Pontiac, Mich., has been sold to the Pontiac Power Company. The new owner will remodel and enlarge the plant, changing the system from low to high-tension alternating current.

The Hildreth Mfg. Company, Lansing, Mich., manufacturer of gasoline motors and pumps, has increased its capital stock from $75,000 to $112,500.

The American Tool Works, St. Joseph, Mich., is building an addition to its factory, 40 x 40 ft. The company, which manufactures special tools and supplies, reports an excellent volume of business.

E. F. Rouse, Bay City, Mich., is forming a company to be known as the Virginia Equipment Company. A factory has been secured and will be equipped with machinery for the manufacture of dust guards for railway passenger cars.

The Michigan Fibre Box Company, Battle Creek, Mich., is planning to double the capacity of its plant in the near future. Additional machinery will be installed and the scope of manufacture extended.

The Vassar Milk Condensing Company has been organized at Vassar, Mich. A reinforced concrete condensing building will be erected at once.

The village of Millington, Mich., has granted a franchise for electric lighting to Oliver B. Whipple, of Saginaw. A plant will be equipped for operating January 1.

The Summers Fibre Company, Port Huron, Mich., has completed plans involving the expenditure of $50,000 for additions to its plant and equipment. The name of the company is to be changed to the Summers Linen Company. Mattresses and woven goods are the chief products.

The American Corrugating Company, Grand Rapids, Mich., manufacturing corrugated board packing cases, is working to capacity and early next year an enlargement to the plant will be made.

Joseph Van Bogart, Battle Creek, Mich., is establishing a new mill and woodworking factory in that city.

The plant of the Harris Electric Company, Mt. Pleasant, Mich., has been purchased by the Chippewa River Power Company. The new owner has been authorized by the State Railway Commission to bond for $2,000,000 and expects to expend a large sum in new equipment for its various properties.

The Brunswick-Balke-Collender Company, Muskegon, Mich., is making considerable additions to its plant, including an addition to the rubber department, 65 x 65 ft., and two new storage buildings.

The Genesee Coal Mining Company, Flint, Mich., is preparing to develop a large coal deposit near that city.

The Dowagiac Folding Fruit Box Company, Dowagiac, Mich., has been incorporated with a capital stock of $25,000. The company has secured factory quarters and some machinery will probably be required. F. R. Richie and H. E. Agnew are among those interested.

The Baker-Hoekstra Company, Kalamazoo, Mich., manufacturer of confectioners' supplies, has increased its capital stock to $50,000. A large amount of new machinery will be installed, some of which has already been provided for.

The Stearns Salt & Lumber Company, Ludington, Mich., has taken over the property of the Handy Things Company and will reorganize the latter concern under the style of the Handy Things Mfg. Company. Some new woodworking machinery will probably be required.

Negotiations are under way looking to the removal of the Spalding Engine Works from St. Joseph, Mich., to Berrien Springs, Mich. The move is planned to provide for an enlargement of the company's plant.

The Commonwealth Power Company, Jackson, Mich., is remodeling its power plant at Owosso, Mich., and will install three new transformers and considerable other electrical machinery. The company is planning a number of new transmission lines.

The Welch Motor Car Company, Pontiac, Mich., is to push work on the addition to its plant, 40 x 100 ft., which will be used in part as an assembling floor.

Cincinnati

CINCINNATI, OHIO, November 14, 1911.

The usual number of single tool orders are being booked, but the general inquiry is said to be more limited. There are indications that the long-looked-for railroad buying may commence at no distant date. Railroad shops in this vicinity are much busier than they were at this time last month.

The Queen & Crescent Railroad Company's shops at Ludlow, Ky., that have been operating at a limited capacity for quite a period, are now working a complete force and at full time.

The boiler makers report some improvement, with the smaller units in considerably better demand.

The automobile manufacturers are buying practically nothing in the machinery line, but the auto truck builders are reported to be more liberal customers.

The Apprenticeship and Continuation School committee appointed to investigate the apprenticeship question held a meeting at the Business Men's Club No-

vember 9 and discussed a plan that will have an important bearing upon the future training of apprentices and mechanics. It is quite probable that the committee will be able to make its final report at the next meeting in December.

The industrial committee of the Cincinnati Commercial Association has completed arrangements for its fifth annual excursion November 16. The plants of the James Heekin Company, the Charles Boldt Glass Company and the R. K. LeBlond Machine Tool Company will be inspected, and at the latter place a luncheon will be served.

It is rumored that the Francke Lumber Company will soon make some extensive additions to its hardwood plant at St. Barnard, a Cincinnati suburb. The company's headquarters are in Berlin, Germany, but it has a branch office in Cincinnati.

The Kanawah Auto Truck Company, Charleston, W. Va., has been incorporated with $50,000 capital stock by W. S. Roberts, George F. Gates and others. It is understood that the new company will only handle and repair auto trucks just now, but may engage in their manufacture later on.

Some refrigerating equipment will probably be required by the Gem City Abattoir Company, Dayton, Ohio, recently incorporated with $22,000 capital stock. William J. Olt, John Roehm and others are interested in the new company.

A small electric lighting plant will probably be installed by the Lewisburg Lighting Company, recently incorporated with $5,000 capital stock at Lewisburg, Ohio. A. C. Robeson and J. M. Bickel are named among the incorporators.

The Blackburn-Allen Company, recently mentioned, has been incorporated at Dayton, Ohio, with $30,000 capital stock, to manufacture ignition apparatus. W. J. Blackburn and W. J. Allen are named among the incorporators.

The Allyn Engineering Company has moved its general offices from the Lyric Building, Cincinnati, to the office building of the Alvey-Ferguson Company, at Oakley. A branch office will be retained in the Lyric Building.

The Oxy-Acetylene Welding & Cutting Company is a new organization at Dayton, Ohio. Shop quarters have been secured in the Armory Building at Sixth and Canal streets.

The new plant of the Seinsheimer Paper Company on York street, Cincinnati, is nearing completion and will soon be ready for the necessary equipment.

It is reported that Swift & Co., Chicago, have completed plans for the large new concrete storage warehouse to be erected in Cincinnati and that the contract will be let at an early date. The proposed structure will be 75 x 100 ft., four stories.

The Columbus Pump Supply Company, Columbus, Ohio, has increased its capital stock from $10,000 to $15,000.

The Cincinnati Milling Machine Company has moved its general offices from its abandoned Spring Grove avenue shop to its large new plant at Oakley.

The South

LOUISVILLE, KY., November 14, 1911.

A perceptible slowing up in business is observed, although the situation is still generally reported as satisfactory. Fewer inquiries have put in an appearance, and while a good deal of business has been closed it has not as a rule been of large size. As the season is getting on to the point where buyers put off purchases because of the desire to hold down expenses until after the first of the new year arrives, this condition was to have been expected. Attention was called recently in *The Iron Age* to the development of the manual training idea in the South. A good deal of equipment is still being sold in this direction. In Louisville purchases of machinery for the two high schools where manual work is taught are being made constantly.

A blaze in the stove foundry of the Stratton & Terstegge Company, Fifteenth and Main streets, Louisville, caused damage of $10,000. The fire was confined to the department used for making tinware and a good deal of metal working equipment was destroyed. This will have to be replaced and the company will make its purchases in the near future.

The Houser Mfg. Company, 644 East Jefferson street, Louisville, has completed the installation of a nickel-plating department, equipment for which was furnished by the Hanson-Van Winkle Company, Chicago. The Houser company, which makes dental supplies and brass fittings for distillers, moved its plant to Louisville recently from the East. It expects to secure a new building before long, when enlargements will be made.

The Art Brass & Metal Works, which recently took over the plant of the Apex Mfg. Company, Louisville, has installed some brass working machinery.

The Red Chief Mfg. Company, Louisville, which recently increased its capital stock, has been making some improvements in its plant. It manufactures corn shellers.

F. A. Crush & Co., 1036 Everett avenue, Louisville, are marketing to the mill supply trade a cast iron rack for holding sheet rubber packing. It will be made by contract at first, as the concern has no immediate plans for building a plant.

The Louisville Gas Company is building a new power house and has let a contract for the installation of a 520-hp. Babcock & Wilcox boiler, with Ross automatic stokers. The company will let a contract this week for the installation of coal hoppers and conveying machinery.

The Dow Wire & Iron Works, Louisville, is erecting an additional storage warehouse for handling bar iron and other materials.

Caldwell & Drake, contractors for the new 11-story hotel, the Henry Watterson, in Louisville, are expected to announce shortly when a contract will be let for the power plant, refrigerating equipment and other machinery items.

The Falls City Construction Company, Louisville, has been awarded a contract for a court house and jail at Jonesboro, La. A heating plant is to be sublet.

The Board of Education, Louisville, is in the market for a $500 metal working lathe to be installed in the forging department of the Manual Training High School. Bids close November 24. Sam D. Jones is business director of the board.

The Marine Electric Company, Louisville, has inporporated with $5,000 capital stock for the purpose of operating a machine shop for electrical repairs. C. E. Thirwell, H. A. Tepel and C. G. Thirwell are the incorporators.

The Continental Car & Equipment Company, Louisville, has developed a 3½-ton electric truck following recent experiments along this line. The truck has been sent to New York to McKinley Boyle, president of the company. It has not yet been decided whether to manufacture the truck in Louisville or New York.

The Louisville Hospital Commission is advertising for bids on the new city hospital plant of five buildings, not including the power house, at an estimated cost of $800,000. Bids will be opened January 4. The hospital will require a power plant and elevators. D. X. Murphy & Bro., Louisville, are the architects.

Madisonville, Ky., voted in favor of issuing bonds for the erection of a water works system. Plans for the construction of a plant will be taken up at once.

The Henderson, Ky., Tobacco Extract Works plans to erect an addition to its factory, with new equipment.

The Black Mountain Coal Company, Barbourville, Ky., recently organized, plans immediate development work. Dr. Samuel Bennett is in charge of the company's operations.

Ashland, Ky., has under consideration plans for the purchase of the water works plant owned and operated by a private corporation and the expenditure of $75,000 for the installation of new equipment in the pumping station.

Russellville, Ky., has abandoned the project to build a water works system.

The Silverman Auto Company, Grand Rapids, Mich., is receiving bids through Pierre Lindhout, 718 Ashton Building, for a two-story and basement factory building 50 x 100 ft., of brick and mill construction, to cost approximately $10,000. No machinery requirements are announced as yet.

The capital stock of the Dominion Iron Works, of Bristol, Tenn., has been increased to $150,000.

A stone crushing plant of considerable proportions is to be build at Cleveland, Tenn., by Rymer Bros.

The Culleoka Produce Company, Culleoka, Tenn., near Columbia, is planning the erection of a packing plant.

Columbia, S. C., will install an additional pump in the municipal water plant.

The Atlantic Coal & Ice Corporation, Atlanta, Ga., will erect a cold storage plant for handling fruit. Refrigerating machinery will be purchased and the company expects to expend in the neighborhood of $50,000.

The Oriskany Ore & Iron Company, S. L. Parish, president, is reported to be planning the erection of a blast furnace at Reusens, near Lynchburg, Va.

New York capital is reported to be interested in the consolidation of traction properties at Tulsa and Sapulpa, Okla., with the intention of connecting the towns by interurban lines. J. W. Orr, of Tulsa, and R. V.

Miller, of Sapulpa, are among those interested in the project.

James L. George, Memphis, Tenn., has purchased an electric light plant at Earle, Ark., a municipal franchise for its operation having been awarded him. The capacity of the plant will be doubled and an ice factory erected adjoining it.

D. Frank Clarke, Charles Clarke, J. Milton Clarke and others will erect a large sawmill at Melbourne, Fla., for the development of a large acreage of cypress and yellow pine timber in Brevard and Osceola counties in that State.

The Southern Mfg. Company, Gadsden, Ala., the plant of which was destroyed by fire several months ago, will be rebuilt in the immediate future.

R. A. Mitchell, president of the Alabama Power Company, Gadsden, Ala., is reported as announcing the erection of a hydroelectric plant at Talladega on the Little River, in Alabama. The survey for the plant has been completed and work is to be begun at once.

The Virginia Aerial Mfg. Company, Richmond, Va., has been incorporated with $100,000 capital stock to manufacture devices for aeroplanes. The company has leased a factory site and is having plans prepared for a building and testing out plant. The incorporators are John C. Hagan, James D. Patton, A. L. Johnston, Jr., W. S. Forbes and G. Johnston.

The National Spring Bed Company, Norfolk, Va., has been incorporated with $10,000 capital stock to manufacture beds, cots, couches, etc. The company has in course of erection a three-story building 30 x 100 ft., which is expected to be ready for occupancy in about three weeks. The equipment required includes one power punch press for working angle iron, one power hack saw, one power bed stretcher, one emery stand, one weaving machine and a quantity of pulleys, shafting, belting, etc. Catalogues and descriptive matter are desired.

The Board of Aldermen of Obion, Tenn., will receive bids until November 21 for constructing and equipping a water works system. C. H. Jenks, Union City, Tenn., is the engineer in charge.

The Paxton Lumber Company, Bristol, Va.-Tenn., is in the market for electric motors and desires quotations on 5, 7, 10 and 15-hp. for alternating current, 220 voltage, three phase, 60 cycle.

Indianapolis

INDIANAPOLIS, IND., November 14, 1911.

The Oolitic Stone Mills Company, Bloomington, Ind., has increased its capital stock from $10,000 to $20,000.

The Sheridan Water, Heat & Light Company, Sheridan, Ind., has been incorporated with $100,000 capital stock, to furnish electric light and power. The directors are J. L. Vickery, J. A. Branson and P. Weaver.

The Bucyrus-Vulcan Steam Shovel Works will complete its new plant at Evansville, Ind., about the first of the year. About 1000 workmen will be employed there.

The Remy Electric Company, Anderson, Ind., has bought the R. C. Peters Company's headlight plant at Grand Rapids, Mich., and the equipment will be removed to Anderson, where a brick building is being erected 60 x 120 ft. to accommodate it.

The International Metal Polish Company, Indianapolis, which recently incorporated, has begun work on a new fireproof building 80 x 100 ft., two stories, to cost about $25,000.

St. Louis

ST. LOUIS, MO., November 13, 1911.

Conditions in the machine tool market continue to show the same general improvement that has been noted in recent weeks, but there has been no accentuated gain in business, such as to presage any very large developments. The reports coming from the Southwestern territory in conjunction with inquiries for tools are of a very favorable character considered from the minor standpoint and the belief is that were political and trust-busting conditions different the increase in business would be very marked.

The United Drug Company, Boston, Mass., which recently established a branch in St. Louis, has decided to equip a plant here for the manufacture of candy, another for rubber goods and a third for stationery. Considerable mechanical equipment will be required.

The re-opening of the big plant of the American Car & Foundry Company, at Madison, Ill., has brought about a large increase in the force at the Helmbacher Forge & Rolling Mills which supplies much of the material required.

The Koken Barber Supply Company, St. Louis, is having plans drawn for a six-story factory 110 x 145 ft., which will more than double the company's present capacity. It will be equipped for the manufacture of barber chairs and other supplies of like type. The equipped factory will cost $200,000.

The Eagle Aerial Mfg. Company, with $100,000 capital stock, has been incorporated in St. Louis for the manufacture of a new type of aeroplane and aeroplane supplies. The incorporators are Thomas H. Keppel, Robert F. Jeese, Jesse E. Keppel, Joseph Van Raalte, H. G. Lind and Lionel Davis.

The Illinois Dredging & Construction Company, with $100,000 capital stock, has been incorporated in East St. Louis by B. A. Campbell, C. H. F. G. Heinfeiden and W. H. Hebenstreidt and is in the market for heavy equipment for use in dredging and similar work.

H. Pauk & Sons Mfg. Company has purchased a five-story factory building in St. Louis which it will utilize as an extension of its show case factory as soon as it can be prepared and mechanical equipment installed.

The New System Plow & Planter Company, Alton, Ill., recently sold out because of internal and financial troubles, is to be reorganized and operations resumed with additional equipment.

The Rukes Steel Barrel & Welding Company, Kansas City, Mo., has been incorporated with $15,000 capital stock and will equip a plant for the manufacture of a patented device. The incorporators are C. F. Rukes, Walter J. Scafe and Gustav Geis.

The Paris Auto Starter Company, Paris, Ill., has been incorporated with $10,000 capital stock by Frank C. Fishback, E. B. Brooks and Paul P. Shutt for the manufacture of a self-cranking device for automobiles. A manufacturing plant will be equipped.

The McRee Green Mfg. Company, with $50,000 capital stock, has been incorporated in St. Louis by McRee Green, H. W. Chandler and O. M. Green and will equip a factory for the manufacture of metal weather strips, screens, etc.

The Superior Shoe Mfg. Company, St. Louis, has been incorporated by Rudy E. Bloch, O. Burg and J. L. Kohner, with $30,000 capital stock, and will at once equip a factory for the manufacture of shoes. A building has been leased for the purpose. It will employ 150 hands.

The Curtis Jack & Truck Company, with $75,000 capital stock, has been incorporated in St. Louis by J. R. Curtis, H. C. Flunker, A. W. Smith, Otto Stifel and George E. Booth. A plant will be equipped for the manufacture of a combination jack and hand truck for the handling of automobiles.

The Buchanan Mfg. Company, Eldorado, Ill., has been incorporated with $15,000 capital stock and will equip a factory for the manufacture of wire fence stretchers.

The H. D. E. Peterson Mfg. Company, Elgin, Ill., has been incorporated with $25,000 capital stock by H. D. E. Peterson, Albert Fehrman and Julius G. Peterson and will equip a plant for a general foundry and manufacturing business.

The National Rubber Company, headed by Eugene Swarzwald, of St. Louis, has acquired the plant of the St. Louis Electric Heating Company, sold under bankruptcy proceedings, and will equip the buildings for the manufacture of rubber paints and other waterproofing liquids.

The Glenolden Furnace Company, with $50,000 capital stock, has been incorporated in St. Louis by Charles, Robert and James Adams and will establish a factory for the manufacture of heating furnaces.

The Automatic Register Company, East St. Louis, Ill., manufacturer of a device for automatically registering the number of passengers entering a car and the number of miles traveled by each, is arranging for the enlargement of its plant within the near future, at an expenditure of about $125,000. The company has had its register tested on the Illinois Traction System, which is now planning to equip a number of its cars with the apparatus.

The Moon Motor Car Company, St. Louis, will build an addition to its factory at a cost of $6,000.

The Monarch Metal Weather Strip Company, St. Louis, has purchased a site upon which a two-story factory building to cost $14,000 will be erected.

The Russellville Water & Light Company, Russellville, Ark., will receive bids until November 20 for furnishing material and constructing a water works system in that city. The equipment includes two 500,000-gal. per day motor-driven turbine pumps, two 30-hp., 220-volt, three-phase, 60-cycle, induction motors, pump station, reservoir, cast-iron pipe, valves, boxes, hydrants, etc.

Texas

AUSTIN, TEXAS, November 13, 1911.

The cotton-holding movement is beginning to have a telling effect upon various lines of business in Texas. The large volume of money that is usually found in the channels of trade at this season of the year when the cotton crop is large and good prices prevail is noticeably absent just now. This condition is not felt as much by dealers in machinery as it is by merchants and others who are dependent directly upon the cotton grower for a large share of their revenue, but it naturally is having more or less bad effect upon the former branch of business.

The National Food Company has let the contract for the erection of a new factory at Decatur. It will be equipped with new and modern machinery for the manufacture of various kinds of food products.

The Commercial Club, of Tioga, is promoting the construction of a complete sewer system and also the installation of an electric light plant.

J. T. Sanderson, Clarksburg, W. Va., is promoting the organization of a company with a capital stock of $250,000 to establish a large woolen mill at San Angelo, Texas. One of the great inducements for the proposed industry is that there is annually concentrated at that place more than 4,000,000 lb. of wool.

Plans have been drawn and approved for the construction of a 15-ft. dam across the Colorado River near Austin and the installation of a small hydroelectric plant for the purpose of irrigating several thousand acres of land and furnishing power for the operation of the machinery of the farmers of that section. Those interested in the enterprise are D. B. Matthews, Charles Jones and Goodwin Jones. J. C. Dumont is the engineer. There will be about $50,000 invested in the enterprise.

The Kenedy Light & Power Company has just finished the installation of an electric light and power plant at Kenedy.

The City Council of Kenedy has under consideration the installing of a waterworks plant and sewer system.

The Athens Pottery Company, which was recently formed at Athens with a capital stock of $100,000, has taken over the pottery manufacturing plants of P. E. Miller at that place and of the Winfield Pottery Company near Winfield. The new company will install machinery and greatly enlarge the two plants.

The Intermittent Vacuum Pre-cooling Company, of Wilmington, Del., has been awarded the contract for installing a pre-cooling plant at San Benito, Texas, at a cost of about $100,000. The plant will have a daily capacity of about 50 cars. S. A. Robertson, of San Benito, and associates are interested in the project.

Womack & Nelms are installing a new dynamo and other machinery in their electric light and power plant at Caldwell.

The cotton gin of P. H. McCormick and associates at El Dorado, which was destroyed by fire recently, will be rebuilt.

The Payne-Parsley Machine & Mfg. Company will reconstruct their cotton-chopping machine factory at Crockett, which was recently destroyed by fire. It will be considerably larger than the original plant.

Oscar Pacius, of Sanderson, and associates will erect a factory at Alpine for the manufacture of wax from the candelilla plant. The people of Alpine have donated the site of the proposed industry. Mr. Pacius and associates recently finished a similar factory at Sanderson.

The Trinity Compress & Gin Company has been formed at Trinity with a capital stock of $25,000. The incorporators are W. A. Bell, J. B. Gibson, J. C. Mansell and others.

The Navidad Mining Company has made application to the Department of Fomento of the Federal Government for a concession to install a hydroelectric plant upon the Navidad River near Iztlan, state of Oaxaca, Mexico. It will construct a dam across the river to obtain the initial power and will build a power transmission line from the plant to its mine.

The Commonwealth Mining Company is having plans prepared for a 300-ton mill that it will install at its Commonwealth mine at Pearce, Ariz.

J. F. Orosco will install a mill upon his group of mines near Mount Hopkins, Ariz.

The American Exploration & Mining Company will install a 50-ton cyanide plant at its mine near Steeple Rock, N. M.

The San Juan Mining Company will install a 200-ton reduction mill at its San Juan mine in the Taviche district, state of Oaxaca, Mexico.

The Alfarina Mining Company will install considerable machinery at its mine at Santa Barbara, state of Chihuahua, Mexico. Frank Morehouse is general manager.

The El Carmen Mining Company will install a large reduction mill at its mine at Santa Barbara, Mexico. S. C. Alley is manager.

El Rayo Mining & Development Company, of Santa Barbara, state of Chihuahua, Mexico, will install two cable tramways at its property. James S. Colbath is manager.

At Corpus Christi plans are under way for a new water works to cost $250,000.

The Hamlin Electric Light, Heat & Power Company, with a preliminary capital stock of $10,000, has been incorporated by W. W. Johnson, W. S. Whaley and Clinton Fraser, at Hamlin, Texas, for the purpose of putting in a plant for municipal and private service.

The Pacific Coast

PORTLAND, ORE., November 9, 1911.

Inquiry for tools of the heavier types is almost entirely lacking. The larger shops of this territory require little new equipment at present, and while there is a fairly steady demand for small equipment the total volume of sales is light as compared with any of the Eastern trade centers. The railroads have been keeping out of the market of late, though the rapid extension of lines in Oregon and Washington will doubtless require considerable increase in the capacity of railroad shops during the next few years. The largest shop equipment in immediate prospect is that of the Berlin Machine Works, but as work is just being started on the buildings it will be some time before the machinery can be installed and the orders will probably be placed with Eastern manufacturers direct.

It is understood that a suit for foreclosure filed against the Moran Company, Seattle, Wash., by Bertram, Griscom & Jenks, of New York, is intended to bring about a reorganization and that additional capital will be invested for the construction of a large dry dock. It is considered doubtful, however, whether any material addition will be made to the shop equipment.

Logging, sawmill and woodworking machinery is rather quiet at the moment, but there is considerable inquiry and a general buying movement is expected during the coming month. Most of the mills in Oregon and Washington will be closed for repairs for 30 days beginning December 15 and advantage will be taken of the closed season for the installation of many needed improvements. This will also give an opportunity to dispose of the stocks on hand and the lumber interests anticipate an extremely busy season. The exportation of machinery to China, which has developed rapidly for the last few years, has been temporarily interrupted, though there is still a fair movement to Japan.

A number of sand and gravel firms operating on the Willamette and Columbia rivers are preparing to increase their equipment and orders are expected for considerable dredging machinery, as well as barges, etc.

The Pacific Bridge Company, Portland, is having plans drawn for a large clamshell dredge.

C. G. Fuller is building on Fifth street, Eltopia, Wash., a new blacksmith and machine shop.

It is reported that the Powell River Pulp & Paper Company, which has just completed a large plant on Powell River, B. C., will double its capacity.

The Ogle Mountain Mining Company, of which J. B. Fairclough, Oregon City, Ore., is president, contemplates the installation of new machinery at an expenditure of about $100,000.

The Oriole Gold Mining Company, Grants Pass, Ore., is preparing to install a 50-ton ore mill.

The plant of the Imperial Powder Company at Chehalis, Wash., which was recently destroyed by fire, will be replaced immediately. The company is also figuring on installing a factory near Medford, Ore.

The Dalles, Ore., Lumber & Logging Company will make extensive improvements in its mill immediately after the first of the year. New band saws will be installed, replacing circular saws.

The power plant of the Schwager & Nettleton lumber mill, near Seattle, Wash., which was recently destroyed by fire, will be replaced shortly. The plant destroyed was valued at $25,000.

Fred L. Webster, coast manager for the Allis-Chalmers Company, with headquarters at San Francisco, is visiting the northern offices.

The Atlas Gas Engine Works, Oakland, Cal., has leased a site at the foot of Twentieth avenue, in that city, where a new plant will be erected at once.

The Natomas Consolidated of California is preparing to replace its $250,000 gold dredge near Folsom, Cal., which was recently destroyed by fire. Bucyrus

machinery is used in all this company's dredges.

The Pacific Gas & Electric Company, Sacramento, Cal., has authorized the issuance of bonds to the amount of $3,000,000 to provide for the improvement and extension of its hydroelectric power system.

The Pacific Sewer Pipe Company, Los Angeles, Cal., is planning to add to its five plants already in operation a sixth which will cost $350,000.

The Enterprise Foundry Company, San Francisco, Cal., has purchased a 20-acre site at Richmond, Cal., and will soon begin the erection of buildings for a new plant. A large force will be employed.

Western Canada

WINNIPEG, MAN., November 11, 1911.

Three of the industries of Medicine Hat, Alberta, have announced their intentions of enlarging their capacity in the spring. The Alberta Clay Products Company will expend $175,000 in new buildings, the Medicine Hat Milling Company, $60,000, and the sash and door factory, $50,000.

At a meeting of the City Council of Battleford, Sask., last week it was decided to submit a supplementary by-law to the ratepayers providing for a further issue of $100,000 for waterworks and sewers.

A considerable amount of money is being spent by the City Council of Prince Rupert, B. C., this year on improvements. The new waterworks system is estimated to cost $550,000. About $100,000 of this will be spent this year.

About $200,000 will be expended by the Coal & Ore Docks Company on its plant at Port Arthur, Ont., this winter. Besides a great enlargement of the yard and storage ground, additional equipment for screening and sorting will be provided.

Frank V. Samwell, Guelph, Ont., is promoting a company with $500,000 capital stock to build and operate a plant at Fort William, Ont., for the manufacture of wrought iron pipes. The terms the City Council of the latter municipality has agreed to in this connection will come up for ratification by the ratepayers in the January elections. The City Council agrees to give the company a site of 15 acres, with a 500-ft. frontage on the water, and to loan the company $100,000 and give it exemption from all taxes but those on school account.

It is announced that the Pella Stacker Company, Pella, Iowa, will locate a Canadian branch of its industry at Port Arthur, Ont. The sum of $45,000 is to be expended on land and buildings. The construction of the factory is to be begun in the spring.

The Giant Powder Company is understood to have made arrangements for the transfer of its present works at Telegraph Bay, on Vancouver Island to Nanoose Bay, a short distance from Comox. Nanoose Bay is the terminal point on the East Coast of the Island for the Canadian Pacific Railway system.

The Taylor Milling & Elevator Company is about to build in Nelson, B. C., the largest wheat elevator in that province and also a flour mill of large capacity.

The Western Dry Docks Shipbuilding Company, Port Arthur, Ont., has the contract to build a large package freight steamer for J. W. Norcross, Toronto.

The B. C. Marine Railway Company will construct at its plant in Esquimault, B. C., a steel screw steamer for the Canadian Pacific Railway Company.

The large penstock at the Powell River Pulp & Paper Company's plant, Powell River, B. C., collapsed some days ago and has delayed the beginning of manufacturing operations there for a short time.

Webb & Gifford have erected a machine shop in New Westminster, B. C.

The Llewellyn Iron Works, of Seattle, has opened an office in Vancouver, B. C.

By-laws are to be submitted to the ratepayers of Moose Jaw to raise money for extending the fire alarm system by an outlay of $17,000 and for enlarging the waterworks by an outlay of $550,000.

The B. C. Hydraulic Company, Victoria, B. C., has offered to install a street railway in Manaimo, B. C., provided the council guarantees interest on the bonds issued.

The Quinlan-Carter Construction Company is moving its plant from Glenbow to Calgary, Alberta.

A building site has been purchased for the Western Canada Foundry Company in Calgary, Alberta. Works are to be erected at an estimated cost of $250,000.

The Canada Life Insurance Company, Toronto, has purchased in Calgary a site on which it proposes to put up an office building to cost $200,000.

Up to December 15 tenders will be received by the Mayor of Neepawa, Man., for the following: Pump house and filter room, water tower, cast-iron water pipes, gate valves, fire hydrants, etc., mechanical filters, pumping machinery, dam, intake and reservoir, wooden stave pipes, sewer pipes, laying conduit and sewage disposal works.

The Renfrew Lumber Company is proposing to build a saw mill on Silver Creek near Hope, B. C.

The Nicola Valley Meat Company is calling for tenders for the erection and equipment at Merritt, B. C., for the cold storage plant to cost $15,000.

The McLaughlin Carriage Company, Oshawa, is erecting in Saskatoon, Sask., a garage and warehouse to cost $60,000.

It is announced that the Carson Creamery Company will construct a plant at Winnipeg to cost $250,000.

Eastern Canada

TORONTO, ONT., November 13, 1911.

Manufacturers are busy and most of them have work for months ahead. Good weather has favored them, as it has enabled many outdoor activities that figure largely in the demand for plant and equipment to continue their operations. The movement of the crop keeps a large fund of money engaged, but manufacturers are not incommoded on that account. The Dominion Steel Corporation has advance orders for rails that will keep its plant busy until next summer.

The City Council of Toronto proposes to submit to the ratepayers a by-law to raise $1,500,000 more to be expended on the municipal hydroelectric system.

It is announced by the Mines Department at Ottawa that J. M. Shuttleworth, of Brantford, and associate manufacturers have contracted with the government to continue the work at Alfred, and will spend over $500,000 in trying an improved Anrep peat machine. The machine will have a capacity of 60 to 80 tons per day, as compared with the 30 tons the government machine turned out. It will be in operation next spring, working double shifts of 20 hours for 110 days. The power for driving the machinery and for lighting the field at night will all be derived from peat, hence the plant will be self-contained.

The National Brick Mfg. Company is constructing a plant at Delson Junction, near La Prairie, Que. The cost of the buildings and machinery will be about $500,000.

The Standard Quarries, Ltd., Montreal, has just bought from Mussens, Ltd., a new crushing plant of 1000 tons per day.

The award of the contract for building the dry dock for Vicars, Sons & Maxim at Montreal is to be announced in a few days, the tenders having been opened this week. The estimated cost of the work is $5,000,000.

The town of Owen Sound, Ont., has under consideration a project for the building of a street railroad.

The municipal corporation of Plaisance, Que., proposes to build a steel bridge over the Nation River.

The following tenders were received by the City Council of Toronto for the construction of its projected subway: Pearson & Co., New York, $5,000,000; Patrick McGovern, Boston, $3,840,000; Coleman Bros., Boston, $3,840,000; Nawn Contracting Company, Boston, $3,628,857; E. E. Smith & Co., New York, $3,613,000; Larkin & Sangster, St. Catharines, $3,509,000; James Stewart & Co., New York, $2,924,000; F. F. Cranforth, Brooklyn, $2,856,000; H. J. Haney & Co., Toronto, $2,600,000; five other tenders, among whom were A. M. Orpen & Co. and J. H. McKnight & Co., local firms.

The ratepayers of Three Rivers, Que., have approved the by-law to provide electric cars for the local street railroad at a cost of $800,000.

The contract for the electrical installation required to operate the new bascule bridge at Quebec, Que., will be let in a few days.

The Norton Company, Chippewa, Ont., will double its plant in the spring. It manufactures grinding wheels.

The Mayor of Hamilton will receive during the next two months sealed proposals for bids to supply the following classes of material for the distribution plant of the city's hydroelectric system:

A.—Substation buildings, heating, lighting, plumbing, etc., for same.
B.—Station equipment, including transformers, switches, switch boards, lightning arresters, instruments, oil tanks and other appurtenances.
C.—Wood poles, cross arms, pins, sideblocks, braces, insulators, machine bolts, lag screws, brackets, anchors, pole steps, guy wires, etc.
D.—Reinforced concrete poles, conduits, conduit, steel reinforcing, cross arms and castings.
E.—Underground conduit system construction, including cable racks, manhole and hand hole castings, structural steel, fuse pillars and castings.
F.—Conduit ducts (tile, fibre or other system for underground distribution).

G.—Weatherproof and rubber covered copper and aluminum solid and stranded wire, lead encased cables and installation of same, distribution boxes, pot heads and connectors.

H.—Line transformers, meters, cutouts and devices, lamps, wiring supplies or other appliance, device, apparatus or material entering into the construction and equipment as above mentioned.

I.—Printing, stationery, office systems, and books of account and

The Fredericktown Nutlock Company, Fredericktown, Ont., is applying for incorporation.

The Laidlaw Bail Tie Company, Hamilton, Ont., is preparing to erect a wire-nail factory.

The Canadian Drawn Steel Company, Hamilton, Ont., is making a large addition to its factory.

The I X L Ladder Company, Montreal, has applied to the Council of Longeuil, Que., for concessions for the erection of a factory.

The Hamilton Bridge Works Company, Hamilton, Ont., has had plans prepared for the construction of a factory to cost $30,000.

The Gillette Safety Razor Company, of Canada, is putting up a factory in Montreal to cost $112,000.

G. J. Foy is building an office and warehouse in Toronto to cost $75,000.

The T. Eaton Company is erecting a factory in Toronto to cost $35,000.

A warehouse to cost $40,000 is being built in Toronto for the E. B. Eddy Company, Hull, Que.

It is stated that the White Chicle Company will erect a plant at Niagara Falls, Ont.

The Guelph Stove Company, Guelph, Ont., is contemplating an enlargement of its plant.

The Canadian Canners, Ltd., is negotiating for the erection of a large factory at Forest, Ont.

The Leather Label Overall Company, Windsor, Ont., is erecting a new plant.

Canadian Motors, Ltd., has begun the erection of its factory in Galt, Ont.

Grant, Holden & Graham, Ltd., capital $100,000, are about to start the construction of works in Ottawa for the manufacture of tents, awnings, etc.

The Canadian Northern Railway Company has arranged for the building of shops in Quebec at a cost of $200,000.

The Edwardsburg Starch Company, Cardinal, Ont., has completed plans for the enlargement of its plant which will double its capacity. Charles Knoll is consulting engineer and superintendent.

The American Gasket Company has established a Canadian branch plant with office in the Review block at Bridgeburg, Ont., opposite Buffalo.

The Hamilton Gas Mantle Company has been incorporated at Hamilton, Ont., with a capital stock of $40,000 and has arranged for a factory for making gas mantles. Jos. Herzog is superintendent.

The Montrose Paper Company, Thorold, Ont., is completing plans for a two-story addition to be made to its factory.

The Dominion Axle & Forge Company, Ltd., Guelph, Ont., recently chartered, has commenced construction of its factory.

Government Purchases

WASHINGTON, D. C., November 13, 1911.

The Paymaster General, Navy Department, Washington, will open bids November 28, under schedule 4069, for one 1½-in. bolt and rivet forging machine and four portable pneumatic geared hoists, and under schedule 4070 for two tool hardening furnaces.

The Bureau of Supplies and Accounts, Navy Department, Washington, will open bids December 12, under schedule 4071, for furnishing and installing electric traveling crane at Mare Island, Cal.; schedule 4073, for two oil burning portable furnaces; schedule 4072, for one electric motor truck.

The Department of the Interior, Washington, will open bids November 21 for furnishing and erecting an acetylene gas lighting plant at the Yakima Indian School, Washington.

The light house inspector, Third district, Tompkinsville, N. Y., opened bids October 30 for installing electrical apparatus in light house tender Iris, as follows: Kelting Electric Company, New York, $1,138.52; Charles Cory & Sons, New York, $1,260; Joseph Barry & Co., New York, $1,300; Griscom-Spencer Company, New York, $2,713; Casey-Naser Electric Company, New York, $1,345; Smith-Meeker Engineering Company, New York, $1,454.

The light house inspector, Fifth district, Baltimore, Md., opened bids October 30 for removing old boilers and furnishing and installing new boilers and oil engine air compressing plant on light vessel No. 52 as follows: Skinner Shipbuilding & Dry Dock Company, Baltimore, Md., $7,900; McIntyre & Henderson, Baltimore, $8,750; Chesapeake Marine Railway Company, Baltimore, $9,147; Spedden Shipbuilding Company, Baltimore, $9,999.75.

The Bureau of Supplies and Accounts, Navy Department, Washington, opened bids October 31 for material and supplies for the navy yards as follows:

Schedule 4004, class 111, for band saw sharpener, band saw stretcher, combination automatic for hand lap grinder.—Bidder 10, Baldwin, Tuthill & Bolton, Grand Rapids, Mich., $790.75 and $786.40; 40, Chicago Machinery Exchange, Chicago, Ill., $949.20; 72, J. A. Fay & Egan Company, Cincinnati, Ohio, $765.75; 75, Frevert Machinery Company, New York, $790.75; 91, Hanchette Swage Works, Big Rapids, Mich., $805.05; 109, E. F. Kerwan & Co., Baltimore, Md., $531; 111, Kemp Machinery Company, Baltimore, Md., $761.75; 133, Manning, Maxwell & Moore, New York, $798.50 and $813.

Schedule 4005, Class 121, one set pneumatic flanging clamps—Bidder 96, Hilles & Jones Company, Wilmington, Del., $522; 142, Niles-Bement-Pond Company, New York, $795; 169, Joseph T. Ryerson, & Son, New York, $780; 170, Scully Steel & Iron Company, Chicago, Ill., $456; 209, Wickes Bros., Saginaw, Mich., $797 and $882.

Class 122, one rapid action punch and riveter.—Bidder 57, Covington Machine Company, Covington, Va., $1,050; 74, Ferracute Machinery Company, Bridgeton, N. J., $1,790; 96, Hilles & Jones Company, Wilmington, Del., $1,248; 111, Kemp Machinery Company, Baltimore, Md., $1,030; 145, George A. Ohl & Co., Newark, N. J., $1,975; 169, Joseph T. Ryerson & Son, New York, $1,327; 170, Scully Steel & Iron Company, Chicago, Ill., $1,297; 188, Toledo Machine Tool Company, Toledo, Ohio, $1,176.25; 209, Wickes Bros., Saginaw, Mich., $1,385.

New Tools and Appliances

This is essentially a news department for which information is invited.

Tool Holders.—Goose-neck construction characterizes a new line of tool holders that has been recently brought out by the Superior Machine Tool Company, Kokomo, Ind. These tool holders are drop-forged from steel, machined and case-hardened and are said to combine strength with resiliency on account of their special construction. Another advantage claimed for the holders is that they avoid all chatter and breaking of blades or cutters. Two types of holder are made, one for cutting-off tools and the other for threading tools. Two sizes of holders are made, one having a ½ x 1⅛ in. shank, and a ¾-in. blade, while the other size has a ⅝ x 1¼ in. shank and a ⅞-in. blade. The cutters for the threading tools are made of high-speed steel and can be furnished for the U. S. standard or the V-threads.

Vacuum-Pot.—Simplicity, close regulation and positive prevention of leaky valves are the special features claimed by a new type of quick-acting vacuum pot invented by Fred B. Miller, 147 Fourth street, Milwaukee, Wis. In operation when the plunger is released air which has been taken in through the air valve is discharged through an adjustable check valve. When the plunger drops the piston takes the thrust without jar by reason of the air cushion and the spring on its lower side. The air valve can be adjusted to increase or diminish the amount of air taken into the cylinder to suit the spring, which is adjusted by a screw.

Gauges.—W. H. Nichols, Waltham, Mass., has recently developed several new types of external and internal gauges. One of these is a thread gauge, in which provision has been made for adjusting the ring as well as the plug within reasonable limits. These gauges are made up to several inches in diameter and the plug consists of a disk threaded upon the periphery, split at six equi-distant points and mounted on a handle which is tapered at the end to fit a hole of corresponding taper in the disk. Although a reasonable amount of adjustment of the gauge is permitted by the taper fit, provision is made to prevent careless or unintentional adjustment due to dropping on the floor or other similar causes. Among the other gauges are included short cylindrical plugs for testing holes that are being ground. The plugs are mounted on very short handles and in using them the grinding wheel is run back only a short distance, since a small amount of space is all that is required to admit the gauge to the mouth of the work. The rings of the larger sizes can be reground, if necessary, to some smaller size after they have become worn. Another gauge is of the taper plug and ring type, with the former cut to less than half the usual length. This gauge is intended for comparatively shallow holes which are made to the standard taper and do not require the regular length of gauge. For testing annular ball races and similar work an internal gauge has been made which carries a pair of spherical contact points at the short end of the lever while the jaws at the opposite end are lapped to close when the gauging points are to a certain diameter. When using this gauge the device is slipped into the work and the gauging jaws open until they are in contact with the interior of the piece. If the work is the proper size the outer jaws will just come in contact with each other.

Current Metal Prices.

The following quotations are for small lots, New York. Wholesale prices, at which large lots only can be bought, are given elsewhere in our weekly market report

IRON AND STEEL—

Bar Iron from Store—

Refined iron:
1 to 1⅞ in. round and square ... ₡ lb 1.70¢
1½ to 4 in. x ⅜ to 1 in. ... ₡ lb 1.80¢
1½ to 4 in. x ¼ to 0.4 in. ... ₡ lb 1.80¢
Rounds ⅜ and 11-16 r nd and square ₡ lb 1.80¢
Angles: Cts. ₡ lb.
3 in. x ¼ in. and larger ... 1.80¢
3 in. x 5-16 in. and ⅜ in. ... 2.20¢
1¾ to 2¼ in. x ⅛ in. ... 1.95¢
1½ to 2¼ in. x 5-16 in. and thicker ... 1.85¢
1 to 1¼ in. x 5-16 in. ... 1.95¢
1 to 1¼ in. x ⅛ in. ... 2.00¢
⅞ x ⅛ in. ... 2.10¢
¾ x ⅛ in. ... 2.15¢
⅝ in. x ⅛ in. ... 3.55¢
1 x 3-32 in. ... 3.40¢
Tees:
1 in. ... 2.25¢
1¼ in. ... 2.10¢
1½ to 2¼ x ¼ in. ... 1.80¢
1½ to 2¼ x 5-16 in. ... 2.00¢
3 in. and larger ... 1.85¢
Beams ... 1.80¢
Channels, 3 in. and larger ... 1.80¢
Bands, 1½ to 6 x 6-16 to No. 8 ... 2.00¢
Burden's "H. B. & S." iron base price ... 2.95¢
"Jordon's Best" iron, base price ... 3.15¢
Norway bars ... 3.60¢

Merchant Steel from Store—

per lb

Bessemer machinery ... 1.70¢
Tire cark, tire and sleigh shoe ... 2.50@3.00¢
Best cast steel, base price in small lots ... 7¢

Sheets from Store—

	Black one-pass C. R. soft steel.	Black R. G. annealed.
No. 16	₡ lb 2.55¢	2.75¢
Nos. 18 to 20	₡ lb 2.40¢	2.85¢
Nos. 22 and 24	₡ lb 2.45¢	2.95¢
No. 26	₡ lb 2.50¢	3.05¢
No. 28	₡ lb 2.85¢	3.30¢

Russia, Planished, &c.

Genuine Russia, according to assortment ... ₡ lb 12 @14½
Patent jointed W. Dewees Wood ... ₡ lb A. 10¢; B. 9¢ net

Galvanized

Nos. 12 and 14 ... ₡ lb 2.65¢
No. 24 ... ₡ lb 3.00¢
No. 26 ... ₡ lb 3.20¢
No. 28 ... ₡ lb 3.50¢
No 20 and lighter 36 inches wide, 25¢ higher.

Genuine Iron Sheets—

Galvanized

Nos. 22 and 24 ... ₡ lb 5.50¢
No. 26 ... ₡ lb 6.00¢
No. 28 ... ₡ lb 7.00¢

Corrugated Roofing—

2½ in. corrugated.	Painted.	Galvd.
No. 24 ₡ 100 sq. ft.	$3.75	$4.70
No. 26 ₡ 100 sq. ft.	2 85	3.90
No. 28 ₡ 100 sq. ft.	2.50	3.65

Tin Plates—

American Charcoal Plates (per box)

"A. A. A." charcoal:
IC. 14 x 20 ... $6.65
IX. 14 x 20 ... 7.90
A. charcoal:
IC. 14 x 20 ... $5.60
IX. 14 x 20 ... 5.70

American Coke Plates—Bessemer—
IC. 14 x 20 ... 107 lb ... $4.50
IX. 14 x 20 ... 5.50

American Terne Plates—
IC. 20 x 28 with an 8 lb. coating ... $8.70
IX. 20 x 28 with an 8 lb. coating ... 10.70

Seamless Brass Tubes—

List November 15, 1909. Base price, 18¢

Brass Tubes, Iron Pipe Sizes—

List November 15, 1909. Base price, 18¢

Copper Tubes—

List November 15, 1909. Base price, 21¢

Brazed Brass Tubes—

List February 1, 1911. 18⅞¢ ₡ lb

High Brass Rods—

List February 1, 1911. 14⅛¢ ₡ lb

Roll and Sheet Brass—

List February 1, 1911 14⅛¢ ₡ lb.

Brass Wire—

List February 1, 1911. 14⅛¢ ₡ lb

Copper Wire—

Base price. Carload lots until 13½¢

Copper Sheets—

Sheet copper hot rolled, 16 oz. (quantity lots) ... ₡ lb 17¢
Sheet copper cold rolled, 1¢ ₡ lb advance over hot rolled
Sheet copper polished 20 in. wide and under, 1¢ ₡ square foot.
Sheet copper polished over 20 in. wide, 2¢ ₡ square foot
Planished copper, 1¢ ₡ square foot more than polished.

METALS—

Tin—

Straits pig ... ₡ lb 45 @46 ¢

Copper—

Lake ingot ... ₡ lb 14 @14¼¢
Electrolytic ... ₡ lb 13¾@14 ¢
Casting ... ₡ lb 13¾@14 ¢

Spelter—

Western ... ₡ lb 6⅞@ 7⅛¢

Zinc—

No. 9, base, cash ... ₡ lb 5½¢ Open... ₡ lb 9¢

Lead—

American pig ... ₡ lb 5 @5¼¢
Bar ... ₡ lb 6⅜@6½¢

Solder—

½ & ½, guaranteed ... ₡ lb 25½@26¢
No. 1 ... ₡ lb 23½@24¢
Refined ... ₡ lb 22½@23¢
Prices of solder indicated by private brand vary according to composition.

Antimony—

Cookson ... ₡ lb. @10½¢
Hallets ... @10 ¢
Other brands ... 9@ 9½¢

Bismuth—

Per lb ... $2.00@$2 25

Aluminum—

No. 1 aluminum (guaranteed over 99% pure), in ingots for remelting ... 21¢ and 22¢
Rods and Wire ... Base price 21¢
Sheets ... Base price 33¢

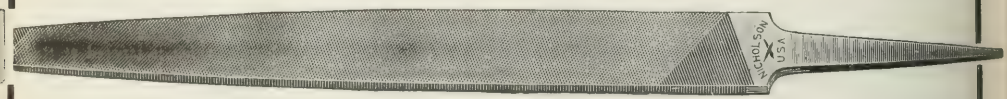
Old Metals—

Dealers' Purchasing Prices Paid in New York.

	Cents.
Copper, heavy and crucible	10.50 to 10.75
Copper, heavy and wire	10.25 to 10.50
Copper, light and bottoms	9.25 to 9.50
Brass, heavy	7.00 to 7.25
Brass, light	5.50 to 5.75
Heavy machine composition	9.00 to 9.25
Clean brass turnings	6.75 to 7.00
Composition turnings	7.50 to 7.75
Lead, heavy	4.75
Lead, tea	3.50
Zinc, scrap	4.00

NICHOLSON U.S.A.

Honesty Is The Best Policy Even In a FILE



YOU WILL ALWAYS FIND THE ***NICHOLSON*** *HONEST ALL THROUGH. IT HAS WON ITS FAMOUS REPUTATION BECAUSE OF ITS KEEN, SHARP BITE AND LASTING QUALITIES*

ASK FOR FILE FILOSOPHY

Nicholson File Company, Providence, R. I.

THE IRON AGE

Established 1855 | New York, November 23, 1911 | Vol. 88: No. 21

Published Every Thursday by the

DAVID WILLIAMS COMPANY

239 West 39th Street, New York

Entered at the New York Post Office as Second-Class Mail Matter.

Subscription Price, United States and Mexico, $5.00 per Annum; to Canada, $7.50 per Annum; to Other Foreign Countries, $10.00 per Annum. Unless receipt is requested, none will be sent. Credit for payment will be shown by extending the date on the wrapper of your paper.

W. H. Taylor, - - - - - - President and Treasurer
I. A. Mekeel, - - - - - - - First Vice-President

Geo. W. Cope, - - - - }
A. I. Findley, - - - - } Editors
W. W. Macon, - - - - }

M. C. Robbins, - - - - Manager
Charles S. Baur, - - - Assistant Manager

Branch Offices

Philadelphia, Real Estate Trust Building
Pittsburgh, Park Building
Boston, Compton Building
Chicago, Fisher Building
Cleveland, American Trust Building
Cincinnati, 807 Andrews Building

CONTENTS.

Large Car Orders 1105
The Car Buying Movement 1106
Prosperous Conditions in Germany 1107
Increasing Cost of Workmen's Compensation 1107
No Potential Monopoly in Steel 1107
The Lowness of Steel Prices 1108
The Pratt & Cady Company's Sales Offices 1108
A New Steel Plant at Cleveland 1108
Molders' Safeguards 1108
The Philadelphia Foundry Foremen 1109
The Connellsville Coke Trade 1109
An Office Lunching Plan 1109
Bruce Macbeth Gas Engine Orders 1109
The Iron and Metal Markets 1110
British Iron Trade More Active 1121
The Bethlehem Steel Company a Seller of Pig Iron 1121
Industrial Week in Buffalo 1121
Another Great Foreign Trade Balance 1121
Personal 1122
The Stanley Committee Resumes 1122
Obituary 1123
For Lower Rates on Iron Ore, Coke and Coal 1124
Labor Notes 1125
Trade Publications 1125
The Broken Lehigh Valley Rail 1126
Steel Corporation and "Independent" Output 1127
Railroad Equipment Orders 1128
Pittsburgh and Vicinity Industrial Notes 1129
National Founders' Association 1130
Labor in the Iron and Steel Industry 1138
The Superiority of Steel Cars 1138
To Prevent Leaks in Overhead Costs 1139
The Heat Treatment of Steel 1141
A New Virginia Blast Furnace 1142
Iron and Steel Roofing Sheets 1143
Isthmian Canal Commission Bids 1146
Gear Hobber with New Drive 1147
The Fritz Medal Presented to Sir W. H. White 1147
The Norton Axle Grinding Machine 1148
Cargo Transference at Steamship Terminals 1151
A Good Record on Sulphurs 1151
Two-Head Automatic Tapper 1151
A Special Planer Drive 1152
Multiple-Spindle Stay Bolt Drill 1153
Motor Wagon Display in New York 1153
Relieving Device Integral with Lathe 1154
A Travel Recorder for Vehicles 1154
The Machinery Markets 1155
Cement Production in 1910 1164
New Tools and Appliances 1165

Large Car Orders

November Total About 40,000

Very Low Prices for Steel—Greater Activity in Pig Iron and in Finished Material

The placing of large car orders in the past week has brought the total for November close to 40,000, or probably half as many as for all the preceding 10 months of the year. It is expected that orders for as many as 40,000 or more will be given out before the end of the year. Today the car companies have from three to four months orders on their books, while the resulting business to iron and steel manufacturers is only indicated in part by contracts for about 400,000 tons of plates and shapes covering the cars bought on the late movement.

The significance of this car buying is not alone that so much new business has come to iron and steel works, important as that is; what means more is that the railroads bought at the lowest prices in years and that the equipment companies got their steel at the lowest prices on the present downward movement, and that both railroads and car works were convinced that they had bought at the bottom. The ability of the car companies to get better prices on the contracts yet to be placed will show whether even a slight advance from the low level of steel prices is possible.

Buyers of pig iron appear to have taken the large equipment orders as a signal to come into the market, and sales of foundry grades in all districts have been heavier than in a good many weeks. In the Chicago district the total of malleable and foundry irons has been fully 20,000 tons, Milwaukee and Detroit furnaces taking a large share. Buffalo reports 30,000 tons sold, including round lots to Canadian foundries. In New England sharper competition has developed, furnaces competing with Buffalo producers have named delivered prices below the equivalent of $13 at Buffalo. At Cincinnati sales of Southern iron for early delivery are reported at $9.75 Birmingham for No. 2 though $10 holds for the first half of 1912. At Philadelphia an 18,000-ton sliding scale contract for Southern iron, Nos. 2, 3 and 4, was closed by a pipe company. Other pipe interests bought 10,000 tons or more in the East.

The purchase of 25,000 tons of Bessemer iron by a Mahoning Valley steel company is accompanied by the sale of 50,000 tons of ore by the steel company to the furnace company, so that the price does not signify, in the absence of full details. That the steel company needed the iron in the blowing out of a single furnace for relining shows its full operation and the drawing down of pig iron stocks at steel works.

The appearance of the Bethlehem Steel Company as a free seller of pig iron in the East is an important development in a section in which the merchant furnace interests have for a long time found their market more and more circumscribed.

Cast iron pipe foundries have received good inquiries in the past week and there is a distinctly better promise of business for 1912. Two gas companies in New York and one in Philadelphia have asked bids on a total of 23,300 tons.

The recent car buying has brought business not only to plate and structural mills but to foundries, bar mills and bolt and nut works. In the East the last named have bought nearly 30,000 tons of bars in the past week.

In all the encouragement the steel trade has taken from the recent expansion in orders, it has not missed the sobering fact that profits have been sacrificed to tempt buyers into the market. In this connection great interest attaches to the presentation in New York this week of the case of the Mahoning and Shenango Valley iron and steel manufacturers who insist on material reductions in freights on ore, coke and coal.

In the past week 1.05c. Pittsburgh has been more frequently done on bars, while 1.10c. for plates and shapes has been the basis of an increasing share of the business. The chief new contracts of interest to the heavy lines are the new Continental-Commercial National Bank building at Chicago, 20,000 tons, and the Los Angeles aqueduct siphons, which the Riter-Conley Mfg. Company will build, calling for 9400 tons.

The Gulf Refining Company has placed 100 miles of 6-in. pipe at Pittsburgh, deliveries to begin at once.

Tin plate mills have closed large contracts with can manufacturers and meat packers at concessions from the $3.40 Pittsburgh basis.

The Car Buying Movement

The sharp contrast between the car buying in recent weeks and the slackness in the earlier part of the year is perhaps not fully appreciated. Throughout this year until the closing days of October car buying was of the most desultory character. While precise data have not been compiled, it is certain that orders placed in the entire first half of this year did not materially exceed 50,000, and it is doubtful whether they closely approximated this figure. In the next four months, or until late October, a careful record indicates a total of orders between 20,000 and 21,000. In a trifle over three weeks since then, however, orders have actually been closed for 38,000 cars, while there is inquiry in the market justifying the expectation that as many more will be ordered within a very few weeks. This would make the present movement round up a total of about 75,000 cars, and there are estimates that it will reach 100,000 cars by the end of the year or soon after. In view of a total of less than 75,000 for practically the first ten months of this year, the situation thus shows a complete reversal.

The November figures are perhaps larger by comparison with past performance than is generally assumed. So much has been said of the capacity of individual car plants that in some quarters an exaggerated notion prevails as to the output of the carbuilding industry when it is operating full. Frequently special records have been made by long runs on a special type of car, these records not being indicative of what is done with the normal assortment of orders. From year to year the Railway Age Gazette has secured direct returns from the car builders of the number of cars built. Its last summary, printed December 30, 1910, is as follows, the totals from 1905 to 1910 inclusive referring to both the United States and Canada, while for previous years they refer to the United States only:

Record of Car Building, 1899-1910.

	Freight.	Passenger.	Total.
[illegible]	119,886	1,305	121,191
[illegible]	115,631	1,636	117,267
1901	136,950	2,055	139,005
1902	162,599	1,948	164,547
1903	153,195	2,007	155,202
[illegible]	60,806	2,144	62,950
1905	165,155	2,551	168,006
1906	240,503	3,167	243,670
1907	284,188	5,457	289,645
1908	76,555	1,716	78,271
1909	93,570	2,849	96,419
1910	180,945	4,412	185,357

The present car orders should not be compared with these totals, for the reason that the above figures, beginning with 1905, include the Canadian output, and further because they include a considerable quantity for export. The largest year was 1907, and of the 284,188 freight cars there reported only about 265,000 were cars built in the United States for domestic service. In 1910, when the total of freight cars reported was 180,945, the number built in the United States for domestic service was 166,119.

The desultory buying of the first ten months of this year probably represented approximately the rate at which cars were being built, say 1600 cars per week, against 5100 per week in the best year, 1907 (in the United States, for domestic use), and 3200 per week in 1910. Thus the rate in the first ten months of this year represented one-third the rate of 1907, the best year, and one-half the rate in 1910.

The present buying, of course, cannot be reduced to a rate per week, for it represents the placing of orders which will require several months to fill. These orders can, however, be regarded in the light of furnishing so many weeks' work at the 1907 rate. Assuming the present movement to represent 75,000 cars, half of which has been placed in three weeks, there is 15 weeks' work furnished at the rate of production in 1907. It is understood that the railroads are asking for early delivery on the cars being built, and it is well known that at the prices the steel mills are charging the car builders for material, and the margins the car builders are allowing for fabrication, early delivery is being made a condition in the placing of the present orders. The chief interest of the iron and steel market of late has been the question of how the industry would get through the winter, and the provision of perhaps three or four months of practically full work for the car shops is thus of vital importance. The question of what will occur in the car building industry in the spring must be put in the same class with many other interesting questions which industry in its present unsettled state cannot seriously consider.

The present car orders call exclusively for steel or steel underframed cars, which was not the case even a few years ago. According to the authority responsible for the car building figures we have just recalled, only about 72 per cent. of the 1907 output was in all-steel or steel underframed cars. According to the same authority 89 per cent. of the freight cars built in the United States in 1910 were all-steel or steel underframed. The most common weight of freight car today is about 20 net tons, all iron and steel in the case of the "all-steel" cars, and nearly all iron and steel in the case of the steel underframed, for the cars with wooden superstructure are of much greater capacity than the old wooden cars, the substitution of

steel for wood in the underframing making a large increase in the strength.

Thus, if the car building industry is to run at, say, 5000 cars per week this winter the total weight of material involved in the finished product will be about 100,000 net tons per week, fully 90,000 tons being iron and steel, while of this tonnage 50,000 tons or more will be in plates.

Such a tonnage will be most welcome to the iron and steel industry, and it should be borne in mind that the iron and steel demand of the country outside of that emanating from the railroads has had a large increase in the past few years, even though the total consumption has appeared to be about stationary. In the three years of practically full iron and steel activity, 1905-6-7, the average production of pig iron was a trifle less than 25,000,000 tons a year, while the production in 1909, 1910 and the present year averages just a shade above 25,000,000 tons. However, it is fair to estimate that in 1905-6-7 nearly if not quite 10,000,000 tons of pig iron a year found its way into railroad material, while in the three-year period just closing perhaps less than 5,000,000 tons a year has gone into this channel. It is beyond question that in demand outside that of the railroads there has been a large increase, even though the total demand is not materially changed, and if the railroads make a near approach to their former requirements the grand total is bound to show a large increase.

Prosperous Conditions in Germany

At this time of keen competition among American manufacturers of steel products and of exceedingly low prices to domestic consumers, it is interesting to note the conditions prevailing in the steel trade in Germany. Next to the United States that country is the greatest producer of steel in the world. In neutral markets Germany is a much more formidable competitor of the United States than is Great Britain. Notwithstanding the fact that productive capacity has of late years greatly increased in Germany, perhaps to almost as great a relative extent as in America, the steel works of that country are at present actively employed. Our Berlin correspondent, in his report printed elsewhere in this issue, states that "the market shows an improving tendency; the volume of production is steadily increasing, while prices are firm all along the line and on some products are rising."

The contrast between prices in Germany and in the United States is especially noteworthy. Plates of medium thicknesses are now selling in Germany at 130 marks per metric ton, or about 1.45c. per pound, f.o.b. mill; structural shapes, at 107.50 marks per ton, or about 1.20c. per pound; ordinary Bessemer soft steel bars, 105 marks per ton, or about 1.20c. per pound; open-hearth steel bars, at 110 marks per ton, or about 1.25c. per pound; wire rods, at about $30.50 per ton. These prices are considerably above the open quotations on similar products in this country. This very satisfactory condition of affairs in Germany is partly due to an active home demand and partly to a good export business, while the government exerts a beneficent rather than a restraining influence. It will be seen from these figures, as compared with American prices, that the tariff at present cuts no figure whatever in influencing prices at American mills. It is also noteworthy that under the German fiscal system the recovery of business from the semi-panic conditions prevailing at the time of the dispute with France over the Morocco question has been rapid and complete. Instead of a prolonged depression, such probably as would have been the case under similar circumstances in this country, prosperity reigns and manufacturers have no reason to find fault with trade conditions. The production of pig iron in Germany in October beat all previous records, having been 1,334,941 metric tons, which is 12,800 tons more than for last March, which had been the banner month.

Increasing Cost of Workmen's Compensation

The practical operation of workmen's compensation, as set forth in a British bluebook, shows conclusively that the cost of the system to the employer is increasing with a rapidity which causes some concern. The fact of an increase had been known in a general way, but until now no figures have been available covering the situation with exactness. The figures extend back but three years, but the increase had its beginning in the earlier days of the operation of the system in Great Britain. In the United States much guesswork has been necessary in fixing rates in liability insurance, but the figures are undoubtedly much higher than those which first prevailed in Great Britain. Nevertheless, it is the opinion of some authorities that costs here will advance as time goes on. The lesson of the bluebook is therefore a valuable one.

The growth in premium rates in England is reflected to some extent by the average amount paid as compensation on the returns of persons employed in specified industries during the past three years. For instance, the total charge for compensation in the metal industry (extraction, founding and galvanizing) increased from 6s. 3d. per head in 1908 to 7s. 5d. in 1909, and 8s. 8d. in 1910. In the engine and shipbuilding industries the charge averaged 12s. in 1908 and 12s. 10d. in 1910. The machine, appliances, conveyances and tool industries, which were given for the first time in 1909, increased from 3s. 11½d. to 5s. ½d. in 1910; the railroads, excluding the clerical staff, from 7s. 7d. per head in 1908 to 8s. 4d. in 1909, and 9s. 4d. in 1910, while in the case of mines the burden for the three years was, respectively, 17s., 20s. 1d., and 20s. 2d. A similar experience has prevailed in other industries. The feeling among British employers is that the augmentation is a very serious matter, and the gravity of the situation is in no ways lessened by the gradual abandonment by workmen of the availability of employers' liability.

No Potential Monopoly in Steel

A well-known New York lawyer, who is spoken of as an expert in corporation practice, said in his testimony before the Senate Committee on Commerce at Washington last week that "the steel trust has the power to produce monopoly but does not use the power; its competitors realize that they are pigmies, but the power to crush them is not used." It will certainly be in the nature of a discovery both to the Steel Corporation and to divers important companies competing with it that it now has or ever had the power to crush its competitors. That the United States Steel Corporation has never attempted to monopolize the American steel trade is not more true than that it could not if it would. The New York lawyer is gifted with some-

what the same type of imagination that inspired the author of a recent work on the American steel trade. The coming supremacy of the Steel Corporation in iron ore was so real to this writer that he was moved to some advance commiseration of the fate of its competitors "expiring beside their exhausted ore pits!" The deliverance of the New York lawyer simply illustrates anew how little account is to be taken of much that is brought out in a political dragnet investigation of an important industrial or economic question.

The Lowness of Steel Prices

Comparison is made by the American Metal Market between the present "composite price" of finished steel products and that of early May, 1911, before the break in prices. The composite price is arrived at by weighting each group of products according to its tonnage importance. Out of 10 pounds of the various products, except rails, bars are credited with 2½ lb., plates with 1½ lb., shapes with 1½ lb., wrought pipe with 1¼ lb., wire products with 1¼ lb., sheets with 1 lb. and tin plates with ½ lb. On this basis the average price per lb. on January 1, 1911, was 1.74c. The American Metal Market of November 16 says:

"Our composite finished steel is now down to 1.4800c. It dropped to 1.5000c. on November 8, with the declines in plates and shapes, but since then we have marked bars down to 1.05c. and shapes to 1.10c., which takes off 2c. per 100 lb. The prices on which the composite are based are the lowest ruling, these being for very desirable orders for immediate ruling. The market is higher for less desirable specifications and for forward deliveries.

"The 1.4800c. price compares with 1.7600c. in April and the fore part of May, after some slight advances had raised it from 1.7400c., where it stood at the beginning of the year. Thus there has been a decline since early in May of 28c. per 100 lb. or $5.60 per net ton. The highest level in recent years was 2.075c. at the close of 1907, so that the decline since then has been 59.5c. per 100 lb., or $11.90 per net ton."

The Pratt & Cady Company's Sales Offices

The Pratt & Cady Company, Hartford, Conn., manufacturer of valves, hydrants, etc., announces that it has established its own sales offices, doing away with the assistance of the Fairbanks Company, which has had the exclusive right to handle the Pratt & Cady products for 28 years. The change has been made necessary by the increase of the business. George L. Spence has been made sales manager, and branch stores have been opened as follows: New York, 259 Canal street, A. M. Page, manager; Boston, 130 High street, W. D. Cashin, manager; Pittsburgh, 321 Third avenue, W. E. Messenger, manager; Detroit, 85 Jefferson avenue, Henry Jeffrey, manager; New Orleans, W. W. Wyneken, manager; Chicago, 157 West Lake street, W. G. Wentworth, manager; Indianapolis, 501 Board of Trade Building, J. M. Goldsmith, manager; Philadelphia, 507 Arch street, McArdle & Cooney, agents; Hartford, 198 Pearl street, Hartford Mill Supply Co., agent.

At a meeting of the directors of the company November 14, John Spencer Camp's resignation as president was accepted. The office of treasurer, which Mr. Camp has held for a long time, was not filled, the intention being to select a Hartford man who has qualifications for the position. George Walworth Hayden was elected president. Mr. Camp's resignation was accepted with regret by the company, but his health will not permit of his continuing in this active work. Mr. Hayden, the new president, entered the employ of the company two years ago as general manager, then becoming vice-president. He has been in the valve business for 23 years, having started with the Crane Company in Chicago, as office boy, working his way up through the different departments, not only in the manufacturing end but in the office as well

The report that the Valley Mold & Iron Company will start up its Alice furnace at Sharpsville, Pa., in the near future is without foundation.

A New Steel Plant at Cleveland

Corrigan, McKinney & Co., Cleveland, Ohio, who recently secured a site for a steel plant, announce that while plans have not yet been prepared and a definite decision has not been reached as to when the work will be started, its erection will probably be begun early next spring. The land secured consists of 41 acres on the east side of the Cuyahoga River, directly opposite the company's two blast furnaces. It is proposed to build a plant having eventually eight open-hearth furnaces with a capacity of about 1000 tons of steel per day. In addition to scrap the plant will consume the greater part of the output of the company's two River furnaces. One of these furnaces, which was completed about a year ago, has never been blown in. The proposed plant will include a blooming mill for the production of slabs and billets. Nothing has been decided as yet as to finishing mills.

Molders' Safeguards

The American Museum of Safety, 29 West Thirty-ninth street, New York, has issued its Safety Leaflet No 2, which treats of safeguards for the molder. The illustrations are taken from the collections of the museum and show a protective device for crucibles, and asbestos mittens, leggings and aprons. The former is used in some Continental brass or alloy foundries, and the safety feature is the cover, which is mechanically fastened by a self-locking handle to the crucible after placing it in the shank. The advantages of this cover are the prevention of oxidization, the reduction of fumes to a minimum and the elimination of skimming with the attendant saving in loss in metal due to a graphite lid fastened to the cover. The asbestos mittens, leggings and aprons are especially adapted to foundries making light work, and enable the men to handle the metal more quickly, due to the fact that they know they will not be burned by the spilled metal or their arms blistered by carrying hand ladles. Other safety leaflets showing how to protect employees and render the dangerous parts of machines and processes safe are in preparation.

The Modern Specialties Mfg. Company, manufacturer of hardware and metal specialties, has removed from Milwaukee, Wis., to Goshen, Ind. Its new factory, now completed, has a total floor space of 25,000 sq. ft., and is equipped with the most modern machinery and appliances, having a capacity of 100,000 Modern Make interchangeable self-heating smoothing irons per year. Every part of every iron will be made in the factory, which has ample light on all four sides, is perfectly ventilated, is heated by the most improved methods known to modern construction, and provides every improvement for the comfort and convenience of the employees. It is electrically equipped throughout.

The National Board of Trade will hold its forty-second annual meeting at the New Willard Hotel, Washington, D. C., January 16 to 18, 1912. January 17 will be Corporation Day, when eminent men of affairs are expected to discuss the corporation question in the expectation that preliminary steps will be taken to harmonize the business opinion of the country along lines which will "secure real reforms and hold them." Among the subjects to be considered at this meeting are the banking and currency system, a non-partisan tariff commission and whether the Panama Canal shall be free to coastwise shipping. The secretary of this organization is A. T Anderson, Maryland Building, Washington, D. C.

The steel and rolling mill plants of the Alan Wood Iron & Steel Company, at Conshohocken and Ivy Rock, above Conshohocken, Pa., and the blast furnaces of the Richard Heckscher & Sons Company at Swedeland, across the Schuylkill River from the Wood plants, are now under one ownership and management, under the corporate title first mentioned. The Richard Heckscher & Sons Company ceases to exist. The merger was formally made at a meeting of the stockholders of both companies November 6.

The Philadelphia Foundry Foremen

The regular monthly meeting of the Associated Foundry Foremen of Philadelphia and Vicinity was held at the Manufacturers' Club, Philadelphia, Pa., on the evening of November 14, with President Clarence R. Brown in the chair. The business of the meeting was deferred to permit the presentation of an address by Dr. Richard Moldenke, secretary American Foundrymen's Association, on "Metal Briquettes: Their Manufacture and Use in Melting Furnaces," illustrated with samples.

In presenting the subject Dr. Moldenke briefly referred to the manufacture of briquettes of iron ore, flue dust, etc., and the development of the process in use for briquetting cast iron borings, turnings, brass, copper and aluminum by pressure without the use of a binder. The development of this process has been quite extensive abroad and it is now being introduced in this country. Sixteen such plants are in operation abroad, with a total capacity of 30,000 to 40,000 tons a year. The manufacture of the cast-iron boring briquettes is conducted in a two stage hydraulic press, in which a pressure of 30,000 lb. per sq. in. is exerted. These presses vary in capacity from 2 to 6 tons per hour. The briquettes weigh from 30 to 35 lb. each, and can be easily handled in charging, without any material loss by breakage. The use of a comparatively uniform size of borings has been productive of the best results, and it was suggested that preliminary grinding would be of advantage. In foreign practice these briquettes have to some extent replaced a considerable proportion of the pig iron charge, but its use in excess of 10 per cent. of the charge was not recommended. The briquettes are porous and thus permit the passage of the gases through the mass. It has been shown that on a full charge of briquettes a loss of about 10 per cent. occurred, but when mixed with an ordinary pig iron charge a loss of but 4 per cent. was experienced. An additional feature is the admixture of steel in the briquettes, thus securing the direct contact of the cast iron and steel in the melting zone of the cupola. Briquettes of steel borings can be used to particular advantage in basic open-hearth furnace practice. The area in the furnace is saved, as is also considerable time in charging. In making briquettes of brass and bronze the ability to charge the compressed metal in the furnace or crucible at one time avoids a large percentage of loss by oxidation.

A general discussion followed on cupola practice. Methods of charging for different purposes and under varying conditions were described and many points of interest in foundry practice were brought out. At the conclusion of the discussion Dr. Moldenke was given a vote of thanks.

Nominations for officers to serve for the ensuing year were made, and the following were duly elected: President, James Whitehead, Abram Cox Stove Company; vice president, Thomas Smith, Midvale Steel Works; secretary-treasurer, D. M. Kittenger, Pencoyd Iron Works; C. J. Krayer, trustee, to serve for three years.

C. Gorman was elected to active membership in the association. Various reports of committees followed.

The Connellsville Coke Trade

The following report of the Connellsville coke trade is taken from the Weekly Courier, Connellsville, Pa.:

The coke trade is holding its own. This is encouraging in view of the fact that production is approximating 325,000 tons and shipments are close to 10,000 cars per week. Both the merchant and the furnace ovens have approximately 70 per cent. of their ovens in blast, the running order is well maintained and a few ovens are being fired up. Coke men are more hopeful for the future of the trade. The large car orders recently placed by the railroads are counted upon to strengthen the steel situation and reflect some measure of that strength into the coke business. Some fugitive labor needs are reported. One company advertises for men this week to man new ovens being fired. Otherwise, conditions remain the same.

Production made a gain last week of 618 tons as compared with the week before, the total being 323,363 tons as against 322,745 tons. The furnace ovens lost 3172 tons, while the merchant ovens gained 3790 tons.

Of the 16,057 furnace ovens in operation, 60 ran seven days; 1188 ran six days; 14,189 ran five days and 6 [illegible] in four days.

Of the 10,948 merchant ovens in operation, 8314 ran six days; 2414 ran five days; 150 ran four days and 70 ran three days.

The number of active ovens in the region was increased by the firing of 81 ovens at Low Phos and 44 at Parshall No. 2, and decreased by the blowing out of 43 at Crystal, making a net increase of 82 ovens.

An Office Lunching Plan

Many manufacturers have found it expedient to furnish a midday lunch for their employees. Most of them charge the actual cost of the lunch to each employee, no matter what position he holds, or serve one on the á la carte basis. A unique and very successful plan has been adopted by the Lodge & Shipley Machine Tool Company, Cincinnati, whereby each office employee is furnished a good wholesome meal, for which he pays a price based on the salary he draws. Including the drafting room employees, about 40 persons are daily served a lunch in a residence building adjacent to the company's plant. Each department is accommodated at a separate table, and while all get the same food and service, a clerk or stenographer drawing $20 a week would only be charged half as much as an employee paid $40 a week. To avoid information as to salaries becoming public, every employee is furnished a non-transferable coupon book, the price of which is known only to the cashier and the holder of it. These coupons have no date limit and thus if the owner is absent from a meal he does not pay for it.

It is the aim of the company to charge only the actual cost of the lunch, distributing this as outlined above. When guests are present the company's entertainment account is charged with $1 for each one, the amount being credited to the general expense fund. In this way no employee is called upon to contribute toward entertaining visitors, the amount stated being more than sufficient to cover the cost of the guest's meal.

Bruce-Macbeth Gas Engine Orders

The Bruce-Macbeth Engine Company, builder of vertical multi-cylinder gas engines, Cleveland, Ohio, reports the following sales recently made: One 75 hp. four-cylinder, natural gas, Olympic Theater, Pittsburgh; one 115 and one 35 hp., natural gas, Harshaw, Fuller & Goodwin Company, Elyria, Ohio; 35 hp., natural gas, Prospect Garage, Cleveland; 55 hp., Pittsburgh Steamship Company, Conneaut Harbor, Ohio; 55 hp., direct connected to triplex pump, Bellevue, Ohio, water works; 300 hp., four-cylinder, producer gas, Patapsco Electric & Mfg. Company, Ellicott City, Md., to be used for municipal lighting; 55 hp., natural gas, Canton Lumber Company, Canton, Ohio; 35 hp., Superior Drop Forge & Mfg. Company, Cleveland; 75 hp., producer gas, J. B. Manor & Co., New Market, Va.; 75 hp., four-cylinder, natural gas, Consumers Ice & Cold Storage Company, Lexington, Ky., second order; two 75 hp., for belting to generators, C. L. Flaccus Glass Company, Tarentum, Pa., fourth order; 135 hp., the Exide Battery Depots, Inc., Cleveland, second order; 65 hp., Boston Consolidated Gas Company, Boston, Mass.; 80 hp., Perfection Spring Company, Cleveland, second order; 150 hp., four-cylinder, natural gas, Van Dorn Iron Works, Cleveland; 300 hp., four-cylinder, natural gas, for municipal lighting, Canal Dover, Ohio, second order; 150 hp., natural gas, H. C. Fry Glass Company, Rochester, Pa.; 250 hp., natural gas, Hotel Southland, Dallas, Texas, for elevators and lighting; 65 hp., twin cylinder, natural gas, Niagara Shoe Company, Buffalo, N. Y.; 115 hp., four-cylinder, natural gas, Prairie State Incubator Company, Homer City, Pa.; two 135 hp., Cameraphone Building, Pittsburgh, Pa.; 115 hp., four-cylinder, Consolidation Coal Company, Fairmont, W. Va.; 350 hp., natural gas, Monongah Glass Company, Fairmont, W. Va., sixth order.

The number of idle cars reported by the railroads of the United States and Canada on November 8 was 26,514, which represents an increase of about 6000 cars in the preceding two weeks, the report of October 25 showing a surplus of 20,532. The greater part of the increase is in coal cars.

The Iron and Metal Markets

A Comparison of Prices

Advances Over the Previous Week in Heavy Type. Declines in Italics.

At date, one week, one month and one year previous.

	Nov. 22, 1911.	Nov. 15, 1911.	Oct. 25, 1911.	Nov. 23, 1910.
PIG IRON, Per Gross Ton:				
Foundry No. 2 standard, Philadelphia	*$14.00*	$15.00	$15.00	$15.50
Foundry No. 2, Valley furnace	13.25	13.25	13.25	14.00
Foundry No. 2 Southern, Cincinnati	13.25	13.25	13.25	14.25
Foundry No. 2, Birmingham, Ala.	10.00	10.00	10.00	11.00
Foundry No. 2, at furnace, Chicago*	14.00	14.00	14.35	16.00
Basic, delivered, eastern Pa.	14.50	14.50	14.50	14.75
Basic, Valley furnace	12.35	12.35	12.50	13.50
Bessemer, Pittsburgh	14.90	14.90	15.40	15.90
Gray forge, Pittsburgh	13.40	13.40	13.65	13.90
Lake Superior charcoal, Chicago	16.50	16.50	16.50	18.00
COKE, CONNELLSVILLE, Per Net Ton, at Oven:				
Furnace coke, prompt shipment	1.55	1.55	1.50	1.45
Furnace coke, future delivery	1.65	1.65	1.55	1.70
Foundry coke, prompt shipment	1.90	1.90	1.80	2.00
Foundry coke, future delivery	2.10	2.10	2.00	2.10
BILLETS, &c., Per Gross Ton:				
Bessemer billets, Pittsburgh	*19.00*	19.50	20.00	23.00
Open-hearth billets, Pittsburgh	*18.50*	19.00	19.00	23.00
Forging billets, Pittsburgh	24.00	24.00	24.00	28.50
Open-hearth billets, Philadelphia	21.40	21.40	21.40	25.50
Wire rods, Pittsburgh	25.00	25.50	26.00	28.00
OLD MATERIAL, Per Gross Ton:				
Iron rails, Chicago	14.50	14.50	13.50	16.00
Iron rails, Philadelphia	15.50	15.50	16.00	18.00
Car wheels, Chicago	12.00	12.00	12.50	13.50
Car wheels, Philadelphia	11.25	11.25	11.75	13.75
Heavy steel scrap, Pittsburgh	12.00	12.00	12.00	14.25
Heavy steel scrap, Chicago	9.50	9.50	9.50	12.25
Heavy steel scrap, Philadelphia	11.50	11.50	11.75	13.00
FINISHED IRON AND STEEL, Per Pound to Largest Buyers:	Cents.	Cents.	Cents.	Cents.
Bessemer rails, heavy, at mill	1.25	1.25	1.25	1.25
Iron bars, Philadelphia	1.20	1.20	1.20	1.37
Iron bars, Pittsburgh	1.20	1.20	1.20	1.40
Iron bars, Chicago	1.15	1.15	1.15	1.35
Steel bars, Pittsburgh	*1.05*	1.10	1.10	1.40
Steel bars, tidewater, New York	*1.21*	1.26	1.26	1.56
Tank plates, Pittsburgh	*1.10*	1.15	1.15	1.40
Tank plates, tidewater, New York	*1.26*	1.31	1.31	1.56
Beams, Pittsburgh	*1.10*	1.15	1.20	1.40
Beams, tidewater, New York	*1.26*	1.31	1.36	1.56
Angles, Pittsburgh	*1.10*	1.15	1.20	1.40
Angles, tidewater, New York	*1.26*	1.31	1.36	1.56
Skelp, grooved steel, Pittsburgh	1.12½	1.12½	1.15	1.25
Skelp, sheared steel, Pittsburgh	1.20	1.20	1.25	1.30
SHEETS, NAILS AND WIRE, Per Pound to Largest Buyers:	Cents.	Cents.	Cents.	Cents.
Sheets, black, No. 28, Pittsburgh	1.85	1.85	1.85	2.20
Wire nails, Pittsburgh	1.55	1.55	1.60	1.70
Cut nails, Pittsburgh	1.50	1.50	1.50	1.60
Barb wire, galv., Pittsburgh	1.85	1.85	1.90	2.00
METALS, Per Pound:	Cents.	Cents.	Cents.	Cents.
Lake copper, New York	**13.00**	12.75	12.62½	13.00
Electrolytic copper, New York	**12.87½**	12.62½	12.50	12.87½
Spelter, St. Louis	**6.60**	6.45	6.20	5.80
Spelter, New York	**6.75**	6.60	6.35	5.95
Lead, St. Louis	**4.27½**	4.15	4.15	4.40
Lead, New York	**4.35**	4.25	4.25	4.50
Tin, New York	**43.35**	43.15	42.05	36.90
Antimony, Hallett, New York	7.65	7.65	7.70	7.75
Tin plate, 100-lb. box, New York	$3.64	$3.64	$3.64	$3.84

*The average switching charge for delivery to foundries in the Chicago district is 50c. per ton.

Prices of Finished Iron and Steel f.o.b. Pittsburgh

Freight rates from Pittsburgh in carloads, per 100 lb. New York, 16c.; Philadelphia, 15c.; Boston, 18c.; Buffalo, 11c.; Cleveland, 10c.; Cincinnati, 15c.; Indianapolis, 17c.; Chicago, 18c.; St. Paul, 32c.; St. Louis, 22½c.; New Orleans, 30c.; Birmingham, Ala., 45c.; Pacific coast, 80c. on plates, structural shapes and sheets No. 11 and heavier; 85c. on sheets Nos. 12 to 16; 95c. on sheets No. 16 and lighter; 65c. on wrought pipe and boiler tubes.

Plates.—Tank plates, ¼ in. thick, 6¼ in. up to 100 in. wide, 1.10c. to 1.15c., base, net cash, 30 days. Following are stipulations prescribed by manufacturers, with extras:

Rectangular plates, tank steel or conforming to manufacturers' standard specifications for structural steel dated February 6, 1903, or equivalent, ¼ in. thick and over on thinnest edge, 100 in. wide and under, down to but not including 6 in. wide, are base.

Plates up to 72 in. wide, inclusive, ordered 10.2 lb. per square foot, are considered ¼-in. plates. Plates over 72 in. wide must be ordered ¼ in. thick on edge, or not less than 11 lb. per square foot, to take base price. Plates over 72 in. wide ordered less than 11 lb. per square foot down to the weight of 3-16-in. take the price of 3-16-in.

Allowable overweight, whether plates are ordered to gauge or weight, to be governed by the standard specifications of the Association of American Steel Manufacturers.

Extras.	Cents per lb.
Gauges under ¼in. to and including 3-16 in. on thinnest edge	.10
Gauges under 3-16 in. to and including No. 8	.15
Gauges under No. 8 to and including No. 9	.25
Gauges under No. 9 to and including No. 10	.30
Gauges under No. 10 to and including No. 12	.40
Sketches (including all straight taper plates) 3 ft. and over in length	.10
Complete circles, 3 ft. in diameter and over	.20
Boiler and flange steel	.10
"A. B. M. A." and ordinary firebox steel	.20
Still bottom steel	.30
Marine steel	.40
Locomotive firebox steel	.50
Widths over 100 in. up to 110 in., inclusive	.05
Widths over 110 in. up to 115 in., inclusive	.10
Widths over 115 in. up to 120 in., inclusive	.15
Widths over 120 in. up to 125 in., inclusive	.25
Widths over 125 in. up to 130 in., inclusive	.50
Widths over 130 in.	1.00
Cutting to lengths or diameters under 3 ft. to 2 ft., inclusive	.25
Cutting to lengths or diameters under 2 ft. to 1 ft., inclusive	.50
Cutting to lengths or diameters under 1 ft.	1.55

No charge for cutting rectangular plates to lengths 3 ft. and over.

Structural Material.—I-beams, 3 to 15 in.; channels, 3 to 15 in., and angles, 3 to 6 in. on one or both legs, ¼ in. and over, 1.10c. to 1.15c. Other shapes and sizes are quoted as follows:

	Cents per lb.
I-beams over 15 in.	1.15 to 1.20
H-beams over 18 in.	1.25 to 1.30
Angles over 6 in.	1.15 to 1.20
Angles, 3 in. on one or both legs, less than ¼ in. thick, plus full extras as per steel bar card Sept. 1, 1909	1.15 to 1.20
Tees, 3 in. and up	1.15 to 1.20
Zees, 3 in. and up	1.10 to 1.15
Angles, channels and tees, under 3 in., plus full extras as per steel bar card Sept. 1, 1909	1.15 to 1.20
Deck beams and bulb angles	1.40 to 1.45
Hand rail tees	1.95 to 2.10
Checkered and corrugated plates	1.95 to 2.10

Sheets.—Makers' prices for mill shipments on sheets of U. S. standard gauge, in carload and larger lots, on which jobbers charge the usual discounts for small lots from store, are as follows:

Blue Annealed Sheets.

	Cents per lb.
Nos. 3 to 8	1.25 to 1.30
Nos. 9 and 10	1.35 to 1.40
Nos. 11 and 12	1.40 to 1.45
Nos. 13 and 14	1.45 to 1.50
Nos. 15 and 16	1.55 to 1.60

Box Annealed Sheets, Cold Rolled.

	One Pass.	Three Pass.
Nos. 10 to 12	1.50 to 1.55	.....
Nos. 13 and 14	1.55 to 1.60	.....
Nos. 15 and 16	1.60 to 1.65	1.70 to 1.75
Nos. 17 to 21	1.65 to 1.70	1.75 to 1.80
Nos. 22, 23 and 24	1.70 to 1.75	1.80 to 1.85
Nos. 25 and 26	1.75 to 1.80	1.85 to 1.90
No. 27	1.80 to 1.85	1.90 to 1.95
No. 28	1.85 to 1.90	1.95 to 2.00
No. 29	1.90 to 1.95	2.00 to 2.05
No. 30	2.00 to 2.05	2.10 to 2.15

Galvanized Sheets, of Black Sheet Gauge.

Nos. 10 and 11	1.85 to 1.90
Nos. 12, 13 and 14	1.95 to 2.00
Nos. 15, 16 and 17	2.10 to 2.15
Nos. 18 to 22	2.25 to 2.30
Nos. 23 and 24	2.35 to 2.40
Nos. 25 and 26	2.55 to 2.60
No. 27	2.70 to 2.75
No. 28	2.85 to 2.90
No. 29	2.95 to 3.00
No. 30	3.15 to 3.20

All above rates on sheets are f.o.b. Pittsburgh, terms 30 days net, or 2 per cent. cash discount in 10 days from date of invoice, as also are the following base prices per square for painted and galvanized roofing sheets, with 2½-in. corrugations.

Corrugated Roofing Sheets, Per Square.

Gauge.	Painted.	Galvanized.	Gauge.	Painted.	Galvanized.
29	.....	$2.30	28	$2.35	$3.45
28	$1.30	2.45	27	2.55	3.65
27	1.45	2.50	26	2.75	4.00
26	1.55	2.60	20	3.00	4.30
25	1.80	3.00	18	4.00	5.65
24	2.05	3.10	16	4.85	6.45

Wire Rods and Wire.—Bessemer, open hearth and chain rods, $25 to $25.50. Fence wire, Nos. 0 to 9, per 100 lb., terms 60 days, or 2 per cent. discount in 10 days, carload lots, to jobbers, annealed, $1.35; galvanized, $1.65. Carload lots, to retailers, annealed, $1.45; galvanized, $1.75. Galvanized barb wire to jobbers, $1.85; painted, $1.55. Wire nails, to jobbers, $1.55.

The following table gives the price to retail merchants on wire in less than carloads, including the extras on Nos. 10 to 16, which are added to the base price:

Fence Wire, Per 100 lb.

Nos.	0 to 9	10	11	12 & 13	13	14	15	16
Annealed	$1.55	$1.60	$1.65	$1.70	$1.80	$1.90	$2.00	$2.10
Galvanized	1.85	1.90	1.95	2.00	2.11	2.20	2.60	2.70

Wrought Pipe.—The following are the jobbers' carload discounts on the Pittsburgh basing card on wrought pipe, in effect from October 2, 1911.

Butt Weld.

	Steel Black.	Steel Galv.	Iron Blk.	Iron Galv.
⅛ and ¼ in.	75	55	68	48
⅜ in.	74	66	69	59
½ in.	77	67	72	62
¾ to 1¼ in.	81	72	75	67
2 to 3 in.	82	74	76	69

Lap Weld.

1¼ and 1½ in.	75	57	68	61
2 in.	77	70	72	65
2½ to 4 in.	79	72	74	67
4½ to 6 in.	78	70	73	65
7 to 12 in.	76	66	71	61
13 to 15 in.	52		47	

Butt Weld, extra strong, plain ends, card weight.

⅛, ¼, ⅜ in.	70	60	65	55
½ in.	73	66	70	64
¾ to 1¼ in.	76	70	74	68
2 to 3 in.	80	74	75	69

Lap Weld, extra strong, plain ends, card weight.

1½ in.	72	56	67	60
2 in.	76	70	73	65
2½ to 4 in.	78	72	73	67
4½ to 6 in.	77	71	72	66
7 to 8 in.	70	60	68	55
9 to 12 in.	65	55	60	50

Butt Weld, double extra strong, plain ends, card weight.

½ in.	65	50	60	54
¾ to 1¼ in.	68	62	63	57
2 to 3 in.	70	64	65	59

Lap Weld, double extra strong, plain ends, card weight.

2 in.	66	60	61	55
2½ to 4 in.	68	62	63	57
4½ to 6 in.	67	61	62	56
7 to 8 in.	60	55	55	45

Plugged and Reamed.

1 to 1¼, 2 to 3 in. Butt Weld } will be sold at two (2) points lower basing (higher price) than merchants' or card weight pipe. Butt or lap weld, as specified.
2, 2½ to 4 in. Lap Weld }

The above discounts are for "card weight," subject to the usual variation of 5 per cent. Prices for less than carloads are three (3) points lower basing (higher price) than the above discounts.

Boiler Tubes.—Discounts on lap welded steel and charcoal iron boiler tubes to jobbers in carloads are as follows:

Steel.		*Charcoal Iron.*	
1¼ to 2¼ in.	65	1¼ in.	48
2½ in.	67½	1½ to 2¼ in.	50
2¾ to 3¼ in.	72½	2½ in.	55
3½ to 4 in.	75	2¾ to 5 in.	60
5 to 6 in.	67½		
7 to 13 in.	65		

2½ in. and smaller, over 18 ft., 10 per cent. net extra.
2¾ in. and larger, over 22 ft., 10 per cent. net extra.

Less than carloads will be sold at the delivered discounts for carloads, lowered by two points for lengths 22 ft. and under to destinations east of the Mississippi River; lengths over 22 ft. and all shipments going west of the Mississippi River must be sold f.o.b. mill at Pittsburgh basing discounts, lowered by two points.

Pittsburgh

PITTSBURGH, PA., November 22, 1911.—*(By Telephone.)*

Pig Iron.—Inquiries are out in the local market for 7000 to 8000 tons of basic, malleable Bessemer and foundry iron, but there is little or no inquiry for standard Bessemer. Reports that the Westinghouse Air Brake Company, Wilmerding, Pa., has withdrawn its inquiry for 1000 to 2000 tons each of foundry and forge iron are untrue. This company is still considering the purchase of some iron, but has not come to a decision. Prices of pig iron continue low and show no signs of betterment. We note a sale of 500 tons of basic iron for delivery to a local open hearth steel plant at about $12.35, Valley furnace, and also a sale of 100 tons of Bessemer iron for prompt shipment at $14, Valley furnace. We quote: Standard Bessemer iron, $14; malleable Bessemer, $12.50; basic, $12.35; No. 2 foundry, $13.25; gray forge, $12.50 to $12.75, all at Valley furnace, with a freight rate of 90c. a ton for delivery in the Pittsburgh district.

Billets and Sheet Bars.—New inquiry for billets and sheet bars is very dull, consumers being covered by contracts, against which they are specifying at a fairly satisfactory rate. We quote open hearth billets $18.50 to $19; Bessemer billets, $19; open hearth sheet bars, $19.50 to $20; Bessemer sheet bars, $20 to $20.50, and forging billets, $24, all f.o.b. cars, makers' mill, Pittsburgh, or Youngstown district.

Merchant Pipe.—The National Tube Company, Pittsburgh, Pa., has received an order from the Gulf Refining Company for 150 miles of 6-in. steel line pipe, deliveries on which will start at once.

Armor Plate.—The Carnegie Steel Company, Pittsburgh, has received an order from the Italian Government for 6500 tons of armor plate, which will be rolled in the armor plate department of the Homestead Steel Works, Homestead, Pa.

(By Mail.)

The report that the Republic Iron & Steel Company has brought 25,000 tons of Bessemer pig iron from the Ohio Iron & Steel Company, Lowellville, Ohio, at $14.25 at furnace requires some explanation. The Republic Company has sold 50,000 tons of iron ore to the Ohio Company, and has bought 25,000 tons of Bessemer iron from the same company for early delivery, much of this iron being in the furnace yards. The price of $14.25 at furnace for Bessemer iron is above the market, as it is easily obtainable at $14. The heavy orders for steel cars and steel rails, together with a generally improved demand for nearly all kinds of finished iron and steel, have put a more cheerful aspect on the iron trade, but the increased volume of business is at the expense of prices, which seem to be seeking steadily lower levels. Pig iron has been about stationary in the past week, but prices on Bessemer and open-hearth billets, structural material, plates and steel bars are weak and slightly lower. Some heavy contracts for tin plate for delivery through the first half and in some cases through all of 1912 have been closed, a part going at the regular price of $3.40 per base box, while to the very large consumers, such as the can makers and meat packers, the usual differentials have been allowed, as has been customary in the tin plate trade for some years. New demand and specifications for steel bars are better, and the steel bar mills are running at a heavier productive rate than for some time. The sheet mills report a larger volume of business with prices on galvanized sheets firmer, due to the very high spelter market. An immense tonnage of blast furnace coke for delivery in the first half and also through the whole of 1912 is under negotiation, and at least part of this business will be closed this week. The scrap trade is firmer, and some dealers are holding heavy steel scrap at $12.50, believing that the market will reach that figure in a very short time.

Ferromanganese.—Sales of four or five carloads have been made for reasonably prompt shipment at $38, Baltimore. Local large consumers are covered for practically all of this year and through the first half of next, and the inquiry is only for small lots. Prices are firm and we quote 80 per cent. for delivery in first half at $38 to $38.25, Baltimore, and on small lots for prompt shipment, $37.50 to $38, Baltimore, the freight rate for delivery in the Pittsburgh district being $1.95 a ton.

Ferrosilicon.—Two cars, or about 60 tons, of 50 per cent. have been sold for prompt delivery at about $65.50, Pittsburgh. The market is very firm and we quote 50 per cent. at $65 to $66. The quotation on 10 per cent. is $22; 11 per cent., $23, and 12 per cent., $24, f.o.b. cars at furnace, Ashland, Ky., or Jackson, Ohio.

Skelp.—The very low prices now ruling do not seem to be bringing out much new business. A local pipe mill has bought about 1000 tons of narrow grooved steel skelp on the basis of about 1.12½c. at maker's mill. We quote grooved steel skelp at 1.12½c. to 1.15c.; sheared steel skelp, 1.17½c. to 1.20c.; grooved iron skelp, 1.40c. to 1.45c., and sheared iron skelp, 1.60c. to 1.65c., all for delivery at consumers' mills in the Pittsburgh district.

Wire Rods.—The demand for wire rods is only for small lots for prompt shipment. Consumers are not specifying in a satisfactory way against contracts, and in some cases shipments have been held up entirely. We quote Bessemer, open-hearth and chain rods at $25 to $25.50, Pittsburgh.

Steel Rails.—No large orders for standard sections, aside from the 12,000 tons for the Norfolk & Western, have been received by the Carnegie Steel Company, its

orders in the past week having been only for small lots ranging from 200 to 500 tons. In former years the Carnegie Company received the overflow orders of the Illinois Steel Company, but these now go to the Gary mill, thus cutting Pittsburgh out of a good deal of its former rail business. Some large inquiries for light rails are in the market from Southern lumber interests, and the anthracite and bituminous coal mining companies are placing fairly heavy orders. In the past week the Carnegie Company received new orders and specifications for close to 3000 tons of light rails. We quote standard sections at 1.25c. per lb.; 8 and 10-lb., light rails, 1.25c.; 12 and 14-lb., 1.16c.; 16, 20 and 25-lb., 1.12c.; 30 and 35-lb.; 1.10c., and 40 and 45-lb., 1.08c., f.o.b. at mill.

Structural Material.—New inquiries seem to have fallen off. The McClintic-Marshall Construction Company has taken 800 tons of bridge work for New York Central extensions and 500 tons for steel buildings for the Newport Rolling Mill Company, Newport, Ky. The Ohio Steel & Wire Company, Warren, Ohio, has placed about 500 tons for steel buildings. Some very low figures are being named on erected work, which it is claimed leave little or no profit. We quote beams and channels up to 15 in. at 1.10c. to 1.15c., the lower price being named only on very desirable orders.

Plates.—While the car orders placed by the New York Central are stated to amount to 17,400, there is a rumor that it has bought 5000 more. The Baltimore & Ohio has placed about 8000 steel cars, of which the Pressed Steel Car Company got 1500 drop-end gondolas; Cambria Steel Company, 2000 all-steel gondolas; the South Baltimore Car Works, 2000 box; Mount Vernon Car Company, 500 box, and Standard Steel Car Company, 2000 all-steel gondolas. The car shops of the Cambria Steel Company are now said to be filled up for the next four months. The cars bought by the New York Central and the Baltimore & Ohio will require a total of nearly 300,000 tons of steel plates and shapes, and probably half of this will be rolled by Pittsburgh mills. The Pressed Steel Car Company has also taken 1000 steel hoppers for the Grand Trunk and 1200 steel hoppers for the Southern. The Carnegie Steel Company is rolling about 3500 tons of plates for a gas holder for the Philadelphia company in this city, and about the same quantity for a gas holder for Detroit, Mich., both jobs going to the Riter-Conley Mfg. Company. The contract for the Los Angeles aqueduct has also gone to the Riter-Conley Mfg. Company and the plates, 9400 tons, will be rolled by the Carnegie Company. The plate mills now have more live orders on their books than at any time for some months. The Homestead mills of the Carnegie Company for the first time in nearly a year are running to practically full capacity. We quote wide and narrow plates at 1.10c. to 1.15c., f.o.b. at mill. On small orders as high as 1.20c. at mill is obtainable.

Merchant Steel.—Orders for merchant steel have been better in the past week than for some time, and specifications against contracts are also coming in at a better rate. Actual orders entered so far this month are fully as heavy as, and perhaps a little larger than, in the same period in October. Prices are lower, and we quote: Iron finished tire, 1½ x ⅜-in. and larger, 1.15c., base; planished tire, ⅛-in. and larger, 1.35c.; channel tire, ¾, ⅞ and 1-in., 1.65c.; toe calk, 1.70c., base; flat sleigh shoe, 1.25c.; concave or convex, 1.55c.; cutter shoe tapered or bent, 2.15c.; spring steel, 1.75c.; machinery steel, smooth finish, 1.50c., all f.o.b., at mill.

Railroad Spikes.—Railroads are specifying more liberally against contracts than for some time. A Western road has contracted for 6000 kegs, and an Eastern road for 3000 to 3500 kegs. We quote railroad spikes at $1.40 base for standard sizes in carload and larger lots, f.o.b. Pittsburgh.

Rivets.—The demand for both boiler and structural rivets is slightly better, consumers sending in orders more freely, probably due to the low prices ruling. Specifications against contracts are also reported as coming in better. We quote structural rivets at 1.45c. to 1.50c. and boiler rivets at 1.55c. to 1.60c., f.o.b. Pittsburgh. On a very desirable order for large tonnage, these prices might be shaded $1 a ton.

Shafting.—New demand and specifications against contracts are heavier. Implement makers are specifying quite freely against contracts, and belated specifications from automobile builders are also coming in. The shafting trade, as regards volume of new business, is therefore better than for some months. We quote cold-rolled shafting at 65 per cent. off in carloads and larger lots and 60 and 10 per cent. off in small lots, delivered in base territory.

Spelter.—The market continues very firm, and the demand is reported heavier than for some time. A local consumer bought last week about 50 tons at 6.50c., East St. Louis, equal to 6.62½c., Pittsburgh. This is the highest price reached in spelter for a long time, and indications are for a still higher market.

Wire Products.—Another reduction has been made of 10c. per keg in cement coated nails. The new demand for wire and wire nails is light, being only for small lots to cover actual needs, and jobbers are not specifying in a satisfactory way against contracts. Prices are weak, and, while $1.55 on wire nails is the open market, it is stated that in some cases $1.50 has been done, especially for delivery to Southern points. We quote wire nails at $1.55; cut nails, $1.50; galvanized barb wire, $1.90; painted, $1.55; annealed fence wire, $1.35, and galvanized fence wire, $1.65, f.o.b. Pittsburgh, usual terms, freight added to point of delivery.

Merchant Pipe.—The Gulf Refining Company is reported to have placed 100 miles of 6-in. pipe with a local mill for delivery in 1912. Several other large projects for gas and oil lines are under way, but may be held over until next year on account of the late season. The general demand for merchant pipe continues quite active, several mills reporting that their orders sent to the mills for rolling are equal to 75 to 80 per cent. of capacity. Discounts on merchant iron and steel pipe are being quite well maintained, but some low prices are being made on line pipe.

Boiler Tubes—Orders for locomotive tubes are fairly active, the mills having more business on their books than for some time. The new demand for merchant tubes is dull, and prices continue to be materially shaded.

Sheets.—Specifications against contracts for black and galvanized sheets have been coming in more freely and the volume of current business being placed is also heavier. From the standpoint of tonnage the sheet trade is showing betterment. Some very large consumers are trying to cover their entire requirements through the first half of 1912 at present prices, but as a rule the mills are not willing to sell so far ahead on this basis, believing that with the betterment in demand it will only be a short time until prices improve. The high prices ruling for spelter have made galvanized sheets very firm, and 2.85c. on No. 28 seems to be bottom of the market; on small lots some mills are able to obtain 2.90c. The sheet mills are now operating to between 60 and 65 per cent. of capacity, but this rate promises to be increased in the near future.

Tin Plate.—Some very heavy contracts for tin plate from the can makers and meat packers have been closed in the past two weeks, and a good many large consumers have covered their entire requirements for the first half of 1912. It is stated that most of this business has been placed at $3.40 per base box for 14 x 20 coke plates, but to the very largest consumers, such as the American Can Company, Continental Can Company and others, the usual differentials have been allowed. The mills are not operating to more than 50 per cent. of capacity, some running at a less rate, but as soon as they commence deliveries on the large contracts for the first half of 1912 their operations will be increased. The American Sheet & Tin Plate Company has started up 15 of the 30 hot tin mills in its Shenango Works at New Castle, Pa., and the other mills may be put on at an early date. We continue to quote coke plates at $3.40 per base box, 14 x 20, at mill, with the regular differentials of 5c. to 10c. per box to the very largest buyers.

Steel Bars.—The low prices ruling on both iron and steel bars are stimulating new demand to some extent, and makers also report that specifications against contracts for steel bars have been heavy. On several very large contracts for steel bars for delivery through the first quarter 1.05c., at mill, was made, but this was in special cases for large tonnages, the regular market being 1.10c., at mill. New demand and specifications for iron bars are light, but in view of the large car orders recently placed it is expected that some betterment will occur in the near future. We quote merchant steel bars at 1.05c. to 1.10c., the lower price being named only on very desirable orders. Small lots bring 1.15c., at mill. We quote common iron bars at 1.20c. to 1.25c., at mill.

Coke.—A Mahoning Valley furnace interest has closed for 15,000 to 18,000 tons of furnace coke for the first half of 1912 on a sliding scale basis based on 9 tons of coke for 1 ton of Bessemer pig iron, the minimum price on the coke to be $1.60 per net ton at oven. This business was divided between two local coke interests. Of the other heavy inquiries for furnace coke in the

market, noted in this report last week, none has yet been closed, but several will likely go through before the end of the week. We note sales of 125 cars, or about 5000 tons, of standard grades of furnace coke for prompt shipment at $1.50 to $1.55, at oven. We quote standard makes of furnace coke for spot shipment at $1.55, and for November and December shipment $1.55 to $1.60, per net ton, at oven. Standard makes of furnace coke for the first half are held at about $1.65 to $1.70. We quote standard makes of 72-hr. foundry coke for spot shipment at $1.85 to $2 and on contracts for first half at $2.10 to $2.40, per net ton, at oven.

Scrap.—The market on scrap is firmer. While prices are not actually higher some dealers are refusing to sell at prices they would have accepted a week or two ago. A local steel interest is credited with having sold upward of 15,000 tons of heavy steel scrap to consumers at about $12, delivered, but this report has not been verified. Higher prices are being asked for heavy steel scrap for forward delivery, some dealers holding at $12.50 minimum. Dealers are quoting as follows, per gross ton, f.o.b. Pittsburgh, unless otherwise noted:

Heavy steel scrap, Steubenville, Follansbee, Sharon, Monessen and Pittsburgh delivery	$12.00 to $12.25
No. 1 foundry cast	12.25 to 12.50
No. 2 foundry cast	11.25 to 11.50
Bundled sheet scrap, f.o.b. consumers' mill, Pittsburgh district	10.25 to 10.50
Rerolling rails, Newark and Cambridge, Ohio, Cumberland, Md., and Franklin, Pa.	12.50 to 12.75
No. 1 railroad malleable stock	11.25 to 11.50
Grate bars	9.00 to 9.25
Low phosphorus melting stock	15.25 to 15.50
Iron car axles	20.50 to 21.00
Steel car axles	16.00 to 16.25
Locomotive axles	22.00 to 22.50
No. 1 busheling scrap	11.00 to 11.25
No. 2 busheling scrap	7.00 to 7.25
Old car wheels	12.00 to 12.25
*Cast iron borings	8.50
*Machine shop turnings	9.00
*Sheet bar crop ends	13.75 to 14.00
Old iron rails	14.50 to 14.75
No. 1 wrought scrap	12.00 to 12.25
Heavy steel axle turnings	9.75 to 10.00
Stove plate	9.00 to 9.25

*These prices are f.o.b. cars at consumers' mills in the Pittsburgh district.
†Shipping point.

Chicago

CHICAGO, ILL., November 20, 1911.

The purchase of equipment by the railroads has been responsible for the continuance of a more than normal booking of specifications by the plate, structural and bar mills in the past week. While railroad buying has greatly improved the tone of the market as regards these lines of finished material a slight falling off can be noted in purchases by the general trade. The Pullman Company obtained an increase of its allotment of New York Central cars from 2000 to 3500, and of the orders placed by the Southern and the Baltimore & Ohio railroads the Mount Vernon Car Mfg. Company received 500 from each. Announcement of the purchase of cars by the Chicago & Northwestern, which was in the market for 3300, has not been made, but it is reported that at least a part has been placed with a northern Indiana builder. It is expected that all of the railroads with cars to place will do so promptly in order to anticipate a firmer attitude on the part of the mills as to price of steel products. The inquiry by the Great Northern for 40,000 tons of rails remains open.

Rails and Track Supplies.—The principal Western inquiry for rails, that of the Great Northern for 40,000 tons, remains unplaced. The purchase of 2000 tons by a San Francisco electric system from a local mill is noted and also an order of 1000 tons for the Chesapeake & Ohio. Specifying against contracts for track fastenings has been fair. We quote standard railroad spikes at 1.50c. to 1.55c., base; track bolts, with square nuts, 2c. to 2.10c., base, all in carload lots, Chicago; standard section Bessemer rails, 1.28c.; open hearth, 1.34c.; light rails, 40 to 45 lb., 1.16c. to 1.20½c.; 30 to 35 lb., 1.19½c. to 1.24c.; 16, 20 and 25 lb., 1.20½c. to 1.25c.; 12 lb., 1.25c. to 1.30½c.; angle bars, 1.50c., Chicago.

Pig Iron.—Northern pig iron has been quite active for the past ten days and an aggregate of malleable Bessemer and foundry iron close to 20,000 tons has been placed. Of this a considerable portion has been bought in Milwaukee and southern Michigan. Small lots of basic are also noted among the sales. Local furnaces are accepting business for delivery through the first quarter and in a few instances through the first half at current quotations. The low prices being quoted on local iron are operating against activity in Southern iron except for pick-up business in carload and 100-ton lots. There is of this kind of business a fair volume, however. The market price of Southern iron for prompt shipment continues on the basis of $10, Birmingham, but weakness is noted where spot shipment business is involved, and offers of less than $10 are authoritatively reported. We quote for Chicago delivery, except for local irons, which are f.o.b. furnace, the following prices on prompt shipments:

Lake Superior charcoal	$16.50 to $17.00
Northern coke foundry, No. 1	14.50 to 15.00
Northern coke foundry, No. 2	14.00 to 14.50
Northern coke foundry, No. 3	13.50 to 14.00
Northern Scotch, No. 1	16.00
Southern coke, No. 1 foundry and No. 1 soft	14.85
Southern coke, No. 2 foundry and No. 2 soft	14.35
Southern coke, No. 3	14.10 to 14.35
Southern coke, No. 4	13.85 to 14.10
Southern gray forge	13.60 to 13.85
Southern mottled	13.60 to 13.85
Malleable Bessemer	14.35 to 14.50
Standard Bessemer	17.00
Basic	14.75
Jackson Co. and Kentucky silvery, 6 per cent	16.40
Jackson Co. and Kentucky silvery, 8 per cent	17.40
Jackson Co. and Kentucky silvery, 10 per cent	18.40

Structural Material.—The contract has been let for the fabrication of 20,000 tons of steel for the new Continental-Commercial National Bank Building in this city, the award going to the American Bridge Company. The actual construction of this building is some distance in the future, and the mills probably will not roll the steel at once. The same company will fabricate 100 tons for a deck girder span for the Spokane, Portland & Seattle Railroad, 146 tons for the Chicago & Alton at Chicago and 509 tons for the Illinois Central at Rockford, Ill. The Riter-Conley Mfg. Company, Pittsburgh, will furnish 9404 tons of material for the Los Angeles aqueduct, and the Pacific Rolling Mill Company was awarded the contract for 1112 tons for the Standard Oil Company's building at San Francisco. Other lettings included 113 tons to the Union Iron Works for a bridge span at San Bernardino, Cal.; 690 tons to the Mosher Mfg. Company, Dallas, Texas, for the Commonwealth National Bank Building in that city; 248 tons to the Decatur Bridge Company for the University of Illinois; 172 tons to the Elkhart Bridge & Iron Company for the Press street steel shed at New Orleans, La. The aggregate thus placed was 32,494 tons. This tonnage does not relieve the local situation, which from the standpoint of architectural structural tonnage is very quiet. With one exception local fabricators are able to take orders for immediate shipment. Structural mills in this territory have benefited from the car orders placed, and the major portion of current rolling is on specifications for this purpose. There is practically no change in the price situation. Mills are perhaps less eager for the small business, and jobbers are talking a little larger share of this business, for which they are quite anxious. We quote, for plain material, Chicago delivery, mill shipment, 1.33c., and out of store 1.60c.

Plates.—Specifications for plates have been coming in freely and the tonnage has been somewhat above normal. The car building shops continue to be the source of the greater portion of it, although tank makers' orders show a disposition on the part of this class of trade to take advantage of the low prices. While there has been no actual change in market prices the mills have been so encouraged by the bookings of the past month that the average consumer can hardly buy to as great advantage as a week ago. Delivery on mill shipment where the specifications are normal can be had in 10 days to three weeks. Mills are now increasingly reluctant to extend deliveries on material sold at current prices. We quote for mill shipment, Chicago delivery, 1.33c. and from jobbers' stocks, 1.60c.

Sheets.—Sheet tonnage booked by local mills continues to be very satisfactory. The volume of trade in this line has been well maintained since early fall, indicating a steady business among users. Prices, on the other hand, are such that they yield little or no profit to the mill and at the same time bring pressure upon the seller of the finished product. We quote Chicago prices as follows: Carload lots, from mill, No. 28 black sheets, 2.03c. to 2.08c.; No. 28 galvanized, 3.03c. to 3.08c.; No. 10 blue annealed, 1.53c. to 1.58c. Prices from store, Chicago, are: No. 10, 1.90c.; No. 12, 1.95c.; No. 28 black, 2.30c.; No. 28 galvanized, 3.35c.

Bars.—Purchases of steel bars aggregated in tonnage one of the largest items of the week. Local competition continues keen and prices have suffered accordingly. Sales apparently were not evenly distributed among the mills, the major portion being taken by one interest. We quote as follows, f.o.b. Chicago: Soft steel bars, 1.18c. to 1.33c.; bar iron, 1.15c. to 1.20c.; hard steel bars rolled from old rails, 1.15c. to 1.20c. From store: Soft steel bars, 1.55c. to 1.60c., Chicago.

Cast Iron Pipe.—At Los Angeles, Cal., the United States Cast Iron Pipe & Foundry Company was the low bidder on 500 tons and this company was also awarded 650 tons for Lincoln, Neb. It is expected that the long deferred award at Muskegon, Mich., will be settled this week. Prospects for the coming season are increasingly encouraging. We quote as follows, per net ton, Chicago: Water pipe, 4-in., $26.50; 6 to 12-in., $24.50; 16-in. and up, $24, with $1 extra for gas pipe.

Old Material.—While there is no change in actual prices of scrap, and apparently there will be none until the prices of new material show some advance, a distinctly firmer attitude is being displayed by the holders of material. There is a fair inquiry from consumers at current quotations, but dealers, in the hope of a rising market based on increased tonnage of finished material now being placed, are reluctant to sell. Railroad offerings of scrap include 1200 tons by the Chicago, Milwaukee & St. Paul, 500 tons by the Chicago & Eastern Illinois and small lots by the Chicago & Alton and the Toledo, St. Louis & Western. We quote for delivery at buyers' works, Chicago and vicinity, all freight and transfer charges paid, per gross ton, as follows:

Old iron rails	$14.50 to $15.00
Old steel rails, rerolling	12.00 to 12.50
Old steel rails, less than 3 ft.	10.75 to 11.25
Relaying rails, standard section, subject to inspection	24.00
Old car wheels	12.00 to 12.50
Heavy melting steel scrap	9.50 to 10.00
Frogs, switches and guards, cut apart	9.50 to 10.00
Shoveling steel	9.00 to 9.50
Steel axle turnings	8.00 to 8.50

The following quotations are per net ton:

Iron angles and splice bars	$11.75 to $12.25
Iron arch bars and transoms	13.00 to 13.50
Steel angle bars	8.75 to 9.25
Iron car axles	16.75 to 17.25
Steel car axles	15.00 to 15.50
No. 1 railroad wrought	10.00 to 10.25
No. 2 railroad wrought	9.00 to 9.25
Steel knuckles and couplers	9.25 to 9.75
Steel springs	9.50 to 10.00
Locomotive tires, smooth	13.50 to 14.00
Machine shop turnings	5.75 to 6.25
Cast and mixed borings	5.00 to 5.50
No. 1 busheling	7.75 to 8.00
No. 2 busheling	5.75 to 6.25
No. 1 boilers, cut to sheets and rings	6.50 to 7.00
Boiler punchings	12.00 to 12.50
No. 1 cast scrap	10.00 to 10.50
Stove plate and light cast scrap	8.50 to 9.00
Railroad malleable	9.50 to 10.00
Agricultural malleable	8.50 to 9.00
Pipes and flues	7.00 to 7.50

Philadelphia

PHILADELPHIA, PA., November 21, 1911.

While a decidedly more cheerful feeling prevails consumers in this territory have not responded as yet with any marked buying movement; the opinion is widespread, however, that an upward turn is at hand. A somewhat greater volume of business has been transacted, nevertheless, in quite a few lines. Finished material prices are firmer. Buyers are making greater efforts to get contracts for forward delivery placed at current quotations, but sellers usually refuse to consider this class of business. Plate mills are operating on a slightly better basis. In instances recent low quotations for open hearth steel rolling billets have been withdrawn. Sheet mills are much more actively engaged. Cast iron pipe makers have been the larger buyers of pig iron, although stove makers have also taken on some round lots. As a rule prices of foundry grades are inclined toward weakness, although actual concessions have been small. There is no movement in steel making grades. Coke is quiet. Old material, while comparatively dull, is sentimentally stronger.

Iron Ore.—Occasional indefinite inquiry is noted for supplies for next year's delivery, but as buyers' ideas of prices are considerably below those at which business was recently done sellers are making an effort to close business. Importations during the week included 3850 tons of Cuban, 5226 tons of Swedish and 12,300 tons of Newfoundland ore.

Pig Iron.—Cast iron pipe makers have been the most active buyers in this district. One of the leading Delaware River interests has contracted for 18,000 tons of Southern Nos. 2, 3 and 4 foundry, delivery 3000 tons per month, over the next six months, at private terms. The same buyer has taken on several smaller lots of Northern low grade iron, the price in instances being reported as less than $14, delivered, although that figure represents the general market for Northern low grade iron, delivered here. Another Delaware River pipe foundry has purchased 5000 tons of pipe iron at close to the market. Several 1000-ton lots, as well as smaller odd lots, have been purchased by the same class of consumers. Stove foundries have also been fairly good buyers; sales of 3000 to 4000 tons in 1000-ton lots, for delivery over the first quarter, are reported, and in instances the $15, delivered, basis for No. 2 X foundry has been shaded. A comparatively good volume of small lots business is reported in standard analysis foundry irons. The major portion of these transactions are for early shipment, the same urgency for delivery being asked by melters as has been prevalent for the past three or four weeks. Virginia foundry iron continues to be sold in moderate lots, deliveries in but few instances extending beyond the next three months. Stove foundries have also made moderate purchases of Virginia irons, in one case a sale of 400 tons at $12.50, furnace, being reported. In addition to recent sales of Southern foundry to pipe makers a sale of 900 tons of Southern coke car wheel iron to a consumer in a neighboring city is noted at $11, Birmingham. Prompt No. 2 Southern foundry is, however, reported easier, and $9.75, Birmingham, has in some cases been done for prompt iron, with $10 held by other sellers, the latter price covering deliveries over the first quarter and half of next year. The movement in forge iron has quieted, although several small sales are reported, in one instance, $14.50, delivered, having been done for Northern rolling mill forge. Steel making grades are dull. There is no inquiry for basic, and while $14.50, delivered, is nominally quoted this price could no doubt be shaded for early deliveries. Standard analysis low phosphorus iron is weak at $19.25, delivered, and on close competition could be shaded 25c. a ton. The general market, while covering a somewhat wider scope, is inclined to be weak. There is considerable inquiry for foundry grades for forward shipment, and sellers are more anxious for business, due in a measure to deferred delivery of basic iron, which has handicapped some producers. The open advent in the merchant iron market by the Bethlehem Steel Company, which it is stated will be able to sell a large quantity of pig iron, provided its own requirements do not increase has not strengthened the situation in this district. Reports continue to be heard of possible reductions in active capacity. One large stack, Crane B, of the Empire Steel & Iron Company was blown out last week and at least one other concern promises curtailment. The following range of prices is named for standard analysis irons, delivered in buyers' yards in this district, shipment extending over the next four months:

Eastern Pennsylvania No. 2 X foundry	$14.90 to $15.25
Eastern Pennsylvania No. 2 plain	14.65 to 15.00
Virginia foundry	15.00 to 15.50
Gray forge	14.25
Basic	14.50
Standard low phosphorus	19.25 to 19.50

Ferroalloys.—More firmness is shown in the price of ferromanganese, practically every primary seller naming $38.50, Baltimore, for 80 per cent. English for first half shipment. Occasional small lots of speculative material, on which the above figure is shaded, continue to be heard of. Sales in this district have, however, been extremely light. Following small sales of 50 per cent. ferrosilicon at $66, prices of this grade have been moved up to $68, delivered. Furnace ferrosilicon is light in demand and prices are unchanged.

Billets.—Increased inquiry, particularly for forward delivery, has stiffened prices and in instances sellers have withdrawn recent quotations of $21.40, delivered, for basic open-hearth rolling billets, and are now firmly holding prices for that grade at $22.40, delivered here. Current orders are small and makers are disinclined to load up order books with business for extended delivery at present prices. The demand for forging billets continues fair; orders are confined to small lots, as a rule, and quotations are unchanged at $26.50 to $27.50, delivered, according to specifications.

Plates.—A better run of current business has been coming to mills in this district and makers view the situation more cheerfully. Stronger efforts are being made by consumers to place contracts for large lots for extended delivery, but the mills refuse to consider such business, nor will they meet the extreme low quotations sometimes reported in other districts. Under the circumstances consumers are swelling their current orders and 300 to 500-ton lots, for early shipment, are more numerous. The minimum quotation of Eastern mills is 1.30c., delivered, and that applies on large business, moderate lots commanding 1.35c. to 1.40c., delivered here.

Structural Material.—Recent bookings here have been extremely light. Estimates are being made on several good sized building prospects, but these have been previously reported. Fabricators have taken sev-

eral small jobs, the quantity of material required being over 100 tons in but few cases. The contract for the Bureau of Engraving building at Washington has been awarded to J. Henry Miller, Inc.; about 4000 tons of material will be required, and it is stated that the leading interest is the low bidder on the structural work. Considerable bridge work is being figured on. The demand for plain shapes has been less pronounced and some Eastern mills are less actively engaged. Prices, however, are being maintained at 1.30c., minimum, delivered, and competition is still sharp for what fabricating work is offered.

Sheets.—A sharp increase in the demand is reported. Orders for early shipment have been more numerous and of larger size and Eastern mills' order books are in better shape than for a long time. A strong effort is shown by consumers to contract for requirements three, six and even twelve months ahead, but Eastern makers refuse to consider such business. No. 28 gauge Western sheets are quoted as low as 2c., delivered here, although Eastern mills, making smooth loose rolled sheets, easily obtain ¼c. to ⅓c. per lb. advance for such material for early delivery.

Bars.—While there have been occasional round lot orders placed for steel bars at 1.20c., delivered, mills in a number of instances refuse to shade 1.25c., delivered here, for ordinary run of business. The iron bar market is inclined to be quiet; buyers are making efforts to get concessions, but mills are holding pretty firmly at 1.20c to 1.25c., delivered. No specification has been offered recently, it is reported, which was sufficiently attractive to obtain a concession.

Coke.—While there has been considerable inquiry both for furnace and foundry grades, transactions of any size have been few. Pending contracts for moderate lots of foundry coke have been closed at prices ranging from $2.15 to $2.30 at oven, while prompt coke is to be had at $1.90 to $2.10, according to grade. Furnace coke for prompt shipment is quoted at $1.50 to $1.55 at oven; for forward shipment $1.65 to $1.75 is asked. The following range of prices, per net ton, is named for deliveries in this district:

Connellsville furnace coke	$3.[illegible] to $4.[illegible]
Foundry coke	2.[illegible] to 4.[illegible]
Mountain furnace coke	3.40 to 3.65
Foundry coke	3.[illegible] to 4.40

Old Material.—The market has been very quiet, although there is a strong feeling on the part of merchants that an improvement is in sight and that prices are on bottom. Consumers, however, show but little interest in the situation and continue to make bargain lot purchases. Heavy melting steel has been purchased at $11.50, delivered, although railroad steel offered recently on railroad lists went, in instances, at better than $12, delivered. Rerolling rails are somewhat scarce and are now held at $13.50 to $14, delivered. No. 1 wrought scrap on railroad lists is reported to have been sold at better than $14, delivered. The following range of prices about represents quotations at which the ordinary current business for prompt shipment can be done for delivery in buyers' yards, eastern Pennsylvania and nearby points, taking a freight rate from Philadelphia varying from 35c. to $1.35 per gross ton, for shipment ranging from prompt to the remainder of the year:

No. 1 heavy melting steel scrap	$11.50 to $12.00
Old steel rails, rerolling (nominal)	12.50 to 13.00
Low phosphorus heavy melting steel scrap	15.[illegible] to 16.00
Old steel axles	17.[illegible] to 17.50
Old iron axles	21.00 to 21.50
Old iron rails	15.50 to 16.00
Old car wheels	11.25 to 11.75
No. 1 railroad wrought	13.75 to 14.25
Wrought iron pipe	10.75 to 11.25
No. 1 forge fire	9.50 to 10.00
No. 2 light iron (nominal)	6.00 to 6.50
Wrought turnings	8.00 to 8.25
Cast borings	7.50 to 7.75
Machinery cast	12.25 to 12.75
Railroad malleable (nominal)	11.00 to 11.50
Grate bars, railroad	8.[illegible] to 8.75
Stove plate	9.25 to 9.75

Cleveland

CLEVELAND, OHIO, November 22, 1911.

Iron Ore.—The shipping season on the lakes will practically close this week. Vessels getting their last cargoes are being delayed because of frozen ore and few shipments from the head of the lakes will be made next week. Only two or three cargoes remain to be brought from Escanaba. Some of the furnacemen seem quite confident that ore prices will be lower next year, but ore sellers are silent on this subject. We quote as follows: Old range Bessemer, $4.50; Mesaba Bessemer, $4.25; old range non-Bessemer, $3.70; Mesaba non-Bessemer, $3.50.

Pig Iron.—While large inquiries are lacking, there is an improved inquiry for small lots of foundry grades. A fair volume of business was booked during the week for delivery over the remainder of the year and into or through the first quarter, these orders being mostly for 200 tons and under. Large consumers generally are not showing any inclination to buy round lots for extended future delivery. However, we note two 1000-ton inquiries for the first half. One is from a Mansfield stove maker who wants 600 tons of Northern iron and 400 tons of Southern, and the other inquiry, which is from the same city, is for 1000 tons of southern Ohio iron. Foundry stocks are low and furnace shipments are good. One leading local selling agency reports that its November sales will exceed those of any previous month this year. Recent railroad buying has stirred up a limited demand for malleable iron. We quote No. 2 foundry iron at $12.75, Cleveland furnace, for outside shipment and $13 at furnace for local delivery. In the Valley No. 2 foundry is quoted at $13.25 at furnace, but this price might be shaded slightly. We quote as follows for prompt shipment and for the first quarter:

Bessemer	$14.50
Basic	13.25
Northern foundry, No. 2	13.25
Gray forge	12.50
Southern foundry, No. 2	14.35
Jackson County silvery, 8 per cent. silicon	$16.55 to 17.05

Coke.—The market is very dull. A local furnace expects to be in the market shortly for its first half requirements. Sales of foundry grades are limited to small lots for prompt shipment. We quote standard Connellsville furnace coke at $1.55 to $1.60 for the remainder of the year and $1.65 to $1.70 for the first half. Connellsville 72-hr. foundry coke is held at $1.90 to $2.15 for prompt shipment and $2.15 to $2.40 for contract.

Old Material.—The sentiment in the scrap trade shows considerable improvement, this being due to the increased demand for steel and the more liberal buying on the part of the railroads. The demand, however, is not active. A fair volume of small lot sales is reported, with no sales or inquiries involving large tonnages. Heavy steel scrap is firmer, mills offering at least 25c. a ton more for this grade than a week ago. Some sales in small lots were made at $11, and it is doubtful if mills can now pick up odd lots at lower prices. Prices on other grades of scrap are unchanged. Dealers' prices per gross ton, f.o.b. Cleveland, are as follows:

Old steel rails, rerolling	$12.25 to $12.75
Old iron rails	14.00 to 14.50
Steel car axles	17.00 to 17.50
Heavy melting steel	11.00 to 11.25
Old car wheels	11.50 to 12.00
Relaying rails, 50 lb. and over	22.50 to 23.50
Agricultural malleable	10.50 to 11.00
Railroad malleable	11.00 to 11.25
Light bundled sheet scrap	9.50 to 10.00

The following prices are per net ton, f.o.b. Cleveland:

Iron car axles	$18.50 to $19.00
Cast borings	6.00 to 6.25
Iron and steel turnings and drillings	6.50 to 6.75
Steel axle turnings	7.25 to 7.75
No. 1 busheling	9.00 to 9.50
No. 1 railroad wrought	11.00 to 11.25
No. 1 cast	11.00 to 11.50
Stove plate	9.00 to 9.25
Bundled tin scrap	11.00 to 11.50

Finished Iron and Steel.—The demand in finished lines appears to show an improvement from week to week. Mill agencies are booking quite a satisfactory tonnage. Orders are coming out for larger lots than a few weeks ago. There is talk among sellers of firmer prices on steel bars, but this so far appears to be mostly a matter of sentiment. While some sellers may not be eager to take on tonnage at the bottom prices that have been prevailing and are quoting 1.10c., Pittsburgh, as their minimum price, steel bars may still be bought at 1.05c. for desirable orders. The demand for plates has improved materially, considerable tonnage having been sold in the local market during the week in lots of around 200 tons. Plate prices are very low. While desirable orders are being taken generally at 1.10c., Pittsburgh, there are reports of this price being shaded to 1.07½c. Structural material is weak and lower prices are reported. The ruling quotation is 1.15c., but it is understood that tonnage has been sold at 1.12½c. and it is believed that a desirable order might bring out a 1.10c. price. Mills are getting a fair volume of structural orders from fabricating shops, but the number of new inquiries for building work is light. The Cleveland Construction Company has placed an order with the Lackawanna Bridge Company for 540 tons for a new power house at Ft. Worth, Texas. An addition to the Hollenden Hotel, Cleveland, will require nearly 1000 tons. The demand for sheets is fairly active, but

the prices that have prevailed for several weeks are no longer being firmly maintained. The recent minimum quotations of 1.85c. for No. 28 black and 2.85c. for No. 28 galvanized are being shaded $1 a ton by some of the mills. Concessions are being made in the price of forging billets, which are being sold at $25.50, Cleveland. Local bolt manufacturers report a good demand from railroads for track bolts. Buyers are taking advantage of the low prices now prevailing to place orders for their spring requirements earlier than usual. The demand for iron bars is very light, mills being unable to meet the low prices quoted for steel bars. We quote iron bars at 1.20c., Cleveland.

Cincinnati

CINCINNATI, OHIO, November 22, 1911.—*(By Telegraph.)*

Pig Iron.—There is a distinct improvement in buying but prices are not so strong as present conditions would seem to warrant. Considerable Southern analysis iron is said to have been placed recently by a few producers around $9.75 at furnace for prompt shipment, and it is quite probable that most of this iron in a normal period could have been graded as No. 2 foundry. On the other hand, a majority of Southern producers are asking and obtaining $10 at furnace for their product and recent sales at this price include 500 tons for November-December movement for a nearby melter. Divided about equally between first quarter and first half shipment, the following contracts were recently closed at the prevailing prices: About 300 tons of Southern foundry for a southern Indiana manufacturer; approximately 600 tons each of Southern No. 2 foundry for a northern Ohio and Detroit consumer. A central Indiana firm also contracted for 1500 tons of foundry, about equally divided between Northern and Southern producers. At $10, Birmingham, 500 tons of No. 2 soft went to a southern Ohio consumer for first quarter shipment. The malleable inquiry from the St. Louis territory previously reported was closed last week, the business going to the Ironton district. A sale of about 18,000 tons of Southern foundry iron for delivery through the next six months is reported by a large local company as having been made to an Eastern pipe maker. Large inquiries are scarce, however, and buyers continue to place their orders without doing much shopping. Malleable is quoted at $13, Ironton, for any delivery until July 1. Based on freight rates of $3.25 from Birmingham and $1.20 from Ironton, we quote, f.o.b. Cincinnati, as follows, for prompt shipment:

Southern coke, No. 1 foundry and 1 soft	$14.00 to $14.25
Southern coke, No. 2 foundry and 2 soft	13.25 to 13.75
Southern coke, No. 3 foundry	12.75 to 13.25
Southern coke, No. 4 foundry	12.50 to 13.00
Southern gray forge	12.50 to 13.00
Ohio silvery, 8 per cent. silicon	16.95 to 17.20
Lake Superior coke, No. 1	14.70 to 14.95
Lake Superior coke, No. 2	14.20 to 14.45
Lake Superior coke, No. 3	13.70 to 13.95
Basic, Northern	14.20 to 14.45
Standard Southern car wheel	25.50 to 25.75
Lake Superior car wheel	19.00

(By Mail.)

Coke.—Furnace coke is more active. About 30,000 tons of Pocahontas 48-hr. was contracted for by a southern Ohio furnace last week, shipments to run through the first half of next year. Other furnace inquiries are being worked on, but so far the buyers and sellers are far apart on the price proposition. Foundry grades are moving well on contracts previously closed, but there is not much new business offering, other than carload quantities to fill in. We continue our quotations of $1.50 to $1.55 per net ton at oven for prompt shipment furnace coke in the Connellsville field and $1.60 to $1.65 in the Wise County and Pocahontas districts, with contract prices about 10c. to 15c. above these quotations. Foundry coke in all three districts is offered at $1.90 to $2 for this year's shipment, with about 25c. per ton added on future contracts, although a few brands bring as high as $2.35 per net ton at oven.

Finished Material.—Structural material seems to be attracting more attention this week than any of the other finished lines, although only a very small business in beams and channels has actually been consummated lately. Prospects are excellent if all the large buildings now being planned are erected, and there is also considerable bridge work in sight. The retail local warehouse price on steel bars remains around 1.55c. to 1.60c. and on structural material 1.70c., cut to lengths, if desired. The inquiry in practically all finished material lines is improving, and there is also considerable business that is placed without much shopping round, as is usually the case when mill prices are not firm.

Old Material.—There is no change in the situation, and many buyers are sitting round awaiting future developments. Consumers generally are taking only what they need in the immediate future, and with the exception of No. 1 cast scrap, which is a trifle stronger, all quotations are unchanged. The minimum figures given below about represent what buyers are willing to pay for delivery at their yards in southern Ohio and Cincinnati, and the maximum quotations the selling prices f.o.b. at yards:

No. 1 railroad wrought, net ton	$9.50 to $10.25
Cast borings, net ton	4.50 to 5.00
Steel turnings, net ton	5.50 to 6.00
No. 1 cast scrap, net ton	9.50 to 10.50
Burnt scrap, net ton	6.25 to 6.75
Old iron axles, net ton	16.25 to 16.75
Bundled sheet scrap, gross ton	5.75 to 6.50
Old iron rails, gross ton	13.00 to 13.75
Relaying rails, 50 lb. and up, gross ton	20.75 to 21.50
Old car wheels, gross ton	9.50 to 10.25
Heavy melting steel scrap	9.25 to 10.00

Birmingham

BIRMINGHAM, ALA., November 20, 1911.

Pig Iron.—The recent heavy buying of railroad equipment has been reflected to an appreciable extent in the volume of inquiry received in this market, especially for forward deliveries, but otherwise the situation is unchanged. Producing interests, without exception, adhere to a basis of $10, Birmingham, for No. 2 for any shipment prior to July 1, but, even in local territory, where "split" grades could be furnished, spot shipments have been obtained at a concession. Certain large producers still refuse to quote on deliveries further advanced than the first quarter, and one has practically no grades to offer for shipment prior to the second quarter. An addition was made to the available tonnage for spot shipment during the week, however, by the placing on the market of approximately 2500 tons on yards at an idle plant, which had been held for higher prices than now rule. Recent specifications against contract have been unusually heavy and have represented practically all branches of the trade. The large pipe manufacturers are now taking a very liberal tonnage, while shipments to manufacturers of agricultural implements, machine tools and car wheels are heavier. The bulk of the inquiry now pending comes from the class of trade just mentioned, although considerably more interest is manifested by consumers in all lines. Recent sales have consisted mainly of comparatively small lots for prompt delivery, and the aggregate for the week was smaller than that of the week previous. It is understood that the operations of the Anniston Iron Corporation will not be changed as a result of the receivership, thereby removing the likelihood of a smaller rate of production.

Old Materials.—There is as yet no improvement in the demand for any grades, and the market is very weak. Receipts at local yards have been light for many months and stocks are small comparatively, without any special effort being made to increase the holdings of any grade. We note a fair movement to local mills in the past week, but very little demand has come from the Northern and Eastern markets. Dealers' asking prices are unchanged, and we continue to quote as follows, per gross ton f.o.b. cars here:

Old iron axles (light)	$12.00 to $12.50
Old steel axles (light)	11.00 to 11.50
Old iron rails	11.00 to 11.50
No. 1 railroad wrought	9.50 to 10.00
No. 2 railroad wrought	8.00 to 8.50
No. 1 country wrought	6.00 to 6.50
No. 2 country wrought	5.50 to 6.00
No. 1 machinery cast	8.00 to 8.50
No. 1 steel	7.50 to 8.00
Tram car wheels	7.00 to 7.50
Standard car wheels	9.00 to 9.50
Light cast and stove plate	5.50 to 6.00

Cast-Iron Pipe.—A contract for some 600 tons of water pipe for requirement at Los Angeles, Cal., has been awarded the United States Cast Iron Pipe & Foundry Company, and a like amount for Meridian, Miss., has been placed with the American Cast Iron Pipe Company. Inquiries now pending consist mainly of lots of 300 to 500 tons each, among which is the requirement of a Southern railroad system. No change has been made in prices, and quotations are being fully maintained for the small lots offered. It is now probable, however, that addition to the active producing capacity that has been in contemplation for some time will not be made until late in the first half of next year.

This is largely due to the delay in advertising certain large municipal contracts that will of necessity be placed, as well as the failure to develop certain orders for gas mains. We continue to quote the market as follows for water pipe, per net ton f.o.b. cars here: 4 to 6 in., $23; 8 to 10 in., $22; 12 in. and over, average $21, with $1 per ton extra for gas pipe.

The Eagle Furnace Company, Attalla, Ala., has just blown in its blast furnace on charcoal iron. This plant is in charge of James H. Walker, formerly with the Shelby Iron Company, Shelby, Ala.

St. Louis

ST. LOUIS, MO., November 20, 1911.

This market continues to show strong evidence that the big buyers are satisfied that the bottom has been reached in prices and that there is no occasion to hold off longer on purchases, at least for the purpose of getting better figures. In spite, however, of the renewal of activity practically nothing is sought for delivery beyond the first quarter of 1912, and there is still insistence upon prompt shipment. The general belief, and it is firmly held, is that the next five months will be pretty lively. Beyond that no one predicts.

Pig Iron.—The large interests are still in the market, though perhaps not so strenuously as at last report. There has been no actual gain in prices, but there is still a firm state of affairs and some furnaces are instructing their representatives to sell no more at present prices. The sales during the past week have run into considerable figures. The deals which can be traced to the activity in car orders will total about 10,000 tons of different grades. One agency here reports sales of 3500 tons of No. 2 and No. 3 Southern, with 1500 tons more already in sight this week. The inquiry noted last week for 1000 tons of malleable developed into orders for 3000 tons of different grades for mixing, for delivery through March. The quoted prices for No. 2 Southern stand at $10 to $10.50, Birmingham basis. The small buyers are not in the market and there is no expectation of their early appearance, most of them being pretty well stocked up and carrying over iron purchased some time ago.

Coke.—The tendency in the coke market is to lag considerably behind the pig iron demand at present, consumers evidently being pretty well supplied. One order of 250 tons for first quarter is about as large as any placed, while most of the transactions have been of the hand to mouth order and on an immediate delivery basis. Contract coke is going forward fairly well on specifications. Prices are a bit firmer. For the best 72-hr. selected Connellsville or Stonega the range is $2 to $2.40, at oven, according to whether the requirement is for prompt shipment or for delivery through the first quarter and according to the size of the order.

Old Material.—There is an improved feeling in this market. Much of this is due to the improvement in the other branches of trade. No new lists came out during the week, and those which were reported last week went at prices which showed no material change, though they evidenced no tendency to lower the prices. Dealers' prices, f.o.b. St. Louis, per gross ton, we quote as follows:

Old iron rails	$12.00 to $12.50
Old steel rails, rerolling	11.50 to 12.00
Old steel rails, less than 3 ft	10.00 to 10.50
Relaying rails, standard section, subject to inspection	22.50 to 23.00
Old car wheels	11.50 to 12.00
Heavy melting steel scrap	10.00 to 10.50
Frogs, switches and guards cut apart	10.00 to 10.50

The following prices are per net on:

Iron fish plates	$10.00 to $10.50
Iron car axles	17.00 to 17.50
Steel car axles	15.00 to 15.50
No. 1 railroad wrought	10.50 to 10.75
No. 2 railroad wrought	9.25 to 9.75
Railroad springs	9.25 to 9.75
Locomotive tires, smooth	10.00 to 10.50
No. 1 dealers' forge	7.00 to 7.50
Mixed borings	6.50 to 6.75
No. 1 busheling	7.00 to 7.50
No. 1 boilers cut to sheets and rings	7.00 to 7.50
No. 1 cast scrap	8.50 to 9.00
Stove plate and light cast scrap	7.00 to 7.50
Railroad malleable	7.50 to 8.00
Agricultural malleable	6.50 to 7.00
Pipes and flues	7.50 to 8.00
Railroad sheet and tank scrap	7.00 to 7.50
Railroad grate bars	6.50 to 7.00
Machine shop turnings	6.50 to 7.00

Finished Iron and Steel.—The optimistic feeling in the finished product market is well maintained and the aggregate of business is keeping up to the mark set last week, though none of the individual orders placed is of very great size. As heretofore the demand is for quick shipment and for specific work. Nothing is going into stock yet. In structural material the biggest order of the week was 900 tons for the new headquarters building of the Laclede Gas Light Company, which went to the Christopher & Simpson Architectrual Iron & Foundry Company. Revival of the Barr building deal, with its requirement of more than 10,000 tons, has set the steel representatives to figuring again, this time with belief that it will not be in vain. Bars are in fair demand and the same is true of plates, which have been enlivened somewhat by the car orders. There is no new demand for implement and vehicle material. In standard steel rails there is some interest in some prospective interurban construction, but deals have not reached the closing stage. In light rails the coal mines are taking some tonnage, but nothing is going to the lumber roads. Track fastenings are in fair request for the season of the year.

San Francisco

SAN FRANCISCO, CAL., November 16, 1911.

Merchants are endeavoring to reduce their stocks as much as possible before the end of the year, as they are able to get prompt delivery and see no necessity for carrying larger supplies than are required for the current trade. Orders, however, are coming out with increasing frequency, and the consuming demand in some lines appears to be a little better. The improvement is most notable in southern California, though much uneasiness has been caused at Los Angeles by the large plurality polled by the socialists in the municipal primary election. Speculative demand is lacking in all parts of the state, owing mainly to want of confidence in the stability of the market, but the requirements of consuming trades are gradually increasing. Rail orders are coming out in good shape, but structural material remains quiet. The local pig iron situation has not yet been affected by the Chinese revolution, as there is a substantial tonnage of Chinese iron still in transit.

Bars.—While no inquiries of special importance are coming out, the movement in the aggregate is fairly active, the distributive trade in soft steel being fully up to the recent average. The principal demand is for reinforcing material, which continues fairly active notwithstanding the approach of the rainy season. Merchants are ordering frequently, but their purchases are confined to such odds and ends as are required to complete assortments. No large purchases for stock are to be expected until a stronger tone becomes manifest in the Eastern markets. There is comparatively little shading of prices in the jobbing trade, quotations on bars from store, San Francisco, standing as before at 2.c. for steel and 1.90c. for iron.

Structural Material.—The October record in San Francisco was about $400,000 below that of September, though better than for October, 1910, and some improvement is expected before the end of the year. Figures are being taken on a number of local buildings requiring 100 tons or less, and this class of work is likely to be the principal feature for some time. An inquiry on the Garland Theater at Los Angeles is expected about the first of the year.

Rails.—The movement of standard sections is well maintained, business having been closed in the last two weeks on projects which have been in the market for some time, and there is more inquiry for light rails than for some time. The small distributive trade in light rails, however, remains quiet. Substantial orders have been placed by most of the electric railroads operating in the central valleys, the Vallejo & Northern having closed for about 3000 tons, while the Fresno, Hanford & Summit Lake is said to have ordered 4500 tons, and a smaller lot has been booked for the Tidewater & Southern, running south from Stockton, Cal. There is also some buying by street railroads, and considerable business is expected in the next few months from the Oakland & Antioch and the Santa Fe, Oakland & San Jose. A fairly active movement is also reported in Oregon and Washington.

Sheets.—The local market on galvanized and blue annealed sheets is weak, resale prices having no definite basis, and the movement is of the same limited nature as for some time past. There is more inquiry, however, from the small consuming trade outside of San Francisco, and riveted pipe manufacturers at Los Angeles are buying freely. Merchants are buying nothing beyond actual needs.

Plates.—Aside from the Los Angeles siphon inquiry, there is little feature to the market. The demand

in the oil fields is unusually light, and the movement in other quarters is very moderate. Jobbing prices are steadily maintained.

Merchant Pipe.—There is no life whatever to the oil well supply business, and the outlook in that line is very uncertain, no improvement being likely before the first of the year. Local plumbing supply houses are also keeping out of the market, though small orders from the hardware trade are more numerous than for some time. The principal demand at the moment is in connection with water and gas systems, and some very fair orders in this line have been taken in southern California. The aggregate tonnage, however, is still unsatisfactory.

Cast Iron Pipe.—The general demand is picking up, though small orders are still the rule. The town of Porterville, Cal., is in the market, and inquiries are expected shortly from Venice and Oxnard, Cal. Preparations are being made for further extensions of gas systems in the vicinity of Los Angeles and San Diego. The town of Prince Rupert, B. C., will receive bids November 20 for 1800 tons.

Pig Iron.—Reports from all parts of the coast indicate extremely quiet conditions in the foundry trade, and as most foundries have ample material on hand for all requirements to the end of the year there is no buying of any consequence. Some Chinese pig iron now in transit is expected to arrive about the first of the year, and while little is definitely known of the actual situation at Hankow it is believed that the movement of pig iron from that point will be resumed within 90 days at most. Some Southern iron has been purchased here recently, the price of No. 2 iron, f.o.b. San Francisco, being $20. Chinese iron is held at $23, and a range of $20 to $23 is quoted on ordinary foundry grades of English and Continental iron.

Old Material.—Scrap of every kind is neglected by all coast buyers. Cast scrap is pressed for sale at low prices, and a heavy tonnage of steel melting scrap would be exported if suitable carriers were available. There is little demand for wrought scrap or old rails, but there are no burdensome accumulations. Prices are quoted as follows: Cast iron scrap, per net ton, $14; steel melting scrap, per gross ton, $10.50; wrought scrap, per net ton, $11 to $15; rerolling rails, per net ton, $11.

Metals.—A shipment of 75 tons of tin from the new mine at York, near Bering Strait, is due at Seattle in a few days.

W. B. Higgins, assistant manager of the La Belle Iron Works, Steubenville, Ohio, is looking over the coast situation, and announces that a man will shortly be sent out from the main office to take charge of the business of this territory, with headquarters in San Francisco. The line has formerly been handled by the C. W. Pike Company, this city.

The C. W. Pike Company, Postal Telegraph Building, has taken on a new agency to replace that of the La Belle Iron Works, and retains the agency for the Lackawanna Steel Company, which it has held for several years. The company opened a branch office in Los Angeles, November 1, at 421 Walter P. Story Building.

Boston

BOSTON, MASS., November 21, 1911.

Old Material.—The scrap metal market continues its monotonous dullness. No important transactions of any description are reported, nor do the dealers see indications of a change. The prices quoted below are those offered by the large dealers to the producers and to the smaller dealers and collectors, per gross ton, carload lots, f.o.b. Boston and other New England points, taking Boston rates from eastern Pennsylvania points. In comparison with Philadelphia prices the differential for freight of $2.30 a ton is included. Mill prices are approximately 50c. a ton more than dealers' prices.

Heavy melting steel	$9.50 to $10.00
Low phosphorus steel	11.45 to 11.95
Old steel axles	14.00 to 14.50
Old iron axles	17.00 to 18.00
Mixed shafting	12.75 to 13.25
No. 1 wrought and soft steel	10.50 to 10.75
Wrought iron pipe	8.75 to 9.00
Skeleton (bundled)	7.00 to 7.50
Cotton ties	7.00 to 7.50
No. 2 light	4.50 to 5.00
Wrought turnings	5.00 to 5.50
Cast borings	4.50 to 5.00
Machinery, cast	12.50 to 13.00
Malleable	9.25 to 9.75
Grate bars	6.00 to 6.50
Stove plate	8.00 to 8.50

The German Iron Market

BERLIN, November 10, 1911.

The iron market situation shows an improving tendency. The volume of production is steadily increasing and all establishments are very busy, while prices are firm all along the line and on some products they are rising. Several days ago the convention controlling heavy plates raised prices 5 marks ($1.25) per ton. The export prices of wire rods are several marks higher than in October; but home prices, which will be fixed for the first quarter of 1912 toward the end of the month, will probably remain unchanged. The sales of pig iron for the first quarter of next year are brisk, and it is expected that substantially all orders will have been placed within a week or two. The production of pig iron in October beat all previous records at 1,334,941 metric tons. This was 43,500 tons more than in October, 1910, and 12,800 tons more than for last March, which was till now the month of record production. The current month will probably create a new record, as several furnaces will be blown in next week. Consumers are calling for contract pig iron at a satisfactory rate, and supplies are diminishing rather than accumulating. Scrap iron is in better demand, and prices are somewhat higher. Ore prices continue firm, and there is greater activity in buying foreign ores.

The big establishments of the Union are very busy on semi-finished material and are turning out considerably more than their allotments call for. They have a steady run of foreign business, and numerous new orders of that description are coming forward. Structural shapes have continued active in spite of the advanced season; dealers are trying to replenish their stocks for next spring, and the foreign markets maintain a steady and good demand at firm prices. In shapes for workshops business is very brisk, and in some specialties it is unusually so; prices have hardened to 107.50 to 110 marks for the common sizes. The home rail market is without change, but the foreign markets continue to send in good orders. Considerable quantities of heavy grooved rails have been taken for export, and the home demand is also better.

The heavy plate market continues the most active section of the trade. The mills are working at their fullest capacity, and consumers are trying to get in hurry orders wherever possible. The demand from shipyards continues very active and will doubtless remain so for a long time, as steamship companies are still ordering new vessels. Orders for medium and thinner plates have also undergone a noteworthy increase. Prices for medium thicknesses have stiffened to 130 to 132.50 marks. Prices for thin plates, which have been unsatisfactory for a long time, are now rising a little. The demand for tin and terne plates is also better. There is a considerable export demand for the latter.

Work on bars has increased of late. Dealers who had been holding back with their orders are now placing contracts for delivery to the end of March. There is a good run of orders from both home and foreign markets. Prices are firmer: in very few cases can soft steel bars be bought below 105 marks; the bulk of the home business is done between that figure and 107.50 marks. Open hearth steel bars sell at 110 marks and higher. Bar iron is in heavy demand at firm prices; and an advance is looked for in view of the higher prices of pig iron. The foreign market is taking large quantities. Mills running on bands and hoops are better employed and buyers are coming forward in greater numbers. This is also true of cold-rolled bands, for which there is also a strong foreign demand. There is more life in the market for wire rods, and wire and wire nails are also very active. The big concerns have recently withdrawn their lowest prices for tubes, indicating that this section of the market also, which has been suffering severely from price cutting since the trade combination was dissolved in the summer of 1910, has at last reached better times.

It is reported that the Hoesch Company is about to absorb the Witten Steel Tube Works.

Belgian news continues favorable; prices are still rising.

The Republic Stamping & Enameling Company, Canton, Ohio, which has used J-M asbestos roofing on both flat and saw-tooth construction for more than 12 years, has just contracted for another 600 squares for new buildings. The new plant of the American Steel & Wire Company, at Corey, Ala., is covered with nearly 10 acres of the same roofing. It is one of the products of the H. W. Johns-Manville Company.

Buffalo

BUFFALO, N. Y., November 21, 1911.

Pig Iron.—The market has shown a marked increase in activity for the week and the outlook is very encouraging. The business placed in the week has totaled nearly 30,000 tons for foundry grades and malleable, with 7500 to 10,000 tons pending. Inquiry of large proportions from the Canadian trade has also developed during the week particularly for malleable. With a greater amount of new business in prospect, as a result of the heavy orders for cars, the situation shows a possibility of better prices in the near future. Some furnaces are now holding very firmly to schedule, being comfortably booked for a considerable time ahead, and current shipments on contracts now amount to a large total daily, with correspondingly rapid reduction of stocks. We quote as follows for present and first quarter delivery, f.o.b. Buffalo:

No. 1 X	$13.75 to $14.00
No. 2 X	13.25 to 13.75
No. 2 plain	13.00 to 13.50
No. 3 foundry	13.00 to 13.25
Gray forge	13.00
Malleable	13.50 to 14.00
Basic	14.00 to 14.25
Charcoal	16.00 to 17.75

New York

NEW YORK, November 22, 1911.

Pig Iron.—With increasing business in pig iron, competition has been sharper and contracts have been made for deliveries running through the first half of 1912 at prices fully as low as for early delivery and in some cases lower. The fact is that some furnaces find that the call from their customers for early deliveries will require about all the iron they can make, so that for the little they now sell for this year they ask more than for next year's iron. Current inquiry, formal and tentative, includes one for 5000 tons from a New Jersey works, while a considerable tonnage will probably be taken by a railroad supply company. In the past week sales made through New York offices have included several of 1000 tons each, while a 1500-ton purchase in New England for which local sellers competed went to an outside district. Competition from western Pennsylvania has been rather keener recently and some quotations made in New England by furnaces competing with those in the Buffalo district represented less than the equivalent of $13, Buffalo. The principal change in the Virginia situation is that furnaces which have quoted $12.25 at furnace for No. 2 X for this year and $12.75 for next year, are willing to sell to the end of the first quarter of 1912 at $12.25. Sales of the week have included iron for a sanitary pipe works and also a considerable tonnage for pipe works on the Delaware River. Little has been done in malleable pig iron. Buffalo furnaces have done quite a little business with Canada in competition not only with Canadian furnaces but with Middlesbrough, England, producers who have a 40 per cent. preferential in tariff, the duty on American iron shipped into Canada being $2.80. It is being realized more generally that at present prices purchases may safely be made for the first half of next year. A new factor in the Eastern pig iron market is the Bethlehem Steel Company, which announces that it will hereafter be a seller of foundry, basic and Bessemer irons, chiefly through its main office at South Bethlehem, Pa., and its New York and Philadelphia branch offices. Quotations are as follows for northern iron at tidewater: No. 1 foundry, $15.25 to $15.50; No. 2 X, $14.75 to $15; No. 2 plain, $14.50 to $14.75. For southern iron we quote $15 to $15.25 for No. 1 foundry and $14.50 to $14.75 for No. 2 foundry.

Finished Iron and Steel.—A decided betterment in sentiment due to conditions developed by numerous inquiries from the railroads is the story of the present local situation. There is a feeling that buyers are coming into the market for 1912 requirements in such volume that the prompt deliveries which have been the order of the day will not be forthcoming and while prices may not necessarily stiffen, they will remain decidedly firm against any drop. The conditions may be indicated by the attitude of the purchasing agent of a large company who, while admitting that he recently bought 400 tons of steel bars—incidentally required to meet no other specifications than the usual physical bending tests and a limit of phosphorus content—at 1.05c at mill, was doubtful if they could now be bought for less than 1.10c at mill. One large producer of steel bars states emphatically that it will not now sell at 1.10c. beyond December 31, but it is admitted that this price has been made by others for delivery to April 1, and it is thought that some business may have been placed at this figure for the first half of next year. The plate trade is encouraged by a decided local increase in shipbuilding, but the market remains at last week's figures. The Newport News Shipbuilding & Drydock Company is to build a passenger and freight steamship for the Clyde line, a number of tug boats are being projected and the Lukens Iron & Steel Company is to furnish the 450 tons of plates for a ferryboat being built at Newburgh, N. Y., for the New York Central. The structural field is still dull, very little offering in the apartment house and loft building line which individually makes attractive jobs. One new large offering is being figured, 2500 tons for the Graphic Arts publishing building on West Twenty-fifth street, and the general contract has been placed for the Seneca telephone building in Buffalo with I. S. Rossell, New York. Bar iron business is reported better and carload lots of refined iron have recently been closed at 1.15c. eastern Pennsylvania mill. The few large size structural jobs closed are: Emmett building, 1800 tons, to the A. E. Norton Company; factory loft building on West Twenty-first street, 600 tons, to the American Bridge Company; Queens County court building, 800 tons, to the Hay Foundry & Iron Works. It is understood that the Wells Brothers Company is general contractor for the Locomobile Company garage and the Bradley Contracting Company has been given the contract for section 13 of the New York subway, involving perhaps 9500 tons of riveted steel work and structural shapes. Quotations are: Steel bars, 1.26c. to 1.31c.; plates and plain structural material, 1.31c. to 1.36c.; bar iron, 1.25c. to 1.30c., all New York. Plain material and plates from store, New York, 1.60c to 1.70c.

Cast Iron Pipe.—Buyers are coming into the market quite freely for next year's delivery. The tonnage of this character now in sight runs into important figures. The Consolidated Gas Company, New York, wants 15,584 tons of 4 to 48-in. pipe, of which 10,150 tons is 48 in.; the Brooklyn Union Gas Company is inquiring for 3613 tons of 4 to 12 in., principally 6 in.; the United Gas Improvement Company, Philadelphia, is in the market for 4100 tons of 4 to 12 in., principally 6 in., and is expected to buy a considerably larger quantity later. Other gas and some water companies are in the market for smaller quantities, while it is believed that quite a little buying is being done quietly. The pipe situation is much more encouraging than at the corresponding time a year ago. Sentiment among pipe manufacturers has therefore greatly improved and prices are firmer. Carload lots of 6 in. are quoted at $22 to $23 per net ton, tidewater.

Old Material.—A considerably improved feeling prevails among dealers although the demand from consumers has increased but slightly. Undoubtedly, however, much old material could be disposed of if dealers were as willing to make concessions as they were two weeks ago. It is felt that the better demand for finished products must shortly lead to heavier requirements for old material and that some advance in prices may then be secured. Meanwhile dealers are not offering their accumulations freely, and those having contracts to fill are losing little time in securing what may be needed to cover anything of which they are short. Cast scrap has shown the most activity of any grade of old material in the past week. Dealers' prices, per gross ton, New York and vicinity, are as follows:

Old girder and T rails for melting	$9.25 to $9.75
Heavy melting steel scrap	9.25 to 9.75
Relaying rails	20.00 to 21.00
Rerolling rails (nominal)	11.25 to 11.75
Iron car axles	19.00 to 19.50
Old steel car axles	15.00 to 15.50
No. 1 railroad wrought	11.50 to 12.00
Wrought iron track scrap	10.50 to 11.00
No. 1 yard wrought, long	10.25 to 10.75
No. 1 yard wrought, short	9.25 to 9.75
Light iron	3.75 to 4.25
Cast borings, clean	5.75 to 6.25
Mixed borings and turnings	5.00 to 5.50
Wrought turnings	6.00 to 6.50
Wrought pipe	8.75 to 9.25
Old car wheels (nominal)	10.00 to 10.50
No. 1 heavy cast, broken up	10.50 to 11.00
Stove plate	8.25 to 8.75
Locomotive grate bars	8.25 to 8.75
Malleable cast	10.00 to 10.50

Ferroalloys.—The ferroalloys market is firm with greater activity in both sales and inquiries. Prices show advances with such tendency to still further increases that some dealers say they are not eager to sell at present rates. Ferromanganese is quoted generally at $38.50, Baltimore. Sales have been made at that price for future delivery. Some inquiry is made for spot at $38 to $38.25. Ferrosilicon is quoted at $68, Pittsburgh,

although that price is shaded by some dealers. A large steel company in St. Louis and a large manufacturing concern in New York are in the market for next year's supply of ferrosilicon and there are several other inquiries.

Metal Market

NEW YORK, November 22, 1911.

The Week's Prices

Cents Per Pound for Early Delivery.

	Copper, New York.			Lead		Spelter	
Nov.	Lake.	Electro-lytic.	Tin, New York.	New York.	St. Louis.	New York.	St. Louis.
16	12.75	12.62½	43.25	4.35	4.25	6.60	6.45
17	12.75	12.62½	43.25	4.35	4.27½	6.60	6.45
18	12.75	12.62½	....	4.35	4.27½	6.60	6.45
20	12.75	12.75	43.50	4.35	4.27½	6.65	6.50
21	13.00	12.87½	43.45	4.35	4.27½	6.75	6.60
22	13.00	12.87½	43.35	4.35	4.27½	6.75	6.60

A feature of the week is the advance in prices of copper, lead and spelter. While the advances absorbed attention, the volume of business done does not seem proportionate.

Copper.—The advance in the price of copper is a much discussed subject in the trade. The market is strong, business is pronounced good and the outlook brighter. The domestic demand is good but not unusual. Exports have been a strong feature in the situation. Sellers of copper, it is admitted, are responsible for the advanced quotations, and the foreign advance is regarded as a possible influence. Electrolytic copper is quoted at 13c., delivered in the Naugatuck Valley, cash 30 days, and 12.87½c., New York, with a strong tendency to an immediate advance. Lake copper is 13c. The London copper quotations for spot are £58 15s. and three months, £59 10s. Exports of copper for the month to date are 21,331 tons.

Pig Tin.—A quiet market exists in pig tin, there being less activity than last week, probably a result of recent heavy buying. Supplies are closely held at 43.35c., an advance of ¼c. over one week ago. Delivery into consumption probably will be small this month. November 17 there was a flurry of inquiry, but no special actions otherwise. The feeling still exists that foreign influence may soon assert itself in the matter of prices. The London market quoted tin to-day at £197 5s. for spot and £188 for three months. So far this month 1750 tons have arrived, with 895 tons reported afloat.

Tin Plates.—The trade in tin plates is mostly of a routine character such as the season justifies. The big canners are not yet fully in the market for their 1912 demands. The price of tin plates laid down in Swansea, Wales, is reported as 13s. 6d. The price in New York for 100-lb. coke plates remains at $3.64.

Lead.—The American Smelting & Refining Company on November 16 advanced its quotations to 4.35c., New York, for shipment lead in 50-ton lots. The price at St. Louis is relatively firmer, lead being sold by independents there at 4.27½c. The production of lead for 1910 as figured by the United States Geological Survey was 470,380 tons of 2000 lb., compared with 448,112 tons in 1909.

Spelter.—Spelter, which is still scarce and held close, is now at 6.80c., although some business has been done at 6.75c. The price to-day is within 20 points of the highest price reached in a decade.

Antimony.—No change is reported in the antimony market. Hallett's is quoted at 7.65c. and Cookson's at 8c

Chicago

NOVEMBER 20.—A much more liberal buying of copper the past week was accompanied by a small advance in price. The metal market in general witnessed more activity than for some time and the general trend of quotations was upward. We have revised our prices and quote at Chicago as follows: Casting copper, 12.62½c. to 12.75c.; Lake, 12.87½c. to 13c., in carloads, for prompt shipment; small lots, ¼c. to ⅜c. higher; pig tin, carloads, 44.50c.; small lots, 47.50c.; lead, desilverized, 4.30c. to 4.35c.; for 50-ton lots; corroding, 4.55c. to 4.60c. for 50-ton lots; in carloads, 2½c. per 100 lb. higher; spelter, 6.65c.; Cookson's antimony, 8.75c., and other grades, 7.75c. to 8.25c., in small lots; sheet zinc is $8.25, f.o.b. La Salle, in carloads of 600-lb. casks. On old metals we quote buying prices for less than carload lots: Copper wire, crucible shapes, 10.75c.; copper bottoms, 9.62½c.; copper clips, 10.50c.; red brass, 9.75c.; yellow brass, 7.50c.; lead pipe, 3.85c.; zinc, 4.50c.; pewter, No. 1, 26c.; tinfoil, 32c.; block tin pipe, 36c.

St. Louis

NOVEMBER 20.—The firmness of last report continues with added force in the metal market. Lead joined the procession and is to-day quotable at 4.27½c. Spelter took another spurt and is firmly held at 6.60c. Tin advanced to 43.70c.; Lake copper to 13.10c.; electrolytic to 13.10c. Cookson's antimony remains firm at 8.35c. The demand the past week has been good and the opening for the current week holds up well. In the Joplin ore market the ore prices responded only in a measure to the sharp advance in the price of spelter. The inactivity of buyers, under present conditions, is discouraging the mine owners, who are talking more than ever of curtailment by means of a widespread shutdown. This will be settled at a meeting Wednesday night. The open market basis for choice blende was $47 per ton, while high grade ore brought $50. On contract the basis was $47.96, with the top grades bringing $52.50 figured on the basis of spelter, East St. Louis. The basis for second grade was $48. Calamine continued to bring high prices, ranging from $23 to $28 assay basis for 40 per cent. metallic content. Choice lots brought as high as $35. Lead ore, in good demand, brought from $54 to $57 per ton. On old metals we quote: Light brass, 4c.; heavy brass and light copper, 8c.; heavy copper and copper wire, 9c.; zinc, 3c.; lead, 3.25c.; pewter, 30c.; tin foil, 29c.; tea lead, 3c.

Iron and Industrial Stocks

NEW YORK, November 22, 1911.

The stock market has again shown considerable strength. Various influences have contributed to this. The rumors now in circulation are directly opposed to those prevailing only a short time ago, when everything tended to depress values. Such rumors are now in circulation as that the suit of the United States Government against the United States Steel Corporation is likely to prove fruitless or may be withdrawn by the Department of Justice. This rumor is stated to have caused a sharp rise in Steel common on Friday, which carried other industrial stocks with it. That date proved to be the culminating point for the period under review, as prices thereafter receded somewhat. The range of prices on active iron and industrial stocks from Wednesday of last week to Tuesday of this week was as follows:

Allis-Chalm., com.	3¼	Pressed Steel, com.	33 - 34¾
Allis-Chalm., pref.	14 - 15	Pressed Steel, pref.	97 -100
Beth. Steel, com.	29 - 31	Railway Spring, com.	30¼- 32¾
Beth. Steel, pref.	57¼- 58¾	Pressed Steel, pref.	101
Can, com.	11¼- 11⅞	Republic, com.	20⅞- 23¼
Can, pref.	50¼- 50⅝	Republic, pref.	79½- 81¾
Car & Fdry., com.	51⅞- 56½	Pipe, com.	14
Car & Fdry., pref.	116 -116⅜	Pipe, pref.	43 - 44
Steel Foundries	32¼- 34	U. S. Steel, com.	60⅞- 65½
Colorado Fuel	27 - 28	U. S. Steel, pref.	108½-110¼
General Electric	152½-155¼	Westinghouse Elec.	64⅞- 67⅜
Gr. N. Ore Cert.	43 - 43½	Am. Ship, com.	48
Int. Harvester, com.	106 -109	Chic. Pneu. Tool	45
Int. Harvester, pref.	120½	Cambria Steel	43½- 43⅞
Int. Pump, com.	33 - 34⅝	Lake Sup. Corp.	27 - 27½
Int. Pump, pref.	82	Pa. Steel, pref.	103
Lackawanna Steel	30 - 31	Warwick	10½
Locomotive, com.	36 - 37⅛	Crucible Steel, com.	11½- 11¾
Locomotive, pref.	102½	Crucible Steel, pref.	78½- 80½

Dividends Declared

The General Electric Company, regular quarterly 2 per cent., payable January 15.

The Crucible Steel Company of America, regular quarterly, 1¾ per cent. on the preferred stock, payable December 22.

The National Lead Company, regular quarterly, ¾ of 1 per cent. on the common stock, payable December 30.

The blast furnace of the Worth Brothers Company, Coatesville, Pa., which has been in operation for about a year and a half, was expected by the builder to make 400 tons a day, but its average production for each day in the past month was about 450 tons, and the banner record was made early in November, when it produced 507 tons of pig iron of fine quality in 24 hours. Experienced iron and steel men who have examined this furnace and have noted the quality of the pig iron produced and the uniform regularity of its operation, pronounce it one of the best in the country. It has given the company practically no trouble since its installation Work on the second furnace is progressing, and it will be completed by February 1, 1912. It will not be put into operation, however, until the steel plant becomes more busily engaged.

British Iron Trade More Active

Improvement has come in the past two weeks to the British iron trade. On Tuesday, November 21, Cleveland warrants closed at 47s 10½d as against 46s 6d in the first week of November, the advance being thus about 35 cents. Furnace companies are in a stronger position than for some time and their quotations for Cleveland No. 3 are 49s to 50s for prompt delivery. Stocks in Connal's warrant stores have been decreasing, though gradually. On November 10 the total was 574,000 tons, which represents a decrease of 27,500 tons from the high point of several weeks ago. In finished iron and steel products good buying continues and in some branches is very satisfactory. Manufacturers have a large tonnage on their books and the activity in shipbuilding is reflected in a strong market for plates and shapes. The scheme recently put into effect by which manufacturers of plates and shapes give a rebate of 5s a ton on the purchases of customers who do not buy from foreign producers met with some opposition in the beginning, but it is denied that its operation has checked business. Some of the members of the manufacturers' syndicate in the Midlands have made the rebate scheme apply to certain classes of car-building material.

The Bethlehem Steel Company a Seller of Pig Iron

It is definitely announced that the Bethlehem Steel Company, South Bethlehem, Pa., which has been a quiet seller of pig iron for some months, has decided to come openly into the market as a seeker for orders. It will be in a position to sell, based on its own present consumption requirements, some 200,000 tons of pig iron per year. The company has, however, refused thus far to sell for delivery beyond the next three or four months. The amount of iron it will actually sell will, of course, depend largely upon requirements in connection with its own steel works.

Industrial Week in Buffalo.—Under the auspices of the Industrial Bureau of the Chamber of Commerce and Manufacturers' Club, an exposition of "Buffalo Made Goods" is being held in Buffalo, N. Y., this week, ending Saturday, which differs somewhat from the usual exhibition hall method of display. The exhibits will be in the show windows of the principal stores bordering both sides of Main street, the most important business street of the city, from Exchange street to Edward street, a distance of about one mile. The exposition is held to illustrate to the citizens and visitors from surrounding towns the wide diversity of the manufactured products of Buffalo. This method of holding the industrial exposition was adopted because of its greater effectiveness, owing to the easy access afforded to the population of the city and the greater opportunity for grouping and displaying manifold attractions in a greater variety of manufactures than in an exposition hall. The portion of Main street covered by the industrial display section is a blaze of light each night, and for the time being is probably the most brilliantly illuminated thoroughfare in the world. A huge dome of colored electric lights is located at each end of the "Industrial Row." A number of special exhibition features are provided in some of the larger stores along the line of this industrial exhibit, including a machinery hall, a furniture hall, etc., and an exhibit from the Technical High School which will show what that institution of Buffalo is doing to qualify and send out young men capable of filling responsible positions requiring mechanical skill.

Another Great Foreign Trade Balance.—According to the Bureau of Statistics October imports and exports of merchandise show in each case an increase over those of the corresponding month of last year. The imports were $131,378,176, against $124,046,331 in October last year; exports, $210,523,993, against $207,709,086 in October a year ago. The excess of exports over imports was for October, $79,045,817, and for the 10 months ended with October, $401,660,066. The October exports were greater in value than those of any other October in the history of the export trade. For the 10 months ended October, 1911, the imports decreased $32,043,379, while the exports increased $235,389,583.

The Dodge Mfg. Company, Mishawaka, Ind., made an interesting display in the exposition in Boston, Mass., held under the auspices of the Boston Chamber of Commerce. The products shown comprised iron-center wood-rim pulleys of various types, with attention called to the fact that they might be run at any speed without danger of explosion; solid and split clutches, showing the facilities with which the power in various departments of manufacturing plants may be cut off in case of accident without delaying to send word to the engine room to shut down the engine, thus perhaps saving a human life; collars, flange, keyless and Collins couplings in which all set screws and bolt heads are below the periphery of the fixtures. Many words of commendation were heard for the transmission house whose business ideals extend beyond mere sales to safety and the preservation of human life.

The Keystone furnace of the Reading Iron Company, Reading, Pa., which went out of blast August 1, resumed November 16. Under favorable conditions it produces about 1800 tons of pig iron weekly. Its product is mostly used by the company in the manufacture of wrought iron pipe. The Temple furnace of the same company is still idle, and it is not known when it will be started.

The Parkesburg Iron Company, Parkesburg, Pa., is running about two-thirds capacity, and is making better time than it has at any time since 1907. The company manufactures charcoal iron boiler tubes.

The present condition of coal mining in Indiana, miners and operators say, does not reflect much industrial activity. President W. D. Van Horn, of the Indiana Mine Workers, says the past month was the dullest October in his 35 years' experience. Philip Penna, secretary of the Indiana Operators' Association, says that such a dull condition is unheard of. In the block coal districts miners are working half-time, whereas the mines run double time usually in October. Winter weather will help the domestic demand, but it is the steam coal trade that is most demoralized.

Consul Alfred A. Winslow, Valparaiso, Chile, makes the following report to the Bureau of Manufactures: "The blast furnace at Corral, recently constructed by a French company at an expense of more than $3,000,000 United States gold, is closed down. This has thrown several thousand men out of work. The new plant was built under a Chilean government guarantee of 5 per cent. interest above operating expenses. Some pig iron was manufactured, but it was found very expensive."

The British government is to undertake an inquiry into the cost of living of working classes. The prices of groceries have advanced 13 per cent. since 1898, and the price of meat rose 20 per cent. between 1905 and 1907. In the last 10 years also the price of clothing materials has risen 5 to 7½ per cent. Another necessity of life—coal—has advanced about four shillings per ton since 1898. On the other side of the balance sheet, wages have gone up but not sufficiently to compensate for the increased cost of living.

The Commonwealth Steel Company, Granite City, Ill., has just completed and will dedicate on Thanksgiving Day a $25,000 building for the use of its employees and their children. It is equipped with educational facilities, and graduates of the school to be maintained there will be given preference in employment in the company's plant

Alford & Fay are building a plant at Fairland Station, just outside the city limits of St. Louis, Mo., which will make a product by a direct process from iron ore from southeastern Missouri mines. It is stated that the initial unit of the plant will have a producing capacity of 100 tons per day.

The foreign trade of the Latin-American republics with the world has increased in the last five years from $1,700,000,000 to $2,260,000,000, a gain of $560,000,000.

Personal

Charles M. Schwab, president Bethlehem Steel Corporation, has returned from a foreign tour, in the course of which he spent some time in China. Interviewed by representatives of the daily press, he said that his mission to China was most satisfactory and that he hoped to be able to make a definite statement later regarding what he had accomplished there.

H. G. Stoddard, who recently resigned as president of the Trenton Iron Company, Trenton, N. J., to become identified with the Wyman & Gordon Company, Worcester, Mass., was the guest of honor at a dinner given by the leading business and professional men of Trenton, November 13. President Farrell of the United States Steel Corporation, ex-Governor Stokes of New Jersey, and Walter K. Bowne, of the Trenton Iron Company, were among the speakers.

Wm. P. Palmer, president of the American Steel & Wire Company, has been elected president of the Trenton Iron Company, a subsidiary interest, succeeding H. G. Stoddard, who recently resigned. C. L. Miller is vice-president and W. K. Bowne is secretary and treasurer. C. A. Vogt has been made auditor. T. H. Taylor succeeds Mr. Stoddard on the board of directors.

E. W. Edwards, president of the Edwards Mfg. Company, Cincinnati, Ohio, was elected last week by a large majority, as a member of the board of directors of the Cincinnati Business Men's Club.

J. M. Manley, secretary of the Cincinnati Branch, National Metal Trades Association, was selected last week to fill the newly created position of assistant-to-the-president of the Cincinnati Business Men's Club. He will continue supervision over the local office of the Metal Trades Association.

The Roberts & Abbott Company, Cleveland, Ohio, composed of E. P. Roberts and W. H. Abbott, has dissolved and E. P. Roberts, who is president of the Cleveland Engineering Society, will continue to occupy the offices in which the company was located at 1123 Schofield Building, as consulting engineer.

The Union Switch & Signal Company, Pittsburgh, announces that J. P. Coleman has resigned as chief engineer and has been appointed consulting engineer; L. F. Howard has been appointed engineering manager, with full authority and responsibility in the organization and administration of the engineering department of the company, and F. B. Corey, who was for some years with the General Electric Company, has entered the service of the Switch & Signal Company, taking up the reorganization of the inspection department as engineer in charge of inspection.

Kilburn D. Clark has resigned as representative in northern and western New York of the Harbison-Walker Refractories Company, Pittsburgh.

Jacques Abady, a director of Alexander Wright & Co., Ltd., Westminster, England, engineers and manufacturers of measurement and control apparatus, sailed for London via Quebec, November 17, after a two weeks' visit with their American branch, the Precision Instrument Company, Detroit, Mich. He is one of the co-inventors of the Simmance-Abady combustion recorder, Simmance-Abady vacuum and pressure gauges and other apparatus for testing various conditions of steam, gas, water and air. His visit was partly with the object of discussing several new inventions, which have passed the experimental stage, and which will shortly be on the market for general use in steam and gas plants. In addition to his business activities, Mr. Abady is a barrister, chairman of the Works Committee of the Council of Westminster, and is the author of "Abady's Gas Analyst's Manual," "Coal and Common Sense," "The ABC of Combustion," and other contributions to technical literature.

B. Hoersgen, president of the Krefeld Steel Company of New York, 30 Church street, will return from Europe November 23.

G. W. Kneisly, formerly with the Edgar Allen American Manganese Steel Company, is now connected with the district sales office of the Lackawanna Steel Company at Cleveland, Ohio.

The Braeburn Steel Company, Pittsburgh, has recently appointed, through President William Metcalf, Jr., J. F. Rees, formerly of its Chicago office, manager of the Detroit, Mich., office with headquarters at 403 Union Trust Building, to succeed J. E. Love, recently resigned. Mr. Rees will cover the territory in the lower peninsula and through Toledo, Ohio.

J. E. Stark has resigned as superintendent of the Western Wire Goods Company, a position he had held for the past four years, and has been elected president and general manager of the Electric City Mfg. Company, 60 Cherry street, Buffalo, New York.

H. S. Matthews, formerly vice president and general manager of the Alabama Consolidated Coal & Iron Company, has succeeded Joseph H. Hoadley as president.

Sidney G. Koon, who has been engaged in metallurgical work for the Jones & Laughlin Steel Company, Pittsburgh, particularly in the open-hearth department, has resigned to join the staff of Walter B. Snow, publicity engineer, Boston, Mass.

E. W. Oglebay, of Oglebay, Norton & Co., Cleveland, dealers in ore, is being talked of as a candidate for the United States senatorship in West Virginia. While having large business interests in Cleveland, Mr. Oglebay has maintained his residence in Wheeling, W. Va.

J. M. Belleville, general freight agent of the Pittsburgh Plate Glass Company, Pittsburgh, was elected president of the National Industrial Traffic League at its meeting held in Chicago last week.

Edgar Brosius, Machesney Building, Pittsbugh, has been appointed representative in the Pittsburgh district of the Orton & Steinbrenner Company, Chicago.

The Stanley Committee Resumes

At the session of the Stanley Committee at Washington, November 20, a motion was made by counsel for the United States Steel Corporation to discontinue the investigation because of the Government's prosecution of the corporation. The committee went into executive session to discuss the motion, but no decision was arrived at. However, on Tuesday, November 21, witnesses were examined as to the cost of the Duluth, Missabe & Northern Railroad. Alfred Merritt, of Duluth, the first president of the road, told the story, already very familiar to the iron trade, of the loan of $1,000,000 made by John D. Rockefeller in the early nineties, and of the subsequent foreclosure of the mortgage he had taken on the railroad. The purpose of the examination, it was pointed out, was to show that the earnings of the railroad were large in comparison with its first cost. No reference was made in the examination of Alfred Merritt to the suit he brought against John D. Rockefeller some years after the road was taken over and of the settlement of that suit out of court, on terms which were at that time supposed to be satisfactory to the witness. Mr. Merritt spoke of the passing to Rockefeller interests of the ore properties he and his brother had discovered and told how valuable these properties are to-day. The Stanley Committee will also be able to find witnesses who parted with real estate in New York City and other cities years ago and would now have to pay many times what they received for it if they were to buy it back.

The annual banquet of the Cincinnati Branch, National Metal Trades Association, will be held at the Business Men's Club on the evening of December 7. Among the speakers who have accepted Secretary Manley's invitation to address the gathering are: M. C. Robbins, manager *The Iron Age*, New York; Charles E. Carpenter, vice-president E. F. Houghton & Co., Philadelphia; John A. Hill, president Hill Publishing Company, New York, and W. E. Downing, freight traffic manager Illinois Central Railroad, Chicago.

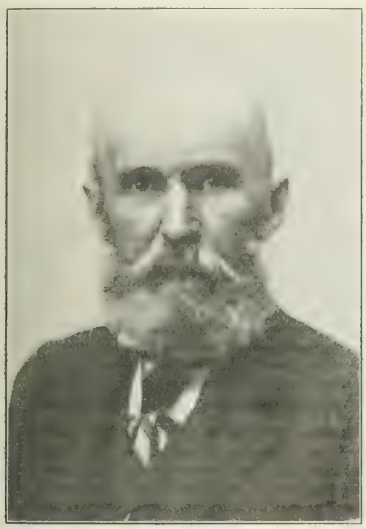
The startling statement was recently made by Premier Kokovsoff of Russia, in reply to questions raised in the Duma, that, owing to the complete failure of the crops in twelve provinces and partial failure in eight others, no fewer than 8,000,000 inhabitants of the 12,500,000 in the affected territory were in urgent need of immediate relief. The expenditure of $60,000,000 would be necessary, one-half to be used at once to defray the cost of supplies already dispatched.

Obituary

Richmond Viall

Richmond Viall, Providence, R. I., superintendent of the Brown & Sharpe Mfg. Company from 1878, died November 10, aged 76 years. His death was caused by a paralytic shock, but he had been in poor health for two years. Born in Barrington, R. I., descended from one of the oldest New England families, he received his early schooling in East Providence, to which town his father had moved. At the age of 17 he became a jeweler's apprentice. After remaining in the employ of Briggs, Hough & Stone for four years, he went to Attleboro, Mass., in 1857 and worked at his trade until the Civil War broke out, when for two years he was engaged in the manufacture of cavalry sabres.

On January 6, 1863, Mr. Viall entered the employ of J. R. Brown & Sharpe as a screw machine operator, working for the usual day's pay, but in a little less than a year he became foreman of the department with 37 men under him. In 1872, when the plant was moved to its present location, he assumed complete charge of the department devoted to the manufacture of the Willcox & Gibbs sewing machines. Six years later he was made superintendent,



RICHMOND VIALL.

a position which he held until his death, although relieved from active work since 1902.

When Mr. Viall took the superintendency in 1878, while the stress of the financial panic was still being felt, he found that the total demand for the company's product, from all over the world, was being supplied by a force reduced to 200 men. Steadily from that time the works became prosperous, and on his retirement from active duties in 1902 more than 2000 men were on the payroll and the floor space had increased to 360,000 sq. ft.

Many factors have contributed to the growth of the Brown & Sharpe Mfg. Company. One was the inventive genius of Joseph R. Brown, coupled with his high standard of workmanship; another was the keen and far-sighted business policy consistently adhered to by Lucian Sharpe; a third was Mr. Viall's personality. Not only was he fitted to superintend the practical operations of a large shop, but his very democratic spirit, his keen insight into human nature, his loyalty, his fine sense of honesty, and his sympathy with the men under him, all united to give him his influence in the expansion of the business. He was not a great mechanic but he possessed executive ability and a nature which would not permit him to do an injustice. He studied men and learned their peculiarities. With a reputation of governing the shop by certain well-defined rules, he still recognized that their strict interpretation did not apply to all cases. He was quick to remedy any falling in the standard of workmanship or any other condition operating against economy.

He realized the value of the co-operation of several individuals instead of the labor of one, and there was no more striking example of this than his willingness to work with his foremen and give each man credit for his work. He insisted upon honesty and dependableness among his foremen, and no man was chosen for this position unless he had these characteristics. No matter how much a man might differ from him in temperament, if he was truthful and competent he would be given preference for a foreman. It was Mr. Viall's opinion that the dissatisfaction and unsettled feelings which sometimes arise in the shop are caused in a great measure by unfair rivalry and by misunderstandings between the foremen and workmen. Accordingly he emphasized the law of mutual helpfulness, in the belief that it increased the value of both skilled and unskilled workmen and also tended to unify and harmonize shop life. His reputation for giving full directions as to the manner in which his instructions were to be carried out was such that there was never any doubt in the mind of the recipient of his orders as to the right course to follow.

No record of Mr. Viall's life would be complete without emphasis on his kind and sympathetic nature. He was ever thoughtful of the welfare of his men and often visited them, searching those who might need his help. He was married in 1859 to Eliza M. Cole by whom he had four children, one of them, William A. Viall, being now the secretary of the company.

GEORGE WHITING HEBARD, vice-president of the Westinghouse Electric & Mfg. Company, died November 17 at Bronxville, N. Y., aged 66 years. He was born at Barre Center, Orleans County, N. Y., received his education at the Albion Academy and came to New York City in 1869. Mr. Hebard was one of the pioneers in the electrical industry, having become identified with the manufacture of such apparatus in 1882. His business interests at the time of his death were extensive. He was vice-president and trustee of the Sawyer-Man Electric Company, and director in the Bridgeport Gun Implement Company, Bryant Electric Company, Consolidated Electric Light Company, Lackawanna & Wyoming Valley Railroad Company, M. Hartley Company, Perkins Electric Switch Company, Union Metallic Cartridge Company, and Greene Consolidated Copper Company. He was a member of the Chamber of Commerce, belonged to the Lawyers' Club of Manhattan and the Union League Club of Brooklyn and took an active interest in church work. He leaves a widow and two sons.

WILLIAM H. LOVE, who was elected president of the New York State Steel Company, Buffalo, N. Y., last spring, died at St. Mary's Hospital in that city November 17, after undergoing an operation for appendicitis. He was 48 years of age. Prior to his election to the presidency, he was attorney for the steel company. He was a man of rare executive ability and was instrumental in placing the affairs of the company upon a good financial basis at the time of its reorganization. Before entering the profession of law, Mr. Love was for a number of years Superintendent of Education for the city of Buffalo.

CHARLES B. GRUBB, a retired ironmaster, died at Lancaster, Pa., November 12, aged 67 years. He was a son and one of the heirs of Clement B. Grubbs, of Lancaster. He was a descendant of Peter Grubb, who was the first to develop the Cornwall ore mines about 1742.

C. F. MARWEDEL, a pioneer merchant of San Francisco, Cal., founder of the metal, tool and shop supply business now conducted by C. W. Marwedel, died November 6 in a sanatorium in Switzerland, aged 78 years.

Crane furnace B, of the Empire Steel & Iron Company, Catasauqua, Pa., was blown out November 16 for necessary repairs. It had been in operation about two years, and will be relined at once. The Oxford furnace, of the same company, will also be relined, so as to be in a position to be put in operation should the demand for pig iron show an improvement.

For Lower Rates on Iron Ore, Coke and Coal

The Case of Mahoning and Shenango Valley Iron and Steel Manufacturers Presented to the Railroads

The Mahoning and Shenango Valley iron and steel manufacturers who for some time have been organizing a movement for lower freight rates on iron ore, coke and coal, presented their case to officers of the railroads over which they ship, at a conference in New York on Tuesday, November 21. The committee of the manufacturers consisted of James A. Campbell, president Youngstown Sheet & Tube Company, chairman; T. J. Bray, president Republic Iron & Steel Company; Henry W. Heedy, secretary Andrews & Hitchcock Iron Company; W. P. Snyder, president Shenango Furnace Company; John Stambaugh, Brier Hill Iron & Coal Company. The Republic Iron & Steel Company was also represented by its chairman, John A. Topping, who was a participant in the discussion. The railroad representatives at the conference were the first vice-presidents of the following roads: Lake Shore & Michigan Southern, Erie, Baltimore & Ohio, Pennsylvania, Pittsburgh & Lake Erie, and Pittsburgh, Bessemer & Lake Erie.

Freight Rates Compared

As has previously been indicated in these columns the average freight rate on materials assembled at Mahoning and Shenango Valley points for the manufacture of pig iron is about 9 mills per ton per mile. The data gathered by the manufacturers show that on coke shipped to the west from the Pocahontas fields as low a rate as 4.5 mills per ton per mile has been made. To the Buffalo district the coke rate is 5.6 mills per ton per mile. The present rate on coke from the Connellsville field to the Mahoning Valley is $1.25 per ton for a haul of 135 miles. From Lake Erie the rate on iron ore to Youngstown is 56 cents a ton. The argument of the manufacturers is summarized in the following statement which was read at the conference of Tuesday by James A. Campbell, chairman of the committee:

The Manufacturers' Argument

YOUNGSTOWN, OHIO, November 16, 1911.

Mr. Joseph Wood,
First Vice-President, Pennsylvania Lines, and Chairman Executive Committee, Ore, Coal and Coke Lines, Pittsburgh, Pa.

Dear Sir: This committee represents furnaces and mill operators as specified herein, in the Mahoning and Shenango Valleys, and in their behalf we respectfully present for your consideration:

1. That the interests represented purchase transportation, when operated to capacity, for approximately:

Coke	3,200,000	tons	annually
Coal	1,700,000	"	"
Ore	5,800,000	"	"
Total	10,700,000	tons	

2. That the iron and steel interests in the Mahoning and Shenango Valleys, operating to capacity, as a whole purchase transportation for approximately:

Coke	5,348,000	tons	annually
Coal	6,116,000	"	"
Ore	10,654,000	"	"
Total	22,118,000	tons	

3. That our investigation indicates this volume is such that these commodities (coke, coal and ore) move in trainloads, averaging 3000 tons, with average earnings per train mile on coke of $30, coal $21 and ore $24.20, from the respective points of origin to points of consumption in the Mahoning and Shenango Valleys. Railroad data would undoubtedly show average trains of about 4000 tons net, with earnings per train mile correspondingly increased.

4. That the earnings for these tonnages per train mile exceed the average earnings in trunk line and C. F. A. territory on all classes of tonnage handled (ore, coal and coke included) in the ratio of 11 to 1 on coke, 8 to 1 on coal and about 9 to 1 on ore.

5. That from the facts, as stated in the preceding paragraph, it is apparent that for the cost of service rendered these commodities are bearing more than their fair proportion of transportation charges.

6. That the continued application of excessive earnings on coke, coal and ore is retarding the proper growth of the iron and steel industry in these districts, has restricted the market for their products and is causing intermittent operation or enforced idleness of mills and furnaces.

7. That since 1898 the physical improvements in tracks, grades, curvatures, bridges, motive power and car capacity have been such that the earnings per train mile on these commodities have greatly increased.

8. That notwithstanding the improvements in operating conditions, under which rates should have decreased, the rate on coke from the Connellsville district to the Mahoning and Shenango Valleys has been successively advanced. The same is true of rates on coal and ore.

9. That we believe it is to the best interest of the railroads serving these valleys that rates on these commodities be very materially reduced.

10. That the interests represented will no longer consent to bear the burden of rates which they believe to be unjust, unreasonable, excessive and discriminatory, and this committee, therefore, respectfully requests that rates on coke, coal and ore to the Mahoning and Shenango Valleys be placed upon a basis in proper relation to the cost of service rendered.

Yours very truly,
(Signed by the Committee.)

Interests represented by committee: Sharon Steel Hoop Company, Valley Mold & Iron Company, Sharpsville Furnace Company, DeForest Sheet & Tin Plate Company, Stewart Iron Company, Youngstown Sheet & Tube Company, Girard Iron Company, Brier Hill Iron & Coal Company, Youngstown Steel Company, Struthers Furnace Company, Ohio Iron & Steel Company, Andrews & Hitchcock Iron Company, Empire Iron & Steel Company, Thomas Steel Company, Shenango Furnace Company, Republic Iron & Steel Company.

The Iron Industry Bears More than Its Share

In the general discussion of the issues involved in their request for lower rates, the manufacturers showed that at an average rate of 5.6 mills per ton per mile on all classes of freight hauled by the represented railroads the raw materials of the iron and steel works of the two valleys are bearing much more than their fair share. In other words, they contend that the low rates which the shippers of high-class freight have enjoyed have been made at the expense of the iron and steel manufacturers. It was urged that the Mahoning Valley manufacturer, confronted as he now is with idleness of plant and impairment of capital, is forced to ask the railroads to give him a freight rate more consistent with the cost of carriage and to abandon the old basis of "what the traffic will bear." It was further contended that the Pittsburgh and Valley districts are in danger from the growth of competition at Chicago, Buffalo, Birmingham and tidewater points. On behalf of the Mahoning Valley interests the following points were specifically presented:

"1. That iron and steel products are selling on the basis of substantially the rates which ruled in 1896; that the spread between cost and market rates is less than ever before in the history of the business.

"2. That the growth of traffic since 1896 in the Central District territory, as was established by the Interstate Commerce Commission, shows an increase of 100 per cent., and that while labor and taxes have increased, iron and steel products and most other items entering into maintenance are relatively cheaper; that with the great increase in density of traffic the cost of conducting transportation has greatly decreased. But notwithstanding these facts, the rates on mineral products or blast furnace supplies since 1896 have shown a very radical increase.

"3. The rates enjoyed by the railroads during the interim in question were so remunerative that evidence before the commission shows that the Pennsylvania Company has added to its capital improvements from profits, approximately $262,000,000; that the Pittsburgh & Lake Erie Railroad has substantially added three tracks to its original one-track system; that the Lake Shore has purchased control of most of its subsidiary companies out of profits.

"4. The manufacturers of our district believe they are now justified in asking the railroads to give them some of the benefits which have accrued to the railroads in the way of lower costs of doing business as a result of capital improvements made from profits in iron and coal traffic, and that rates hereafter charged be maintained on as low a train-mile basis as that enjoyed by any other iron-making section. If the railroads are satisfied with the present rates on coal and coke to Chicago and Buffalo, then, under the more favorable conditions which maintain in the Mahoning Valley, relatively much lower rates could and should be made to our iron-making section."

Commissioner Lane's View

Commissioner Lane, of the Interstate Commerce Commission, in a recent decision against a freight advance, made the following comment on the practice of basing freight rates on "what the traffic will bear." It was quoted in the manufacturers' argument:

"Manifestly, under this principle all that stands between the shipper and extortion is the wisdom and the good sense of the traffic manager who makes the rates. If, in his judgment, it is advisable to carry a small volume of traffic upon a high rate, rather than a large volume of traffic upon a low rate, there is nothing to interfere with this decision and all the consequences affecting the country at large, excepting now the right of appeal to the government as represented in this commission. Rates being made upon this theory, the function of the traffic manager is that of a statesman; he determines zones of production and consumption, the profits of the producer and the cost to the consumer; he makes his rates, if he so pleases, to offset and nullify the effect of import duties and determines the extent and character of our foreign markets.

"To make rates for transportation based solely upon the ability of the shipper to pay those rates is to make the charge for transportation depend upon the cost of production rather than upon the cost of carriage—to measure a public service by the economies practiced by the private shipper. This necessarily gives to the carrier the right to measure the amount of profit which the shipper may make and fix its rate upon the traffic manager's judgment as to what profit he will be permitted. This theory entitles the railroad to enter the books of every enterprise which it serves and raise or lower rates without respect to its own earnings, but solely with respect to the earnings of those whose traffic it carries. This is not regulation of railroads by the nation, but regulation of the industries and commerce of the country by its railroads."

A formal reply from the railroads is expected in the near future. Until that is received no action will be taken by the manufacturers looking to the bringing of their case before the Interstate Commerce Commission.

Labor Notes

The wages of telegraph operators, towermen and agents on the New York Central Lines have been advanced from 10 to 15 per cent., dating from November 15. Employees to the number of 6000 will be benefited.

The Southern Railway has advanced the wages of several hundred of its clerical employees, the increase ranging from 5 to 15 per cent., in accordance with time of service. The Southern Railway also has arranged to raise the wage scale of its telegraphers, the average increase being about 15 per cent.

The Brotherhood of Boiler Makers has called on strike its members from the plants of the American Locomotive Company in sympathy with its members on strike from the shops of the New York Central Lines. Reports show that the boiler makers are drifting back to work in some of the plants and in others the company is replacing them with new workmen.

The commission appointed by the Massachusetts Legislature to consider the advisability of establishing a minimum wage for women and minors held a public hearing at Boston last week. Employers of labor opposed the proposal on the grounds that it is unconstitutional and injurious to employers and employees alike; that it would give to the inferior employee the bonus which now goes to the superior one, and that it would increase the cost of living.

The Inland Steel Company, Chicago, has brought out a new edition of its handbook of "Open-Hearth Steel Products." This book is of value, not only for the illustrated sections and accompanying specifications of shapes rolled by this company such as have appeared in previous publications, but particularly in connection with the added lines. The most recent of the company's new products are boiler, structural and ship rivets and track spikes and bolts. The other products catalogued comprise blooms, billets and slabs, structural shapes, universal plates, sheets for all purposes and concrete reinforcing bars. Rerolled products from rail-carbon Bessemer steel are also presented in various forms. In addition to the usual tables of weights and dimensions, standard specifications and classifications of the several forms of steel are embodied in the contents.

Joseph E. Thropp, owner of the Earlston and Saxton furnaces, in Bedford County, Pa., has contracted with the Southwark Foundry & Machine Company, Philadelphia, for a 25,000-cu. ft. capacity Rateau turbine blast blower for his large Earlston furnace. It is expected to have it installed in four months.

Subterranean temperatures in relation to depth below ground have been noted in boring carried on for some 7300 ft. at Czuchow, in Silesia. At a depth of 1640 ft. the temperature was 79 deg. Fahr.; it reached 104 deg. at 3281 ft.; 130 deg. at 5250 ft., and 182 deg. at a depth of 7285 ft.

Iron instead of steel for underframes is specified in an order for 3000 railroad cars just placed by the Great Western Railroad, England. Iron is preferred by that railroad company as less susceptible to corrosion.

Punxsy furnace, of the Punxsutawney Iron Company, Punxsutawney, Pa., is to be blown in the first week of December. It has been out of blast for about ten months.

Trade Publications

Feed Water Heaters.—Bates Machine Company, Joliet, Ill. Catalogue No. 8, 6 x 9 in.; pages, 24. Illustrates and describes the Cookson cast-iron heater and receiver with cut-out valves which is intended to serve as a purifier, oil separator and condensation receiver. One of the special features possessed by the heater is the ability to purify all the exhaust steam from the engine and auxiliaries. A new type of feed separator is used in this heater having [illegible] that permit the heater body to be cleaned without interfering with the functions of the separator. The Iron Age June 29, 1911, contained an illustrated description of this heater.

Filter.—James Beggs & Co., 36 Warren street, New York, N. Y. Catalogue No. F 37. Describes the Blackburn-Smith pressure filter which employs small and easily renewable cartridges for removing suspended matter from water or other liquids. Some of the applications of this filter are the clarification of a muddy water supply, removing oil and slime from boiler feed water or for clarifying [illegible] and in processing systems.

Hydraulic Pumps.—The Watson-Stillman Company, 50 Church street, New York, N. Y. Catalogue No. 81, superseding catalogue No. 71. Size, 6 x 9 in.; pages, 120. Describes a number of standard and several new types of hydraulic pumps built by this company. In addition to the description of the pumps the catalogue contains considerable information of value to hydraulic engineers and users of hydraulic machinery. Beside the pumps themselves a number of accessories, such as valves, bonnets, valve stems, gauges, packing, etc., are also listed.

Triplex Plunger Pumps.—The Goulds Mfg. Company, Seneca Falls, N. Y. Bulletin No. 102. Relates to a line of single-acting triplex plunger pumps. The construction of these pumps is described at some length with half-tone engravings of the various parts supplementing the text. This is followed by specifications and illustrations of the two different classes of pumps which are designed [illegible]

The Broken Lehigh Valley Rail

The Interstate Commerce Commission's Report

WASHINGTON, D. C., November 20, 1911.—The Interstate Commerce Commission today made public the report of Hiram W. Belnap, Chief Inspector of Safety Appliances of the commission, who investigated the accident caused by a broken rail at Manchester, N. Y., on the Lehigh Valley Railroad, on August 25 last. In order to secure complete information as to the composition of the broken rail and to determine if possible what caused it to fail, it was arranged through the Department of Commerce and Labor that its Bureau of Standards should make a complete examination of the several pieces which were delivered to it for this purpose. The result of the examination by James E. Howard, engineer physicist of the Bureau of Standards, is also made public.

Details Regarding the Train

The train to which the accident occurred left Buffalo 40 minutes late and consisted of 12 cars hauled by two engines. At Rochester Junction, 20 miles east, two additional cars were picked up, making 14 cars in all. On approaching the west end of the Manchester yard, the signals were found at caution, and being required by rule not to exceed a speed of 25 miles an hour through the yard the speed of the train was reduced accordingly. At the time of the accident the train was probably not exceeding that speed.

The report shows that the broken rail that derailed the train was 247 ft. west of a steel girder deck bridge spanning Canandaigua Outlet; that it resulted in the death of 27 passengers and one employee and injured 59 passengers and four employees. One of the injured passengers subsequently died. All the equipment of the train was carefully inspected and both of the engines hauling the train were thoroughly examined. The examination failed to disclose any defective condition of equipment that in any way contributed to the accident and all wheels and flanges were found to be in perfect condition.

Maximum Wheel Pressure on the Defective Rail

Trains are operated on the division where the accident occurred by the Hall automatic block system, and the signals governing the crossover switches in the east end of the Manchester yard are electrically connected with the block signal system so that if in any way the circuit between two blocks is broken the semaphore would indicate danger and could not be mechanically lowered to safety by the towerman. The fact that all the signals were set at clear by the towerman makes it evident to Chief Inspector Belnap that the rail that caused the accident was not broken at the time the train entered the block. This being true, it is regarded as probable by the chief inspector that as steam was just being admitted to the cylinders of both engines, in order to get the train under full headway, it withdrew much of the load from the pilot wheels, resulting in an excessive load on the driving wheels, thus applying a maximum wheel pressure to this defective rail, causing it to break under one of the engines. The cars immediately following the engines, although passing over this rail without being derailed, nevertheless caused additional fractures until, its continuity being destroyed, the forward trucks of the sixth car dropped to the ties. This conclusion is established by the battered condition of the west ends of pieces of the rail found after the accident, as shown by photographs made by Mr. Howard.

The broken rail causing the accident was manufactured by the Bethlehem Steel Company, open-hearth process, 20 per cent. discard, 90 lb. to the yard, and was rolled December 24, 1909, heat No. 14,208. It was what is known as an A rail, which is the first rolled from the ingot. This rail was first laid in the main track of the Lehigh Valley Railroad, at which time it was a 30 ft. rail. Later it was shortened to 20 ft. and relaid. After the accident it was found that it had been broken in many places, the first being 31 in. in length, the next 27 in., the next 23 in., etc. Inspection showed that it was defective, being what is known as being a "piped rail." Analysis of the defective part shows that piping was due to slag originating in the steel furnace. In the examination of the rail, after the accident, the piping or slag split could be seen in practically every part of it.

Transverse Fissures in the Head of the Rail

From the report of Mr. Howard, which the chief inspector freely quotes, it seems that in the head of this rail there were transverse fissures and that defects of this character cannot be detected except by chance. It further appears that they are of a more dangerous character than piping, since they are developed after the rail is laid. Mr. Howard's report points out that the development of these transverse fissures suggests that the limit of wheel pressures has been reached and probably surpassed, on rails of the usual width and shape of head, and that the increasing occurrence of accidents of this character is a warning of this fact. In this connection it is stated that the accident reports of the Interstate Commerce Commission show that in 1902 there were 78 derailments due to broken rails while in 1911 there were 249 derailments due to the same cause. In the last decade there have been 2059 derailments caused by broken rails, resulting in 106 killed and 4112 injured.

Copies of letters written by officials of the Lehigh Valley Railroad to their subordinates show that the company was cognizant of the fact that there were defective rails in service of the character of the rail herein described. In these letters the employees are cautioned to look sharply for defective rails "during the coming cold weather" when rails with slight defects are more likely to fail than in the warmer weather, and any rails that show indication of piping, cracks or other defects should be weeded out promptly.

Chief Inspector Belnap says these orders were issued prior to the time that the rail in question was reduced in length. Not only was the rail cut, but three one-inch holes were drilled through the web of the rail near the cut end, each of which, as well as the cut end of the rail, clearly showed after the accident evidences of the piping mentioned. "This rail," the report continues, "was cut and laid about four months prior to the accident and, on account of the unmistakable evidence of piping found after the accident, it would appear that this defect could and should have been discovered before relaying the rail."

Wheel Pressures Should Be Diminished

The chief inspector says in conclusion that with the information at present available it is extremely difficult to suggest any preventive of accidents of this character. From such information as he possesses, however, it seems apparent that the remedy lies in the diminishing of the wheel pressures and the lowering of direct compressive and bending stresses. Referring again to Mr. Howard's report, the chief inspector concludes that exhaustive experiments and tests should be begun and that a complete and searching examination should be made of the whole question.

This examination should deal with steel rails from the furnace to the time they are laid in the track; it should determine whether the tests now used in the steel mills are adequate to detect imperfect rails; it should ascertain whether the use of high carbon steel is not attended with dangers not recognized in the drawing up of current specifications; it should be extensive enough to inquire into the causes which contribute toward such a destruction of the structural integrity of the steel as was the case with this rail; it should take up the securing of measurements in the track of the actual fiber stresses which are caused by the new types and weights of locomotives, and under the different wheels of these locomotives, in order to obtain information from which to judge of the severity of the strains to which the track is daily subjected; in fact, track conditions as they exist at the present time should be dealt with even to the most minute detail.

Referring again to Mr. Howard's report, the chief inspector gives it as his opinion that the danger zone in the use of steel rails as are at present manufactured has been reached, and since it is supposed that transverse fissures are the direct result of high wheel pressures acting on a hard level a complete investigation should be made for the purpose of scientifically determining the matter and ascertaining a remedy. Until such an investigation has been made the danger of similar accidents will exist.

J. G.

Steel Corporation and "Independent" Output

Decrease of Former and Increase of the Latter in Every Line but One in the Period 1902 to 1910

The American Iron and Steel Association has compiled, and has published in its Bulletin of November 15, the statistics of production of iron and steel by the United States Steel Corporation on the one hand and by the independent steel companies on the other. A comparison is made between 1902, the first full year of the Steel Corporation's existence, and 1910, the effect of the compilation being to refute the charge that the Steel Corporation is a monopoly. The Bulletin's statement is as follows:

Production in 1902 and 1910 by Steel Corporation and Independents

IRON ORE

The total shipments of iron ore from the Lake Superior region in 1902 amounted to 27,585,904 tons, of which the Corporation shipped 16,659,470 tons and the Independents 10,926,434 tons, the shipments of the Corporation exceeding those of the Independents by 5,733,036 tons, or 52.4 per cent. In 1910 the total shipments of Lake Superior iron ore amounted to 43,442,397 tons, of which the Corporation shipped 22,185,972 tons and the Independents 21,256,425 tons, the shipments of the Corporation exceeding those of the Independents by 929,547 tons, or only 4.3 per cent. The increase in shipments by the Corporation from 1902 to 1910 amounted to 5,526,502 tons, or over **33.1** per cent., while the increase in shipments by the Independents in the same period amounted to 10,329,991 tons, or **94.5** per cent.

The total production of iron ore in 1902 amounted to 35,554,135 tons, of which 16,063,179 tons were produced by the Corporation and 19,490,956 tons by the Independents, the production of the Independents exceeding that of the Corporation by 3,427,777 tons, or 21.3 per cent. In 1910 the total production of iron ore amounted to 56,889,734 tons, of which the Corporation produced 25,245,816 tons and the Independents 31,643,918 tons, the production of the Independents exceeding that of the Corporation by 6,398,102 tons, or 25.3 per cent. The increase in production by the Independents in 1910 over 1902 amounted to 12,152,962 tons, or **62.3** per cent., while the increase in production by the Corporation amounted in the same period to 9,182,637 tons, or **57.1** per cent.

COKE

The total production of coke in 1902 amounted to 25,401,730 tons, of which 9,521,567 tons were produced by the Corporation and 15,880,163 tons by the Independents, the production of the Independents exceeding that of the Corporation by 6,358,596 tons, or 66.7 per cent. In 1910 the total production of coke amounted to 41,708,810 tons, of which the Corporation produced 13,649,578 tons and the Independents 28,059,232 tons, the production of the Independents exceeding that of the Corporation by 14,409,654 tons, or 105.5 per cent. The increase in production by the Independents in 1910 over 1902 amounted to 12,179,069 tons, or **76.6** per cent., while the increase in production by the Corporation amounted in the same period to 4,128,011 tons, or **43.3** per cent.

PIG IRON

The total production of all kinds of pig iron, including ferro-alloys, in 1902 amounted to 17,821,307 tons, of which 7,975,530 tons were produced by the Corporation and 9,845,777 tons by the Independents, the production of the Independents exceeding that of the Corporation by 1,870,247 tons, or 23.4 per cent. In 1910 the total production of all kinds of pig iron, including ferro-alloys, amounted to 27,303,567 tons, of which the Corporation produced 11,831,308 tons and the Independents 15,472,169 tons, the production of the Independents exceeding that of the Corporation by 3,640,771 tons, or 30.7 per cent. The increase in production by the Independents in 1910 over 1902 amounted to 5,626,392 tons, or **57.1** per cent., while the increase in production by the Corporation in the same period amounted to 3,855,868 tons, or **48.3** per cent.

STEEL INGOTS AND CASTINGS

The total production of all kinds of steel ingots and castings in 1902 amounted to 14,947,250 tons, of which 9,750,386 tons were produced by the Corporation and 5,196,864 tons by the Independents, the production of the Corporation exceeding that of the Independents by 4,553,522 tons, or 87.6 per cent. In 1910 the total production of all kinds of steel ingots and castings amounted to 26,094,919 tons, of which the Corporation produced 14,179,369 tons and the Independents 11,915,550 tons, the production of the Corporation exceeding that of the Independents by 2,263,819 tons, or 18.9 per cent. The increase in production by the Corporation in 1910 over 1902 amounted to 4,428,983 tons, or **45.4** per cent., while the increase in production by the Independents in the same period amounted to 6,718,686 tons, or **129.2** per cent.

STEEL RAILS

The total production of Bessemer and open-hearth rails in 1902 amounted to 2,941,421 tons, of which 1,992,010 tons were produced by the Corporation and 949,411 tons by the Independents, the production of the Corporation exceeding that of the Independents by 1,042,599 tons, or 109.8 per cent. In 1910 the total production of Bessemer and open-hearth rails amounted to 3,635,801 tons, of which the Corporation produced 2,138,946 tons and the Independents 1,496,855 tons, the production of the Corporation exceeding that of the Independents by 642,091 tons, or 42.8 per cent. The increase in production by the Corporation in 1910 over 1902 amounted to 146,936 tons, or **7.3** per cent., while the increase in production by the Independents in the same period amounted to 547,444 tons, or **57.6** per cent.

STRUCTURAL SHAPES

The total production of structural shapes in 1902 amounted to 1,300,326 tons, of which 753,481 tons were produced by the Corporation and 546,845 tons by the Independents, the production of the Corporation exceeding that of the Independents by 206,636 tons, or 37.7 per cent. In 1910 the total production of structural shapes amounted to 2,266,890 tons, of which the Corporation produced 1,163,300 tons and the Independents 1,103,590 tons, the production of the Corporation exceeding that of the Independents by only 59,710 tons, or 5.4 per cent. The increase in production by the Corporation in 1910 over 1902 amounted to 409,819 tons, or **54.3** per cent., while the increase in production by the Independents in the same period amounted to 556,745 tons, or **101.8** per cent.

PLATES AND SHEETS

The total production of plates and sheets, including black plates (or sheets) for tinning, in 1902 amounted to 2,665,409 tons, of which 1,583,865 tons were produced by the Corporation and 1,081,544 tons by the Independents, the production of the Corporation exceeding that of the Independents by 502,321 tons, or 46.4 per cent. In 1910 the total production of plates and sheets, including black plates (or sheets) for tinning, amounted to 4,955,484 tons, of which the Corporation produced 2,380,106 tons and the Independents 2,575,378 tons, the production of the Independents exceeding that of the Corporation by 195,272 tons, or 8.2 per cent. The increase in production by the Corporation in 1910 over 1902 amounted to 796,241 tons, or **50.2** per cent., while the increase in production by the Independents in the same period amounted to 1,493,834 tons, or **138.1** per cent.

WIRE RODS

The total production of wire rods in 1902 amounted to [illegible] tons, of which 1,126,826 tons were produced by the Corporation and 447,467 tons by the Independents, the production of the Corporation exceeding that of the Independents by 679,359 tons, or 151.8 per cent. In 1910 the total production of wire rods amounted to 2,241,830 tons, of which the Corporation produced 1,508,294 tons and the Independents 733,536 tons, the production of the Corporation exceeding that of the Independents by 774,758 tons,

or 105.6 per cent. The increase in production by the Corporation in 1910 over 1902 amounted to 381,468 tons, or **33.8** per cent., while the increase in production by the Independents in the same period amounted to 286,069 tons, or **63.9** per cent.

CERTAIN FINISHED PRODUCTS

The total production of merchant bars, iron rails, skelp, nail plate, and other finished rolled products not enumerated above in 1902 amounted to 5,462,667 tons, of which 1,701,700 tons were produced by the Corporation and 3,760,967 tons by the Independents, the production of the Independents exceeding that of the Corporation by 2,059,267 tons, or 121 per cent. In 1910 the total production of merchant bars, iron rails, skelp, nail plate, etc., amounted to 8,521,274 tons, of which the Corporation produced 3,203,279 tons and the Independents 5,317,995 tons, the production of the Independents exceeding that of the Corporation by 2,114,716 tons, or 66 per cent. The increase in production by the Independents in 1910 over 1902 amounted to 1,557,028 tons, or **41.3** per cent., while the increase in production by the Corporation in the same period amounted to 1,501,579 tons, or **88.2** per cent.

ALL FINISHED PRODUCTS

The total production of all kinds of finished rolled iron and steel products in 1902 amounted to 13,944,116 tons, of which 7,157,882 tons were produced by the Corporation and 6,786,234 tons by the Independents, the production of the Corporation exceeding that of the Independents by 371,648 tons, or 5.4 per cent. In 1910 the total production of finished rolled products amounted to 21,621,279 tons, of which the Corporation produced 10,393,925 tons and the Independents 11,227,354 tons, the production of the Independents exceeding that of the Corporation by 833,429 tons, or 8 per cent. The increase in production by the Corporation in 1910 over 1902 amounted to 3,236,043 tons, or **45.2** per cent., while the increase in production by the Independents in the same period amounted to 4,441,120 tons, or **65.4** per cent.

WIRE NAILS

The total production of wire nails in 1902 amounted to 10,982,246 kegs of 100 pounds, of which 7,122,354 kegs were produced by the Corporation and 3,859,892 kegs by the Independents, the production of the Corporation exceeding that of the Independents by 3,262,462 kegs, or 84.5 per cent. In 1910 the total production of wire nails amounted to 12,704,902 kegs, of which the Corporation produced 7,041,692 kegs and the Independents 5,663,210 kegs, the production of the Corporation exceeding that of the Independents by 1,378,482 kegs, or 24.3 per cent. The decrease in production by the Corporation in 1910 as compared with 1902 amounted to 80,662 kegs, or **1.1** per cent., while the increase in production by the Independents in the same period amounted to 1,803,318 kegs, or **46.7** per cent.

TIN AND TERNE PLATES

The total production of tin plates and terne plates in 1902 amounted to 360,000 tons, of which 264,109 tons were produced by the Corporation and 95,891 tons by the Independents, the production of the Corporation exceeding that of the Independents by 168,218 tons, or 175.4 per cent. In 1910 the total production of tin plates and terne plates amounted to 722,770 tons, of which the Corporation produced 440,694 tons and the Independents 282,076 tons, the production of the Corporation exceeding that of the Independents by 158,618 tons, or 56.2 per cent. The increase in production by the Corporation in 1910 over 1902 amounted to 176,585 tons, or **66.8** per cent., while the increase in production by the Independents in the same period amounted to 186,185 tons, or **194.1** per cent.

A Table of Percentages

The Bulletin article in its summation says that notwithstanding the acquisition in 1907 of the property of the Tennessee Coal, Iron & Railroad Company, the United States Steel Corporation, instead of establishing and maintaining a monopoly in the manufacture of iron and steel, has not, in the ten years of its history, with one exception, increased its production of the articles mentioned in the table in the same proportion as the independent companies. In several lines the growth of the Independents was particularly marked. The Independents shipped from the Lake Superior region in 1910 almost twice as much iron ore as they shipped in 1902. In 1910 they made twice as many tons of steel ingots and castings and rolled twice as many tons of structural shapes and plates and sheets as they rolled in 1902, while in 1910 their output of tinplates was virtually three times as much as it was in 1902. In the table below percentages are presented which summarize the statements given in detail above:

Production and shipments.	1902—Per cent. Corporation.	1902—Per cent. Independents.	1910—Per cent. Corporation.	1910—Per cent. Independents.
Iron ore lake shipments	50.6	49.4	51.1	48.9
Iron ore production	45.2	54.8	44.4	55.6
Coke production	32.5	67.5	32.7	67.3
Pig iron production	44.8	55.2	43.3	56.7
Crude steel production	65.2	34.8	54.3	45.7
Steel rails, production	67.7	32.3	58.8	41.2
Structural shapes, production	57.9	42.1	51.3	48.7
Plates and sheets, production	59.4	40.6	48.0	52.0
Wire rods, production	71.6	28.4	67.3	32.7
Miscellaneous rolled production	31.2	68.8	37.6	62.4
Finished rolled production	51.3	48.7	48.1	51.9
Wire nails, production	64.9	35.1	55.4	44.6
Tin and terne plates, production	73.4	26.6	61.0	39.0

In 1902 the production of the Tennessee Company is included with that of the Independent companies, but in 1910 its production is included with that of the Corporation. In 1902 it made 5.9 per cent. of the production of pig iron by the Independents and it made 3.19 per cent. of the production of steel ingots and castings.

Railroad Equipment Orders

The recent orders of the New York Central Lines are apportioned as follows: For the New York Central, 6350 freight cars; Lake Shore, 4000 box cars; Big Four, 1525 freight cars; Michigan Central, 2525 freight cars, and the Pittsburgh & Lake Erie, 3000 box cars, a total for all lines of 17,400. Of locomotives 120 have been purchased also by the New York Central Lines. The Baltimore & Ohio has placed its car orders as follows: For 2000 box cars and 2000 all-steel gondola cars with the Standard Steel Car Company, 2000 all-steel gondola cars with the Cambria Steel Company, 1500 composite gondola cars with the Pressed Steel Car Company and 500 box cars with the Mount Vernon Car Company. The Southern Railway has ordered 1200 gondola cars from the Pressed Steel Car Company, 500 gondola cars from the Mount Vernon Car Company and 500 box cars from the Lenoir Car Works. The Cambria & Indiana has placed an order for 300 hopper cars with the Cambria Steel Company. The Grand Trunk has ordered 1000 hopper cars and 1000 box cars from the Pressed Steel Car Company. The Harriman Lines are in the market for 65 all-steel combination baggage and postal cars. The Delaware, Lackawanna & Western is having 1000 miscellaneous freight cars reinforced with steel underframes by the American Car & Foundry Company. The Pennsylvania Railroad, which was reported in the market for 5000 cars, is now said to be preparing a new list which will bring the total up to 15,000. The Chicago, Milwaukee & St. Paul Railway, which ordered 500 steel under-frames from the Bettendorf Axle Company, has increased the order to 1000. The Norfolk Southern has increased its inquiry from 500 to 1000 steel coal cars. The Illinois Central is in the market for 30 cabooses. The Chesapeake & Ohio is in the market for 24 locomotives, and the Norfolk & Western for 25 locomotives.

A notable development in the combustion of illuminating gas was brought to the attention of the gas industry in this country by Prof. William A. Bone, of Leeds, England, at the October meeting in St. Louis of the American Gas Institute. The details are not yet available, but it is understood that a discovery has been made by Professor Bone involving the maintenance of incandescence on the surface of a refractory material against which is directed a jet or jets of the gas mixed with perhaps six times the volume of air. The commercial interest lies in the fact that the arrangement secures local high temperature so that furnaces may be built of the refractory material and high efficiency of combustion and high temperature requirements may be met. The form of combustion has been applied to steam boilers.

The Brown Hoisting Machinery Company, Cleveland, Ohio, has received an order from the Dominion Steel Corporation, Sidney, Nova Scotia, for an electric trolley and bridge crane for handling ore on the docks. The handling plant will have a total length over all of 355 ft. The bridge will have a 225-ft. span and the trolley travel will be 316 ft.

Pittsburgh and Vicinity Industrial Notes

The Pennsylvania Salt Mfg. Company, Natrona, Pa., will make important improvements in its plant, including an addition to the power plant and laboratory, a new office building, and the replacing of old structures with fireproof buildings.

Hubbard & Co., Pittsburgh, manufacturers of shovels, spades, scoops and railroad tools, will erect a machine shop, 99 x 200 ft.

The Pittsburgh, McKeesport & Greensburg Railway Company, which is building a car barn at Irwin, Pa., will include a machine shop and repair pit.

The Verona Steel Castings Company, Pittsburgh, has applied for a charter and will engage in the manufacture of steel castings. The incorporators are J. M. Hansen, William Bierman and E. E. Jones, who are officers of the Standard Steel Car Company. About 18 months ago this company purchased a plant at Verona, Pa.

James L. Stuart, Pittsburgh, Pa., who has the general contract for the erection of an addition to the University of Pittsburgh buildings, has awarded sub-contracts as follows: Structural steel, John Eichleay, Jr., Company; roofing, Pittsburgh Clay Products Company; sheet metal work, Berritt Iron & Roofing Company, Wilkinsburgh, Pa., and ornamental iron work, Winslow Brothers, Pittsburgh.

The Union Spring & Mfg. Company, Pittsburgh, is building an addition to its foundry, 40 x 60 ft., to contain a 10-ton Shaw crane. This will increase its capacity about one-third. It makes Kensington all-steel journal boxes, small steel castings, springs, etc.

The Thomas Carlin's Sons Company, Oliver Building, Pittsburgh, has received an order from the Indiana Steel Company, Gary, Ind., for a Blake type crusher 15 x 9 in. and reports a fair trade in castings for mill and other uses.

The Carnegie Steel Company has ordered a large synchronous motor generator set and a switchboard from the General Electric Company for the Schoen Steel Works, McKees Rocks, Pa.

The Carlin Machinery & Supply Company, North Side, Pittsburgh, has issued a second list of new or rebuilt machinery which it has on hand. The list includes stationary and hoisting engines of various sizes, stationary and portable derricks and other new and rebuilt machinery.

At the monthly meeting of the board of directors of the Crucible Steel Company of America held in Pittsburgh November 15 the treasurer presented his report for the two months ending October 31, showing that earnings in that period were in excess of the requirements for the preferred dividend covering the quarter ending November 30, the operating profits for October alone being in excess of $400,000, the largest showing since February, 1910.

The Harris Pump & Supply Company, Pittsburgh, has secured a contract for the installation of a 200-gal. per min. pump, to be operated by a 25-hp. gas engine for the Ohio Valley Water Company at Bellevue, Pa.

The Wheeling Metal & Mfg. Company, Glendale, W. Va., is making preparations for the addition of a department for the manufacture of skylights and metal cornice work. Frank Ransom of Charleroi, Pa., has been appointed manager of the new department.

The Forter-Miller Engineering Company, Hartje Building, Pittsburgh, is building seven standard-size gas producers for the Corning Glass Company, Corning, N. Y.

The National Roll & Foundry Company, Avonmore, Pa., is operating its works double turn. The company makes air blast chilled rolls, and reports having received some large orders for this product in the past month.

The Pittsburgh Gas Stove & Mfg. Company, Pittsburgh, has filed notice of an increase in its capital stock from $5,000 to $100,000. Edward J. Dashbach is secretary.

The Murphy Foundry Company, Beaver Falls, Pa., which secured a site about 200 ft. square on First avenue, near Sixteenth street, has erected a main building of steel, absolutely fireproof, about 100 x 150 ft., containing among other equipment, a 10-ton Byram cupola and a 10-ton crane. A smaller building houses the charging and grinding equipment, etc. The property has a siding on the Pittsburgh & Lake Erie Railroad, which affords connections with the Pennsylvania system. The company will manufacture high-grade gray iron castings, such as machinery parts and glass-house molds, besides carrying on a jobbing business in castings up to two tons. Lawrence Murphy, formerly with Knott, Harker & Co., and the Keystone Driller Company's local concerns, is president, while William G. Murphy, formerly foreman of the foundry of the Best Mfg. Company, Pittsburg, and later of that of the United States Sanitary Mfg. Company, Monaca, Pa., is secretary and treasurer. The company has close connections with another interest which enables it to secure promptly all the necessary patterns required in its business; also facilities for machining and finishing its castings.

The Glenmoor Mfg. Company has been organized at East Liverpool, Ohio, with a capital stock of $25,000, and will erect a plant for the manufacture of a patented metallic packing for engines. The plant will include a foundry and machine shop, and bids are now being taken on the erection of the buildings.

The annual meeting of the Penn Motor Car Company was held at New Castle, Pa., last week, at which the following officers were re-elected: A. G. Breitweiser, president; J. S. Herbert, vice-president and chief engineer; J. J. Keeling, treasurer; C. E. Gregg, secretary and sales manager. The company is building a new factory, for which a large amount of machinery is being purchased.

The new 90-in. plate mill and the 14 and 16-in. continuous finishing mills being erected by the Republic Iron & Steel Company at Youngstown, Ohio, are nearly completed and will probably be put in operation in December. The plate mill will have a monthly capacity of 5000 tons and the other mills close to 10,000 tons.

The Miles Motor Tire Spring Company, capitalized at $200,000, has been organized and will erect a plant at Braddock, Pa., near Pittsburgh. The incorporators are Charles W. Dressler, Thomas C. Aten, Charles L. Balyser and Zeneb A. Delwarts, all of Braddock; Frederick Miles of Wilkinsburg, Pa., and M. R. Myers, of Huntington, Pa.

The Berkshire Street Railway Company, Pittsfield, Mass., has placed an order with the Westinghouse Machine Company, East Pittsburgh, Pa., for two 750-kw. low-pressure steam turbines driving three-phase, 25-cycle, 375-volt, A-C. generators, to operate in conjunction with the old equipment, consisting of two 1200hp. Rice & Sargent reciprocating engines running at 96 r.p.m., directly connected to two 750-kw. alternators. The Kokomo Public Utility Company, Kokomo, Ind., has ordered from the Westinghouse Company one 1200-kw., one 60-hp. and one 35-hp. steam turbines as an addition to its present plant. The 1200-kw. turbine is one of the Westinghouse bleeder type, and an interesting point in connection with the installation is that an exhaust-steam heating system is to be used in connection with this turbine. These three turbines operate at a steam pressure of 160 lb., and under 28 in. of vacuum, obtained by means of a Westinghouse-Le Blanc condenser. The previous equipment consisted of two 1000-kw. Allis-Chalmers turbines, delivering two-phase, 60-cycle current, at 2300 volts, and the new equipment is intended to supplement this.

The Interstate Steel & Supply Company, 4046 Jenkins Arcade Building, Pittsburgh, dealer in iron, steel, coal, coke, sheets and general supplies, has recently secured warehouse facilities in the Duquesne Warehouses, Pittsburgh, which enable it to carry stocks of hoops, bands, nails, etc., to make prompt shipments. Max Rote, formerly with the Shaw Electric Crane Company, Cleveland, and the American Locomotive Company, is general sales agent of the company.

The Mesta Machine Company is erecting an addition to its office building at its works at West Homestead, Pa.

The city of Erie, Pa., will receive sealed proposals for a triple expansion crank and fly wheel pumping engine of 20,000,000 gal. capacity, in accordance with specifications of Chester & Fleming, hydraulic engineers, Pittsburgh, Pa.

The Laughlin-Barney Machinery Company, Union Bank Building, Pittsburgh, has been appointed agent in the Pittsburgh district for the Western Machine Tool Works, Holland, Mich., manufacturer of triple-geared radial drills in capacities of 3 to 7 ft. in four different patterns for each size, adapted to the use of high speed drills of maximum cutting speed. The company also represents the Luther & Gies Company, Milwaukee, Wis., manufacturer of the Milwaukee back-geared crank shaper.

National Founders' Association

Fifteenth Annual Meeting, New York, November 15 and 16

The liability of employers for industrial accidents and the conditions influencing business were absorbing topics of the annual convention of the executive heads of the foundries of the country held in the Hotel Astor, New York, last week. The word strike was practically not mentioned, and the fact was taken to emphasize the continuance of the individual close consideration of the problems of the employed. The constructive work, besides comprehending the education of the employee, both in respect to his work and the conditions which make for the success of his employer, includes the effort to direct impending legislation along rational lines to safeguard business against the ill-considered acts of the overzealous.

The National Founders' Association held its fifteenth annual meeting in New York at the Hotel Astor, November 15 and 16. The achievements of the meeting as regards the larger aspect of the association's influence related to the question of present business conditions and the question of the liability of employers for industrial accidents. The story of its general attitude toward present influences on business is the story of the meeting of the Administrative Council of the association held Tuesday afternoon, November 14, and more or less spontaneously made the subject of the alumni banquet participated in on Tuesday evening by the 40 past and present members of the council in attendance on the convention. The expression of the composite opinion of the alumni was brought to the attention of the association at its Thursday morning session, which had been arranged to take up the business question, and resulted in the adoption of a resolution calculated to reach all sorts of associations and commercial bodies with the idea of encouraging all interests to participate actively in the movement to stop insincere and ill-advised schemes for Federal interference with business.

The part which the meeting may be said to have taken on the question of compensation for accidents is a further unification of the idea that if further legislation along the line is to be consummated, as seems unquestioned, such matters as the limit of compensation and the necessity of having a law strictly constitutional must be looked after. Another feature of the meeting was the showing of the betterment which the wide existence of the open shop among association members has brought about in manufacturing methods and the mutual cooperation which exists and has been fostered by special attention to the human factor among the employees. These points were brought out in the address of President O. P. Briggs, in the reports of Secretary F. W. Hutchings and Commissioner A. E. McClintock, the latter of whom exhibited lantern views of the remarkable progress which has been made by the molding machine, both in handling difficult subjects and large castings, and views of equipment for the workman's comfort and in a paper by J. J. Wilson, superintendent of foundries, Cadillac Motor Car Company, Detroit, Mich., who brought out also what the molding machine had done in the making of difficult castings.

The Wednesday morning session was given over to the reports of officers and the appointment of convention committees. The president appointed the following committees on resolutions and on finance:

Resolution Committee: F. B. Farnsworth, McLagon Foundry Company, New Haven, Conn.; William S. Hallowell, Harrison Safety Boiler Works, Philadelphia; J. A. Milne, Allis-Chalmers-Bullock, Ltd., Montreal, Que.

Finance Committee: Irving H. Reynolds, William Tod Company, Youngstown, Ohio; E. L. Dawes, Standard Sanitary Mfg. Company, New Brighton, Pa.; Henry Woodland, Allis-Chalmers Company, Milwaukee, Wis.

President Briggs's address was in part as follows:

President Briggs's Address

The condition of the general foundry business, like that of most manufacturing lines in the United States, is not at so high a tide as we could wish for. Many of our plants on this side of the dividing line between Canada and the United States are running on short time and stock orders and have been doing so for several months, and in general the condition of the foundry business is not so prosperous as we might desire, or as the present sound financial condition of the country would indicate that it should be. It is a great pleasure to report to you an entirely opposite condition prevailing among our more fortunate members on the other side of the Canadian line.

BUSINESS AND POLITICAL AGITATION

The question naturally arises with us as to why such a condition should prevail in the United States. We have fairly good crops in all lines, plenty of money for commercial purposes, no wars or disturbances,—at peace with everybody except ourselves. In the minds of most of our manufacturers, I find one reason above all others prevalent, namely,—too much political agitation. Undoubtedly, the welfare of the country demands that certain unlawful combinations be restrained, and brought into a condition of respecting the laws of our country governing such combinations. That reasonable steps to preclude such combinations are necessary and advisable, no one denies.

There seems to be, however, in the minds of our people, the impression that this most beneficent undertaking, once begun, has fallen largely into the hands of certain agitators, demagogues, and alarmists who have shouted their war cry abroad to an extent far beyond the intent of the law or the best interests of even the most injured by these alleged combination restrictions. There seems to be among those in official positions, members of Congress and state legislatures, such a preponderance of people who have not the knowledge of what a commercial age requires from the viewpoint of the employer, the employee and the consumer, as to render it extremely doubtful in the minds of the most innocent as to whether or not it is possible, at the present time, to conduct a business with any degree of safety whatever, where the energies and capital of more than one man are required.

Taking an example from our friends, the unions, this condition among certain people is best illustrated by a bright young Irishman, who, having recently become imbued with the idea of trades unionism, and when attending a union gathering had listened for an hour or so to the eloquent address of a typical Socialist, whose entire discourse was directed to the urgent necessity of destroying every industry that was a success, and demanding that the railroads be downed, the packers be downed, the steel corporations be downed, the food dealers' combinations of all kinds be downed, and having covered the entire scope of our natural products to a very complete extent, the young Irishman, feeling it was high time to act, arose and said, "I move, Mr. President, that this union at once proceed to down everything that is up."

While so considering this great question, will every one bear in mind that the greatest sacrifice and suffering resulting from a continued, prolonged depression of business, and consequent idleness of the wheels of industry, falls heaviest upon the working people.

STRENGTH OF THE UNION

During 1906, 1907 and 1908, the iron molders' union lost heavily in membership and exhausted its treasury. Subsequent events have proved the correctness of this assertion. I believe its membership was depleted at least 60 per cent. In 1907 its dues were increased very materially, in order to replenish an empty treasury. This recuperating program has gone on from that time until this.

During the last year and one-half or two years, they have been compelled to support a large number of strikes, almost entirely outside of this association. This drain upon the treasury has been very heavy, especially the money sent to the West, where strong efforts have been put forth during the last two years to establish an 8-hour workday, in conjunction with the machinists and other allied unions.

Notwithstanding this excessive drain, they have a little more than held their own, financially, during the past year.

now having actually on hand, in cash, considerably over $400,000. They are sending organizers into all parts of the country,—into all territories,—and are exercising every effort within their power to bring the membership up to its former number.

That the iron molders' union has changed its attitude and methods to a considerable extent has been very apparent of late. From the time of the present management until recently, it made its boast of never calling off a strike. Technically, that was about correct. Lately, however, several strikes have been called off unconditionally, and such action was sanctioned by the national officers of the union. It is to be presumed that the real purpose of this was to discontinue strike benefits, and husband funds for the purpose of resurrecting the union.

THE SHORTER WORKDAY

In my report last year I called your attention to the effort being put forth by the unions at that time for a shorter workday, its main effort being centered on the Pacific coast. Subsequent to that time, a strike of considerable proportions was called by the machinists in New York City, for the purpose of accomplishing the same end.

The people on the coast, both north and south of San Francisco, maintained a most firm and persistent stand in opposition to the union efforts. As reported to you a year ago, the metal trade employers of the city of San Francisco were under contract with the unions, looking to the ultimate establishment of an 8-hour day. You will recall that one of the conditions of this contract with the unions was that unless they succeeded in establishing the 8-hour day both north and south of San Francisco, the contract could be canceled at the option of the manufacturers of that locality.

The unions having failed to establish the shorter workday in the territories named, the indications at this time are that San Francisco will now exercise its opportunity to extricate itself from this most ruinous, closed shop contract, and return to the same working hours and conditions as other employers of the Pacific coast. Indeed, it would seem imperative that such be the case, when you consider the fact that the industries of San Francisco have dropped off to such an alarming extent. This rapid decline in industrial activities of San Francisco has recently been stated by the Home Industrial League of that city as follows: "In 1904 San Francisco and environs had 4500 factories, with $238,103,663 capital invested and 44,875 hands. In 1910, she has 1398 factories, with $78,981,879 capital invested and 14,000 hands, a loss of more than two-thirds of her industrial strength."

Bear in mind that under the present open shop conditions, the working people involved, upon a careful analysis, are found to be enjoying better conditions, receiving larger annual wages, and enjoying many more of the luxuries of life than under any union rule ever administered at the hands of the iron molders' union or its contemporaries of the American federation of labor brand.

Another phase of unionism is more pronounced at this time than ever before, namely, the tendency of the American federation of labor union toward Socialism and socialistic principles. This has been quite marked recently by the change of presidents of the machinists' union, the former president being deposed, at the recent election, and his successor, it is understood, being a rank Socialist. He was elected over the former president by so great a majority as to indicate a larger following to the socialistic idea than ever before.

IMPROVED METHODS IN FOUNDRY PRACTICE

At the close of the year 1907,—the year following the great strike of 1906,—so much progress had been made in introducing modern appliances for the manufacture of castings that it was thought by many that the limit of the application of such improved methods had been reached; that our foundry practice which, in the light of subsequent events, had been sleeping or dormant for many, many years, in comparison with the progress made in other lines of manufacture, had attained a position of development fully equal to that of kindred lines of manufacture. The fallacy of this belief has been demonstrated during the past year in a most phenomenal manner. I believe that more new fields have been entered with the molding machine and similar devices, during the past year, than in any one year barring only that of 1906.

Prior to 1906, a large percentage of the employees of foundries of this association was unionized closely. Today, in my judgment, not to exceed 15 per cent. of them are unionized, and those shops still operating under union conditions are securing advantages which were never before possible.

Prior to 1906, when a manufacturer of heavy machinery castings found his shop struck, it was next to impossible to secure castings in neighboring foundries, nearly all manufacturers of this line of machinery castings being compelled to operate under union regulations, their men refusing to work on patterns from struck shops. To-day the reverse is true, and has been true for the last four or five years, namely,—if any man in this association, a manufacturer of heavy castings, finds his shop struck, his entire output can be placed in open shop foundries of the association that have been opened up and placed under proper working conditions during the period cited.

In several cases during the past two years manufacturers of this class of castings, whose shops were struck, were compelled to secure their entire output from our open shop foundries, and did so readily at a price that surprised them, due to the fact that under the open shop conditions the proprietor, instead of the union, was operating the shop. The benefit to the foundry industry in this respect is incalculable. To me the surprising feature of this is that so few proprietors outside of your own membership appreciate what your association has accomplished. To a very great extent, the improved methods of making castings introduced during this period have helped to make this condition possible.

It is commendable on behalf of our membership that, in employing a new class of men for this work, they are disposed to treat them fairly, to pay them good wages, to provide good conditions and to see that they receive in all respects their share of the profits and benefits of the new methods. Our employees are our strongest allies. Not less than 75 and probably 85 per cent. of all our employees are good, honest citizens, anxious to do what is right.

THE REVIEW AND EDUCATIONAL WORK

The extension of the educational work is still very perplexing to your officers, all believing that a greater dissemination of the true situation and facts obtaining among working people of this country must be made. The association is truly entitled to great credit for what it has done by way of circulating such information, especially the information contained in our publication, The Review. Every month that rolls around brings us in more positive evidence of the efficacy of this magazine. I honestly believe the result of the educational feature of this review as it has been disseminated has been more beneficial in bringing around amicable relations and proper conditions, and a contented state of mind on the part of the employees who have read it, than any similar amount of money ever expended by this or any other association.

Whenever and wherever we have been able to present our case directly to these people, without the intervention of the so-called agitator, either of the labor union type or his sympathizers, we have been able to convince them of the correctness of our position. I do not think there is an exception to this rule.

EMPLOYERS' LIABILITY AND WORKINGMEN'S COMPENSATION

During the past year there has been considerable activity along the line of employers' liability and workingmen's compensation. In the constitutional respect, the atmosphere is somewhat cleared, certain errors being pointed out, by reason of which it is hoped that the efforts of the various commissions and committees having the matter in hand will result in a proper solution of the undertaking in due time.

Coincident with this work, the Federal Government, by way of its commission appointed for that purpose, is getting somewhat active, which action will be most interesting and helpful to all our members, when published. While in some respects we have been considered a little slow in taking action upon this most important question, I can but believe that we are making infinitely more progress in proceeding carefully than we would have made by plunging headlong into such a new movement without proper consideration and analysis of conditions prevailing in our own country. A standing committee has had this matter in hand for several years, and its report will be before you at the proper time, as slated on the program.

LABOR LEGISLATION

The question of labor legislation is perhaps more complex at this time than ever before, due to the mixed condition of political affairs in our Federal Government. Just what stand the two branches of Congress will take upon the labor demands during the coming session is problematical. Suffice it to say that if the employers and the better element of the working people are to have their cause properly cared for, greater precautions than ever will be necessary the coming winter. The unions are always on the job to a far greater extent than the employers.

PATENT LEGISLATION

A new phase of the labor situation as met at Washington is now presented by way of an attempt on behalf of certain members of Congress to modify or repeal the patent laws of this country. Bills to this effect were introduced at the last session of Congress. They will probably be reintroduced during the coming winter. It is pos-

sible that your consideration of patent legislation may be a little far-fetched at this time, when viewed from the standpoint of the functions of an organization of this kind. However, it appears to me that a repealing of our patent laws as they now stand would work as great disaster to the working people of this country as it would to the employers. All moves of this kind, in my judgment, tend to lower wages and, worse yet, to destroy ambition, a qualification which already is at too low an ebb in the minds of the working classes generally.

MEMBERSHIP AND FINANCES

The secretary's report on membership is the most gratifying report ever presented to a convention of this association, and I am pleased to report to you that the details of securing this increased membership have been in the hands and under the guidance of Secretary Hutchings, associated with Commissioner McClintock, and the rest of us, as occasions have presented themselves. To Hutchings and McClintock must be given the greatest credit for this magnificent showing. Especially is the secretary to be commended for the results obtained. I cannot say too much in commendation of him in this regard. Your finances are in splendid shape, as will be noticed by the treasurer's report.

Pursuant to the action of the last convention, the same offices have been maintained, notably, Detroit, New York, Chicago and Minneapolis. If the association desires that the same territory be covered and about the same programme of defense and education be continued in the future, as has been in the past, it would seem necessary to maintain them in the future. Commissioner McClintock has been stationed for the greater portion of the time at Chicago, Mr. Hutchings at Detroit, and Mr. Taylor has been in charge of the New York office, where all have given splendid satisfaction, as usual.

The Secretary's Report

The report of Secretary Hutchings included the following interesting points: The molders' union inaugurated and supported thus far in the calendar year 1911 strikes in 47 foundries, involving 1500 molders and coremakers. Six of these shops, employing 306 molders and coremakers, were of the association membership. In other words, there had been nearly seven times as many struck shops on the outside as on the inside. Since January, 1910, the molders' union has declared and supported strikes in 198 foundries, of which Mr. Hutchings had a record. Only 21 of these shops were in the membership. The strikes in 149 out of the 198 foundries have progressed to a point where there is no doubt that the union has been defeated, and in many of these it has recognized this defeat by discontinuing its support and instructing its strikers to find work elsewhere.

MEMBERSHIP

Since the last convention, he mentioned that the Administrative Council has acted favorably upon the applications of 61 foundry plants. The membership at the present time covers 491 foundry plants. For the past year the association continued the dissemination of literature to iron molders and machinists in conjunction with the National Metal Trades Association. This comprehended the mailing of The Review each month and an occasional circular of information to workmen. The favorable effect of the work was clearly shown by the letters received frequently from workmen. There can be no question, he said, that a broader distribution of the truth in regard to the present methods of trade unions, especially the one from which the members are defending themselves, would act as a material influence in lessening the liability to strikes.

The Commissioner's Report

The report of the commissioner was, as stated, illustrated by means of lantern photographs. The views covered a very large jolt-ramming machine in the works of the Mesta Machine Company; the successful machine molding of a piano plate, which is a light, thin casting of large area, with pins included in the casting on which are stretched the piano wires; some large work at the General Electric Company; large valves made in the foundry of the Ludlow Valve Mfg. Company, Troy, N. Y., including a 60-in. valve weighing 19,000 lb. and requiring a character of product capable of withstanding a water pressure of 300 lb. per square inch; work at the plant of William Sellers & Co., and the successful use of hinged match plates in the foundry of the McClary Mfg. Company, London, Ont., where 30 tons of stove plates are produced per day. The commissioner's report was in part as follows:

The depressed condition of the foundry trade during the past year, has had much to do with limiting the number of molders' strikes. The molders' union has kept up an active campaign for new members, has endeavored wherever possible to gain recognition, for the purpose of compelling the individual workman to pay dues, and likewise their opposition to molding machines and handymen has been constantly before us. Their efforts to regain some of the ground they have lost during the past six years, are now taking the form of an active campaign to organize into separate local unions the negro molders in the South, and the foreign specialty molders in many foundry centers in the North. While the executive board of the union, at its spring meeting, gave sanction to strike a large number of shops in various parts of the country, the authority to act was left in the hands of the national officers, who have in the majority of cases deferred action pending more favorable trade conditions.

Of the fifteen struck shops reported to you one year ago, three of these are still receiving support and attention from your officers. We have also assisted in furnishing molders to three probationary members who are resisting the union.

In addition to the above, your officers were called in consultation with a number of members where trouble was pending, but in each case the difficulties were overcome without the necessity of active support on the part of the association.

During the past season, your representatives in the field have kept constantly in mind the importance of endeavoring in every way possible to impress on the membership the necessity of putting in effect such measures as would prevent strikes, and also enable a much stronger line of defence in case trouble actually occurs.

FREEDOM FROM UNION CONTROL

It is now seven years since this association in annual convention adopted its present policy and announced its willingness to give support to any of its members who wished to operate on the open shop plan, and free themselves from the tyranny of the molders' union. While at present 80 per cent. of the foundries enrolled in this association are non-union or open shops, at the time this declaration was made, 90 per cent. of the membership were operating strictly union shops, and the problems facing the members were serious to an extreme degree.

The influence of the union restrictions on freedom of employment and apprentices, and their opposition to molding machines and improved appliances had existed for so long a period that a majority of the foundry superintendents and foremen were inclined to the idea that it was not possible to operate a shop successfully without union molders, which condition was intensified where the product was large castings. During the past seven years, you have noted some radical changes and what was believed impossible in foundry practice a few years ago, we now witness as an every day accomplishment.

Instead of the average foundry foreman being skeptical about the success of the open shop, we find the reverse is now true. Superintendents and foremen seeking positions are particular to state that they believe in the open shop, and are familiar with molding machine practice. They realize that conditions have changed, and that foremen imbued with union ideas are no longer in demand.

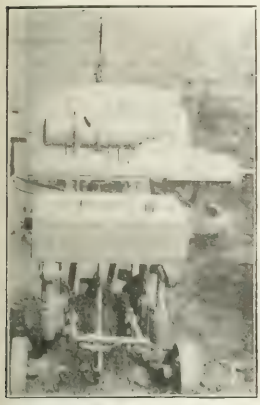
DEVELOPMENT OF MOLDING MACHINES

Two years ago, I exhibited photographs of miscellaneous machinery castings, weighing from 100 lb. to 12,000 lb., the molds for which had been made on jarring machines. Machines having a capacity of ramming copes and drags weighing 20,000 lb. were the largest then in use. At this writing, there are in successful operation machines capable of handling molds weighing 80,000 lb., and another machine is about to be installed to make molds weighing 120,000 lb. The problem of adapting the machine to this class of work, which hitherto was thought to be outside the range of mechanical methods, is being solved. While the tendency has been to build molding machines for heavier castings, fully as marked progress has been made in castings of lighter weight, which in the opinion of most foundrymen could not be made in this way.

I would refer particularly to piano plates as an illustration. In addition to reducing the molding cost over hand methods fully two-thirds, 135 pins for supporting the strings are cast in the plate. On hand molded plates, it has been necessary to drill holes in the castings, into which soft steel pins are driven. These machines are operated entirely by laborers, are paid piece work, and on the above described plate, five men put up and pour off 65 molds per day, while on the larger size, six men produce 55 plates.

MAINTENANCE [illegible]

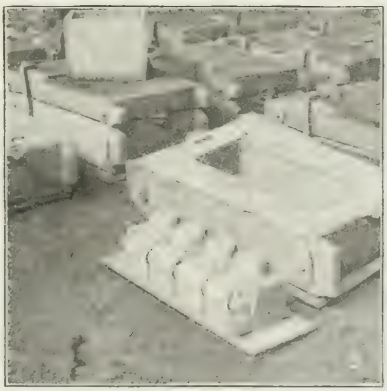
In the establishment and maintenance of the open shop foundry, the molding machine and handyman molder are the foundryman's greatest aid. The shop depending entirely upon the non-union journeyman molder, and making no effort toward the use of molding machines or the education of a goodly percentage of apprentices and handymen, is in a dangerous position to withstand the onslaught





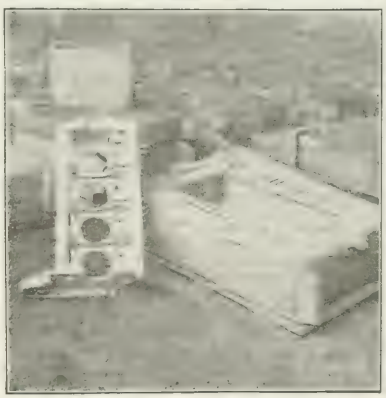














EXAMPLES OF [illegible] MOBILE CASTING FOUNDRY

Views 1 and 2 show the drag and the cope half respectively of a [illegible] cylinder, with the pattern just drawn from the sand. In explanation of the pictures, which, with the rest of the illustrations, were selected from lantern photographs exhibited by J. J. Wilson before the National Founders' Association, attention is called to the method of gating shown in No. 1 to distribute the iron to prevent segregation in the heavy sections. In No. 2 the leader is shown on both sides of the pattern and beside the machine may be seen the casting itself. Views 3 and 4 show the cope and drag molds of the engine end plate. The casting is shown in both views, No. 3 the cope side and No. 4 the drag side. The flask is 13 x 21 in. and the casting is very thin. The gates are distributed on both sides and corners on them are rounded off to avoid sharp corners of sand being broken off. No. 5 shows the drag half of the intake pipe connecting carburetor to engine combustion chambers, with core in place and finished casting below; No. 6 shows the cope half of the same mold. The special features are very thin section and a smoothness on the inside equal to that outside. The inside is cored. No. 7 shows cope, drag and casting of the bottom half of the crank case or oil pan, a casting 3/16 in. thick. The drag is made on the rockover; the cope on a stand. There are six cores in the cope which must be set accurately, a gauge being used to locate all the cores in the right position. No. 8 shows the drag for the upper half of the crank case as it came from the machine with core beside the mold ready to be turned over and set into the mold. The core is about 26 in. long, 10 in. high and 10 in. wide, and laborers set the cores fully as well as the molders. No. 9 shows the cored side of the engine end casting and is regarded as difficult for the job molder. The multiple [illegible] gates is shown in both Nos. 8 and 9.

of the union. The success of the open shop depends on being able to pay the skilled non-union molder a higher wage than he can get by depending on the union, with its minimum wage scheme, which tends to hold the best men nearer a common level. It should be borne in mind that the non-union and open shop, with its operatives of varying degrees of skill, must of necessity require greater and more direct supervision. This is compensated for by lower tonnage costs, ability to maintain a full quota of foundry operatives during good times, and freedom from the restrictions of the union.

Another point to which I would call attention of the membership is the tendency toward dry sand as against green sand molding. In maintaining an open shop, and instructing handymen, the ramming of green sand molds is much more difficult of accomplishment than in the case of dry sand. For this reason, molds formerly made in green sand and requiring a high degree of skill, are now rammed by laborers and handymen, and the effect of too hard ramming overcome by drying the molds. Loam molding which long held the position of being the most difficult branch of the trade, is now successfully handled by handymen under the direction of an assistant foreman or an instructor or two, who lay out the jobs and superintend the various operations of the work.

I am also pleased to report that there is a constantly growing effort to overcome what was formerly considered the secrets and mysteries of the art of molding. The foundry chemist has exploded the mystery of cupola practice; the mixtures of core sand are no longer known only to some employee, and the knowledge of the whereabouts of patterns and core-boxes carried in the head of some pattern carrier. I can recall many instances where serious loss and much confusion was caused because the firm had no system of marking and cataloging its patterns and core-boxes, and where the foreman and man in charge of patterns suddenly decide to cast their lot with those on strike.

At this point, I wish to say just a word regarding the molders and coremakers now employed for struck shops. The loyalty and high character of these men is at a higher ebb than ever before, due to two facts:—first, we have always done exactly as we agreed with them in every particular; second—during some of those hard times, we have been compelled to carry these contract men at considerable expense, not being able to place them readily, notwithstanding which there has never been a contract made between any of these men and the association, during the present administration, that has not been lived up to to the last penny, so that the good results of this protection to these men is more and more apparent every day.

OPEN SHOP VERSUS SHOP CONDITIONS

It is particularly gratifying to report that in my travels about the country, I find much is being done by the members of this association to provide their foundries with better light, heat, ventilation and wash room facilities. This condition does not apply to any one section of the country. One reason why so much money is being invested in foundry wash rooms, baths, lockers, etc., is because it pays. If we want a man to do neat work, we look for a man who is neat of person. If we expect to get a good day's work from a man, we must help him to keep himself in good condition physically.

The open shop is opening the door of opportunity to a class of workmen the union says should forever remain common laborers, and it is also using some very practical means to help him maintain or improve his physical condition.

In the matter of accident prevention, there is a marked improvement in the guarding of tools, warning employees as to danger points, etc. It is not now uncommon to enter a foundry and see various signs displayed cautioning the workmen of dangers attendant the careless handling of molten metal, the importance of wearing suitable shoes, etc. These signs act as constant reminders and supplant the instructions of the foremen. Over the gateway to a foundry, I recently noticed a large sign bearing an inscription to the effect that "if you wish to avoid accident and expect a fellow-workman to do nothing that may cause you injury, you must do nothing that will injure him."

Molding Machines for Automobile Castings

The Wednesday afternoon session was introduced with the presentation of a paper by J. J. Wilson of the Cadillac Motor Car Company, describing by means of the stereopticon the use of molding machines for automobile castings. There are but four distinct types of molding machines, he explained—the squeezer, stripping plate, rock over and jarring. Others are combinations. The impression seems to prevail, he continued, that any machine intended for the foundry does not require to be as well built as the machine for the machine or pattern shop. Machines in the foundry are subjected to hard usage and they are constantly exposed to rust and sand or grit to a much greater degree than is the case in any other department. Sufficient attention has not been paid to the protection of all the wearing parts from sand. The following notes give important points in Mr. Wilson's paper and the accompanying illustrations will be of considerable interest in this connection:

If you are going to adopt machines in your foundry start right, make the selection with care and have the best pattern equipment obtainable: Iron flasks, well-made taper wood or metal snap flasks, which parts are interchangeable. All pin holes should be drilled accurately with a jig which has been fitted with hardened steel bushings. When the pattern is placed on the machine, after the type of machine most adaptable has been thought out, the kind of pattern material and how it should be made, method of gating, kind of flasks, etc., then we have the complete equipment for making good work, except a man to make the castings. The superintendent, foreman or instructor must furnish the experience for the operator until he becomes proficient.

What are the results to be obtained from the judicious use of the molding machine? 1.—A greater output per man and per pattern. 2.—Castings more uniform and true to pattern, which is essential in automobile castings or any other work where jigs and special tools are used for all the machine operations. 3.—The product at a reduced cost. 4.—Most important for our own peace of mind and benefit of the man who is willing and does do an honest day's work, a fair day's wage and the open shop.

An important matter in the core room is the inspection of cores. It is only by the daily, thorough inspection of cores that we can hope to detect cores made from boxes which have become worn and shifted, or cores improperly made or vented. If the cores are not properly inspected it frequently happens that a large number of cores are made in boxes from which a piece may have been lost or the boxes badly worn, sand not properly rammed or corners or edges knocked or worn off.

Frequently we see a casting which will be run with one or two gates, where a dozen to fifteen might be used to better advantage. Iron should be so distributed that the danger from segregation in the heavy sections and unequal strain caused by the hot iron not being well distributed in the mold when pouring is reduced to a minimum.

One of the things which is looked upon as being of considerable importance in many of the foundries is the high melting ratio of coke to iron. Our policy has been to make very small charges, evenly distributed, every bit of material weighed, both iron and coke. No special effort is made to save fuel at the expense of an inferior product. The only thing considered is the quality of iron which comes from the cupola. This is necessary, regardless of whether we melt one to five or one to nine.

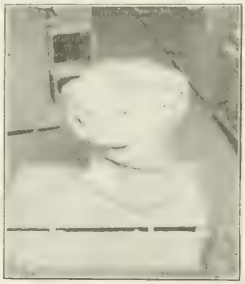
The general freedom with which what might be called inside information of the various works had been contributed through both Commissioner McClintock and Mr. Wilson, led C. H. Gifford, American Blower Company, to remark that the existence of secrets is becoming less and less the case in foundry practice, and he proposed a vote of appreciation, which vote was carried, for the addition to general knowledge contributed through the broad-gauge attitude of William Sellers & Co., W. W. Kimball & Co., McClary Mfg. Company, Ludlow Valve Mfg. Company, General Electric Company, Mesta Machine Company and Cadillac Motor Car Company in affording the opportunity to exhibit the pictures.

Liability of Employers for Industrial Accidents

The programme of the meeting had arranged for special consideration of the question of liability of employers for industrial accidents and papers were presented by the representatives of two insurance companies and by the attorney of the association.

The first speaker was W. G. Cowles of the liability department of the Traveler's Insurance Company. He mentioned the constitutional obstacle which must be met in a compensation law which is to stand. He laid special emphasis on the claim that compensation does not proceed as a matter of right, but must have an element of mutuality. He admitted that there should be compensation, particularly in the hazardous occupations, but maintained that

the employee should, to express it briefly, contribute toward the maintenance of compensation funds, and in that way provide the condition of mutuality regarded as so important. The speaker dwelt at length on the experiences of the German state insurance, contributing statistics to show that it had not, in his opinion, worked very satisfactorily. There is no collection of reserve in that case and he felt that it was worth while to consider what is to occur in Germany in the event of a paralysis in trade. He also mentioned the operation of the law in the State of Washington, where as the result of accidents in powder companies there is a total claim against the State of $32,000 and about $270 to meet the claim. He emphasized that there should be no competition in rates among the insurance companies, of which there were about 60 now doing business in the country. He intimated that there should be some sort of state control so that the good and bad risks would pay the proper rates and that in general a better service could be given by the insurance companies.

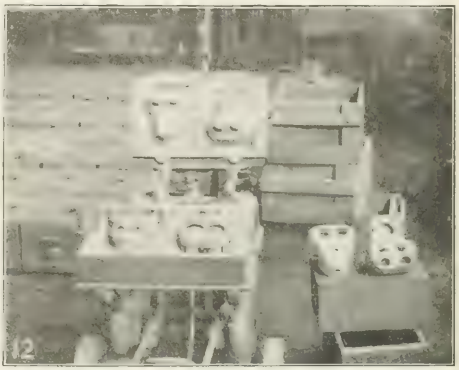


Edwin W. DeLeon of the Casualty Company of America also contributed a paper, and both he and Mr. Cowles referred to various analyses which had been made particularly of the German experiences, but Mr. DeLeon also advanced arguments against state insurance on the basis of the experiences in England and in Continental countries in addition to Germany.

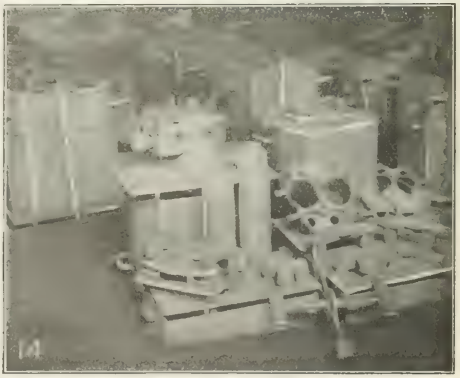
J. H. Schwacke of William Sellers & Co., Philadelphia, of the association's committee on the subject, reported informally that the committee had not yet followed any specific line of conduct, but felt that it was best to see that what is done with regard to the compensation laws in different states is done right

George M. Gillette, Minneapolis Steel & Machinery Company, Minneapolis, referred to the Federal Commission now at work to draw up a bill for presentation to Congress. As such a bill is likely to be taken for a pattern for state legislation, and as the commission









No. 11 shows the cope half of the combustion chamber and both cope and drag sides of the casting. No. 12 is the same as No. 11, except that the cores are set in the mold and the gauge is shown for locating the proper depth of the combustion core. No. 13 is the drag half of the combustion chamber, showing assembled core and the core in parts ready to be pasted together. No. 15 shows a section of the combustion chamber which is water cooled. This is to give an idea of the thin walls and the little variation allowed in the casting.



No. 14 shows the drag of the cylinder in the right center of the picture with the core in place. It also shows the assembled core at the left center; the assembled combustion chamber core on a jig, a complete set of cores ready for the pasters and in the immediate foreground the gauge for locating the barrel cores in the mold. This is a very difficult core to set in a green sand mold without shaving or scraping the sides of the mold. No. 10 is a view of the finished casting and is to be studied in connection with illustration No. 14.

EXAMPLES OF THE USE OF THE MOLDING MACHINE IN THE AUTOMOBILE CASTINGS FOUNDRY.

has already intimated some of the lines of the bill, to which exception ought to be made, he felt that a close watchfulness of the proposals of that committee was quite important.

Mr. Gillette mentioned that the Federal idea seemed to be that workmen shall not contribute. He considered there was hardly anything more important also in respect to a compensation law than that there should be no compensation for at least two weeks after an accident, as otherwise there was likely to be a large amount of malingering. He was disposed to take exception with the representatives of the insurance companies who had stated that with the government experience there had been a greater percentage of accidents under the law. His understanding of the records was that accidents both in Germany and in England had decreased. There had been a great increase in the number of reported cases, but a decrease in the number of cases of permanent injury.

Imminence of Pro-Labor Laws

At the opening of the Thursday morning session Marshall Cushing, legislative representative of the association, at Washington, made a report on legislation. He mentioned that eight-hour agitation, the anti-injunction legislation as affecting labor and the general socializing process going on throughout the country are now more likely to develop laws than has ever been the case. He felt that such bills will undoubtedly pass in the House of Representatives and he did not engage to say what would happen in the Senate. He called attention to the fact that in the event the Sherman law is amended so as to not to apply to labor unions, the presidential veto is of course to be relied upon With regard to the employers' liability bill as likely to be submitted through the commission now studying the subject, of which commission Senator Sutherland, Utah, is the chairman, he suggested that if the bill is not presented in December, it will undoubtedly appear in January.

Opening up the discussion on the proposed bill later in the session, Mr. Gillette explained that one of the things which staggered him is that not a single employing concern has expressed its view with regard to the kind of legislation it approves. Practically all of the discussion related to the constitutional restrictions of a bill of the kind. He believed that the commission would like to know the views of the employers, particularly as regards the limit of compensation. The National Founders' Association ought to take its part.

On motion of Mr. Schwacke, the attorney of the association, George M. Monaghan was appointed to take care of this work, to be assisted by a committee of members appointed by the officers. Incidentally a spark of humor was injected into the discussion by Theodore O. Vilter, of Milwaukee, who told how he had agreed to support a friend for member of Congress with the one stipulation which, on explanation to his friend, was stated to involve merely that the aspirant for honors should on taking his seat offer as his first resolution a motion that Congress should adjourn for two years.

Isaac W. Frank was of the opinion that each industry should carry its own burden and that agriculture should be so included. Statistics, he asserted, had shown that the farming industry produces a large percentage of accidents, and yet it would strenuously oppose a compensation movement of which it would have to sustain its part. Mr. Gillette added that if the commission was bound to present a bill to Congress, the committee of the association should confer in regard to the details. Incidentally statements by a number of the participants in the discussion went without contradiction, that there was probably a fairly unanimous feeling among the members present that some sort of a compensation measure was proper, the principal object being that the bill should not be one-sided, but the attitude of the employing element should be understood.

Present Business Conditions

What was styled by President Briggs as the real subject of the convention was the consideration of present business conditions. A report was received from a committee appointed by the Council to consider the subject. This committee, composed of J. H. Schwacke, C. H. Gifford and Philetus W. Gates, through Mr. Schwacke, offered a resolution, which, after a discussion highly in accordance with the resolution, was unanimously adopted. The resolution in full is printed in this account.

Mr. Schwacke said that he was deeply impressed with the fact that the association must not expect to develop successful counter agitation as a body, but the individual must carry the movement to his own locality and get boards of trade and other commercial bodies, and then the State, and finally the National Government, to consider the side of the subject which has not yet attempted specially to make itself felt. Business men, he said, are determined to have a voice in things affecting them so vitally.

Isaac W. Frank argued along the same line and said that it was high time that business men should assert themselves to offset the agitation which is calculated to indicate favor towards the laboring man who does not understand the importance of the question.

Mr. Gillette suggested that present business conditions are not entirely due to radical legislative movements. That had a great deal to do with the present condition of affairs but not all. One of the other factors was the national currency, a matter which ought to be settled absolutely right without regard to partisan feeling. Another question was the tariff matter, and he ventured that there is no divergence of views that this should be taken out of politics. A third influence affecting present conditions was the general relation of capital to labor. He was inclined to agree that wages were not adjusted to the high cost of living but under present conditions they certainly could not be raised. If the citizen asserts that politicians have found a low level, it is not because of politics but because the individual has not done his duty as a citizen.

In the concluding business of the meeting, on motion of Mr. Frank, it was voted that an additional sum of money should be invested in the association paper, the Review, to give it wider circulation for educational purposes.

Election of Officers

The report of the nominating committee was then submitted by T. L. Richmond, Buffalo Scale Company. In a brief address he explained that while President Briggs had decided he could not continue the office, owing to the fact that he was about to enter business, considerable pressure had been brought to bear to make him accept, and he was forthwith unanimously elected by the association. The remainder of the nominations were also unanimously elected and the officers and district committees for the next year are as follows:

President, O. P. Briggs, Minneapolis; vice president, J. H. Schwacke, William Sellers & Co., Inc., Philadelphia; secretary, F. W. Hutchings, Detroit; treasurer, People's State Bank, Detroit.

DISTRICT COMMITTEES.

First District—Henry B. Sargent, chairman, Sargent & Co., New Haven, Conn.; Thomas W. Fry, vice chairman, Sullivan Machinery Company, Claremont, N. H.; A. F. Corbin, Union Mfg. Company; New Britain, Conn.; E. A. Jones, E. D. Jones & Sons Company, Pittsfield, Mass.; D. K. Bartlett, Builders' Iron Foundry, Providence, R. I.

Second District—S. L. Moore, chairman, Moore Brothers Company, Elizabeth, N. J.; C. A. Chase, vice chairman, Syracuse Chilled Plow Company, Syracuse, N. Y.; E. S. Dean, United States Radiator Corporation, Geneva, N. Y.; W. H. Barr, Lumen Bearing Company, Buffalo, N. Y.; F. E. Wheeler, International Heater Company, Utica, N. Y.

Third District—Charles J. Mesta, chairman, Mesta Machine Company, Pittsburgh, Pa.; Thomas Shipley, vice chairman, York Mfg. Company, York, Pa.; Alexander Jarecki, Jarecki Mfg. Company, Erie, Pa.; W. R. McClave, McClave-Brooks Company, Scranton, Pa.; Stuart R. Carr, Stuart R. Carr & Co., Baltimore, Md.

Fourth District—H. J. Boggis, chairman, Taylor & Boggis Foundry Company, Cleveland, Ohio; C. H. Gifford, vice chairman, American Blower Company, Detroit, Mich.; William Gilbert, Buckeye Foundry Company, Cincinnati, Ohio; E. B. Perry, Industrial Works, Bay City, Mich.; C. E. Blue, Wheeling Mold & Foundry Company, Wheeling, W. Va.

Fifth District—H. T. Hornsby, chairman, United Iron Works Company, Springfield, Mo.; Staunton B. Peck, vice chairman, Link-Belt Company, Chicago, Ill.; J. H. Steedman, Curtis & Co., St. Louis, Mo.; James F. Lardner, Rock Island Plow Company, Rock Island, Ill.; E. E. Baker, Kewanee Boiler Company, Kewanee, Ill.

Sixth District—Otto H. Falk, chairman, The Falk Company, Milwaukee, Wis.; Oliver Crosby, vice chairman, American Hoist & Derrick Company, St. Paul, Minn.; Theodore O. Vilter, Vilter Mfg. Company, Milwaukee,

Wis.; J. L. Record, Minneapolis Steel & Machinery Co., Minneapolis, Minn.; Frederick Robinson, J. I. Case Threshing Machine Company, Racine, Wis.

Seventh District—L. L. Anthes, chairman, Anthes Foundry Company, Ltd., Toronto, Ont.; C. H. Waterous, Waterous Engine Works Company, Ltd., Brantford, Ont.; J. A. Kilpatrick, Canada Iron Corporation, Ltd., Hamilton, Ont.; George W. Watts, Canada Foundry Company, Ltd., Toronto, Ont.; William Harty, Jr., Canadian Locomotive Company, Kingston, Ont.

Eighth District—W. D. Tynes, chairman, Hardie-Tynes Mfg. Company, Birmingham, Ala.; W. E. McClamroch, vice chairman, Southern Engine & Boiler Works, Jackson, Tenn.; E. Y. Hartwell, Hartwell Iron Works, Houston, Texas; C. C. Huntington, Vesta Gas & Range Mfg. Company, Chattanooga, Tenn.; John H. McClure, Phillips & Buttorff Mfg. Company, Nashville, Tenn.

Activities of the Alumni

Succeeding the meeting on Tuesday afternoon of the Administrative Council, present and past members of the council, who have come to be styled the alumni, met in a dinner which was one of the social events of the annual meeting, as well as the occasion for outlining some of the destinies of the association. The activities, which were participated in by 40, all told, centered about the presentation to C. Bermingham, who incidentally has recently retired from active identification with the Canadian Locomotive Company, with a silver punch-bowl and ladle, designed by Tiffany & Co., New York. An idea of the character of the tangible indication of the regard in which Mr. Bermingham is held is given when it is mentioned that the two pieces contained 233 oz. of sterling silver. It is understood that the truth of the inscription on the bowl: *"Foecundi calices quem non fecere disertum"* (which in English means: "Whom has not the inspiring bowl made eloquent") was tested, as was also the cubic capacity of the bowl, which is given as 28 pints. The presentation was made by Frederic Nichols of the Canada Foundry Company, and Charles M. Jarvis, American Hardware Corporation, New Britain, Conn., acted as toastmaster. Most of the addresses related to the all-absorbing topic of the present condition of business. Among those who spoke were Philetus W. Gates, H. A. Carpenter, C. H. Gifford, F. B. Farnsworth, Isaac W. Frank, H. M. Wallis of the J. I. Case Threshing Machine Company, Henry B. Sargent, J. H. Schwacke and Harry Cockshutt of the Cockshutt Plow Company, Brantford, Ont., the last of whom took occasion to discuss the reciprocity question from the Canadian standpoint.

The Banquet

The annual banquet of the association was held Wednesday evening at the Hotel Astor. James Inglis, American Blower Company, was toastmaster, and there were two speakers, George P. Graham, late Minister of Railways and Canals, Canada, and recently accorded a seat in the Canadian Parliament by the resignation of a member, and Dr. George F. Vincent, president of the University of Minnesota. Mr. Graham's speech was particularly illuminating in regard to the small majority which carried the movement against reciprocity, and also with regard to the statesmanship obtaining in the country to the north. American newspapers, he emphasized, had little to say regarding Canada's political activity, while Canada is fully informed with regard to conditions in this country. Dr. Vincent's speech was a remarkable exposition of the present trend of human activity and incidentally it was delivered at the rate of 300 or 350 words a minute. In spite of its rapid-fire delivery, in fact, because of it, it hit the target repeatedly. Of this the diners were quickly conscious on the conclusion of his broadsides. No longer, said he, for example, should the novitiate in life be enjoined to paddle his own canoe; now we all travel in ocean liners.

Action of National Founders' Association on Conditions Affecting Business

To the thoughtful citizen it is apparent that the tendency of much of the state and national legislation is to depress rather than to encourage activities which make for the country's material advancement and prosperity. Political and social unrest find expression in extreme measures which seriously disturb economic stability. Radical and unwarranted legislation is proposed as the panacea for every ill and every shortcoming. Political mountebanks feed upon prejudice and build upon hatred and selfishness. The pendulum of public opinion, therefore, has swung to extremes and has caused apprehension and uncertainty where confidence and certainty should prevail.

In the meantime a country whose normal temperament is hopeful and optimistic, a land of wonderful resourcefulness and boundless possibilities, of remarkable energy and constructive ability, is languishing under a prolonged industrial depression.

That the panic of 1907 was primarily a financial disturbance which should be followed by a period of industrial depression was to be expected. That this depression should be prolonged over a period of years is unwarranted and must be laid to causes which should and must be removed. Be it therefore

Resolved, That, in the judgment of the National Founders' Association, the time has arrived when the country should awaken to the real situation, discountenance public expressions and legislative action designed to discourage legitimate enterprise and commercial and industrial development and denounce the political tinkerers who destroy confidence and undermine the economic stability of a great nation. And be it further

Resolved, That we bespeak for the American people a returning confidence in themselves, a conservative attitude on all controversial problems and the application of sane methods to their solution; a more friendly co-operation between capital and labor, between employer and employee; that we impress upon the agencies of government the duty to promote rather than retard the progress and prosperity of a whole people.

At the meeting of the Administrative Council after the adjournment of the convention Commissioner McClintock and others of the association's staff were reappointed.

Hetherington & Berner, founders and machinists, have moved into their new home at Kentucky avenue and White River, Indianapolis, Ind. The buildings, which are fireproof, cover about three acres and include a structural steel shop with 12,800 sq. ft. of floor area; foundry, 13,600 sq. ft.; machine shop, 13,700 sq. ft. with a mezzanine floor as a pattern shop with 10,000 sq. ft.; office building with engineering and drafting departments on the second floor; power house, with both steam and electric energy, and a large blacksmith shop and storage buildings. In all there is a total of more than 70,000 sq. ft. of floor area. Saw tooth roofs and plenty of large windows give ample light, and the equipment is of the most modern type, including electric hoists in the yards for loading and unloading cars. The establishment does a general mechanical business, giving special attention to asphalt plants and machines for making encaustic tile. It was founded in 1867 by B. F. Hetherington and Frederick Berner, Sr., and is now controlled by their descendants.

Labor in the Iron and Steel Industry

The first volume of the special report of the United States Bureau of Labor on "Conditions of Employment in the Iron and Steel Industry" will soon be ready for distribution. It is entitled "Wages and Hours of Labor" and constitutes the first results of an investigation in response to a Senate resolution of June 23, 1910, introduced by United States Senator Borah. The information upon which this volume is based covers practically all the iron and steel workers in the United States. All iron and steel producing localities are represented, and the number of plants included in the study is 344.

Hours of Work

This report includes only the basic iron and steel occupations that are closely connected with production, the occupations extending from the blast furnace through the rolling mill. Out of over 90,000 employees for whom information was secured the customary working week for one-third was a seven-day week. Approximately one-fourth of the 90,000 employees worked 64 hours or over per week which, in effect, means a 12-hour day every day in the week, including Sunday.

The investigation further developed that the seven-day working week was not confined to the blast furnace department where there is a metallurgical necessity for continuous operation, and in which department nine-tenths of the employees worked seven days a week, but it was also found that to a considerable extent in other departments, where no such metallurgical necessity existed, productive work was carried on on Sundays just as on the other days of the week. For example, in some establishments the Bessemer converters, the open-hearth furnaces, and blooming, rail and structural mills were found operating seven days of the week for commercial reasons only. The most common plan for operating under this schedule of hours was to work one shift of employees on the day of change of shift through the entire 24 hours, the succeeding shift working the regular 12 hours when it came on duty. In some plants the change was effected by having one shift remain on duty 18 hours and the succeeding shift 18 hours.

Other industries where continuous operation is necessary have found it practicable to devise a system by which one day of rest out of each seven could be secured for each employee; and since the beginning of this investigation by the Bureau of Labor a committee of the American Iron and Steel Institute has taken up this subject and has proposed a plan which gives each employee one day of rest each week, and which does away with the 24 or the 18 hours of consecutive work now required when changing from the day shift to the night shift. The plan is now being given a test in a few plants and may be adopted generally throughout the iron and steel industry.

The detailed tabulations of the report show that of the 90,599 employees studied, 44,993 (49.68 per cent) had a working week of 72 hours or over, which is, in effect at least, a 12-hour day of six days a week. Approximately one-third of all the employees (31.17 per cent) had a regular working week of more than 72 hours, which practically means work on Sunday. More than 22,000 (24.63 per cent.) had a working week of 84 or more hours, or at least 12 hours every day of the week, including Sunday. Approximately three-fourths of all the employees had a working week of over 60 hours; 10.80 per cent. of all the employees had a working week of just 60 hours, while only 15.81 per cent. had a working week of less than 60 hours.

Earnings

Of the total of 90,599 employees included in the investigation, 3,495, or 9.38 per cent, earned less than 14 cents per hour; 10,883, or 12.01 per cent, earned 14 cents and under 16 cents, and 25,535, or 28.18 per cent, earned 16 and under 18 cents. Thus 44,913, or 49.57 per cent of all the employees, received less than 18 cents per hour. Those earning 18 and under 25 cents per hour numbered 22,975, or 25.36 per cent, while 22,711, or 25.07 per cent, earned 25 cents and over. A few very highly skilled employees received $1.25 per hour; and those receiving 50 cents and over per hour numbered 3,915, or 4.32 per cent of all employees.

In general the earnings of less than 18 cents per hour represent unskilled labor. The group earning 18 and under 25 cents per hour consists of semi-skilled workmen, while those earning 25 cents and over per hour are skilled employees. The most common rate per hour for unskilled labor in the New England district was 15 cents; in the Eastern district 13 and 14 cents; in the Pittsburgh district 16 and 17 cents; in the Great Lakes and Middle West district 15, 16, and 17 cents; and in the Southern district 10, 12½, 13, and 13½ cents.

The Superiority of Steel Cars

A striking demonstration of the security to passengers accomplished by the use of steel cars occurred November 17, when a fast train on the Pennsylvania Railroad left the rails near Monmouth Junction, N. J. The train was running at 50 miles an hour, and in taking a crossover switch the locomotive was overturned, fatally injuring the engineer and the fireman, both dying that night. Although two cars filled with passengers left the tracks, and the others were stopped suddenly, there was no telescoping nor buckling. No one of the 200 passengers received so much as a scratch, and not a window pane was broken in any of the cars. There was no wood in the train, every car from the baggage car to the rear day coach being of equally strong steel construction, with cement floors and steel window frames.

This occurrence strongly emphasizes the points brought out with regard to the superiority of steel cars in a communication received a short time before from the Dahlstrom Metallic Door Company, Jamestown, N. Y., extracts from which are given below:

"In almost all wrecks of wooden cars a great many of the people injured or killed are struck or pierced by splinters from the wood. This would not happen with steel cars, because the steel would not split up and cause such injuries.

"It is fully as important to have cars fireproof nowadays, in spite of the use of electric light and steam heat, as it ever has been. A case illustrating this point was the wreck on the Lehigh Valley Railroad some months ago, when an excursion train was derailed and came in contact with some oil tanks standing along the track, flooding the wreck with oil which caught fire and burned fiercely, the wooden cars, of course, adding fuel to the flame, and causing the death of eight persons out of eleven killed. Furthermore, it is only necessary to refer to any number of fires occurring in buildings, owing to defective electric wiring. If a fire will occur in a building from this cause, there seems to be just as much danger in wooden cars from similar causes.

"It is also a fact that the steel interior finish of a car is more sanitary and of a more pleasing appearance than a wooden car. The steel cars are more easily kept clean, which can readily be verified by asking any of the crew of any given train in the steel cars. The elimination of carved ornaments and deep paneling which are so prominent in the wooden cars, and which only form harboring places for dust and germs, makes the steel car entirely sanitary. It is also a fact that germs and insects do not thrive on steel as they do on wood.

"The all-steel dining cars are much preferred by the porters and conductors to the wooden cars. The porters of the Pullman sleeping cars find them much more convenient and easy to take care of, and we believe that any passenger will prefer the all-steel cars and be more comfortable on account of the added sense of security in case of accident which such a car would give him.

"Naturally the idea of giving up wood for interior finish will die hard and be fought against by the hardwood interests. But the fact remains that the practical car builders and the officers of the more prominent railroads who have given the matter close study are all in favor of the steel-car construction, so that without a doubt the steel car has come to stay and to be a factor in more safe and comfortable railroad travel."

The filing of the incorporation of the Woodward Iron Company, capital $13,000,000, at Dover, Del., is an incident of the acquisition of the Birmingham Coal & Iron Company by the Woodward Company. The latter previously had a capital of $3,000,000.

To Prevent Leaks in Overhead Costs

The Bullard Machine Tool Company's System of Constant Vigilance Which Has Decreased the Burden Materially

The great expense leaks in a manufacturing plant are for the most part in the overhead cost. The cost system of course itemizes the burden into its various elements. But while the information is always available to the watchful manager it must be put into form to serve the useful purpose, so that its details are made as obvious as those of the labor and material accounts. The value of a critical, continuous analysis has been proved by experience to yield rich rewards.

The Bullard Machine Tool Company, Bridgeport, Conn., has had in operation for some time a system of weekly comparisons of overhead costs. A detailed separation of items was first made, grouped homogeneously for greater convenience. A weekly appropriation was set for each item, this being the average cost covering a period of three years. The system plays no part in the bookkeeping. The appropriation is not, literally speaking, what the name might signify, but rather an amount for use in comparisons, from which economies or increased expenditures may be reckoned. The figures are for the information of the management, arranged in form for convenient inspection and filing. It is the basis of serious study of the various factors of costs, with the purpose of reducing them wherever possible. It is a sentinel which cannot be passed without a challenge. Each week the several sheets required for the headings, filled out by the accounting department, are inserted in small loose-leaf books, each interested official having his own. A sample leaf is shown in Fig. 1. The amounts used are wholly fictitious.

Series "L" Date.....

No.	Name	Appr.	Excess Exp.
11000	Changes on Dwgs. & Bluep'ts	20	5.25
11001	Rep. and Alt'ns to Patterns	15	
11002	Work in Pattern Room	10	
11003	Cost Accts., Bonus, Invt., etc	55	
11004	Inspectors and Testing	106	
11005	Tool Room Keeper's Time	24	
11006	Cranes and Elevators (oper.)	75	
11007	Electric Lights	12	
11008			
11009	Watchman (Day)	12	
11010	Millwright, Belts, Pulleys, etc.	25	
11011	Sweeping and Cleaning		
11012	Wash Room	12	
11013	Truck, Unloading Castings, etc.	95	
11014	Oiling, Ice	15	
11015	Rep. to Small Tools, Gen. Use	25	
11016	Automobile Repair Shop	5	
11017	Changes on Tool Drawings	10	
11018	Shipping	4	
11019	Experimental Work	8	
11020	Messenger & Delivery Service	16	
11021			
		665	615–75
	Efficiency 108 per cent		

Fig. 1—A Sample Sheet of the Weekly Overhead Report of the Bullard Machine Tool Company.

Against the items is a column for the amount of the appropriation and another for the excess expenditure, if it should exist. The footings are the total appropriations of the sheet, and the total expenditures, including the excesses. Only the latter are enumerated by items, but the total has the whole cost. Each sheet also contains the per cent. of efficiency, which is the comparison of the expenditures to the appropriation. In this particular case it is 108 per cent. In the several sheets every division of overhead is included, and the total relation in percentage is given, comprising the totals of all sheets. If expenditures exceed appropriations the percentage of efficiency is below 100. If expenditures are less than the appropriations the efficiency is above 100. It must not be lost sight

Series "L" Date.....

No.	Name	Appr.	Excess Exp.
11100	(Closed)		
11101	Rep. & Mat. 30" M No. 5702		
11102	" 48" VTL No. 6156		
11103	" 24" VTL No. 6041		
11104	" 24" VTL No. 6045		
11105	" " 36" VTL No. 6141		
11106	" 36" VTL No. 5758		
11107	" 42" Std. No. 5587		
11108	" " 42" R.P. No. 5550		
11109	" " R.P. No. 6266		
11110	" Type HA Grinder		
11111	" " Type DA Grinder		
11112	" " 36" VTL No. 6244		
11113	" " 36" VTL No. 6214		
11114	" 36" VTL No. 6232		

Fig. 2—The Weekly Report Which Gives the Burden Charges Against Bullard Machines in the Home Works.

of that 100 per cent. is what these costs were on an average in a period of three years, and therefore an excess above 100 per cent. efficiency means that amount of saving. In actual practice the use of the system has resulted in a decreased expenditure of funds for overhead costs that amounts to a handsome sum.

In the beginning of the system, each item of the weekly comparison was critically studied. Abnormal expense was found in various departments of the analysis. Excessive non-productive labor was brought to the surface and removed. The systematized study revealed a wastefulness, hitherto unsuspected in a plant much better managed than is usual. Better methods were devised in order to cut costs. The first few months yielded handsome returns on the labor involved in the task.

Fully as important, perhaps more so in the long run, is the constant check which the system affords. Each increase over the appropriation is immediately questioned. As it appears in figures within the week of its occurrence, no time is wasted. A few minutes of study, glancing through the list, tells the story, and the machinery of further investigation is immediately started. In some cases the increase is justified; in others it is checked immediately. Not only are the leaks stopped, but the opening of new ones is made impossible. A single week is no final criterion, of course. An average of weeks is computed from time to time.

A sheet of special interest is seen in Fig. 2, which is given over to the overhead costs of individual machines in the company's works. Most of them are Bullard vertical lathes or boring mills in commercial operation, or under experiment. The management has quick and sure information as to items of expense which might indicate weaknesses or defective design in an experimental tool, or exceptional conditions in a standard machine.

The items of other sheets are as follows:

Repairing buildings and elevators; repairing boilers, engines and pumps; repairs to line shafts, improvements; electric expense (power); engineer, fireman, oiler; sprinkler expense; cleaning boilers; new building.

Miscellaneous; Y. M. C. A. industrial education; disk grinders, truing emery wheel, etc.; repairs of machines and fixtures; setting up new machine and equipment; cleaning shop machines.

Preparing for photographs; estimates, tool layouts, proposition drawings; demonstrating; refinishing returned accessories; repairing and refinishing returned machines and accessories.

Foremen; repairs to large tools; care of patterns; repairs to small tools, jigs.

The Heat Treatment of Steel*

A DISCUSSION OF EQUIPMENT AND METHODS EMPLOYED

The Composition of Steel and Processes of Manufacture—Heating and Annealing Furnaces and Quenching Mediums—Notes on Case Hardening

BY JAMES H. HERRON, CLEVELAND†

In any paper relating to the heat treatment of steel it is necessary to consider not only the different classes of steel, as defined by their methods of manufacture, but each part separately of the equipment of the heat treating plant, in order that a full understanding may be had of the material treated and the methods of treatment.

As the length of this paper will not permit a consideration of all steels, it will be confined solely to carbon steel used for manufacturing purposes and from a low carbon content to approximately carbon of 1 per cent. Special carbon steels, alloy steels and tool steels cannot be considered, because each in itself would require as much space as can be allowed for this paper. The subject of heat treatment can only be considered in a general way, with the exception of case hardening, where definite treatment can be given, owing to the practically fixed composition of the steel.

The writer will endeavor (1) to give, briefly, the methods used in making steel, and (2) to describe each part of the equipment of the heat treating plant and its use.

Processes of Steel Manufacture

Bessemer: The iron should be delivered to the Bessemer converter in the molten state and practically free from all elements but carbon, silicon and manganese. The quantity of air blown through the metal oxidizes these elements with an evolution of sufficient heat to raise and maintain the mass at a high temperature. It is impossible in the Bessemer converter to eliminate the sulphur and phosphorus. The former can be taken care of in the blast furnace, but there is no means of eliminating the latter. It is, therefore, present in the iron and remains in the steel as an impurity. One very particular disadvantage of the Bessemer process is the amount of oxygen and nitrogen remaining in the steel from the air which is blown through the metal when liquid. These are impurities and weaken the steel physically in proportion to their amount. An iron high in carbon and manganese is usually added to the molten steel before pouring—the carbon to recarburize the mass and the manganese to unite with some of the oxygen present; the resulting oxide passing off in the form of slag. Bessemer steel should rarely be used.

Open Hearth: In the basic open hearth process there is the opportunity to remove not only the same elements eliminated in the Bessemer process but also phosphorus. The removal of phosphorus is accomplished by the use of basic material, such as magnesite, burnt dolomite and lime, for a hearth lining, and limestone which is added to the bath. The slag thus formed with the impurities in the charge is strongly basic and takes up the phosphorus. As a small amount of phosphorus is detrimental this steel is not only better in this respect, but it contains less oxygen and nitrogen, due to the fact that the air is not blown through the steel but drawn over it. This renders it much purer and physically it has from 10 per cent. to 25 per cent. greater value than Bessemer steel of the same composition. For all general purposes the use of open hearth steel is strongly advised.

Electric: The electric process is principally used to purify steel already made by the basic open hearth process. Not only can the elements above mentioned be eliminated in great part, but the sulphur also. Owing to reducing conditions and the high temperatures present in the electric furnace, the oxides are reduced and the dissolved gases liberated. The metal produced is very pure, containing a minimum amount of the objectionable impurities. This method is especially adapted to the manufacture of alloy steel, where alloying metals can be mixed with the charge in the furnace and thoroughly melted before pouring. This gives a better distribution of the alloying element throughout the mass. Such steel physically is from 30 per cent. to 60 per cent. greater value than open hearth steel of a similar composition; and while the cost is higher, for some classes of work this additional cost is fully justified.

Crucible: Owing to the fact that comparatively little steel, except for use in tools or having a high carbon content for special purposes, is now made by the crucible process we will not discuss this method of steel making.

The Composition of Steel

Of the elements entering into the composition of steel some are of value while others are a detriment. The value of the steel is determined largely by these elements. Not only should their presence be considered, but the amount of each should be accurately determined.

Carbon: The general influence of carbon on steel is to give greater tenacity. It also renders the steel harder and stiffer. The tensile strength is increased about 600 to 800 lb. per square inch for each additional point of carbon, while the ductility is decreased about 0.5 per cent. for each additional point of carbon. Steel with 0.20 per cent. carbon begins to show appreciable hardening when cooled quickly, but does not show evidence of brittleness in the normal state until the carbon has reached approximately 0.70 per cent.

Manganese adds to the toughness of steel and increases the tensile strength by about 100 lb. per square inch for each additional point. The ductility is decreased with the addition of manganese. For medium steel the manganese is very satisfactory at from 0.40 to 0.60 per cent. Higher or lower manganese may be specified for special purposes. Steel with manganese of more than 1 per cent. should be avoided except in special cases, because of increased hardness and a tendency to brittleness.

Phosphorus renders steel cold short or brittle. It is, therefore, to be avoided as much as possible. The lower the phosphorus content the better, with the exception of springs, where there should be a minimum as well as a maximum limit. Steel should be specified with phosphorus not to exceed 0.40 per cent. This is the specification for good open hearth steel.

Sulphur has a tendency to render the steel hot short and is, therefore, to be avoided in any steel that is to be forged or otherwise worked hot. Sulphur is detrimental to steel that is to be quenched in any way. The quality of hot shortness renders it brittle, and is likely to cause much trouble, especially in case hardened work. The sulphur, for good results, should not exceed 0.05 per cent. and it is much better to keep it below 0.04 per cent.

Silicon is generally supposed to render steel cold short. It should be avoided in steel for general purposes and should not exceed 0.20 per cent.

Oxygen and Nitrogen: Little attention seems to have been given in the past to the oxygen and nitrogen content of steel, but this is becoming an important matter. In the near future, doubtless, determinations of these will be included in chemical analyses and a maximum specified. They are found as free gases, also as oxides and nitrides. These are impurities and therefore weaken the steel to the extent in which they are present. Doubtless the presence of the oxygen renders the steel susceptible to high temperature by burning.

*A paper read at the monthly meeting of the Metal Trades Superintendents' and Foremen's Club of Cleveland, November 18, 1911.

†Consulting Metallurgical Engineer.

Slag: More or less slag is found in steel. As this has a weakening tendency, steel in which it is excessive should be avoided. The usual way to determine approximately the amount of slag present is by the microscope. Few specifications have been written including the slag content, but this will probably be a serious consideration in the future.

Heat-Treating Equipment

For the successful heating of steel, the matter of furnace design is very important. Of the two classes of furnaces—the forging furnace and the annealing and heat-treating furnace—the latter is the one generally used for case hardening purposes, with and without modifications.

FORGING FURNACES

In forging furnaces the arch should be so constructed that the maximum temperature is got in the heating zone. This is accomplished by placing the burner somewhat above the line of heating. The flame impinges upon a half arch, which causes it to roll back through the heating zone. In this way the combustion is probably complete before the gases come in contact with the material to be heated, and the result is much cleaner heating than is possible by the flame from the burner playing directly upon the material to be heated. Fig. 1 shows the brickwork for this type of furnace. The burner at O may be varied vertically somewhat, depending on the character of the flame. A burner giving a horizontal fan-shape flame can be set closer to the heating zone than the burner giving the cone-shape flame.

All oil fired furnaces should be supplied with cover plates to the burner openings, so that when the burner is shut off the opening may be closed to prevent the heat of the furnace carbonizing the oil on the face of the burner.

ANNEALING AND HEAT-TREATING FURNACES

The ideal annealing and heat-treating furnace is the muffle type; but since this is not practical in large furnaces, the nearest approach to it must be considered. In such a furnace the combustion chamber is either provided under the hearth or at the side, and of sufficient size to insure complete combustion. The former seems to be much more satisfactory, and therefore is more generally used. The ports leading from the combustion chamber to the heating chamber should be so arranged, for position and size, that the heating chamber may be heated uniformly. In a well designed furnace the temperature of the heating chamber should not vary in all of its parts more than 20 deg. F. The heating chamber can be made of a suitable size to take care of the work to be done. In any heat-treating furnace the flame should not under any circumstances come in direct contact with the material to be heated. Fig. 2 illustrates a type of furnace with combustion chamber under the hearth. In this case the burners are at O in the front of the furnace. The burners can be conveniently arranged either on both sides or on one side. In the latter case the wall in the center supporting the floor tile should be arranged in piers.

There are numerous modifications of heat-treating furnaces, with burners and outlet openings placed in different positions, and with the baffling arrangement in the combustion chamber somewhat varied to suit the ideas of the designer. There seems to be a wide variation possible, and still obtain good results. All heat-treating furnaces should be provided with covers to the burner openings in order that the furnace may be completely sealed if necessary.

Fuel

A number of different fuels are satisfactory for annealing and heat-treating, but we shall consider only two, since coal and coke have been largely replaced by gas or oil. Gas is an ideal heating medium where the natural product can be obtained, but where it is necessary to use manufactured gas the cost is prohibitive. The regulation of the gas flame is in the hands of the operator, and small variations of temperature can be secured with little trouble.

Oil can always be used because it can be obtained readily in almost all sections and delivered in bulk, and at such prices, compared with its heating value, that it is probably the most economical fuel that can be obtained. Oil to atomize freely should not be too heavy, and satisfactory results are obtained between 30 and 36 deg. Baume without preheating. The prime essential in the use of oil as fuel is to thoroughly atomize the oil and supply enough additional air to insure complete combustion. In cold weather all oil should be preheated, preferably by heating coils in the supply tank.

Atomizing Mediums

Dry steam is probably the most satisfactory atomizing medium but is usually unsatisfactory to use on a large number of furnaces or where the distance it is carried is great. Air, therefore, is generally used either at a low or high pressure. The former at about 2 lb. pressure gives very satisfactory results; the latter at about 15 lb. pressure seems to give equally satisfactory results. The results are, of course, contingent upon the design of the burner. In some installations high pressure air is used for atomizing and low pressure air, furnished by fan, is used for combustion.

Control of Temperature

For all important work the use of some reliable pyrometer is strongly recommended. Most pyrometers should be checked frequently against some standard. For those who are unwilling to check their pyrometer constantly the trained eye is much safer to rely upon. A pyrometer that is not kept checked and is depended upon may give bad results and be the cause of much of the failure that cannot otherwise be accounted for.

In the thermo-electric pyrometer the tube should be located as nearly as possible in the same zone as the object to be heated, and in some cases it should be in direct contact with this object. It should in no case be subject to the direct action of the flame, and in some special cases it is desirable to shut off the furnace entirely for some minutes before making the observation. The thermo-electric couple may be checked by comparison with some standard or at the known melting point of some metal; the metal to be in the pure state. An excellent article on "Checking Pyrometers in Service," by R. W. Davenport, was published in the American Machinist of January 12, 1911.

A number of optical pyrometers are on the market, which have in some cases proven satisfactory. The instrument is focused directly on the object and the temperature is determined by the comparison with a filament or flame of known temperature. This has one evident advantage—that it gives the temperature of the object regardless of the temperature of the furnace.

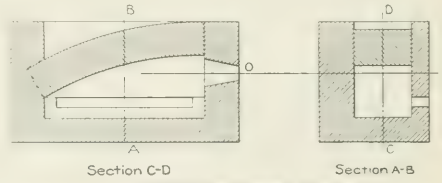


Fig. 1.—Bricking for Forging Furnace

The radiation pyrometer for high temperatures has proved very satisfactory. In this case the thermal couple does not come in contact with the heat but is in the instrument. The instrument is focused upon the heated object and the temperature indicated or recorded by a suitable instrument.

In working without a pyrometer and relying on the eye, the light surrounding the furnace should be dull, and should be kept as nearly constant as possible in order that the eye may not be misled by the changing contrasts between the surrounding light and that of the object heated. In particular, direct light should be excluded and any arc or other strong lights should be so placed that neither they themselves nor any concentrated part of their light is in the field of the operator's sight, when he is estimating by eye the temperature of the objects heated. Of course, allowances should be made for the character of the day and whether work is being done in the day or at night.

The magnet has been somewhat used to determine the proper annealing and hardening heat. This applies only to steels containing between 0.50 per cent. and 0.90 per cent. carbon, since steel with less than 0.50 per cent.

carbon ceases to be magnetic before the hardening or annealing temperature is reached. The magnet should be frequently applied after the heated object has reached approximately the annealing and hardening heat. When the magnet no longer "holds on" the proper heat is reached. In the use of the magnet care should be taken that it is not heated sufficiently high to lose its magnetism.

Quenching

The size of quenching tanks required for any particular class of work will depend upon the size of the pieces to be treated. It is generally customary to have tanks of from 150 to 250 gal. capacity. Where the pieces are very large the capacity of the tank should exceed this.

The selection of a quenching medium is at times very important. Except in special cases high carbon steel should not be quenched in water. Oil should invariably be used. Low carbon steel, or steel below 0.30 per cent. carbon, may be quenched in water or brine. It is better as a rule to quench thin pieces in oil regardless of their carbon content.

Forethought and care are necessary in the method of quenching, regardless of the medium. A piece should be quenched in such a manner as to cause the least distortion, or so that the distortion may be symmetrical. Where thick and heavy masses of metal are adjacent to thinner and smaller masses, the hardener will have to use his judgment as to the best method of quenching. It is generally customary to quench the piece in such a way that the heavier parts come in contact with the quenching medium before the thinner parts. It is seemingly quite important in what manner a piece is soused in the quenching medium. These are points to which the hardener should give a good deal of thought before undertaking the operation itself. In many instances it may require special facilities to do the work properly, but these are usually justified.

The most general medium for quenching is water. This should be in a constant state of circulation so that the temperature may remain uniform.

Oil quenching in heat treating has become deservedly popular. The oil used should be a medium oil of flash test, from 300 to 500 deg. F. Fish, lard and cotton seed oils have been used extensively, but mineral oils, costing much less, are rapidly replacing these more expensive oils. The oil should be so cooled that the temperature does not at any time exceed 90 to 100 deg. F. This is at times accomplished by a central cooling system, using pump circulation. At other times individually cooled quenching tanks are used.

Water covered with a few inches of oil is used where the piece should be hard, but where quenching in water would probably cause hardening cracks. The shock in quenching is not as severe as in the case of water, and the steel becomes nearly as hard. The only way to keep such a tank cooled is by water jacket

For parts that should be exceedingly hard brine may be used, about 20 per cent. solution by weight or of the density to float a potato. The brine should be kept cooled after the same manner as oil, either by circulating through cooling coils or using a water jacket to the cooling tank.

Temperature

The proper temperature at which any steel is to be heat treated should be determined in advance. This temperature may be determined by the chemical composition of the steel, or by plotting a cooling curve and noting the point of recalescence. The critical point in heating is about 50 deg. above the point of recalescence, observed in cooling. In annealing or heat treating the critical point in heating only should be used. Some definite temperatures will be considered in the following paragraphs on annealing, heat treating and case hardening.

Heating

The flame should be neutral or slightly rich if anything. This will prevent scaling in heating for forging purposes and surface decarbonization in annealing and heat treating. Great care should be exercised in the time required to bring the object to the right temperature. Heating should not be rapid, except possibly in the case of large objects, where the heating of the interior lags behind that of the exterior. This should only apply to the early part of the heating, the final approach to the temperature aimed at should be slow, so that the interior may be brought fully up to this temperature without carrying the exterior far beyond it. In unequally heated pieces stresses are set up which may cause their failure. Many of the bad results that the steel has been held responsible for are, in fact, the fault of heating. The steel when heated uniformly will have a translucent appearance; that is, no variation of color will be noted when examining the surface. When steel is not heated through it will appear darker toward the center of the exposed surface; and until this effect entirely disappears steel should not be withdrawn from the furnace. The heater should exercise considerable care so that no part of the object will be overheated or underheated to any great extent. Overheating causes a coarse, weak structure. Underheating, especially in soft steel, tends to have the same effect; the steel also showing signs of brittleness. After steel has reached the proper temperature it should not be kept in a soaking condition for any length of time. A rule of thumb sometimes used is five minutes per inch of thickness of the object heated. This will probably insure the refining of the grain. In the case of annealing the steel may be permitted to cool in the furnace. In hardening it should be immediately withdrawn and quenched before the temperature drops perceptibly.

Annealing

The purpose of annealing is not only, as seems to have been the impression somewhat current, to soften the steel but to refine the grain. It relieves the stress set up in the steel by rolling, forging and other working, at a low heat. This temperature is determined as above stated and should be sufficiently high to exceed the critical point. In general the higher the carbon content the lower the annealing temperature; therefore different temperatures are used for different ranges of carbon content. The following ranges of temperature are recommended by the American Society for Testing Materials.

Ranges of Carbon Content.	Ranges of Temperature.
Less than 0.12 per cent.	1607 to 1697
Less than 0.12 per cent. to 0.29 per cent.	1544 to 1598
Less than 0.30 per cent. to 0.49 per cent.	1499 to 1544
Less than 0.50 per cent. to 1.00 per cent.	1454 to 1499

These refer to the usual manganese content. For steels with more than 0.75 per cent. manganese slightly lower temperatures may be used. In order to bring the interior of large objects to an effective annealing temperature the outside may be often advantageously raised somewhat above that temperature. Therefore a range of temperatures is given for each range of carbon content. The upper limit of this range applies to larger objects and also to the lower range of carbon content given.

Parts that are to be subsequently heat treated in a finished condition should be either annealed in the rough or rough machined state. This will prevent undue distortion when the final hardening takes place, by relieving the internal strains set up by forging, rolling, etc., and before quenching, which would set the distorted condition.

Cooling

The rate of cooling should be regulated to suit the carbon content of the steel and the physical properties desired. The higher the carbon the slower should be the cooling. Also, the slower the cooling the softer and more ductile the steel, and the lower will be the elastic limit and tensile strength. Objects containing more than 0.50 per cent. carbon and thin objects of more than 0.25 per cent. carbon should cool slowly in the furnace, in lime or in clay until they become black, when they may be removed. Thin objects of less than 0.25 per cent. carbon and thicker objects of less than 0.50 per cent. carbon may be cooled in the air if they are protected from the weather and from sharp draughts of air. In case great softness and ductility are desired, all steel should be subjected to slow cooling. Where a greater elastic limit and ultimate strength are desired, cooling in air is advisable even in case of thin objects over 0.25 per cent. carbon and thicker objects over 0.50 per cent. carbon. They can be cooled in air by being massed together to retard somewhat the cooling.

The so-called "normal steel," to distinguish it from annealed steel, is that which is received from the mill, or the forge plant, before regular annealing is done. Annealing in charcoal is only advisable where the carbon content exceeds 1.00 per cent.

"Heat Treating"

The foregoing process of annealing is in fact heat treating, but the term "heat treated" is usually meant to distinguish steel which has been through a toughening process by heating, quenching and subsequent partial annealing. The simplest form of heat treating is as follows: After forging or machining.—1. Heat to the annealing temperature. 2. Quench. 3. Reheat to 600 to 1200 deg. F. and cool slowly.

The drawing operation (3) should be varied to suit each individual case. The higher the temperature of this operation the softer and more ductile is the steel, but the lower the elastic limit and ultimate strength. This, of course, makes a tough structure. If less toughness is required and greater strength, the temperature of the drawing operation should be lower. For some classes of work the drawing operation can be entirely omitted.

Better results than with the above treatment may be obtained by the so-called double treatment as follows: After forging or machining.—1. Heat to annealing temperature. 2. Quench. 3. Reheat to 50 deg. less than the initial temperature. 4. Quench. 5. Reheat to 600 to 1200 deg. F. and cool slowly. This double treatment produces a refinement of grain which is not possible with the single treatment, and should be resorted to for parts where extremely good qualities are desired. By varying the temperature of the drawing operation (5) high elastic limits may be obtained, up to nearly double the amount in the annealed material, while if greater toughness is required the higher drawing temperatures may be used. Steel subjected to this treatment is excellent to withstand shock and alternate stress.

For steel with carbon exceeding 0.40 per cent. a still more elaborate process of heat treatment may be used: After forging or machining.—1. Heat to about 50 deg. above annealing temperature. 2. Quench. 3. Heat to annealing temperature. 4. Cool slowly in furnace in lime or clay. 5. Reheat to about 50 deg. F. below annealing temperature. 6. Quench. 7. Reheat to 800 to 1000 deg. F. and cool slowly. Steel subjected to this treatment has high fatigue resisting qualities, and can be used for parts that require a high elastic limit and tensile strength, but a relatively low ductility.

The above are the most general methods of heat treatment, and can be varied to some extent to suit special cases. It is impossible in this paper to give anything except that which would apply in a general way, since it is not discussing steel of any particular composition.

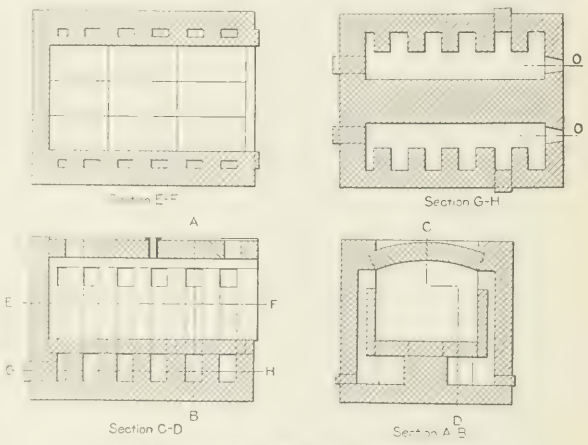


Fig. 2. Blocking for Small Heat Treating Furnace

Case Hardening

Case hardening is one of the most important branches of heat treatment. Where objects are required to have a tough core and a very hard surface, this is the most satisfactory method for such requirements. Steel from 0.18 per cent. to 0.25 per cent. carbon gives the best results for this class of work. Of the different methods used in case hardening, we shall take up but two that may be considered within the range of this paper. In one method, which is of limited application, cyanide of potassium is used in a molten or in a powdered form. The former is convenient for small objects, such as the parts of typewriters, adding machines, etc. The most generally employed method is packing the material to be case hardened in either cast iron or wrought iron boxes, in a compound the base of which is carbon.

CARBONIZING COMPOUNDS

Raw bone can be used where the pieces are of considerable size. Thin pieces should not be packed in raw bone; owing to its high phosphorus content, it has a tendency to cause brittleness in the parts. A mixture of granulated bone and granulated charcoal has proved very successful. Expended bone, about two parts mixed with one part of raw bone, seems to be a fairly satisfactory mixture. Small screws and other parts can be carbonized in expended bone only. Charred leather is a very satisfactory carbonizing material, and is quite extensively used, although in some cases the cost is prohibitive. Bone black, or animal charcoal, is very frequently used, and gives very satisfactory results. This is sometimes saturated with a carbon oil and is called Hydro-Carbonated Bone Black. It seems to be effective and the only objection to its use is that it carbonizes with the evolution of some smoke, which is objectionable when the furnace is not provided with a flue. A number of special compounds introduced by several manufacturers have proved very satisfactory. These give uniformity of case, which strongly recommends their use on particular classes of work.

METHOD OF PACKING

The size of box depends upon the size of the parts to be carbonized; it should be of such shape that the heat will readily penetrate to the center without too long an exposure. The pieces should not be placed closer than 1 to 1½ in. to the side or bottom of the box, but can be placed within ½ in. of each other. The cast iron, of which most boxes are composed, has a strong affinity for carbon and will therefore decarbonize the pieces that are placed in too close proximity to it. The cover should be placed upon the box and sealed with fire clay. This is quite important, because the gases generated in the decomposition of the carbonizing material enter the steel in its expanded state and assist in the operation.

HEATING

The depth of case depends upon the temperatures at which the pieces are heated and the length of time exposed to the full heat. This will give as a rule from 0.010 to .015 in. depth of case per hour of exposure. Test wires are convenient to determine when the interior of the box has reached the temperature of the exterior. These wires are about 3/16-in diameter and are inserted through holes in the cover. As the heating progresses the wires are withdrawn, and when of a uniform color the timing is begun. Only boxes of the same size or same width should be used at one time.

PROCEDURE

The simplest method of case hardening is as follows: After forging or machining.—1. Carbonize at a temperature between 1600 and 1750 deg. (1700 desired.) 2. Quench. The above method has been used in the past to a very considerable extent but is now being replaced by one more elaborate. The high temperature at which the piece is quenched in this treatment leaves a coarse granular structure, which is not satisfactory and does not possess the requisite toughnes for the majority of work.

The method used to a very considerable extent is as follows: After forging or machining.—1. Carbonize at a temperature between 1600 and 1750 deg. (1700 desired.) 2. Cool slowly in the carbonizing compound. 3. Reheat to 1500 to 1550 deg. F. and quench. This method, called the single reheating method, refines the grain of the interior and makes the exterior exceedingly hard. This gives a

tough structure and for all ordinary parts may answer the purpose.

Another class of work demands the best treatment—such work as gears, etc.—and the following heat treatment is suggested: After forging or machining.—1. Carbonize at a temperature between 1600 and 1750 deg. (1700 desired.) 2. Cool slowly in the carbonizing compound. 3. Reheat to 1500 to 1550 deg. F. 4. Quench in oil. 5. Reheat to 1400 to 1450 deg. F. 6. Quench in water. 7. Draw in hot oil at a temperature from 300 to 450 deg. F., depending upon the degree of hardness required.

This method refines and strengthens the interior, the uncarbonized part, and refines the exterior, the carbonized part. The last operation may be dispensed with, but for work requiring this special treatment, and to be exceedingly tough, both interior and case, it is desirable. It should be continued from one to three hours to insure the full benefit of the readjustment of the material to the particular heat condition and the relieving of all internal strains. In steel given this heat treatment the exterior will show a very fine structure, and the interior will probably show a silky, fibrous structure.

The above will give largely the variations in case-hardening operations that will apply to a large number of cases.

Heating in Lead

Heating in lead is used extensively where only a slight variation in temperature is permissible. There are a number of unsatisfactory conditions, including: (1) the density of the lead and the necessity of holding the pieces in the lead by some mechanical means; (2) the purity of the lead. The lead should be as pure as possible and especially free from sulphur. Trouble is sometimes experienced by the lead sticking to the work. This can be avoided by dipping the articles in a solution of cyanide of potassium and water—about 1 lb. of the powdered cyanide to 1 gal. of boiling water. This should be used cold and the articles permitted to dry before putting them in the lead bath. The pieces should be left in the lead long enough to come to the temperature of the bath, but not permitted to remain in the lead longer than heating through. The pieces can be quenched in oil, water or brine as preferred.

Heating in Salt

There is a good deal of difference of opinion regarding the method of heating in salt for hardening purposes. Barium chloride has been used quite extensively, and seems to work perfectly clean at first; but after having been used for some time it begins to pit the steel, which is probably due to the oxide dissolved in the metal salts. If the barium chloride is replaced it then works satisfactorily again. As long as this constant replacement goes on good results are obtained.

There are other salts that seem to give satisfactory results. One of the large steel plants uses a mixture of calcium chloride and sodium chloride; about three parts of the former to one part of the latter. This combination melts at about 900 deg. F. and so is low enough to prevent the cooling effect of the steel from solidifying the bath. One advantage of the salt bath is that no bad results come from the material of the bath adhering to the object. When the latter is quenched the salt is solidified and cracks off.

Drawing Temper

The most satisfactory way of drawing temper is doubtless the oil bath. A heavy viscous oil is used, of a high flash point, from 600 to 700 deg. F. This can be maintained at a uniform temperature by the aid of a thermometer. The pieces should be permitted to remain in the oil until thoroughly heated. Excellent results are obtained by leaving the pieces in the oil some time, which seems to relieve the quenching strains. This, of course, is an expensive method of drawing, but for small work is, doubtless, preferable to any other.

Drawing on a hot plate is a very satisfactory way, especially for dies and large tools. In this case the heated plate is usually kept much above the temperature to which it is desired to draw, and the extent of the drawing is observed by the temperature color.

The sand bath has been a means of drawing tools and other small parts for some time past. This has been only partly satisfactory, so is being replaced in small tool plants largely by the oil bath, which gives much greater uniformity in the work. If heat colors are desired in the finished article they can only be obtained by tempering in air.

A New Virginia Blast Furnace

The Oriskany Ore & Iron Corporation, Buena Vista, Va., which on November 1 gave up to the Alleghany Ore & Iron Company the latter's Buena Vista blast furnace, on expiration of the lease, will build a furnace at Lynchburg, Va. The negotiations which have been pending for some time were closed in the past week. There has been active co-operation in the project by Lynchburg interests, and among the inducements given for the location of the furnace are a free site of 70 to 80 acres, furnished by the Lynchburg Traction & Light Company, and a cash subscription of $25,000, of which $20,000 is made by the traction company and $5,000 by the Lynchburg Chamber of Commerce. The Oriskany Ore & Iron Corporation, of which R. L. Parrish is president and W. W. Taylor vice-president and general manager, agrees to build within two years a blast furnace of 125 tons daily capacity. It is stated that the plant will be along the general lines of the Buena Vista furnace, which is 70 x 16 ft., and equipped with four stoves. Contracts will be let at once and construction work will proceed as rapidly as possible, with the expectation of completing the furnace within a year. A plant will also be built for nodulizing iron ore and this will probably be ready by July 1, 1912. The Oriskany company has contracted with four independent fertilizer companies at Charleston, S. C., to deliver to it about 100 tons a day of "blue billy," the by-product from the treatment of Spanish pyrites. The Barr Ore & Iron Company, the stock of which is owned by the Oriskany Ore & Iron Corporation, has a brown hematite iron ore property at Pittsville, Va., from which 250 tons a day will be shipped to the Lynchburg furnace, a distance of about 40 miles. Located near the hematite ores, the Barr Ore & Iron Company also has a deposit of magnetite. This will not be drawn upon for the present as the contract with the Charleston fertilizer companies for blue billy extends over a period of years. The company's railroad connections will permit it to use either Pocahontas or New River coke.

The new furnace site is a level tract of land on the James River, three miles from the center of Lynchburg. There is direct connection with the Chesapeake & Ohio Railroad, and arrangements have been made by which a switching charge applies within a three-mile radius; under this the furnace company can ship also over the Southern and the Norfolk & Western roads. The product of the new furnace will be foundry and basic pig iron.

William B. Phillips, director of the University Bureau of Economic Geology and Technology, Austin, Texas, states that in Clay County is the largest natural gas field now known in Texas, supplying the cities and towns of Fort Worth, Dallas, Wichita Falls, Henrietta, Byers, Petrolia, Bellevue, Bowie, Sunset, Alvord, Decatur, Bridgeport, Rome, Irving, etc. About the first of this year the Lone Star Gas Company, Fort Worth, had in operation a total of 196 miles of 2 to 16-in. pipe. Since that time the service has been extended, and it is likely that further additions will be made. The gas is of excellent quality. It is likely that the cheapest natural gas in the world can now be obtained at Wichita Falls, as it is stated that it will be supplied to responsible manufacturing establishments at 1½ cents per 1000 cu. ft. This flourishing town has had 6 and 7-cent gas for some time, but the reduction to 1½ cents breaks all known records.

The Cincinnati Bickford Tool Company, Oakley, Cincinnati, Ohio, exhibited three Cincinnati upright drilling and tapping machines and one Cincinnati Bickford radial drill at the Turin Exposition, Turin, Italy, and has just been notified that the jury of awards has given the company the Grand Prix.

Iron and Steel Roofing Sheets*

The Methods of Coating and the Advantages of the Metallic Base—The Question of Durability

BY P. M. BUCK†

This paper will be confined mainly to the discussion of those forms of roofing made from steel or iron, rolled into sheets in the usual manner, annealed to give the proper softness and ductility and coated with various substances for the purpose of excluding air and moisture from the underlying base metal of the sheet.

Painted and Galvanized Sheets

The three most important classes under this main heading are painted black sheets, galvanized sheets and terne plate. The first-mentioned, as the name indicates, is a black sheet of steel without any metallic protective coating, but covered with a coating of a good grade of paint before leaving the mill.

Galvanized sheets are made by passing the black sheets, after the surfaces have been thoroughly cleaned and prepared, through pure molten zinc. By this process the surfaces are uniformly covered with an adherent coating of zinc, which entirely excludes the oxygen and moisture of the atmosphere; and inasmuch as the solution pressure, in other words the corrodibility, of zinc is very low, the life of such a sheet under weather conditions, even without being painted, is remarkably long. In addition to the direct exclusion of the elements, zinc has another property which makes it an excellent protective medium for iron and steel. I refer to the well-known fact that zinc is electropositive to iron or steel, and wherever the two metals are exposed together the difference of potential tends to protect the iron or steel at the expense of the zinc. This is easily illustrated by shearing off the covered edge of a galvanized sheet and exposing the raw edge to the weather. After months', or even years', time an examination of this raw edge will show that no corrosion whatever has taken place; and although the action of the zinc itself at the point of contact has been somewhat accelerated, yet the natural low corrodibility of zinc causes this action to be very slow. The ultimate life of a sheet where the underlying metal has been laid bare is, of course, less than that of one perfectly protected, yet the electrolytic protection mentioned will, as above indicated, preserve the metal for a considerable length of time.

Galvanized sheets, painted sheets and black sheets unpainted are furnished by the average manufacturer in nearly any gauge or size, plain or corrugated, or V-crimped, and also in the form of roll roofing, so that it is possible for a consumer to procure almost any form desired.

Terne Roofing Plates

Terne plate is made by passing thoroughly cleaned steel plates through molten terne mixture. This terne mixture is an alloy of pure tin and pure lead in varying proportions, the most common mixture being 27 per cent. tin and 73 per cent. lead. When plates emerge from the bath of molten metal they are thoroughly covered with a fairly uniform coating of this alloy. Since terne mixture itself is practically incorrodible one may expect long service from a roof formed of this material. Terne plates are furnished commonly in sheets 20 x 28 in., 112 sheets to the box, but as is the case with galvanized and black sheets it is also furnished in the form of roll roofing where the sheets are soldered on the ends and ready to roll out on the roof and fasten at the sides in one of the well-known methods of flat seam or standing seam construction.

Protecting Steel Sheets

Steel or iron is an excellent material for using as a base in the manufacture of roofing sheets, inasmuch as it has in itself nearly all of the properties required for roofing material. It is strong, ductile, rigid, impermeable to rain, snow, storm or sun, and is fireproof. But it is corrodible and must be protected from the action of oxygen and moisture. This is true of all iron or steel, no matter what the composition or what name is given to the product. Any unprotected iron or steel, if exposed to the weather, will form a film of red rust on the surface after the first rain.

The engineer in constructing a tall office building employs in the framework the best material available for the purpose to give the strength, rigidity and carrying power necessary to sustain the building. This material is, of course, structural steel. But he also knows that this material must be protected from corrosion and he therefore covers it and protects it from the atmosphere with concrete, tile or some other of the well-known materials of construction.

So in the building up of a roofing sheet the basic structure of the sheet, i. e., iron or steel, is always covered either by the manufacturer or by the consumer with some film which will exclude air and moisture. It would be ridiculous to expose any iron or steel sheet to the weather without such protection.

Ability to Last

One sometimes hears the statement made that roofing sheets manufactured to-day do not "last" as long as those obtainable in former times. This impression is entirely erroneous and is no doubt explained by the fact that against the advice of honest manufacturers the tendency has been in recent years toward the use of lighter and lighter weight sheets, until to-day roofing of entirely insufficient weight has been substituted to an alarming extent for the heavier weights more suitable for permanent construction. This rather reprehensible practice can, no doubt, partially be attributed to the dishonest contractor, who has substituted lighter weight sheets than his employer had a right to expect. It is also partially due to a tendency on the part of the builder to secure an extremely low first cost.

In any case we wish to condemn this practice strongly and to go emphatically on record to the effect that sheets are made to-day by reputable manufacturers and are procurable on the market at least as good from point of actual service as any that have been manufactured in the past.

Owing to the widely varied forms in which sheet metal can be obtained, it is possible to construct from metallic sheets practically any type of roofing, from the flat or nearly flat construction to that of the steepest pitch.

Advantages in Construction

In the use of corrugated galvanized or black sheets the additional strength and rigidity imparted to the sheets by the corrugations make it possible to use this form without any underlying sheathing or roof construction except the purlins themselves, thus considerably reducing the ultimate cost of the roof and at the same time procuring by the use of proper gauges a roof fully as strong as other types requiring foundation sheathing for the roof surface material.

This same advantage is present to a greater or less extent in the use of flat or uncorrugated sheets of either galvanized or terne plate, since a practically continuous sheet formed by soldering and seaming presents a light, strong and more or less rigid construction capable of being applied to a skeleton frame and not requiring a solid wooden sheathing, as is necessary for most of the other forms of roofing construction.

As mentioned above sheet metal is impermeable to the weather and is not injured by hailstones, nor readily damaged by any falling body. On the soldered and seamed construction generally used on flat roofs there are no

*An address before the Engineers' Society of Western Pennsylvania, November 7, 1911.

†Chief Chemist American Sheet & Tin Plate Company.

cracks for snow to sift through. Sheet metal roofs are absolutely incombustible and therefore fireproof.

Tin covered firedoors and shutters are the highest type recommended by the best authorities in the land, and metal roofs have recently been rated as the highest form of roofing by the National Fire Protection Association after years of experiments and tests with various other forms of roofing, including slate.

Comparisons

A metal roof properly laid also prevents the passage of flames from below and thus will, for a considerable time, retard the ferocity of a fire started from within. In the case of wooden shingles and slate a high wind often exerts force enough to strip the roof of its covering. This cannot take place on continuous metal roofs. Metal sheets will not curl up as is the case with wooden shingles and will not crack from impact or from the expansion and contraction due to changes in temperature.

Metal roofs are more easily applied and the first cost of installation is, therefore, considerably lower than that of any other type of permanent roof construction.

In the case of shingles and slate a leak, once started, is often vary hard to locate and difficult to repair. This is also especially true in the case of the so-called "built up" roofs. In this type water often gets between the layers of felt and by the alternate freezing and thawing in the winter works itself to remarkable distances between the layers, causing blisters, and it is usually very difficult to trace and repair a leak in a roof of this character. A leak in a sheet metal roof is usually very easy to find and can be repaired at a very low cost in a very short time.

Metal sheet roofs are clean and sanitary, so that where necessary water from them can be collected into cisterns used for domestic purposes. Having no gravel and tar the surface is not so apt to clog up eave trough and conductor pipes as is often the case with so-called "slag" roofs.

The feature of the weight of a roof is often overlooked. This is an important advantage of tin roofs. For instance, 100 sq. ft. of I. C. tin laid with standing seam weighs about 65 lb., as compared with 400 lb. for wooden shingles, approximately 400 lb. for three-ply slag, 500 lb. for four-ply slag and 650 lb. for slate. Thus it can be readily seen that the lower cost due to lighter construction necessary in the framework for supporting walls necessary to bear a sheet metal roof must be taken into consideration.

Considering the subject from all standpoints we believe that metal sheets for roofs are not surpassed, if equaled, by any other form of construction, and we believe we are correct in saying that, considering either a temporary or permanent roof, the lowest cost per year of service can be had by the use of metal sheets

The Accelerated Acid Test

Tests have been proposed and advocated by some manufacturers for the quick determination of the probable life of metal sheets in service. None of these have so far proved of any value whatever, but the one which has become most generally known is the accelerated acid test. This consists in exposing portions of a black sheet to 25 per cent. sulphuric acid and noting the relative loss of material in solution. In other words the test is based on the solubility of the material in sulphuric acid.

The writer has made many experiments which prove the utter fallacy of this test as a direct measure of corrosion, and nearly all of the investigators of this subject have come to the same conclusion. This resistance to the action of acid in certain products is obtained by the introduction of small amounts of copper into the molten steel, and if, for any reason, resistance to acid is desired or the consumer wishes to purchase on the basis of such resistance, material is furnished by the average manufacturer to-day which contains this small amount of copper and which will resist acid to an equal or greater extent than any of the widely exploited products.

It is absolutely necessary to paint the black sheet to protect it from the weather and it also affords additional protection of considerable value to coated sheets. The subject of the proper paint for a black or coated sheet is one well worthy a separate paper and will not be discussed by the writer at this time. Many tests are being made by eminent investigators along this line; much good has already come from their reports and more can be expected in the future.

Isthmian Canal Commission Bids

WASHINGTON, D. C., November 15, 1911.—Bids for material for chain fenders for all locks were opened yesterday at the Isthmian Canal Commission. The bidders were as follows:

Fawcus Machine Company, Pittsburgh, Pa.—Group 1, $24,359. Item 1, $2,172; 2, $15,711; 3, $1,935; 4, $596; 5, $3,402; 6, $543.

Group 2, $437,526. Item 1 A, $19,839; 1 B, $18,261; 2 A, $267,976; 2 B, $26,091; 3 A, $18,654; 3 B, $8,713; 3 C, $6,557; 4, $9,576; 5 A, $40,079; 5 B, $12,458; 6, $9,323. Grand total, $461,885.

Pittsburgh Valve, Foundry & Construction Company, Pittsburgh, Pa.—Group 1, $48,273. Item 1, $4,647; 2, $37,650; 3, $2,170; 4, $612; 5, $2,598; 6, $596.

Group 2, $434,875.80. Item 1 A, $29,375; 1 B, $24,636; 2 A, $268,921.80; 2 B, $18,073; 3 A, $21,790; 3 B, $10,015; 3 C, $7,550; 4, $7,007; 5 A, $32,360; 5 B, $9,797; 6, $5,361. Grand total, $483,148.80.

Rosedale Foundry & Machine Company, Pittsburgh, Pa.—Group 1, $26,213. Item 1, $2,395; 2, $16,980; 3, $2,210; 4, $5,060; 5, $3,358; 6, $710.

Group 2, $470,914. Item 1 A, $25,320; 1 B, $23,106; 2 A, $285,870; 2 B, $19,254; 3 A, $21,165; 3 B, $9,830; 3 C, $7,535; 4, $8,124; 5 A, $48,130; 5 B, $14,640; 6, $7,940. Grand total, $497,127.

William Tod Company, Youngstown, Ohio—Group 1, $37,800. Item 1, $4,100; 2, $24,000; 3, $2,800; 4, $1,200; 5, $4,000; 6, $1,700.

Group 2, $782,000. Item 1 A, $44,500; 1 B, $43,000; 2 A, $485,000; 2 B, $33,200; 3 A, $29,400; 3 B, $13,800; 3 C, $10,300; 4, $26,600; 5 A, $47,600; 5 B, $14,800; 6, $33,800. Grand total, $819,800.

United Engineering & Foundry Company, Pittsburgh, Pa.—Group 1, $21,113. Item 1, $1,914; 2, $12,916; 3, $1,923; 4, $609; 5, $3,265; 6, $486.

Group 2, $406,892. Item 1 A, $19,679; 1 B, $18,030; 2 A, $251,311; 2 B, $17,827; 3 A, $18,376; 3 B, $8,528; 3 C, $6,410; 4, $9,970; 5 A, $38,494; 5 B, $11,950; 6, $6,317. Grand total, $428,005.

Otis Elevator Company, New York—Group 1, $24,704.20. Item 1, $2,399.66; 2, $15,980.69; 3, $2,190.40; 4, $483.25; 5, $3,164.97; 6, $485.33.

Group 2, $465,522.67. Item 1 A, $26,526.40; 1 B, $24,315.86; 2 A, $281,612.58; 2 B, $18,693.48; 3 A, $18,667.33; 3 B, $8,819.87; 3 C, $6,684.38; 4, $6,065.97; 5 A, $51,142.83; 5 B, $15,570.86; 6, $7,423.11. Grand total, $490,226.87.

Steacy-Schmidt Mfg. Company, York, Pa.—Group 1, $25,966. Item 1, $2,370; 2, $17,600; 3, $2,775; 4, $400; 5, $2,456; 6, $365.

Group 2, $485,368. Item 1 A, $23,550; 1 B, $22,150; 2 A, $310,800; 2 B, $22,000; 3 A, $25,500; 3 B, $13,895; 3 C, $9,200; 4, $6,240; 5 A, $34,800; 5 B, $10,568; 6, $6,665. Grand total, $511,334.

Westinghouse Machine Company, Pittsburgh, Pa.—Group 1, $30,499. Item 1, $3,365; 2, $20,245; 3, $2,347; 4, $528; 5, $3,640; 6, $374.

Group 2, $514,026. Item 1 A, $30,652; 1 B, $28,098; 2 A, $322,679; 2 B, $21,957; 3 A, $21,384; 3 B, $8,910; 3 C, $7,128; 4, $9,209; 5 A, $44,203; 5 B, $13,813; 6, 5,973. Grand total, $544,525.

Wheeling Mold & Foundry Company, Wheeling, W. Va.—Group 1, $30,730.79. Item 1, $3,045.15; 2, $20,175.38; 3, $2,319.44; 4, $918.02; 5, $3,421.18; 6, $851.64.

Group 2, $573,417.37. Item 1 A, $34,393.07; 1 B, $31,528.64; 2 A, $352,954.64; 2 B, $26,654.87; 3 A, $22,728.48; 3 B, $10,553.40; 3 C, $7,975.70; 4, $10,685.55; 5 A, $40,394; 5 B, $12,545; 6, $17,004.02. Grand total, $604,148.16.

Bethlehem Steel Company, South Bethlehem, Pa.—Group 1, $36,489.70. Item 1, $4,522.30; 2, $22,378.70; 3, $3,613.50; 4, $1,056; 5, $4,125.20; 6, $794.

Group 2, $721,957. Item 1 A, $47,613; 1 B, $44,562; 2 A, $424,433; 2 B, $27,029; 3 A, $38,418; 3 B, $18,040; 3 C, $13,519; 4, $19,851; 5 A, $58,300; 5 B, $17,102; 6, $13,090. Grand total, $758,446.70.

Bids were opened by the commission to-day to furnish structural steel, steel rivets and reinforcing steel rods as follows:

Baltimore Bridge Company, Baltimore, Md.—Class 1, $20,205.40, 75 to 105 days. Class 2, $203.20, 75 days. Class 3, $3,370.34, 45 days.

Belmont Iron Works, Philadelphia, Pa.—Class 1, $20,261.07, 110 days. Class 2, $286.50, 80 days. Class 3, $3,316.80, 80 days.

Buffalo Steel Company, Tonawanda, N. Y.—Class 3, $2,886.53.

Concrete Steel Company, New York—Class 3, $2,821.44, 45 days.

Corrugated Bar Company, New York—Class 3, $2,824.75, 45 days.

Des Moines Bridge & Iron Works, Pittsburgh, Pa.—Class 1, $19,191.56, 80 to 120 days.

Oliver Iron & Steel Company, Pittsburgh, Pa.—Class 2, $197.24, 30 days.

Lewis F. Shoemaker & Company, Philadelphia, Pa.—Class 1, $22,706.16, 75 to 105 days. Class 2, $245.45, 75 days. Class 3, $3,584.48, 75 days.

United States Steel Products Company, New York—Class 1, $14,791.67, 90 to 120 days. Class 2, $163.57, 90 days. Class 3, $2,833.24, 45 days.

J. B. Kendall Company, Washington, D. C.—Class 1, $18,334.45, 50 to 75 days. Class 2, $182.31, 50 days. Class 3, $284.20, 50 days.

McClintic-Marshall Construction Company, Pittsbugh, Pa.—Class 1, $19,005.22, 100 to 120 days. Class 2, $185.44, 100 days. Class 3, $3,477.34, 120 days.

Gear Hobber with New Drive

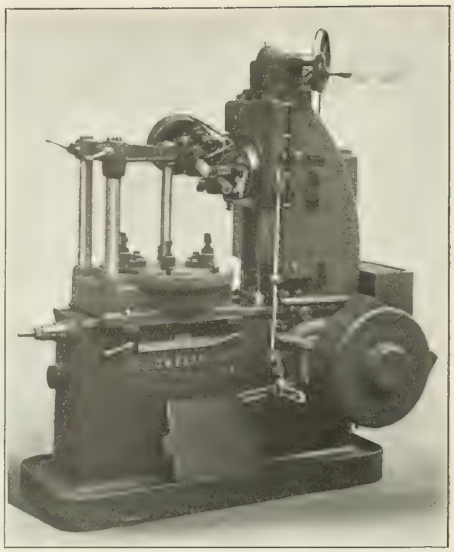
Speed Changes and Safety Features of Gould & Eberhardt Product

A number of improvements have been recently made in the line of high duty gear hobbing machines designed and manufactured by Gould & Eberhardt, Newark, N. J. These include a new single pulley drive with an adjustable guard to comply with the legislative enactments requiring all pulleys, gears, etc., to be guarded to prevent accident instead of the cone pulley drive formerly employed; the providing of ten speed changes for the machine, and an automatic stop or knockout which stops the entire mechanism of the machine when it has finished cutting a helical or spur gear.

Formerly it was necessary to reduce the speed of the cone pulley when using large diameter hobs as it was not possible to run them at as high a speed as the small diameter ones, and this reduction in the speed of the cone pulley decreased the power of the machine correspondingly when it was most needed with the large diameter hobs. The substitution of a single pulley drive gives the driving pulley a constant speed and the maximum power at all times. Another advantage of the single pulley drive is that it is not necessary for the operator to shift the belt to change the speed which it is pointed out is a difficult matter and one attended by some danger when the ceilings in a factory are exceptionally high.

The change gear mechanism provides ten speed changes in place of only four available with the cone pulley drive. These extra speed changes it is pointed out enable the operator to select the proper speed for the hob regardless of its size or the material from which it is made and the metal that it is cutting. It is thus possible to increase the speed of the machine when using small diameter hobs so that they will run at a greater number of revolutions per minute than hobs of larger diameter, and this can be done to increase the output of the machine without increasing the cut per tooth as the feed per revolution of the blank remains constant.

The automatic device for stopping the entire mechanism of the machine when a blank has been completely cut enables the operator to set the cutter slide trip dog in the proper position so that when the gear is finished the entire mechanism of the hobber will stop automatically with the exception of the driving pulley. This feature, it is emphasized, is important in cutting helical gears, as heretofore the operator has been compelled to watch his machine very closely until the gear was completed. It was then necessary to stop the machine by shifting the countershaft belt and this had to be watched closely so that the cutter slide would not continue to feed until it jammed into the revolving table. If to prevent this the feed to the cutter slide was thrown out before the hob had entirely cleared the blank being cut the former would mill the helical tooth away and thus spoil the gear. With this new arrangement if the feed is thrown out either by accident or otherwise before the gear is finished, the entire mechanism of the machine is stopped and no damage will be done. Other advantages of this arrangement are that the operator can feed up to a shoulder or line in cutting a helical or spur gear while the feed can be stopped automatically at the same point on every blank, thus making the work uniform, and by the use of this automatic stop it is possible for one man to operate more machines than could be previously taken care of.



An Improved Type of Fully Automatic Hobber for All Kinds of Gears Built by Gould & Eberhardt, Newark, N. J.

An adjustable guard has been placed over the single pulley drive to comply with the laws recently enacted requiring all gears, pulleys, etc., to be guarded to prevent accident. The guard can be easily adjusted to the proper angle of the belt. All of the running gears are also inclosed with guards.

The Fritz Medal Presented to Sir W. H. White

At the nineteenth annual dinner of the Society of Naval Architects and Marine Engineers, in the Waldorf-Astoria, New York, on the evening of November 17, Sir William H. White, former Chief Constructor of the British Navy, the designer of the Mauretania, received the John Fritz medal for notable achievement in naval architecture. Sir William is the seventh man to receive the medal in the nine years since it was founded. The venerable American iron and steel manufacturer, now 89 years old, in whose honor the medal was founded in 1902, was present. Onward Bates, of the John Fritz Medal Board of Award, presented the medal to Sir William on behalf of the board. He said:

"On August 12, 1902, our venerated friend, who honors us with his presence to-night, was 80 years old, and on that occasion his friends decided to commemorate that anniversary and his own great achievement with the creation of the John Fritz medal. A corporation was formed of 16 members, four from each of the great engineering societies of this country. That board has awarded the medal for 1911 to Sir William Henry White for notable work in naval architecture, and to-night his name is added to those of Lord Kelvin, George Westinghouse, Alexander Graham Bell, Thomas Alva Edison, Charles T. Porter and Alfred Noble."

In accepting the medal Sir William said: "This medal is founded to perpetuate the memory of a great engineer, a great and splendid gentleman, a man of such eminent ability and winning personality that we all want to call him our own. To you, Mr. Fritz, my old friend, I can only say that to all English-speaking engineers you will always be 'Uncle John.' To you, Mr. Fritz, weighted down with years, let me say that the memory of your friendship will abide with me as long as I live. We shall not forget 'Uncle John.'"

The evening closed with a reception to Mr. Fritz, during which the engineers present pressed forward to grasp his hand.

The Norton Axle Grinding Machine

A Special Production to Grind Complete Three Railroad Axles an Hour—The Results of Engineering Tests Under Practical Operation

The car axle grinding machine shown in the accompanying illustrations is designed by its builder, the Norton Grinding Company, Worcester, Mass., expressly to repair standard car axles and to grind new car axles of standard specifications. The machine is not suitable for other kinds of grinding, the intention being to simplify as far as possible the construction of the machine and to make it more profitable in its operation. The machine is a pioneer in a great field of usefulness.

Fig. 1 shows the machine with axle on centers, and also how the wheel is placed on or taken off the grinding wheel spindle by means of a hoist which is a part of the equipment. Fig. 2 shows the manner in which the axle is raised by means of compressed air for turning on the centers. Fig. 3 shows the axle being lowered into the saddles, following the turning on the centers. Fig. 4 is a photograph of the end of a car axle which has just been ground on the machine. Fig. 5 represents the condition of bearings which have been produced by three different methods: A—turning, filing and polishing; B—turning and roller burnishing; C—grinding with this machine.

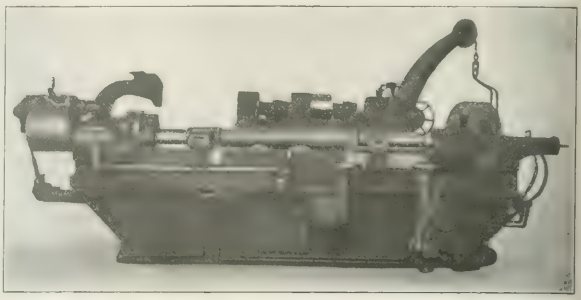


Fig. 1.—Axle on Centers; Hoist for Handling Grinding Wheel at Right.

The Operation of the Machine

The operation of the machine is as follows: After the crane has dropped the axle into the saddles provided for that purpose, the locating of the axle for placing it on centers does not require further handling by the operator. He has simply to turn on the compressed air which lifts the axle onto the centers of the machine. The driving mechanism, which is of floating type, is then clamped to the end of the axle, allowing the axle to revolve on the two dead centers. The next operation is to clamp the footstock firmly to the table and proceed to grind. The location of the table or work as related to the wheel is obtained either by power or hand.

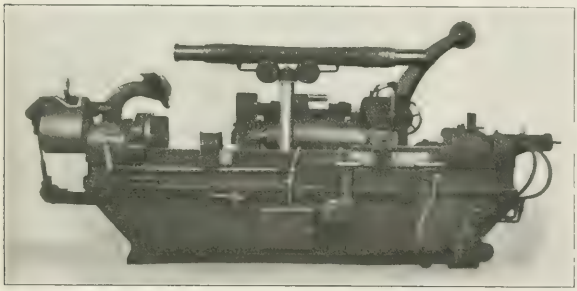


Fig. 2.—Axles Raised by Compressed Air and Ready for Turning.

Two speeds are provided for power table traverse, a fast speed for quickly locating the work for grinding, and a slower speed which may be used when necessary for locating the work, also for truing the wheel with the special truing attachment. The wheel slide is brought forward with a hand wheel.

When the grinding is completed on one end of the axle the operator relieves the footstock clamp, releases the driving dog with a wrench, turns on the air which draws back the footstock, automatically removing the axle from both centers. By means of another air valve the axle is raised by a plunger as shown in Fig. 2, the operator turns the axle by hand on a ball bearing pivot, and, allowing the air to escape from the lifting spindle, the axle falls into the saddles provided for that purpose, being automatically guided into correct position. Turning on the air which operates the footstock, the axle is again lifted to the centers. The operator then clamps the driving dog in position and proceeds to grind the second end of the axle.

The machine is the outgrowth of suggestions by railroad men that if it were practicable to grind axles in commercial time with a modern grinding wheel there would be a large saving, due to the fact that when grinding it is necessary to remove only sufficient metal from the surface to make the axle round and true. When repairing axles by turning they rarely removed less than 1/16 in. from the diameter, and more commonly ⅛ in. This amount in most cases would be from three to four times what would be necessary to make the axle true and round by grinding. That being the case, it was reported by railway men that there would be a saving in axles which would amount to an enormous sum of money annually and would fully warrant a substantial, rigid machine of sufficient weight and quality to produce the best work with a minimum expenditure of time.

A Comparative Test

Referring to Fig. 5 attention is called by the builders to the fact that these samples have been rubbed parallel with the axes with bronze rings which are shown in the photograph. These bronze rings were made with perfectly cylindrical bearings. The act of rubbing parallel with the axis slightly abrades the high spots. This was



Fig. 3.—Axle Lowered Into the Saddles.

done without the use of abrasive material between the rings and the samples, the abrasion being caused wholly by the friction of the bronze metal on the steel. This method reveals the actual condition of the bearing, something which is impossible to observe when the bearing is simply ground, or turned and polished. It will be noted that the ground specimen shows practically perfect bearing over the entire surface. In other words, according to this exposition, practically every particle of steel touches the ideal ring, whereas the other two specimens show high and low places and they further show that such work has not only high and low rings, but that these high and low places are eccentric with each other and do not continue around the entire circumference. In other words they show that the film of oil between the box and a revolving journal made in this way cannot be uniform throughout the entire revolution, hence the tendency to heating when the journal is new must be greater than would be the case with the ground journal.

The designers also call attention to the point that with the ground surface, before the ring is rubbed upon it, there is a grain due to the grain of the grinding wheel. This, it is believed, will permit more perfect lubrication than would be the case with a burnished surface. If this lubrication is good when the journal is first put into use the journal will not heat, whereas with the other methods, as shown in the photograph, the high spots, coming around in an irregular, eccentric manner, must cut through the film of lubricant and cause heating. The photograph and explanation are included for the reason that a number of railway men when examining the ground journals have apparently been comparing them with some polished or mirror surface which they have seen on journals, and the company wishes to bring out the fact that ground journals, although they do not have a mirror surface, will give better results because they have a perfect cylindrical bearing where every particle of steel of the surface has exactly the same radius, thereby forming a perfect cylinder, the only qualification to this statement being the grain of the surface due to the grinding wheel: but even with this grain on the surface there are still many more particles of steel at the uniform radius than in the case of surfaces finished by the other methods. A journal with a mirror finish will not lubricate as well as will the perfect cylinder with grain surface. It is further maintained that the imperfections in the turned and polished, and the turned and roller burnished specimens are not uniform. They do not continue around the entire circumference. They are eccentric with each other and have various other imperfections which prevent any uniformity of bearing and therefore a uniform thickness of lubricant between the box and the journal is impossible.

The Results of Engineering Tests

Exhibit A shows the condition of the several shafts before grinding.

Exhibit B shows the time required for grinding the various elements of the shaft, also the horsepower used, as well as information regarding the grinding wheel.

Exhibit C shows the average reduction of the diameters of the journals and wheel fits.

Referring to Exhibit A, the diagram is intended to represent an axle, A-B-C at the left hand end being the journal and D-E-F at the left hand end being the wheel fit. Thus F-E-D and C-B-A represent the same parts at the right hand end of the axle. Referring to the first line of figures, Axle No. 1, it will be noted that the journal was 5.510 at A, 5.509 at B and 5.508 at C. It will also be noted from the second row of figures that this axle was round at all three of these places. A further reference to the table, however, will show that many of the axles were very much out of round and that all parts of the journal were not concentric, due to the fact that one place on the journal in some cases was round and in other cases was not round.

By referring to Exhibit B a very good idea may be had of the horsepower which was consumed in the grinding of the several axles, also the time which was required for grinding the various elements of the shaft, including putting the work into the machine, turning the work on centers for grinding of the second end of the axle, and taking the axle out of the machine.

An analysis of Exhibit A, Exhibit C and Exhibit B will explain the difference in time and amount of material removed from the different axles. For instance, on Axle No. 2 it will be seen from Exhibit A that the journal at the left hand end was 0.028 in. larger at one end than at the other, and was 0.014 in. out of round, while the journal at the right-hand end had a difference of 0.027 in. diameter and was 0.015 in. out of round. Referring to the same axle on Exhibit C, which shows the average rough diameter, we see that the reduction of diameter at the left-hand end was 0.030 in. and at the right-hand end was 0.021 in.; and from Exhibit B it will be seen that Axle

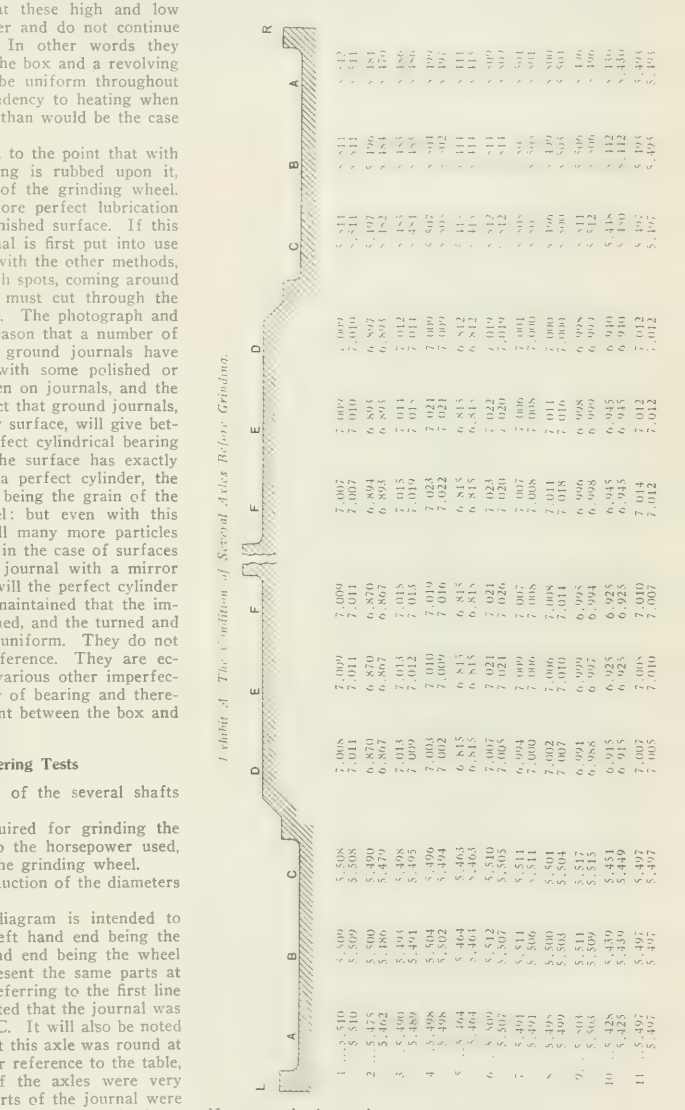


Exhibit A. The Condition of Several Axles Before Grinding.

No. 2 required 33 min. and 25 sec. total time, while other axles which were more nearly uniform in diameter and more nearly concentric before grinding required less time and the amount of material removed was also less than in the case of Axle No. 2.

The centers in the axles used for these experiments were in very bad condition. The angle of the center hole was different on each and every axle and the holes were very much scored and out of round. It was necessary to ream out a portion of these holes so as to permit of grinding the journals, etc., cylindrical. This, as a matter of

course, changed the axis on which the axles revolved and made some apparent discrepancies in the figures obtained by measurement of the rough axles and the amount of material removed in obtaining the finished axle. Also the using of such imperfect centers would be quite liable to result in imperfect work. An examination of the axles after grinding showed that the ground axle was practically perfect as to roundness with slight errors in some cases where the centers were unusually bad. With good center holes the ground axle shows no imperfections that the micrometer will exhibit.

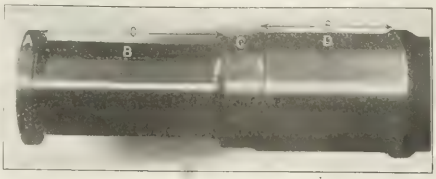


Fig. 4.—End of Axle After Grinding.

and hardened. This bearing is calculated to make the machine very durable for railroad work, as there can be no wearing or wabbling of the driving gear under hard service. Some of the other details are as follows:

The gearing for driving the work is of special form, to give smooth, uniform action, and to prevent chattering of the surface of the ground axle. The centers of the machine are especially designed and there are no joints or tail slides to become worn and cause chatter on account of loose fits. They can never become loose, it is stated, even carelessly handled.

Exhibit B—Time Required for Grinding the Various Elements of the Axle.

Axle number		2	3	5	6	8	10	11
Time		Min. Sec.	Min. Sec.	Min. Sec.	Min. Sec.	Min. Sec.	Min. Sec.	Min. Sec.
Putting in		7–20	1–12		1–32	1–27	0–56	1–06
Grinding right hand	(A)	0–45	0–34	1–14	0–18	1–03	0–37	0–28
End	(B)	7–20	5–51		2–58	7–51	6–22	4–09
	(C)	1–35	1–30	2–22	0–42	1–34	1–55	1–08
	(D)	3–00	2–51	5–44	2–12	4–15	1–46	2–42
Turning work on centers		1–25	1–48	1–32	1–25	1–17	0–48	1–22
Grinding left hand	(A)	1–45	0–37	1–14	0–44	1–04	0–56	0–49
End	(B)	7–15	3–30	8–02	5–07	7–58	8–05	5–53
	(C)	3–05	0–57	1–58	0–58	1–07	2–18	1–28
	(D)	4–00	2–14	3–52	3–11	4–03	2–56	3–32
Removing work from machine		1–40	1–04	1–16	0–59	1–03	1–12	1–12
Total time		35–25	22–08	27–14	20–16	32–42	27–31	23–49
Maximum horsepower		42.0	29.1	40.1	29.2	34.0	32.0	35.4
Average horsepower		17.1	11.9	16.3	11.8	13.8	12.75	

Motor running light requires 4¼ horsepower.
Motor and machine running light require 6.44 horsepower.
Wheel, 24 in. diameter, 9 in. face; speed of wheel, 1,036 r.p.m.; surface cutting speed, 6,500 ft. per min.

Referring again to exhibit B, giving the grinding times and the power consumed, the company calls attention to the fact that since the demonstration of October 18 and 19, further experiments have been made with a newly designed grinding wheel, and a material reduction in the grinding time, procured in fact so great a reduction that an average production of three complete axles an hour, all parts ground as in Fig. 4 can be guaranteed. It has been learned by these later experiments that still further improvement in time can be obtained if additional axles can be secured for further investigation.

The Machine Specifications

The total weight of the machine is about 23,000 lb. The weight of the grinding wheel head with its revolving parts, including the wheel and wheel guard, is about 5000 lb. The weight of the grinding wheel head gives an idea of the rigidity of the machine, this being necessary to secure smoothly finished journals under the maximum removal of stock with the grinding wheel.

The machine is motor driven, one motor supplying the power for all the elements of the machine. This motor is constant speed and may be of any make, voltage and current. The pump delivers about 50 gal. of water or lubricant per minute upon the wheel and work. This water or lubricant is contained in a tank which is integral with the base of the machine.

The headstock and footstock are made heavy to absorb vibration. On the headstock is a gear box containing speed change gears for different revolutions of the work, and a lever for starting and stopping the work is conveniently located near the center of the machine. The work driving gear, which is of floating type, revolves on a roller bearing designed especially for this purpose, the parts for this roller bearing being carefully heat treated and hardened.

The main bearing on the wheel slide of this machine is 5 in. diameter and 12 in. in length. The spindle is of heat treated steel instead of the old-fashioned hardened spindle, to ensure the same hardness throughout. The driving belt is 8 in. in width and drives the spindle over a 12 in. diameter pulley for the slowest speed of the wheel. The wheel guard is made thick and heavy to prevent the possibility of accident in case of wheel breakage. All of the revolving parts in this machine are of high grade steel and where necessary are heat treated. The hand wheels and connections between the hand wheels and their work are provided with ball bearings to make the action of the wheels smooth and easy. Where worm gearing is used it runs in an oil bath, and the spindle bearings and speed countershaft for driving the wheel are all self-oiling.

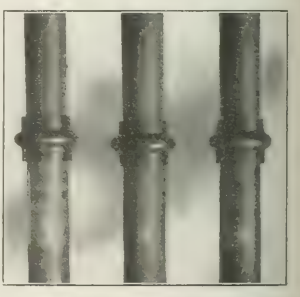


Fig. 5.—Condition of Bearings Produced by Three Different Methods.

Exhibit C—Average Reduction of Diameter on Journals and Wheel Fits.

N	LEFT HAND END — JOURNAL Rough Diam.	Fin. Diam.	R'duct. Diam.	WHEEL FIT Rough Diam.	Fin. Diam.	R'duct. Diam.	RIGHT HAND END — JOURNAL Rough Diam.	Fin. Diam.	R'duct. Diam.	WHEEL FIT Rough Diam.	Fin. Diam.	R'duct. Diam.
2	5.482	5.452	0.030	6.869	6.846	0.023	5.485	5.464	0.021	6.893	6.880	0.013
3	5.493	5.488	.005	7.013	7.004	.009	5.484	5.466	.018	7.015	7.005	.010
5	5.464	5.446	.018	6.815	6.798	.017	5.414	5.400	.014	6.815	6.797	.018
6	5.508	5.493	.015	7.021	7.000	.021	5.513	5.506	.007	7.020	7.009	.011
8	5.500	5.482	.018	7.008	6.994	.014	5.500	5.487	.013	7.011	6.987	.024
10	5.438	5.409	.029	6.922	6.900	.022	5.442	5.422	.020	6.943	6.926	.017
11	5.447	5.426	.021	7.007	6.990	.017	5.494	5.483	.011	7.012	7.001	.011

The Browning Engineering Company, Cleveland, Ohio, has recently taken several orders for locomotive cranes and reports that its plant is well filled with work. Its late orders also include a number for automatic buckets.

Cargo Transference at Steamship Terminals

H. McL. Harding, consulting engineer, in a paper on "Cargo Transference at Steamship Terminals," read before the Society of Naval Architects and Marine Engineers at its eighteenth general meeting in New York City last week, said that the attention of the railroad world has been so concentrated on the engineering problems arising between terminals that not until lately had been recognized the influence of the terminal on rapidity and economy of transportation. As an example of a realization of terminal needs he mentioned the $3,000,000 freight terminal of the Missouri, Kansas & Texas Railroad at St. Louis, where mechanical methods instead of manual labor are depended upon.

Illustrations of cranes and carrying devices in use at Bromberg, Germany; Brussels and Antwerp, Belgium; Gronengen, Holland, and the Pacific terminal of the Panama Canal were among those which accompanied Mr. Harding's paper. It was stated that most of the transferring machinery of the Continental ports, such as Hamburg and Antwerp, was ancient. While there are many electric cranes in use in the latter city, the author pointed out that hydraulic cranes are still being installed there instead of electric, the reason given being that hydraulic cranes had given good service and so were being used in later installations. Hydraulic cranes, Mr. Harding said, had never been recommended for American ports. He gave statistics to show the cost of mechanical freight transference at certain Atlantic port piers. The total loading cost per ton, including tiering, for 2,000 tons loaded in nine hours was $0.13028, against $0.366 by manual labor, while the total cost per ton of discharging 2000 tons in nine hours was $0.14575, against $0.3915 by manual labor.

A Good Record on Sulphurs.—The Robesonia Iron Company, which started up its furnace at Robesonia, Pa., October 12, gives the following data as to the sulphur content of the pig iron made in the last preceding campaign of its furnace, which ended with July 10, 1911. The company's product is low phosphorus pig iron:

	Gross tons.	Per cent.
Sulphur 0.020 and under	25,356	19.91
Sulphur 0.021 to 0.030	43,922	34.49
Sulphur 0.031 to 0.040	24,905	19.56
Sulphur 0.041 to 0.050	15,966	12.54
Sulphur 0.051 to 0.075	13,702	10.75
Sulphur 0.076 to 0.100	2,854	2.24
Sulphur 0.101 to 0.156	345	0.51
	127,345	100.00

The International Acheson Graphite Company, Niagara Falls, N. Y., has been awarded a grand prize by the Turin Exposition, Turin, Italy. The company has exhibited in all of the world's great expositions, and never yet has it been given other than the highest award. It is the only maker of graphite in the world, and this award continues the splendid recognition that is given to the advancement of science as represented by the processes operated in the wonderful plant of the International Acheson Graphite Company. It is additional testimony to the remarkable creative and inventive genius of Dr. Edward G. Acheson, who is shortly to return from a European tour.

The Wellman-Seaver-Morgan Company, Cleveland, Ohio, has received an order from the Canadian Pacific Railroad for a $500,000 coal handling plant to be erected at Fort William, Ont. The plant will include a bridge, two Hulett unloaders, coal conveyor cars and a trestle. Considerable electrical power equipment will also be required. An interesting fact in connection with this contract is that it is the first order that has been taken for Hulett unloaders for handling coal, as hitherto they have been used exclusively for handling ore.

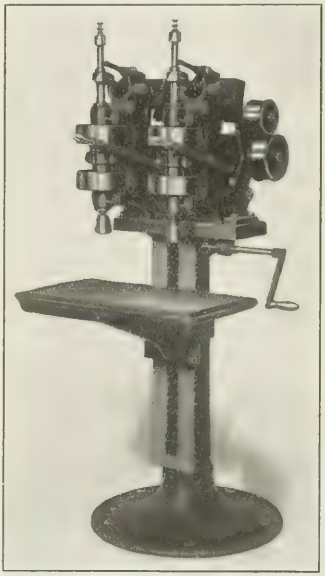
The Society of Automobile Engineers, whose headquarters are at 1451 Broadway, New York, now has nearly 1100 members. Among recent applicants for membership who were elected were Thomas A. Edison and George Westinghouse.

H. H. Hossman, Portsmouth, Ohio, has received the contract for all the iron and steel work for a practically new blast furnace for the Star Furnace Company, Jackson, Ohio.

Two-Head Automatic Tapper

A recent addition to the standard line of automatic tapping machines built by the Garvin Machine Company, Spring and Varick streets, New York City, is a new two-head machine which is known as the No. 1 two-head automatic tapping machine. The special advantages claimed for this new machine are that the capacity of a one-head machine is practically doubled, while at the same time it is possible to finish pieces having two holes of different sizes with one handling quickly since the machine works automatically, and when the tap is once started in the work it is not necessary for the operator to wait until the hole has been tapped before inserting a new piece in position, but he can be busy putting in a second piece for the other spindle to work upon, thus keeping both of them busy all the time.

The drive for this tapper is the same as that of the No. 2-A automatic machine which was illustrated in *The Iron Age*, August 24, 1911, each of the spindles being fitted with two friction pulleys driven in opposite directions by a continuous belt from an overhead countershaft while a friction clutch keyed to the spindle is located between the pulleys. This clutch is connected with the lever shown at the right of each head by a toggle arrangement which can be adjusted to give any desired tension, a construction which it is pointed out eliminates the necessity of employing an extra safety device to prevent the breaking of the taps. This hand lever starts the tap which is tripped and reversed automatically at any point by an adjustable screw stop on the upper end of the spindle coming in contact with the tripping lever on the top of the machine. The spindles are balanced and they are fitted with a positive drive chuck for holding the taps. The table, which is of ample proportions, is adjusted by a screw motion and has an oil groove around it to keep the lubricant from running over the floor.



The No. 1 Two-Head Automatic Tapping Machine Built by the Garvin Machine Company, New York, N. Y.

The tap is started by the hand lever after which no further attention is required until the hole is finished, as the tool will go to the bottom of the hole and return automatically. The capacity of the machine is about 1/16 to 3/8 in. U. S. standard tap in cast iron or 1/16 to 1/4 in. in steel, the maximum depth of hole in both materials being 1 1/2 in.

The tin miners in the Federated Malay States are complaining of the 10 per cent. export duty on tin.

A Special Planer Drive

The Slow Speed Type Developed by the Cincinnati Planer Company

An adjustable-speed electric motor drive has been developed by the Cincinnati Planer Company, Cincinnati, Ohio, which has an additional slow speed arrangement that involves the use of gears. In general the drive does not differ very materially from that illustrated in *The Iron Age*, October 27, 1910, except for the incorporation of the slow speed mechanism. The slow speeds are intended to be used for machining very hard castings, such as chilled rolls, and also for work of irregular shape or having wide surfaces which are to be finished by a form tool at a slow speed. Fig. 1 shows a 36-in. planer equipped with the new drive, while Fig. 2 is a rear view of the tool showing more of the details.

An adjustable-speed motor having a variation of 2 to 1 is directly coupled to the top shaft and drives the planer. This shaft runs in ring-oiling bronze bushed bearings and carries the ordinary cutting and return pulleys which are keyed to the shaft. The cutting and return speeds are varied by moving the levers A and B on the controller, shown at the lower left corner of Fig. 1, to the position corresponding to any predetermined speed desired. The cutting speeds range from 27 to 54 ft. per minute, and return speeds of from 75 to 150 ft. per minute are available or any combination of these can be obtained.

Any cutting speed within the above limits can be obtained without altering that of the return, while the return speed can be varied without in any way affecting that of the cutting stroke. In this way it is possible to operate at a cutting speed of 27 ft. and a return of 150 ft. or at a cutting speed of 40 ft. with a return of 100 ft.; or, if desired, the return speed can be set at 100 ft. and only the cutting stroke varied. A limit switch in front of the housings operates the controlling levers so that once they have been set for any particular speed an automatic return to that speed at each stroke is secured. Changes in the speeds of the cutting and the return strokes can be made instantly while the machine is idle or running on either stroke.

The Slow Speed Mechanism

The special slow speed is obtained through the back gears on the top of the housing and the gear on the left

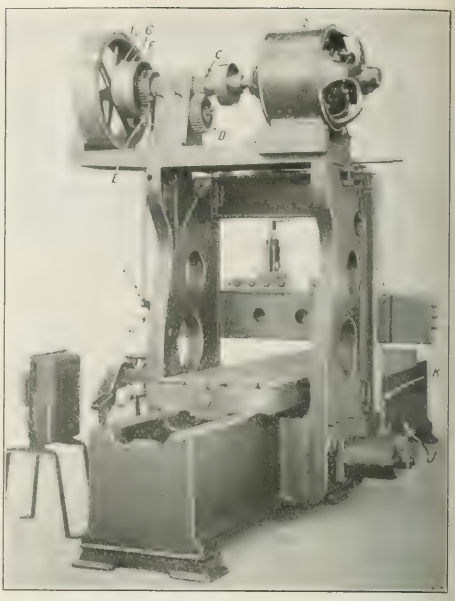


Fig. 2.—Rear View of the Planer Showing Details of the Drive.

housing. Referring to Fig. 2, the pinion C is keyed fast to the top shaft and meshes with the gear D that is keyed to the back gear shaft on which the pinion E is fastened. This second pinion meshes with the gear F which is tightly keyed to the hub of the pulley G that is loosely mounted on the top shaft. When the handle H, which is also shown in Fig. 1, is moved the cutting belt is shifted from the cutting pulley I, Fig. 2, to G, thus giving a slow speed to the pulley on the planer. A further speed reduction is made through the back gears to the regular gear train in the bed which gives cutting speeds of from 1.6 to 3.2 ft. per minute.

When it is desired to change the planer from the slow

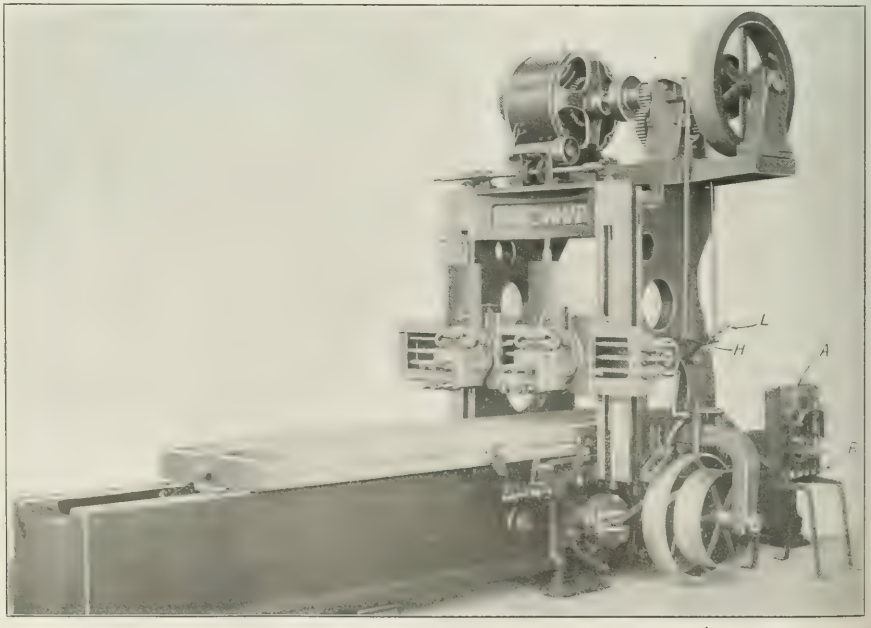


Fig. 1.—A 36-In. Planer Equipped with a Special Slow Speed Drive Designed by the Cincinnati Planer Company, Cincinnati, Ohio.

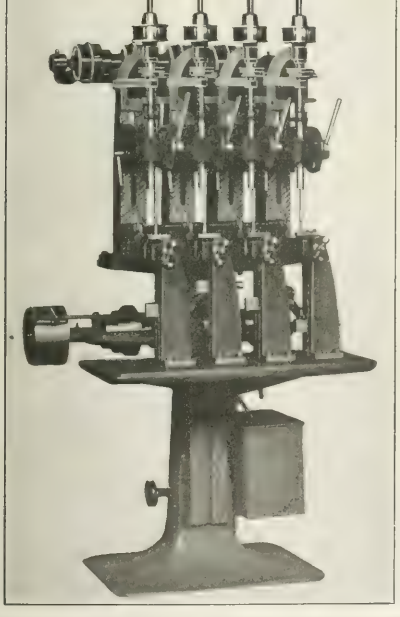
to the regular speed all that has to be done is to disengage the back gear handle J and reverse the clutch handle K. The cutting belt is then shifted from the pulley G to the regular cutting pulley I by moving the handle H. If it is desired to use the planer for any considerable length of time at the regular cutting and return speeds the back gears D and E can be disengaged by operating the handle L. In this way a very flexible arrangement is secured which gives cutting speeds of from 1.6 to 3.2 ft. or from 15 to 54 ft. per minute.

Multiple-Spindle Stay Bolt Drill

Machine for Removing the Cores of Boiler Bolts

In view of the recent recommendation of the Interstate Commerce Commission regarding the use of telltale holes in locomotive boiler stay bolts which allow steam to escape when the stay bolt breaks and thus give warning of danger, a recent product of the Foote-Burt Company, Cleveland, Ohio, is of particular interest to railroad and boiler shops at the present time. This machine, which is a four-spindle stay bolt drill is not, strictly speaking, a new machine, but is one that has been redesigned to make it a thoroughly up-to-date machine by improving the construction of the details and to provide for the increased strain caused by the use of high speed steel.

The machine has the capacity of four 5/16-in. drills and will accommodate stay bolts from ¾ to 1¼ in. in diameter and ranging in length from 3 to 15 in. Each of the four spindles has three independent speeds and two changes of power feed, the latter being equipped with an automatic knock-off that can be set for any depth of hole within the capacity of the machine. Both the feed and the speed can be changed quickly on any spindle without changing those on any of the other three. Each spindle has a large driving pulley, the power being transmitted from a self-contained auxiliary countershaft. Three-step driving cone pulleys on the main countershaft and corresponding ones on the auxiliary countershaft give the three speeds, there being a separate driving cone pulley for each spindle. An automatic power feed is provided through a steel worm and a bronze worm gear. From the spindle power is transmitted through gears and a belt to the feed shaft which drives a worm gear that in turn drives the feed pinion shaft. The belt runs on two sheaves of different sizes and by shifting it from one sheave to the other the two changes in power feed are secured. A clutch on each spindle controls the engagement of the power feed while the lever feed is always in mesh. The automatic power feed knock-out consists of an adjustable collar on the upper end of the spindle sleeve which engages with a trip and stops the feed.



A New Type of Four-Spindle Stay Bolt Drill Built by the Foote-Burt Company, Cleveland, Ohio.

The table has a maximum vertical adjustment of 24 in. and is counterbalanced by a weight inside the column. A lever connected with an eccentric shaft clamps the table in the desired position. A vertical adjustment of 12 in. is provided for the spindles which are clamped by a lever operating an eccentric shaft. The spindles are of 0.35 per cent. carbon steel and are ground to fit. When the countershaft is running at a speed of 350 r.p.m., spindle speeds of 1,150, 630 and 370 r.p.m. are available.

The stay bolts are centered beneath each spindle and held rigidly in position by specially designed chucks having a simple quick-acting gripping mechanism. The drill runs in a hardened bushing which insures its starting in the center of the piece held in the chuck. These chucks can be readily removed, thus rendering the machine available for a variety of sensitive drillings.

The following table gives the principal dimensions and specifications of the drill:

Distance between spindles and upright, in.	7½
Distance between spindle centers, in.	6½
Maximum distance between table and spindles, in.	36
Minimum distance between table and spindles, in.	4
Length of power feed, in.	3
Morse taper of hole in spindle	No. 1
Size of table, in.	12x31
Weight, lb.	1200

An oil pump and a return tank are included in the equipment of the machine so that liberal quantities of lubricant can be used. On account of the extremely rigid design of the machine and its ease of operation it is claimed that a boy can keep the four spindles running at their maximum capacity, thus reducing the piece cost to a minimum.

Motor Wagon Display in New York

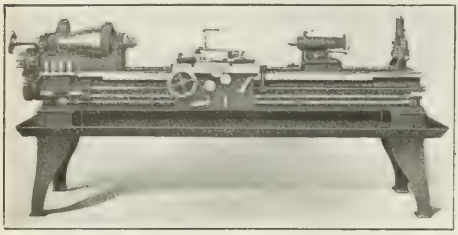
Business men engaged in all lines of industry and trade requiring much haulage and delivery of goods or materials will be able to make a study of motor trucks and delivery wagons in New York next January. From the 10th to the 17th of the month there will be gathered together in the Grand Central Palace the most improved models of these machines produced by 35 or more manufacturers. Many of the makes are wholly new to the general public, while most of the companies that have made displays before have added new models to their lines. The machines to be exhibited cover the widest possible range in type of vehicle, load capacity and selling price. The show is to be conducted under the auspices of the National Association of Automobile Manufacturers by S. A. Miles, who has managed the annual automobile shows held in Chicago since 1900. As the Grand Central Palace Show is to be held concurrently with the annual motor car exhibition in Madison Square Garden, non-resident visitors who attend either exhibition will be able to see the other without making a second trip to New York. The same manufacturers will not have displays at both shows, and consequently during automobile show week it will be possible to inspect 200 or more of the newest and best models of commercial cars built by 70 different companies.

The council of the Iron and Steel Institute has unanimously elected Arthur Cooper of Middlesbrough, England, to succeed the Duke of Devonshire as president of the institute in May next. The presidency is held for two years, the duke having been elected in 1909, in succession to Sir Hugh Bell. Mr. Cooper was elected a member of the institute in 1874, was appointed on the council in 1894, and became a vice-president in 1906. In 1892 he was awarded the Bessemer gold medal for his services to the metallurgy of iron and steel. He is the managing director of the North-Eastern Steel Company, Ltd., and is also a director of Dorman, Long & Co., Ltd., Middlesbrough.

Relieving Device Integral with Lathe

Notable Development of the Hamilton Machine Tool Company

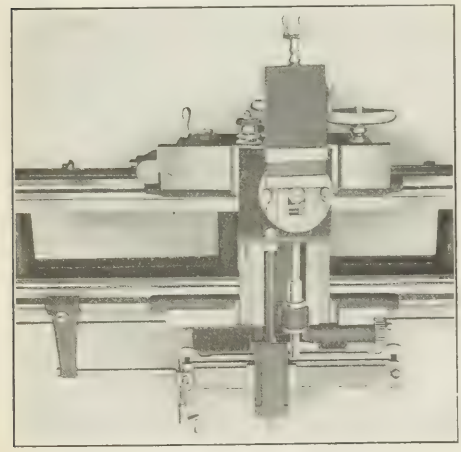
A new relieving device that is built into and is a part of the lathe itself is a recently developed feature of the 14-in. and 16-in. tool room lathes manufactured by the Hamilton Machine Tool Company, Hamilton, Ohio. The



The Hamilton Relieving Lathe.

drive for the relieving mechanism is from the back gears through change gears to a splined shaft which extends the full length of the bed. Driven from this shaft and sliding along with the carriage is a spur gear which transmits the power to a second gear that is adjustable on a sleeve and drives a pair of bevel gears as shown. This mechanism also drives the shaft at right angles to the first shaft and parallel to the bridge of the carriage.

Driven from this shaft and journaled in the carriage slide and swivel is a second pair of bevel gears, the vertical one carrying the relieving cam which transmits the in-and-out motion through the cam links adjustable box slide and heavy adjustable spiral spring to the compound rest tool slide. Three cams of double, triple and quadruple throw are furnished with each machine, and these with the different combinations of change gears enable the machines to relieve tools having from two to sixteen flutes inclusive. Changing the amount of throw from 1/32 to 5/16 of an inch to suit any particular work is ac-



Relieving Device Forming an Integral Part of the Lathe.

complished by turning a screw on the outside of the swivel which regulates the position of the adjusting block on the cam link. The "kicking off" of the tool at the right time is accomplished by adjusting the spur gear on its sleeve to the proper position.

As the drive is through the center of the swivel the machine will relieve all straight, angular and face mills up to 10 in. in diameter. The work of the new Hamilton relieving lathe is not confined to outside relieving only, but will do inside work as well, such as hollow mills and spring screw threading dies, doing it, it is explained, as rapidly and as accurately as a machine built solely for that purpose.

A Travel Recorder for Vehicles

A tamper-proof instrument to record the movement of vehicles, showing the time and duration of travel and stops, has been brought out for use on commercial vehicles by the Service Recorder Company, Cleveland, Ohio. The device is said to work equally well on heavy or light vehicles, either horse-drawn or motor-driven, and it is believed that a device of this character will have a large field among the users of commercial vehicles where it is desired to obtain records for various purposes, such as those effecting economical management and in computing the cost of cartage and making special deliveries.

The device consists of a specially designed timing mechanism having a movement similar to that of a clock and a recording mechanism operating on the pendulum principle. A steel stylus records the travel of the vehicle upon a printed chart that is revolved constantly by the clock mechanism and which is graduated for the 24 hours of the day and night, the smallest graduations on the chart representing 5 min. The whole device is inclosed in a round brass case 7 in. in diameter and 2½ in. thick.

The recorder is a simple and substantial device which it is claimed is both reliable and not apt to get out of order. There are no flexible shafts or outside gears or connections of any kind and the device can be attached to a vehicle or detached in less than a minute, although this cannot be done without access to the interior, which is under lock and key. In setting the recorder the paper chart is inserted against a metal disk attached to the drum of the timing mechanism and placed so that the time at which it is being set will be shown on the chart by a pointer extending from the case. This chart is held in place against the disk by a circular plate having a simple catch.

The disk makes one complete revolution every 24 hr. and when the pendulum oscillates with the movement of the vehicle the stylus makes a series of distinct lines about ¼ in. long near the edge of the chart, the location of these lines showing the exact time that the vehicle is in motion. When the vehicle is moving the lines run so closely together that they make a solid line ¼ in. wide and when the motion stops only a light circular line is made on the chart. A special blue paper with a white opaque coating is used for the chart so that while the stylus is pressing on the back of the sheet its motion is very clearly marked by lines on the record side. If it is desired to consult the chart at any time this can be easily done by opening the door of the case and the chart can also be changed at any time. As an additional safeguard against interference with the record by unauthorized persons the dial of the chart is automatically punched to show the time the case is opened or closed.

When the records are removed they can be filed for future reference, and among the uses to which this recorder can be put are to show when a vehicle starts in the morning, when it is put up at night, how much time is taken at noon, the time and duration of delays at loading stations and shipping points, the time consumed in going between any two given points, the time of actual service of a vehicle for the day, to measure the efficiency of the motor truck and as a check on the amount of overtime earned by the drivers.

The Youngstown Sashweight & Foundry Company, Youngstown, Ohio, has completed its plant for the manufacture of sashweights exclusively. It is claimed that this plant is the largest of any in the country for manufacturing its special line. Methods have been so perfected that the company can successfully and economically melt cheap scrap of all kinds, such as tin cans, old galvanized roofing, cinder metal, etc. The capacity is 50 tons per day on a single turn of eight hours. Inquiries have been so heavy that the plant is expected to be placed on double turn the coming week.

The great Corliss engine, the power feature at the Centennial Exposition in Philadelphia in 1876, afterward removed to the Pullman Company's plant at Pullman, Ill., was sold October 5 to the Oakdale Iron Company, Chicago, for scrap. This engine, although rated at only 1400 hp., weighed over 650 tons.

The Machinery Markets

All sections do not report the same activity in the machinery market, but the reports when balanced show a fairly satisfactory condition. Large dealers in New York describe business as "spotty," or good here and poor elsewhere. Others said they were doing well. Contracts have been awarded for machine tools to equip the Newark East Side Commercial and Manual Training School. One or two lists of fair size are pending in New York. More activity in inquiries for hoisting machinery is reported in New York. In Chicago an increase in trade is observed, some fairly good orders for machine tools having been booked, with inquiries for single tools from the railroads. Detroit reports that small buying is active, with the demand from the automobile trade good. Cleveland conditions have improved with increased local business and inquiries are more plentiful. An order for handling and conveying machinery, amounting to $500,000, has been placed in Cleveland by the Canadian Pacific Railway. An improvement in inquiries for wood working and electric equipment is noted in Cincinnati. Business in Philadelphia also is described as "spotty," although hope is held out that the increased buying of rolling stock by the railroads will soon be felt. New England is fairly active, although without big business. In the South the buying is for present needs. Requirements of small concerns continue to hold the attention of trade in St. Louis, but the aggregate amount of business is encouraging. Texas reports that manufacturing enterprises are busy and calling for some equipment. In Mexico political troubles have given the trade a setback. On the Pacific coast some slight improvement is noted, but no substantial betterment is expected before the new year. The export trade is fairly good.

New York

NEW YORK, November 22, 1911.

What change there is in the New York machinery market is conceded to be for the better. Although inquiries are scattered and call for one, or at best a few tools, it is conceded that the month so far compares favorably with preceding ones. Contracts have been closed for the machine tools required by the Newark East Side Commercial and Manual Training School. This business has been pending since early in the summer when the bids were opened. One New York firm gets an order for 12 lathes and some miscellaneous tools for the Newark school. The Lehigh Coal & Navigation Company, Lansford, Pa., whose list, recently out, represents about $20,000, has not placed the business up to date, nor is there any development so far as could be learned with the requirements of the New York, New Haven & Hartford Railroad. Increased activity was shown during the week in hoisting machinery, there being several inquiries for apparatus of this kind from private sources. The inquiries are of a kind which are taken to indicate a healthier feeling in the trade. Exports are fairly satisfactory.

H. V. Lewis and Arthur H. Valiquette are actively engaged in the conduct of the H. V. Lewis Company, 30 Church street, which was organized recently and represents as direct sales agent a few well-known manufacturers of machine tools in the New York and Philadelphia territory. The company will represent the Prentice Brothers Company, Worcester, Mass., maker of drilling machines and engine lathes; Kempsmith Mfg. Company, Milwaukee, Wis., milling machines, and Newark Gear Cutting Machine Company, gear cutters and shapers. The officers of the new company are: H. V. Lewis, president; George C. Hughes, vice-president and Arthur H. Valiquette, secretary and treasurer.

The Turner Construction Company, 11 Broadway, New York, has received the general contract to erect a six-story reinforced concrete factory building, 62 x 63 ft., and a one-story power house, 50 x 100 ft., for the Barnet Leather Company, Little Falls, N. Y. The machinery details have not been announced, but it is understood much in the way of power and leather making machinery will be required.

The Hassell-Coe Construction Company has been incorporated with $50,000 capital stock to manufacture rock breaking machinery. The incorporators are A. W. Hassell, Edward Coe and William T. Crisswell, 150 Nassau street.

The Robert Reiner Importing Company, Gregory avenue, Weehawken, N. J., has had plans prepared, and has awarded a contract to the Turner Construction Company, 11 Broadway, New York, for the construction of a two-story reinforced concrete building to replace its plant recently burnt. The company is importer and manufacturer of Swiss and German embroidery machinery. It is understood that much of the equipment will be of special design and imported, but some power equipment will be required.

The Sunset Company, 786 Broad street, Newark, N. J., has been incorporated with $50,000 capital stock to manufacture dynamos, electric appliances, etc. The incorporators include C. D. Winter, Benjamin Glockfield, John Beckingham and Frank Rosenbaum, all of Newark.

The city of Plainfield, N. J., will open bids November 27 for the construction of a pumping plant and appurtenances, clay pipe sewer and cast iron pipe. J. T. MacMurray is city clerk.

The National Sand & Development Company, Peekskill, N. Y., is receiving bids for the installation of an excavating, crushing, screening and washing plant for handling sand and gravel to have a capacity of 1000 cu. yds. per day. Geo. H. Rice, Secretary, Peekskill.

The Meteor Automobile Company, Mount Vernon, N. Y., has been incorporated with a capital stock of $50,000 to engage in the manufacture of motors, engines, motor vehicles, etc. F. A. Kateley, A. F. Gescheidt and L. Emmeluth, Mount Vernon, are the incorporators.

The Board of Contract and Supply, Albany, N. Y., is taking bids for furnishing three 15 kw. direct current turbo-generators for the water works system.

The C. J. Lundstom Mfg. Company, Little Falls, N. Y., is completing arrangements for the erection of a five-story addition, 85 x 120 ft., to be made to its factory.

The Olney Packing Company, Medina, N. Y., will build and equip an addition to its packing plant on Olney street.

The Monitor Clock Works, Medina, N. Y., is having plans prepared for a factory which will have 30,000 sq. ft. of floor space.

J. H. Williams & Co., Brooklyn, N. Y., manufacturer of drop forgings, have purchased a site of 60 acres at the northerly city line of Buffalo, N. Y., on the Niagara Falls Division of the New York Central Railroad, and is completing arrangements for building an extensive manufacturing plant on the property.

The Pratt & Letchworth Company, Buffalo, N. Y., is building an additional steel foundry at its plant at Tonawanda street and the New York Central Railroad.

The Hoffman-Allen Company, Buffalo, is completing the equipment of its factory, and has already ordered a large boring mill, a milling machine and several lathes.

Fire destroyed the plants of Manzel Brothers, manufacturers of automobile oil pumps and of the Reliable Metal Stamping Company occupying a large building at Babcock street and the Pennsylvania Railroad, Buffalo. The loss on building and machinery was about $80,000. Rebuilding operations will be commenced at once.

The Automatic Transportation Company, Buffalo, manufacturer of aerial transportation systems and portable loading and unloading apparatus for railroad freight stations, wharves and storage warehouses, is building an addition to its plant at Main street and the Erie Railroad.

The Buffalo Sled Company, North Tonawanda, N. Y., is building an addition to its plant on Schenk street, which will double its capacity. A warehouse is also being erected and the plant equipped with a sprinkler system.

The Niagara Chocolate Company, Niagara Falls, N. Y., will erect a large plant covering one acre of ground on Buffalo avenue. The main building will be 75 x 110 ft., two stories and basement, with wings 75 x 100 ft. Machinery of the most modern type will be installed, and the plant will be constructed to embody improved hygienic conditions including baths, rest rooms, etc. A large number of girls will be employed. Wm. H. Crosby of Buffalo is president and Ferd Plate, Niagara Falls, vice-president, treasurer and general manager. The company has a capital stock of $200,000.

The Universal Road Machinery Company is constructing another manufacturing building at its plant at Kingston, N. Y., making the sixth factory building to be erected by the company since the establishment of its plant at Kingston.

Dunning & Glasser, 16 State street, Rochester, N. Y., were low bidders for the pumping station to be erected by the City of Rochester at Brighton Beach. F. X. Pifer is city secretary, Room 37 City Hall.

The Erie Pump & Engine Works, Erie, Pa., recently incorporated, will manufacture centrifugal pumps and steam engines, principally the former.

The Water Works Commission, Erie, Pa., will open bids December 6 for furnishing a 20,000,000-gal. pumping engine.

New England

BOSTON, MASS., November 21, 1911.

Conditions in the machinery market have experienced a change which is difficult to analyze. The week has been dull and on top of that an influence has been felt which is not encouraging to the dealers. Some of the machinery manufacturers have reduced production. Others may have taken on additional men; in a few cases such is the case. But as a whole the existing policy is toward retrenchment, because the accumulation of stocks has come nearer the limit of safe financial management. Men are talking politics, wondering what the future is to bring forth. The result is a waiting game, which for the time being is more strongly accentuated. Reports from the wire industry of New England indicate a falling off of business. Correspondents of the machinery people write from other parts of the country a similar experience.

As for stocks of machine tools they are by no means too large, relatively speaking. Were a business boom to start up it would be a matter of a few weeks only before deliveries would be creeping into the future, if one can accept the opinion of machinery dealers from various parts of the United States. Yet millions of dollars' worth of completed product are stocked in New England and at least an equal ratio may be apportioned to other territories. Certain types of machines are in better demand, but with most of the standard lines orders are less than production.

Seymour E. Hall has been made manager of the Rochester, N. Y., office of Hill, Clarke & Co., Inc., Boston. Mr. Hall had occupied the same office at Cleveland for Hill, Clarke & Co., Chicago.

The Taunton-New Bedford Copper Company, New Bedford, Mass., is purchasing a complete rolling mill equipment, engine, boilers and other equipment for the new mill building which was mentioned in *The Iron Age* of last week. The company does not care to give out requirements in detail. The building will be 125 x 375 ft. The company operates copper and yellow metal rolling mills and manufactures specialties, including pure copper nails and tacks, yellow metal sheathing, slating and boat bails and Hill electric switches.

The Remington Oil Engine Company, Stamford, Conn., manufacturer of stationary and marine oil engines, has brought out a modification of its product to operate on fuel oils, distillates, etc., having a density as low as 28 deg. Baume, flash test 150 deg., and 18,000 to 19,000 B.t.u. This engine brings the cost of fuel for power down to three cents an hour per B.hp. hour. The oil is injected into the combustion chamber as liquid, but the temperature is so arranged that atomization, vaporization and combustion of the oil takes place as much as possible in sequence, instead of simultaneously, which does away with a deposit of carbon on the cylinder wall. The company has had the best year in its history.

The Washburn shops of the Worcester Polytechnic Institute, Worcester, Mass., is to bring out a 15-in. high-speed sensitive drilling machine, equipped with ball bearings throughout, with the purpose of supplementing the new 14-in. machine by one of larger capacity.

The Crane Valve Company, Bridgeport, Conn., will erect a one-story building, 25 x 150 ft., which will be devoted to pattern storage.

W. & B. Douglas, Middletown, Conn., is putting on the market the Compact electric house pump, in which the reduction gear of the company's worm-driven triplex pump has been applied to a single cylinder, double-acting type, the result being a unit that is practically noiseless. It is designed for suction lifts of 25 ft. and a discharge head of 175 ft. or 75 lb. pressure.

W. W. & C. F. Tucker, Hartford, Conn., are adding new machinery for the manufacture of compression grease cups, which will be interchangeable.

The report is denied that the Columbia Motor Car Company will remove its works from Hartford, Conn., to the Middle West. The rumor arose out of the closing of the drafting department, and, possibly, because of the removal to Detroit of the Alden Sampson Mfg. Company, Pittsfield, Mass., which is also owned by the United States Motor Company.

Stockholders of the West Mystic Boat Company, West Mystic, Conn., which has been absorbed in the National Boat & Engine Company, are organizing a new company to carry on a similar business.

The Boston & Maine Railroad has authorized the expenditure of $5,000,000 for the creation of a union passenger terminal at Portland, Me.

The United States Finishing Company, Pawtucket, R. I., will erect a power house 100 x 200 ft. of brick.

The Eastern Mfg. Company, South Brewer, Me., will enlarge its works by the erection of a large pulp mill. The company has contracted with the Bangor Railway & Electric Company for 3000 hp. in electric current, which will operate the entire plant.

Philadelphia

PHILADELPHIA, PA., November 21, 1911.

Here and there reports of a somewhat better volume of business are heard. Better conditions are, however, by no means general and no difficulty is experienced in finding both merchants and manufacturers who report continued dullness in the demand. In several instances, however, merchants have been able to close up a better proportion of the pending business and, while sales are still largely confined to single tools, occasional transactions covering several moderate sized tools as well as one small shop equipment are to be noted. While railroad buying, as far as machinery and tools are concerned, still continues very light, no fresh inquiry having developed, the trade is encouraged with the increased purchases made of rolling stock and motive power equipment, and anticipates a better development of general conditions.

A slightly better inquiry for some classes of tools is reported, but mostly covering small general requirements. Machine tool builders report unchanged conditions; in some cases, however, builders of special equipment, while still fairly well occupied, note a decreased inquiry for that class of equipment. The demand for boilers and engines shows but little change; occasional orders are closed by both merchants and builders, but the equipment has been mostly confined to that of the smaller capacities.

An irregular demand for second-hand machine tools, machinery and general tool equipment is noted. The foundry trade continues to operate on an irregular basis. Gray iron casting plants, while probably increasing their melt, are by no means actively engaged, while steel casting plants operate on a basis varying from 35 to 60 per cent., largely on orders for comparatively early delivery.

The Hyde Park Mfg. Company, Bernharts, Pa., manufacturer of cotton bats, patent ball peen hammers, horseshoe calks and sleeves, ball-bearing washing machine frames, patent ball bearings, etc., established in 1908, has been incorporated with a capital stock of $45,000. The officers are J. Wallace Miller, president and treasurer; J. H. Madeira, vice-president; Charles H. Madeira, secretary and sales manager. The company is erecting a two-story fireproof manufacturing building, but has not decided upon its requirements in the way of machinery and tool equipment.

The Philadelphia Department of Public Works, Bureau of Surveys, Harry A. Mackey, director, will take proposals until November 28 indorsed "Bids for

main sewer, branch sewers and Pennypack sewage disposal plant." Schedule A and B cover the sewer work, while Schedule C includes a frame disinfection house, a heating system and machinery supplies for the disposal plant.

A fire originating from locomotive sparks destroyed the office building and a large part of the shop of the Lehigh Valley Structural Steel Company, Allentown, Pa., last week. Very slight damage was done to the machinery or material in course of work. Plans for rebuilding are in progress, and meantime the company is operating the undamaged portion of the plant.

The Riverside Malleable Iron & Steel Works has been incorporated with a capital stock of $150,000. G. B. Smallcomb and F. W. McKown, Pittston, Pa., are named as being among the incorporators.

Dienelt & Eisenhardt, Inc., are quite busy. Orders are in hand for a large amount of oilcloth making machinery, including printing machines for export to Russia. One large oilcloth printing machine has recently been delivered to G. W. Bird & Son, East Walpole, Mass. The demand for dead-stroke hammers, hydraulic jacks and pipe-expanding machinery has been rather inactive, although orders for considerable special equipment, particularly paper bag making machinery, have been very satisfactory.

The Department of Wharves, Docks and Ferries, Philadelphia, will receive bids until November 29 for the construction of a bulkhead on the Schuylkill River in front of Bartrams Park; $50,000 is available for the work. Plans and specifications may be obtained on application to the director, Joseph F. Hasskarl, 555 Bourse Building, this city.

The Energy Elevator Company continues actively engaged in all departments. The demand for hand and power freight elevators has been well maintained and a very satisfactory volume of business, coming from various sections of the country, has been booked. During the coming summer this company anticipates plant extensions which will increase its productive capacity about 25 per cent.

The Easton Tool & Machine Company, 39-41 North Silgraves street, Easton, Pa., exclusive manufacturer of the Jackson line of vises, including the Utility drill press vise and the Turneasy line of blow off cocks, has been incorporated with a capital stock of $25,000. For the time being the company does not anticipate constructing a new plant, but will probably somewhat enlarge their present quarters. The officers of the new corporation are: C. L. Sonen, president; A. E. Dieffenderfer, vice-president; R. J. Lippey, treasurer, and C. J. Jackson, secretary and general manager.

Proposals are wanted by December 11 for constructing a complete sewerage disposal plant for Norristown, Pa. S. Cameron Corson is borough engineer.

Chicago

CHICAGO, ILL., November 21, 1911.

Sales of machine tools at Chicago and in the surrounding territory are reported as showing a very encouraging increase. A sale of tools including planer, lathe and milling machine, fully equipped and other small shop tools, aggregating $5,000 in value, to a Two Rivers, Wis., concern is reported and also a similar sale amounting to $2,200. Several other sales of radial drills, lathes and shapers are noted. The Chicago, Burlington & Quincy is reported to be in the market for two bolt cutters and the Illinois Central list remains unplaced. The increased volume of sales is not taken to indicate any change in the reluctance of buyers to install new equipment at this time, but is the result of enforced purchases of new tools. It is also anticipated that manufacturers are disposed to reserve their resources for investment in materials of manufacture rather than in equipment in view of the fact that material prices are certain to advance as business improves while machine-tool prices have been maintained at the level at which they may be bought at present. In this connection it may be said however that buyers are now enforcing all of the incidental concessions possible and the margins in machinery sales, particularly of second-hand tools, are reduced to a minimum.

The Precision Lubricator & Mfg. Company has been incorporated, with a capital stock of $21,000, by John S. Roberts, Emerson B. Stoddard and I. M. Volgas.

The Stewart & Clark Mfg. Company has purchased property at Wolfram street and the Chicago & Northwestern Railway tracks. The buildings now occupying the site will be removed and a factory building erected.

The Electric Appliance Company, Chicago, has been organized with a capital stock of $60,000 to build electrical apparatus. The incorporators are William W. Low, Thomas I. Stacey and William B. Walrath.

The Acme Automatic Tire Pump Company, Chicago, has been incorporated with a capital stock of $50,000 to manufacture and deal in automatic pumps, automobiles, etc. The incorporators are Francis J. Carroll, Emil R. Rosenthal and Francis J. Houlihan.

The American Film Company, Chicago, has taken out permits for a one-story brick factory at 6227 Evanston avenue, to cost $15,000.

The Adams & Elting Company, Chicago, paint manufacturer, to provide for the contemplated enlarging of its plant, has purchased a tract of land at Colorado and South Forty-fifth avenues.

The Brown Portable Elevator Company has let the contract for the construction of a $10,000 factory building at North Chicago near Waukegan, Ill.

The M. H. Foundry Company, Belleville, Ill., has increased its capital from $10,000 to $50,000, and has purchased the buildings formerly occupied by the Belleville Tack Works, in which a general brass foundry will be operated.

The C. E. Bonner Mfg. Company, Champaign, Ill., contemplates the purchase of new equipment in the near future to keep pace with its greatly increased output.

The Rheinhardt Stove & Furnace Company, New Athens, Ill., has been organized with a capital stock of $10,000 to manufacture furnaces and stoves and to engage in sheet-iron work. The incorporators are G. S. Rheinhardt, Henry Deichman and Peter Haupt.

At Fox Lake, Wis., a special election is to be held November 27 to authorize the issuance of bonds to the amount of $20,000 for a new water-works plant.

The Beaver Dam Foundry, Beaver Dam, Wis., will add a core room of concrete construction to its plant, and for handling heavier work will install two new cranes over its foundry floor.

The Milwaukee School and College of Aviation is preparing plans for the building of a foundry and machine shop at West Allis, Wis. The company is a $50,000 corporation.

The American Malted Food Company has arranged for the building of a factory at Waukesha, Wis., to cost $20,000, for which new equipment will be required.

The Harder Auto Truck Company has been organized with a capital stock of $100,000 to manufacture and deal in vehicles by Henry P. Chandler, J. M. Johnston and K. Cornwall.

Edw. F. Gales has taken out a permit in the amount of $50,000 for the erection of a four-story brick factory at 232 North Morgan street.

The Williams-Anderson Machinery Company has been incorporated by J. H. Westover, John E. Waters and Eric Winters, with a capital stock of $50,000, to do a general machinery, manufacturing and merchandising business.

The Western Mechanical Company will manufacture and deal in mechanical appliances. It has been organized by A. L. Williamson, M. J. Sullivan and K. C. Sawin with a capital stock of $2,500.

The Chicago, Milwaukee & St. Paul Railway Company has taken out a permit providing for the construction of a machine shop at 2915 West Chicago avenue, to cost $1,000.

The Avery Machine Company, Minneapolis, Minn., will soon begin the erection of a four-story steel-construction building, 130 x 150 ft., at a cost of $100,000.

The Farm Power Machinery Company, Minneapolis, Minn., has been incorporated, with a capital stock of $100,000, by H. L. Brockway, Walter Corey and R. C. Thompson.

The Glide Road Machine Company, Minneapolis, Minn., has had plans prepared for a two-story factory building, 76 x 90 ft., of brick construction, at an approximate cost of $6,000. At present the company is not in the market for new equipment, but later will be in need of additional machinery for the manufacture of road-making machinery.

The Miller Machine Company, Bridgeport, Ill., recently mentioned as having been incorporated with $50,000 capital stock, is in the market for one 26 in. Bridgford lathe, new or second hand, one 24-in. shaper, one 3-ft. radial drill press, one 12½ or 14-in. pipe machine, one emery wheel stand, one 25-hp. crude oil engine, a quantity of shafting, hangers, belting and wood-cutting supplies.

The Colby Motor Company, Nason City, Iowa, has had plans prepared for a new plant, one and two stories, 200 x 400 ft., of slow-burning mill construction, at an estimated cost of $30,000. The company announces that a site has been procured, but building operations will not begin until spring.

Cleveland

CLEVELAND, OHIO, November 21, 1911.

The demand for machine tools has improved during the week. Dealers regard the general outlook encouraging and are more optimistic than they have been for some time. The largest order reported is from a local manufacturer, who bought seven tools, aggregating about $4,000. Other sales have been mostly in single tools. Inquiries are more plentiful, there being several out for small lots of tools. The demand for second-hand machinery has improved, being now fairly active. In handling machinery a local builder has taken an order for a $500,000 coal handling plant for the Canadian Pacific Railroad. Another local concern has an order from a Canadian steel company for a large ore handling plant. Some other inquiries for both ore and coal handling plants are pending.

The Chicago Pneumatic Tool Company has let a contract for a three-story addition to its present Cleveland plant. The extension will be 70 x 140 ft., of mill construction. Some new machinery equipment will probably be required. This plant is well filled with orders and for some time has been running at full capacity and overtime.

The Continental Sugar Company, Cleveland, is having plans prepared for a $1,500,000 beet sugar plant to be erected near Ironville, Ohio, a suburb of Toledo. An 80-acre site has just been purchased. Several concrete and steel buildings will be required. J. F. Harper is president of the company and Fred T. Sholes, secretary-treasurer.

The Dunlap Mfg. Company, Columbus, Ohio, has been incorporated with a capital stock of $50,000 by S. M. Dunlap, A. I. Schetenstein, T. C. Dunlap, L. F. Slater and B. G. Watson to take over the plant of the Dunlap Engineering Company, which was sold recently at receiver's sale to S. M. Dunlap. The new company will make pneumatic tools and automobile parts.

The Electric Sign & Scenic Company, Mansfield, Ohio, has been incorporated with $5,000 capital stock by George H. Lowrey, E. P. Robbins and others to manufacture electric signs. For the present it will occupy quarters in the Holm Building on East Third street.

The Board of Commissioners of Stark County, Ohio, will receive bids at Canton, Ohio, December 15 for a Strauss trunnion bascule lift bridge to be erected over the Ohio Canal at West Main street, Massillon, Ohio. The estimated cost is $10,000. Plans are on file in the county auditor's office.

The Director of Public Service, Cleveland, will receive bids November 28 for a second-hand 6.6 ampere D.-C. series arc dynamo for the municipal lighting plant, and arc lamp transformers, regulators and converters.

The City Council, Columbus, Ohio, has authorized the building of substation in connection with the municipal lighting and water plants. Equipment amounting to about $12,000 will be purchased.

The Fremont Furnace Company, Fremont, Ohio, is planning the enlargement of its foundry, doubling the size of its molding department, and the erection of a warehouse, 40 x 100 ft.

The Ashtabula Bow Socket Company, Ashtabula, Ohio, has purchased a large building site and the building formerly occupied by the Veneer Package & Machine Company in order to largely increase its present manufacturing capacity.

A new plant will be established in East Liverpool, Ohio, for the manufacture of a patent metallic packing. Those back of the enterprise are L. M. Thomas, Joseph V. Clark, Fred Glenn, G. L. Brokaw and Edward Hoenig. The company will be capitalized at $25,000. It is stated that the erection of a plant, including a steel castings foundry and machine shop, will be started shortly.

The Jeffrey Mfg. Company, Columbus, Ohio, manufacturer of mining, elevating, conveying and power transmission machinery and coal mine equipment, has opened another branch office. It is located at 1201 American Bank Building, Seattle, Wash., from which the company will handle its business in the Northwest. Percy E. Wright, the Seattle manager, is a sales engineer, connected with the home office for the past 10 years, but thoroughly conversant with the conditions in the Northwest territory, having been traveling in that part of the country for a number of years. The Jeffrey Company maintains 13 branch offices in the United States, as well as nearly 100 agencies in leading commercial centers all over the world.

It is reported that the American Can Company, Toledo, Ohio, will build an addition to its new plant for the manufacture of steel barrels. The new building will be 80 x 200 ft.

The Cyclone Wire & Fence Company, Cleveland, has had plans prepared for a two-story factory building, 120 x 78 ft.

The Commercial Club, Greenville, Ohio, has closed a deal for the location of a plant in that city for the manufacture of pearl bottoms. Several factory buildings will be erected. It is stated that the plant will be moved to that city from Muscatine, Iowa.

A new oil fuel engine will be installed in the municipal lighting and water plant, Bryan, Ohio. The Council has authorized an issue of $23,000 in bonds for the new equipment.

Cincinnati

CINCINNATI, OHIO, November 21, 1911.

No improvement in the machine tool trade developed last week, although it is reported that the inquiry was a trifle better. Both woodworking and electrical equipment are in fair demand, and second-hand machinery dealers are said to be doing a more satisfactory business.

As the date for opening the Panama Canal draws nearer, the interest in possible South American business grows. A number of local manufacturers, including machine tool builders, are doing some quiet investigating in that particular field, which heretofore has practically been neglected by most of them.

Much local interest is taken in a petition of the Baltimore & Ohio Railroad Company, now before the City Council, for permission to construct a switch from its main line to serve the factories and machine tool plants in the Camp Washington district. Practically all of these plants are without railroad connections, and if the proposed request is granted, many extensions to existing factories will be made, and probably the location of new industries in this particular section of the city will also result.

At a recent meeting of the creditors of the defunct Licking Rolling Company, Newport, Ky., Captain J. T. Hatfield was selected as trustee. The appraisers appointed are Joseph B. Andrews of the Andrews Steel Company, Newport; T. W. Sandford, Covington, and J. A. Sebastini of the Cincinnati Iron & Steel Company. A movement is on foot to have the plant taken out of bankruptcy and put in operation again.

The Triumph Electric Company, Oakley-Cincinnati, Ohio, has recently opened a district sales office in the Farmers' Bank Building, Pittsburgh, Pa., in charge of D. D. Gill. The Triumph Company was formerly represented in the Pittsburgh territory by the Doubleday-Hill Electric Company, but its rapidly increasing business there necessitated handling it through its own office.

The Cincinnati Continuation School methods continue to attract an increasing amount of attention from all over the country. Last week Dean J. H. Renshaw received special visits from the Boards of Education of Nashville, Tenn., and Toledo, Ohio, and it is understood that the members of these boards went home determined to establish schools in their respective cities, to be modeled along the lines of the Cincinnati institution.

The Cincinnati Lathe & Tool Company has completed the removal of its offices and shop equipment from the Spring Grove avenue building to its new plant in Oakley. The Ohio Pattern Works, occupying the second story of the old plant, will utilize the space vacated by the first-named company.

The Wildberg Box Company, now located on Ninth street, Cincinnati, has acquired a factory building on Evans street, near Gest street, into which it will move at an early date. Its manufacturing facilities will be greatly increased.

Architect L. Dittoe, Provident Bank Building, Cincinnati, has completed plans for the new factory of the Cincinnati Veneer Company, whose plant was recently partially destroyed by fire.

Collison-Pierson & Co., a newly incorporated firm at Charleston, W. Va., are reported to have plans under way for the erection of a large garage, in which will be a small repair shop.

The Crane-Hawley Company, plumbing specialty manufacturer, with headquarters in Chicago, is having plans prepared for a six-story reinforced concrete building to be erected on Ninth street, not far from its present location. The new structure will not be used for manufacturing purposes.

The M. Marcus Building Company, Cincinnati, has plans under way for a large reinforced concrete building to be erected on Reading road, in which the company expects to have its general offices.

Detroit

DETROIT, MICH., November 20, 1911.

Sales of machine tools have improved somewhat during the past week, but the improvement is due only to a better buying of single tools and small lots, large bookings being scarce in this market. The shop supply business is holding up well, drills being especially active, and dealers handling this class of equipment anticipate a good run of business for the remainder of the year. The demand for generators, motors, turbines and other electrical and hydro-electric machinery has picked up materially during November, and makers are enjoying a satisfactory business. The market for woodworking machinery has taken a decided slump. There is little call for boilers. Operators of foundries state that the demand for castings is increasing, but that business is still considerably below normal. Contrary to the unsettled state of affairs existing in many lines of industrial endeavor, the condition of the automobile trade is pronounced unusually good by a majority of important manufacturers, and while motor companies are not as heavy purchasers of machinery as they were last year, still, increased production in this industry is causing considerable buying. The volume of new building work reported this week shows a marked shrinkage.

The Garrison Electrical Heater Company has been incorporated with a capital stock of $10,000 to manufacture electric specialties. Among the incorporators are P. C. Garrison, W. E. Standart and R. Boomer.

The Kelsey Wheel Company, manufacturer of automobile wheels, has commenced the erection of an extensive addition to its plant.

The Cadillac Motor Car Company has awarded contracts through R. F. Raseman, architect, for the construction of a large warehouse and a three-story brick power house adjoining its present plant. Provision has already been made for some of the equipment, which will include a large coal conveyor. The cost of the improvements is $25,000.

The Barr Mfg. Company, maker of automobile parts and marine engines, has increased its capital stock from $40,000 to $55,000.

The Cutler Hub Company has been organized at Saginaw, Mich., for the manufacture of wooden hubs. The new company has acquired a factory site of three acres and will proceed at once with the erection of a plant. Initial purchases of mechanical equipment have already been made.

The All Metal Mfg. Company, Grand Rapids, Mich., has filed articles of incorporation, giving its capital stock at $15,000. Among the stockholders are F. E. Miner, H. D. and E. A. Crandall. The new company will manufacture tools and equipment for the poultry trade.

The taxpayers of Kent City, Mich., have voted in favor of bonding for $3,000 to provide for a water works system.

Reports to the effect that the Michigan United Railways are to be taken over by a syndicate headed by E. W. Clark of Philadelphia have received semi-official confirmation. The new management will expend a large sum in improvements throughout the system, including the electrifying of the present steam railway between Kalamazoo and Benton Harbor, Mich.

The Grand Rapids-Muskegon Power Company, Grand Rapids, Mich., is making extensive additions to its properties. The company is doubling the capacity of its steam power plant and is planning the erection and equipment of three substations in the near future. A rotary converter will be installed in the old Fulton street plant.

The Beach Mfg. Company, Charlotte, Mich., has begun the erection of a new heating and power plant, 42 x 42 ft., and one story.

The American Steel Belt Company has been organized at Pontiac, Mich., to manufacture steel and leather belting. The capital stock of the new company is given at $30,000 and the principal stockholders are M. M. McGrath, D. L. Davis and R. K. Cronkhite. The company's product will probably be manufactured under contract at the start.

The Weis Mfg. Company, Monroe, Mich., maker of office furniture, has broken ground for the construction of a brick addition, three stories, 90 x 150 ft. The addition will be occupied by the cabinetmakers' department and the bindery.

The Battle Creek Table Company, Battle Creek, is making plans to enlarge its business, issue bonds and acquire a new plant. Negotiations for the new building are under way and it is probable that the mechanical equipment of the company will be materially increased.

The Rose Machine Company, Grand Rapids, Mich., has increased its capital stock from $20,000 to $50,000. Plans are under way for a decided enlargement of the plant and its equipment. The company manufactures textile sewing machines.

The Ann Arbor Railroad Company will begin construction work early in the spring on a large new roundhouse, and will make extensive additions and improvements to its shops at Ann Arbor, Mich. With this end in view the company has acquired a site of 10 acres. It is understood that Master Mechanic C. P. Bergman will have charge of the improvements.

E. B. Gibford is equipping a small factory in Adrian, Mich., for the manufacture of cutlery specialties.

The Valley Grey Foundry Company, Saginaw, Mich., is building a two-story addition to its plant, 33 x 92 ft. The new addition will be used as a pattern loft, etc.

Fire in the plant of the Globe Mfg. Company, Battle Creek, Mich., maker of surgical instruments, caused damage of $15,000. Among the machines damaged was a large dynamo and several buffing and plating machines.

Fire destroyed the plant of the Alpena Laundry Company, Alpena, Mich., causing a loss of $11,000. Steps to resume operations will soon be taken and $5,000 of laundry machinery will have to be replaced.

A tornado which struck Owosso, Mich., completely destroyed the large plant of the Estey Mfg. Company, maker of furniture, causing a loss of $150,000. The plant will be rebuilt as soon as practicable. The recently completed addition to the factory of the Woodward Furniture Company was also destroyed at a loss of $30,000, and the plant of the Owosso Mfg. Company, also a maker of furniture, was damaged to the extent of $8,000. A large amount of woodworking machinery will have to be replaced and it is expected that the companies will soon be in a position to make purchases.

The Keeler Bros. Company, Grand Rapids, Mich., manufacturer of brass goods, plans the erection of an addition to its present plant.

George W. Miskin, Bay City, Mich., has acquired a factory building in Pontiac, Mich., and will equip it for the manufacture of launches.

A hoopmaking plant having an annual capacity of 2,000,000 hoops will be established at Lathrop, Mich., by Henry Luke of Cheboygan, Mich.

The Fisher Show Case Company has been incorporated at Grand Rapids, Mich. Those interested are O. E. Fisher, D. E. Fisher and W. Delney.

Aulsbrook & Jones, Sturgis, Mich., are in the market for a steam boiler for the addition in course of erection to its plant.

Indianapolis

INDIANAPOLIS, IND., November 21, 1911.

The Antidam Mfg. Company, Indianapolis, has been incorporated with $10,000 capital stock to manufacture auto parts. The directors are R. J. Irvin, J. M. Irvin and George R. Bott.

The Pedalmobile Company, Indianapolis, has been incorporated to manufacture pedalmobiles. The directors are George Herff, F. Minthorne and A. T. Purcell.

The General Specialty Company, Indianapolis, has been incorporated to do a manufacturing business. The directors are J. W. Coulter, R. E. Gregg and W. W. Gregg.

The Eagle Iron & Car Works, Terre Haute, Ind., was damaged by fire November 12 to the extent of $10,000. The loss was mainly on the erecting room, core room and car sheds.

George Lenhert has been appointed receiver of the Star Motor Car Company, Indianapolis.

The sawmill and drykiln owned by John H. Moeller at Mt. Vernon, Ind., were burned November 16. The loss was estimated at $20,000, partly insured.

The Twentieth Century Mixer Company, Connersville, Ind., has been incorporated with $60,000 capital stock to manufacture concrete mixers, wheelbarrows, etc. The directors are William C. Bass, Jr., George C. Hicks, Jr., and R. J. Greenwood. The company is a reorganization. It moved from Bedford, Ind. Enlargements are contemplated.

The Otterbein Light & Power Company, Otterbein, Ind., has been incorporated with $10,000 capital stock to supply electric current. The directors are R. H. Bolt, L. Leaming and R. W. Pierce.

The Anderson Valley Lumber & Spoke Company, St. Meinard, Ind., has been incorporated to operate a planing mill, etc. The directors are J. A. Greulich, N. A. James, S. W. Pitts, George Bechter and J. E. Vaal

The Franklin Color Works, Franklin, Ind., has been incorporated with $20,000 capital stock to manufacture paints. The directors are R. J. Mossop, Lowell Mossop and William Featherngill.

Adam Hunsberger purchased the R. Z. Snell Mfg. Company at South Bend, Ind., at receiver's sale for $7,500. The company manufactures concrete mixers. Plans for enlarging the plant are being considered.

The Colfax Mfg. Company, South Bend, Ind., has purchased a new site and will erect on it a five-story brick factory that will double the capacity of the plant.

The Griffith Mfg. & Supply Company has been incorporated at Griffith, Ind., with $20,000 capital stock to manufacture metal castings. The directors are H. B. Potter, W. J. McFarland, Alexander Jamieson, I. W. Hough and Joseph Grimmer.

The Commissioners of Laporte County, meeting at Laporte, Ind., on December 4 will let the contract for a bridge over the Kankakee River. Fred. A. Hunshear is county auditor.

The South

LOUISVILLE, KY., November 21, 1911.

Though the general tone of business is quiet, the situation is being maintained in a satisfactory manner, and dealers and manufacturers report that the outlook is favorable. Though reports from various sections indicate that the demand for boilers has fallen off, makers of electrical equipment say that the demand is very fair. It appears that nearly all buying is for immediate use, and that the needs of the future are not being anticipated. This has resulted in a lot of small orders, while exceptionally big ones are getting to be uncommon. The export trade in electrically driven tools has shown some improvement of late.

The Kentucky & Indiana Terminal Railroad Company, Louisville, which, as was recently announced, was planning the erection of large machine shops, has purchased the shops of the Baltimore & Ohio and the Southern Railway here, and will make some improvements in them. The general project has not been entirely abandoned, but has been given up for the present.

The work of organizing the Louisville Steel & Iron Company is proceeding, and it is hoped to have the plant in South Louisville in operation by January 1. It is expected that there will be some changes in and addition to the equipment. Officers of the new company will probably be elected before the end of this month.

The Model Generator Company, Louisville, maker of acetylene generators and welding equipment, has installed some special machines of its own design. They were built by Bertsch & Co., Cambridge City, Ind. The company has also enlarged its factory building.

The Tycrete Concrete Products Company, Louisville, is building a concrete block shop, and will install concrete mixers, block-making machines, etc.

The St. Matthews Ice & Cold Storage Company, St. Matthews, Ky., has increased its capital stock from $45,000 to $90,000, but will make no changes in its plant. The increase was for the purpose of taking care of the purchase of the plant of the Crescent Ice & Storage Company, Louisville, in which some minor changes will be made.

The Longest Bros. Company, Louisville, has completed the equipment of its shops for the manufacture of motor trucks. Gasoline cars are being built in three and five-ton sizes.

Matt Corcoran & Co., Louisville, have opened a shop for the manufacture of distillers' supplies and other copper goods.

The Anderson Sawmill & Veneer Company, Louisville, recently incorporated, takes over a going concern and will need no machinery.

The Kentucky Wagon Mfg. Company, Louisville, which recently took over the business of the Electric Vehicle Company, is enlarging its plant to provide for the manufacture of electric motor trucks. At present a 1,000-pound car is being made, but it is intended to make one-ton, two-ton and three-ton cars. Henry B. Hewett is general manager of this branch of the business.

H. J. Gutman & Co., Louisville, are remodeling a building at Fourth and Walnut streets. Two electrically operated elevators are to be installed.

The Railroad Metallic Tie Company, Princeton, Ky., reference to the organization of which was made recently in *The Iron Age*, has announced that it will let a contract to a machinery company for the manufacture of the ties. John W. Hollowell is president of the concern.

The Chesapeake & Ohio Railroad will require an electric pump for use in connection with a water plant it is equipping at Silver Grove, Ky., opposite Cincinnati, O.

The American Nicotine Company, Henderson, Ky., has been incorporated with $200,000 capital stock for the manufacture of tobacco products. It will probably take over the plant of the Henderson Tobacco Extract Works, which has been planning enlargement. C. F. Gloystein, Henderson, is manager of this concern, and will be an officer of the new company.

Ashland, Ky., has decided to issue bonds for the purchase and improvement of the water works system. The municipality plans to spend about $80,000 in installing new equipment in the pumping station and in making other improvements.

Russell, Ky., has sold $75,000 of bonds, and will use the proceeds for the installation of a system of water works.

The Alvey Bros. Machinery Company, St. Louis, is the style of a new company organized by Gus Alvey, P. C. Alvey and others, of Elizabethtown, Ky., for the manufacture of conveying machinery. The company has no connection with the Alvey-Ferguson Company, Louisville and Cincinnati, which makes conveying machinery.

The Paducah Brewing Company, Paducah, Ky., has let contracts for the installation of considerable new equipment, including air compressors, cooling towers, etc.

The city of Covington, Ky., will let contracts this week for the installation of two 30-ton reduction furnaces for use in garbage incineration.

Lexington, Ky., business men are organizing a $50,000 company, the object of which is to bring new factories to the city. Sites will be purchased by the company and given to new enterprises free.

The Bon Jellico Coal Company, recently organized at Knoxville, Tenn., for the development of Whitley County, Ky., coal lands, is making openings and preparing to begin operations. The machinery of the mines will be operated by electricity, and the company will erect a power plant of considerable proportions. E. B. Taylor, Williamsburg, Ky., is in charge of the purchases.

The spoke factory of John W. Little, Paducah, Ky., which was destroyed by fire recently, will be rebuilt. Wood-working equipment will be purchased.

The electric light plant of Campbellsville, Ky., was destroyed by fire November 15, the loss being $30,000. Arrangements have not yet been made to rebuild, but it is understood that the plant will be replaced in the immediate future.

The Pond Creek Coal Company is being organized to take over 30,000 acres of coal lands in Pike county, Ky., purchased by Hayden, Stone & Co., Boston, with the intention of opening mines and developing immediately. The Island Creek Coal Company, Logan county, W. Va., will operate the property.

Cowan, Tenn., is planning the construction of a water works system and an electric light plant.

The Cumberland Marble Mill Company, Meadow, Tenn., is planning the installation of considerable new machinery in its plant, including four gang-saws, a derrick, a rubbing bed and a traveling crane.

The Morris Machine Works, Rockwood, Tenn., has begun operations, and is conducting a machine and blacksmith shop. E. W. Morris is manager.

The Nashville Armature Works, Nashville, Tenn., is in the market for three 110-volt motors and a 40-kw. belt-driven generator.

W. L. Riogan, Helena, Tenn., is inquiring for estimates on an electric light plant to be operated by water power for the use of a school building.

The Mount Morgan Coal Company, Williamsburg, Ky., is contemplating installing additional machinery in its coal mine.

The W. M. Lyles Mfg. Company, Crossville, Tenn., is in the market for a hoisting engine and boiler for use in logging work.

The Southern Railway, which is planning a number of improvements at Chattanooga, Tenn., will require a 10-ton pillar crane for freight handling. Contracts for equipment will probably be let from the Washington offices.

The expenditure of the Knoxville Light & Power Company, which will operate an electric plant at Knoxville, Tenn., with current from the Eastern Tennessee Power Company, will approximate $400,000, it is reported.

The Chicago, Memphis & Gulf Railroad will probably erect a roundhouse and machine shops at Dyersburg, Tenn.

The city of Clarksville, Tenn., will receive bids until December 4 on the equipment for the new pumping station which it will erect. Address S. J. Lowe, superintendent water department, Clarksville.

The Cumberland Concrete Construction Company, Clarksville, Tenn., is in the market for power equipment for the operation of its concrete block plant.

The L. N. Dantzler Lumber Company, Moss Point, Miss., is to erect a paper pulp factory at an estimated cost of $500,000.

J. B. Kelvin, Gary, Ind., and S. E. Light, Lebanon, Pa., are reported to be considering the establishment of a rolling mill at Sand Springs near Tulsa, Okla., for the manufacture of structural material.

Fort Smith, Ark., is to spend $100,000 in the improvement of its water plant, and the installation of much new machinery in the pumping station. G. W. Kiersted is the engineer in charge.

F. G. Blair and Henry B. Foster have been granted a franchise for the erection of an electric-light and gas plant at Tuscaloosa, Ala.

The Tulsa Automobile & Mfg. Company, Tulsa, Okla., is receiving machinery for its automobile factory, which it is planned to start in operation January 1. The company has a capital stock of $200,000, and expects to develop the Southwest as an automobile market.

Frank M. Morris and others will build and operate a water-works system at Ragland, Ala., under a franchise recently awarded.

Besser, Ala., is considering issuing bonds for the construction of a system of water-works.

Vicksburg, Miss., has under consideration a bond issue of $400,000, the proceeds of which are to be used in the construction of a water system.

The Kansas City Southern Railway is reported to be planning the erection of a round-house and machine shops at Westville, Okla.

John A. Fiske, Cocoa, Fla., is organizing a company with $60,000 capital stock and contemplates establishing a plant for the manufacture of unit bricks under the Sawyer patents. Machinery details are not yet prepared.

New Orleans, La., will open bids December 7 for furnishing a 6,000-kw. turbo-generator, 150-kw. converter and a seven-panel switchboard. Information can be had of F. S. Shields, secretary.

The statement in *The Iron Age* of November 2 regarding the machinery requirements of the Louisville Lead & Color Company, Louisville, was probably misleading. The machinery equipment required are paint mills operated by electric drive, a heating plant and an automatic sprinkler system.

St. Louis

ST. LOUIS, MO., November 20, 1911.

The machine tool market continues to maintain its note of optimism and improvement which has prevailed in recent weeks, but this is chiefly due to the aggregate of the small orders, rather than to any large individual orders received. The requirements of small concerns continue to be the chief item of interest in the market, but there is a belief on the part of the dealers, from information at hand, that there will be a steady gain for some time to come.

The Broderick & Bascom Loggers' Supply Company has been incorporated in St. Louis with $50,000 capital stock to handle a special branch of the business of the Broderick & Bascom Rope Company and to manufacture some of the specialties required in the new line of business. The stockholders are Charles E. Bascom, John K. Broderick, John J. Broderick, Joseph D. Bascom and H. J. Bailey, the last-named of Alton, Ill.

The Morris Lumber Company, St. Louis, with $50,000 capital stock has been incorporated by Howard Cole, George J. Green, R. M. Morris and others to manufacture lumber and will equip a mill at once, at Clio and Kearney, Ark., and Bastrop, La.

Paul J. Scheller and H. J. Peckinpaugh have accepted the gas franchise voted them by Edwardsville, Ill., and have completed the organization of a $100,000 company which will at once equip a plant for the manufacture of gas.

The city of Springfield, Mo., voted November 16 to issue $600,000 of bonds for the construction of a municipal waterworks plant with deep wells as the supply. The purpose is to do away with the present privately owned plant. It is likely, however, that the situation will be compromised.

The State Cabinet Company, Marietta, O., has leased quarters for the establishment of a branch factory and distributing station for the southwest for its product.

An entire block of ground near the center of the city has been leased by Henry Leschen, of the Leschen & Sons Rope Company, for the construction of a large building to be sub-divided and leased to automobile manufacturers repairers, accessories manufacturers, etc. It is understood that a large number of mechanically equipped plants have already been arranged for as lessees. The building will be about 150 x 400 ft. and six to ten stories.

The Superior Shoe Mfg. Company, with $100,000 capital stock, the stockholders being Oscar W. Burg, Rudy E. Bloch and Joseph L. Kohner, will at once equip a plant in St. Louis with a capacity of 1,000 pairs of shoes per day.

The Whitman Agricultural Implement Company will expend about $30,000 at once in extending its factory mechanical equipment and facilities.

The Laclede Gas Light Company, St. Louis, has sold $818,000 of its treasury bonds for the purpose of extending its equipment. Part will also be expended upon a new office building for the company.

The Kirksville Gas, Heat & Light Company, Kirksville, Mo., has increased its capital stock from $50,000 to $100,000 for the purpose of increasing its equipment and capacity.

The Copeman Electric Stove Company, St. Louis, has been incorporated with $30,000 capital stock by Allan Kennedy, C. A. Tilles and John F. Carr, and will equip a plant for the manufacture of electric heating appliances.

The Eagle Aerial Mfg. Company has been incorporated with $100,000 capital stock for the manufacture of aeroplane equipment, etc., by Thomas H. and Robert F. Keppel and James Van Raalte.

The Richmore Mining Company, Joplin, Mo., has been incorporated with $42,000 capital stock by Harry C. Neff, H. W. Hazell and Charles McDonald, and will equip a mining plant at once.

The Johnston Harvester Company, Peoria, Ill., has leased a building in St. Louis which it will equip at once as a branch plant and distribution station.

The Missouri Press Brick & Improvement Company will expend $25,000 at once in extending its mechanical equipment for the manufacture of brick.

The Banner Rubber Company, St. Louis, has increased its capital stock from $100,000 to $400,000 for the purpose of equipping a much larger plant for the manufacture of automobile tires and other rubber goods.

The Blanton Company has decided to expend $35,000 in increasing its mechanical equipment for manufacturing butterine.

The Olympia Coal Mining Company, Peoria, Ill., has been incorporated with $100,000 capital stock, and will equip a coal mining plant on its property at once.

The Tower Grove Foundry Company has purchased additional frontage adjoining its present property on Hunt street, St. Louis, and will add a $15,000 extension to its plant.

The Roth Tool Company, 2122 Choutou avenue, St. Louis, of which Edward B. Roth is president, has been organized with a capital stock of $20,000, and has purchased the plant of the Former B. Roth Tool Company at the above address.

The city of Pacific, Mo., will open bids November 27 for the construction of a water works system. Information can be obtained from the city clerk.

The Columbia Novelty Mfg. Company will erect a two-story shop at No. 1435 North Eighth street, St. Louis, Mo., to cost $1,800.

King City, Mo., has voted for an issue of bonds to provide funds for the building and equipment of an electric light plant.

The Omaha & Council Bluffs Street Railway Company has taken out a permit for the erection of car shops at Twenty-seventh and Ohio streets, Omaha, Neb., to cost $20,000.

Texas

AUSTIN, TEX., November 18, 1911

Cold weather of unprecedented severity for this time of the year prevailed over nearly all of the cotton belt during the early part of the week. The freezing temperature put a stop to further cotton production except in the extreme southern portion of the state. The cotton holding movement shows evidence of increased support and business remains dull and inactive pending an improvement in cotton prices or a turning loose of the product which is now being held. Notwithstanding the depressed condition of the general business situation there is considerable doing in the machinery line, particularly as it relates to manufacturing enterprises. The situation in Mexico is again becoming menacing, due to alleged revolutionary plots against the new government. There is now little hope of machinery trade in that country improving for some time to come.

The Dallas Electric Light & Power Company, Dallas, will nearly double the capacity of its power plant. The present capacity of the plant is 5800 kw. With the installation of additional machinery 5000 kw. will be added. Power from this plant is used to operate the street railway system in Dallas.

Pumps and other machinery will be installed in the municipal water and light plant at Sherman. Harvey McDuffie is superintendent.

A syndicate of Michigan men composed of Hudson T. Morton and J. H. Taylor, of Ann Arbor; R. G. Steele, of St. Johns; Andrew Fyfe, of Grand Rapids; F. E. Turrell, William T. Utley and H. M. Wallace, of Detroit, will install a gas producing plant and distributing system at Waxahachie, Texas. The City Council has granted a franchise for the improvement.

The W. H. Irvin Ice Factory, Incorporated, has been formed at Houston with a capital stock of $50,000. The incorporators are W. H. Irwin, John Hazard and Robert Terry.

The Rockdale Coal Company has been formed at Rockdale, with a capital stock of $30,000 for the purpose of operating coal mines. The incorporators are E. A. Camp, William Wells and H. E. Rowlett.

The Palacios, San Antonio & Pecos Valley Railroad Company has made a proposition to the citizens of Yoakum, Texas, to locate its proposed general shops and offices there. It stipulates that this will be done if a bonus of $50,000 and free ground for terminals and necessary buildings are donated. H. L. Montandon is chief engineer.

The Western Bridge Company has been formed at Sherman, with a capital stock of $10,000. The incorporators are W. H. C. Greer, Bert Hahn, T. H. Dunn and others.

The Hancock Electric Company has been formed at Dallas with a capital stock of $5,000. The incorporators are W. L. Hancock, Abe Hyman and J. B. Adoue, Jr.

The Stone & Webster engineering corporation interests which recently took over the electric light and power plant at Beaumont, has organized the Beaumont Electric Light & Power Company with a capital stock of $880,000 to operate the present plant, and to make important enlargements. The incorporators are Marshall M. Phinney, of Boston; C. W. Kellogg, Jr., of Dallas; E. J. Emerson, of Beaumont; L. C. Bradley, of Galveston; David Daly, Harry L. Harding and W. H. Stevens, of Houston. It is reported that the new company will construct an interurban electric railway between Beaumont and Port Arthur, 25 miles.

The Cotton Belt Gin & Lumber Company has been formed at Lufkin with a capital stock of $20,000. The incorporators are I. D. Fairchilds, T. W. Largent, E. F. Dunlap and others.

C. S. Karely, of Portland, is promoting the organization of a company with a capital stock of $45,000, to establish a factory at Corpus Christi, for manufacturing paper bottles.

The waterworks committee of the City Council, of Marlin, has recommended that the city purchase the interests and lease of A. R. Wright in the local waterworks plant and distributing system and that bonds be issued to the amount of $20,000 for enlarging and improving the plant. The matter is now under consideration by the City Council.

The city of Georgetown is spending $50,000 in the betterment of the water and light plant. An increased water supply has been developed by sinking a well.

A. H. Wilborn, of Memphis, and A. C. Wilborn, of Dallas, have completed the erection of a factory at Amarillo, for manufacturing metal tanks and galvanized corrugated iron road culverts.

Armour & Co. are installing a cold storage plant at Stamford, at a cost of $10,000.

The City Council of Harlingen, will soon begin the installation of a waterworks plant and distributing system and an electric light and power plant. Bonds for these proposed improvements have been issued. The work of construction will be superintended by the firm of Randall, Lovegrove and Wyman, of Houston.

The Del Rio Water Company is installing a 200,000-gal. tank and making other improvements to its waterworks system at Del Rio.

The Southwestern Sugar Company has been investigating the situation at Colonia Dublan, state of Chihuahua, Mexico, with a view of erecting a large factory for the manufacture of beet sugar.

The Corralitis Cattle Company is constructing a dam across the river near Colonia Dublan, Mexico, and will install pumping machinery for the irrigation of a large tract of land.

One of the largest electric power projects in Mexico is that of the Compania Hydro-Electrica Mexicana, S. A., of Monterey, Mexico, which was recently formed with a capital stock of $30,000,000. It proposes to install hydroelectric plants on the Rio Blanco in the state of Nuevo Leon and Tamaulipas and on the Rio de los Marangos in the state of San Luis Potosi. The company has already acquired concessions from the federal and state governments for these proposed plants. It expects to develop about 60,000-hp. which it will transmit to Monterey, Tampico, San Luis Potosi, Victoria, Montemorelos, Linares and other towns, covering a big scope of territory in northern and central Mexico. The surveys for the necessary dams and transmission lines are now being made. The officers of the company are Thomas Makinson Sanders, president; Frederick James Robinson, vice-president; Thomas Phillips, treasurer; Jose Romero, manager and Manuel Migoni, secretary. It is stated that construction work will be started on the different plants within the next few weeks and that it is expected that electric power will be available within the next 12 to 18 months.

The Pacific Coast

SAN FRANCISCO, CAL., November 14, 1911.

While a somewhat better feeling is manifest in the machinery trade, the volume of machine tool business shows little improvement. Both sales and inquiries of individual importance are lacking, and while a few operators are planning general improvements no general action is likely to be taken before the end of the year. Small single-tool orders, however, are coming out in somewhat better shape than last month. A good many machine shops are preparing to move into new quarters, and some new equipment will be required, but such improvements are confined to as narrow limits as possible.

The demand for some classes of machinery of local manufacture is very slow, mining equipment being especially quiet at present. The business of the past summer in this line has been considerably below expectations. The larger shipbuilding shops, also, are operating far below capacity, though builders of small boats and marine gas engines are busy. Notwithstanding the approach of winter, the demand for irrigating equipment is increasing, several shops being well filled up with small work of this nature. Some oil-well supply business is coming to this market, but shops in the oil fields have little work on hand, and are buying practically nothing in the way of new tools. Woodworking machinery remains very dull. A number of new inquiries are coming out for road machinery, and there is more movement in quarry equipment than for several months past. Some improvement work is in progress at California cement plants, and one new plant will probably be installed during the winter. Electrical equipment of all kinds is moving freely. Important extensions are being made to both power transmission and electric traction lines throughout the state.

The Benicia Iron Works, Benicia, Cal., will start work shortly on a large woodworking shop.

The Reliance Foundry Company has been incorporated in San Francisco, with a capital stock of $30,000, by J. S. Welbank, H. I. Cruzan and T. A. Sexton.

The Island Investment Company, Honolulu, T. H., has let a contract for machinery for a large steam-electric generating plant to be erected on the island of Maui. Oil fuel will be used.

The Southern Pacific Railroad and the American-Hawaiian Steamship Company are preparing to install

a pumping plant and salt-water fire-fighting system at the outer end of the Oakland long wharf.

The Monterey County Gas & Electric Company is preparing to increase the capacity of its pumping plant at Salinas, Cal.

The town of Bakersfield, Cal., is considering the installation of a rock crusher and a number of gravel cars.

The City Electric Company, San Francisco, is preparing plans for a new sub-station on Folsom street near Sixth.

The Associated Milling Company, recently organized at Manhattan, Nev., intends to install a new ore mill, including 10 stamps, tube mills, etc.

A contract has been let for the installation of 20 additional stamps at the ore mill of the Alaska mine at Pike City, Cal.

The San Juan Portland Cement Company, San Juan, Cal., is expected to complete its plant within the next few months. Most of the machinery was delivered some time ago, but has never been set up.

The Main Brass & Mfg. Company has been incorporated at Los Angeles, with a capital stock of $25,000, by Herbert, Charles and Henry Ovendale and Lawrence Macomber.

The Brisco Iron Works, manufacturing deep-well pumps, is considering the establishment of a foundry and shop at Porterville, Cal.

The city of Los Angeles has made such progress on its Owens River aqueduct that a large amount of the machinery used in the project is no longer required, and some of this equipment is now being placed on the market. The sale has been authorized of six Holt caterpillar traction engines. It is reported that the city will open a store for the sale of its used machinery.

Grier & Hawley, of Sacramento, Cal., have ordered a Class 14 Bucyrus excavator, with a 1½-yard bucket and a 60-ft. boom.

The town of Whittier, Cal., has under consideration bids for a steam road roller.

Plans are being prepared for a warehouse building for the Meese & Gottfried Company, local machinery merchants, to be erected at 19th and Harrison streets.

The Union Iron Works, this city, is now assembling a steel caisson for the Pearl Harbor drydock, said to be the largest ever constructed on the Pacific Coast.

The Western Foundry Company is preparing to put up a new cupola on Folsom street near Fifth.

A large pumping plant is to be installed shortly at the local works of the American Steel & Wire Company on Harrison street near Fifteenth.

S. G. Beach, Placerville, Cal., is putting on the market a lot of second-hand sawmill equipment from the Mountain Mill, which he recently purchased.

The California Glass Insulator Company, Los Angeles, Cal., has secured a site at Long Beach, Cal., and is having plans prepared for a plant to be erected there for the manufacture of pressed and blown glassware. Most of the equipment has been purchased, but the company will be in the market from time to time for machinery for the manufacture of its product.

The municipality of Elma, Wash., through C. M. Long, town clerk, is advertising for bids to be opened December 5 for the construction of a water-works and pumping plant complete.

Eastern Canada

TORONTO, ONT., November 18, 1911.

A change in the weather has interfered with the activity of outdoor work and has caused some falling off in the demand on that account. Most of the factories report business good, as there has been a considerable volume of orders for future delivery in most cases. The railway equipment manufacturers are fully employed, and will be throughout the winter. In many lines of machinery and equipment supplies prices are easier than they were even when trade was dullest in the United States. There is more complaint than there was then of price-cutting on the part of American competitors. Still it seems to be the opinion that Canadian manufacturers are getting a larger proportion of the home business than they ever had before.

The Seymour Power & Electric Company is about to erect a substation at Napanee, Ont.

The Electric Power Company, Toronto, is building a power house at Trenton, Ont.

The Commercial Construction Company, Sudbury, Ont., has been incorporated with a capital stock of $40,000 to carry on a bridge-building business.

The Thomas Pink Company's office, storerooms, engine room and machine shop at Pembroke, Ont., have been burned down. Total loss, $50,000. The company will rebuild at once.

The Rock City Tobacco Company, Quebec, Que., will build a large addition to its tobacco factory.

An addition to the Chateau Frontenac, Quebec, that will cost $1,000,000, is being planned by the Canadian Pacific Railway Company.

The factory of the Perth Flax & Cordage Company, Stratford, Ont., has been acquired by the Bennewitz Mfg. Company, which is to operate there.

A by-law to raise $100,000 to build a concrete reservoir, install electric pumps, etc., is to be submitted to the ratepayers of Berlin, Ont., very shortly.

James Fowler is negotiating with the town of Oakville, Ont., for the establishing of a factory there to make electric motors, telephone supplies, etc.

The Montreal Witness quotes T. Cantley, general manager of the Nova Scotia Steel & Coal Company, as follows: "Our new hydraulic forging plant is now almost completely set up. It is a fine specimen, built in Europe, and will cost us not much under $500,000. Each such addition places the company in a stronger and more independent position. Apart from the bad effects of ruinous price-cutting in the United States, business is good, with prospects bright."

The Guelph Stove Company, Guelph, Ont., has made an arrangement with the City Council for the enlargement of its plant and operations.

The Grand Trunk Railway Company is anxious to secure 750 electrical hp. from Kingston, Ont., to work a rolling and crushing plant which it intends to establish two miles east of that city.

The firm of Logan Bros., Ltd., Renfrew, Ont., woolen and knitting manufacturers, is about to install a new plant in order to keep pace with its greatly increased business.

A charter of incorporation has been granted to the British North American Drydock & Shipbuilding Company, Ltd., with a capital stock of $1,000,000. All the signatories in the charter are Quebec City men. They are as follows: Philippe Bazin, J. F. Burstall, V. Cahateauvert, William Dobell, Nap. Drouin, J. B. Letellier, William Price, J. T. Ross and William Shaw. It is understood that this company will immediately make application for the subsidies for the new construction at Quebec of a very large drydock, and upon formal acceptance of the scheme by the government the work will begin at once.

The Stewart Sheafloading Company, Winnipeg, is being negotiated with for establishing a large factory in Guelph, Ont., to cost $100,000.

The municipality of Point Claire, Que., will require iron pipe, engine and boiler pump, dynamos, etc., for water works plant it is putting in.

The Town Council of Tilbury, Ont., has under consideration a proposal from H. H. Hallett and associate to establish a brick and tile factory in that town.

The E. B. Eddy Company's proposed improvements of power plant, etc., at Hull, Que., will, it is estimated, cost $500,000.

The National Drug & Chemical Company, Toronto, is preparing to erect a store and warehouse in Hamilton, Ont., to cost $50,000.

A merger has been formed, with Kingsville, Ont., as the center, of the Volcaine Company of Windsor, Ont.; the United Fuel Supply and Ridgetown Gas Company and the Northern Pipe Line Company.

The Robinson Bros. Cork Company is extending its plant at Port Colborne, Ont.

The municipality of Port Colborne, Ont., is negotiating for a branch of an American steel manufacturing concern that would employ 200 men.

H. Vineberg & Co. are erecting a factory to cost $200,000 in Montreal.

J. C. Wilson & Co., Montreal, are building offices and warehouse to cost $125,000.

The town of Goderich is in negotiation with L. P. Brodie, who proposes to establish mammoth salt works there and produce electrical power for supplying the town.

G. D. Memberg & Sons, Hamilton, Ont., are about to install mattress-making machinery to cost about $15,000.

The Russell Motor Car Company, Toronto, is building a factory in that city to cost $30,000.

Henderson Black & J. Connors are about to build an addition to their binding-twine factory in Walkerton, Ont.

Canadian Motors, Ltd., is putting up a factory at Galt, Ont., to cost $4,000.

The International Harvester Company has taken out permits to put up additional factory buildings in Hamilton, Ont.

The Laidlaw Bale Tie Company, Hamilton, Ont., is putting up a $30,000 factory.

The Monarch Knitting Company, St. Thomas, Ont., is erecting a $60,000 addition to its present plant. The new building will be equipped with machinery for producing 600,000 lb. of worsted yarns per year.

The Roe-Mac Company, F. H. Keefer, president, Port Arthur, Ont., manufacturer of paving materials and liquid binders, will build a plant at that place, comprised of a crushing mill, a hydrated lime mill, a chemical and analytical laboratory, a cooperage shop and office building, to cost $40,000. The company has established a branch plant at North Tonawanda, N. Y.

The Crown Gypsum Company, Lythmore, Ont., has awarded a contract to Dick & Sons, Welland, Ont., for a factory, 70 x 244 ft., to replace its plant recently burned. All modern improvements will be installed. J. H. White is superintendent.

Western Canada

WINNIPEG, MAN., November 15, 1911.

Winter has now set in here, with more strenuous weather than the average for the middle of November. Consequently building on small structures has fallen off. There is, however, considerable work being done on large buildings. In the prairie country industrial operations are usually quiet for a couple of months in the frostiest part of the winter, but on the Pacific coast, where cold does not interfere much, there is considerable expansion in contemplation for this winter.

In Calgary, where the Canadian Pacific Railway Company is about to erect its western machine and car shops, surveyors have been at work laying out the site and placing the stakes for the excavation work. According to the company's agreement with the city, work is to be started immediately, or not later than one month after the ratification of the agreement.

A report from Vancouver says that a number of coast and mountain mill owners are planning additions and improvements to their plants, to be carried out during the winter if the prairie demand for lumber gives promise of briskness.

The plant of the Canadian Pacific Lumber Company at Port Moody, B. C., is being improved by the placing of two new 60-in. x 16-ft. boilers and a large gang saw. The output of the mill will be increased as a result.

The Canadian Puget Sound Lumber Company, Ltd., has carried into effect many improvements calculated to increase the daily cut of lumber and effect a substantial saving in operating expenses of the Sayward sawmill at Victoria,, B. C., and is now turning attention to the sash and door factory, which is to be enlarged and made up to date by the addition of fast-speed machines.

The Canada Cement Company is building at Winnipeg an immense plant for the manufacture of cement.

Wm. Clark & Co., North Battleford, Sask., are incorporating, and are preparing plans for a foundry and machine shop.

The B. C. Telephone Company, Vancouver, B. C., has prepared plans for a new exchange in that city. The amount to be expended by the company on its scheme of improvements is in excess of $2,000,000.

The Great West Saddlery Company will put up a three-story block at Lethbridge, Alberta.

The Canada Iron Corporation will erect a gas plant in connection with its works at Fort William, Ont. The estimated cost is $50,000.

Two units of 10,000 kw. each are now installed at Stave Falls, near Vancouver, B. C., by the Western Canada Power Company.

The Alberta British Columbia Lumber Company, Cranbrook, B. C., has been incorporated with a capital stock of $50,000.

The Capilano Rock & Gravel Company, Vancouver, B. C., has been incorporated with a capital stock of $250,000.

The International Harvester Company, Hamilton, Ont., has purchased a site at Lethbridge, Alberta, on which it will erect a $100,000 warehouse.

The North Battleford Mfg. Company, North Battleford, Sask., has increased its capital stock to $100,000, and will erect a new factory.

The city engineer of Calgary, Alberta, has prepared plans for a bridge to cost $100,000.

The Regina, Sask., offices and warehouse of the American-Abell Engine & Thresher Company were destroyed by fire recently, the loss amounting to $100,000. A great stock of implements was destroyed.

The Granby Smelting Company is building large power works at Goose Bay, B. C.

The plant the Carson Hygienic Dairy Company is erecting in Winnipeg is to cost $250,000.

The Hesher Marble Company is putting up a $50,000 warehouse in Calgary, Alberta.

The Mueller Mfg. Company, which makes water works and plumbing supplies at Decatur, Ill., is negotiating for a site and privileges for the location of a large Canadian branch plant in Port Arthur, Ont.

Government Purchases

WASHINGTON, D. C., November 20, 1911.

The Bureau of Supplies and Accounts, Navy Department, Washington, will open bids December 12, under schedule 4082 for one traveling crane for delivery to Pearl Harbor, Hawaii; schedule 4083, one surface condenser for Charleston, S. C.; schedule 4103, one universal milling machine for Portsmouth, N. H., and schedule 4102, for one car puller, eight transformers and spark gaps for Brooklyn, N. Y.

The Paymaster General, Navy Department, Washington, will open bids, December 12, under schedule 4071, for one 20-ton, four-motor electric traveling crane for Mare Island, Cal.; schedule 4072, one electric motor truck and under schedule 4073 two oil burning furnaces for Puget Sound.

The Bureau of Supplies and Accounts, Navy Department, Washington, opened bids November 14 for material and supplies for the navy yards as follows:

Schedule 4030, class 88, one combined stake riveter and punch—Bidder 84, Fairbanks Company, Washington, D. C., $788; 103, Hilles & Jones Company, Wilmington, Del., $795; 151, Manning, Maxwell & Moore, New York, $1,034; 158, New Doty Mfg. Company, Janesville, Wis., $825; 162, Niles-Bement-Pond Company, New York, $870; 185, Joseph T. Ryerson & Son, Chicago, Ill., $805; 191, Scully Steel & Iron Company, Chicago, Ill., $710; 210, Toledo Machine & Tool Company, Toledo, Ohio, $825; 241, Wickes Bros., Saginaw, Mich., $719 and $742; 58, Covington Machine Company, Covington, Va., $750.

Schedule 4031, class 89, one electrolytic oxygen-hydrogen generating plant—Bidder 178, International Oxygen Company, New York, $11,420.

Schedule 4032, class 91, gun firing equipment and interior communication motor generators—Bidder 82, Fort Wayne Electrical Works, Fort Wayne, Ind., $1,492; 107, Holtzer-Cabot Electric Company, Brookline, Mass., $1,413.33; 160, Newport News Shipbuilding & Dry Dock Company, Newport News, Va., $2,267.57.

Cement Production in 1910

Ernest F. Burchard, of the United States Geological Survey, reports that in 1910 the production of Portland cement in this country reached the enormous total of 76,549,951 barrels, with a value of $68,205,800. This is equivalent to 12,986,152 gross tons, valued at $5.25 a ton. It is an increase over the output for 1909 of 11,558,520 barrels, or nearly 18 per cent., and an increase in value of $15,347,446, or more than 29 per cent. This increase alone is greater than the total output of Portland cement in 1900. In addition to Portland cement there was also produced last year 1,139,239 barrels of natural cement and 95,951 barrels of puzzolan cement, a total of 77,785,141 barrels.

The price of Portland cement in 1910 was as low as 73 cents a barrel in some places, the average for the United States being 89.1 cents a barrel. In 1890 the average price was over $2 a barrel and as late as 1903 it was $1.24 a barrel.

Mr. Burchard remarks that measured by the capital invested the cement industry is one of the world's three great extractive industries. In capital employed it apparently far outranks the gold-mining industry of the United States, including Alaska, as well as the copper industry. Only coal and iron stand ahead of it.

The following table of the production of Portland cement in the United States from 1880 to 1910 shows the healthy growth of the industry and also the decrease in prices:

Years.	Barrels.	Average price per barrel.
1880	42,000	$3.00
1890	335,500	2.09
1895	990,324	1.60
1900	8,482,030	1.09
1905	35,246,812	.94
1909	64,991,431	.81
1910	76,549,951	.89

A copy of the report may be obtained on application to the Director of the Geological Survey, Washington, D. C.

New Tools and Appliances

This is essentially a news department for which information is invited.

Repair Outfit for Steel Tape.—A recent product of the Pittsburgh Instrument & Machine Company, Pittsburgh, Pa., is a combination steel tape punch, shears and riveter, made in handy form for repairing broken steel tapes. The ends of the two adjacent portions are squared by the shears, the holes for the rivets are punched and the rivets put in in one operation without removing the tape from the tool.

Self-Opening and Adjustable Die-Head.—A new type of automatic opening die which is especially intended for use in the turret of Cleveland automatic screw machines, but can also be employed in other automatic or semi-automatic machines, the operation of which is similar, has been placed on the market by the Geometric Tool Company, New Haven, Conn. Five sizes of die are made to cut threads having a maximum diameter of 5/16, 9/16, ¾, 1, and 1¼ in. respectively. Splines of liberal size hold the dies at one side of the opening in which they fit, and cams engaging slots in the inner faces of the dies regulate their position with relation to the diameter of the thread to be cut. The die-head is not held rigidly, but is supported by a spring mechanism between the head and the shank, thus enabling the chasers to compensate for any inaccuracy of turret adjustment. The travel of the turret determines the length of thread to be cut while a lock-nut adjustment at the side of the head enables it to be more closely controlled. A micrometer adjustment at one side of the head gives the necessary variation in the diameter of the threads for a tight or loose-fitting screw. A closing pin causes the chasers to close automatically by the rotation of the turret and operates in connection with a closing bar mounted on the turret housings. In addition to the five sizes mentioned other sizes can be furnished when ordered.

Milling Attachment for Cutting Oil Grooves.—The National Machine Tool Company, 128 Opera place, Cincinnati, Ohio, has developed a milling machine attachment for cutting the oil grooves in loose pulleys at the rate of approximately 6 in. per minute. An eccentric bushing is furnished with the tool, as well as four shoes, which enable 10 different diameters of holes to be cut, the change from one size to another being made by removing one screw. If desired, this attachment can be used on a drill press in practically the same way as the company's key-seating tool.

Continuous Miller.—A new model of continuous milling machine has been developed by the Becker Milling Machine Company, Hyde Park, Mass. The construction of the machine in general is the same as the company's regular model C, the only difference being in the table construction. The adjustment of the table toward the spindle is by means of a longitudinal slide, the cross slide having been omitted. This construction enables the machine to be used for surface milling in a straight line as well as for strictly rotary work, which is the field the miller is intended to cover. One of the recent jobs handled was the milling of sad irons. For doing this work a fixture having a capacity of 14 castings was clamped on the circular table, which is 30 in. in diameter. In doing this work the table made a complete revolution in from 3 to 4 min.

Long Stroke Riveter.—The Hemming Brothers Company, New Haven, Conn., is building a long-stroke riveter which is capable of producing any desired shape of head, filling a countersink, making perfectly tight joints or riveting so lightly as to permit the parts joined to swivel. The variation in the force of the blow for doing the different kinds of work is regulated by pressure on a foot treadle. Where both ends of a rivet have to be headed simultaneously, the machine is equipped with a lower revolving fixture secured to the horizontal table and striking light reciprocal blows from below.

Textile Roll Planer.—The Whitcomb-Blaisdell Machine Tool Company, Worcester, Mass., has recently built a planer for textile rolls. The table of the machine is 30 in. wide and 10 ft. long, and is equipped with multiple automatic indexing centers. On the return stroke the 12 tools with which the planer is furnished are lifted out of the cut by a lever located on the right side.

Self-Oiling Pulleys.—For use where the service is severe, Edward Cunningham & Co., Canton, Mass., have placed on the market a new type of self-oiling pulley in which centrifugal force is employed to lubricate it. A central reservoir is cored out of the pulley hub and as the pulley revolves the oil is thrown outward in the oil chamber by centrifugal force and passes down through oil tubes secured in a member fastened to the shaft. These tubes deflect the lubricant and it is forced by inertia down through them to the oil grooves on the shaft and returns to the oil chamber by centrifugal force.

Adjustable Triangle.—A 45-deg. triangle arranged so that one end of the hypothenuse can be slid along the base to make any angle with it between 45 and 90 deg., while at the same time the hypothenuse makes the complementary angle with the upright leg, has been placed on the market by the Adjustable Triangle Company, P. O. Box 23, Station H, New York, N. Y. The base of the triangle has a slot parallel to the ruling edges in which a round pin fixed to the end of the hypothenuse slides. The upper end of this member is also slotted and slides on a pin fixed to the end of the upright leg. The blades or legs of the triangle are made of maple wood and the metal fittings are of German silver. The end of the pin projecting up through the slot is threaded and carries a thin modified wing-nut, a quarter turn of which is sufficient to free the pin or bind it firmly at any point along the slot. The upper end of the movable blade is cut off along a flat curve so that it does not project beyond the outer edge of the upright in any position, and this enables the triangle to be used with either the base or the upright against the T-square blade. The upper edge of the base is graduated in half degrees and facilitates setting.

Automatic Die-Head.—For use on hand and automatic screw machines, for cutting threads of standard and special pitches or pipe threads of any size within its capacity, the National Tool Company, Cleveland, Ohio, has brought out an adjustable self-opening and self-closing die-head. The chasers are mounted in carriers which slide in a grooved disk that is contained in a shell screwed to the shank. A hardened and ground knurled adjusting ring tapered on the inside is fitted over this shell and is threaded to engage with it. Hardened steel balls are interposed between the ring and the chaser carriers. This knurled ring controls the adjustment of the dies for threads of various diameters. When mounted in the turret the die is opened by stopping the travel of the turret slide and as soon as the turret comes to a stop the inner die-block is drawn forward by the action of the thread which is being cut and this movement brings the recesses in the chaser carries opposite the steel balls and thus permits the chasers which are under the tension of springs to open. The length of thread is governed by setting the stop on the turret slide. The dies are closed by a latch which when the dies are opened extends across the center of the head. The turret advances until this latch comes in contact with the end of the stock to be threaded which forces the die-block and the chasers back to the exact threading position, the dies being shifted inward by the hardened balls and the latch automatically swinging out of the way while the chasers are closing. With this die no special fixtures are required to close it, and threads can be cut close to a shoulder. Since the shank is hollow any length of thread within the range of the turret slide travel can be cut. In the construction of the die care has been taken to avoid having small parts on the exterior where they are apt to be broken and the die cannot be rendered inoperative by any chips or dirt which might get into the working parts. Seven sizes of die are made and the capacity ranges from ⅜ to 2 in.

Foot Power Grinder.—The Carborundum Company, Niagara Falls, N. Y., has just brought out a foot-power grinder which is operated by a one-foot treadle and a spiral gear shaft. Ball bearings are employed and the grinder is equipped with two 7-in. carborundum wheels, one for coarse grinding and the other for fine. Malleable iron is used in the construction of the parts subjected to the greatest strain. The over-all hight of the machine is 40 in. and the weight is 68 lb

Current Metal Prices.

The following quotations are for small lots, New York. Wholesale prices, at which a large order only can be bought, are given elsewhere in our weekly market report.

IRON AND STEEL—

Bar Iron from Store—

Refined iron:
1 to 1¼ in. round and square.... ₣ lb 1.70¢
1¼ to 4 in. x ⅝ to 4 in..... ₣ lb 1.70¢
1¼ to 4 in. x ¼ to 0-1 ..... ₣ lb 1.80¢
Rods—⅝ and 11-16 round and square. ₣ lb 1.80¢

Angles:	Cts. ₣ lb.
3 in. x ¼ in. and larger	1.80¢
3 in. x 5-16 in. and ⅜ in.	2.20¢
1¼ to 2½ in. x ⅛ in.	1.95¢
1¼ to 2⅝ in. x 5-16 in and thicker	1.80¢
1 to 1¼ in. x 5-16 in	1.95¢
1 to 1¼ x ⅛ in	2.00¢
⅞ x ⅛ in.	2.10¢
⅝ x ⅛ in.	2.20¢
⅝ in. x ⅜ in.	3.35¢
½ x 3-32 in.	4.40¢
Tees:	
1 in.	2.25¢
1¼ in.	2.10¢
1½ to 2½ x ¼ in.	1.90¢
1⅝ to 2½ x 5-16 in.	2.00¢
3 in. and larger	1.85¢
Beams	1.80¢
Channels, 3 in. and larger	1.80¢
Bands—1½ to 6 x 6-16 to No. 8	2.00¢
Burden's "H, E. & S." iron, base price	2.95¢
"Burden's Best" iron, base price	3.15¢
Norway bars	3.60¢

Merchant Steel from Store—

per lb

Bessemer machinery ..... 1.70¢
Toe calk, tire and sleigh shoe..... 2.50@3.00¢
Best cast steel, base price in small lots..... 7¢

Sheets from Store—

Black	One pass, soft steel.	R. G. cleaned.
No. 16	₣ lb 2.35¢	2.75¢
Nos. 18 to 20	₣ lb 2.40¢	2.85¢
Nos. 22 and 24	₣ lb 2.45¢	2.95¢
No. 26	₣ lb 2.50¢	3.05¢
No. 28	₣ lb 2.65¢	3.25¢

Russia, Planished, &c.

Genuine Russia, according to assortment ..... ₣ lb 12 @14¼
Patent planished, W. Dewees ..... ₣ lb A. 10¢; B. 9¢ net
Wood ..... ₣ lb A. 10¢; B. 9¢ net

Galvanized

Nos. 12 and 14	₣ lb 2.65¢
No. 24	₣ lb 2.60¢
No. 26	₣ lb 2.70¢
No. 28	₣ lb 3.50¢

Nos. 20 and lighter 36 inches wide, 25¢ higher.

Genuine Iron Sheets—
Galvanized

Nos. 22 and 24	₣ lb 5.50¢
No. 26	₣ lb 6.00¢
No. 28	₣ lb 7.00¢

Corrugated Roofing—

2½ in. corrugated.	Painted.	Galvd.
No. 24	₣ 100 sq. ft... $3.55	$4.70
No. 26	₣ 100 sq. ft... 2.85	3.90
No. 28	₣ 100 sq. ft... 2.50	3.65

Tin Plates—

American Charcoal Plates (per box)

"A. A. A." charcoal.
IC, 14 x 20 ..... $6.35
IX, 14 x 20 ..... 7.60
A. charcoal:
IC, 14 x 20 ..... $5.30
IX, 14 x 20 ..... 5.40

American Coke Plates—Bessemer—
IC, 14 x 20.....107 lb..... $4.20
IX, 14 x 20..... 5.20

American Terne Plates—
IC, 20 x 28 with an 8 lb. coating..... $8.10
IX, 20 x 28 with an 8 lb. coating..... 10.10

Seamless Brass Tubes—
List November 13, 1908. Base price, 18¢

Brass Tubes, Iron Pipe Sizes—
List November 13, 1908. Base price, 18¢

Copper Tubes—
List November 13, 1908. Base price, 21¢

Brazed Brass Tubes—
List February 1, 1911. 18⅞¢ ₣ lb

High Brass Rods—
List February 1, 1911. 14⅛¢ ₣ lb

Roll and Sheet Brass—
List February 1, 1911. 14⅜¢ ₣ lb

Brass Wire—
List February 1, 1911. 14⅜¢ ₣ lb

Copper Wire—
Base price, Carload lots mill 13¾¢

Copper Sheets—
Sheet copper hot rolled, 16 oz. (quantity lots) ..... ₣ lb 17¢
Sheet copper cold rolled, 1¢ ₣ lb advance over hot rolled.
Sheet copper polished 20 in. wide and under, 1¢ ₣ square foot.
Sheet copper polished over 20 in. wide, 2¢ ₣ square foot.
Planished copper, 1¢ ₣ square foot more than polished.

METALS—

Tin—

Straits pig ..... ₣ lb 46 @47 ¢

Copper—

Lake ingot ..... ₣ lb 14 @14½¢
Electrolytic ..... ₣ lb 14 @14¼¢
Casting ..... ₣ lb 13¾@14 ¢

Spelter—

Western ..... ₣ lb 7 @ 7¼¢

Zinc—

No. 9, base, casks... ₣ lb 8½¢ Open... ₣ lb 9¢

Lead—

American pig ..... ₣ lb 5¼@5½¢
Bar ..... ₣ lb 6⅝@6¾¢

Solder—

½ & ½, guaranteed..... ₣ lb 25⅝ @26¾¢
No. 1 ..... ₣ lb 23¾@24¼¢
Refined ..... ₣ lb 22½@23¼¢
Prices of solder indicated by private brand vary according to composition.

Antimony—

Cookson ..... ₣ lb..@10½¢
Hallets ..... @10 ¢
Other brands ..... 9@ 9½¢

Bismuth—

Per lb ..... $2.00@$2.25

Aluminum—

No. 1 aluminum (guaranteed over 99% pure), in ingots for remelting..... 29¢
Rods and Wire..... Base price 31¢
Sheets ..... Base price 33¢

Old Metals—

Dealers' Purchasing Prices Paid in New York.

	Cents.
Copper, heavy and crucible	10.50 to 10.75
Copper, heavy and wire	10.25 to 10.50
Copper, light and bottoms	9.25 to 9.50
Brass, heavy	7.00 to 7.25
Brass, light	5.50 to 5.75
Heavy machine composition	9.00 to 9.25
Clean brass turnings	6.75 to 7.00
Composition turnings	7.50 to 7.75
Lead, heavy	4.75
Lead, tea	3.50
Zinc, scrap	4.00



NICHOLSON

Granted that just ONE mechanic in your shop can save from ten to twenty minutes time per day through the use of NICHOLSON FILES—how great will be the saving when from fifty to one hundred or more men "get busy" with the fast cutting

NICHOLSON?

NICHOLSON U.S.A.



Nicholson File Company
Providence, R. I.

THE IRON AGE

Established 1855 — New York, November 30, 1911 — Vol. 88: No. 22

Published Every Thursday by the
DAVID WILLIAMS COMPANY
239 West 39th Street, New York

Entered at the New York Post Office as Second-Class Mail Matter.

Subscription Price, United States and Mexico, $5.00 per Annum; to Canada, $7.50 per Annum; to Other Foreign Countries, $10.00 per Annum. Unless receipt is requested, none will be sent. Credit for payment will be shown by extending the date on the wrapper of your paper.

W. H. Taylor, - - - - - President and Treasurer
I. A. Mekeel, - - - - - - First Vice-President

Geo. W. Cope, - - - - } Editors
A. I. Findley, - - - - }
W. W. Macon, - - - - }

M. C. Robbins, - - - - Manager
Charles S. Baur, - - - Assistant Manager

Branch Offices

Philadelphia, Real Estate Trust Building
Pittsburgh, Park Building
Boston, Compton Building
Chicago, Fisher Building
Cleveland, American Trust Building
Cincinnati, 807 Andrews Building

CONTENTS.

Very Heavy Buying of Pig Iron ... 1167
The Spheres of Wrought Iron and Rerolled Steel ... 1168
An Appeal to Prejudice ... 1169
Do Congressmen Enjoy Ruinous Steel Prices? ... 1170
A Proposed Bounty on Canadian Pig Iron ... 1170
The Place of 1911 in the Pig Iron Record ... 1170
Ericsson Memorial Dinner ... 1170
Programme of Mechanical Engineers' Meeting ... 1171
Additional Niagara Falls Power Development ... 1171
Improvement in Electric Induction Furnace Linings ... 1171
Iron and Metal Markets ... 1172
Labor Notes ... 1182
Personal ... 1183
Obituary ... 1183
To Concentrate Moose Mountain Iron Ores ... 1183
Railroad Equipment Orders ... 1183
Pittsburgh and Vicinity Industrial Notes ... 1184
An Interesting Engine Order ... 1184
Plans of the Otis Steel Company ... 1184
Kerr Turbine Sales ... 1184
The Weiss Briquetting Process for Ores and Flue Dust ... 1185
The World's Production of Coal ... 1185
Engineers Visit Cambria Works ... 1185
Future Development of the Middle West ... 1186
Production of Manganese Ores ... 1187
Wrought Iron Versus Steel Pipe ... 1188
The Harbison-Walker Refractories Company ... 1188
Women in the Metal Trades ... 1189
Sixty-Seven Years of Charcoal Iron Production ... 1189
Overhead Expense ... 1190
New York City Taxation ... 1191
Routing Material Through Shop Departments ... 1192
The New Waltham Thread Miller ... 1194
Producer Gas Investigations ... 1194
General Electric Air Compressor Sales ... 1194
An Improved Simplex Radial Drill ... 1195
Plan to Restore Original Beauty of Niagara Falls ... 1195
The New Steel Plant at Duluth ... 1196
Automatic Motor Controllers ... 1199
The Reading-Bayonne Steel Casting Company ... 1199
A 500-hp. Forced Blast Unit ... 1200
A Battery Truck Crane ... 1200
Recorder with Frictionless Inking Device ... 1201
The Worth Brothers Company's New Railroad ... 1201
New Silver Drills ... 1202
The Enlarged M. Rumely Company ... 1202
Why Ferromanganese Is Rising ... 1202
A New Crane Trolley ... 1203
Three Notable Open-Hearth Furnaces ... 1203
Seneca Falls Relieving Attachment ... 1204
An Improved Spring Die ... 1204
Alabama's Governor Pleases Railroad Interests ... 1204
The Machinery Markets ... 1205
Trade Publications ... 1213

Very Heavy Buying of Pig Iron

The Week's Total Nearly 400,000 Tons

Republic Company Advances Steel Bars—A Reduction in Wrought Pipe

A buying movement in pig iron, far more vigorous and extensive than has been seen in recent years, is in full swing in all sections of the country. In Southern iron the total closed is fully 200,000 tons, while Northern furnaces have done nearly as much, making the total for the week not far from 400,000 tons.

One Southern interest has disposed of 150,000 tons, about equally divided between foundry and basic irons. The pipe foundries have been heavy buyers, one company taking from 75,000 to 100,000 tons of Southern iron for its various plants, chiefly Western and Southern. The large agricultural machinery manufacturers have also bought from Southern furnaces. The sales of Southern basic have been mostly to steel foundries and are in consequence of the large car and locomotive orders announced last week. Southern No. 2 sold in the larger transactions of the week at $9.75 and Southern basic at $9.60 Birmingham.

The business of the past week has been largely for delivery over the first half of 1912, though some buying was for the first quarter only. Large inquiries for pig iron are pending, relatively much more in Central and Western districts than in the East. Car works requirements in malleable castings are being covered and in turn malleable foundries are closing for pig iron. The number of gray iron foundries which have placed orders for 1000 tons or more in the week for delivery in the first half of next year is very large. Appreciation of the lowness of prices seems to have spread widely and quickly.

A Southern Ohio steel company has taken bids on 20,000 tons of basic iron and in the Pittsburgh district inquiries for basic for the first half of 1912 amount to over 50,000 tons. One steel company that has not needed outside iron for several years is in the market for basic. The price has declined slightly and sales are now reported at $12.25 Valley furnace.

The week has been much less eventful in finished lines than in pig iron. A lull in car orders is natural after the burst of activity in the middle of the month. But the Missouri Pacific has bought 2000 cars more, making its total 5400 since August, and the Grand Trunk has placed 2000 steel hopper cars, while of the 4500 cars given out by the Canadian Pacific 2000 have come to shops on this side. The Chicago & Northwestern is expected to buy 75 locomotives in addition to 3300 cars. The Santa Fe's inquiry is for 8000 cars.

The rail market has been quiet for two weeks.

Details of specifications must be arranged on some pending business. Thus far only about 250,000 tons have been bought for 1912.

Indications have been pointing to a firmer market in steel bars. A definite turn to the situation was given this week by an announcement by the Republic Iron & Steel Company that it would take no more prompt business below 1.10c Pittsburgh and no business for delivery after January 1 below 1.15c. Recent business in bars has been heavy. Another manufacturer reports sales for shipment through February at 1.10c and for reinforcement work in the new New York subway, where deliveries run through 1912, at 1.15c.

Announcement is made of a reduction of one point or $2 a ton on butt weld pipe and of $4 a ton on lap weld pipe, effective December 1.

Railroad bridge orders have been growing in response to low prices, as happened in 1909. In Eastern districts the larger structural awards of the week amounted to about 29,000 tons, of which 18,000 tons went to the American Bridge Company.

Fuller operation of finishing mills has come in spots. Following the release of railroad orders, plate mills in the Pittsburgh and Chicago districts are making much larger outputs. Tin plate operations have increased to between 50 and 60 per cent. Eight of the 23 hot mills at Martins Ferry, Ohio, will be started December 4. Some mills have sold 60 to 70 per cent. of their output for 1912. Concessions from the $3.40 basis continue.

While wire mill capacity has been quite well employed, prices are weaker and sales have been made at $1.50 for nails and at $1.30 for annealed fence wire.

The Spheres of Wrought Iron and Rerolled Steel

In very recent times the manufacture of wrought iron appears to have found a definite place, in which it is promised more or less permanence. For years it has not been the leading material in the production of merchant bars, and its use among merchant mill products is now confined almost entirely to the manufacture of specialties. On the other hand, the manufacture of wrought iron for plates and sheets, particularly the latter, and for welded pipe has measurably increased, and for the production of a certain tonnage of these products wrought iron appears to have made for itself a definite place.

Inasmuch as the entire product of rolled soft material was at one time wrought iron, and steel entered the field simply by reason of its cheapness and convenience, it is necessary to draw a distinct line between the manufacture of iron as the remains of a decadent industry and the manufacture of iron as a definite and desired product. On the one hand, in recent years iron mills have been operated merely because they were in existence; such iron mills would not then have been erected with fresh capital. At the same time, however, certain new iron mills have been built for the purpose of making definite products, almost exclusively iron sheets and iron pipe. Naturally the supplanting of iron by steel was not instantaneous, and indeed it is surprising that the change was effected as rapidly as it was, for it necessarily involved the abandonment of a great deal of plant. Undoubtedly one reason for the quickness of the change was the fact that it occurred largely during a severe industrial depression, when the abandonment of plant was a light matter, and when, on account of the total demand growing so slowly, it was not difficult for the new material to push the old out of the field.

The greatest production of rolled iron occurred early in the nineties, although, on account of the earlier general adoption of steel as rail material, the production of rolled steel had already passed the production of rolled iron. For a period of several years, from some time in the eighties until the early nineties, we had the spectacle of the wrought iron industry growing in tonnage even though it was outclassed by the steel industry. Then rolled iron declined rapidly in tonnage for years until the present century, when a revival occurred, culminating in a high output in 1907. Throughout the entire period old iron mills were being abandoned, and the increase in tonnage was due partly to the starting of old mills which had not been abandoned, and partly to the erection of new iron mills to make the particular products to which we have referred as now occupying a defined and probably permanent place.

Statistical records of the wrought iron industry are quite incomplete, but the summations of the number of existing puddling furnaces made in the various editions of the American Iron and Steel Association's directory are of interest. We do not think the practice of the iron mills has been uniform in reporting their furnaces. Some, but apparently only a few, have reported their busheling and scrap furnaces as such, and we presume the totals given in the directories of "puddling furnaces" do not include such furnaces. They should do so, or else summarize them separately, for there is no fundamental distinction, as regards the finished product, between puddling, busheling and scrap furnaces; and indeed furnaces for heating piles on boards should have been given some place in the summaries. However, the statistics of "puddling furnaces" from recent editions of the Directory are as follows:

November, 1887	4882	April, 1898	3889
November, 1889	4014	November, 1901	3251
January, 1892	5120	June, 1904	3161
January, 1894	4715	November, 1907	2635
January, 1896	4408		

The maximum number was evidently reached in 1891 or 1892, but the decline in production in the nineties was much more rapid than the decline in the number of furnaces, so many lying idle during and after the industrial depression.

Statistics of tonnage production of wrought iron are available for 1890 and many previous years, and for 1904 up to the present time. Prior to 1888 complete statistics of rolled steel were not collected, and in the years 1891 to 1903 inclusive statistics of rolled iron and rolled steel were gathered together. From the tonnage data available there is reason to infer that the maximum tonnage production of wrought iron occurred very early in the nineties. The maximum proportion of rolled iron compared with all rolled material was of course 100 per cent. before the advent of steel. The proportion has been decreasing continuously since then, but it is our purpose to suggest that this decline in percentage has very lately been almost arrested, through wrought iron having made a definite place for itself in certain lines of consumption. In the following table we present statistics covering the only years for which the computation can be made of the percentage of rolled iron to total rolled iron and steel:

The Production of Rolled Iron in the United States.

	Rolled iron, gross tons.	Its percentage of total rolled iron and steel.
1888	2,153,263	46.5
1889	2,530,272	44.1
1890	2,511,194	42.8
1904	1,700,084	14.7
1905	2,059,990	12.2
1906	2,186,387	11.
1907	2,200,086	11.1
1908	1,238,449	10.5
1909	1,709,431	8.7
1910	1,740,156	8.1

At the outset, rolled iron was made more from forge or mill pig than was the case in later years, because little scrap was available. Later, the proportion made from old material increased, because wrought iron scrap became more abundant, and undoubtedly by far the major portion of the wrought iron produced in the nineties was made from old material, for at that time a great deal of iron scrap was coming out. The tonnage of old steel scrap was then very limited, for steel had not been in use in large quantities for a sufficiently long time to bring much old material into the market. For a period of years the outcome of old wrought iron steadily increased, but in recent years there is reason to suspect it has been decreasing, and if the production of wrought iron—which decreased from 1907 to 1910—does not materially increase in the future, the outcome of old wrought iron is destined to decrease further. Thus it follows that of late the manufacture of wrought iron has had to depend more largely than formerly upon the use of forge pig iron. This, however, is in line with the policy of certain manufacturers who have been pushing iron sheets and iron pipe in the market as a distinct commodity.

On account of the nearly complete substitution of steel for iron, nearly 92 per cent. of the total rolled material in 1910 being steel, the old material coming out from year to year tends more and more to be steel rather than wrought iron. This steel naturally flows to the basic open-hearth steel furnace. To a limited extent it has been rolled with iron, whereby separate masses are stuck more or less permanently together; but as a rule steel does not lend itself to such rolling processes as does wrought iron, quite miscellaneous aggregations of which can be made into a fairly good finished product by fagoting and heating piles on boards.

It chances, however, that steel is coming back as old material in a better condition, and in larger masses and of more uniform section, than was the case with iron; and when enough steel of similar description is available, it becomes commercially feasible to roll it into other forms without any attempt at welding, making the finished section smaller than the original section. In the past few years a very important industry of this sort has grown up, in the rolling of old steel rails into light rails, bedstead angles and a great variety of other small structural shapes, as well as into various descriptions of merchant bars, and particularly bars intended for concrete reinforcement. Thus far the steel rerolling industry has attacked little material but old steel rails. It may easily be foreseen that in the future it will become commercially practicable to attack other forms, as the use of steel of large sections grows. Steel sheet piling is a comparatively new product, and as it can be used over and over again it is not offered as old material to any extent. Eventually, however, this piling, after such abuse as renders it unfit for further service, will come into the market, and when the flow is sufficiently steady it will be rerolled rather than remelted.

The rerolling of old steel has been, as a rule, an expensive process as compared with the cost of rolling new steel. The reason is that the average rerolling mill has been a hand mill very largely, while the new steel is rolled chiefly on continuous mills of the most modern type. Given a sufficiently uniform section of old material upon which to work, there is no reason why rerolling practice should not be reduced to a very low cost basis. It will then take much the same economic place in making old steel fit for re-use as has been occupied by the iron mill rolling piles on boards, fagots, etc.

An Appeal to Prejudice

Chairman Stanley of the committee that is assumed to be investigating the United States Steel Corporation said last week after the testimony of the Merritt brothers concerning their dealings with John D. Rockefeller and F. T. Gates in the early days of the Mesaba iron range, that he had gone into the matter "in the interest of humanity." Even taking the chairman at his word, he deserved the full force of the rebuke dealt him by a fellow-member, who protested against such a use of the machinery given the committee by the House of Representatives "to prejudice the defendants before this committee—and I say 'the defendants' knowingly, because the whole attitude of the committee has been as a prosecuting committee."

Granting that Chairman Stanley's view of the Merritt transactions was the right one—though there are counter statements which put a very different light on them—his effort to connect them in the public mind with the Steel Corporation is shameful evidence of the appeal to prejudice and passion into which the inquiry has apparently degenerated. The sinister innuendo of his remarks, taking credit to himself for bringing the Rockefeller-Merritt controversy into the committee's hearings, will not be missed. He said with unconcealed sarcasm:

> We have heard so much about the absence of moral turpitude on the part of these people [officers of the Steel Corporation] who may have technically violated the law and who are now defendants in this action, that I thought it just as well to introduce a little evidence that would exculpate this committee forever afterward from any intimation, any suspicion, that we were seeking to punish—not to punish, because I do not seek to punish but to investigate—to investigate a technical violation of the law, were there no law, no archaic and foolish law, like the Sherman Act in force. And I picked up this little incident from my journey in Minnesota, which to me was very interesting and very sad, which I thought might just settle that question in the minds of many men—many distinguished men, a great many men—who are disturbed for fear this committee might throw light upon facts which might lead possibly to any action by the courts which would convict them, who are only technically guilty and who are morally, personally, industrially, innocent and commendable.

In other words, this "very interesting and very sad" story is introduced into the investigation of the Steel Corporation so that there might never be any doubt of the turpitude of the officers of that corporation in connection with a transaction with which they had not the remotest thing to do. And on the motion to strike out the Merritt testimony "as irrelevant and entirely out of place," we are told that the Stanley committee divided on strict party lines. Nothing that might be added to the above extract from the record could make it plainer that political necessity is a chief incitement to the continuing attack on great business.

Do Congressmen Enjoy Ruinous Steel Prices?

Washington advices report that the Stanley Committee is restive under the criticism that the expenses which it has incurred are disproportionate to the results accomplished. The chairman of the committee says that these expenses have up to the present time been about $25,000 and he believes that this will not be regarded by the House of Representatives as excessive. As an offset to the expenditure of public funds thus made, members of the committee claim that soon after it began its work reductions were forced in steel plates, structural shapes, tubes and other forms of steel manufacture to such an extent that "a saving has been realized by consumers amounting to from $25,000,000 to $40,000,000." In the light of this enormous saving by various consuming interests, it is urged that the cost of the investigation is hardly worth considering.

It is an extreme view to take of the work of this committee that the severe reductions in steel prices which have been made this year have been wholly due to the influence of the committee's investigation. Those who are engaged in the iron and steel trade may hardly be inclined to give the full credit of these reductions to the committee's work, although they may blame it for helping to depress business. Some of them were begun before it got to work actively. At the same time it might be said that the members of the committee who make such a claim are seeking for praise where they would deserve censure. The prices of the steel products on which such heavy reductions have been made were not exorbitant, and the country was not seriously suffering from the exactions of the steel manufacturers. The prices now ruling, however, and for which these members of Congress take credit to themselves, are such as to afford little profit to manufacturers having the greatest advantages for producing at low cost and are most eligibly located, while others are hardly getting a new dollar for an old one. The condition of the iron and steel industry is hardly of the kind that even a member of Congress should gloat over.

A Proposed Bounty on Canadian Pig Iron

Hopes are entertained by the Canadian iron and steel manufacturers that the new Dominion Government will again grant a bounty on pig iron. A deputation of Canadian iron and steel manufacturers waited on the Prime Minister and his cabinet colleagues at Ottawa, November 22, to urge the granting of a County "as a partial compensation for the disabilities under which the industry is placed through the lowering of duties, exemptions and discriminations." The spokesmen of the deputation were J. H. Plummer, president Dominion Steel Corporation; T. J. Drummond, president Canada Iron Corporation and Algoma Steel Company; Thomas Cantley, president Nova Scotia Steel & Coal Company; R. Hobson, president Steel Company of Canada, and R. J. Mercure. A memorial was presented asking for an investigation of conditions in the iron and steel industry and for some declaration of policy that would warrant the directors of iron and steel industries in going ahead with plans for enlargements and improvements. Prime Minister Borden promised that the matter should have consideration.

As the Canadian manufacturers exerted a powerful influence toward defeating the proposed reciprocity agreement with the United States, and thus assisted in placing Mr. Borden and his party in power, it would seem that they have such strong claims on the new administration that the bounty they ask for will be granted to them. Possibly a bounty may be needed, but the developments of the past few months do not seem to have made this certain. Even with pig iron prices on this side of the border down to an extremely low level, owing to the depression prevailing here, the Canadian manufacturers appear to have been well able to hold their own against American competition in their markets.

The Place of 1911 in the Pig Iron Record

It is now possible to estimate rather closely the record 1911 will make in pig iron production. For the first half of the year the official returns showed 11,665,000 gross tons. The increase in output since July will bring the total for the second half close to 12,200,000 tons, so that the year will show not far from 23,900,000 tons, allowing for some increase upon the rate of production at the beginning of November. The year thus takes its place between 1905 and 1906 in the pig iron column, the former with an output of 22,992,380 tons and the latter with 25,307,191 tons. Thus 1911 will stand fifth in order of pig iron production, 1910 with 27,303,567 tons, 1909 with 25,795,471 tons, 1907 with 25,781,361 tons and 1906 with 25,307,191 having precedence in the order named. The consumption in 1910 was probably not over 26,000,000 tons, since stock accumulations were well over 1,000,000 tons; in 1911 the reverse has been true, consumption having been sufficient to eat into stocks, probably to the extent of more than 400,000 tons. Measured by the pig iron entering either into home consumption or exports, 1911 has thus fallen only about 6 per cent. short of the record year—a performance far beyond what the iron trade has been willing to believe as the various disappointments of the year have in turn disclosed themselves.

Ericsson Memorial Dinner.—The Capt. John Ericsson Memorial Society of Swedish Engineers held its fifth annual dinner, in commemoration of Ericsson's arrival in this country 72 years ago, at the Engineers' Club, New York City, November 25. About 75 engineers from various points in the East attended. C. G. de Laval, general manager of Henry R. Worthington, Inc., Harrison, N. J., presided. Among the speakers were C. J. Mellin, consulting engineer American Locomotive Company, Schenectady, N. Y.; G. P. Wern, manager Meade-Morrison Mfg. Company; Col. William C. Church, editor Army & Navy Journal; Col. E. D. Meier, retiring president American Society of Mechanical Engineers; Capt. A. P. Lundin, president Welin Davit and Lane & De Groot Company, and Edward H. Johnson, who for many years was associated with Thomas A. Edison. Among others present were Albert Brodin, Reading Iron Company, Reading, Pa.; E. H. Frisell, of Milliken Brothers, Inc., Staten Island, and Frank Mossberg, president Frank Mossberg Company, Attleboro, Mass.

The American Society of Engineer Draftsmen, of which Walter M. Smyth, 116 Nassau street, New York, is secretary, will hold its regular monthly meeting in the Engineering Societies Building, 29 West Thirty-ninth street, at 8.15 p. m., December 21. C. M. Shigley, Columbus, Ohio, will read a paper on "Patent Office Drawing" and William H. Chorlton, of the designing department of the American Bridge Company, will lecture on "Bridge Drafting from the Engineer's Point of View."

Programme of Mechanical Engineers' Meeting

The professional programme has been announced for the annual meeting of the American Society of Mechanical Engineers, in the Engineering Societies Building, New York, December 5, 6, 7 and 8. As already mentioned, the opening session occurs on the evening of December 5 and is given over to the presentation of the presidential address and a general reception and reunion. The regular business session occurs Wednesday morning; excursions, including an inspection of the steamship Olympic, are arranged for Thursday afternoon, and the annual reunion in honor of the newly elected officers will be held Thursday evening at the Hotel Astor. The programme of papers, requiring simultaneous sessions on Wednesday afternoon and Thursday morning, is as follows:

Wednesday morning: "The Turret Equatorial Telescope," James Hartness; "Expense Burden—Its Incidence and Distribution," Sterling H. Bunnell; "Standard Cross-Sections," H. de B. Parsons.

Wednesday, 2 p. m.: "Tests of Large Boilers at the Detroit Edison Company," D. S. Jacobus; "Strain Measurements of Some Steam Boilers Under Hydrostatic Pressures," James E. Howard; "Herringbone Gears," P. C. Day.

There will be a separate cement session in charge of the sub-committee on cement manufacture.

Wednesday, 8.00 p. m.: "Geo-Dynamics, or the Mechanics of the Formation of Worlds," address by Dr. Robert Simpson Woodward, president Carnegie Institution, of Washington, D. C.

Thursday, 10.00 a. m.: "The Core Room—Its Equipment and Management," Henry M. Lane; "Tests of a Sand-Blasting Machine," Wm. T. Magruder; "Die Castings," Amasa Trowbridge; "Variable-Speed Power Transmission," G. H. Barrus and C. M. Manly.

Thursday, 10.00 a. m., Gas Power Section: "Oil Engines," H. R. Setz; "Test of an 85-hp. Oil Engine," Forrest M. Towl; "Design Constants for Small Gasoline Engines," Wm. D. Ennis; "Natural Gas Engine of 1000 Kw.—Tests, Construction and Working Costs," E. D. Dreyfus and V. J. Hulquist.

Friday, 10.00 a. m.: "The Development of the Textile Industries of the United States," Frank W. Reynolds; "Rational Psychrometric Formulæ—Their Relation to the Problems of Meteorology and of Air Conditioning," W. H. Carrier; "Air Conditioning Apparatus," W. H. Carrier and F. L. Busey; "Some Experiences with the Pitot Tube on High and Low Air Velocities," Frank H. Kneeland.

Additional Niagara Falls Power Development

All three of the power companies located on the Canadian side of the river at Niagara Falls are making extensive additions to their plants. The enlarged generating facilities will enable them to increase their power output to more closely approximate the maximum permitted by the government. The work now in progress will cost several million dollars and provide facilities for generating 71,500 additional horsepower.

The Canadian Niagara Power Company, the Canadian branch of the Niagara Falls Power Company on the New York State side of the river, has under way an addition to its power house which will cost $150,000 and afford facilities in the completed power plant for the conversion into power of the 11,000 ft. of water per second, which is the maximum it is permitted to divert. This extension will be ready next spring, but only one additional unit of 10,000 hp. will be installed at that time, others being added as required. The present plant consists of six 10,000-hp. units. The greater portion of the power output is transmitted to Buffalo. The amount that this company may export to the United States is 52,500 hp.

The Electrical Development Company, all of whose current is marketed in Toronto, has just completed an addition to its power house and will soon receive bids for the generating equipment. The company is now generating 50,000 hp. with four generators of 12,500 hp. each, and three other units of the same capacity each are to be assembled. The company is limited to the development of 125,000 hp., while the power development limit of the other companies is fixed by the amount of water diversion permitted to each company.

The Ontario Power Company, which is under contract with the Hydro-Electric Commission to supply current to the Canadian Government line, and whose power house is underneath the cliff at Table Rock, has completed a second delivery pipe 18 ft. in diameter from the Dufferin Islands to the power house, and is at work on the penstock extensions. This company, which now has ten 12,000-hp. generators in operation, will add two more of the same size, bringing the total capacity of the plant up to 144,000 hp.

The increased revenue to be derived by the Canadian Government from the additional power development will amount to $125,000 and will be devoted to the further beautification of Victoria Park on the Canadian side of the Falls and the completion of the boulevard along Niagara River from Victoria Park to Ft. Erie, opposite Buffalo. The power companies have agreed that all traces of the work of improvement shall be removed by next summer and the park restored to its former condition.

Improvement in Electric Induction Furnace Linings

In the evolution of the electric induction furnace, the production of a suitable lining to withstand the special conditions has presented difficulties. These difficulties resulted partly from the shape of the bath, deep as compared with its width, and partly from the strong rolling motion of the charge, both of which make it a difficult matter to overcome troubles due to expansion and contraction. It may, therefore, be of interest to record the results obtained from a long series of trials with a pure induction furnace of the Kjellin type, carried out at the works of the Poldihutte Tiegelguszstahlfabrik, Kladno, one of the principal ordnance works in Austria.

In January, 1908, the Poldihutte company put into commission a Kjellin induction furnace having a capacity of over 4 tons. High class steel was produced by means of the basic process, the lining first used being Veit magnesite. The furnace was not erected on solid foundations, but for special reasons was mounted on a carriage with provision for rotating the body of the furnace in either direction about a vertical axis. This arrangement necessarily allowed considerable vibration, which resulted in the production of cracks in the magnesite lining to such an extent that it was found impossible to obtain more than 49 charges without a renewal.

The engineers of the Poldihutte company began experiments with various combination linings, with such good results that the average durability obtained during 1909 was 200 charges per lining. The improvement has been continuous, as is shown by the following statement, giving the highest number of charges obtained per lining during each quarter from the commencement of 1910:

	Charges.
First quarter of 1910	227
Second quarter of 1910	259
Third quarter of 1910	262
Fourth quarter of 1910	288
First quarter of 1911	386
Second quarter of 1911	392
Third quarter of 1911	491

It is stated that no repairs were carried out in the lining at the slag line. Patents have been granted in all countries, and the British and American rights are held by the Grondal Kjellin Company, Ltd., London.

Admitting compressed air into the gas engine cylinder at the end of the exhaust stroke is proposed in a recent issue of the Zeitschrift des Vereines Deutscher Ingenieure. It is recognized that the residual of the burned gases remaining in the cylinder and mixed with the new charge dilutes the fresh mixture, impoverishes it, and generally interferes with the ignition of the charge, unduly elevates the initial temperature, predisposes the motor to premature explosion and affects the efficiency of operation. The author showed by means of diagrams and figures of a number of tests how the efficiency was increased as the result of the adoption of the valve which admits the air under pressure at the end of the exhaust stroke.

The Iron and Metal Markets

A Comparison of Prices

Advances Over the Previous Week in Heavy Type. Declines in Italics.

At date, one week, one month and one year previous.

	Nov. 29, 1911.	Nov. 22, 1911.	Oct. 25, 1911.	Nov. 30, 1910.
PIG IRON, Per Gross Ton:				
Foundry No. 2 standard, Philadelphia	*$14.85*	$14.90	$15.00	$15.50
Foundry No. 2, Valley furnace	*13.00*	13.25	13.25	14.00
Foundry No. 2 Southern, Cincinnati	*13.00*	13.25	13.25	14.25
Foundry No. 2, Birmingham, Ala.	*9.75*	10.00	10.00	11.00
Foundry No. 2, at furnace, Chicago*	14.00	14.00	14.35	16.00
Basic, delivered, eastern Pa.	14.50	14.50	14.50	14.75
Basic, Valley furnace	*12.25*	12.35	12.50	13.50
Bessemer, Pittsburgh	14.90	14.90	15.40	15.90
Gray forge, Pittsburgh	*13.25*	13.40	13.65	13.90
Lake Superior charcoal, Chicago	16.50	16.50	16.50	18.00
COKE, CONNELLSVILLE,				
Per Net Ton, at Oven:				
Furnace coke, prompt shipment	*1.50*	1.55	1.50	1.45
Furnace coke, future delivery	*1.60*	1.65	1.55	1.70
Foundry coke, prompt shipment	*1.85*	1.90	1.80	2.00
Foundry coke, future delivery	2.10	2.10	2.00	2.10
BILLETS, &c., Per Gross Ton:				
Bessemer billets, Pittsburgh	19.00	19.00	20.00	23.00
Open-hearth billets, Pittsburgh	18.50	18.50	19.00	23.00
Forging billets, Pittsburgh	24.00	24.00	24.00	28.50
Open-hearth billets, Philadelphia	21.40	21.40	21.40	25.50
Wire rods, Pittsburgh	25.00	25.00	26.00	28.00
OLD MATERIAL, Per Gross Ton:				
Iron rails Chicago	14.50	14.50	13.50	16.00
Iron rails, Philadelphia	15.50	15.50	16.00	18.00
Car wheels, Chicago	**12.50**	12.00	12.50	13.50
Car wheels, Philadelphia	**11.50**	11.25	11.75	13.75
Heavy steel scrap, Pittsburgh	12.00	12.00	12.00	14.25
Heavy steel scrap, Chicago	9.50	9.50	9.50	12.25
Heavy steel scrap, Philadelphia	11.50	11.50	11.75	13.00
FINISHED IRON AND STEEL,				
Per Pound to Largest Buyers:	Cents.	Cents.	Cents.	Cents.
Bessemer rails, heavy, at mill	1.25	1.25	1.25	1.25
Iron bars, Philadelphia	1.20	1.20	1.20	1.35
Iron bars, Pittsburgh	1.20	1.20	1.20	1.40
Iron bars, Chicago	1.15	1.15	1.15	1.35
Steel bars, Pittsburgh	1.05	1.05	1.10	1.40
Steel bars, tidewater, New York	1.21	1.21	1.26	1.56
Tank plates, Pittsburgh	1.10	1.10	1.15	1.40
Tank plates, tidewater, New York	1.26	1.26	1.31	1.56
Beams, Pittsburgh	1.10	1.10	1.20	1.40
Beams, tidewater, New York	1.26	1.26	1.36	1.56
Angles, Pittsburgh	1.10	1.10	1.20	1.40
Angles, tidewater, New York	1.26	1.26	1.36	1.56
Skelp, grooved steel, Pittsburgh	1.12½	1.12½	1.15	1.25
Skelp, sheared steel, Pittsburgh	1.20	1.20	1.25	1.30
SHEETS, NAILS AND WIRE,				
Per Pound to Largest Buyers:	Cents.	Cents.	Cents.	Cents.
Sheets, black, No. 28, Pittsburgh	1.85	1.85	1.85	2.20
Wire nails, Pittsburgh	*1.50*	1.55	1.60	1.70
Cut nails, Pittsburgh	*1.45*	1.50	1.50	1.60
Barb wire, galv., Pittsburgh	1.85	1.85	1.90	2.00
METALS,				
Per Pound:	Cents.	Cents.	Cents.	Cents.
Lake copper, New York	**13.25**	13.00	12.62½	13.00
Electrolytic copper, New York	**13.12½**	12.87½	12.50	12.87½
Spelter, St. Louis	**6.80**	6.60	6.20	5.80
Spelter, New York	**6.95**	6.75	6.35	5.95
Lead, St. Louis	**4.35**	4.27½	4.15	4.40
Lead, New York	**4.45**	4.35	4.25	4.50
Tin, New York	**45.25**	43.35	42.05	37.35
Antimony, Hallett, New York	*7.60*	7.65	7.70	7.75
Tin plate, 100-lb. box, New York	$3.64	$3.64	$3.64	$3.84

*The average switching charge for delivery to foundries in the Chicago district is 50c. per ton.

Prices of Finished Iron and Steel f.o.b. Pittsburgh

Freight rates from Pittsburgh in carloads, per 100 lb. New York, 16c.; Philadelphia, 15c.; Boston, 18c.; Buffalo, 11c.; Cleveland, 10c.; Cincinnati, 15c.; Indianapolis, 17c.; Chicago, 18c.; St. Paul, 32c.; St. Louis, 22½c.; New Orleans, 30c.; Birmingham, Ala., 45c.; Pacific coast, 80c. on plates, structural shapes and sheets No. 11 and heavier; 85c. on sheets Nos. 12 to 16; 95c. on sheets No. 16 and lighter; 65c. on wrought pipe and boiler tubes.

Plates.—Tank plates, ¼ in. thick, 6¼ in. up to 100 in. wide, 1.10c. to 1.15c., base, net cash, 30 days. Following are stipulations prescribed by manufacturers, with extras:

Universal plates, tank steel or conforming to manufacturers' standard specifications for structural steel dated February 6, 1903, or equivalent, ¼ in. thick and over on thinnest edge, 100 in. wide and under, down to but not including 6 in. wide, are base.

Plates up to 72 in. wide, inclusive, ordered 10.2 lb. per square foot, are considered ¼-in. plates. Plates over 72 in. wide must be ordered ⅛ in. thick on edge, or not less than 11 lb. per square foot, to take base price. Plates over 72 in. wide ordered less than 11 lb. per square foot down to the weight of 3-16-in. take the price of 3-16-in.

Allowable overweight, whether plates are ordered to gauge or weight, to be governed by the standard specifications of the Association of American Steel Manufacturers.

Extras.	Cents per lb.
Gauges under ¼ in. to and including 3-16 in. on thinnest edge	.10
Gauges under 3-16 in. to and including No. 8	.15
Gauges under No. 8 to and including No. 9	.25
Gauges under No. 9 to and including No. 10	.30
Gauges under No. 10 to and including No. 12	.40
Sketches (including all straight taper plates) 3 ft. and over in length	.10
Complete circles, 3 ft. in diameter and over	.20
Boiler and flange steel	.10
"A. B. M. A." and ordinary firebox steel	.20
Still bottom steel	.30
Marine steel	.40
Locomotive firebox steel	.50
Widths over 100 in. up to 110 in., inclusive	.05
Widths over 110 in. up to 115 in., inclusive	.10
Widths over 115 in. up to 120 in., inclusive	.15
Widths over 120 in. up to 125 in., inclusive	.25
Widths over 125 in. up to 130 in., inclusive	.50
Widths over 130 in.	1.00
Cutting to lengths or diameters under 3 ft. to 2 ft., inclusive	.25
Cutting to lengths or diameters under 2 ft. to 1 ft., inclusive	.50
Cutting to lengths or diameters under 1 ft.	1.55

No charge for cutting rectangular plates to lengths 3 ft. and over.

Structural Material.—I-beams, 3 to 15 in.; channels, 3 to 15 in., and angles, 3 to 6 in. on one or both legs, ¼ in. and over, 1.10c. to 1.15c. Other shapes and sizes are quoted as follows

	Cents per lb.
I-beams over 15 in.	1.15 to 1.20
H-beams over 18 in.	1.25 to 1.30
Angles over 6 in.	1.15 to 1.20
Angles, 3 in. on one or both legs, less than ¼ in. thick, plus full extras, as per steel bar card Sept. 1, 1909	1.15 to 1.20
Tees, 3 in. and up	1.15 to 1.20
Zees, 3 in. and up	1.10 to 1.15
Angles, channels and tees, under 3 in., plus full extras as per steel bar card Sept. 1, 1909	1.15 to 1.20
Deck beams and bulb angles	1.40 to 1.45
Hand rail tees	1.95 to 2.10
Checkered and corrugated plates	1.95 to 2.10

Sheets.—Makers' prices for mill shipments on sheets of U. S. standard gauge, in carload and larger lots, on which jobbers charge the usual discounts for small lots from store, are as follows:

Blue Annealed Sheets.

	Cents per lb.
Nos. 3 to 8	1.25 to 1.30
Nos. 9 and 10	1.35 to 1.40
Nos. 11 and 12	1.40 to 1.45
Nos. 13 and 14	1.45 to 1.50
Nos. 15 and 16	1.55 to 1.60

Box Annealed Sheets, Cold Rolled.

	One Pass.	Three Pass.
Nos. 10 to 12	1.50 to 1.55	.....
Nos. 13 and 14	1.55 to 1.60	.....
Nos. 15 and 16	1.60 to 1.65	1.70 to 1.75
Nos. 17 to 21	1.65 to 1.70	1.75 to 1.80
Nos. 22, 23 and 24	1.70 to 1.75	1.80 to 1.85
Nos. 25 and 26	1.75 to 1.80	1.85 to 1.90
No. 27	1.80 to 1.85	1.90 to 1.95
No. 28	1.85 to 1.90	1.95 to 2.00
No. 29	1.90 to 1.95	2.00 to 2.05
No. 30	2.00 to 2.05	2.10 to 2.15

Galvanized Sheets, of Black Sheet Gauge.

Nos. 10 and 11	1.85 to 1.90
Nos. 12, 13 and 14	1.95 to 2.00
Nos. 15, 16 and 17	2.10 to 2.15
Nos. 18 to 22	2.25 to 2.30
Nos. 23 and 24	2.35 to 2.40
Nos. 25 and 26	2.55 to 2.60
No. 27	2.70 to 2.75
No. 28	2.85 to 2.90
No. 29	2.95 to 3.00
No. 30	3.15 to 3.20

All above rates on sheets are f.o.b. Pittsburgh, terms 30 days net, or 2 per cent. cash discount in 10 days from date of invoice, as also are the following base prices per square for painted and galvanized roofing sheets, with 2½-in. corrugations.

Corrugated Roofing Sheets, Per Square.

Gauge.	Painted.	Galvanized.	Gauge.	Painted.	Galvanized.
29	.....	$2.30	23	$2.35	$3.45
28	$1.30	2.45	22	2.55	3.65
27	1.45	2.50	21	2.75	4.00
26	1.55	2.60	20	3.00	4.30
25	1.80	3.00	18	4.00	5.65
24	2.05	3.10	16	4.85	6.45

Wire Rods and Wire.—Bessemer, open-hearth and chain rods, $25. Fence wire, Nos. 0 to 9, per 100 lb., terms 60 days, or 2 per cent. discount in 10 days, carload lots, to jobbers, annealed, $1.30; galvanized, $1.60. Carload lots, to retailers, annealed, $1.40; galvanized, $1.70. Galvanized barb wire to jobbers, $1.80; painted, $1.50. Wire nails, to jobbers, $1.50.

The following table gives the price to retail merchants on wire in less than carloads, including the extras on Nos. 10 to 16, which are added to the base price:

Fence Wire, Per 100 lb.

Nos.	0 to 9	10	11	12	13	14	15	16
Annealed	$1.50	$1.55	$1.60	$1.65	$1.70	$1.75	$1.85	$2.05
Galvanized	1.80	1.85	1.90	1.95	2.00	2.05	2.15	2.35

Wrought Pipe.—The following are the jobbers' carload discounts on the Pittsburgh basing card on wrought pipe, in effect from October 2, 1911:

Butt.

	Steel		Iron	
	Blk.	Gal.	Blk.	Gal.
⅛ and ¼ in.	73	58	58	43
⅜ in.	74	59	59	44
½ in.	75	60	60	45
¾ to 1 in.	76	61	61	46
2 to 3 in.	76	61	61	46
1¼ and 1½ in.	77	62	62	47
2 in.	77	62	62	47
2½ to 4 in.	78	63	63	48
4½ to 6 in.	77	62	62	47
7 to 12 in.	76	61	61	46
13 to 15 in.	62	47	47	32

Butt, Extra Strong.

⅛, ¼ in.	72	57	57	42
⅜ in.	73	58	58	43
½ in.	74	59	59	44
¾ to 1½ in.	75	60	60	45
2 to 3 in.	76	61	61	46

Lap Weld, extra strong, plain ends, card weight.

1½ in.	74	59	59	44
2 in.	75	60	60	45
2½ to 4 in.	76	61	61	46
4½ to 6 in.	77	62	62	47
7 to 8 in.	76	61	61	46
9 to 12 in.	65	55	55	40

Butt Weld, double extra strong, plain ends, card weight.

¼ in.	60	45	45	30
⅜ to 1½ in.	65	50	50	35
2 to 3 in.	67	52	52	37

Lap Weld, double extra strong, plain ends, card weight.

2 in.	71	56	56	41
2½ to 4 in.	72	57	57	42
4½ to 6 in.	71	56	56	41
7 to 8 in.	70	55	55	40

Plugged and Reamed.

1 to 1½, 2 to 3 in. Butt Weld	Will be sold at two (2) per cent. lower basing (thicker than merchants' card weight pipe. Butt or lap weld as specified.
2, 2½ to 4 in. Lap Weld	

The above discounts are for "card weight," subject to the usual variation of 5 per cent. Prices for less-than-card weight are [illegible] basing (thicker pipe) than the above discounts.

Boiler Tubes.—Discounts on lap welded steel and charcoal iron boiler tubes to jobbers in carloads are as follows:

Steel.		*Charcoal Iron.*	
1¾ to 2½ in.	65	1¾ to 2½ in.	48
2¾ in.	67½	2¾ in.	50
2½ to 3½ in.	70	2½ to 3½ in.	55
3¾ to 4 in.	75	3¾ to 4 in.	60
5 to 6 in.	65		
7 to 13 in.	65		

2½ in. and smaller, over 18 ft., list per cent. net extra.
2¾ in. and larger, over 22 ft., list per cent. net extra.

Less than carloads will be sold at the delivered discounts for carloads, lowered by two points for lengths 22 ft. and under to destinations east of the Mississippi River; lengths over 22 ft. and all shipments going west of the Mississippi River must be sold f.o.b. mill at Pittsburgh basing discounts, lowered by two points.

Pittsburgh

PITTSBURGH, PA., November 29, 1911.—*(By Telephone.)*

Pig Iron.—The very low prices on basic iron, which is reported to have sold recently as low as $12.15, Valley furnace, have induced large purchases, and some heavy inquiries are in the market. A local steel company, that has not been a buyer of pig iron for several years, is asking for 25,000 to 30,000 tons, and may possibly buy 50,000 tons if the iron can be had for the deliveries wanted and at the right price. Another local steel interest, that has been a fairly large buyer of basic iron, is getting prices on 15,000 to 20,000 tons for first quarter delivery, and may possibly buy more. Another local steel interest bought 500 tons of basic for prompt shipment at $12.25, Valley furnace, and another bought 1500 tons for first four months of next year at the same price. Part of this iron comes from Valley furnaces and part from Midland, Pa., the latter equalizing freight with the Valley furnaces. A southern Ohio company is buying this week upward of 20,000 tons of basic iron, and a northern Ohio consumer has bought 1000 tons for prompt shipment. There is practically no new inquiry for Bessemer iron. The Westinghouse Air Brake Company has bought 4000 to 5000 tons of forge and foundry iron, part coming from Valley furnaces and part from central Pennsylvania. Prices on foundry iron are slightly weaker, some furnaces offering to sell for first quarter delivery at $13 at furnace, though others refuse to shade $13.25. We quote: Standard Bessemer iron, $14; malleable Bessemer, $12.50; basic, $12.25; No. 2 foundry, $13 to $13.25; gray forge, $12.35 to $12.50, all at Valley furnace, the freight rate for delivery to the Pittsburgh district being 90c. a ton.

Billets and Sheet Bars.—Open-hearth billets and sheet bars are being offered at slightly lower prices in small lots for prompt shipment. A leading steel mill reports that its specifications against contracts for billets and sheet bars in November have been a little heavier than last month. We quote open hearth billets $18.50 to $19; Bessemer billets, $19; open hearth sheet bars, $19.50 to $20; Bessemer sheet bars, $20 to $20.50, and forging billets, $24, all f.o.b. cars, makers' mill, Pittsburgh or Youngstown district.

Structural Material.—The American Bridge Company, Pittsburgh, has taken a contract for 2300 tons of steel for the Seneca Building of the New York Telephone Company, Buffalo, N. Y., and 1600 tons for a department store at Rochester, N. Y.

(By Mail.)

Reports from sales managers agree that the volume of new orders being sent to the mills for rolling is steadily increasing, due no doubt to the low prices ruling. More live inquiries for cars are in the market that will no doubt soon result in contracts. New business is being placed in sheets, and some heavy contracts for tin plate have been taken for spring and summer delivery. Effective December 1 a reduction of one point, or $2 a ton, on butt weld pipe and two points, or $4 a ton, on lap weld pipe will be made.

Ferromanganese.—A sale of 200 tons of 80 per cent. foreign for first quarter delivery has been made on the basis of $38, Baltimore. Inquiry is light. Prices are firm and we quote 80 per cent. for delivery in first half at $38 to $38.25, Baltimore, and on small lots for prompt shipment, $37.50 to $38, Baltimore, the freight rate for delivery in the Pittsburgh district being $1.95 a ton.

Ferrosilicon.—Prices on 50 per cent. continue to advance, and it is quoted to-day at $68, Pittsburgh, the highest price reached in a long time. An inquiry is in the market for 75 to 100 tons. The lower grades are cheaper, and we quote 10 per cent., $21; 11 per cent., $22, and 12 per cent., $23, f.o.b. cars at furnace, Jackson, Ohio, or Ashland, Ky.

Skelp.—No important sales have been made in the past week. We quote grooved steel skelp at 1.12½c. to 1.15c.; sheared steel skelp, 1.17½c. to 1.20c.; grooved iron skelp, 1.40c. to 1.45c., and sheared iron skelp, 1.60c. to 1.65c., all for delivery at consumers' mills in the Pittsburgh district.

Wire Rods.—The rod market is dull, new inquiry being only for small lots. Most consumers are covered by contracts, on which prices are being adjusted each month to a lower basis than for the preceding month. We quote Bessemer, open hearth and chain rods at $25, Pittsburgh, but on a firm offer this price might be shaded.

Steel Rails.—No important contracts for standard sections have recently been placed here, new orders being for small lots only, ranging from 200 to 500 tons. The demand for light rails is active from the coal mining and lumber interests, and in the past week the Carnegie Steel Company received new orders and specifications for about 3500 tons. We quote standard sections at 1.25c. per lb.; 8 and 10-lb., light rails, 1.25c.; 12 and 14-lb., 1.16c.; 16, 20 and 25-lb., 1.12c.; 30 and 35-lb., 1.10c., and 40 and 45-lb., 1.08c., f.o.b. at mill.

Structural Material.—No important contracts have been placed, and there are no large inquiries out. All the local structural interests are short of work and are able to make prompt deliveries. Low prices continue to be made, and it is said some jobs have been placed in the past week or two at prices that mean very close to 1c. for the plain material. We quote beams and channels up to 15 in. at 1.10c. to 1.15c., but on some very desirable specifications the lower price has been shaded.

Plates.—The Canadian Pacific has bought 4500 box cars, of which the Canadian Car & Foundry Company will furnish 2500, the American Car & Foundry Company 1000 and the Pressed Steel Car Company 1000. The Grand Trunk is reported to have placed an order with the Pressed Steel Car Company for 2000 all-steel hopper cars, of which 1000 will be built at McKees

Rocks and 1000 at its Chicago works. Inquiries reported in the market include 3000 to 3500 freight cars for the Chicago & Northwestern; 100 flat cars for the Missouri & North Arkansas; 500 ballast cars, 500 automobile cars, 250 freight cars and 25 cabooses for the Chicago, Rock Island & Pacific, and 50 steel postal cars and 20 steel traction cars for the Harriman Lines. We quote narrow and wide plates at 1.10c. to 1.15c. at mill, but on some very large contracts and desirable specifications, 1.05c. at mill has been done.

Tin Plate.—Some heavy contracts placed in the past two or three weeks by meat packers and can makers are stated to have been made for delivery over all of next year. Practically all such contracts carry a price guarantee. Several of the independent mills report they have sold the greater part of their output for the first half of 1912, and specifications are expected to begin to come in early in the new year, when the rate of operations will be considerably increased. The leading mills are operating at present to about 50 per cent., but a few are running to 60 per cent. or more. The open market on tin plate remains at $3.40 per base box for 14 x 20 coke plates, but some large contracts have been taken at 10c. per box or more under this figure.

Steel Bars.—Both the new demand for steel bars and specifications against contracts are running heavier, partly due to the demand from the car builders. Several of the leading steel bar mills report that actual orders sent to the mills this month for rolling exceed those in October. As yet prices have not shown any betterment. The general market on steel bars is 1.10c. at mill for ordinary orders, but on very desirable specifications 1.05c. has been named. Some mills, however, refuse to meet this figure, 1.10c. being their minimum. The new demand for iron bars is reported slightly better, and we quote common iron bars at 1.20c. to 1.25c. f.o.b. maker's mill.

Sheets.—Some large contracts for black and galvanized sheets for delivery in the first quarter and first half of next year have been made in the past week at prevailing prices. Some mills are not disposed to sell ahead so far, being confident that after the first of the year prices will be better and the demand heavier. Orders sent to the mills for rolling this month have been larger than in October, and specifications against contracts are also coming in more freely. The high prices ruling for spelter, which has sold as high as 6.75c., East St. Louis, having naturally increased the cost of making galvanized sheets, prices on this grade are firmer. While some report they are slightly increasing operations, the mills generally continue to operate at 60 to 65 per cent. of capacity. The market on black sheets is based on 1.85c. for No. 28, but in a few cases 1.80c. has been done on desirable orders by mills that have low rates on freight to points of delivery.

Merchant Steel.—New orders and specifications in November have shown a material increase over last month, the heavier buying being induced, no doubt, by the lower prices ruling. One leading mill reports that its shipments in November were 20 per cent. larger than in October. We quote: Iron finished tire, 1½ x ⅜-in. and larger, 1.15c., base; planished tire, ⅛-in. and larger, 1.35c.; channel tire, ¾, ⅞ and 1-in., 1.65c.; toe calk, 1.70c., base; flat sleigh shoe, 1.25c.; concave or convex, 1.55c.; cutter shoe tapered or bent, 2.15c.; spring steel, 1.75c.; machinery steel, smooth finish, 1.50c., all f.o.b. at mill.

Railroad Spikes.—An Eastern railroad has sent in specifications for 5000 kegs of spikes on which prompt shipments are being urged. Inquiries from the railroads are better now than for some time. We continue to quote $1.40 base for standard sizes in carload and larger lots, f.o.b. Pittsburgh.

Rivets.—Makers report that the new demand and specifications against contracts are coming in at a more satisfactory rate than for some time, and that they have more actual orders on their books for shipment than for some months. We quote structural rivets at 1.45c. to 1.50c. and boiler rivets at 1.55c. to 1.60c., f.o.b. Pittsburgh. On a very desirable order for large tonnage, these prices might be shaded $1 a ton.

Shafting.—New orders and specifications are coming from the automobile builders and implement makers at a heavier rate than at any time for some months. The shipments of shafting by the mills in November are showing a material increase over October. We quote cold-rolled shafting at 65 per cent. off in carloads and larger lots and 60 and 10 per cent. off in small lots, delivered in base territory.

Spelter.—Prices continued to climb and prime Western grades are quoted to-day at 6.75c. to 6.80c., East St. Louis, the freight rate to Pittsburgh being 12½c. per 100 lb.

Wire Products.—The present condition in the wire and wire nail trades is very unsatisfactory, the new demand being dull and only for small lots to cover actual needs. It is evident that there is a large overcapacity for production, and with the present light demand none of the wire nail mills is operating to more than 50 to 60 per cent. of capacity. We quote wire nails at $1.50 to $1.55; cut nails, $1.45 to $1.50; galvanized barb wire, $1.80 to $1.85; painted, $1.50 to $1.55; annealed fence wire, $1.30 to $1.35, and galvanized fence wire, $1.60 to $1.65, f.o.b. Pittsburgh, usual terms, freight added to point of delivery.

Merchant Pipe.—Effective Friday, December 1, a reduction of one point, or $2 a ton, will be made on black and galvanized butt weld pipe, and two points, or $4 a ton, on black and galvanized lap weld pipe. No change in prices will be made on extra strong or double extra strong pipe, and the guarantee that has heretofore been given on pipe will be removed after November 30, the statement being made that it has served its purpose. A California gas interest is in the market for 100 miles of 12-in. pipe. New demand and specifications for merchant pipe during November have been slightly heavier than in October. Leading mills are operating at 60 to 70 per cent. of capacity.

Tubes.—The new demand for both locomotive and merchant tubes is showing betterment. Orders sent to the mills for rolling during November have been heavier than in any previous month this year. Some fairly large orders for locomotive tubes have been placed in the past week or two and several large inquiries are in the market. Prices on locomotive tubes continue to be more or less shaded.

Coke.—Some large contracts for furnace coke for first half and others for all of next year have been closed and more are pending. Most of this coke is going to the Mahoning and Shenango valleys, but a good part of it is for Eastern consumers. Among the contracts for strictly Connellsville furnace coke were 12,000 tons per month for all of next year at $1.65, per net ton, at oven, and 7000 tons per month for all of next year at $1.75. The high price on the latter contract is explained by the fact that the consumer wants a make of coke he has used for several years, and also it runs very low in sulphur. Contracts for 8000 tons per month have been made for all of next year to a Mahoning Valley furnace interest at $1.70; 10,000 tons per month for first six months, at $1.60; 12,000 tons a month for all the year at $1.60, and 15,000 tons per month for all the year at $1.60. Two contracts for furnace coke, one for 9000 tons and the other for 12,000 tons per month, the latter for Eastern shipment, have been made on a sliding scale, based on the price of Bessemer iron, i. e., so many tons of coke for one ton of Bessemer iron. We also note a sale of 18,000 tons of coke per month for 1912 on a sliding scale contract, based on nine tons of coke for one ton of Bessemer iron, with a minimum price of $1.60 for the coke. Several other large contracts for furnace coke will likely be closed within the next week or two. Contracts for strictly Connellsville 72-hr. foundry coke have been made for the first half of 1912, one at $2.10 and another at $2.15, and two contracts at $2.25 per net ton at oven. Some grades of foundry coke, not so high in quality as called for in these contracts, are being sold as low as $2 per net ton at oven for the first half of 1912. One leading coke interest reports that practically its entire output of furnace coke for the first half of 1912 is under contract. It is expected that the placing of this large business in furnace coke may have the result of making prices firmer, as $1.60 for all of next year is regarded as a low figure, in view of the fact that there is not much prospect of lower wages in the coke regions. Standard makes of furnace coke for spot shipment are still being offered at $1.50 at oven, and we note a sale of 85 cars for spot shipment at that price. We quote standard makes for December shipment at $1.50 to $1.55; for first half of next year at $1.60, and for all of next year at $1.60 to $1.65, per net ton at oven; standard makes of 72-hr. foundry coke for spot shipment, $1.85 to $2, and for first half of next year at $2.10 to $2.25, to consumers.

Scrap.—The Charles Dreifus Company, dealer in iron and steel scrap, Oliver Building, in this city, has bought from a Youngstown steel interest about 15,000 tons of high grade heavy steel scrap. An embargo has been placed on scrap routed for the Pittsburgh Steel Company, Monessen, Pa. Local dealers report that very little of the scrap offered in the list of the Pennsylvania Railroad, which closed last week, was awarded, the prices offered being so low that the road refused to accept them. The tone of the scrap market is possibly a little firmer, and a noticeable feature is that it is as

hard for dealers to buy heavy steel scrap at present prices as it is to sell it. Consumers are taking in a moderate amount of material, but their purchases in the past week have been light. As noted in previous reports the Jones & Laughlin Steel Company has recently been a heavy purchaser of steel scrap, consisting of billet and rail ends, plate shearings, etc., cut to charging box sizes, for which it has paid as high as $12.50, delivered. We make a range of 50c. per ton on our quotations on heavy steel scrap, the higher price being for selected stock and cut into charging box sizes. Dealers are quoting as follows per gross ton, f.o.b. Pittsburgh, unless otherwise noted:

Heavy steel scrap, Steubenville, Follansbee, Sharon, Monessen and Pittsburgh delivery	$12 00 to $12 50
No. 1 foundry cast	11.75 to 12.00
No. 2 foundry cast	10.75 to 11.00
Bundled sheet scrap, f.o.b. consumers' mill, Pittsburgh district	10.25 to 10.50
Rerolling rails, Newark and Cambridge, Ohio, Cumberland, Md., and Franklin, Pa.	12.50 to 12.75
No. 1 railroad malleable stock	11.25 to 11.50
Grate bars	9.00 to 9.25
Low phosphorus melting stock	15.25 to 15.50
Iron car axles	20.50 to 21.00
Steel car axles	16.00 to 16.25
Locomotive axles	22.00 to 22.50
No. 1 busheling scrap	11.00 to 11.25
No. 2 busheling scrap	7.00 to 7.25
Old car wheels	12.00 to 12.25
*Cast iron borings	8.25 to 8.50
*Machine shop turnings	8.75 to 9.00
†Sheet bar crop ends	13.75 to 14.00
Old iron rails	14.50 to 14.75
No. 1 wrought scrap	12.00 to 12.25
Heavy steel axle turnings	9.75 to 10.00
Stove plate	9.00 to 9.25

*These prices are f.o.b. cars at consumers' mills in the Pittsburgh district.
†Shipping point.

Chicago

CHICAGO, ILL., November 29, 1911.—*(By Telegraph.)*

Pig Iron.—The local market is decidedly more active, as evidenced by a much larger volume of inquiry. Improvement is also noted in the number of sales and in the size of the orders placed. Evidence is lacking, however, that any large buying movement is under way and conditions in general do not support the belief that large tonnages have been purchased here. A number of lots of Northern basic have been sold, including one of 1000 tons to a South Milwaukee manufacturer. Malleable foundries are displaying a real interest in buying, and the demand for other foundry grades, while less noticeable, contributes to a generally improved situation in which Southern iron is considerably less active than Northern. Comparative prices of iron from the South and from the North are such that Southern iron can scarcely enter into opposition with Chicago or north of it, while in that portion of the Chicago territory where an advantage still obtains for Southern iron buying has been and is still restricted. We quote for Chicago delivery, except for local irons, which are f.o.b. furnace, the following prices on prompt shipments:

Lake Superior charcoal	$16.50 to $17.00
Northern coke foundry, No. 1	14.50 to 15.00
Northern coke foundry, No. 2	14.00 to 14.50
Northern coke foundry, No. 3	13.50 to 14.00
Northern Scotch, No. 1	16.00
Southern coke, No. 1 foundry and No. 1 soft	14.85
Southern coke, No. 2 foundry and No. 2 soft	14.35
Southern coke, No. 3	14.10 to 14.35
Southern coke, No. 4	13.85 to 14.10
Southern gray forge	13.60 to 13.85
Southern mottled	13.60 to 13.85
Malleable Bessemer	14.35 to 14.50
Standard Bessemer	17.00
Basic	14.75
Jackson Co. and Kentucky silvery, 6 per cent	16.40
Jackson Co. and Kentucky silvery, 8 per cent	17.40
Jackson Co. and Kentucky silvery, 10 per cent	18.40

(By Mail.)

While the orders being received for the various finished steel products are not very well balanced, the absence of steel rail specifications being especially noticeable, the aggregate tonnage is decidedly large and in many instances above normal. From this standpoint the situation is nearly all that could be desired and a continuance of the current volume of business from now until the first of January will remedy the unsatisfactory phase of the situation, namely, prices. Concessions and price irregularities and the general market level remain practically at the extreme point. If it were not tempered by the deplorable price situation the tone of the market would be distinctly optimistic. The belief is growing that a real and continued improvement may now be anticipated. Plate tonnage has piled up on the mills in this district, particularly sheared plates. Steel bars have followed closely and specifications for structural material are being received steadily. Recent car orders are the source of the major portion of these specifications. A large aggregate of rail tonnage is under consideration, although probably not more than 75,000 tons may be considered as actually in the market. Some additional car business was placed during the week, but the larger inquiries are still open. Steel and malleable iron foundries are beginning to feel the impetus of car orders, as inquiry for basic and malleable iron, both Northern and Southern, has been active. The local market for old material displays a much firmer attitude on the part of dealers and the prices paid to the railroads on recent scrap lists indicate that an advancing market is anticipated. Consumers are declining to pay any advance over current quotations and are restricting themselves accordingly to such small purchases as can be picked up at these prices.

Rails, Track Supplies and Railroad Equipment.—A round tonnage of rails is said to be under consideration by a number of the Western roads and, in addition to the 40,000 tons for the Great Northern, the San Antonio & Aransas Pass is inquiring for 20,000 tons. Several smaller inquiries have been received but the railroads seem to be in no haste to purchase. The Committee on Rail Specifications, composed of engineers from both the railroads and manufacturers, has been in session the past week and its conclusions regarding specifications are reported to be incidental to the placing of certain large orders. Specifications for track supplies, including bolts, spikes and rail joints, have begun to appear in larger volume and bookings are heavy. New orders for cars the past week were, with the exception of those purchased by the Canadian Pacific, unimportant. That railroad bought 4500 box cars, of which 2500 will be built by the Canadian Car & Foundry Company, 1000 by the Pressed Steel Car Company and 1000 by the American Car & Foundry Company. A number of new inquiries developed. The Chicago & Northwestern, in addition to the 3300 cars for which it is inquiring, is in the market for 75 locomotives. The Harriman Lines are figuring on 12,000 to 40,000 cars and the Santa Fé on 8000. The Castle Valley Coal Company expects to buy 200 all-steel coal cars; the Live Poultry Transportation Company, Chicago, is in the market for 250 steel underframe poultry cars, and the San Antonio & Aransas Pass is inquiring for 100 steel underframes. The Pullman Company and the American Car & Foundry Company have been recipients of several small orders for miscellaneous types of cars, while a number of similar inquiries remain unplaced, particularly that of the Illinois Central. We quote standard railroad spikes at 1.50c. to 1.55c., base; track bolts, with square nuts, 2c. to 2.10c., base, all in carload lots, Chicago; standard section Bessemer rails, 1.28c.; open hearth, 1.34c.; light rails, 40 to 45 lb., 1.16c. to 1.20½c.; 30 to 35 lb., 1.19½c. to 1.24c.; 16, 20 and 25 lb., 1.20½c. to 1.25c.; 12 lb., 1.25c. to 1.30½c.; angle bars, 1.50c., Chicago.

Structural Material.—Contracts carrying 2370 tons of structural steel were awarded for fabrication the past week. Of these the largest item was 1056 tons for an addition to the Oregon Hotel, Portland, Ore., taken by Milliken Bros. The American Bridge Company will furnish 500 tons of girder spans for the Chicago, Burlington & Quincy Railroad, and the Lackawanna Bridge Company took orders for 405 tons of bridge material for the Chicago, Indianapolis & Louisville Railroad. The Hansell-Elcock Company, Chicago, will supply 272 tons for a Crane Company's building in this city. The Riter-Conley Mfg. Company, Pittsburgh, will build 80 transmission poles for the Southern California Edison Company, for which 137 tons is required. Mill specifications for plain material continue active, the major portion of the orders coming from car builders. Prices are without change and we quote for plain material, Chicago delivery, mill shipment, 1.33c., and from jobbers' stocks 1.60c.

Plates.—Except to increase the volume of unfilled orders, the past week has brought little change in the market situation. Local mills are more than sold up for the immediate future, although they are still eager for business. It has been necessary to run the Gary universal mill on sheared plates, and the lack of shearing capacity has curtailed the capacity of this mill. Despite the heavy bookings, prices have failed thus far to respond, and we continue to quote for Chicago delivery, mill shipment, 1.33c., and from jobbers' stocks 1.60c.

Sheets.—The volume of business in sheets continues to be very good and local mills are running as full as at any time. The market shows no improvement, however, as regards prices, and irregularities are the rule. So far as possible, this market is seeking to keep for itself all the business emanating in this territory, but, to do so, concessions are usually required. Little im-

provement can be hoped for until a still larger volume of business develops. We quote Chicago prices as follows: Carload lots, from mill, No. 28 black sheets, 2.03c. to 2.08c.; No. 28 galvanized, 3.03c. to 3.08c.; No. 10 blue annealed, 1.53c. to 1.58c. Prices from store, Chicago, are: No. 10, 1.90c.; No. 12, 1.95c; No. 28 black, 2.30c.; No. 28 galvanized, 3.35c.

Bars.—Steel bars continue to be one of the weak elements in the market, and the tendency of manufacturers to turn to steel, when prices are as low as at present, has restricted the volume of bar iron sales. The tonnage placed during the week, although large, seems not to have diminished competitive effort for orders, and price concessions are as extreme as at any time. We quote as follows, f.o.b. Chicago: Soft steel bars, 1.18c. to 1.33c.; bar iron, 1.15c. to 1.20c.; hard steel bars rolled from old rails, 1.15c. to 1.20c. From store: Soft steel bars, 1.55c. to 1.60c., Chicago.

Wire Products.—Although the efforts of producers directed toward acquiring tonnage through price concessions in the past few weeks have brought about some increase in the volume of business, the wire market continues soft and irregular. There remains, apparently, a need for much heavier business before the situation from the standpoint of the mills can be considered satisfactory. Wire nails and plain wire are being subjected to the greatest pressure. Wire for fence and other manufactured products is moving more actively as the result of preparations for spring trade. Plain wire, No. 9 and coarser, base, $1.58; wire nails, $1.78; painted barb wire, $1.78 to $1.83; galvanized, $2.08 to $2.13; polished staples, $1.78 to $1.83; galvanized, $2.08 to $2.13, all Chicago.

Cast Iron Pipe.—In the West, particularly throughout the intermountain and Pacific coast territory, a considerable volume of pipe business is reported under consideration, pending the settlement of freight rates, some of which have already been reduced. Current lettings during the week were small. It is anticipated that the contract at Muskegon, Mich., which has been delayed from week to week, will be placed at once, a decision having been reached regarding the use of steel or cast iron pipe. At Hubbard, Ohio, a contract for 500 tons will be awarded December 2. We quote as follows, per net ton, Chicago: Water pipe, 4-in., $26.50; 6 to 12-in., $24.50; 16-in. and up, $24, with $1 extra for gas pipe.

Old Material.—The influence of the large tonnage of finished material orders recently placed is very apparent as regards the local market for scrap. To the dealers the prospect of a rising market is in sight, and they, accordingly, have bought recent railroad offerings at prices above current quotations, and, in turn, are declining to sell to consumers except at an advance. Manufacturers, on the other hand, decline to admit that an advance in the price of old material is warranted in view of the low prices obtaining on new material. This applies more particularly to rolling mill scrap, foundry grades being in demand. They are, therefore, restricting their purchases to such quantities as can be picked up at current quotations. A local wheel maker is in the market for 1000 to 5000 tons of car wheels, for which a price of $13 delivered is offered. Railroad scrap lists are offered by the Chicago, Rock Island & Pacific and the Chicago, Burlington & Quincy, the former to the amount of 3000 tons. We quote for delivery at buyers' works, Chicago and vicinity, all freight and transfer charges paid, per gross ton, as follows:

Old iron rails	$14.50 to $15.00
Old steel rails, rerolling	12.25 to 12.75
Old steel rails, less than 3 ft.	10.75 to 11.25
Relaying rails, standard section, subject to inspection	24.00
Old car wheels	12.50 to 13.00
Heavy melting steel scrap	9.50 to 10.00
Frogs, switches and guards, cut apart	9.50 to 10.00
Shoveling steel	9.00 to 9.50
Steel axle turnings	8.00 to 8.50

The following quotations are per net ton:

Iron angles and splice bars	$11.75 to $12.25
Iron arch bars and transoms	13.00 to 13.50
Steel angle bars	9.00 to 9.50
Iron car axles	16.75 to 17.25
Steel car axles	15.00 to 15.50
No. 1 railroad wrought	10.25 to 10.50
No. 2 railroad wrought	9.25 to 9.50
Steel knuckles and couplers	9.25 to 9.75
Steel springs	9.50 to 10.00
Locomotive tires, smooth	13.50 to 14.00
Machine shop turnings	5.25 to 6.25
Cast and mixed borings	5.00 to 5.50
No. 1 machinery	8.00 to 8.50
No. 2 bushelling	5.75 to 6.25
No. 1 boilers, cut to sheets and rings	6.50 to 7.00
Boiler punchings	12.00 to 12.50
No. 1 cast scrap	10.50 to 11.00
Stove plate and light cast scrap	8.75 to 9.25
Railroad malleable	9.50 to 10.00
No. 1 agricultural malleable	8.50 to 9.00
Pipes and flues	7.00 to 7.50

Philadelphia

PHILADELPHIA, PA., November 28, 1911.

Railroad purchases continue to exert a favorable influence on the situation. Pig iron producers are particularly encouraged by the greater amount of inquiry for foundry grades for forward delivery Competition in finished iron and steel is still strong, and, while no new levels have been established, recent concessions are more generally quoted as open prices. The tendency, however, is to make quotations on a basis that may govern each individual condition, thus resulting in a rather wide range of prices. Few Eastern mills have made any material tonnage gains during the week. Billets are quiet and prices lack strength. The good demand for sheets continues. Foundry coke is a trifle more active. A shade better movement in some grades of old material is noted, but, while the market is sentimentally stronger, no price changes of importance are reported.

Iron Ore.—Consumers are feeling round a little to get a line on prices for next year's delivery. For near future requirements furnaces in this district need very little ore, although some would no doubt take on small lots if prices were such as to enable them to use the ore advantageously. Importations during the week include 5600 tons of New Brunswick, 4090 tons of Swedish and 5600 tons of Cuban ore.

Pig Iron.—Central Pennsylvania producers have, in a measure, been setting the pace in connection with prices of foundry grades in this district, particularly when any quantity was involved. Some of these producers, selling No. 2 X at $13, furnace, with a freight rate of $1.85, have been making a delivered price that Eastern furnaces have been compelled to meet or lose trade from regular customers. Several 1000-ton lots have been closed recently on that basis. Competition between producers in this immediate territory is not so sharp, and the bulk of current sales, involving lots up to a few hundred tons, have been made at $15, delivered, while there is a fair amount of non-competitive business going at $15.10 to $15.25 for eastern Pennsylvania No. 2 X. Purchases of large blocks of low-grade iron by cast iron pipe makers continue the feature. A large lot of Northern pipe iron was sold at $14.25, delivered, while other good purchases have been made at $14, and in instances this price is reported to have been shaded. The aggregate volume of business in the foundry grades has been considerably larger and the trade is more encouraged with the outlook, particularly in view of the greatly increased inquiry for forward delivery. The larger buyers are coming into the market more freely, the Baldwin Locomotive Works being out with an inquiry for 6000 tons, and the Pennsylvania Railroad is getting prices on 5000 tons for first quarter delivery. Others are asking for 1000-ton lots or larger. The cast iron pipe foundries are still inquiring for a total of 20,000 to 25,000 tons. Outside of the low-grade iron going to pipe foundries, little movement in Southern iron is reported in this district. Virginia foundry irons are not moving very freely; small and moderate lots for early delivery are selling at $12.25 to $12.50, furnace. The demand for forge iron appears to be at a standstill. No demand for basic iron is reported; this grade is now being pretty firmly held at $14.50, delivered. Of standard analysis low phosphorus iron, little has been taken by melters in this district, although a fair quantity has been sold for shipment West; prices continue weak. The following range of prices is named for deliveries in buyers' yards in this district, shipment extending over the next four months:

Eastern Pennsylvania No. 2 X foundry	$14.85 to $15.35
Eastern Pennsylvania No. 2 plain	14.60 to 15.00
Virginia foundry	15.00 to 15.50
Gray forge	14.25
Basic	14.50
Standard low phosphorus	19.25 to 19.50

Ferroalloys.—Notwithstanding the fact that the principal sellers maintain and have sold small lots of 80 per cent. ferromanganese at $38.50, Baltimore, principally for Western delivery, a sale of a small lot at $1 under that figure is reported, indicating that all the speculative material has not yet been cleaned up. Fifty per cent. ferrosilicon is held at $68, delivered, but no business has been reported; little demand for 10 to 12 per cent. is noted and prices are reported unchanged.

Billets.—The situation regarding prices is somewhat complex. Some show of firmness was made by Eastern makers a week ago, but they have again receded to the recent $19, Pittsburgh, base for basic open-hearth rolling billets, equal to $21.40, delivered here, but contend that they will not meet the new basis of $18.50 or $20.90, delivered in this vicinity, named by some of the Western mills. Business in this district is small and

the market has not been seriously tested. Forging billets are moderately active, but prices are weak, and while quotations are $26.40 to $27.40, delivered, the minimum price can probably be shaded 50 cents a ton on desirable specifications.

Plates.—Sharp competition between Eastern mills for business in what is considered their natural territory is noted. While no further concessions are reported, the lower range of prices is more generally quoted, particularly if the quantity involved is desirable. Few Eastern mills meet the extreme prices named by Western mills, with the result that the bulk of the larger orders have gone to the latter. There is a decidedly better demand on the part of consumers who are anxious to anticipate their requirements for the first quarter and half of next year, but Eastern mills, as a rule, refuse to consider such business at present prices. Mills are not operating much better than 50 per cent. of capacity. Prices show a rather wide range, as low as 1.25c. having been done in sharp competition for desirable orders, but for the general run of current business quotations range from 1.30c. to 1.35c., delivered here.

Structural Material.—The demand appears quieter and competition for what little business is offered is sharper. Bids are in for 1800 tons of structural material for the Stock Exchange Building, while specifications are being completed for the new Manufacturers' Club, for which about 2000 tons will be required. Some little bridge and boat material is pending, but closes slowly. Eastern mills are, as a rule, meeting Western quotations for plain shapes, 1.25c., delivered here, being named in sharp competition, although quotations for small current orders are 1.30c. to 1.35c.

Coke.—A trifle better demand, particularly for foundry coke, is noted. Small contracts for delivery up to April 1 are reported, but few sellers being willing to make more extended commitments, owing to the uncertainty regarding spring labor difficulties in the coal fields. Beyond some small spot transactions little movement in furnace coke is reported. Practically nothing in contract furnace coke has recently been done. Quotations are unchanged, the following range of prices per net ton being named for deliveries in buyers' yards in this district:

Connellsville furnace coke	$3.65 to $4.05
Foundry coke	4.15 to 4.50
Mountain furnace coke	3.40 to 3.65
Foundry coke	3.95 to 4.40

Old Material.—An air of greater confidence in the situation prevails, although in very few instances have prices been affected. Transactions are still closely confined to small lots, with sellers less inclined to dispose of their holdings. Heavy melting steel of prime grade has been purchased at $12, delivered, one mill taking on about 1500 tons, while another melter bought small lots of yard steel at $11.50, delivered. No. 1 wrought iron has been more freely taken, usually, however, in small lots, and prices of this grade show a slight upward movement. Car wheels and stove plate have also been in more active demand. The following range of prices about represents quotations at which the ordinary current business for prompt shipment can be done for delivery in buyers' yards, eastern Pennsylvania and nearby points, taking a freight rate from Philadelphia varying from 35c. to $1.35 per gross ton, for shipment ranging from prompt to the remainder of the year:

No. 1 heavy melting steel scrap	$11.50 to $12.00
Old steel rails, rerolling (nominal)	12.00 to 12.50
Low phosphorus heavy melting steel scrap	15.50 to 16.00
Old steel axles	17.00 to 17.50
Old iron axles	21.00 to 21.50
Old iron rails	15.50 to 16.00
Old car wheels	14.50 to 15.00
No. 1 railroad wrought	14.25 to 14.75
Wrought iron pipe	10.75 to 11.25
No. 1 forge fire	9.50 to 10.00
No. 2 light iron (nominal)	6.00 to 6.50
Wrought turnings	8.00 to 8.25
Cast borings	7.50 to 7.75
Machinery cast	12.25 to 12.75
Railroad malleable (nominal)	11.00 to 11.50
Grate bars, railroad	9.25 to 9.75
Stove plate	9.25 to 9.75

Sheets.—The demand has been fully maintained and Eastern mills continue to operate at full capacity. Order books are in comparatively good shape, buyers placing business more freely and in better quantity, and would contract for extended delivery if mills would accept business of that character. The improved demand does not appear to have materially affected prices, 2c. to 2.05c., delivered here, being named for No. 28 Western sheets, while Eastern mills, making smooth loose rolled sheets, obtain ¼c. to ⅛c. per lb. advance for such material for early delivery.

Bars.—While some effort is being made to establish a 1.25c., delivered, basis for steel bars, business has been done at 1.20c. when any quantity was involved. Iron bars have developed a trifle more strength, although not quotably higher; concessions are not so readily obtainable and quotations are comparatively firm at 1.20c. to 1.25c., delivered in this vicinity.

The Charles Dreifus Company, iron and steel scrap, formerly located at 501 Pennsylvania Building, Philadelphia, has removed to suite 518 in the same building.

Cleveland

CLEVELAND, OHIO, November 28, 1911.

Iron Ore.—Merchant ore firms regard the outlook as very promising for a good volume of business in ore during the coming year. Sales early in 1910 for that season's delivery were far in excess of the needs of consumers, and many furnace interests had enough ore left over last year to last them through the greater part of this year. With good stocks on hand and the business outlook not satisfactory early this year consumers bought sparingly and some waited until late in the summer before placing orders for what they would require up to the opening of navigation in 1912. Because of this conservative buying ore sellers believe that stocks will be fairly well cleaned up by the opening of next season and that good orders will be booked during the spring. The quantity of ore on the lower lake docks December 1 is expected to be nearly as large as a year ago. We quote prices as follows: Old range Bessemer, $4.50; Mesaba Bessemer, $4.25; old range non-Bessemer, $3.70; Mesaba non-Bessemer, $3.50.

Pig Iron.—Quite an active buying movement in Northern foundry pig iron has developed in this market. During the week a large aggregate tonnage was sold for delivery in the northern Ohio territory in lots ranging from 200 to 1000 tons. Some of this iron was for delivery through the first quarter, but the greater part was for the first half. Round sales outside of this immediate territory include 5000 tons, about half each of foundry and gray forge iron, to the Detroit plant of the American Car & Foundry Company for early delivery, and one 2000-ton lot. The buying of Southern iron is also quite active. The largest seller of Southern grades reports that its November sales exceed those of any previous month this year, and a similar report is made by a large local selling agency in Northern iron. A good volume of inquiries is still pending. Among the sales we note the following: 1000 tons of Northern and 500 tons of Southern to an Ohio stove plant, 500 tons of Northern and 500 tons of Southern to another Ohio stove maker, 1000 tons of Northern and 500 tons of Southern to a Mansfield manufacturer, 600 tons each each of Northern and Southern to a Canton foundry, 500 tons of Northern to a northern Ohio foundry, 600 tons of Northern and Southern to a gas engine builder and 1500 tons of Northern and Southern in Ft. Wayne, Ind.—all of the above being for the first half. A northern Ohio implement manufacturer also bought considerable Southern iron for the first half. A manufacturer near Cleveland has bought 500 tons of No. 1 Northern for the remainder of the year and the first half. An Erie, Pa., engine builder has bought 1000 tons of No. 2 foundry for the first half and some other business has been closed in Erie. A Cleveland foundry has an inquiry out for 1500 tons of Southern for the first half and a sanitary interest down the State is in the market for about the same tonnage of Northern and Southern for the same delivery. The United Steel Company, Canton, Ohio, has just closed for 1000 tons of basic for early delivery. A Toledo malleable foundry wants 200 tons of malleable for December and 1500 tons for the first half. Another inquiry is for 500 tons of Southern charcoal. The improved demand for foundry grades has not resulted in any change in the price situation. One local producer is selling No. 2 foundry at $12.75, for delivery throughout the first quarter, but some round lots have been sold at $13 to $13.25, Cleveland furnace, for delivery through the first half. We quote as follows for prompt shipment and for the first quarter, delivered Cleveland:

[illegible]	$14.50 to $15.15
[illegible]	13.25
Northern foundry, No. [illegible]	13.25
Gray forge	12.50
Southern foundry, No. [illegible]	14.35
Jackson County silvery, 8 per cent. silicon	$16.55 to 17.05

Coke.—Some large contracts for furnace coke are expected to be closed shortly. In foundry coke some contracts are being made for next year's supply. Two large local foundries have contracted for Stonega

Virginia coke. We quote standard Connellsville furnace coke at $1.55 to $1.60 for the remainder of the year and $1.65 to $1.70 for the first half. Connellsville foundry coke is held at $1.90 to $2.15 for prompt shipment and $2.15 to $2.40 for contract.

Finished Iron and Steel.—Stimulated by the prevailing low prices the demand in finished lines has become more active and the aggregate tonnage booked in the week was quite large. Many consumers who have carried low stocks for a long time are taking advantage of the low prices to stock up, and others who feel that prices will go no lower are eager to place contracts for their first quarter or first half requirements. There is a good demand for steel bars, which are selling at 1.05c., Pittsburgh, for round lots, although some mills are making a minimum quotation of 1.10c. Good plate orders are coming in, the general market price on large business being 1.10c. There is a fair demand for structural material, considerable sales having been made for specific work. Structural material is quoted at 1.10c., Pittsburgh, for round lots and desirable specifications. While low prices have not yet brought out much business for building work considerable tonnage of this sort is in prospect. The American Shipbuilding Company has received an order from the Hall Coal Company, Ogdensburg, for a boat of the Welland Canal size for the coal trade, for which 1200 tons of plates and shapes will be furnished by the Carnegie Steel Company. The Wellman-Seaver-Morgan Company, Cleveland, has placed an order for 1500 tons of plates, shapes and steel bars for the new coal handling plant to be erected at Ft. William, Ont., for the Canadian Pacific Railroad. This contract will also require 600 tons of Bethlehem sections. The demand for sheets is fairly good, but prices are low. Some mills are making a minimum quotation of 1.80c. for No. 28 black and 2.80c. for No. 28 galvanized. The demand for rivets shows considerable improvement with no change in prices. The demand for iron bars is light. We quote iron bars at 1.20c., Cleveland mill.

Old Material.—There is little activity in the scrap market. Sales during the week were all in small lots, about the only demand being for heavy steel scrap, for which the ruling price is $11. Local mills seem to be fairly well supplied for the present, and local dealers are not figuring on tonnage for outside shipment. Prices are fairly firm with no change in quotations. Dealers are unwilling to sell out of stock at current prices. Dealers' prices per gross ton, f.o.b. Cleveland, are as follows:

Old steel rails, rerolling	$12.25 to $12.75
Old iron rails	14.00 to 14.50
Steel car axles	17.00 to 17.50
Heavy melting steel	11.00 to 11.25
Old car wheels	11.50 to 12.00
Relaying rails, 50 lb. and over	22.50 to 23.50
Agricultural malleable	10.50 to 11.00
Railroad malleable	11.00 to 11.25
Light bundled sheet scrap	9.50 to 10.00

The following prices are per net ton, f.o.b. Cleveland:

Iron car axles	$18.50 to $19.00
Cast borings	6.00 to 6.25
Iron and steel turnings and drillings	6.50 to 6.75
Steel axle turnings	7.25 to 7.75
No. 1 busheling	9.00 to 9.50
No. 1 railroad wrought	11.00 to 11.25
No. 1 cast	11.00 to 11.50
Stove plate	9.00 to 9.25
Bundled tin scrap	11.00 to 11.50

Cincinnati

CINCINNATI, OHIO, November 29, 1911.—*(By Telegraph.)*

Pig Iron.—The general tone of the market is more cheerful, but prices are soft, especially on Southern iron for prompt shipment. However, the lower grades are scarce and the usual difference in quotations is not generally observed. Malleable shows considerable activity; for first half shipment a northern Ohio manufacturer and a Missouri melter are inquiring for 1500 and 2000 tons respectively, and for first quarter movement a southern Ohio consumer is reported to have taken 3000 tons at $13, Ironton. Inquiries for Southern foundry iron are more numerous, and two Indiana melters are getting prices on about 1000 tons each, shipments to run through March of next year. A local manufacturer also wants for the same delivery 600 tons running 2 per cent. and over in silicon. Sales include 400 tons of No. 2 foundry booked at $10, Birmingham, for first half shipment. There has also been considerable first quarter and prompt business taken at this same figure. Northern No. 2 foundry is stationary at $13 for any shipment up to July 1, though in a few instances it is rumored that this figure had been shaded on a few prompt shipment orders. A central Ohio melter recently bought 1800 tons of basic to be shipped during the first half, and a southern Ohio rolling mill is expected to close soon for 20,000 tons for shipment in the next six months. Based on freight rates of $3.25 from Birmingham and $1.20 from Ironton, we quote, f.o.b. Cincinnati, as follows for prompt shipment:

Southern coke, No. 1 foundry and 1 soft	$13.75 to $14.00
Southern coke, No. 2 foundry and 2 soft	13.00 to 13.50
Southern coke, No. 3 foundry	12.75 to 13.25
Southern coke, No. 4 foundry	12.50 to 13.00
Southern gray forge	12.50 to 13.00
Ohio silvery, 8 per cent. silicon	16.95 to 17.20
Lake Superior coke, No. 1	14.70 to 14.95
Lake Superior coke, No. 2	14.20 to 14.45
Lake Superior coke, No. 3	13.70 to 13.95
Basic, Northern	14.20 to 14.45
Standard Southern car wheel	25.50 to 25.75
Lake Superior car wheel	19.00

(By Mail.)

Coke.—Foundry coke is in a little better demand; three consumers in the Central West are feeling around for a future supply with the total tonnage estimated around 12 cars a week. Contract shipments of both foundry and furnace grades are excellent, but new orders for furnace coke are limited to small supplies for domestic use. Prices are a trifle firmer on furnace coke in the Connellsville district and $1.55 to $1.65 is quoted on prompt shipment business; Wise County and Pocahontas brands are bringing about the same figures, with the usual 10c. to 15c. higher demanded on future contracts. Foundry coke is unchanged in all three districts, and is quotable around $1.85 to $2 for prompt movement and from $2 to $2.25 for future shipment.

Finished Material.—The week begins with a reported improvement in several lines. Prices are also said to be steadier. No more than the regular run of small orders for structural material have been booked in the past few days, but, as previously reported, there is considerable business in sight here, some of which may develop before January 1. The local warehouse price on structural material is around 1.70c. and on steel bars 1.55c to 1.60c.

Old Material.—There is a better inquiry for several grades of scrap, but dealers are unable to obtain anything more than the regular selling quotations, with the possible exception of No. 1 cast scrap, which is said to be in better demand. Offerings are about keeping pace with sales, and yard stocks do not show that they are being diminished at any appreciable rate. The minimum figures given below about represent what buyers are willing to pay for delivery at their yards in southern Ohio and Cincinnati, and the maximum quotations the sellings prices f.o.b. at yards:

No. 1 railroad wrought, net ton	$9.50 to $10.25
Cast borings, net ton	4.50 to 5.00
Steel turnings, net ton	5.50 to 6.00
No. 1 cast scrap, net ton	9.50 to 10.50
Burnt scrap, net ton	6.25 to 6.75
Old iron axles, net ton	16.25 to 16.75
Bundled sheet scrap, gross ton	5.75 to 6.50
Old iron rails, gross ton	13.00 to 13.75
Relaying rails, 50 lb. and up, gross ton	20.75 to 21.50
Old car wheels, gross ton	9.50 to 10.25
Heavy melting steel scrap	9.25 to 10.00

Birmingham

BIRMINGHAM, ALA., November 25, 1911.

Pig Iron.—A lot of 1000 tons of No. 2 soft, for shipment in the first quarter, was sold early in the week at $10, Birmingham; later, two lots of 1000 tons each for shipment over the first half were sold at $10 for No. 2 foundry, and 1000 tons of analysis iron for first half shipment was sold at a slightly lower price. Of the smaller sales made in the week, a lot of 600 tons of No. 2 for spot shipment brought $10; 500 tons of Nos. 2 and 3, for shipment in the first quarter, brought $10 and $9.50, respectively; 60 tons of No. 1 sold at $10.50, while 150 tons of gray forge brought $9.25. In addition to the sales mentioned, an aggregate of smaller lots estimated at 5000 to 7500 tons was sold for delivery covering the next four to six months, one interest alone having sold an aggregate of 6500 tons in the week. The inquiry now pending involves a very satisfactory tonnage, and is such as to indicate that the provision for future requirements by the trade generally has been comparatively limited. The manufacturers of cast iron water pipe are negotiating for attractive tonnages, the manufacturers of smaller size cast iron pipe are also making inquiry, and the car wheel manufacturers have asked for prices on charcoal and special analysis iron. Specifications against contracts have increased in proportion with the increase in the demand for advanced

deliveries, and, as a result, the market for spot deliveries is unquestionably stronger. For the advanced deliveries, it can only be said that the producing interests are probably less willing to enter tonnage for the entire first half at the $10 schedule. It is noted that certain of the large concerns still refuse to open order-books for deliveries after the first quarter, and that in the case of two smaller ones no tonnage is offered for shipment after January 1. There has been no change in the rate of production of foundry iron and the capacity being operated on basic is being taken care of by local consumption.

Cast Iron Pipe.—The city of Portland, Oregon, is to award a contract December 12 for approximately 12,000 tons of water pipe, the announcement of which has had a decided tendency to strengthen this market. Local interests have within the week been awarded a fairly attractive tonnage of water pipe in small quantities, in addition to the requirement of some 2000 tons of gas pipe for the city of Birmingham, and, as a consequence, the active capacity is practically taken care of until February 1. Orders for certain sizes have recently been declined, and the aggregate accumulation of all sizes on local yards is considerably less than at this time one year ago. Quotations are unchanged, and by reason of the condition of local order books it is doubted if shading to any extent would obtain for additional large contracts. We quote water pipe as follows, per net ton f. o. b. cars here: 4 to 6 in., $23; 8 to 12 in., $22; 12 in. and over, $21, with $1 per ton extra for gas pipe. Special fittings are quotable at $45 to $50 per net ton at foundry.

Old Material.—This market is still without developments of especial interest, with all parties concerned disposed to follow a conservative course in the matter of purchases. Steel grades are slightly more in demand than last week and it is probable that slightly higher prices can now be had for light machinery cast. For heavy grades, however, there is practically no demand and prices are very uncertain. We continue to quote nominally as follows, per gross ton here:

Old iron axles (light)	$12.00 to $12.50
Old steel axles (light)	11.00 to 11.50
Old iron rails	11.00 to 11.50
No. 1 railroad wrought	9.50 to 10.00
No. 2 railroad wrought	8.00 to 8.50
No. 1 country wrought	6.00 to 6.50
No. 2 country wrought	5.50 to 6.00
No. 1 machinery cast	8.00 to 8.50
No. 1 steel	7.50 to 8.00
Tram car wheels	7.00 to 7.50
Standard car wheels	9.00 to 9.50
Light cast and stove plates	5.50 to 6.00

Finished Material.—Local mills report a liberal volume of specifications for bars and shapes in both steel and iron, while the movement of barb wire, wire fencing and wire nails is very satisfactory. The entire capacity at the Alabama City mill is in operation; the Bessemer mill continues to work a double shift, and the three small mills are well supplied with orders. There is very little demand for light rails.

Coke.—The local production of all grades will be somewhat larger this month than for October, but prices have not changed. Furnace coke is quotable at $2.30 to $2.50 per net ton at Birmingham district ovens, and 72-hr. foundry coke is quoted at $3.25 to $3.50.

St. Louis

ST. LOUIS, MO., November 27, 1911.

The appearance in the market of inquiries for deliveries beyond the first quarter of 1912 has served to encourage the furnace representatives still more, and, while the demand that exists has not led to any increases in price, there is a more confident feeling that there will be fair business, at least through the winter months and well into spring. The orders, as a rule, continue small in individual quantity, but the aggregate is good and the shipment requirements are immediate.

Pig Iron.—One agency reports 2500 tons for the week, made up of an aggregate of smaller lots, while others have booked orders from the Missouri Malleable Casting Company for 3000 tons of malleable in addition to the order of the same quantity previously reported. There is a considerable demand for the lower grades and about 1000 tons for mixing purposes is reported as sold during the week. The stove companies are coming in for supplies of material. The Bridge & Beach Mfg. Company took about 1200 tons of various grades. The Buck's Stove & Range Company is also in the market and has already taken a small lot for immediate requirements. The buying movement of the foundries is, however, regarded as not due to actual need but because of a belief that it is wise to supplement present supplies before the demand caused by the railroad orders sends prices up. Quite a number of inquiries for delivery beyond the first quarter is reported.

Coke.—The market for coke is quiet, the principal demand being for stock grades. The orders received lag somewhat behind the pig iron demand, showing that supplies in consumers' hands are not exhausted. Coke is going forward on specifications under contract in good quantity, but the new orders received are chiefly in carload lots for specific purposes and require immediate shipment.

Finished Iron and Steel.—In structural material the feeling is better, though the orders coming in are not large. Apparently customers are getting small jobs and hurrying them through. The price remains close to 1.10c. Practically no structural shapes are going into stock with the fabricators. Interest is developing in the prospect of another 21-story building, this for the Commonwealth Trust Company, requiring about 5000 tons. There is a good chance of both this and the Barr building, 10,000 tons, going through the first of the year. For standard rails the market is inactive because of the inability to conduct operations during the winter in construction work. In bars the prices are unsteady, though there has been no dropping off. A fair tonnage has been placed, chiefly for prompt delivery, mostly among the wagon and agricultural machinery manufacturers. Plates have been in fair demand, with the prices a bit weaker than at last report. The tonnage moved has been reasonably good. Track fastenings have been in good demand at firm prices.

Old Material.—The market for scrap shows a little better tone in all divisions except, perhaps, the relaying rail section, where the demand has fallen to almost nothing because of the absence of the lumber companies from the market. No lists came out during the week, but several are carded to appear soon after the first of the month. In general the dealers are hopeful of better things and if the weather turns cold enough, cutting off the gathering up of scrap, there are likely to be some lively increases in prices. Dealers' prices, f.o.b. St. Louis, per gross ton, we quote as follows:

Old iron rails	$12.50 to $13.00
Old steel rails, re-rolling	12.00 to 12.50
Old steel rails, less than 3 ft.	10.50 to 11.00
Relaying rails, standard section, subject to inspection	21.00 to 21.50
Old car wheels	12.00 to 12.50
Heavy melting steel scrap	10.50 to 11.00
Frogs, switches and guards cut apart	10.50 to 11.00

The following prices are per net ton:

Iron fish plates	$10.50 to $11.00
Iron car axles	17.50 to 18.00
Steel car axles	15.50 to 16.00
No. 1 railroad wrought	10.75 to 11.25
No. 2 railroad wrought	9.75 to 10.25
Railroad springs	9.75 to 10.25
Locomotive tires, smooth	13.50 to 14.00
No. 1 dealers' forge	7.50 to 8.00
Mixed borings	5.50 to 6.00
No. 1 busheling	9.00 to 9.50
No. 1 boilers, cut to sheets and rings	7.50 to 8.00
No. 1 cast scrap	9.00 to 9.50
Stove plate and light cast scrap	7.50 to 8.00
Railroad malleable	8.00 to 8.50
Agricultural malleable	7.00 to 7.50
Pipes and flues	8.00 to 8.50
Railroad sheet and tank scrap	7.50 to 8.00
Railroad grate bars	7.00 to 7.50
Machine shop turnings	7.00 to 7.50

Boston

BOSTON, MASS., November 28, 1911.

Old Material.—The situation in New England has not changed. No transactions of importance are reported. The prices quoted below are those offered by the large dealers to the producers and to the smaller dealers and collectors, per gross ton, carload lots, f.o.b. Boston and other New England points, taking Boston rates from eastern Pennsylvania points. In comparison with Philadelphia prices the differential for freight of $2.30 a ton is included. Mill prices are approximately 50c. a ton more than dealers' prices:

Heavy melting steel	$9.50 to $10.00
Low phosphorus steel	11.45 to 11.95
Old steel axles	14.00 to 14.50
Old iron axles	17.00 to 18.00
Mixed shafting	12.75 to 13.25
No. 1 wrought and soft steel	10.50 to 10.75
Wrought iron pipe	8.75 to 9.00
Skeleton (bundled)	7.00 to 7.50
Cotton ties	7.00 to 7.50
No. 2 light	4.50 to 5.00
Wrought turnings	5.00 to 5.50
Cast borings	4.50 to 5.00
Machinery, cast	12.50 to 13.00
Malleable	9.25 to 9.75
Grate bars	6.00 to 6.50
Stove plate	8.00 to 8.50

Buffalo

BUFFALO, N. Y., November 28, 1911.

Pig Iron.—There has been a good deal of quiet buying during the week, and market conditions look better than at any time for several months. Sales for this territory in the week just ended have aggregated about 50,000 tons of foundry grades, 20,000 tons of malleable and some basic for spot, first quarter and first half delivery, and additional inquiry for 10,000 to 12,000 tons not yet placed. A small portion of the business placed was for export to Canadian consumers. New orders for prompt delivery and heavy shipments on current quarter contracts are depleting furnace stocks at an increasingly rapid rate, and one large interest reports practically nothing left on yards except a few hundred tons of special iron which is being held on orders already received. Competition from other districts keeps prices from reaching any higher level. Some furnaces, however, are turning down 1912 business except at the top prices of the ruling schedule on account of being practically booked to present capacity for delivery for the remainder of the year. One furnace interest reports the booking of 35,000 tons during November for delivery over the first quarter. For current quarter and first half delivery we quote as follows, f.o.b. Buffalo:

[illegible]	[illegible]
[illegible]	[illegible]
[illegible]	[illegible]
[illegible]	13.00 to 13.25
[illegible]	13.00
Malleable	13.50 to 14.00
[illegible]	14.00 to 14.25
[illegible]	14.50 to 14.75

Old Material.—There is continued improvement in the tone of the market. Inquiries are coming in more freely and considerable new business has developed in the week. Shipments on contracts are moving in increasing volume. A much better feeling exists among dealers generally, who anticipate a more pronounced increase in the amount of new business in the near future on account of the larger requirements in the production of material for the filling of railroad orders. We quote as follows per gross ton, f.o.b. Buffalo:

Heavy melting steel	$12.50 to $13.00
Low phosphorus steel	15.75 to 16.25
No. 1 railroad wrought	14.00 to 14.50
No. 1 railroad and machinery cast scrap	13.50 to 14.00
Old steel axles	18.50 to 19.00
Old iron axles	22.00 to 22.50
Old car wheels	12.25 to 12.50
Railroad malleable	12.25 to 12.75
Boiler plate	12.25 to 12.75
Locomotive grate bars	11.00 to 11.25
Pipe	9.25 to 9.50
Wrought iron and soft steel turnings	6.75 to 7.00
Clean cast borings	6.25 to 6.50

Finished Iron and Steel.—The change of sentiment for the better noted during the past two weeks has been emphasized in the week just closed and an improved underlying feeling is manifest. Buyers are showing increasing inclination to negotiate contracts. In place of maintaining an indifferent attitude they are taking rather an aggressive stand for purchasing material for delivery as far into next year as possible. They are meeting strong opposition from sellers in securing such contracts at to-day's prices at least beyond the first quarter; but quite a number of contracts for bars, plates and shapes has been closed for delivery limited to the first quarter. Current prices in this territory are 1.10c., Pittsburgh base, for bars and small shapes for immediate specification, and shipment at convenience of mills, and 1.15c. for desirable tonnage of structural shapes and plates. The usual asking price for small lots and less desirable bar offerings is 1.15c. and 1.20c. to 1.25c. for plates and shapes on orders of the same character. The week has shown considerable buying of nails and wire products for spring delivery. The Turner Construction Company has the contract to erect a 6-story reinforced concrete warehouse for the Keystone Warehouse Company, Buffalo, which will require 150 tons of reinforcing bars, and Stewart & Co., Chicago, have the contract for the Kellogg elevator addition, this city, requiring 100 tons of reinforcing bars. The Canadian export trade is fair and many buyers are showing a disposition to make contracts for requirements well into next year. Business in fabricated structural material continues to be very active for the season, and some fabricators anticipate there will be a strengthening of prices by or before the end of the year. The Charles F. Ernst Sons Iron Works, Buffalo, was low bidder for the 735 tons of steel required for the remodeling of the Sixty-fifth Regiment Arsenal for use as a city convention hall and exposition building, and the Buffalo Structural Steel Company has received the contract for the fabrication and erection of the steel for the Niagara Storage Company's warehouse addition, 175 tons, and for the steel for the Bennett store and apartment building, Buffalo, 100 tons. The American Bridge Company has been awarded the contract for the Edwards department store building, Rochester, requiring 1800 tons of steel, and the same company was awarded the contract for the 2200 tons of steel for the 15-story Seneca telephone building. The 200 tons of steel for the Elmwood avenue telephone substation were awarded to the Buffalo Structural Steel Company. The Lackawanna Bridge Company, Buffalo, has taken a 400-ton bridge contract for the Monon Railroad Company and contract for steel work for a power house at Ft. Worth, Texas, requiring 100 tons of steel.

The German Iron Market

Looks Much Like a Boom

BERLIN, November 17, 1911.

The favorable tendency of the iron trade remains undiminished. On the Dusseldorf Exchange a week ago there was an almost general advance in prices. Most of these merely took account of the recent advances made by trade combinations, as already reported in this correspondence. Steel bars, however, which are not controlled by an organization, were quoted at 104 to 107 marks, as compared with 103 to 106 for the previous week.

The activity at furnaces and mills has rather increased within a week, and the general aspect of the trade is that of a great boom period. The average of orders at steel plants runs to about April 1. Specifications on contracts are everywhere coming in briskly, but most of the works are demanding six to eight weeks for making shipment. Not a few establishments cannot agree to make prompt delivery, even upon payment of a premium.

The foreign demand for iron and steel continues very good and contributes materially to the activity of the trade. Even pig iron is being taken for export in larger amounts than usual. It is believed that the firm tendency of prices has not yet exhausted itself, and that further advances will occur.

An increase in the demand for ore is reported from the Siegerland region. That district has just taken contracts for 150,000 to 200,000 tons of brown iron ore yearly, for shipment to the Silesian district, subject to a reduction of railroad freights, now nearly 12 marks a ton, by one-third by the railroad authorities. This is a new departure, Siegerland ores never having been shipped before to Silesia. Ore prices continue firm for all classes.

Cast Iron Pipe Trade Better Than Ever Before

Business in pig iron is very active. Specifications have increased. Many of the big mixed works, which generally produce all the iron they need, are now buying extra amounts in the market. Manufacturers of cast iron pipe are taking unusually large quantities. It is said that they are doing a better business than ever before. The reason for this is found in the fact that many water works are being enlarged, or new ones put in, owing to the effects of the great drouth of the past summer.

The great specialities of the Steel Works Union—semi-manufactured material, rails and structural shapes—continue in much the same condition as previously reported. In bars the situation has further improved for basic steel. Dealers, having at last become convinced that there is to be no relaxation of prices, have latterly been buying heavily. The big mixed establishments have sold out their capacity in bars to the end of March, and are refusing further orders at existing prices. The foreign market continues to take large amounts at about 100 marks per ton f.o.b. Antwerp. The trade combination controlling bar iron will soon begin taking orders for the first quarter of 1912; an advance of about 2.50 marks is looked for. The export demand for bands and hoops is good, and prices, which are now unsatisfactory, are expected to advance soon. The previous activity in plates of all thicknesses continues unabated.

The news from the Belgian market this week is good, but, after the steady upward movement of prices during the past month or two, a quieter pace seems to prevail now. No further price advances have been reported from there.

New York

NEW YORK, November 29, 1911.

Pig Iron.—The volume of business has increased in the past week but prices have not improved; in fact they are slightly lower. The furnaces represented by local offices, particularly those in the Buffalo district, have closed with a good many buyers, the deliveries being almost entirely for the first quarter and the first half of 1912. The Buffalo furnaces have apparently done a good deal more business in Western New York territory than in the Manhattan district or in New England. They have also placed quite a little iron in Canada and on this business the basis was somewhat below $13 at furnace for No. 2 X, as low as $12.75 being reported. Contrary to what has been true on other buying movements in Canada, the Canadian furnaces in this case assumed the aggressive. The business reported in New York State consists of basic, foundry and malleable grades, basic selling at $13 to $13.25 Buffalo. A large electric company is still in the market for a total of 6000 tons for its New England and Eastern New York works, its recent purchases amounting to about 2000 tons. A malleable foundry in New England has inquired for 1000 tons, and a large heater interest in New Jersey for 1800 tons for the first quarter of 1912, with the possibility of taking 1800 tons additional for the second quarter. The weekly reports of buying by Eastern pipe foundries keep up, with perhaps more basis of fact this week than usual, contracts having been closed here by the leading pipe interest for some of its Western and Southern plants. The total is put at upward of 30,000 tons. More selling of Southern iron at $9.75 Birmingham for No. 2 is reported, and while it is stated that the lower grades are relatively firmer, this would seem to be disputed by a sale of No. 4 at $9 Birmingham. Reports from New Jersey and Pennsylvania territory indicate sharper competition in the past week and Pennsylvania furnaces west of the Alleghenies have been closely competing with Buffalo producers for business in New England. Quotations are as follows for northern iron at tidewater: No. 1 foundry, $15 to $15.25; No. 2 X, $14.75 to $15; No. 2 plain, $14.50 to $14.75. For southern iron we quote $15 to $15.25 for No. 1 foundry and $14.50 to $14.75 for No. 2 foundry.

Finished Iron and Steel.—There is an increased volume in business but even this and other favorable conditions have not served to stiffen prices. Architects are reported to have more projects under consideration than probably has ever been the case, but few of these promise early settlement. From a reliable source it was learned that not a few of these projects are of the investment sort and not of the speculative variety,—in short, they are the kind likely to prove attractive. The week has seen a large amount of structural work settled, as the subjoined list will indicate, and as regards the price situation, it is interesting to add that a considerable number of sellers are asserting that they will not attempt to meet the low prices obtaining in other centers, preferring instead to let the business go elsewhere. That the situation has not strengthened in all respects is shown, for example, by the action of two different sellers' representatives calling within a few hours of the same day on a large buyer, urging him to make offers for open-hearth billets although the likelihood of his needing them was problematical. The plate business has shown no betterment over last week and Eastern mills are thought to be operating at about 50 per cent. capacity. Steel bars have been contracted for in this market at 1.10c., Pittsburgh basis, for jobbing contracts for the first quarter and at the same price for manufacturers' requirements up to July 1, although the volume of business has not been very large. Of structural work pending, it is understood that the 2500-ton Graphic Arts building on West Twenty-fifth street is being refigured; the 50,000 to 60,000 tons required to complete the New York Connecting Railroad will probably not be settled for months; no decision has been made at this writing on the 3000-ton Eagle Silk building; it is expected that bids will be asked soon for a 1300-ton highway bridge at Lewistown, Pa.; about 350 tons additional steel for the New York Central terminal work are wanted, and it will probably not be long before bids will be advertised for the approach reconstruction at both ends of the Brooklyn Bridge. Among recent awards the American Bridge has received a large tonnage in the Eastern section of the country, including 4000 tons for the Bureau of Engraving and Printing, Washington, D. C.; 2200 tons for the Seneca telephone building, Buffalo; 8150 tons for section 15 of the New York subway, and 2000 tons for the Pennsylvania Railroad bridge at Williamsport, Pa., credited a few weeks ago to another company. Other awards are as follows: Hyde Building, Twenty-fifth street and Madison avenue, 4700 tons, to Levering & Garrigues Company; Flanders Hotel addition, 700 tons, to Hedden Iron Construction Company; bridge at Pittsburgh for the Pennsylvania Railroad, 300 tons, understood to have been taken by the McClintic-Marshall Construction Company, which has a 100-ton bridge for the Boston & Maine; Y. M. C. A. Building, Boston, 1100 tons, to the New England Structural Company; bridge, Baltimore & Ohio, Pittsburgh division, 400 tons, to Fort Pitt Bridge Company; Castle Square Building, Boston, 200 tons, G. W. & F. Smith Iron Works, and an apartment house, Backer Construction Company, Fifty-fifth street, New York, to Hay Foundry & Iron Works; some 2000 tons in bridges for the Chesapeake & Ohio have been placed, and 200 tons for the Pennsylvania Railroad at Jersey City. The Hedden Construction Company is general contractor for the Jersey City post office. The Boston & Maine will take bids December 4 for a 150-ton bridge at Lynn, Mass., and the New York, New Haven & Hartford has inquiries out for a 500-ton bascule bridge at Buzzard's Bay. The quotations, which recognize the Pittsburgh market, with the stipulation that little or no business at the low levels seems to be taken in this territory, are: Steel bars, 1.21c. to 1.31c.; plates and plain structural material, 1.26c. to 1.36c.; bar iron, 1.25c. to 1.30c., all New York. Plain material and plates from store, New York, 1.60c. to 1.70c.

Cast Iron Pipe.—The Consolidated Gas Company, New York, has purchased the 15,584 tons referred to last week for spring delivery, all, or at least the greater part, having been bought from the leading interest. The other large inquiries are understood to be still pending. Numerous other important buyers are in the market for delivery next spring. One of the largest inquiries now out comes from Portland, Oregon, for 12,000 tons of water pipe, which is to be closed December 12. Carload lots of 6 in. are quoted at $22 to $23 per net ton, tidewater.

Old Material.—Dealers are encouraged by the better demand in some branches but buying is by no means general. Old car wheels and cast scrap are called for in somewhat larger quantities, due undoubtedly to the orders for cars recently placed, which will cause foundry operations to be somewhat augmented. Heavy melting steel scrap is quiet as dealers and consumers are somewhat apart in their views regarding prices. Dealers' prices, per gross ton, New York and vicinity, are as follows:

Old girder and T rails for melting	$9.25 to $9.75
Heavy melting steel scrap	9.25 to 9.75
Relaying rails	20.00 to 21.00
Rerolling rails (nominal)	11.25 to 11.75
Iron car axles	19.00 to 19.50
Old steel car axles	15.00 to 15.50
No. 1 railroad wrought	11.75 to 12.25
Wrought iron track scrap	10.50 to 11.00
No. 1 yard wrought, long	10.25 to 10.75
No. 1 yard wrought, short	9.25 to 9.75
Light iron	3.75 to 4.25
Cast borings, clean	5.75 to 6.25
Mixed borings and turnings	5.00 to 5.50
Wrought turnings	6.25 to 6.75
Wrought pipe	9.00 to 9.50
Old car wheels	10.50 to 11.00
No. 1 heavy cast, broken up	10.50 to 11.00
Stove plate	8.25 to 8.75
Locomotive grate bars	8.25 to 8.75
Malleable cast	10.00 to 10.50

Ferroalloys.—The market continues firm with a tendency in ferrosilicon to advance. The price of 80 per cent. ferromanganese is held at $38.50, Baltimore, forward delivery; a Pittsburgh company is in the market for 350 tons. Ferrosilicon is quoted at $70, Pittsburgh, and it is asserted that sales have been made at that price. Consumers appear to be in need of ferroalloys as they are urging delivery on their contracts and recent buying.

Metal Market

NEW YORK, November 29, 1911.

The Week's Prices

Cents Per Pound for Early Delivery.

	Copper, New York.			Lead—		Spelter—	
Nov.	Lake.	Electrolytic.	Tin, New York.	New York.	St. Louis.	New York.	St. Louis.
23	13.10	12.87½	43.00	4.35	4.25	6.80	6.65
24	13.12½	13.00	44.60	4.35	4.25	6.80	6.65
25	13.25	13.00	45.00	4.45	4.35	6.80	6.65
27	13.25	13.12½	45.50	4.45	4.35	6.90	6.75
28	13.25	13.12½	45.50	4.45	4.35	6.90	6.75
29	13.25	13.12½	45.25	4.45	4.35	6.95	6.80

Prices advanced during the week on all metals except antimony. The tin market was very active Thursday, Friday and Saturday. Spelter continues scarce and tightly held and tin is not plentiful.

Copper.—The copper market remains fairly firm. Electrolytic is quoted in New York about 13.12½c. to 13.25c. Domestic demands seem to be about satisfied for the present. Some producers are well sold up and are declining to sell for future delivery at any price. One large seller, practically the only one which can make early delivery, quotes electrolytic at 13.12½c. f.o.b. New York, cash. Other sellers ask 13.25c., cash 30 days, and a few small lots have been snapped up at that price. Lake copper is quoted at 13.25c. London quotes spot copper at £58 18s. 9d., futures at £59 12s. 6d. The exports of copper to date total 25,250 tons.

Pig Tin.—As had been anticipated, the price of pig tin has been advanced, 45.25c. now being quoted in New York. A very active market started Thursday and continued Friday and Saturday. A large business was done for December and January delivery, footing probably 1500 tons in the three days. The activity is believed to be due to conditions in London where the syndicate is in firm control. Shipments from the Straits are the smallest of many months. London quotes spot tin £201, futures £191 10s., and buyers must go to London for their supply. Stocks here are low. The delivery into consumption to date has been 3100 tons, leaving 898 tons on hand. The arrivals of tin so far this month are 2229 tons, with the amount afloat estimated at 1305 tons.

Tin Plates.—The demands of the canners for tin plates have developed with the season and the trade has increased accordingly. Other consumers, such as the tinware manufacturers, have less business at this season, public attention being turned as a rule to holiday goods, but the tinware manufacturers are expected to come in the market strong after the first of the new year. The price is unchanged at $3.64 for 100 lb. coke plates in New York. The price for tin-plates laid down at Swansea, Wales, is also unchanged at 13s. 6d.

Lead.—The price of lead was advanced 10c. per 100 lb. by the American Smelting & Refining Company on November 27, making the New York price 4.45c. and the St. Louis price 4.35c. The outside price is 4.50c. The market is firm and active.

Spelter.—This metal continues to advance. The price in New York is 6.95c. and in St. Louis 6.80c. Manufacturers of galvanized sheets and other galvanized material have felt the high prices keenly and are complaining that the spelter costs are out of all proportion with the prices they obtain for their products. Spelter is so scarce that none can be had from the West until the first half of January. Retail lots are selling at 7.25c. per lb.

Antimony.—Antimony has not shared the general advance in price. There is no special activity in the market. Cookson's is quoted at 7.75c. to 7.87½c.; Hallett's, 7.60c. to 7.70c.; Hungarian and Chinese grades, 6.90c.

Old Metals—The demand is good and dealers' selling prices have been advanced as follows:

	Cents per lb.
Copper, heavy and crucible	12.25 to 12.75
Copper, heavy and wire	12.00 to 12.50
Copper, light and bottoms	11.00 to 11.25
Brass, heavy	8.75 to 9.00
Brass, light	6.75 to 7.00
Heavy machine composition	11.00 to 11.25
Clean brass turnings	8.25 to 8.50
Composition turnings	9.00 to 9.50
Lead, heavy	4.20
Lead, tea	3.95
Zinc, scrap	5.25

Chicago

NOVEMBER 27.—In sympathy with the strong Eastern market, the local price of both casting and Lake copper has advanced. Tin, spelter and zinc are also quoted higher, though in some quarters these advances are considered artificial. Local buying has been fairly active. We have revised our prices and quote at Chicago as follows: Casting copper, 13.25c.; Lake, 13.50c., in carloads, for prompt shipment; small lots, ¼c. to ⅜c. higher; pig tin, carloads, 46.50c.; small lots, 49.50c.; lead, desilverized, 4.30c. to 4.35c., for 50-ton lots; corroding, 4.55c. to 4.60c. for 50-ton lots; in carloads, 2½c. per 100 lb. higher; spelter, 6.80c.; Cookson's antimony, 8.75c., and other grades, 7.75c. to 8.25c., in small lots; sheet zinc is $8.50, f.o.b. La Salle or Peru, Ill., less 8 per cent. discount, in carloads of 600-lb. casks. On old metals we quote buying prices for less than carload lots: Copper wire, crucible shapes, 10.75c.; copper bottoms, 9.62½c.; copper clips, 10.50c.; red brass, 9.75c.; yellow brass, 7.50c.; lead pipe, 3.85c.; zinc, 4.50c.; pewter, No. 1, 26c.; tinfoil, 32c.; block tin pipe, 36c.

St. Louis

NOVEMBER 27.—The metal market here is still on the upward march and the figures to-day show decided gains over last week. Lead is quoted sharply higher at 4.37½c. and strong at that figure. Spelter, which showed a slight recession late last week, took a turn about to-day and rose to 6.85c., at which it was firmly held. Tin is strong at 45.35c. Copper took a spurt, Lake being quoted at 13.72½c., and electrolytic at 13.62½c. Cookson's antimony is off to 8.22½c. The general demand is quiet, largely on account of the advances which are making buyers cautious. In the Joplin ore market the highest price of the year for zinc blende was reached, offerings going to $50.59, contract figures, on a basis of 60 per cent. metallic zinc, this figure being reached on the spelter average at East St. Louis. In the open market blende went to $47, basis of 60 per cent. metallic zinc, while better grades reached $48. The highest price in the open market was $50, while choice lots selling on contract brought $53. Calamine continued in good demand, bringing $24 to $28 per ton, assay basis of 40 per cent. metallic zinc, while the choice lots reached $35. Lead ore brought $56 to $58 per ton. On old metals we quote: Light brass, 4c.; heavy brass and light copper, 8c.; heavy copper and copper wire, 9c.; zinc, 3c.; lead, 3.25c.; pewter, 20c.; tin foil, 29c.; tea lead, 3c.

Iron and Industrial Stocks

NEW YORK, November 29, 1911.

The stock market has shown well sustained strength in iron and industrial stocks, due largely to the greater volume of business in iron and steel products. Conspicuous in strength has been Can preferred, which sold at the highest price ever realized on this stock. The range of prices on active iron and industrial stocks from Wednesday of last week to Tuesday of this week was as follows:

Allis-Chalm., com....	3⅛- 3¼	Pressed Steel, com..	33¼- 34¼
Allis-Chalm., pref.....	13	Pressed Steel, pref.....	100
Beth. Steel, com....	30 - 30¼	Railway Spring, com.	32 - 32⅝
Beth. Steel, pref....	57 - 60	Railway Spring, pref.	101⅞-102⅝
Can. com.....	111¼- 115⅛	Republic, com.....	23 - 23⅞
Can. pref.....	90 - 91⅛	Republic, pref.....	82⅞- 84⅝
Car & Fdry., com..	54¼- 56½	Pipe, com.....	14⅛- 14½
Car & Fdry. pref...	116 -116¼	Pipe, pref.....	44½- 47
Steel Foundries.....	34 - 34⅝	U. S. Steel, com....	63⅜- 65⅞
Colorado Fuel	27 - 29¼	U. S. Steel, pref...	109 -109¾
General Electric....	154¼-156	Westg. Elec.....	65⅛- 66
Gr. N. Ore Cert....	42¾- 43½	Va. I. C. & C.....	60 - 62
Int. Harv., com....	104½- 109	Am. Ship. com.....	48
Int. Harv., pref.....	120½	Chic. Pneu. Tool...	45¼- 45½
Int. Pump, com....	33⅛- 34⅝	Cambria Steel.....	43⅝- 44¼
Int. Pump, pref....	82¾- 83⅞	Lake Sup. Corp.....	26½- 27⅜
Lackawanna Steel...	31 - 32	Warwick	10⅛
Locomotive, com....	36½- 37½	Crucible Steel, com.	11½- 11¾
Locomotive, pref....	102½-104	Crucible Steel, pref.	80 - 81⅝
Nat. En. & St., pref.	96 - 96½		

Dividends Declared

The Republic Iron & Steel Company, regular quarterly, 1¾ per cent. on the preferred stock, payable January 2.

The Safety Car Heating & Lighting Company, regular quarterly, 2 per cent. and extra 1 per cent., payable December 22.

The Railway Steel Spring Company, regular quarterly, 1¾ per cent. on the preferred stock, payable December 20.

The Wheeling Steel & Iron Company, quarterly, 2 per cent., payable December 1.

Upson Nut Company Sold to Bourne-Fuller Company

CLEVELAND, OHIO, November 29, 1911.—(*By Telegraph.*)—The Bourne-Fuller Company, jobber of iron and steel, Cleveland, Ohio, has concluded negotiations through which it will acquire control of the Upson Nut Company, owning a blast furnace, steel plant and bolt and nut works in Cleveland and another bolt and nut works in Unionville, Conn. The transfer of ownership will take place January 1. The two companies will continue to be operated as separate concerns. The present Upson Nut Company, a Connecticut corporation, will pass out of existence. A new Ohio corporation, bearing the same name, has been formed, which will acquire the assets of the old company. The Bourne-Fuller Company will largely increase its capital to provide funds for the purchase of the Upson properties. In the extension of the Bourne-Fuller Company some new Cleveland interests will become affiliated with it.

Personal

W. H. Meyst has been placed in charge of the office just opened by the DeForest Sheet & Tinplate Company, Niles, Ohio, at 836 First National Bank Building, Chicago. The office will handle the sale of steel sheets and black and galvanized roofing. Mr. Meyst was formerly associated with Theodore Geissman & Co. E. D. Thompson, secretary of Theodore Geissman & Co., will become associated with the new DeForest Chicago office January 1.

Alfred Crook, former superintendent of the Philadelphia Roll & Machine Company, Philadelphia, Pa., has been appointed general manager, to succeed August Marx, deceased. The announcement is officially made by William Selfridge, president. Mr. Crook has been actively connected with rolling mills and their machinery and equipment since the age of 14, when he started work in the mills of the old Brown-Bonnell Iron Company, Youngstown, Ohio. He then learned the molding trade and for several years was engaged in the foundry business in Youngstown, Ohio, under the firm name of Crook & Griffith, but after three years disposed of his interest to become superintendent of the Youngstown Iron Sheet & Tube Company. After four years' service he resigned to accept the position of superintendent of the Philadelphia Roll & Machine Company.

Franklin Alter, the venerable president of the American Tool Works Company, Cincinnati, Ohio, fell on a slippery pavement November 22, dislocating his right shoulder and suffering other injuries. On account of his advanced age it was thought that he was seriously hurt, but later advices are more reassuring.

W. B. Franklin, of the Philadelphia office of the United States Cast Iron Pipe & Foundry Company, has been appointed to succeed A. J. Goodhue as Western sales manager, in charge of the Chicago office. Mr. Goodhue has been absent from the office for several months because of illness and his condition continues discouraging.

In the changes in the officials of the Trenton Iron Company, Trenton, N. J., incident to the resignation of President H. G. Stoddard, it is announced that J. W. Smith, formerly superintendent of plant, has been made general manager and W. E. Cone, New York sales manager, has been made general sales agent.

F. H. N. Gerwig, assistant superintendent of the Carrie furnaces of the Carnegie Steel Company, has resigned to become superintendent of blast furnaces of the Pittsburgh Steel Company, Monessen, Pa., and will look after the erection of the two or three blast furnaces to be erected there, which are expected to be completed and in operation late in 1912 or early in 1913. His resignation becomes effective January 1, and his successor has not been appointed.

W. R. Balsinger, manager of sales in the armor plate department of the Carnegie Steel Company, Pittsburgh, has just returned from Europe, where he secured the order from the Italian Government for 5000 tons of armor plate and for 1650 tons of Carnegie specially treated deck plates.

Obituary

WILLIAM E. HARRIS, Niles, Ohio, died November 17, aged 76 years. He was born in England, became an employee of a rolling mill at a very early age, and acquired a high reputation as a sheet roller. He was induced to come to this country shortly after he was 21 years old by Phillips & Jordan, Covington, Ky. His subsequent American experience in rolling mills was at Newport, Ky.; Cincinnati, Ohio; Chicago, Ill., and St. Louis, Mo. He was the general superintendent for the St. Louis Stamping Company (Neidringhaus Brothers) for 13 years and himself rolled the first black plates for tinning made by that pioneer establishment in manufacturing tin plate under the McKinley tariff act. In 1892 he built the tin plate mills for the Falcon Iron & Tin Plate Company at Niles. The Falcon Company, in which he had a large interest, was merged in the American Tin Plate Company in 1899, when Mr. Harris retired. He was the inventor of numerous devices in connection with the manufacture of tin plate. He leaves a widow, two daughters and a son.

AUGUSTUS P. THOMPSON, one of the pioneer iron manufacturers of Buffalo, N. Y., died in that city November 24, aged 87 years. In 1860 Mr. Thompson, associated with Edward S. Warren and De Garmo Jones, built the second anthracite blast furnace erected in Buffalo, the first having been built by Palmer & Co. The two concerns were soon consolidated as the Buffalo Union Iron Works and built one of the largest rolling mills in the country at that time. Mr. Thompson remained with the company until 1866, when he bought an interest in the white lead manufactory of S. G. Cornell & Son, afterward incorporated as the Cornell Lead Works, of which he became president. Since that company's merger with the National Lead Company Mr. Thompson had been manager of the Buffalo branch.

ROBERT C. MORRISON, founder and president of the Joliet Bridge & Iron Company, Joliet, Ill., died suddenly November 24, during the convalescent period following typhoid fever, aged 55 years. He was born in Scotland and located in Joliet in 1880. He was active in the municipal and religious life of his city.

HARRY F. FORBES, president of the Rockford Malleable Iron Works, Rockford, Ill., died November 20. He had not been in robust health. He attended a football game at Ann Arbor, November 18, and died suddenly on reaching home. He was also president of the Peoples Bank of Rockford.

To Concentrate Moose Mountain Iron Ores

A contract has recently been made between the American Grondal Company, 45 Wall street, New York, and Moose Mountain, Ltd., licensing the latter to operate a plant for the wet magnetic concentration and briquetting of magnetite ores under the Grondal patents in connection with its mining operations in Hutton township, district of Nipissing, Ontario. The Moose Mountain company for some time has conducted both in Europe and the United States an investigation of the treatment of ores of the type it is proposed to use. This investigation has been under the direction of C. E. Herrmann, assistant to the president of the company. He has consulted freely with Joseph Sellwood, Duluth, vice-president and general manager of the Moose Mountain company, and also with Leonard B. Miller, of Oglebay, Norton & Co., Cleveland. All sampling and analytical work in connection with experimental tests have been in charge of F. A. Emmerton, Cleveland.

A plant with a nominal capacity of about 375 tons a day of finished material is now under construction at Sellwood, Ontario, and is expected to be in operation in the season of 1912. Construction is in charge of the company's superintendent, F. A. Jordan. Alex. Laughlin & Co., Pittsburgh, are construction engineers and have retained Hamilton & Hansell, New York, as consulting engineers regarding features of the plant directly affecting the Grondal process. The product from the plant will be in the form of briquettes containing 63 per cent. metallic iron and about 0.02 per cent. phosphorus. The Moose Mountain company has available a vast amount of ore that may be utilized by concentration, and if the new plant proves successful commercially its capacity will be greatly increased.

Railroad Equipment Orders.—Orders for box cars recently placed by the Canadian Pacific include 2500 to be built by the Canadian Car & Foundry Company, 1000 by the Pressed Steel Car Company and 1000 by the American Car & Foundry Company. The Grand Trunk has bought 2000 hopper cars from the Pressed Steel Car Company. The Missouri Pacific has bought from the American Car & Foundry Company 1500 freight cars, two-thirds of them automobile cars, and from the Standard Steel Car Company 500 freight cars. All are to be of 80,000-lb. capacity. These orders make 5400 cars bought by the Missouri Pacific since August. The Atchison, Topeka & Santa Fe is said to be figuring on 8000 cars, but no confirmation has been had. The Harriman Lines are expected to be in the market soon for 12,000 to 40,000 freight cars.

Pittsburgh and Vicinity Industrial Notes

The United Engineering & Foundry Company, Pittsburgh, has received an order from the American Hoist & Derrick Company, St. Paul, Minn., for a 150-ton, high-speed, steam hydraulic forging press. The machine will be delivered from stock, as the company makes this size in half-dozen lots.

C. R. Doyle, secretary of the Borough Council, Ambridge, Pa., will receive bids December 4 for the construction of a municipal water plant. Plans and specifications are on file at the office of the engineer, J. P. Leaf, Rochester, Pa.

The Erie City Iron Works recently contracted through T. H. McGraw, Jr., its district sales agent, Pittsburgh, Pa., with the Ben Franklin Coal Company for a complete power plant, consisting of a 19 x 18, side-crank, high-speed engine, direct connected to a 150-kw General Electric generator, with boilers, heater, foundations and building for complete installation, also an electric locomotive. The machinery will be located at the Ben Franklin Company's new development at Moundsville, W. Va.

The Parkersburg Bridge Company, it is announced, will shortly begin the erection of a steel suspension bridge across the Ohio River between Parkersburg, W. Va., and Belpre, Ohio, involving an expenditure of $450,000. Plans have been prepared by E. K. Morris, Pittsburgh, Pa.

The Manufacturers' Publicity Association, composed of representatives of the manufacturing concerns of Pittsburgh and vicinity, held its annual meeting and election of officers in the Fort Pitt Hotel last week. J. C. McQuiston, Westinghouse publicity manager, was chosen president; Stephen C. Mason, secretary McConway-Torley Company, vice-president; A. W. Kerin, advertising manager Mesta Machine Company, was re-elected treasurer; C. W. Brooke was chosen secretary for the third term. It was decided to co-operate with the Industrial Development Commission in advertising Pittsburgh and to lend the assistance of the association to C. B. Nash, instructor in charge of the advertising course of the Young Men's Christian Association.

The directors of the Seneca Chain Company, with works at Kent, Mansfield and Zanesville, Ohio, have voted to reduce the common stock from $294,300 to $147,150.

Work has started on the erection of 22 additional stories to the First National Bank Building, Wood street and Fifth avenue, Pittsburgh, by the Thompson-Starrett Company, the structural steel being fabricated and furnished by the Riter-Conley Mfg. Company.

The American Sheet & Tin Plate Company, Frick Building, Pittsburgh, has issued a leather-bound, well-printed booklet, giving information which the trade will highly appreciate regarding ratios of odd sizes of tin plate and also presenting a complete list of the district sales managers in its various branch offices throughout the country.

The Russel Machine Company, Twenty-eighth street and Allegheny Valley Railway, Pittsburgh, dealer in second-hand machinery, has awarded a contract to the Fort Pitt Bridge Works, Pittsburgh, for a steel building, 50 x 120 ft., to be iron clad, the erection of which will commence next month. When finished it will be equipped for the repairing of used machinery. The company requires a 10-ton crane for the new building and will likely purchase a hand-operated type.

United Engineering & Foundry Company, Pittsburgh, Pa., has shipped to the American Bridge Company, Ambridge, Pa., one 150-ton, high-speed hydraulic forging press, being the second press of this type purchased by the same buyer within six months.

R. W. Oswald, Jenkins Building, Pittsburgh, has been appointed district representative for the Nagle-Corliss Engine Works, Erie, Pa., for its line of Corliss and four valve engines, ranging from 25 to 1500 hp.

Joseph T. Ryerson & Son, Chicago, are now issuing a weekly stock list, the first list being under date of November 13. On one side are printed the stocks of shapes, plates, bars and rivets and on the reverse side the various specialties carried. This list has the advantage of being printed on a heavy, stiff paper of sufficient weight to make it durable and so that it may be kept in a conspicuous place conveniently.

An Interesting Engine Order

Mackintosh, Hemphill & Co., Pittsburgh, have received an order from the Algoma Steel Company, Ltd., Sault Ste. Marie, Canada, for a 36 x 42-in. three-cylinder, direct-connected reversing engine, for driving the new billet mill. This engine will be designed with the steam and exhaust piping arranged so that it can be operated either as a three-cylinder high pressure, or, by using one cylinder for high pressure steam and the two others low pressure, as a compound.

This particular type of engine was selected by W. C. Mitchell, general manager of the Algoma Company, as being best fitted to meet its special requirements. The mill is to be used chiefly for rolling small billets from blooms and therefore must necessarily be run at a high speed. The company wishes to avoid a shut-down in operations during the period of taking out the old 30-in. blooming mill and the installation of a new 35-in. blooming mill and 55 x 60-in. direct-connected reversing engine, and desires to use the new equipment temporarily for rolling ingots down to rail blooms. In order to get the additional power required for doing this work, all three cylinders of the new engine will be run under high-pressure steam. After the new 35-in. blooming mill is put in operation, it is the intention to run the engine compound on the smaller work.

Mackintosh, Hemphill & Co. having received the above order, a rare opportunity will be offered those interested to see under construction at one time three distinct types of direct-connected reversing blooming mill engines, namely, the engine above referred to; a 55 x 60-in. twin-cylinder, direct-connected reversing engine for the same concern, which is to run in conjunction with a low-pressure turbine of European make, and a 44 and 70 x 60-in. twin, tandem-compound, condensing, direct-connected reversing engine for the Pittsburgh Crucible Steel Company. This is worthy of mention, in that it shows the diversity of requirements to be met in modern rolling mill practice.

Plans of the Otis Steel Company

At the annual meeting of the Otis Steel Company, Ltd., at London, England, November 10, the chairman, T. Frame Thomson, who had just returned from a visit to the steel works of the company at Cleveland, Ohio, said that two proposals were under consideration which would in due time be acted upon by the directors. The first was that of surrendering the company's English domicile and incorporating in the country where its operations are carried on. The second related to the inability of the present works to handle all the business offering. The depressed condition of trade, it was pointed out, offered a favorable opportunity for undertaking extensions. In spite of adverse conditions in the American steel trade in the past year it was stated that profits had been practically normal. The average trading profit of the company's six preceding years was £115,000 and it was £117,000 for the year ended June 30.

Kerr Turbine Sales.—The Kerr Turbine Company, Wellsville, N. Y., reports that over 700 of its machines, aggregating more than 50,000 hp., are in active service, and that more unfilled orders are now booked than at any previous time in the history of the company. Although the plant has been materially enlarged, a night shift has been necessary for the past two and a half years. Among important recent orders are the following: One 350-kw. turbo-alternator for the Brooklyn refinery of the Standard Oil Company; two 2800 gal. per min. turbo pump units for Tidewater Oil Company; one 60 b.h.p. turbo-generator with Prony brake attachment for the University of Melbourne, Australia, which takes steam at 200 lb. with 200 deg. superheat, and exhausts to 28 in vacuum; one 215 hp. turbo-blower for People's Gas Light & Coke Company, Chicago, being the tenth set of this size ordered by that company; one fire pump driven by 265 hp. Kerr turbine for the B. M. Osbun Company, Chicago. This last named is stated to be the only turbine-driven fire pump in the city of Chicago.

The American Sheet & Tin Plate Company will start up 8 of the 23 hot tin mills in its Martins Ferry Works, at Martins Ferry, Ohio, on Monday, December 4

The Weiss Briquetting Process for Ores and Flue Dust

An article by E. Holzhüter on the Weiss briquetting process appears in Stahl und Eisen for September 21. This process is protected by German patent No. 183108. The chief features of interest are the penetration of the briquettes by carbon dioxide under pressure and the use of cold carbon dioxide at the beginning and warm gas at the end of the binding process, in order to produce a firm bond of calcium carbonate.

In carrying out the operation a part of the necessary limestone is added directly to the ore or flue dust. The other part is burnt direct in a special shaft retort furnace. The concentrated carbon dioxide from these furnaces is caught in a holder, while the burnt lime is changed into powdery hydrate of lime and added to the material to be briquetted in the proportion of 5 to 6 per cent. The materials are thoroughly and intimately mixed. The mixture is then formed into suitable shape in a press under comparatively small pressure, about 300 atmospheres. The best shape is a cylinder of about 7¾ in. diameter and 4 in. high. The briquettes are placed by hand in small cars hanging from a rail, each holding 1 1-3 tons. The cars are of such a shape that they can be tilted from both sides. They are open on the top, and by tilting the round briquettes roll out. When a car is filled it is transferred to the hardening chamber that will contain 29 cars. When this chamber is filled and closed, carbon dioxide is introduced at a pressure of 20 atmospheres, so that it penetrates immediately to the center of the briquettes. From these chambers the cars enter other chambers through which pass the warm waste gases from the retort furnaces, and the remaining gas from the hardening boilers. In this way the briquettes are treated under pressure first with cold and then warmer carbon dioxide. In from three to four hours briquettes are produced that are solid and hard to the center, and that notwithstanding this also possess great porosity. They can be handled immediately and used directly in the blast furnace.

The chemical changes that take place in the operation are simple, and by means of them the limestone necessary for any raw material can be readily calculated. An excess of 10 per cent. should be allowed for the moisture in the stone, and the unavoidable loss of carbon dioxide. The proper percentage of calcium hydrate to add to the ore or flue dust of course varies and can readily be found by experiment.

Next comes a description in detail of a plant in course of construction at a large blast furnace works. Its capacity is 600 tons per 24 hours, of ore, flue dust, etc. Drawings are given of the plant and illustrations of the special car.

In the case of ore with a large amount of moisture the lime is added in the form of milk of lime. The total process is carried out in about five hours, and the material is only once touched by hand; that is when it is loaded in the cars before entering the hardening chambers. For the plant described 44 men and 2 foremen are necessary. The author calculates that in Germany the cost for treatment of each of ore, flue dust, etc., will be 2 marks.

The only material that cannot be successfully treated by this process is ore containing a large percentage of clay. For such ores the best thing to do is to press them into suitable shape and either dry or burn them in regular brickmaking furnaces. A table of results obtained by W. Venator is also given showing the good porosity of briquettes made from various kinds of flue dust (including American), crushed magnetite and burnt pyrites. G. B. W.

A recent French report on the ore deposits of Normandy, in which several German companies are heavily interested, estimates that there are 700,000,000 tons of ore in the district. Production there had increased very slowly for the last quarter of the nineteenth century, but it has been growing more rapidly since 1900. For that year 570,000 tons was produced, but this year it is expected that about 900,000 tons will be reached. Several more mines have recently passed into German hands, and it would appear that German capital is taking a much livelier interest in the district than French.

The World's Production of Coal

The total coal production of the world in 1910 was approximately 1,300,000,000 tons of 2000 lb., of which the United States contributed 39.2 per cent. This country has far outstripped all others, and in 1910, according to the United States Geological Survey, it exceeded Great Britain, which ranks second, by over 200,000,000 tons. Great Britain's production in 1910 was less than 60 per cent. of that of the United States, and Germany's was less than half. The increase in both of these countries in 1910 over 1909 was comparatively small, whereas the increase in the United States was nearly equal to the entire production of France and was more than the total production of any foreign country except Great Britain, Germany, Austria-Hungary and France.

The United States has held first place among the coal-producing countries of the world since 1899, when it surpassed Great Britain. In the eleven years since 1899 the annual output of the United States has nearly doubled, from 253,741,192 tons to 501,596,378 tons, whereas that of Great Britain has increased only 20 per cent., from 246,506,155 tons to 296,007,699 tons.

The following table shows the coal production of the principal countries of the world in 1910, except those for which only the 1909 figures are available:

The World's Production of Coal, in Tons of 2000 Lb.

United States (1910)	501,596,378
Great Britain (1910)	296,007,699
Germany (1910)	245,043,120
Austria-Hungary (1909)	54,573,788
France (1910)	42,516,232
Belgium (1910)	26,374,986
Russia and Finland (1910)	24,967,095
Japan (1909)	16,505,418
Canada (1910)	12,796,512
China (1909)	13,227,600
India (1909)	13,294,528
New South Wales (1909)	7,862,364
Spain (1909)	4,546,713
Transvaal (1910)	4,446,477
Natal (1910)	2,572,012
New Zealand (1909)	2,140,597
Mexico (1909)	1,432,990
Holland (1909)	1,235,515
Queensland and Victoria	1,119,708
Italy (1909)	611,857
Sweden (1909)	272,056
Cape Colony (1909)	103,519
Tasmania (1909)	93,845
Other countries	5,236,903
Total	1,278,577,812

Engineers Visit Cambria Works

A large number of members of the Engineers' Society of Western Pennsylvania made a visit of inspection to the plant of the Cambria Steel Company, Johnstown, Pa., Saturday, November 25, on invitation of Charles S. Price, president of the company. Departments of the extensive plant which the visitors noted with much interest were the new rod and wire mills, and the 18-in. continuous mill (described in *The Iron Age* of May 5, 1910) which brings blooms 8 in. square down to 1¾ in. billets or tin bars by four 22-in. stands and eight 18-in. stands of rolls. The two-high blooming mill at the Franklin plant is of Mackintosh, Hemphill & Co. type and rolls down to as small as 4 in. square. There are also in this plant a 34-in. slabbing mill and 134-in. plate mill which have been described in these columns. The trip through the Gautier department, where a large portion of the product is agricultural implement parts, developed a good many features of mechanical interest. The safety devices in various parts of the plant received attention, particularly those in the wire rod and wire mills.

The Cambria Steel Company employs 18,000 men. The site of its works extends 6½ miles along the Conemaugh [illegible]

A Diesel engine of six cylinders, to develop 12,000 hp., has been designed, it is stated, for use on a German battleship. Each set of three cylinders, it is understood, is self-contained and forms a complete machine capable of working independently. From brief tests it is indicated that each cylinder may develop as much as 2500 hp. or more. The engine is being built at Nuremberg, Germany.

A 500 hp. electric locomotive using a Diesel engine for driving the dynamo has been designed by the North British Locomotive Company, according to the Engineer of London.

Future Development of the Middle West*

Indications from Iron Trade Records—The Problem of a Shortage of Common Labor —An Optimistic Forecast

BY H. P. BOPE†

For the purposes of this address we will take the Middle West as that part of the United States lying between the Pennsylvania line and the western border of Nebraska, including the Mississippi and Gulf basins. It is that section of the country which has shown the greatest increase in population and in the value of manufactures and of farm products in the past decade. While the interests of the eastern section of this territory are more or less closely connected with the East, there is no intention of making this a sectional matter. We must draw the line somewhere, and this seems to be the section of the country which would most naturally be called the "Middle West."

Growth in Population, Crops and Manufactures

The population of this division in 1910 was 47,000,000 in round figures, or about one-half of the total population of the country. The increase as compared with the census of 1900 was 23½ per cent., the range being from 0.3 per cent. decrease in Iowa to 110 per cent. increase in Oklahoma. In 1910 the value of the manufactured products of this section was $8,272,000,000, an increase of 49 per cent. in the decade.

These are startling figures, and while it is impossible to make an analysis for a particular product it is fair to say that the average applied to all manufacturing interests in that period. In the 10 years from 1900 to 1910 there were one business depression and one extreme financial panic; yet neither of these seems to have greatly retarded, or if so, but temporarily, the extraordinary increase in the wealth represented and the general prosperity of the section. The value of the crops harvested in 1910 was $2,354,000,000, which is in fair proportion to the value of the manufactures in the same district.

There has been a steady increase in population, in the value of farm products, and in the value of manufactures during the past 10 years. The growth in population due to natural causes and to immigration—which latter, however, is likely to fall off in the future—will continue to be sufficient to require an important advance in both the other items. It is unnecessary to go further back than the last decade, the figures for which are sufficient to show a gain proportionate to that in any other period in the history of the country, and one from which we may safely draw the conclusion that in the three elements of population, farm products and manufactures there will be no recession even if the figures do not reach the size of those representing the growth of the past 10 years. * * *

The Iron Industry as a Criterion

Any discussion of the future naturally involves one's risking some reputation as a prophet. It will be safer, therefore, for me to take the interest with which I am directly connected as a basis for such prediction, on the theory that, steel and its allies being king, if steel be prosperous and its future assured other industrial interests will share in the general prosperity. Steel has been a steadily advancing article in not only the mere tonnage produced but in the necessities which it has created and which it alone can serve. A few figures, therefore, showing the great increase in the consumption of steel, we will say between 1902 and 1910, give us a foundation on which to build a prediction for the future. I will use only round figures:

The total shipment of iron ore from the Lake Region in 1902 was 27,600,000 tons; in 1910 it was 43,400,000 tons.

The total production of iron ore in 1902 was 35,500,000 tons; in 1910 it was 56,900,000 tons.

In pig iron the total production in 1902 was 17,800,000 tons; in 1910 it was 27,300,000 tons.

I shall not attempt to segregate the different items of steel products, such as rails, structural material, plates, etc., but shall use the totals: The total production of all kinds of steel products in 1902 was 14,000,000 tons; in 1910 it was 21,600,000 tons.

Now what are we to gather from these figures? The tonnage produced was all consumed. The trade conditions were such that no stocks have been accumulated during the past year, and there is still an overproduction which partly accounts for the trade depression we have witnessed during the present year. But the growth of the country is such that we may reasonably expect that the demand will soon largely exceed the supply in spite of this overproduction, and another period of congestion will ensue. We may base this prediction on the known rule that the consumption of steel doubles itself in about every 10 years. This results, first, from the application of steel to new uses, and second, from the increasing use of steel, due to the larger demands upon it. By this I mean in railroad service, for instance, where heavier cars, larger loads, longer trains and increased speed have necessitated and are requiring to-day the use of heavier rails, the strengthening of bridges, etc., thereby creating a further use for steel itself. And there are other things which will readily occur to you in this connection. We never get away from the use of steel, from the cradle to the grave. Moreover, by careful and regular attention to the demands of export trade there has been created an outgo from this source which has helped wonderfully to take up our surplus, to create a balance of trade and to establish world trade relations which will grow instead of shrinking.

Other Industries Will Go Forward

Now, while I have taken steel as an illustration, exactly the same things are occurring in other lines of industry. The automobile, for example, has come to stay, and the demands not only for steel but the other things which go into the make-up of even the cheapest class of cars have created and will maintain a demand for products which will serve to steady an industry but little more than an infant, however lusty.

The opening up, by irrigation, of extensive tracts of land in the far west, hitherto unprofitable; the extension of railroads and their powerful ally the traction lines, opening up to settlement places before inaccessible, but now enabling a workman to live with more comfort at not too great a distance from the place of his labor; the conservation of resources which we have been using up to this time with a too prodigal hand, and the value of which we now realize as never before; the larger economies which are being worked out not only in the actual manufacture of articles but in their sale, and in the general conditions of life—all seem to me to point to an era of unexampled prosperity in this, the most favored region not only in our own land but anywhere in the world.

When one industry is largely prosperous its effect is felt upon all others; and if the largest is prosperous, as I believe it will be shortly, there will be enough and to spare not only for kindred but other industries not directly related to steel. Nor do I think you will say that the picture is too bright. We are prone to think the things we want to think, but experience is hard-headed and does not permit anything to be presented which is not based upon its wisdom. If the great American orator was correct, as I think he was, in his familiar statement that he knew of no way to judge of the future but by the past, then by such judgment we may reasonably expect the prediction I have made to be fulfilled.

*From an address delivered before the Chamber of Commerce of Cleveland, Ohio, November 29, 1911.

†Vice-president and general sales agent of the Carnegie Steel Company.

Industrial Warfare Destructive

But we shall not attain to all we want merely by waiting for it to come. There are certain obstacles to be overcome and certain dangers to face which are of tremendous importance and the effect of which cannot be minimized by any appeal to "magnificent resources or trained experience." We may classify them under the three heads of legislative, financial and economic.

No business man to-day in the light of all experience would care to go back as a permanent condition to the days of the small concern and of what was known as "cut-throat" competition. So much has been said on this subject during the past few months that it is undoubtedly uppermost in the minds of a great majority of the people of this country to-day. If nations desire peaceful relations because of the costliness and the folly of war, what shall be said of any one who advocates different conditions as between great corporations, upon the prosperity of which depend the happiness, the prosperity, the very lives of so many of the people of this country? Industrial warfare is just as destructive as national warfare, and farther reaching in its effects. Hague tribunals are mockeries if vengeful warfare is to be waged by large industrial institutions against each other. We have learned by experience that industrial war is costly. We have had a number of remedies proposed in the past few weeks by those who are giving constructive consideration to the subject. Let us have sensible conditions by which fair profits may be shared, with fair dealing between competitors, with conservation of capital, with reasonable returns to labor, with stability to markets—conditions under which the country has reached the largest development it has ever witnessed in any equal period of time.

Secondly are the financial obstacles. The financial system of this Government is a crime in the records of constructive financial statesmanship. The first Secretary of the Treasury was so immeasurably above all his successors that he seems to have cast a shade out of which they were all afraid to emerge. A large part of the system he devised is still in use, showing how effectively he looked into the future. But we are concerned with a larger future than even Hamilton dreamed. We need a system which shall give such stability in finance as a co-operative system, under proper supervision, will give in commerce. Europe has had no financial panic in over 50 years and yet has stood the test of several wars in that period. A condition such as existed here in the fall of 1907 would be impossible there. Let us hope that a measure something along the lines of the Aldrich plan will soon be made a part of our financial system, one which when enacted will well serve to place us on a basis of stability and prevent the conditions of 1907.

Insufficient Supply of "Common Labor"

The third class of obstacles are economic. There are several serious matters which might be mentioned under this head, but I shall mention but one. It is to-day but a little cloud no larger than a man's hand, but with any great increase in our industrial development would soon become a very serious menace to great expansion. It is a matter to which, so far as I know, very little consideration has been given even by the manufacturers themselves, because they have been so readily able in the past to overcome any shortage quickly because the supply was there. To-day that supply does not exist. I refer to what is known as "common labor." When I first became connected with the steel business, over 30 years ago, common labor was plentiful and cheap. With no disrespect to our fellow-citizens of Irish parentage, the Irishman was the principal supply for our common labor, and with equal respect to him it was the best we have ever had. He is a foreman to-day where he was a common workman. Recognizing the opportunities of this country his children went to the public schools, fitted themselves for higher positions, and to-day that supply is not available and never will be. Keen, bright, active, he soon rose to a higher realization of his powers and his opportunity. He was succeeded by the Slav and the Hun, some of whom are still with us. But that supply was never adequate to the increasing demand nor was it always the best labor except under certain conditions.

With larger industrial activity in Europe people of the class of labor that has been brought to our shores in these past ten years have ceased to be interested in the golden possibilities of the land of the free. Forced military service and higher taxation, with no change in the social condition of the masses, have not been powerful enough to drive them away from the land of their birth, and so latterly we have fallen back upon the Italian. With increasing dread the Italian Government has watched the flow of emigration; and the present trouble in Tripoli is but an expression of the desire on the part of that government to establish a colony near at home to retain her subjects where they will still be Italian; where the fruits of their labors will be for Italy, and where they will still be subject to military duty, or, if not, as colonists will still be Italian subjects. Other European countries, in their need of colonial expansion, have the same desire. In a sense they are jealous of the wonderful expansion of the United States; they fear our commercial supremacy as they have always feared the inventive genius of our citizens. The supply of common labor can no longer be obtained from Europe in sufficient volume to meet our needs. There seems to be an inherent opposition to the use of the Japanese and the Chinese. Yellow and white do not mix even in such a capacity, when it means the use of large numbers. We are not facing this condition yet, but to be forewarned is to be forearmed, and our manufacturers must reckon with this question at no distant day. Legislation, commercial and financial, we shall have, for the minds of our people are now bent on constructive statesmanship, and it will aid tremendously in the future industrial development of this middle west. The labor condition which manufacturers and railroads are facing will be harder to solve. Improved machinery, labor saving, will help in some respects, and the genius of the American manufacturer and operator will overcome much of the danger from lessening labor supply; but for many classes of work absolutely requiring manual labor it is a serious menace.

Still the future is bright with promise; and going forward in the spirit of liberality, of fairmindedness, of honesty, which has ever characterized the American manufacturer, the next quarter of a century should prove more prosperous and fuller of promise than any equal period in our history.

Production of Manganese Ores

Russia has furnished about 40 per cent. of the world's consumption of manganese ores in the past 10 years. Nearly the entire output of the Caucasus mines is exported, while Russian consumption is supplied from Nikopal in southern Russia, which produces about 25 per cent. as much as the Caucasus. India and Brazil are Russia's principal competitors in the world's markets. Russia's exports to Great Britain and Germany have increased greatly, but that country has contributed but a small part of the imports of the United States, which in the fiscal years ending June 30, 1909, 1910 and 1911, were 165,061, 237,037 and 209,211 gross tons, respectively. In the past three years British India has furnished about two-thirds of the manganese ore imported by this country. In the calendar year 1909 it shipped to the United States 145,140 gross tons, out of total imports of 212,765 tons. Brazil stood second with a total shipment to the United States of 35,600 tons.

The price of Russian manganese in Germany has been on the basis of 1.10 marks per unit for 50 per cent. manganese, with 0.1 mark added for each unit above or deducted for each unit below the standard. The maximum limit for phosphorus is 0.15 per cent. and for silica 9 per cent. In the United States the schedule of prices on which purchases of managanese ore are made by the Carnegie Steel Company is based on 26 cents per unit of manganese for a percentage over 49 and 5 cents a unit of iron, the base silica content being 8 per cent. and that of phosphorus 0.20 per cent. For each 1 per cent. in excess of 8 per cent. silica the deduction is 15 cents a ton. The production in the United States in 1909, the last year for which official statistics are available, was 1544 tons, the smallest year's output on record, comparing with an average of 6155 tons in the ten years beginning with 1900.

Wrought Iron Versus Steel Pipe

A Discussion of Accelerated Corrosion and of Physical Tests

In the ninth edition of its familiar pamphlet "Wrought Iron Pipe versus Steel Pipe" the Reading Iron Company makes some additions to the text, particularly under the heads of "Accelerated Corrosion Tests" and "Physical Tests." In support of the view that the respective losses of specimens of iron and steel immersed in acid solutions are not a reliable index of their relative resistance to corrosion, quotations are made from various sources. Among the citations are one from a paper by Dr. Cecil H. Desch before the West of Scotland Iron and Steel Institute and one from a report on accelerated corrosion tests by R. C. McBride, Youngstown, Ohio, both of which have already been published in *The Iron Age*. A quotation is also made from an article by Bradley Stoughton in the Engineering Magazine of July 1911, in which the writer says that in an accelerated test the action is so rapid that slight obstacles to corrosion are not felt and conditions which might oppose rusting for a considerable length of time will be practically without effect. Professor Stoughton also quotes from a report of the Committee on Corrosion of Iron and Steel, of the American Society for Testing Materials, the statement that "the results so far obtained show that the [accelerated acid] test is not generally applicable and in some cases may be very misleading."

The pamphlet says that in a test made in the Reading Iron Company's laboratory with samples of wrought iron sheets and steel sheets "the former showed a loss of 62 per cent and the latter only 26 per cent," by the acid test, "although the roof, of which the steel sheets formed the cover, had become so corroded after less than two years' use as to be utterly worn out, requiring its renewal." The pamphlet adds:

> As regards the argument advanced by the champions of the electrolytic theory of corrosion, that the purer the iron or steel, the greater will be its resistance against corrosion, we would say that, while many of the accelerated corrosion tests seem to confirm this contention, yet there are also many other tests which point quite in the opposite direction. * * * The chief engineer of a large water works in California stated to the writer that many years ago he built a water conduit of imported Swedish plates, riveted together; that they did not have enough of these plates, and were compelled to use common tank iron plates, which they found in stock, to complete the conduit. The result was that the portion made of tank iron (which is generally high in cinder) outlasted the Swedish iron (which is generally very low in cinder).
>
> Professor Howe states that in cases in which strength may profitably be sacrificed for incorrodibility, it may perhaps be practicable to increase the mechanical protection (against corrosion) by increasing the cinder (vol. 8, page 245, Proceedings of American Society for Testing Materials). As the impurities in wrought iron are chiefly combined with the cinder contained therein, and since the more cinder, the greater its resistance against corrosion, it is evident that the argument that the purer the iron, the greater its resistance [illegible] as far as pipe or wrought iron is concerned.

In discussing the claim of some manufacturers that if wrought iron and steel are intended for the same purpose both should be subjected to the same physical tests and show equal results, the pamphlet says that the cinder inclosing the iron fibers is both the virtue and the fault of wrought iron. It gives resistance to corrosion and its rope-like structure distributes the shock and consequently resists fracture due to vibration longer than a homogeneous metal like steel. "But the very presence of these life-prolonging cinder fibers has a tendency to reduce the tensile strength and elongation, and it is therefore entirely wrong to require wrought iron to show high tensile strength, elongation, reduction of area, etc., when used for purposes where the factor of safety is large and the object desired is durability."

Citations are made from various cases which, it is stated, indicate the unreliability of physical tests as a guide to durability under ordinary strain. The opinion of the late Dr. Charles B. Dudley is quoted to the effect that "there is a very large amount of accumulated experience which seems to indicate that a metal like iron, which is believed to be a bundle of fibers, each one surrounded by slag and which has within itself the power of the distribution of the strain, is a more reliable metal when subjected to bending stresses than a perfectly homogeneous metal like steel." The pamphlet then comments as follows:

> It is only within some few years that the difference in the behavior of wrought iron and soft steel has been fully appreciated by many practical men, but as yet little attention has been paid to it by teachers in our engineering colleges, and, while more and more of the older engineers and architects, who have had long practical experience, are taking this difference into consideration when drawing up their specifications, many of the younger members of the professions are calling for the same physical tests required for soft steel when drawing up specifications for wrought iron. It is to be hoped that the new specifications for wrought iron now under consideration by a committee of the American Society for Testing Materials will help to remove this misunderstanding and induce more of the engineering professors to embody them in their curriculum.
>
> When standard pipe is used for ordinary purposes, the factor of safety is so large that the hydraulic pressure test, which not only tests the strength of the metal, but the tightness of the weld as well, makes any other physical test superfluous, and many of the recent specifications by many leading architects and engineers omit all physical and chemical tests for pipe outside of the hydraulic pressure test, but insist that the iron be made from puddled pig iron, without the admixture of any scrap, and the use of iron made by busheling or [illegible] is prohibited.

The Harbison-Walker Refractories Company

The annual report of the Harbison-Walker Refractories Company, Pittsburgh, for the year ended September 30, 1911, has been mailed to stockholders in advance of the annual meeting to be held January 15, 1912. The income account is as follows, compared with the previous year:

	1911.	1910.
Earnings	$1,686,335	$2,073,341
Less improvements and depreciation	243,134	205,595
Net profits	1,443,201	1,867,746
Bond interest	77,000	88,875
Balance for dividends	1,366,201	1,778,871
Preferred dividends	576,000	576,000
	789,201	1,202,871
Common dividends	360,000	270,000
Surplus for year	430,201	932,871
Total surplus	$5,215,060	$4,784,860

The condensed balance sheet as of September 30 compares as follows:

Assets.	1911.	1910.
Property account	$28,635,163	$28,599,397
Betterments completed	1,284,223	1,147,700
Betterments uncompleted	400,642	497,551
Deferred charges	295,877	298,608
Current Assets:		
Inventories at cost	1,699,778	1,590,759
Accounts receivable	1,257,210	1,407,082
Bills receivable	20,412	24,105
Cash	689,074	565,437
Investment securities	580,425	594,399
Total assets	$34,862,804	$34,725,039
Liabilities.		
Preferred stock	$9,600,000	$9,600,000
Common stock	18,000,000	18,000,000
Bonds outstanding	1,265,000	1,565,000
Reserve for bonds, interest, taxes, etc.	560,261	469,198
Current liabilities	222,483	305,981
Surplus	5,215,060	4,784,860
Total liabilities	$34,862,804	$34,725,039

The company has purchased and cancelled as per sinking fund requirements $1,585,000 bonds since its organization, and it has further cancelled in anticipation of sinking fund requirements $650,000, leaving total bonds now outstanding of $1,265,000 out of the original bond issue of $3,500,000. There was expended for improvements during the past year, increasing the capacity and efficiency of the works, the sum of $116,326, and in addition to the charges for depreciation of plants there was charged off $90,006 for depreciation of mining and tram outfits and $30,802 for depletion of clay, coal and ganister properties. The profits, after paying the regular 6 per cent. on the preferred stock, were equal to 4.33 per cent. on the common stock. The latter received 2 per cent. in dividends for the year, leaving the sum of $430,201 to be carried to surplus.

An agreement has been reached between the city of Buffalo and the Erie, Lehigh Valley, Nickel Plate and Buffalo Creek railroad companies for the building of lift bridges over the Buffalo River, making possible the extension of the river-deepening improvement work to Abbott road. The bridges will be of the single span lift type and will give a clearance of 100 ft. and a 225-ft. channel. Contracts will be let as soon as specifications can be drawn.

Women in the Metal Trades

A special report has just been issued by the United States Bureau of Labor dealing with the employment of women in the metal trades. As the greater proportion of women employed in this group of industries are machine operators, the report is, as a matter of fact, a study of accidents to machine operators in the class of establishments considered. Men are employed in the same occupations as the women in the metal industries, and consequently an opportunity is also afforded of comparing the liability to accidents of both sexes working under similar conditions.

The investigation covered the chief manufacturing centers of the metal trades in Massachusetts, Rhode Island, Connecticut, New York, Pennsylvania, Maryland, Ohio, Illinois, Indiana, Michigan, Minnesota, Iowa and Missouri. Visits were made to 346 establishments and detailed information secured for the employees of 246. Complete data were secured for a total of 85,225 wage-earners, of whom 69 per cent. were males and 27 per cent. females 16 years of age or over. Only about 4 per cent. of the total were children of both sexes under 16 years of age. The greatest stress was placed upon foundries and upon establishments engaged in the manufacture of bolts, screws, brass ware, hardware, jewelry and tin cans, although information was also obtained for employees representing 20 other important branches of the metal trades, such as cutlery, fire-arms, tin plate and tinware.

Extent to Which Women Are Employed

About one-fourth of the total number of wage-earners, 16 years of age or over, in establishments manufacturing bolts and screws and tin cans are women, while about one-fifth of the total number in brass ware and one-sixth of those in hardware manufacturing plants are females. The general tendency in the metal trades seems to be toward the increased employment of girls over 16 years of age. The reasons given for this are that the girl of 16 is more mature than the boy of the same age and that she is steadier and more reliable and usually more ambitious than a boy of the same age or under. In other words, the possibility of better service and less responsibility, with little added cost, has caused the employer to substitute in many occupations the girl of 16 and upward for the boy under that age. The only difficulty which presents itself to the employer in this situation is the impossibility of picking out leading men and foremen from the women workers. The girls do not furnish material for this purpose. Either the boy above 16 must be attracted by higher pay or special methods must be adopted for the training of boys for these positions.

Hours of Work

Although it was ascertained that the number of children employed, as compared with the adult workers, was small, the additional fact was developed that the proportion of children under 16 who work 60 hours each week was nearly three times as large as among the women, and over 60 per cent. more than among the men. This situation was due to a few large plants in other States than Illinois, New York and Ohio which employ an unusually large number of this class of employees. The States excepted have a legal inhibition against employees under 16 years of age working 60 hours per week. The full 60-hour week was found still to be the practice of a little more than one-sixth of the total number of 246 establishments investigated. The other plants fell into two groups: 1. Those having the 10-hour day with varying concessions in early Saturday closing. 2. Those having a working day of nine hours or less. Of the entire number of 85,225 employees studied, 29 per cent. of the males and 33 per cent. of the females 16 years of age or over, together with 29 per cent. of the children, worked less than 55 hours each week; 51 per cent. of the adult males, 39 per cent. of the adult females and 30 per cent. of the children had a working week of 55 but less than 60 hours; and 20 per cent. of the adult males, 11 per cent. of the adult females and 32 per cent. of the children under 16 years of age were employed in plants which were in operation for a period of 60 hours each week.

Accidents

As regards accident rates in different trades, exhaustive information from 60 establishments with 40,719 employees showed that 11.47 wage-earners were injured in 1907 out of each 100 employed. Of this average 6.11 employees for each 100 represented both sexes 16 years of age or over, while 2.01 represented males and 3.35 females less than 16 years old. The accident rate in a number of the leading branches of the metal trades was for both men and women adult workers as follows:

Industry.	Number injured per 100 employed.
Bolts and screws	0.59
Brass ware	18.52
Enameled ware	2.77
Firearms and ammunition	3.50
Hardware	9.50

The accident rate was generally smaller for women than for men, and the latter were usually found to be in the occupations of greater hazard. Children under 16 years of age formed but a small percentage of the total number of wage-earners studied, and, due consideration being given to relative numbers, had a much smaller accident rate than the adults. Out of a total of 571 accidents for all classes of employees of which the underlying causes were carefully studied, 174 were discovered to arise from careless manipulation of machinery, 56 to the taking of risks by employees, 6 to inattention to surroundings, 26 to imperfect mechanism and 75 to unforeseen liability. The greatest number of accidents were recorded in connection with the operation of stamping presses which are largely used in the manufacture of brass ware and hardware. The hours in all establishments investigated during which the greatest number of accidents occurred were between eight and nine o'clock in the morning and between three and four in the afternoon.

Conclusions Relative to Accidents in the Metal Trades

The summary conclusions which were reached as the result of the entire inquiry were:

1. The hazard to women in the metal-working industries is considerable.
2. When men and women work at the same task its dangers menace the women much more seriously.
3. The employment of children in dangerous occupations is rare and is decreasing.
4. Negligence of the worker as a cause of accident has been greatly overemphasized.
5. The accidents of most frequent occurrence are largely preventable.

Sixty-seven Years of Charcoal Iron Production.—The Shelby Iron Company, Shelby, Ala., on November 21, blew in its No. 2 furnace, which had been out for five months, during which time it was partly reconstructed while several improvements were added. This furnace and its predecessors represent a long series of blasts, going back to a five-ton furnace built in 1844. From time to time there have been rebuildings with increase of size, and to-day the plant consists of two 65 ft. modern stacks. From the beginning the policy of the successive managements has been to make a special grade of warm blast iron for the manufacture of car wheels, chilled rolls and special castings. All the ore used has been mined from deposits of brown ore in immediate proximity to the plant. These ores are high in iron and low in phosphorus and sulphur, with sufficient manganese to produce the desired mixture.

The Pennsylvania Railroad has let contracts for new construction work, which, when completed, will have cost approximately $83,000,000. The new work includes six miles of track elevation for six tracks in place of the present four surface tracks through Rahway and Linden, N. J., and the elimination of 14 grade crossings. With the completion of this work the Pennsylvania Railroad will have eliminated every grade crossing in the thickly populated sections through which the New York division runs. The elevation of tracks in Rahway and Linden will necessitate an embankment of nearly 2,000,000 cubic yards of earth and will require approximately 150,000 cubic yards of masonry. The bridges over the streets will consist of steel girders with solid reinforced concrete floors similar to those recently constructed at the elevation at Bristol, Pa.

Overhead Expense

How It Should Be Equitably Apportioned

BY A CONNECTICUT MANUFACTURER.

The editorial in *The Iron Age* of October 19, entitled "Overhead Expense and Cost Systems," touches on a subject which comes strongly home to me. I have given the matter a great deal of study and have inaugurated some changes in the methods which will without doubt do away with the greater part of the difficulty mentioned. Perhaps your readers will be able to take to themselves and apply to their own establishments, if not the details, yet the principles which will be shown to underlie the changes in methods mentioned.

I have found that most of the available treatises on the subject of factory accounting deal only with a class of establishment represented by the machine-tool builders. In this class the machinery consists of relatively large units, the operations are of considerable duration, and the manufactured articles are comparatively large. On such work as this it is not so difficult a task to keep track of individual expenses, whether they be of productive labor, material or overhead. All through this State, however, are scattered shops in which the machinery consists of many duplicate presses, in which the operations are repeated at the rate of often 150 per minute, and in which the manufactured articles are small and handled by the thousand. The problems of cost accounting presented by such conditions have been rarely touched upon in any treatises, so that we have been left to develop systems to suit our own requirements.

The Flat Rate Method

In the early days we calculated our costs and apportioned our overhead expense by what is now called the "flat rate" method. The shop rooms grew as they could; usually that of the most aggressive and capable foremen grew faster than the rest, the most important thing being rate of production. The flat rate was usually calculated by the following ratio:

$$\frac{\text{Total shop expenses}}{\text{Total manufacturing labor and material}} = \text{Per cent factor.}$$

Some shops found this percentage to be 135, others 150, and we considered that an article using 60 cents per thousand for labor and 40 cents per thousand for material cost us $1.35 or $1.50 as the case might be. A great deal of business was taken on such figuring and good dividends were paid. It is evident to us all now, of course, that such a cost represented only average conditions and was grossly incorrect in many cases.

Later we became more enlightened and realized the absurdity of such loose calculations. But realizing a bad condition and hitting upon a good remedy are two quite different things; we are still working to overcome this difficulty and are constantly looking for some improvement in our accounting which will make our costs more accurate without increasing our clerical expense beyond reason. We have always the desire to get actual costs on the one hand and the necessity for economy in our accounting on the other, and I do not hesitate to say that up to the present time all cost systems are compromises between what we would like to do and what we are able to do. Undoubtedly, the compromise becomes each year more favorable to the manufacturer; each year we are able to rearrange our methods in some way to give us costs more true to actual conditions.

Classifying the Product, Machinery and Operations

The first marked step away from the previously mentioned flat rate system was to classify the product and to divide up the shop into smaller shops, or rooms, keeping a separate set of records for each room. Thus there was the lamp room, the hinge room, the wire-goods room and the button shop. Right on the heels of this change came a more distinct step in advance. Instead of subdividing by class of product, the subdivision considered first the class of machinery and the nature of the operations. Thus, instead of the above mentioned rooms, we had the blanking room, the stamping room, the assembling room, the dip and plating room and the packing room. The basis for this subdivision is now well known, the aim being to classify the work and equipment into groups in which the accompanying expense, or "overhead," bears a comparatively fixed ratio to the productive labor. This arrangement is carried out almost solely to simplify the accounting and to do away with the use of an average overhead ratio.

After this subdivision had been carried out, we found to our satisfaction that the overhead expense in the assembling room, for example, was only about one-half that in the cutting-up room; we now had a distinct ratio for each room which our reason told us must be far more accurate than had been the old flat rate. Our cost was now made up roughly of the following components:

Productive labor	$1.00	} Plus material
Room overhead	1.00	
General expense	1.00	

The third item, General Expense, was and is made up of all such expenses as might be considered not strictly chargeable to the rooms individually; it is supposed to include a type of expense from the incurrence of which the whole shop shares equally. It will be found that this General Expense is often equal to the Room Overhead and is a matter of no little importance in the cost of an article, so that it was not strange that there should occur to a manufacturer, striving to meet close competition, the idea that perhaps all of this extra $2 added to his $1 of productive labor might not belong there. That is the way it struck me.

An Unsatisfactory Compromise

Having developed my system to the above point, I saw I was in a measure still disregarding actual conditions and clinging to the habit of adding a stated amount to each article based on the productive labor cost. Even with the gain I had made by classifying my equipment, I was still using an unsatisfactory compromise; although my rooms were so arranged that there was a fairly equitable apportionment of Room Overhead expense, I was still apportioning my General Expense by the obsolete flat rate system. It was evident to me that, if I was to have my costs approach still closer to actual conditions, I must try to do away with the flat rate and must recover my general expenses by some method which more accurately reflected actual conditions, or else which possessed a flexibility far removed from my hard and fast rule. I felt that there was occurring in my shop just what is described in your editorial; that I was making my easily handled standard work pay for the special and bothersome work.

Arriving at such a conclusion was nothing more nor less than natural. My methods of manufacture and my equipment were strictly up-to-date, so that I could not defend my loss of certain business except in a very few ways, and I chose to believe that this loss was due mainly to fallacies in my methods of figuring costs. Other makers were turning out the standard products on which I had worked for years and they repeatedly quoted prices below mine. In spite of my having all the tools and the skill, I lost orders to those competitors when my common sense told me that I could turn out the products as cheaply as they, if not more cheaply. I put aside the suggestion that they were losing money on the business they took away from me. It is better not to count too much on an adversary being a fool.

A study of the whole matter resulted, as I have said, in a decision to substitute for the hard and fast rule then in force a compromise which would allow a knowledge of actual conditions to be used in computing a "cost." I was confident that my records of Prime Cost (material and productive labor) were quite accurate and the new

plan considered them so. The overhead expense, however, was to be differently handled, especially that part of the overhead which is called General Expense. My investigation had shown that a great deal of this General Expense was really of a specific nature; while it was not chargeable to any one room, or rooms, neither was it in justice chargeable to all classes of work alike. Some of it was chargeable to a certain class of articles, some to heavy work, some to development, others to betterment. Instead, then, of dumping all this expense into the General Expense account and leveling it out at a flat rate on all articles regardless of where it really belonged, it was planned to keep a separate account for each kind, using quite a few headings at first.

Subdivision of General Expense

A more graphic picture of the plan would be to explain conditions thus. Previously there had been a large bin marked General Expense into which had gone thousands of dollars a year. To look into this bin toward the end of the year, with an idea of ascertaining just what was in it, resulted usually in a throwing up of the hands. In future, therefore, it was intended to divide up the bin into a number of smaller compartments, marking each with a statement as to what it was intended to contain. It would then be an easy matter to note at any time the nature of the contents of the bin and the comparative contents of each compartment.

The General Expense account is therefore to be given a number of subdivisions; also the sales account. There will then be available a record of what kinds and amounts of expense have been incurred, and what kinds and quantities of goods have been sold. Such records do not particularly complicate the accounting, the only important point being to see that a sufficiently intelligent person shall indicate in what class each sales item and each expense item belongs. The following selections from my General Expense account will indicate how the plan was carried out:

1. Selling expense. Where and for what class of goods.
2. Samples, etc. What class of goods.
3. Expenses to increase production. Class of goods.
4. Expenses to reduce costs. Class of goods.
5. Expenses due to defective design, material, or workmanship. Give room and class.
6. Building upkeep. Give building.
7. Administration.
8. Storerooms, offices, etc.

It will be noted that some expenses usually included in General Expense do not appear. For example, cost of power plant I subdivided and charged against the rooms by a method which, though empirical, gave a much closer approximation of exact conditions than does distribution through the General Expense account. Likewise the interdepartment transportation, which was charged against the rooms, each room standing the expense for trucking out. This last was not hard to do since my truckmen were paid on a piece-work basis, the rate varying with the distance traveled, such as from one room to another.

During the year following the collection and recording of expenses in detail considerable surprise was caused by the unexpected volume of some expenses and the paucity of others. A few months was sufficient to show up the big items, and the records were a constant source of satisfaction because they formed such a clear vindication of the wisdom of the change.

The Apportionment of Expense Items

At the end of the year came the next important step —the apportionment. It was not enough to simply classify the expenses; they must now be studied, item by item, with the end in view of deciding just what method should be used in each case to recover the expenses. This I did, my course of reasoning being indicated by the following examples:

The expense to increase production (3) was greatest on my railroad lamp goods, owing to a sudden influx of orders that year from railroad purchasing agents who had previously been following a policy of retrenchment. A calculation showed me that my selling prices would not stand for the loading of all this expense in one year; so I decided to divide it into three instalments for distribution over three years. Under the old method I should have lost sight of all this and have allowed the whole amount to burden one year's work.

The expense due to defective work and goods I found to be heaviest on my fancy metal novelty line. This did not at all surprise me, as I well knew the exacting conditions and the quality of finish necessary in that work. I was glad, however, to know definitely how much I was losing that way and just what ratio it bore to my sales on such articles.

The storeroom expense (8) was found to be made up of three divisions: raw material, semi-finished goods and finished goods. The handling of the raw material seemed to me best charged against the metal itself; in the past, a light article with a high labor cost bore more of this expense than did a heavy article with a low labor cost. And I found that the greater part of the expense for storing semi-finished goods was chargeable to my metal button business.

Getting Greater Leeway in Fixing a Selling Price

It will be clear that in the end I had a set of figures of this kind which gave me great leeway in fixing a selling price or in judging whether a certain line was profitable or not. The calculated costs as turned in from my cost office were now much less than they had been. But to the cost-office total I must add an amount dictated by my judgment as being correct. For example, I am to quote prices on the coming year's business with a customer who uses shoe-hardware and am figuring the cost on a shoe eyelet. My labor cost is $0.06 per thousand, and the material is $0.10 per thousand. Under the old ruling my overhead would be $0.18 per thousand, making a total cost for labor, material and overhead of $0.34 per thousand. But a glance at my new classification of expenses shows me that this class of work is not in the least troublesome, calls for practically no selling expense, nor does it go near the storerooms. I will therefore add only enough to cover the few actually general expenses which it should bear and fix my selling price accordingly, quoting, let us say, $0.27½ per thousand, based on a cost of $0.25 and giving me at least 10 per cent. profit.

On certain lamp burners of an expensive type, however, my new method gives me overheads much higher than before. This I find is due to storage cost for goods in process, for expenses due to repairs on defective work, for work spoiled beyond repair, etc. The burners are made up of so many parts that these latter troubles occur much more often than on simple goods such as eyelets, buckles and the like. The narrow margin on some of the lamps, between cost and selling price, opened my eyes to the necessity for alterations of method or design to make the business more profitable. The generous margin on other lines, where my equipment is first-class but running rather intermittently, prompted me to urge my salesmen to take more of such business, which I can help them to get by quotations more favorable than formerly.

To me the new method promises results, and it does not take a stretch of the imagination to picture like benefits in establishments manufacturing different lines. The process is really nothing more nor less than placing in the hands of those whose duty it is to make prices a set of records of great value in judging how profitable the manufacture of a certain line, or article, may be. And it seems to me that the possibilities are even greater than I have outlined.

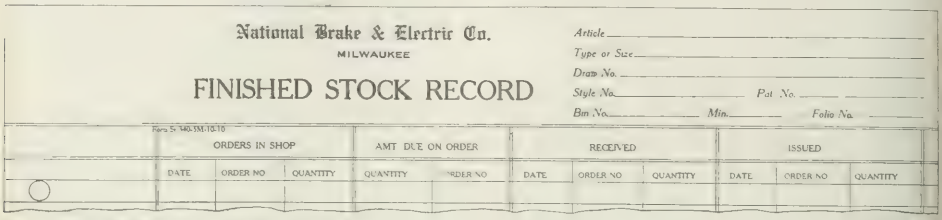
New York City Taxation.—Prominent business men of the city of New York will hold a conference on city taxation in the auditorium of the Merchants' Association, 54 Lafayette street, at 3.30 p. m., Wednesday, December 6. The public is invited to attend. A circular announcement of this meeting states that those who are calling it are confident that the gradual reduction of the rate of taxation on all buildings in the city to one-half the rate of taxation on all land is an important measure of relief to all business men and manufacturers of the city. A bill to effect such relief from the present system of taxation is to be introduced in the next session of the Legislature. George White will preside over the conference and the speakers will be John J. Hopper, Charles T. Root and Mornay Williams.

Routing Material Through Shop Departments

Simple System in Use at Works of the National Brake & Electric Company, Milwaukee

In the manufacture of air-brake equipments and motor-driven air compressors, a wide variety of pieces are required to be handled. Pioneer in this field, the National Brake & Electric Company, Milwaukee, manufactures an extended line of sizes and types. The large number of different machining operations and materials used and the movement of material through foundry, forge and machine shops have in them complexities which make the system of this company's production department of interest. Authority and directions for the purchase or manufacture of all material issue from the cost or production department. The check on the finished material manufactured in the shops or purchased outside is had through the medium of the general shop store. Into this store every piece of finished material or group of materials making one finished unit are delivered, either actually, or if the parts are moving right through to shipment, by record. Similarly, every finished part is issued from the storeroom. The record of this movement through the storeroom is a continuous inventory, recorded on the form shown in Fig. 1. These forms are [illegible] for different classes of material to permit classified binding in loose leaf books for reference. The records are obtained as follows:

When a general order is to be put through the shop, the production department sends to each department in



National Brake & Electric Co.
MILWAUKEE

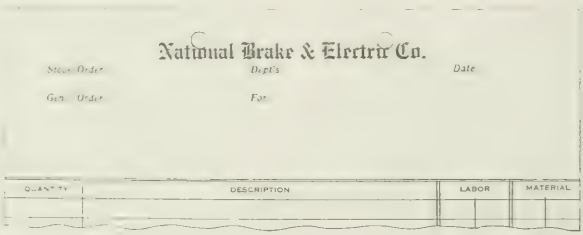
FINISHED STOCK RECORD

Article
Type or Size
Draw No.
Style No. Pat No.
Bin No. Min. Folio No.

Form S-140-1M-10-10

ORDERS IN SHOP			AMT DUE ON ORDER		RECEIVED			ISSUED		
DATE	ORDER NO	QUANTITY	QUANTITY	ORDER NO	DATE	ORDER NO	QUANTITY	DATE	ORDER NO	QUANTITY

Fig. 1.—Record of Movement of Finished Material or Products Through the Storeroom.—Loose Leaf, Printed Both Sides, in Light Red and Blue Ruling; Size 9½ x 12 In.

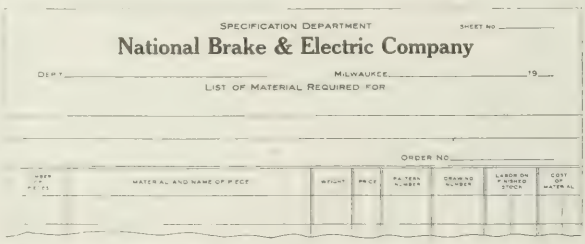


National Brake & Electric Co.

Store Order | Dept's | Date
Gen. Order | For

QUANTITY	DESCRIPTION	LABOR	MATERIAL

Fig. 2.—Form of Order [illegible] Material; Black Ruling on White Sheet; 8½ x 11 In.



SPECIFICATION DEPARTMENT SHEET NO.

National Brake & Electric Company

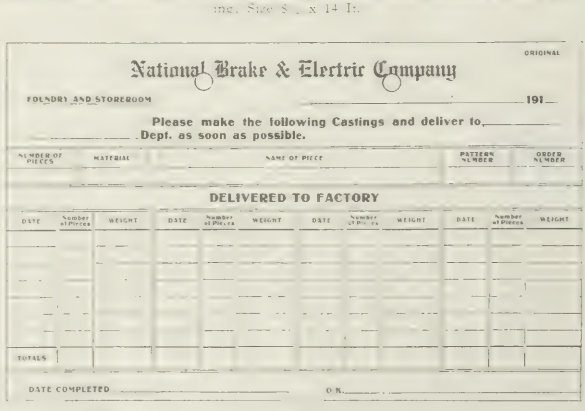
DEPT. MILWAUKEE, 19

LIST OF MATERIAL REQUIRED FOR

ORDER NO.

DEPT. PC'S	MATERIAL AND NAME OF PIECE	WEIGHT	PRICE	PATTERN NUMBER	DRAWING NUMBER	LABOR ON FINISHED STOCK	COST OF MATERIAL

Fig. 3.—Form Covering Specifications to Be Met by a Given Department; Blue Ruling; Size 8½ x 14 In.



ORIGINAL

National Brake & Electric Company

FOUNDRY AND STOREROOM 191

Please make the following Castings and deliver to Dept. as soon as possible.

NUMBER OF PIECES	MATERIAL	NAME OF PIECE	PATTERN NUMBER	ORDER NUMBER

DELIVERED TO FACTORY

DATE	Number of Pieces	WEIGHT	DATE	Number of Pieces	WEIGHT	DATE	Number of Pieces	WEIGHT	DATE	Number of Pieces	WEIGHT
TOTALS											

DATE COMPLETED O.K.

Fig. 4.—Form Issued in Duplicate for Pattern Shop and Foundry for Castings to be Made; Size 8½ x 5½ In.

which work is to be done on the order, the forms shown in Figs. 2 and 3. On the former is the general description of the material making up the order; on the latter the specifications of what is required from the particular department to which it is sent. Copies of these are also sent to the storeroom to be entered up in the first column, Fig. 1. This affords the storekeeper the necessary information to check back the movement through the store room of the correct amount of material for completing the order in question. When castings are to be made the form Fig. 4 is issued in duplicate to the pattern shop and foundry. If it is a stock casting this form also goes to the storeroom so that castings already made may be applied on the order.

When any material is to be issued to a department from the storeroom, that department makes requisition on the form Fig. 5 in duplicate, one copy being retained for filing in the storeroom and the other going to the cost department. This constitutes a storeroom receipt for the material delivered and is the source of the

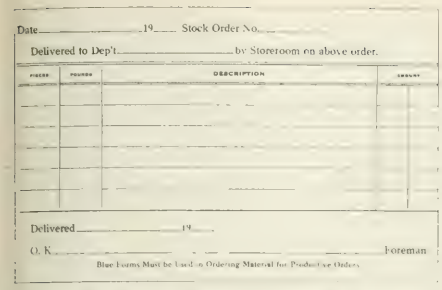

Date 19 Stock Order No.
Delivered to Dep't by Storeroom on above order.
PIECES | POUNDS | DESCRIPTION | AMOUNT
Delivered 19
O. K. Foreman
Blue Forms Must be Used in Ordering Material for Production Orders.

Fig. 5.—Form of Requisition on Storeroom, 6 x 4 In.
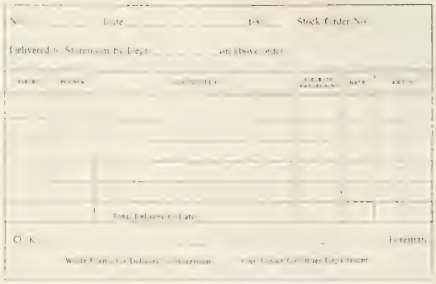

No. Date 19 Stock Order No.
Delivered to Storeroom by Dept. on Above Order
Date Delivered to Dept.
O. K. Foreman.

Fig. 6.—Form Covering Department Deliveries to Storeroom.

record in column 4 of Fig. 1. Column 2 is a check between columns 1 and 4 of this form.

When work on any part is completed in one department ready for shipment or final assembly, it is delivered to the store, the form Fig. 6 being used in duplicate, one form going to the storeroom as the basis for the record in column 3 of Fig. 1 and the original being kept by the foreman of the department as a receipt for the delivery of the material. Parts not finished in one department and moving to another are recorded only between the foremen of these departments by means of a form practically identical with Fig. 6, the original signed by the foreman receiving the parts being kept by the department delivering them, as a receipt, the duplicate going with the work.

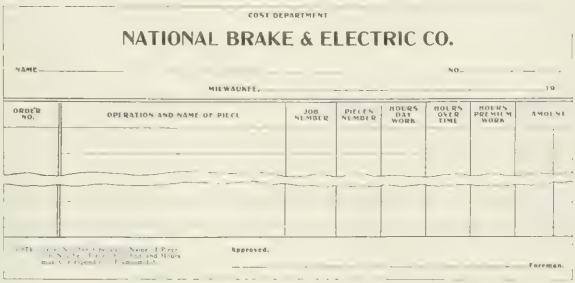

COST DEPARTMENT
NATIONAL BRAKE & ELECTRIC CO.
NAME NO.
MILWAUKEE, 19
ORDER NO. | OPERATION AND NAME OF PIECE | JOB NUMBER | PIECES NUMBER | HOURS DAY WORK | HOURS OVER TIME | HOURS PREMIUM WORK | AMOUNT
Approved.
Foreman.

Fig. 7.—Record of Workmen's Time: Yellow Sheet, 8 x 5½ In.

Excess parts issued from the storeroom are returned with a form in duplicate, also like Fig. 6, one going to the storekeeper for the balancing of his inventory and the other to the cost department. When work in any department is completed on any one order and when the storeroom has handled the material necessary to fill this order all of the original forms Figs. 2 and 3 are returned to the cost department, where labor and material costs are entered up.

Each piece going through the shop has on it conspicuously the number of the shop order upon which it is to



Fig. 8.—View of the Storeroom in the Plant of the National Brake & Electric Company.

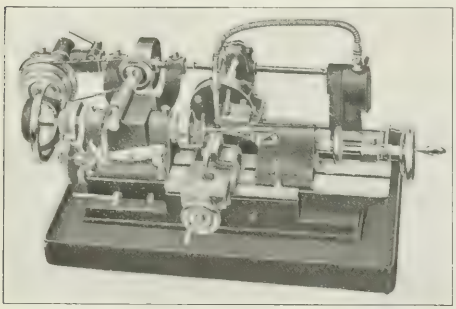
be applied and the workman makes out his time on the time card Fig. 7. On all of the work for which it has been possible to establish a time allowance for machining a premium system is operated, the employee sharing equally with the company the profit in the work done in excess of the allotment.

The storeroom of the shop, which is a part of the recent additions to the plant, is exceptional in its construction, capacity and equipment. A view of it is shown in Fig. 8. It is of reinforced concrete construction of the mushroom type, absolutely fireproof in itself and equipped with a sprinkler system for the protection of the material stored. It is lighted with incandescent mantle clusters. Small parts are stored in steel rack shelves and the larger parts are stored on the floor in allotted spaces with ample aisles for access. The floor is of concrete and the heavy parts are handled on portable crane trucks.

The New Waltham Thread Miller

Two sizes of thread milling machine which embody in their construction several improvements over the miller illustrated in *The Iron Age* December 8, 1910, have been brought out by the Waltham Machine Works, Waltham, Mass. The principal changes as compared with the earlier machine are a constant speed drive, a new location for the friction clutch controlling the carriage motion, an increased variation for the lead screw and the ability to handle larger pieces of work.

The machine is driven from a constant speed shaft attached to brackets on the rear of the machine which in turn drives the cutter spindle through a worm and worm wheel sliding on the squared portions of both the constant speed and the cutter head driving shafts. The right end of the former shaft is connected to a pump that supplies oil to the work with the shaft running in either direction. The pump with its connection to the shaft and the tube for conveying the lubricant to the piece being milled are both



An Improved Machine for Milling Threads Built by the Waltham Machine Works, Waltham, Mass.

shown in the accompanying engraving. A shaft mounted at right angles to the constant speed shaft in the bracket which serves as the bearing for the opposite end is driven by a worm and worm gear and is belted to the work spindle on the head stock. This belt runs over a four-step cone pulley which can be changed if desired to give any one of the 16 different feeds that are available by shifting the belt and changing the pulley. Longitudinal adjustment is provided for the feed driving shaft to facilitate the shifting of the belt and secure the desired tension.

The oil which is pumped on the work after leaving the cutter falls into a receptacle on the cross slide and is led away through a channel to the rear of the machine. This channel terminates adjacent to the oil reservoir which is situated at the lower right corner where the pan base is sufficiently deep to hold a supply. All the other parts of the base slope toward this point.

On the new machine the clutch that is automatically released when the cut is completed is placed directly on the work spindle. A large diameter hand wheel is mounted on this spindle to return the carriage to the starting point without disengaging the gearing. If desired the gearing can be disengaged and the carriage moved by the hand wheel on the right of the lead screw.

The compensating bar for varying the lead of the screw has been altered so that enough variation to take care of the shrinkage which occurs in the hardening process can be secured. The increase in the amount of lead which it is possible to obtain is indicated by a pointer attached to the swiveling bar and reaching through to the graduated index on the front of the machine. Two thumb screws on the front of the machine regulate the movement of the compensating bar. The right lead screw bearing is threaded and can be rotated by a lever. In this way the location of the carriage with reference to the cut can be changed, thus making a fine adjustment of the cutter relative to the work previously milled possible.

Tapers which are too slight to be cut with the regular taper attachment can be obtained by the use of the cross slide with which the tail stock is provided or this arrangement can also be employed to rectify the alignment of the centers if that should become necessary.

The centers in the new machine have been raised to accommodate work 3 in. in diameter if the pitch of the thread is not too coarse. The bed has been extended so that longer pieces can be mounted between centers and the travel of the carriage has been increased from 6 to 7¼ in. The larger size of miller is 6 in. longer and weighs 50 lb. more than the smaller one, the latter weighing 310 lb.

Producer Gas Investigations

A résumé of producer gas investigations has been published in Bulletin 13, of the Bureau of Mines, Department of the Interior. It makes a book of 405 pages, illustrated with 12 plates and 250 separate diagrams and charts. It is presented under the joint authorship of Professor R. H. Fernald and C. D. Smith, and is divided into three parts, covering producer gas and producer gas plants; reports of investigations at St. Louis and Norfolk, and reports of investigations at Pittsburgh. The investigations cover the period from October 1, 1904, to June 30, 1910. They thus begin with the operations at the coal-testing plant erected at Louisiana Purchase Exposition at St. Louis. The investigations are particularly important to localities remote from coal supply; marked economy, it is emphasized, can be gained by a general use of the gas producer in New England. The size of the publication is an indication of the monumental character of its contributions to industrial engineering, and the authors and the auspices of its publication give it, of course, the desired stamp of authenticity and reliability.

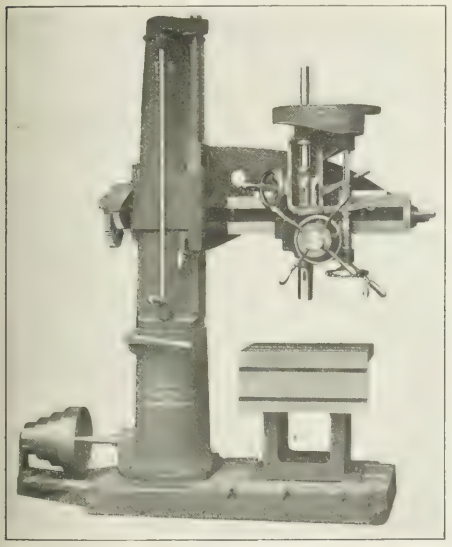
General Electric Air Compressor Sales.—The General Electric Company, Schenectady, N. Y., reports the following sale of centrifugal air compressors: Skinner Engine Company, Erie, Pa., for blowing its new 54-in. cupola; Lamson Consolidated Store Service Company, for cash conveyor system in Mandel Brothers' store, Chicago; Lunkenheimer Company, Cincinnati, Ohio, for use with oil-fired furnace; Great Western Smelting & Refining Company, San Francisco, for use with oil-fired furnace; Universal Pneumatic Transmission Company, for cash conveyor system in J. M. Adams's store, Buffalo, N. Y.; American Shop Equipment Company, Detroit, Mich., for use with oil-fired furnace; American Steam Pump Company, Battle Creek, Mich., for use with a 42-in. cupola; two to Guarantee Construction Company, New York, one for installation at Jonquiere, Quebec, and one for Suburban Light & Power Company, Chicago, for use in connection with ash-handling systems; two to Dodge Bros., Detroit, Mich., for use with oil-fired furnaces.

At the regular monthly meeting of the Cleveland Engineering Society, Cleveland, Ohio, December 12, Norman Macbeth, illuminating engineer of the Westinghouse Lamp Company, will present a paper on "Applications of Illuminating Engineering in Store and Factory." At a special meeting November 28 Dr. William C. Geer, chief engineer of the B. F. Goodrich Company, Akron, Ohio, presented a paper on "Rubber."

An Improved Simplex Radial Drill

In addition to the preliminary steps taken in the redesigning of its entire line of radial drills which were illustrated in *The Iron Age*, December 30, 1909, the Dreses Machine Tool Company, 227 West McMicken avenue, Cincinnati, Ohio, has made some other changes in its 31 and 36-in. Simplex radial drills. Simplicity in the construction and mechanism was the main object sought in changing the design of these machine tools, and they are intended for use in repair shops and places where complicated and delicate tools are not wanted nor desirable as well as other situations where heavy duty is required. Although as far as possible the design of these machines has been simplified, it is emphasized that none of the modern features essential for rapid production are lacking. All the mechanisms have been condensed to the simplest form with a view to making the oiling easy, reducing the wear and tear and decreasing the changes for getting out of order as far as possible.

The construction of the column and the arm is about the same as that of the 36-in. drill which was illustrated less than two years ago, the main difference being in the manner of supporting the table. In the older machine the column fitted into a stump and rested upon rollers for easy movement, while the table encircled the lower stump and a



The Redesigned Simplex Radial Drill Built by the Dreses Machine Tool Company, Cincinnati, Ohio.

portion of the column. Depressing a lever corresponding to that shown at the left of the column in the accompanying engraving bound the column carrying stump, the column and the table substantially together. This lever was always within reach of the operator so that the parts mentioned could be clamped or released with his left hand without changing his position, a tension screw below the lever always insuring a working fit. The table was supported at its outer end by a stand having an adjusting screw so that it could always be kept at right angles to the spindle. In the new machine, however, the table is separated from the column, an arrangement which makes it available for the full horizontal traverse of the spindle. The shape of the column is such as to give resistance to the tendency to spring while locating of a single pair of bevel gears on the inside results in the elimination on the driving mechanism of one long shaft, two gears and two bearings, which, as is readily apparent, is a great advantage.

The spindle has a ball thrust bearing and is started, stopped and reversed by the well-known three bevel gear arrangement which engages one or the other of the driving gears by a friction clutch. This clutch is operated by the long lever shown at the right of the head below the arm. An automatic stop, graduated depth gauge and a four-handle quick return are provided. Any of the levers of the quick return pilot wheel can engage and disengage the feed instantly, while an automatic locking plug keeps it disengaged when tapping is being done. The head is moved on the rail by a spiral and rack and is clamped by the lever at the back of the vertical shaft carrying the feed driving worm. This arrangement combines minute adjustment with rapid setting. The feed is of the all-geared type and has four changes which can be varied while the machine is in operation, the changes being secured by a shiftable knurled collar on the feed rod.

Two sizes of drills known as the 31 and the 36 in. machines are built, and the following table gives the principal dimensions and specifications of the two sizes:

	31-In.	36-In.
Range, in.	63	73
Distance between spindle and base, in.	51	58
Traverse of head on arm, in.	21	26
Traverse of arm on column, in.	32	38
Minimum distance between column and spindle, in.	10	10
Traverse of spindle, in.	12	12
Minimum diameter of spindle, in.	1 9 16	1 9/16
Morse taper of spindle	No. 4	No. 4
Number of feed changes	4	4
Minimum feed per revolution of spindle, in.	0.007	0.007
Maximum speed per revolution of spindle, in.	0.023	0.023
Number of speed changes	8	8
Minimum speed, r. p. m.	16	16
Maximum speed, r. p. m.	390	390
Size of table, in.	17x22	17x22
Overall height, in.	85	94
Floor space required, ft.	6x8	6½x9
Maximum pipe tap handled, in.	2	2
Maximum standard tap handled, in.	1¼	1¼
Maximum diameter of hole in cast iron, in.	2½	2½
Maximum diameter of hole in steel, in.	1¼	1¼
Power required, horsepower	2	2
Net weight, lb.	3,000	3,000
Shipping weight, lb.	3,500	3,800
Contents of case, cu. ft.	75	82

If desired a swinging table or a tilting table with or without worm movement can be supplied to order. In addition to the cone pulley drive from an overhead countershaft the machine can be furnished with motor drive or with a speed variator, the construction of which was described in *The Iron Age* March 10, 1904.

Plan to Restore Original Beauty of Niagara Falls

A daring engineering feat has been proposed by Senex Smith, an engineer of Washington, D. C. He recommends a surgical operation in Niagara Falls at the very point where the deluge hurls itself thickest.

For some years tourists have noticed in the Horseshoe Falls a great V-shaped notch, 20 or more ft. deep and from 70 to 80 ft. across from leg to leg. Because the volume of water is greater here than at any other point, the notch looms up against a greenish white crest line like a huge dark green patch. Sentimental visitors have named this notch the "Great Green Heart." As a matter of fact, however, this is nothing but a virulent cancer that is threatening to ruin the Falls. The water at this point found a soft spot in the underlying rock and has eaten into it, gouging out a 20-ft. deep channel. The deeper the channel grows the more water flows into it from the shallower ends of the Falls, and the more the water is diverted into it the more relentlessly the channel deepens.

According to a report by United States army engineers, to be submitted when Congress convenes, the Horseshoe Falls are eating their way upstream at the rate of 5 ft. a year. The erosion is still greater in the V-shaped notch that now threatens to turn the entire Falls into a mere narrow gorge whirlpool. Mr. Smith's plan, which is announced by the Scientific American, is for the State of New York and the Province of Ontario to erect a temporary dam in the rapids at the very head of the Horseshoe, so as to deflect the Niagara River over the Canadian end of the falls. When the rock under the "Great Green Heart" had been thus laid bare the ugly notch would be filled in and built up with concrete and Portland cement to the proper level. After this a vanadium steel sill would be laid along the entire ledge of the precipice. This would prevent the water from eating into the rocks for centuries to come, and would restore to the Falls their original natural beauty.

The New Steel Plant at Duluth

Present Status of the Construction Work—Exceptional Facilities for Transportation Through Belt Line Connections

Work on the plant of the Minnesota Steel Company, a subsidy of the United States Steel Corporation, is progressing satisfactorily at Duluth. A number of buildings are completed and several others are well along. The plans call for some 50 buildings. Foundations for nearly all of the larger ones are well toward completion. Exclusive of land purchases and of construction and right of way, etc., for the transfer railroad, there has been expended thus far about $1,750,000. Lands, railroad construction by the company and all other outlays will bring the expenditures to this time to very nearly $6,000,000.

The site is within and near the southerly end of the city of Duluth, along the St. Louis river, and upon the river the site has a frontage of two miles available for the larger type of freight vessels plying the great lakes. The location is bisected by a branch and bordered by a main line of the Northern Pacific Railway, the Canadian Northern passes on the hillside a few hundred feet away, while the Spirit Lake Transfer road, owned by the United States Steel Corporation, crosses the property and forms a belt line about the head of Lake Superior, connecting with every railroad system that comes to the cities of Duluth and Superior. Though this road is not yet completed, it now forms a

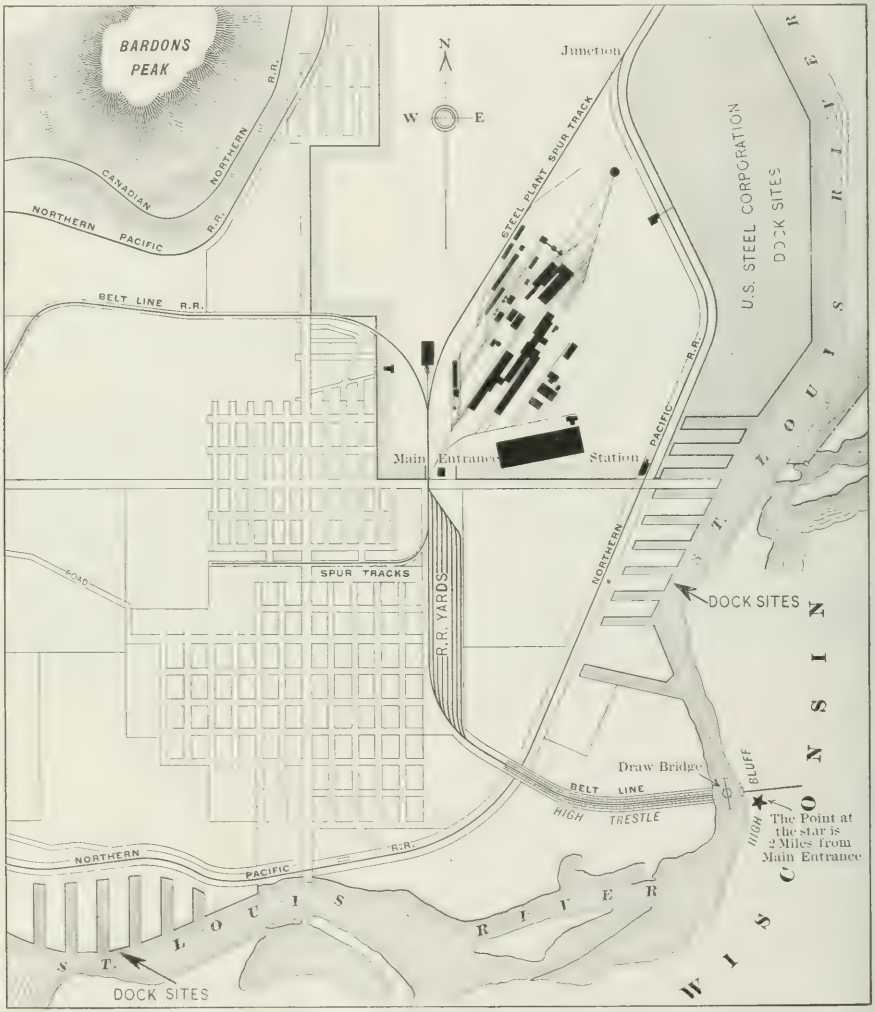


Fig. 1.—Map Showing the Location of the Minnesota Steel Company's Site, Its Railroad Connections and the Bridge Connecting with Superior, Wis.

junction with all the roads on the Minnesota side the river; it has a double deck, two-track steel girder bridge, nearly a mile long, across into Wisconsin, and also has some 2.5 miles of track in the city of Superior, Wis., with right of way 16 miles around that city to Wisconsin Point, where

ultimately there will be receiving docks for coal and supplies needed at the works.

The company controls about 2,000 acres of land well situated for its purposes, most of which is level and well drained and lies some 50 ft. above the datum of Lake Superior. The soil is clay, covering strata of sand and gravel many feet deep. Both gravel and sand used in foundations, concrete blocks, brick, etc., for these works have been dug from the excavations made for the buildings themselves.

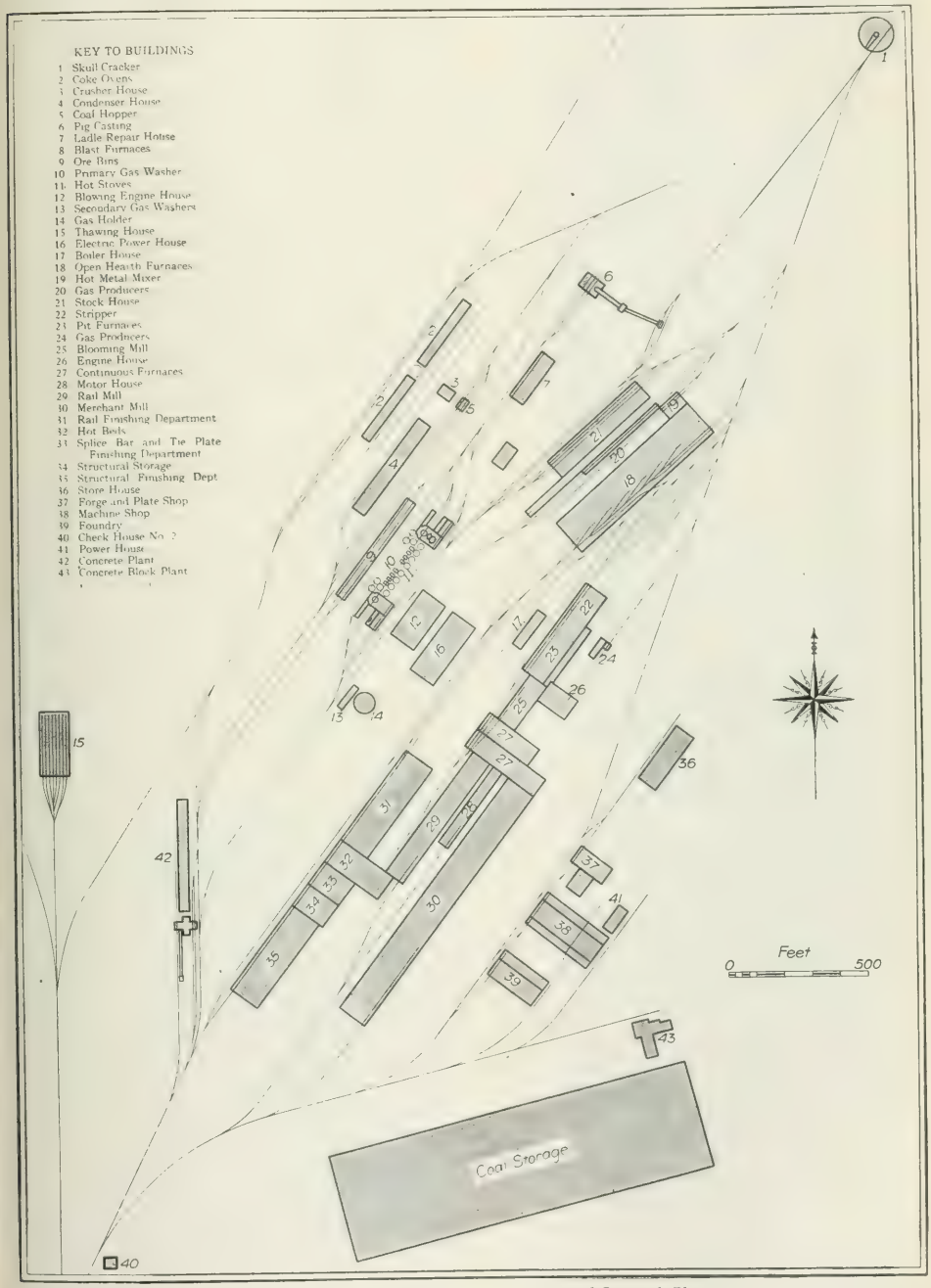


Fig. 2.—Arrangement of Buildings of the Minnesota Steel Company's Plant.

The Plant Contemplated

The works will include two blast furnaces of 400 to 500 tons daily capacity each; 90 Koppers byproduct coke ovens of capacity to furnish all coke needed in the furnaces; seven open hearth furnaces of a rated capacity of 75 tons each; four 4-hole soaking pits; two continuous reheating



Fig. 3.—View Taken Early in November, Showing Progress of Work. Open Hearth Building and Blooming Mill Foundations in Foreground. Merchant Mill at Right, with Machine Shop, Forge, Foundry and Power House in Background.

furnaces of the regenerative type with end discharge and designed to take 16-ft. billets; one 40-in. reversing blooming mill; one 28-in. finishing mill; one 16-in. continuous roughing train with three stands of 12-in., two stands of 10-in. and two stands of 8-in. finishing rolls. The products will be rails, shapes and merchant steel to an estimated amount of 1,000 tons a day. The power plant will include a total capacity of 10,000 kw. The blowing engines will be 4 driven by gas from the coke ovens, and will have a capacity of 40,000 cu. ft. of free air per minute. The pumping station will have 30,000,000 gal. daily capacity. There will be machine, forge and structural shops. The layout is shown in Figs. 1 and 2.

Status of Construction Work

The buildings now completed include a concrete power house, 100 x 40 ft., containing 800 hp. of boilers and engine and 500 kw generator, and a concrete stack 6 x 165 ft.; a concrete block storage building 300 x 40 ft.; a central gravel screening and mixing plant, of 500 yd. capacity per 10 hours; a concrete block works of capacity for 4,000 blocks per 10 hours; a hospital; a garage for an automobile ambulance; a machine shop 280 x 140 ft. with floor space of 56,000 sq. ft., and covered by a traveling crane; plate shop, 140 x 80 ft.; forge shop, 140 x 65 ft. Buildings well on toward completion as shown in Fig. 3, include an open hearth building and the connected stockhouse, gas producers and hot metal mixer. The open hearth building is 648 ft. long. Also under way are the coke ovens, ore bins, crusher house, etc., and the blast furnaces and stoves. The merchant mill, 1040 ft. long, is in frame, and its concrete block walls are partly completed. Foundations for the pit furnaces, blooming mill and continuous mills are in, as are those for the rail mill. This latter is to be 540 ft. long and is in direct line with the blooming mill and continuous mills, and, on the other end, with the structural finishing department and structural storage, making a continuous structure 1960 ft. long. Something like 200,000 cu. yd. of earthwork has been done, and 70,000 yd. of concrete foundations are laid. Between 6000 and 700 ft. of sewer, some of it 80 in. in diameter, has been put at various depths, to as much as 30 ft. underground. There are 10 miles of standard gauge railroad track in the grounds, 12 miles of power line and two miles of large water mains. Some 500,000 concrete building blocks have been made, and most of these have been set into construction. Some 6,500 tons of structural steel has been delivered, of which more than half has been erected by the American Bridge Company. All buildings are of steel frame work with concrete block walls.

Ore will come in over the Spirit Lake Transfer Railroad tracks, and will be brought direct to the blast furnace stockhouse or, in winter, it will go first into a thawing house.

In the planning of these works advantage has been taken of experience gained at Gary and elsewhere, and it is believed the result will be the most modern and economical in operation of any steel works yet built. The statement has been published that steel is to be made in electric furnaces, but there is no plan at present for the employment of electric refining. Power for the entire works will be electric, generated by gas engines that will utilize by product gases produced in the works. The power plant will be one of the most notable gas-driven installations to be found.

It is expected that a number of works under control of the United States Steel Corporation, for which the finished products of this mill will be raw material, will be grouped about the Minnesota Steel Company in time. It is for the purpose of locating these that the company has acquired a solid block of lands far in excess of its own requirements; indeed, the present works will use not to exceed 20 per cent of the lands purchased. The first dependent plant will be that of the Universal Portland Cement Company, which will begin the construction of a mill soon after the new year, that is to have capacity for 1,250,000 bbl. of cement per annum.

J. H. Williams & Co., manufacturers of drop forgings, Brooklyn, N. Y., confirm the report that they have purchased a site in Buffalo on which they hope to start to erect a plant some time next year and move, perhaps, within three years. As several points remain to be settled before a definite decision can be reached, the removal is not yet considered a certainty.

Automatic Motor Controllers

The Electric Controller & Mfg. Company, Cleveland, Ohio, has recently placed on the market a line of automatic controllers designed for the specific purpose of securing great convenience in the control of motor-driven machinery. The special advantages claimed for these controllers are the limiting of the accelerating and decelerating currents to a safe value, accelerating and decelerating the motor in the shortest safe time, varying the time of motor acceleration and deceleration according to the load upon the motor, eliminating the use of mechanical clutches on motor-driven tools, providing a means for stopping the motor quickly in case of accident and the securing of an inherent automatic no-voltage protection. Two views of machine tools equipped with this controller are given, Fig. 1 showing the device applied to a punch press with the controller mounted near the machine while in Fig. 2, a shaper, is illustrated with the controller lever mounted on the top of the tool.

The controller consists of a small operator's switch and an accelerating unit which is built in four different forms. These units were illustrated in *The Iron Age* April 6, 1911. Three types of controller are built to secure either non-reversing and dynamic braking, reversing without dynamic braking or reversing and dynamic braking. In each type a variety of four different forms of accelerating units are offered which vary in design from a simple train of accelerating switches to a unit having a fuse protected service switch, a train of accelerating switches and complete circuit breaker features. The accelerating unit automatically increases or decreases the speed of the motor through the action of series wound accelerating switches possessing the property of acting both as switches and current limiting relays as well. When the current flowing in the winding of one of these switches exceeds a certain predetermined value the switch locks open and cannot be closed until the current is reduced to the proper value.

When the operator's switch is thrown to the running position current flows through the motor, all of the starting resistance and the coil of the first series wound accelerating switch. As the motor accelerates the current decreases and when it reaches the proper value the first switch closes and cuts out a portion of the starting resistance. The operation of the succeeding accelerating switches is similar and when the last of the train closes all of the starting resistance has been cut out of the circuit and the motor is directly across the line. When the operator's switch is returned to its original position the motor circuit is opened and the motor gradually comes to a stop. Different positions of the handle in the various types provide for drifting, reversing or rapid stopping by dynamic braking.

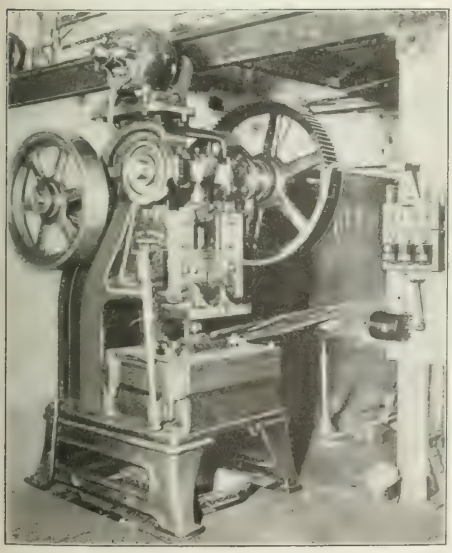


Fig. 1.—A Punch Press Equipped with a New Type of Automatic Controller Built by the Electric Controller & Mfg. Company, Cleveland, Ohio.

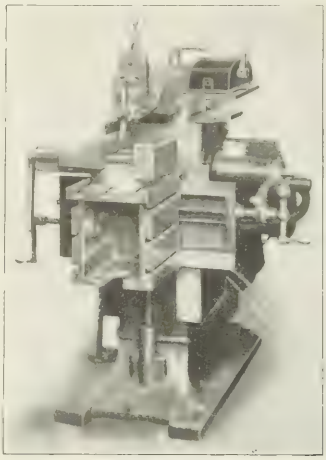


Fig. 2.—One of the Controllers Applied to a Shaper.

This last condition is secured by a change of connections produced by the movement of the operator's switch. This first inserts all the starting resistance in series with the motor armature and the motor is then quickly and evenly brought to rest by automatic dynamic braking. In this case the accelerating switches act as decelerating switches and cut out the resistance, step by step, as the current produced by the motor which is operating as a generator due to the change in its connections decreases as the motor slows down.

The Reading-Bayonne Steel Casting Company.—On December 1 the Reading Steel Casting Company, with works at Reading, Pa., and the Bayonne Steel Casting Company, with works at Bayonne, N. J., will be consolidated under the name of the Reading-Bayonne Steel Casting Company. The officers of the new company will be as follows: William D. Sargent, chairman of the board of directors; J. Turner Moore, president; A. E. Williamson, vice-president, and D. W. Yeckley, secretary and treasurer. All have been engaged in the steel casting industry for many years. The new company has an authorized capital stock of $750,000. This increase in capital over the combined capital of the two old companies has been made necessary by the steady enlargement of the business. The combined capacity of the two plants is 800 to 1000 tons per month. Located as they are, one in the Schuylkill Valley and the other in the Greater New York district, they are prepared to serve a large circle of customers. Both companies have large, thoroughly equipped plants for the manufacture of medium and light weight Tropenas steel castings. The Reading Steel Casting Company has been in the business for five years and a half and the Bayonne Steel Casting Company is entering upon its second year.

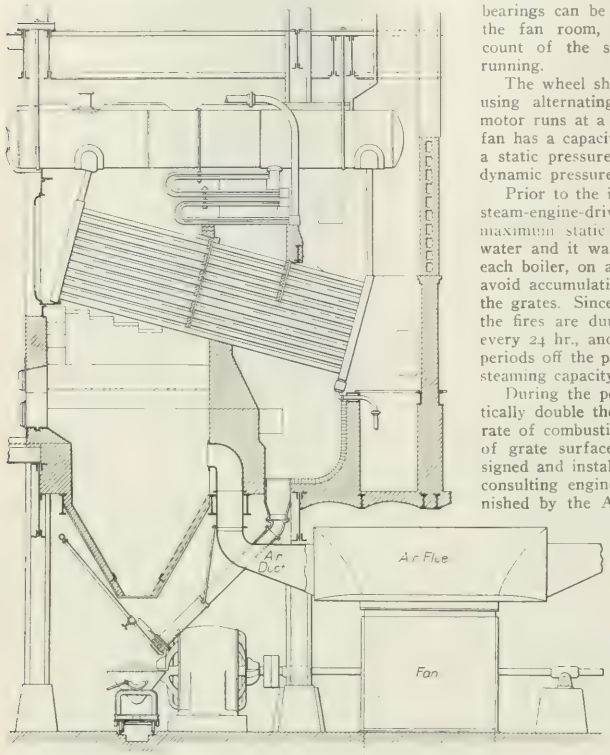
Germany's iron and steel exports in October amounted to 489,800 metric tons, against 426,000 tons in October, 1910; and for ten months the outgo was 4,388,000 tons against 4,002,000 tons. In October the exports of semi-rolled steel reached 45,480 tons, against 40,800 tons in October, 1910: beams 44,000 tons, against 30,000 tons, and steel rails, 40,700 tons, against 54,600 tons.

The Marting Iron & Steel Company, Ironton, Ohio, which blew out one of its alternate blast furnaces November 8, because of the falling in of the inwall, is now relining the other stack and expects to have it in blast by the latter part of the year.

A 500-hp. Forced Blast Unit

BY CHARLES H. HUGHES, NEW YORK.

One of the largest blowers in New York or vicinity was recently installed in the power house of the Hudson & Manhattan Railroad Company, Jersey City, N. J. In addition to its size it is interesting on account of the exceptional pressure, about 5 in., obtained, which permits of the use, with good results, of No. 3 anthracite buckwheat coal.



Forced Draft Sirocco Fan for 7200 hp. of Steam Boilers.

The present equipment of this station includes two 3000-kw. and two 6000-kw. General Electric turbo generators of the vertical shaft type, steam for which is supplied by eight 900-hp. Babcock & Wilcox boilers, each having 9000 sq. ft. of heating surface, four drums and superheaters. The boilers are in rows of four, back to back, and above each boiler is an economizer, four of which lead to two uptakes, in turn connected with a single steel stack 11 ft. in diameter and 180 ft. high above the street.

With a boiler equipment having a normal rating of only 7200 hp. and a turbine installation of 18,000 kw. it is evident that the latter is in excess of the former. Although the ultimate installation will be sixteen 900 hp. boilers, the present ones are worked to more than their normal rating to supply sufficient steam. This is accomplished by means of a forced draft system, with a fan delivering air at a static pressure of nearly 5 in. of water and practically doubling the boiler rating.

The arrangement of the forced draft system is shown in the accompanying drawing. In the basement of the station below the boilers a double-inlet double-width Sirocco fan is installed. The fan with its casing is completely inclosed by a wall of hollow terra cotta tile and the room thus formed has three windows through which air is taken and two doors. The fan wheel is of the double inlet type 72 in. wide by 72 in. in diameter, and is fastened to a tapered steel shaft 16 ft. long in diameter at the center and 6 in. at the bearings. The increased diameter at the center secures rigidity. The bearings are lined with a special babbitt metal, are self-aligning and are fitted with oil rings. The shaft on which the wheel is mounted is supported on bearings outside of the fan room, while the driving motor is in still another room. With this arrangement the bearings can be oiled when necessary without going into the fan room, which is an important feature on account of the strong suction created when the fan is running.

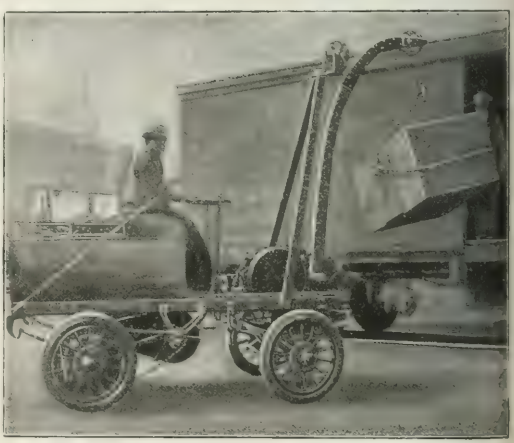
The wheel shaft is coupled to a 500-hp. electric motor using alternating current of 25 cycles, 430 volts. The motor runs at a speed of 480 r.p.m. and at this speed the fan has a capacity of 209,000 cu. ft. per minute and gives a static pressure of 4.9 or nearly 5 in. of water, and a dynamic pressure of 7.5 in.

Prior to the installation of the Sirocco fan, when four steam-engine-driven fans were supplying the air, the maximum static pressure obtainable was about 2 in. of water and it was found necessary to dump the fires for each boiler, on an average, four times in every 24 hr. to avoid accumulation of too deep a bed of ashes on top of the grates. Since the installation of the motor-driven fan, the fires are dumped on an average only three times in every 24 hr., and these operations are now carried on at periods off the peak loads when the temporary loss of the steaming capacity of one boiler is of no consequence.

During the peak loads the boilers are forced to practically double their normal rating, and at these times the rate of combustion exceeds 30 lb. of coal per square foot of grate surface. The forced draft equipment was designed and installed under the direction of L. B. Stillwell, consulting engineer, New York City. The fan was furnished by the American Blower Company, and the duct work by subcontractors for the Hudson & Manhattan Railroad Company.

A Battery Truck Crane

A device for handling with expedition and at a low cost freight and materials, loose or in packages, which have to be lifted and moved through moderate distances, has been developed by the General Electric Company, Schenectady, N. Y. It has been given the name of the battery truck crane, an electric vehicle which has a swinging crane mounted on the front end. The crane's hook is raised and lowered by a 1-ton hoist mounted on the front end just back of the crane. The motors driving the hoist and the vehicle are operated from a battery mounted on the rear end, as indicated in the illustration.



One of the Uses of the Battery Truck Crane.

The time, money and step saving applications of this crane are classed under three heads: hoisting, hoisting and

carrying on the hook and towing trailers. In case material, which may be subdivided into parcels of 1 ton or less, has to be deposited within a 6 or 8-ft. radius and this action does not require that the parcel be moved through a vertical distance of over 10 ft., the machine is brought into an advantageous position, the brakes are set, and the vehicle remains stationary as the boom of the crane moves back and forth between the picking up and depositing points. In this manner the battery truck crane may be employed to load or unload railroad cars, wagons, etc.

When material has to be moved less than 400 ft. or, in small quantities, to any distance, the article is lifted by the hook and conveyed to its destination by the vehicle. The short wheel base permits making short turns so the machine may be driven about shop aisles.

For the miscellaneous transfer of large quantities of package freight or other material through a distance of about 400 ft., the procedure is to use the truck crane to tow trailers in trains of about four. To secure the best results there should be a train loading and another unloading while the machine is on the road between to eliminate waiting.

Recorder with Frictionless Inking Device

On April 13, 1909, a patent was granted to William H. Bristol, president of the Bristol Company, Waterbury, Conn., covering a frictionless ink recorder using a hinged electrical movement carrying a receptacle containing the marking fluid. This instrument was brought out in response to a demand for a frictionless ink type of recording instrument to parallel the Bristol smoked chart recorder as closely as possible in simplicity of construction and to record accurately fractions of millivolts and to serve as a recording electric pyrometer. The original instrument has been tested out during the past two years and the new type of recorder which is illustrated herewith has been placed on the market. Some of its applications are for pyrometers, recording voltmeters, recording shunt ammeters and in electrolytic research work. Fig. 1 is an interior view showing the galvanometer movement case hinged to the back of the instrument and carrying the

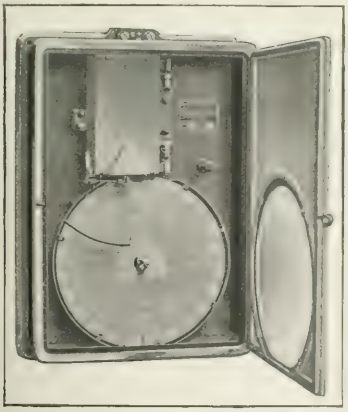


Fig. 1.—The New Frictionless Ink Recorder Made by the Bristol Company, Waterbury, Conn.

inking pad in front of the recording arm, while Fig. 2 shows the electrical movement swung to one side for convenience in removing the record and inserting a fresh chart.

In the original recorder the receptacle for the marking fluid extended over the recording tip and had means for making periodical contact with the supply of the marking fluid and the chart. In the latest style a capillary gold tube open at both ends is carried at right angles to the surface of the chart at the end of the recording arm. The inking pad is suspended from the case of the electrical movement and is curved to correspond with the arc described by the motion of the end of the recording arm. When the movement is swung back into its operating position as shown in Fig. 1 the recording arm can swing freely and accommodate itself to the position corresponding to the small amount of current measured. The clockwork which revolves the chart at any desired speed also automatically presses the inking pad toward the chart once in

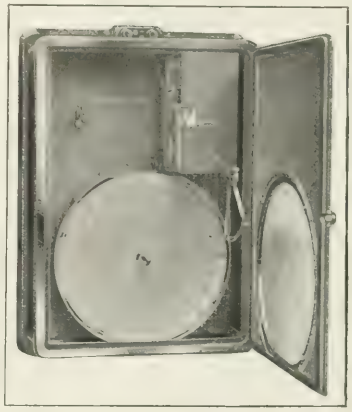


Fig. 2.—View Showing the Recording Attachment Swung to One Side to Permit the Insertion of a New Sheet.

10 sec., thus bringing one end of the capillary tube into contact with the chart and the opposite end simultaneously into contact with the inking pad. A fine dot of ink is left on the chart and the capillary tube is replenished from the pad. In this way the recording arm carries a constant supply of ink and maintains a perfect balance which it is emphasized is very important in an instrument of this nature. The electrical movements used in these recorders were especially made for this purpose by the Weston Electrical Instrument Company, Waverly Park, N. J.

The Worth Brothers Company's New Railroad

The Worth Brothers Company, Coatesville, Pa., which for several years past has been attempting to get its plant connected directly with the Pennsylvania Railroad system, has at last hit upon a plan that will bring the desired result. The main line of the Pennsylvania Railroad runs through Coatesville about a mile north of the plant, and until this time all the freight consigned to the Worth Brothers Company sent over the road had to be transferred to the Reading and run over a mile of its tracks to the plant. Natural conditions make it impossible to run a spur from the main line to the plant. A line has now been projected by the Worth Brothers Company running about three miles across country, where it will connect with a branch of the Pennsylvania Railroad about four miles from the main line. A part of the construction work on this new line is now well under way. The route crosses a valley about a half mile wide over which a steel bridge about 100 ft. high is being constructed. The opening up of the new line will give the company easy access to a number of limestone quarries along the branch road, which will supply flux for its blast furnaces.

The Steel Company of Canada has under preparation plans for building new works in Hamilton, Ont., that will cost $2,000,000. The works are to include a rod mill, a blooming mill, a billet mill, and two 60-ton open-hearth furnaces. The order for the plans has been given to one of the largest engineering firms in the United States, and it is expected that tenders will be called for as soon as the plans are prepared. It is said that the government's action is expected to be favorable in respect to the application for a bounty on pig iron and in the matter of a duty on wire rods. If it were not so expected the company might not carry out the plans in exactly the manner indicated

New Silver Drills

A new line of post drills, including both power and hand driven drills has been recently placed on the market by the Silver Mfg. Company, Salem, Ohio. These tools have ball bearings and are equipped with intermediate gears. Figs. 1 and 2 show two of the new drills, the former being designated by the maker as its self-feed drill, while the latter is a hand-power tool for light drilling of all kinds. The ball bearing feed nut used is illustrated in Fig. 3.

The first tool is designed for both fast and slow speeds and is made in three sizes, each size being made in two types, one for hand power and the other for either hand or belt power. The smallest size is designed for light and medium work and the largest for the heaviest hand drilling, the capacity being 1¼ in. for the smallest tool and 1½ in. for the other two. The spindles are bored for ¾-in. shank drills. An automatic feeding device located back of the spindle is operated by a cam inside of the gear wheel, thus giving a practically continuous feed which is increased or diminished by turning a thumb screw. These tools will drill to the centers of 15, 18 and 22 in. circles, the greatest distance from the spindle to the table being 13, 16 and 18 in. respectively. The spindle in the smallest drill is 1 in. in diameter, and in the other two the diameter is ⅛ in. greater, the traverse being 3¾, 4 and 4¼ in. for the three sizes. The spindle makes one and one-half revolutions per turn of the crank on the fast speed, while the crank turns one and one-half times for each revolution of the spindle on the slow speed. The tight and loose pulleys on the belt power tools are 8 in. in diameter and 2½ in. wide. They are intended to operate at a speed of approximately 250 r. p. m., which gives a spindle speed of 170 r. p. m.

The balls in the ball bearing feed nut shown in Fig. 3 take the spindle thrust without wear or lost motion and it is claimed that they reduce the friction at this point to a minimum and save from 20 to 50 per cent. in the amount of power consumed. The balls are protected from dust and dirt and are carried in disks or cups of case hardened steel. The intermediate gear wheel does away with the necessity of reversing the crank on the slow speed. In Fig. 1 the crank is shown in the slow speed position. The bearings of the drill are ground and machine molded gears are used to insure a perfect mesh. Steel is used for the spindle and the upright column and the frame is a one-piece casting. The hand power drills when crated weigh 115, 170 and 230 lb., while the combination hand and belt power tools are 15 lb. heavier. The hights of the three sizes of drill are 48, 50 and 54 in.

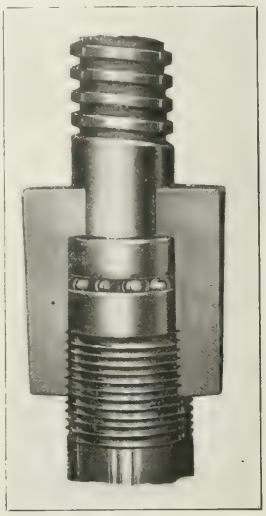


Fig. 3—The Ball Bearing Feed Nut Used on These Drills

The hand power drill illustrated in Fig. 2 is very similar in design to the other and is intended for light drilling of all kinds. The drill has hand feed and also a continuous automatic feed worked by a cam on the inside of the main gear wheel and adjusted by a thumb screw in the same way as the tool illustrated in Fig. 1. Two speed changes are available and these are secured by moving the crank hub from one shaft to the other. The tool has a capacity of 1 in. and will drill to the center of a 12-in. circle. The greatest distance from the spindle to the table is 10 in. and the spindle traverse is 3 in. The ratio of spindle revolutions to turns of the crank is the same as in the other drills. The diameter of the column is 1¾ in; the over-all hight, 38 in., and the crated weight 80 lb.

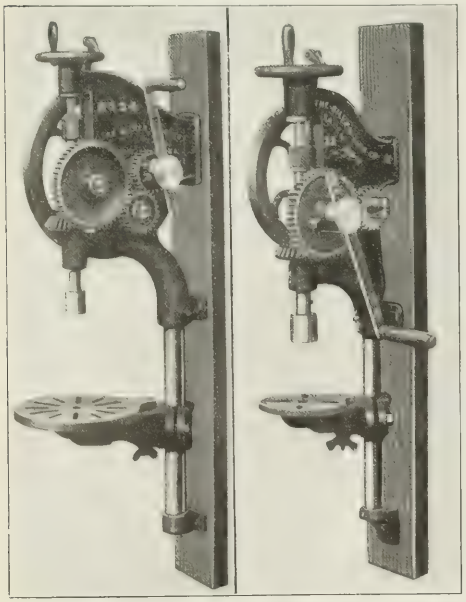


Fig. 1—A New Type of Ball Bearing Post Drill.

Fig. 2—The Hand Power Ball Bearing Drill.

Two New Types of Drills Made by the Silver Mfg. Company, Salem, Ohio.

The Enlarged M. Rumely Company

The M. Rumely Company, LaPorte, Ind., has increased its capital stock from $3,000,000 to $22,000,000 through reorganization and the merger with it of Gaar, Scott & Co., Inc., Richmond, Ind., and the Advance Thresher Company, Battle Creek, Mich. The three companies are manufacturers of threshing machinery. The capitalization is larger than that of any other manufacturing concern having its headquarters in Indiana and the consolidation makes the new company the third largest threshing machine company in the world. The capital stock is divided into $12,000,000 common and $10,000,000 preferred. The M. Rumely Company was established in 1853 with $250,000 capital; Gaar, Scott & Co. in 1836 and the Advance Thresher Company in 1885. The total assets of the new company are given by the appraisers at $21,281,306, of which current assets are $16,177,784. The three plants employ about 4000 men.

Why Ferromanganese Is Rising

The three big German establishments (Gelsenkirchen, Gutehoffnungs-Hütte, and Niederrheinische Hütte) that produce ferromanganese have effected an arrangement with English producers as to prices and markets, according to late advices from Berlin.

At the annual meeting of the Foundry & Machine Exhibition Company, held in Pittsburgh, recently, the recommendation of the directors, made at the Buffalo meeting, that a 20 per cent. dividend be paid to exhibitors at the Pittsburgh convention, was indorsed. This dividend will be paid to all exhibitors who participated in two consecutive shows and the dividend will be held in reserve for those who exhibited for the first time at the last convention, but will be paid to them in 1912 if they exhibit at Buffalo.

A New Crane Trolley

Compactness without complicated construction characterizes a new crane trolley with overhanging gears that has been brought out by the Cleveland Crane & Engineering Company, Wickliffe, Ohio. Its general construction follows that of the other trolleys built by this company and it is pointed out that while throughout its entire design all the parts essential to perfect operation have been retained, at the same time only the fewest possible numbers of pieces are used. There are no loose bearing brackets on the trolley, all bearings being cast on the side frames and bushed with bronze. The trolley is designed for very heavy steel mill service and with that end in view cast iron has been employed for the drum only. Fig. 1 is a plan view of the new trolley, while Fig. 2 is an end elevation of the hoisting end.

The hoisting mechanism is composed of a large diameter cable winding drum, *a*, Fig. 1. The gear *b*, which is of wide face and large pitch, is keyed to the drum and meshes with the brake pinion *c*. This pinion runs on the intermediate shaft *d* which has the large motor gear *e* keyed to its opposite end. The motor pinion *f*, which is keyed directly to the motor armature, meshes with this gear. A heavy forged shaft running in a bronze bearing *g* on the upper side of the trolley frame supports the drum. The bearings for the intermediate shaft are also located on this side of the frame and together with those of the drum shaft are of the capped tongue and groove type, the cap being held in place by through bolts to the complete exclusion of studs, cotters or keys in the construction of these boxes. Both of these shafts are so located that either one of them can be removed without disturbing the other.

The driving mechanism of the trolley consists of a driving motor which transmits power to the wheels through two sets of gears and two shafts. One of these shafts is the long axle which extends across the trolley and to which the two driving wheels *k*, one on either side of the trolley, are keyed. Mounted on this axle also is the gear *l* which meshes with the pinion *m*. This pinion is keyed to the intermediate shaft *n*. The pinion *p* is keyed to the motor armature and meshes with a gear which is keyed to the intermediate shaft. The intermediate shaft bearings are of the same type as those used in the hoisting mechanism and are located in the end of the frame. The axle boxes *q*, Fig. 2, are of the M. C. B. type with oil waste collars and bronze half hexagonal boxes *r*. These parts are held

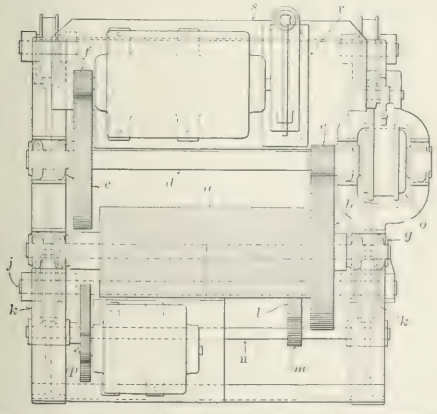


Fig. 1.—Plan View of a New Crane Trolley with Overhanging Gears, Built by the Cleveland Crane & Engineering Company, Wickliffe, Ohio.

in place by through bolts and together with the shafts can be easily removed without disturbing any other part.

The two main frames are kept in alignment by a heavy structural tie piece, *s*, which is securely riveted to the frame casting. Its design is simple and it supports the top block *t* consisting of a straight pin on which are mounted the rope sheaves with bronze bushings pressed in and arranged to turn on the pin which is held rigidly in position. Both motors and the electric brake *v*, Fig. 1, are mounted directly on top of this tie piece which is so designed that any standard make of motor can be used. This arrangement is also very convenient for inspecting and repairing the motors. In addition to the electric brake there is also a mechanical brake *o* for stopping the travel of the trolley.

The lower block used in these trolleys is also of simple

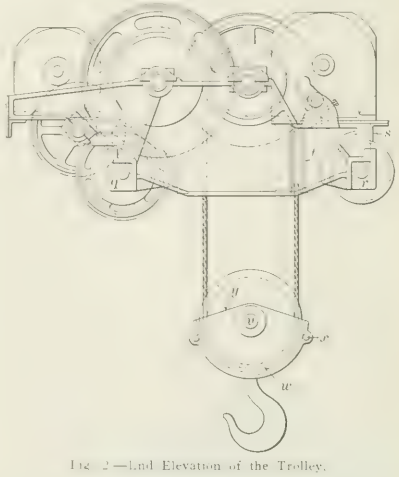


Fig. 2.—End Elevation of the Trolley.

construction and consists of a straight pin, *u*, Fig. 2, which carries the sheaves that are duplicates of those used in the upper block. These sheaves extend through the side plates *w* which are of heavy structural material and connect the pin with the cross head. They are also held in place by through bolts *x* having pipe separators. The cross head *y* is a simple forging with a large hole bored in the center which carries the neck of the hook and on top of which the ball bearings on which the hook turns are mounted. The ends of the cross head are turned with trunnion bearings which fit into the side plates, thus making a very small number of parts.

Three Notable Open-Hearth Furnaces

In September the Phoenix Iron Company of Phoenixville, Pa., completed the erection of an additional open-hearth furnace. The hearth of this furnace is 15 x 42 ft. and steel is tapped into two ladles simultaneously through a bifurcated spout equipped with controlling device, all of which is covered by patents owned by the company. The largest heat to date is 194½ net tons of ingots, the average heat being 185 tons. During the eight weeks the furnace has been in operation the weekly average has been 1352 net tons of ingots. This, it is believed, is the largest product that has ever been made by any furnace using all cold raw material and producer gas.

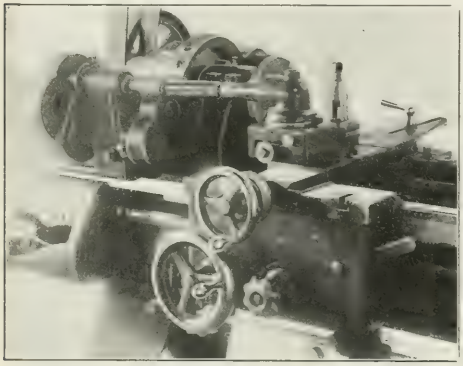
This makes the third furnace the company has making large heats tapping into two ladles. The first one started making steel in January, 1909, 14 x 32 ft. in hearth size, and averages per heat 140 net tons of ingots. The second furnace started making steel in October, 1909. The size of hearth is 14 x 36 ft., and the average heat is 156 net tons of ingots. An illustration of this furnace was given in *The Iron Age* of October 20, 1910.

W. J. Holliday & Co., Indianapolis, Ind., wholesale dealers in iron and steel, have purchased the Central Chair Company property on South Missouri street for $92,500. The lot is 171 x 420 ft., with a four-story brick factory building on it. The new owners will build a series of steel-constructed warehouses to accommodate their rapidly growing business. The first of these, 80 x 171 ft., will be begun at once. The plan endeavors to make it as modern as any building of its kind in the United States, with the purpose of handling stock as efficiently and economically as possible.

Seneca Falls Relieving Attachment

A new relieving or backing-off attachment has been recently brought out by the Seneca Falls Mfg. Company, 255 Water street, Seneca Falls, N. Y. It is intended for use with its 14 and 16 in. quick change tool room lathe, the former of which was illustrated in *The Iron Age* November 24, 1910. This attachment can be used in connection with the taper turning attachment and micrometer cross feed stop and also with the power cross and longitudinal feeds, and its use in conjunction with special cams enables elliptical or other irregular shapes to be turned.

The attachment can be easily and quickly disconnected so that it does not interfere with the regular operation of the lathe. The tool slide is removed by loosening a binding screw which is claimed to be much easier and quicker to operate than the regular T bolts and slots, pulling out the splined shaft from the driving mechanism and finally throwing the driving gear out of mesh with the head stock gear. The tool slide is attached to the carriage cross slide in place of the compound rest and will operate at any angle through an arc of 90 deg. on either side of the center of the carriage. The lower portion swivels on the cross slide in the same way as the compound rest and the upper part containing a pair of bevel gears in turn swivels upon it. In this way free working of the driving shaft which is connected to the driving mechanism by universal joints is secured. The stroke can be adjusted while the



A New Lathe Relieving Attachment: Made by the Seneca Falls Mfg. Company, Seneca Falls, N. Y.

machine is in motion to give any desired amount of relief from 0 to ¼ in., the amount being indicated by graduations on the adjusting knob.

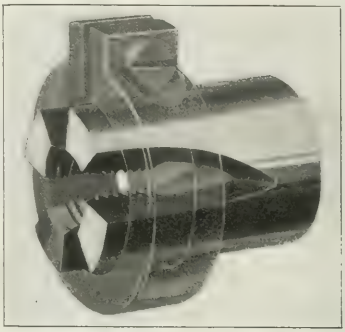
The driving mechanism is attached to the bed in front of the head stock and receives power from the head stock gear. The number of strokes per revolution of the work is governed by change gears, a set being furnished which provides 22 variations These gears give all numbers of strokes per revolution of the work from 2 to 16 and all even numbers from 18 to 30.

Suit has been filed in the United States Court at Chattanooga, Tenn., by the Trust Company of America, of New York, asking for a receiver for the Chattanooga Iron & Coal Company, a subsidiary of the Southern Steel & Iron Company, and seeking to foreclose a mortgage aggregating $600,000 and dated January 1, 1906. The Southern Iron & Steel Company of New Jersey and the Georgia Steel Company are also named as defendants, but merely to restrain them from proceeding against the property of the other defendant.

The Cincinnati Lathe & Tool Company, builder of engine lathes and machine tools, announces that it is now comfortably located in its new shops in Oakley, a suburb of Cincinnati, Ohio. The new shops have every facility for manufacturing Cincinnati lathes with the least time and labor costs, being up to date in all respects. The company's address is now Oakley, Cincinnati

An Improved Spring Die

For some time the National-Acme Mfg. Company, Cleveland, Ohio, has been making quantities of spring or prong dies for use in its screw machine products department and has built up a fully equipped department for their manufacture Recently, however, the company has



A New Type of Spring Die Placed on the Market by the National-Acme Mfg. Company, Cleveland, Ohio.

decided to offer these dies to the trade in general and the improved spring die which is shown in the accompanying illustration is the result. This die is made in a number of styles and sizes. Those regularly carried in stock include the Society of Automobile Engineers (formerly the A. L. A. M. standard), the V. and the U. S. standard threads, while if desired dies of special pitches and shapes can be supplied to order.

Alabama's Governor Pleases Railroad Interests

The Railway Business Association, composed of manufacturers of equipment and supplies, held its annual business meeting and its third annual dinner at the Waldorf-Astoria, New York, on the evening of November 21. The following officers were elected for the coming year: President, George A. Post; vice-presidents, H. H. Westinghouse, O. H. A. M. Kittredge, W. E. Clow and George W. Simmons; treasurer, Charles A. Moore; assistant treasurer, M. S. Clayton.

The dinner was labeled the "Prosperity Special" on the menu card, and in addition to members of the association there were present 40 presidents and vice-presidents of railroads, 23 presidents of chambers of commerce in many states, and Governor Emmet O'Neal of Alabama. The address of the evening was made by the governor. He has pronounced views on the right of a state to regulate its own commerce, but expressed himself as favoring the railroads so far as to carefully avoid any crippling of such enterprises or any impairment of their ability to earn a fair return on the capital invested, saying that the South has much to thank the railroads for, needs more of them, and does not intend to prevent fair and even liberal returns on their property. How to improve business and what legislation may do to business received much attention from the other speakers.

After a strenuous fight Mrs. Elizabeth Seaman, who as Nellie Bly was widely known some years ago as a newspaper writer, has lost her fight to save the Iron Clad Mfg. Company, of which she is the head, from being declared insolvent. By direction of the court a jury in the United States District Court in Brooklyn, N. Y., November 23, found that the company was bankrupt and that a referee should be appointed to ascertain the amount of the assets and liabilities of the company and settle its affairs

Katchen & Rabinowitz, structural and ornamental iron work, have moved from 78 Seventh avenue, Newark, N. J., to their own building, 201 Norfolk street, in that city. They have provided for themselves much larger quarters and better facilities for making fire escapes and all ornamental iron work.

The Machinery Markets

From nearly all machinery centers the reports are of a generally healthful tone in the trade. It is believed that the next 60 days will not only see a continuation of the present trend of business in machine tools, but that railroad requirements, noteworthy for their size, will be made known. This business, it is admitted, may not be in evidence until after the holidays. New York dealers pronounce the general volume of business in small lots as good. Prospective railroad requirements are being keenly anticipated in New York. The Delaware & Hudson and New York Central are regarded as probable buyers whose lists will touch large figures. Philadelphia has done a fair volume of fresh business and, like other centers, reports that railroad equipment buying is expected to help the trade. New England shops are busy. In Chicago activity continues. Good sales have been made. The railroads have taken single tools and a $10,000 inquiry is being figured on by Chicago dealers. Detroit has had several inquiries for machine tools and the second-hand trade has been active. Orders for three or four tools have predominated in Cleveland. Cincinnati says business is improving and there is a demand for skilled labor. The South is busy, and St. Louis reports that factory construction in that city means more business. Texas shares in the generally favorable report. Exports have shown no backward tendency.

New York

NEW YORK, November 29, 1911.

The aggregate amount of business in the New York machinery market is pronounced good by most sellers, despite the absence of any new lists or large orders which run into large amounts. The total volume of small orders is a cause of satisfaction. There has been little change during the week, although the feeling of encouragement has increased somewhat. Of some large machine tool builders in the East it is said they have no cause for complaint. Developments in the next 60 days in the machinery trade are expected to give an impulse of activity to dealers and makers. The opinion is growing that good business is to come from the railroads in the near future. Prospective lists from the Delaware & Hudson and the New York Central are among those intimated in the trade. Dealers in hoisting and conveying machinery express themselves as pleased with the amount of business they have in hand, a considerable portion of which will run into next year.

The improvements contemplated by the Titan Steel Castings Company, Newark, N. J., which have been held in abeyance, are to be begun at an early date and pushed to completion. They include an addition 200 x 200 ft. to the plant of the company in Newark.

Paul G. Mehlin & Sons, piano manufacturers, 27 Union Square, New York, have had plans prepared by Balch & Beardsley, 38 West Thirty-second street, for a new plant to be erected at West New York, N. J. The plans call for a main building, three stories, 63 x 225 ft., with an L, 63 x 126 ft., and a power plant, 35 x 70 ft., all of reinforced concrete construction. The equipment now at their works at 549 West Fifty-fourth street will be moved, but much new wood-working machinery will be required.

Contracts will be let in about three weeks for the new plant of the C. F. Mueller Company, manufacturer of macaroni, which is to be erected at Westside avenue and Boyd street, Jersey City, N. J. The plans provide for a main building, 65 x 150 ft., five stories, and a separate power plant. The machinery requirements include macaroni making machinery, conveyors of a light type, heating and ventilating equipment of a special design and a complete steam power plant. Balch & Beardsley, 38 West Thirty-second street, New York, are the architects in charge.

The American Musical Supply Company, 20 Morris street, Jersey City, N. J., has had plans prepared for a factory building to be erected at Woodward street, adjoining the Morris Canal. The new building will be 75 x 125 ft., three stories, of brick and mill construction, the estimated cost of which is $30,000. The company will move its equipment from its present plant, but much special machinery for the manufacture of piano-tuning pins, together with boilers and engine, will be required.

The Torbensen Gear & Axle Company, Bloomfield, N. J., has been incorporated with $120,000 capital stock to manufacture rear axles for motor trucks. The company will not install a plant at present, but will have its product manufactured by contract.

Kraeuter & Co., Newark, N. J., manufacturers of mechanics' tools, has had plans prepared for a four-story reinforced concrete addition, 60 x 75 ft., to be erected at Sixteenth street and Eighteenth avenue, that city. The estimated cost of the structure is $40,000. Equipment details are not as yet available.

The Universal Fibre Board Company, Rochester, N. Y., contemplates the erection of a plant with an area of 20,000 sq. ft. at Middleport, N. Y.

The James Thompson Steel Construction Company, Buffalo, N. Y., has been incorporated by James and C. Thompson and Edward Mayer. About the first of the year the company expects to establish a small fabricating plant. Temporarily the company's office will be at 318 Norwood avenue.

Plans are being prepared for the immediate rebuilding of the plant of the A. L. Swett Iron Works Company on Glenwood avenue, Medina, N. Y., which was partially destroyed by fire November 24, with a loss of $30,000, the larger portion of the loss being confined to the foundry and pattern shop.

The Rochester, Syracuse & Eastern Railroad Company will build a new power house north of its present location, at Lyons, N. Y., at an estimated cost of about $40,000. The new building is rendered necessary owing to changed location of the Erie Barge Canal.

The Bolton Light, Heat & Power Company, Bolton Landing, N. Y., contemplates extensions to its plant and system and has been authorized by the Public Service Commission to issue $12,000 in bonds for the purpose.

The city of Binghamton, N. Y., has voted to issue bonds to the amount of $158,200 for the construction of a municipal lighting plant, with necessary generating equipment.

C. C. Kellogg & Sons, Utica, N. Y., have let contracts for the construction of a two-story lumber mill and woodworking plant, 64 x 188 ft., of reinforced concrete.

New England

BOSTON, MASS., November 28, 1911.

The situation in the machinery market changes but little. No new business of particular moment is reported, but scattering orders relieve the monotony. Opinions differ broady regarding causes of the existing dullness and also as to the outlook, the leaven of those who believe in better times ahead being on the increase.

Harry G. Stoddard, president of the Trenton Wire Company, Trenton, N. J., has become associated with the Wyman & Gordon Company, Worcester, Mass., manufacturer of drop forgings. Mr. Stoddard will be a director of the corporation and will hold an office in the management, but this detail has not been determined. He will pay special attention to the sales end of the business. The company has grown very rapidly in the volume of its product in recent years and Mr. Stoddard will divide the details of management with Lyman F. Gordon, the president and treasurer, and George F. Fuller, the secretary and superintendent. Mr. Stoddard has been president of the Trenton Iron Company, a subsidiary of the United States Steel Corporation, for seven years and previously was manager of the Worcester Works of the American Steel & Wire Company.

The contract has been awarded for the new building of the Lamson Consolidated Store Service Company, Lowell, Mass. The structure will be 50 x 150 ft., four stories.

The United States Metal Screen Company, Norwalk, Conn., will manufacture a metal screen, the in-

vention of F. S. Banks, Wilton, Conn. Quarters have been taken in the Joseph Loth Company's building on Grand street.

The Ames Plow Company, Boston, Mass., has nearly completed its new works at South Framingham, Mass., and will remove the entire business from Worcester, where the works have been located for many years.

The Fox Gun Company, Philadelphia, is considering removing its business to Fitchburg, Mass. The change is subject to the placing of a bond issue of $100,000 in Fitchburg, and it is stated that this part of the transaction has been completed.

Joseph A. Serre, Danbury, Conn., has acquired the property of the Danbury & Harlem electric railway, and proposes to complete the line. The road is built from Danbury to Peach Lake, N. Y., and the power house has been equipped for five years, but no cars have ever been operated.

The American Steel & Wire Company will erect an addition to its New Haven works, 40 by 40 ft.

The New York, New Haven & Hartford Railroad will begin work immediately upon the new machine shop, which will be part of the new round house installation at Cedar Hills, a suburb of New Haven, Conn. The building will be 76 x 250 ft., one and two stories. A store house and office building will be 46 x 151 ft., two stories. The company has been making inquiries as to the equipment of the shop for some weeks.

The New Haven Boiler Works, New Haven, Conn., states that it has purchased the equipment of the addition to its plant, the contract for which has been let. The building will be 48 x 136 ft., one story.

The works of the Fore River Shipbuilding Company, Quincy, Mass., are actively busy. Two submarines for the United States, the Haddock and Chiclot, will be laid down immediately, and two others of the same type are well under way.

The Ready Tool Company, Bridgeport, Conn., manufacturer of small tools, will soon move into more commodious quarters. The company announces that it has become the owner and manufacturer of the M. B. Hill Mfg. Company's machine dogs, which had been made in Worcester, Mass.

J. L. Lucas & Son, 3 Fox street, Bridgeport, Conn., have brought out the Gas Saver brazing forge, which is intended primarily for automobile, factory and garage work. It burns either illuminating or fuel gas, and requires at least 3 lbs. of air pressure. It is built either right or left handed, with single or double torches.

Negotiations have fallen through for the purchase of the shipyard of Robert Palmer & Sons, Noank, Conn., to the Morris Heights Ship & Engine Company, Morris Heights, N. Y., which company has outgrown its present facilities, it is stated.

Philadelphia

PHILADELPHIA, PA., November 28, 1911.

Merchants are doing better, although the aggregate of the past week by no means represents what might be termed good business. A greater number of orders for machine tools have been booked by some of the local dealers, the bulk of which are in the nature of comparatively fresh business. There is the same hesitancy displayed in negotiations which have been under consideration for some time although the trade feels that the more pronounced buying by the railroads will have a favorable influence on other pending projects. Sales have been closely confined to single tools, either of the usual standard or special types; here and there reports of transactions covering the purchase of a few tools are heard, but very little business is pending involving any large purchases of shop equipment.

Manufacturers show but little improvement in plant operation. Considerable irregularity is noted in the receipt of orders, and some special tool makers, who have been quite busy heretofore, are now feeling the effect of quieter conditions. The bulk of the orders coming in are from consumers outside of this particular district. Boiler makers and engine builders have been taking some fair orders although the better share of the business has been in the smaller equipment. The second hand machinery trade continues on an irregular basis; buying covers a very general range of machine shop equipment, as well as boilers and engines, although in none of these lines has the demand been active. Developments in the foundry trade have been unimportant, although indications of better buying of castings for use in connection with railroad equipment construction are to be noted.

The John T. Baily Company, rope and twine manufacturer, has broken ground for a two-story reinforced concrete addition to its plant at Tasker and Water streets. The addition will be irregular in shape, measuring about 60 x 150 x 350 ft., and will be used on completion for general manufacturing purposes. New machinery for rope and twine making will be installed, as well as additional power equipment for generating electricity.

The Woodhouse Chain Works, Trenton, N. J., is operating its plant on a basis of 90 per cent. of full capacity, the principal demand being for high grade hand made chain, particularly of the heavier type. A duplicate order for something over 100 lineal ft. of special dredge chain has just been shipped to a customer in the Far West. The Woodhouse Works is now preparing its machinery for operation in the making of proof coil machine chain, up to one in. in size.

Isaac A. Sheppard & Co., stove manufacturers, who recently disposed of their plant at Fourth street and Montgomery avenue to the John B. Stetson Company, have purchased a site of seven acres at Erie avenue and Sepviva street, on which a complete modern stove manufacturing plant will be erected. Plans for the buildings are now in preparation and consideration is being given to the question of power and general equipment, although requirements have not been decided upon.

The Trenton Iron Company, Trenton, N. J., is installing additional power equipment comprising a 1000-hp. gas engine built by the Bethlehem Steel Company, to operate in direct connection with a Crocker-Wheeler Generator. New gas producers for use in connection with the new engine will be furnished by R. D. Wood & Co. The Trenton Iron Company has been increasing its operative capacity in several of its various departments and has a comparatively good volume of business on its books. A recent order, on which work has been started, is for an aerial tramway of the Bleichart system for the Saline Valley Salt Company, operating in southern California. This system will be 14 miles long and have a capacity of 25 tons per hour.

The city of Philadelphia has taken title to the plant of the Abrasive Material Company, Seventy-second and Upland streets, for boulevard purposes. The company will therefore proceed at once on the erection of its proposed new plant in Bridesburg in the northeastern section of the city, reference to which has previously been made. Plans for the new buildings are practically completed and consideration is now being given to the power equipment, which will probably include both steam and electric power.

William Wharton, Jr. & Co., Incorporated, note increased activity in their railroad department, street railway track equipment being customarily quiet at this season. Inquiries are said to be of a more promising nature.

It is stated that a plot of ground located at Broad, Wallace and Fifteenth streets, 100 x 400 ft., has been sold to a syndicate which will improve it by the erection of an eight or ten story commercial building. George F. Lasher, Morton B. Hirsch and Harrison C. Rea are said to be interested in the project.

Chicago

CHICAGO, ILL., November 28, 1911

Activity in the purchase of machinery continues in this market and the past week witnessed the buying of machinery for many classes of manufacture. The International Harvester Company bought nine lathes having a total value of approximately $4500. Sales of machines in Illinois to the amount of several thousand dollars are reported, among which is noted one lot aggregating $3000. Among other purchases recorded were four Gardner disc grinders, two being the patternmaker's type. The Chicago, Burlington & Quincy Railroad purchased the bolt cutters mentioned last week but the Illinois Central list is still in the market. A manufacturer in one of the Chicago outlying districts is receiving propositions on tools aggregating in value $10,000. Sales of a number of second hand millers and planers added to the volume of business. The effect of the long continued meager business wears off but slowly and the necessity for encouraging purchases by concessions of various kinds continues to reduce the margins on which tools are sold.

The Burkel Mfg. Company has been incorporated to do a general manufacturing and mercantile business by Andrew J. Ryan, I. I. Livingston and Daniel Jerka.

The Acme Automatic Tire Pump Company has

been incorporated with a capital stock of $50,000 by Oscar Ralston Holbo, Henry Nicolas Hansen, Fred B. Cavanaugh and George Washington York.

The Electric Appliance Company has been incorporated with $60,000 capital stock to manufacture and deal in electrical appliances, apparatus, etc. The incorporators are William W. Lowe, Thomas I. Stacey, and William B. Walrath.

The Mogul Motor Truck Company has been incorporated with a capital stock of $125,000 by George C. Griffith, L. S. James, Frank Dawson and John F. Hicks to manufacture and deal in motor vehicles.

The Rockwood Sprinkler Company has filed notice of an increase in its capital stock from $100,000 to $150,000 and of its directors from three to five.

The United States Steel Grain Door Company has been incorporated with a capital stock of $5000 to do a general manufacturing and merchandise business. The incorporators are I. E. Burtis, G. Burtis and H. W. Drew.

The Solar Inverted Arc Lamp Company has been incorporated with $10,000 capital stock by David Broutman, Isadore S. Krinsky and Samuel Solomon, to manufacture and deal in gas and electric fixtures and appliances.

The plant of H. W. Caldwell & Sons Company was visited by fire November 21. The damage was confined to the conveyor department of the works and was not sufficient to interfere with the regular routine of the company's business nor to handicap it in making the usual deliveries on orders.

The Illinois Culvert Company, Springfield, Ill., has been incorporated with $12,000 capital stock by L. R. Craig, A. E. Heywoth, and Fred L. Vermillion. The company will manufacture culvert pipe, roofing, etc.

The Corrugated Iron Specialty Works, formerly located at White Hall, has begun installing machinery in its new factory at Harvard, Ill.

The Lake Shore & Michigan Southern has under consideration the building of railroad yards and shops at Miller, a few miles east of Gary, Ind., which will require an expenditure of $200,000.

The Illinois Central Railroad has plans prepared for a new round-house at Champaign, Ill., which include among the tools to be installed, a planer, sensitive drill, shaper, double emery grinder, bolt cutter, grindstone, 22 and 36-in. engine lathes.

The Crawford Locomotive & Car Works, Streator, Ill., has under contemplation the improvement and enlargement of its present plant. The immediate improvements planned are in connection with the power plant and forge shops.

Smith & Harsman, Peoria, Ill., have purchased property on North Orange street in that city and expect to erect there a new machine shop.

The Avery Company, Peoria, Ill., builder of tractors and motor trucks suffered a severe fire loss last week causing damage to the amount of $150,000 to its boiler shop. The injured portion of the plant will be rebuilt at once.

The Burr Company, Champaign, Ill., with $100,000 capital stock has been incorporated to do a general manufacturing, structural iron, steel products, foundry and machine business. The incorporators are E. M. Burr, N. C. Bur and Manford Savage.

The Olney Lumber & Mfg. Company, Olney, Ill., has increased its capital stock from $10,000 to $20,000 for the purpose of extending its mill equipment.

The Chicago Railway Signal & Supply Company, Carpentersville, Ill., has been incorporated with $10,000 capital stock by John F. Fierke, Howard C. McNeil and Charles E. Griffith, and will equip a plant for the manufacture of railroad signals and similar appliances.

The Middleton Auto Company, Eagle Grove, Iowa, has been incorporated by Lyman B. Middleton and Claude E. Middleton.

The Hay Tool Mfg. Company, Council Bluffs, Iowa, whose plant was recently destroyed by fire, is rebuilding and expects to purchase machinery to the amount of several thousand dollars.

The Kiel Motor Car Company, organized by Fred Theissen and Phillip Juenheimer, will build a new plant at Kiel, Wis. The company has been incorporated with a capital stock of $14,000.

The Automatic Trip Carrier Company, Rice Lake, Wis., has had plans prepared for a brick factory, 50 x 200 ft., with an engine room, 24 x 24 ft. The plant will be equipped with up to date machinery with individual electric drive.

The J. Q. Clarke Tank Company has been incorporated at Crawfordsville, Ind., with $15,000 capital stock to manufacture tanks, fountains, etc. The directors are J. Q. Clarke, J. H. Elder and H. S. Binford.

Detroit

DETROIT, MICH., November 28, 1911.

Business is light, the improvement in the machine tool trade that made itself manifest during the early part of the month not being sustained. A number of fair inquiries for metal working machinery are in sight, but merchants are finding it difficult to close definite orders and the belief is general that no really big business will be done until after the holidays. Dealers continue to do a good business in shop supplies. Second-hand machinery is in moderate demand, sales of metal working equipment predominating. Gray iron foundries are booking a good volume of orders, particularly those which make a specialty of motor castings. Makers of steel castings also note the demand as somewhat improved.

Many of the more important counties of this State are preparing to devote large sums to roadmaking the coming year and a good market for machinery for this purpose is looked for.

Exploratory and mining operations are being actively carried forward in the iron mining district of northern Michigan and reports indicate that considerable machinery is being installed, including drills, boilers and hoisting equipment.

The Detroit Edison Company has added $6,000,000 to its capital, increasing the capital stock to $15,000,000. Vice-President Alexander Dow states that the increase is to provide for extensions and improvements to the company's plants and system that will be needed during the next few years. The company is taking figures to enlarge its battery station recently completed at Brush and Macomb streets.

The Art Stove Company is building a brick factory addition and warehouse at its plant at Milwaukee avenue and Russell street.

The Simpson Tire Fibre Company has been incorporated with a capital stock of $100,000. Incorporators named are S. L. Simpson, James D. May and Harry J. Dingemann, all of this city. No particulars are available, but it is reported that the new company will manufacture automobile tire protectors.

The Scripps Motor Car Company will erect a large addition to its present plant on Clinton street.

The West Side Brewing Company has awarded preliminary contracts for the erection of a new wash room and storage cellar adjoining its present plant.

The plant of the Universal Radiator Company at Hart and Charlevoix avenues has been sold to the Michigan Electric Welding Company. The Radiator Company will wind up its business and the machinery will be sold. The new owner will shortly equip the plant for its own use.

The Consolidated Light & Power Company of this city, of which J. L. Hudson is president, has purchased the Milling, Light & Power Company at Clare, Mich. There are five power dam propositions in the vicinity of Clare which the company will carry to fruition during the coming year.

The Detroit Tube Products Company is a new organization, incorporated with a capital stock of $40,000. Among those interested are A. C. Jones, H. E. Bellaimey and F. W. McClellan. No manufacturing plans have been announced.

The Central Foundry Specialty Company has been incorporated with a capital stock of $25,000. George J. Zimmermann is at the head of the new company, which will engage in the manufacture of gray iron castings.

Construction bids on the new power plant for the University of Michigan at Ann Arbor were found to be in excess of the amount appropriated, $280,000. It is considered probable that the Regents will call for new bids on the work.

The city of Lansing, Mich., is completing an addition to the municipal electric light and water station in which a large air compressor, yet to be purchased, will be installed. The Water Works Board has the matter in hand.

The Giles Boat & Engine Company, Ludington, Mich., which has heretofore been exclusively engaged in the manufacture of gasoline engines and launches, will add a new apartment for making stationary engines, fruit sprayers and pumps. About $10,000 will be expended for new machinery.

The New Process Steel Company, Marshall, Mich., operating a steel castings plant, has filed an involuntary petition in bankruptcy and the Detroit Trust Company has been appointed receiver. The plant will probably be continued in operation by the receiver until a sale can be consummated.

The Brooks Mfg. Company, Saginaw, Mich., which

recently increased its capital stock to $400,000, will install a new department for the making of knock-down houses and will enlarge the facilities of its present departments. Some new wood working machinery is expected to be purchased.

The Tilden Saw & Mfg. Company, Wyandotte, Mich., is preparing to begin the manufacture of a patent self-loading barrel truck. The new department will be in operation by January 1.

The Havers Motor Car Company, Port Huron, Mich., has increased its capital stock from $60,000 to $200,000 to take care of rapidly increasing business.

The taxpayers of Farmington, Mich., will vote November 28 to authorize the issuance of bonds to the amount of $15,000 for a water works system.

Preliminary steps are being taken by the City Council of Battle Creek, Mich., for the establishment of a municipal electric lighting plant in that city.

The Visible Spark Plug Company, Detroit, has been incorporated by Wesley S. Rapp, M. W. Hearn and S. S. Sutherland with a capital stock of $10,000. The new company will engage in the manufacture of spark plugs and carburetors.

Cleveland

CLEVELAND, OHIO, November 28, 1911.

The recent improved demand for machine tools has not been maintained. Dealers are getting a moderate volume of single tool orders. No sales of any size, however, were reported during the week, the largest lots being not more than 3 or 4 tools. The general situation is regarded by many manufacturers in metal working lines as improved and some plants are getting a better volume of orders. The placing of railroad equipment orders, however, is mainly responsible for the better feeling. Reports from machinery salesmen indicate that some manufacturers who might be in the market for machinery will do nothing until after the first of the year, so that the indications are that December will be a dull month. Business with some machine tool builders is better than it was a month ago but orders are still unsatisfactory. Builders of automatic screw machinery are doing a good business in their products but the demand for screw machinery is not active. Scattered orders are coming out for bolt and nut machinery. The demand for sheet metal working machinery is somewhat improved.

Considerable second hand machinery is being offered to dealers at the present time. The demand is not active.

The Nickel Plate Railroad has prepared plans for extensive additions to its shop plant at Conneaut, Ohio. The erection of a new 30-stall roundhouse will be started in a few days, it being the intention to complete 22 of these stalls at the present time. The roundhouse will be of structural steel and concrete. Plans have also been prepared for a power house and machine shop but the plans for these have not yet been approved.

Bids will be received by the Board of Commissioners for the erection of the Lima State Hospital December 19 for the mechanical equipment at the hospital near Lima, Ohio. Plans and specifications are on file at the office of the architect, Frank L. Packard, New Hayden Building, Columbus, Ohio.

The Cuyahoga Realty Company, Akron, Ohio, will erect a large garage and store room at 41-45 North High street in that city.

The L. McCormick Sanitary Trap Company, Chicago, Ohio, has been incorporated with a capital stock of $15,000 by O. C. McCormick and others to manufacture sanitary traps.

The Standard Steel Tank Company, Girard, Ohio, formerly the Ohio Boiler Company, has commenced the erection of an addition that will double its present capacity.

The Mead & Musser Company, Cleveland, has been incorporated with a capital stock of $10,000 by R. C. Linder and others to manufacture hardware specialties.

The Campbell Bros. Mfg. Company, Harrison, Ohio, has been organized with a capital stock of $35,000 by Albert W. Campbell and others to manufacture agricultural implements.

With a capital stock of $50,000 the Twentieth Century Mfg. Company, Mansfield, Ohio, has been incorporated to manufacture washing machines.

The Chisholm & Moore Mfg. Company, Cleveland, has awarded a contract for the erection of an addition to its machine shop. The building will be of brick, 27 x 54 ft. and two stories.

Bids will be received by the Director of Public Service, Cleveland, December 7 for air compressor equipment for the Kirkland pumping station. Specifications are on file with the superintendent of the Water Department.

The Deming Company, Salem, Ohio, is enlarging its foundry by the erection of an addition 50 x 50 ft.

The Sandusky Auto Parts & Motor Truck Company, Sandusky, Ohio, has increased its capital stock from $150,000 to $500,000.

The Universal Machine Company has practically completed its new plant at Bowling Green, Ohio. The principal products will be belt machinery, the Toledo marine engines and automobile parts.

Cincinnati

CINCINNATI, OHIO, November 28, 1911.

A number of machine tool builders report an improvement in both domestic and export business. Several nice-sized orders were booked last week, but it cannot be claimed that the general business situation has cleared up enough to warrant the building up of any great hopes for the immediate future. However, there is a demand for skilled mechanics at the local office of the National Metal Trades Association, showing that manufacturers in this district are probably busier than in other sections of the country.

Small boilers continue fairly good sellers, in spite of the fact that this is not the season for letting heating contracts. Gas engine manufacturers are busy, but steam engine builders have entered into a rather dull period.

Wm. H. Doolittle, factory inspector for the National Metal Trades Association, is in Cincinnati visiting the plants of members in this district, and reports practically every factory visited as being well equipped with latest safety appliances for the prevention of industrial accidents. This is a new idea of the Metal Trades Association, and members are very much pleased with it. The inspector's services are free to all members.

The Co-op Club, composed of students taking the co-operative course in engineering at the University of Cincinnati, held its fifth annual meeting and banquet on the evening of November 23. The following speakers addressed the gathering Prof. A. M. Wilson, Dr. John Burnham, J. M. Manley, and Mr. Calhoun, of the Mercantile Library. About 300 club members were present, an indication that the organization is a popular one with the students.

It is reported that the Russell Company, Dayton, Ohio, has made arrangements to finance a new company that will erect a hydroelectric plant near Woodsdale, Ohio, that will cost over $500,000. W. H. Zimmerman & Co., Chicago, are the engineers who made up estimates for the new project.

On November 23 fire almost completely destroyed the plant of the J. Baum Safe & Lock Company, Cincinnati, the estimated loss being about $50,000. The company has already leased new quarters that will be fitted up at once, and for which some special equipment will be required.

The Hooven, Owens, Rentschler Company, Hamilton, Ohio, has just received a second order from the Ford Motor Car Company for a 2500 h.p. gas engine to be installed in a new plant now in course of erection at Toronto, Canada.

Considerable structural material will be required for the construction of the Ludlow avenue viaduct, bids for which were opened last week by the Cincinnati municipal authorities. It is generally believed that the contract will be awarded to the Cranford Construction Company of Cincinnati, now building the Gilbert avenue viaduct, mentioned some time ago.

F. W. Alstaetter, major, United States Engineering Department, Wheeling, W. Va., will open bids December 23 for the necessary structural steel, forgings, castings, &c., for the lock at Dam No. 28, Ohio River.

Contract for the addition to the plant of the Columbus Wire & Iron Works, Columbus, Ohio, recently mentioned, has been awarded to A. Beyer & Son, of Columbus.

It is rumored that the Dayton Steel Construction Company, Dayton, Ohio, has plans under way for a one-story plant to be used in fabricating structural steel.

The Cincinnati Commercial Association announces that it has secured more commodious quarters in the Carew Building, and will move from its present location in the Union Trust Building, some time in December.

The new plant of the Eagle Woodenware Company, at Hamilton, Ohio, recently mentioned, is nearly completed and will soon be ready for the necessary manufacturing equipment. The new structure is of brick, one story and measures about 50 x 150 ft.

Unconfirmed reports have been circulated to the effect that the Virginian Railroad Company will soon spend about $2,000,000 for improvements to its yards and shops at Princeton, W. Va.

The Metal Flanged Concrete Pipe Company has been incorporated at Mt. Gilead, Ohio, with $15,000 capital stock. Among the incorporators are S. C. Roettinger, W. L. Paxson and others.

The Cincinnati Ice Company will probably build an ice and cold storage plant at Dayton, Ky., some time next year.

The South

LOUISVILLE, KY., November 28, 1911.

Business is improving somewhat, compared with the situation a week ago. There is no especially marked development to which the betterment may be ascribed, except that the more favorable condition of the cotton market is encouraging the movement of the crop and thereby increasing the supply of money. The demand for refrigerating and power machinery is good. Sawmill equipment is in fair demand, though the dullness of the lumber market is hurting this trade somewhat. Gasoline engines are selling well.

Manufacturers' agents report that sales in the South have been much larger than in other sections, and that this territory is making a handsome increase over the corresponding period of last year. Southern farmers and Southern manufacturers are buying more and better machinery of all kinds.

The fire damage to the foundry of the Henry Vogt Machine Company, Louisville, has been repaired, and the department will be operating as before within a few days.

E. D. Morton & Co., Louisville machinery dealers, report the sale of two Warner & Swasey lathes to the Standard Sanitary Mfg. Company for use in its Louisville plant; a St. Louis grinder to the Webster Loose Leaf Mfg. Company, Louisville, and a Wells grinder to the J. V. Pilcher Mfg. Company, Louisville.

The Transit Motor Car Company, Louisville, has been incorporated with $20,000 capital stock for the manufacture of motor trucks. The officers of the company are E. C. Walker, president; George Laib, vice-president, and W. B. Young, secretary and treasurer. The concern takes over the plant of the E. C. Walker Mfg. Company at Jackson and Lampton streets and will continue its business of making gasoline engines. No changes in the equipment will be made immediately, but enlargements are expected later on. The company will manufacture gasoline trucks in 2, 3 and 4-ton sizes.

The Kentucky Saw Works, Louisville, reports a fairly good business, though sawmill operators are proceeding conservatively in view of the sluggish condition of the lumber trade. The concern recently installed a Hanchett automatic saw sharpener in its plant.

The project to build a power canal at Louisville to utilize the energy developed by the falls of the Ohio, which was suggested by Mayor Head, has been abandoned because of an unfavorable report by the engineers appointed to investigate its feasibility.

The Louisville Gas Company has let a contract for the installation of a coal conveying system at its power plant to the Jeffrey Mfg. Company. The sale was made through Fred. B. Wehle.

E. B. Norman & Co., of Louisville, have announced plans for the development of a 28,000-acre timber tract at Holly Ridge, La., and will erect a large double-band mill with a capacity of 70,000 ft. The erection of the mill has been begun. Most of the equipment has been contracted for, members of the company stated.

The Mengel Box Company, Louisville, has let a contract for the erection of a large reinforced concrete box factory at Winston-Salem, N. C. The building will be completed by June 1, 1912. A lot of woodworking machinery will be purchased. T. S. Hamilton, mechanical engineer in charge of this work, said that the major portion of the equipment would be of special design.

Alexander Bros., Cadiz, Ky., have purchased a lighting franchise from the municipality and will erect a plant in connection with the ice factory which they are now operating.

The Kenessee Coal Company, Somerset, Ky., has been incorporated with $100,000 capital stock by J. M. Ross, John B. Pieratt and G. W. Hill. The company will develop 1000 acres of coal land at Worley, Ky.

H. E. Bullock, Pineville, Ky., is purchasing machinery for the Black Mountain Coal Company, Barbourville, Ky., which is making openings for the development of 2500 acres of coal lands near Burchfield, Ky.

The Louisville & Nashville Railroad has purchased a 100-ton scales from the Fairbanks-Morse Company for installation at Maysville, Ky. The railroad company is reported to be expending a considerable amount in the improvement of its shops at Howell, Ind., near Evansville.

The Sears Lumber, Coal & Development Company, Jackson, Ky., has organized with $100,000 capital stock. The incorporators are M. F. Gray, Max Lange, M. G. Jenkins and O. A. Sears.

The Kentucky Traction & Terminal Company, Lexington, Ky., has let contracts to the General Electric Company for the equipment of substations at Frankfort, Paris, Nicholasville and Georgetown, Ky., as well as the main power-house at Lexington.

J. T. Day, Hazel Green, Ky., is planning the installation of an electric light plant.

The Roy Patton Lumber Company has been organized at Jackson, Ky., and has taken over the saw and planing mill of Thomas Bundy. It will be equipped with additional machinery for the manufacture of automobile bodies and spokes.

The Daviess County Distilling Company, Owensboro, Ky., the bottling house and warehouse of which were burned recently, has announced that the bottling equipment will be replaced and operations continued.

The E. E. Sutherland Medicine Company, Paducah, Ky., has let a contract for the erection of a three-story reinforced concrete building. A steam heating plant will be installed, and electric motors, a hoist and elevators will be purchased. There will also be a printing department.

The Middlesboro Waterworks Company, Middlesboro, Ky., has filed amended articles of incorporation, increasing its capital stock from $5000 to $50,000.

H. G. Garrett, J. M. Stevenson and W. T. Ogden, all of Winchester, Ky., have made plans for the erection of a factory for the manufacture of a patented gas. They have secured the Kentucky rights from a New York company controlling the patents.

The New South Brewery & Ice Company, Middlesboro, Ky., the plant of which was destroyed by fire November 22, has announced that it will rebuild.

The Southern Mining Company, Williamsburgh, Ky., has leased from the Asher Coal Mining Company, Wasioto, Ky., 16,000 acres of coal land in Bell County, Ky. The Southern Company plans the expenditure of $500,000 in developing the property and equipping mines, some of which are now in operation. The Asher company recently established an agency in Louisville, and it is expected that improvements will be made in the elevators and other equipment there.

The Jellico Electric Light, Heating & Power Company, Jellico,, Tenn., is making a number of improvements, having installed a 200 hp. boiler and a new smokestack being in course of erection. The stack will take care of the new boiler and also an additional one of equal power which it is intended to install later.

The J. & J. Electric Company, Memphis, Tenn., has incorporated with $250,000 capital stock. Charles Johnson, Claude Johnson, W. T. McLain and others are interested.

R. H. Hart has been appointed receiver of the Standard Machinery Company, Chattanooga, against which a petition in bankruptcy was recently brought. The receiver will carry out contracts which the concern now has.

A foundry and machine shop are to be equipped at Greeneville, Tenn., by S. L. Williams & Sons.

The Southern Tire & Rubber Company, Augusta, Ga., has been incorporated with $125,000 capital stock by W. A. Smith, H. S. Dunbar and J. P. Armstrong for the manufacture of automobile tires, hose, belting and other rubber goods.

The Texarkana Ice Company, Ashdown, Ark., has been given a franchise for the operation of an electric lighting system.

Gravette, Ark., is to issue $25,000 of bonds for the purpose of erecting an electric light plant. E. L. Chatfield is chairman of the committee in charge.

The Standard Portland Cement Company, Charleston, S. C., has announced that it will double the capacity of its plant at Leeds, Ala., and will install a steam turbine plant. F. H. Lewis, Birmingham, is the engineer in charge.

Bennington, Okla., will let contracts for equipment for its waterworks plant after December 15, when bids will close. Pumping equipment, tanks, a tower, pipe, etc., will be required. Nagel & Peterson, Muskogee, Okla., are the engineers.

The Mebane Iron Bed Company, Mebane, N. C., is in the market for a power punch press, used preferred.

An electric power plant will be built on Coosa River, Ala., by the Ragland Water-Power Company, of which W. T. Brown is engineer. Martin H. Lide, Birmingham, Ala., is the engineer in charge.

The Fairbanks-Morse Company has been awarded a contract for the equipment of a round-house and repair shops of the Seaboard Air Line at Savannah, Ga. The cost will approximate $150,000.

The Allen Nut Lock Company, New Orleans, La., has been incorporated with $300,000 capital stock by Oglesby Allen, Jr., Joseph G. Allen and others for the manufacture of a patented nut-lock.

The Victor Huber Marble & Granite Company, New Orleans, La., is reported to be planning the erection of an addition to its cut-stone plant.

The Texas Pine Tar Company, DeQuincy, La., will erect a plant for the manufacture of resinous products. Power equipment, including an engine and boiler, will be purchased, as well as retorts, stills, etc.

The Central Foundry Company, Oklahoma City, Okla., will erect an addition to its plant.

Automobile gearings and other machinery parts will be manufactured by F. J. Milman, Clinton, S. C., who contemplates the establishment of a machine shop at Greenwood, S. C.

The Georgia Supply & Machine Company, Atlanta, has taken over the plant of the Georgia Foundry & Machine Company and will erect an additional foundry. M. N. Griffin is president of the company, which was recently organized with $60,000 capital stock.

The Barrett Mfg. Company, New York, is reported to be planning the erection of a large plant at Corey, Ala. The estimated cost is $150,000.

The Reid Lumber Company, Birmingham, Ala., is erecting a sawmill at Coker, Ala.

R. F. McMackin, Johnson City, Tenn., is erecting a sawmill near Ewart, N. C., and will manufacture lumber from a timber tract at that point.

The Ideal Garage Company, Frederick, Md., has been incorporated with $30,000 capital stock to take over the business of the Frederick City Garage Company. The company will erect a building, 50 x 234 ft., with a machine shop attached.

St. Louis

ST. LOUIS, MO., November 27, 1911.

As the winter season develops the business in the machine tool market shows increasing activity in a general way, but there are no particular lines that show more activity than others nor are there any specially large orders for equipment coming in. There are some good-sized lists likely to come forward as soon as some factory construction work, now under way, reaches a more advanced stage, but at the present time the demand seems to be still confined to the single tool request, with some degree of activity in the second-hand division of the market. Some of the inquiries coming show growing interest in the Southwestern territory tributary to St. Louis and these look likely to develop into orders before long.

The work on the Wrought Iron Range Company's new plant at St. Louis is well under way, the provision being for a fourfold increase in capacity. The boiler house, blacksmith shop and garage will all be separate buildings from the main plant, which is to be 304 x 313 ft., two stories.

Fire the past week destroyed the paint and putty manufacturing plant of the Markay Mfg. Company at Theresa and Gratiot streets, St. Louis. It will be rebuilt and re-equipped with machinery.

The St. Clair Water Company, with $100,000 capital stock, has completed incorporation with J. D. Houseman of St. Louis, Mo.; J. F. McGowan of East St. Louis, and John B. Downman and P. W. Page of St. Louis as stockholders, for the purpose of supplying of water to East St. Louis upon the expiration early in the coming year of the 50-year franchise now held by the City Water Company of East St. Louis.

The Bessemer Coal & Mining Company, St. Louis, owning six mines in Perry and St. Clair counties, Ill., has been reorganized and will itself operate three mines in Perry county, while a new company, not yet named, will operate three mines in St. Clair county. The mining equipment will be considerably remodeled and brought down to date.

The Prest-O-Lite Company, Indianapolis, Ind., has begun work on its branch plant in St. Louis, and will soon be in condition to consider the equipment of the factory.

The Fulton Iron Works Company, which is building a new $500,000 plant on the western St. Louis limits, is progressing rapidly with the structures which will soon be in shape to receive their final equipment.

The American Furnace Company is pushing to completion its new factory building, 2725-31 Morgan street, which is two stories and equipped with electric elevator service and a fan system of heating and ventilating. The new equipment will include two riveting machines, each capable of setting 70 cold rivets per minute and pneumatic tools for chipping castings and calking joints. The new building will be occupied in March or April.

The Lee Center Farmer's Elevator Company, Lee Center, Ill., has been incorporated with $100,000 capital stock by A. F. Jeanblanc, Charles W. Ross, F. N. King, E. A. Pommercy and S. L. Shaw to construct and equip a grain elevator.

The Busch-Sulzer Bros. Engine Company has so far completed its $2,100,000 organization as to proceed with the location of a site for its plant and the construction thereof. It will be near the Anheuser-Busch brewery, whose officers control the company which owns the patents of the Diesel oil engine invented by Rudolph Diesel of Munich. The plant will cost about $500,000, and will include a foundry, machine shops and all the other structures necessary for the complete manufacture of the engine. It will employ 600 men when completed.

The Mutual Brewing Company, for which $150,000 capital was recently raised by St. Louis retail liquor interests to establish competition with the breweries, has been incorporated and arrangements are under way for the location and equipment of the plant.

The Martell Automatic Heater Company has completed arrangements to remove its manufacturing plant from St. Louis to Cape Girardeau, Mo.

The Valier & Spies Milling Company, with mills at Marine, Ill., has bought a site in St. Louis for the establishment of a new mill and also for warehouse purposes.

The St. Joseph Tanning Company, with home capital stock of $150,000 in West Virginia, has obtained permission from the Missouri Secretary of State to use $75,000 in the equipment and operation of a tannery at St. Joseph, Mo.

The Oklahoma Land & Mining Co., of Ohio, incorporated under the laws of that State, has obtained formal permission in Missouri to use all of its $30,000 capital in equipping a mining plant at Joplin, Mo.

The Bressolo Wrench Mfg. Company, with $99,000 capital stock, has been incorporated at Spring Valley, Ill., by William L. and F. M. R. Bressolo, Fred Gunther and Anton Faletti to manufacture wrenches and other tools.

The De Sieur Vacuum Can Mfg. Company, East St. Louis, Ill., has been incorporated with a capital stock of $100,000 by St. Vincent De Sieur, C. A. Summers and Theodore Soellinger.

The city of Muskogee, Okla., will receive bids through the mayor for furnishing one 6,000,000-gal. pumping engine.

T. T. Frissell, constructing quartermaster, United States army, Fort Logan, Col., will receive bids until December 20 for the construction of a new water distributing system. Bids should be indorsed: "Proposals for the Construction of New Water Distributing System."

Texas

AUSTIN, TEXAS, November 25, 1911.

Unusually good reports as to the machinery trade come from various parts of Texas and the Southwest this week. Orders for large quantities of machinery of various kinds have been placed, particularly for manufacturing plants. While business conditions generally are still depressed on account of the low price of cotton and the consequent holding of that staple, the effect is not as yet felt materially by the machinery trade. Of course, this does not apply to implements and machinery for farmers. There is very little being done in that line at present.

The Board of Trustees of the State College of Industrial Arts at Denton has let the contract for the new domestic arts building here to Wiggins & Michaud,

of Fort Worth, for $61,831. The heating plant contract was let to White & Donnelly, of Austin, for $7071.

F. W. Abney, Charleston, W. Va., will construct a system of irrigation near Big Springs, at a cost of about $60,000.

The city of Eastland is installing a water works plant and distributing system at a cost of $25,000.

Herman Loeb will install a cotton compress at Marshall, to cost $15,000.

The Trinity River Irrigation district, which was recently created in Chambers County, has been organized by the election of F. M. Hamilton, president, and John Wooten, secretary. Engineers have finished their surveys and estimate that the proposed fresh water reservoir and irrigation system will cost about $125,000 to construct. The proposition of voting this sum for the purposes named will be submitted to the land owners of the district.

The Texas Motor Car & Supply Company, Victoria, has let the contract to the Bailey Mills Company of that place for the erection of an addition to its machine shop.

The Ohio & Texas Sugar Company is to be reorganized and the capacity of its sugar mill at Brownsville doubled by the time of the opening of the next sugar cane grinding season.

The Maverick Gas & Oil Company has been formed at Beaumont with a capital stock of $100,000. The incorporators are J. S. Wheless, W. E. H. McFaddin and W. D. Gordon.

The Carlson Strap Fastener Company has been formed at Wichita Falls, with a capital stock of $10,000. It will manufacture strap fasteners. The incorporators are F. A. Carlson, L. D. Rhodes, E. G. Cook and others.

The Kansas Ice Company is installing a 100-ton ice plant at Belen, N. M.

The Kerr Land Company, Minneapolis, Minn., will construct an irrigation system and develop 25,000 acres of land in El Paso county. It will install a number of pumping plants upon shallow wells.

The Meerschaum Company of America contemplates establishing a factory at Deming, N. M., for the manufacture of articles of meerschaum. Its mines are situated 60 miles north of Deming.

H. B. Johnson and R. H. Bouldare of Silver City, New Mexico, are promoting the installation of a large hydroelectric plant on the Gila River, 65 miles north of Deming, N. M., and the construction of power transmission lines to Deming and through the Mimbres valley to furnish power for irrigating pumping plants and other industries. The whole project will require something like $1,200,000, and the time required to complete it will be between two and a half and three years. The first development contemplated will require from $300,000 to $350,000.

Official announcement is made that the Mexican Midland Light & Power Company, Ltd., of Montreal, Canada, which was recently chartered with a capital stock of $45,000,000, has acquired the concessions and other holdings of the Mexican Hydroelectric Company, which has its headquarters in Mexico City. This new company will, it is announced, carry out the plans of the Mexican Hydroelectric Company for the installation of hydroelectric plants on the Waaranjo River, in the State of San Luis Potosi and the Rio Blanco in the States of Nuevo Leon and Tamaulipas. Besides the available water power that is owned by the company its concession from the federal government called for the construction of systems of electric railroad and several hundred miles of power transmission lines.

The pumping station of the water works plant at Brownwood, Texas, which was recently destroyed by fire, will be rebuilt at a cost of about $10,000.

The Gulf Pipe Line Company has acquired a site at Fort Worth for a large refinery that it will soon erect. It will also lay a six-in. pipe line from Saltillo to Fort Worth, a distance of about 150 miles.

The Southwestern Marble Company of El Paso will install a marble cutting and finishing plant near Mt. Riley, N. M., to cost about $200,000.

The Arizona Marble Company will install a large marble cutting and finishing plant at its quarries near Bowie, Ariz. Gerald Hughes is president.

H. P. Holt and associates will build a plant at Roswell, N. M., for the manufacture of orchard heaters at a cost of $25,000.

The Menard Public Service Company is installing an electric light plant and water works system at Menard.

W. B. Nixon is arranging to add new machinery and enlarge the capacity of its cotton gin at Runge.

The Cody-Dyer Mining & Milling Company, Tucson, Ariz., will install a 100-ton mill at its mines near there. Col. W. F. Cody of Tucson is president.

A new 75-ton cyanide plant will be built at the Mohawk mine near Mammoth, Ariz. T. W. Gundaker of Mammoth is manager.

The Mammoth Mining Company will install a smelter at its mines near Wickenburg, Ariz.

The Black Range Custom Reduction Company will enlarge its mill at Fairview, N. M., to 100 tons capacity.

W. Humphrey and associates will install a 50-ton mill at their Guerguito mine, situated 30 miles from Nacozari, state of Sonora, Mexico.

The Monte Vista Mining Company will build a mill at its mine at El Tigre, state of Sonora, Mexico.

The Athens Pottery Company, Athens, manufacturer of stoneware, has been incorporated to take over the pottery plant at Winfield. The company plans to make improvements to the works and is in the market for two 125-hp. high pressure boilers and one 125-hp. Corliss engine.

Eastern Canada

TORONTO, ONT., November 25, 1911.

Trade is active, and the larger manufacturing concerns appear to have an accumulation of orders that will keep them busy through a large part of the winter. If the plans of railroad and other builders go forward as arranged and if the general development programmes laid out for nearly all the provinces are not held up, it will require continuous activity on the part of the manufacturers of equipment and plant to keep the demand supplied. The new Dominion government at Ottawa will without delay proceed to construct the Hudson Bay Railway. The Ontario government means to extend its Temiskaming & Northern Ontario system toward Hudson Bay. Alberta and Saskatchewan governments are both guaranteeing the bonds of additional branch lines. It would take much space to enumerate the merely public and quasi-public projects that are on the list to be begun energetically in the next twelvemonth. Private enterprise is close in the wake of public enterprise whose activity adds to the security of private ventures and facilitates the financing of these. In manufacturing extension a feature to be noted is the submitting of schemes to towns and cities requiring a municipal loan or calling for the subscription of capital up to a certain percentage of the whole on the part of local investors. This mode of launching new industries is resorted to in behalf of some quite substantial concerns that propose to establish branches in Canada.

A large number of snow plows were ordered this season on account of Canadian lines.

Legal representatives in Toronto of the Semet-Solvay Company, Syracuse, N. Y., have applied to the City Council of Toronto for a site of 100 acres upon which the company would locate a large coke plant. According to their statement, the company would expend $2,500,000 on the proposed works. Coal by-products would also be manufactured. The site desired is in the city's public possession, and is required because it is on the water front. Building operations would be begun at once.

The Cross Fertilizer Company, Ltd., was incorporated by Dominion authority a few weeks ago to carry on business from Sydney, N. S., as the principal center. The capital stock is $300,000. The company will be directed by Alexander Cross & Sons, Ltd., Glasgow, Scotland. The company's works at Sydney are very near completion. Most of the machinery is in place. Operations will be begun by the beginning of December. Some of the waste products of the existing industries at Sydney will be utilized in the new fertilizer plant.

The directors of the Dominion Steel Corporation decided at a meeting in Montreal November 20 that further money to pay the cost of the new plant that is being constructed be raised by the issue of preferred stock, instead of by the sale of bonds.

The Cockshutt Plow Company, Brantford, Ont., has secured a controlling interest in the Adams Wagon Company and Brantford Carriage Company. Each of the plants acquired employs several hundred hands, and is to be enlarged.

Finlay Bros., stove manufacturers, Carleton Place, Ont., will enlarge their plant by about 50 per cent. They now employ 150 hands. A by-law is to be voted on by the ratepayers to fix the company's assessment for a number of years at a specified amount.

The Ware Mfg. Company is beginning the construction of a factory at Oakville, Ont.

The Barber Ellis Company, Brantford, Ont., has plans for the erection of a new plant in that city. There will be a main factory of 70 x 300 ft.

J. H. Cole, Cleveland, Ohio, has been in communication with the Mayor of Owen Sound, Ont., in reference to the proposal to establish a nut and bolt factory in Owen Sound. He expects to include a plant for wire drawing.

The Shawinigan Water & Power Company, Shawinigan Falls, Que., has completed the development of a great part of its new plant providing for the 75,000 hp. for use in Montreal. There are five new penstocks of 15,000 hp. each, which are eventually to be carried to a separate power house now erected, and in which are to be installed two complete units of 15,000 hp. each, with a new steel tower transmission line operating at 100,000 volts, and an independent terminal station at Maisonneuve.

Stansfield's, Ltd., Truro, N. S., is preparing to make a large addition to its already large knitting mills plant.

The ratepayers of Newmarket, Ont., have voted in favor of the Town Council's agreement with the Harding Automobile Company, under which the company undertakes to build and operate an automobile factory in Newmarket on the town's granting a loan of $25,000.

The Smith Foundry Company, Ltd., Fredericton, N. B., has begun the erection of a new plant to replace its buildings recently burned. There will be a machine shop, blacksmith shop and pattern department. The company will require a new complete outfit of general machinery for such purposes, all to be electrically operated.

The Canadian Hanson & Van Winkle Company, Ltd., Toronto, has been incorporated with $100,000 capital stock to take over the Canadian business of the Hanson & Van Winkle Company, Newark, N. J., and the Robert G. Bruce Company, Ltd., Toronto. The new company has purchased a site in Toronto and has begun the erection of buildings, including an up-to-date foundry for nickel castings. The company will engage in the manufacture and sale of electroplating chemicals, mill and foundry supplies.

The Standard Silver Company, Toronto, Ont., is erecting a five-story factory and will equip it with modern machinery for the manufacture of electroplated ware.

Western Canada

WINNIPEG, MAN., November 24, 1911.

A healthy optimism seems to pervade the industrial life of western Canada, and although there will not be much activity for a couple of months, on account of cold weather, the outlook for next spring is very favorable. Already plans are being made for a considerable number of buildings. A great deal of money has been invested here during the year, and the railroads have spent many millions in extension work. That together with the money from a larger crop than ever before, even after considerable injury through climatic conditions, has caused money circulation to be quite satisfactory.

Next month a by-law will be submitted to the ratepayers of St. Boniface to raise $200,000 for a gas plant. It is proposed that it be owned and operated by the municipality.

The town of Neepawa, Man., is calling for tenders, up to December 15, for cast-iron water pipe, pumping machinery, mechanical filters, water tower, and other apparatus in connection with the waterworks there. R. H. Fusee is the chairman of the committee.

Bloedel, Stewart & Welsh, Ltd., recently organized at Vancouver, B. C., have acquired the large timber holdings of T. L. Shevlin and of the Gulf Lumber Company, are building five miles of logging railroad and for the present will operate as loggers, but will erect a large lumber mill later.

The Phoenix Lumber Company, Ltd., Transcona, Man., has been incorporated with a capital stock of $20,000, to carry on business as timber, pulp and lumber manufacturer and general contractor.

The Riverside Lumber Company, Ltd., Calgary, Alberta, has applied for a site in the Calgary industrial area, on which to build a sash and door factory.

The Wattsburg Lumber Company, Wattsburg, B. C., has applied to the city of Calgary, Alberta, for a site near the junction of the Canadian Northern and Canadian Pacific railways upon which to establish a lumber plant.

The Alberta British Columbia Lumber Company, Ltd., has been incorporated at Cranbrook, B. C., with a capital stock of $500,000.

M. Conlin is preparing to build a ten-story hotel in Vancouver, B. C. It will be of reinforced concrete, and will cost about $300,000.

The Grand Trunk Pacific Railway has bought a site in Moose Jaw, Sask., on which it is said a union station will be erected for that road and the Canadian Northern.

A by-law authorizing the gift of 10 acres of land at Bare Point is to be submitted to the ratepayers of Port Arthur, Ont. It is proposed to erect there a glucose factory to employ 150 men at the outset. The parties seeking the site also ask that the plant be assessed for ten years at a fixed valuation of $75,000.

The Dominion Match Company proposes to establish a very large match factory in British Columbia. What is known as the Parker process will, it is said, be employed in the works. Ray Thompson, Vancouver, B. C., is the secretary and treasurer of the company.

The Canadian Collieries, Ltd., Dunsmuir, will expend $1,600,000 in the next twelve months upon new equipment and other improvements in its Cumberland coal field on Vancouver Island, B. C. Grant Smith & Co., Vancouver, B. C., have just received a contract from the Collieries to develop a water power at a cost of $800,000, the purpose being to furnish electrical power to run the mines and operate the company's railway from Cumberland to Union Bay.

J. Gusman, representing Milwaukee interests, has applied to the municipal authorities of Calgary, Alberta, for a site on which to establish a brewery to cost at the outset not less than $100,000.

The reduction works the Granby Consolidated Company is preparing to start at Goose Bay, on Observatory Inlet, B. C., will, it is estimated, cost $1,000,000. The plant will be equipped with a converter for manipulating the copper matte into blister copper, which will be shipped to a New York refinery.

Government Purchases

WASHINGTON, D. C., November 27, 1911.

The office of the depot quartermaster, Army Building, New York City, will open bids December 4, under schedule 265, for furnishing one vertical simple pump.

The lighthouse inspector, fifth district, Baltimore, Md., opened bids November 13 for furnishing and installing an oil engine air compressor for fog signal as follows: Skinner Shipbuilding & Dry Dock Company, $268.74; Spedden Shipbuilding Company, $286.68; McIntyre & Henderson, $420; Marine Railway Machine & Boiler Works, $475.

The Isthmian Canal Commission, Washington, opened bids November 22, under canal circular 662, for locomotive cranes and hoisting engines as follows:

Class 1, fourteen 15-ton locomotive cranes, American Hoist & Derrick Company, St. Paul, Minn., $49,700 and $33,916; Brown Hoisting Machinery Company, Cleveland, Ohio, $48,400; Browning Engineering Company, Cleveland, Ohio, $34,000; Industrial Works, Bay City, Mich., $30,400; McMyler Interstate Company, Bedford, Ohio, $39,400 and $32,440; Ohio Locomotive Crane Company, Bucyrus, Ohio, $27,140; Horton & Steinbrenner Company, Chicago, Ill., $26,352, and $27,984.

Class 2, item 1, four 11-ton stiff-leg derricks—American Hoist & Derrick Company, St. Paul, Minn., $22,057.84; McMyler Interstate Company, Bedford, Ohio, $12,296; Modern Steel Structural Company, Waukesha, Wis., $14,200; Lidgerwood Mfg. Company, New York, $11,988.

Class 2, item 2, four hoisting engines for derricks—American Hoist & Derrick Company, St. Paul, Minn., $6,195.28, $6,582.12 for electrical equipment, $204.90 each for transformers; Lenher Engineering Company, New York, $7,800, $10,400 including electrical equipment and $90 each for transformers; Williamson Brothers Company, Philadelphia, Pa., $5,180; Lidgerwood Mfg. Company, New York, $13,340; alternate propositions, steam equipment, $2,674, $2,333, $3,140; alternate propositions for electrical equipment, $2,893, $3,430, $5,110 and $5,322; transformers, $250 and $401.50.

The Isthmian Canal Commission, Washington, opened bids November 20 for furnishing electric towing locomotives for all canal locks, under circular 650 as follows:

Class 1, item 1, one electric towing locomotive for Gatun—Bidder 1, Atlas Car & Mfg. Company, Cleveland, Ohio, Westinghouse, $38,500; General Electric, $31,100; Bidder 2, McMyler Interstate Company, Bedford, Ohio, Westinghouse, $26,175, General Electric, $20,400; 3, Fawcus Machine Company, Pittsburgh, Pa., Westinghouse, $22,145, General Electric, $18,613; 4, General Electric Company, Schenectady, N. Y., $25,278; 5, Westinghouse Electric & Mfg. Company, Washington, D. C., $24,702.

Item 2, for 39 electric towing locomotives for all locks—Bidder 1, Atlas Car & Mfg. Company, Cleveland, Ohio, Westinghouse, $764,400; General Electric, $761,670; 2, McMyler Interstate Company, Bedford, Ohio, Westinghouse, $602,550, General Electric, $598,650; 3, Fawcus Machine Company, Pittsburgh, Pa., Westinghouse, $492,017, General Electric, $473,382; 4, General Electric Company, Schenectady, N. Y., $468,000; 5, Westinghouse Electric & Mfg. Company, Washington, D. C., $532,430.

Item 3, spare parts—Bidder 1, Atlas Car & Mfg. Company, Cleveland, Ohio, Westinghouse, $28,642.18, General Electric

$28,706.98; 2, McMyler Interstate Company, Bedford, Ohio, Westinghouse, $21,343.30; General Electric, $19,362.80; 3, Fawcus Machine Company, Pittsburgh, Pa., Westinghouse, $16,051, General Electric, $16,051; 4, General Electric Company, Schenectady, N. Y., $17,194.60; 5, Westinghouse Electric & Mfg. Company, Washington, D. C., $17,989.75.

Class 1, alternate A, Bidder 1, Atlas Car & Mfg. Company, Cleveland, Ohio, Westinghouse, $827,395.93, General Electric, $808,960.73; 2, McMyler Interstate Company, Bedford, Ohio, Westinghouse, $643,484.30, General Electric, $630,971.80; 3, Fawcus Machine Company, Pittsburgh, Pa., Westinghouse, $521,621.76, General Electric, $499,426.76; 4, General Electric Company, Schenectady, N. Y., $498,016.35; 5, Westinghouse Electric & Mfg. Company, Washington, D. C., $564,334.50.

Trade Publications

Locomotive Cranes.—The Browning Engineering Company Cleveland, Ohio. Pamphlet. Illustrates and describes a line of locomotive cranes built by this company and shows by numerous illustrations the various uses to which it can be put.

Electrical Appliances.—General Electric Company, Schenectady, N. Y. Seven Bulletins. Nos. 4837, 4840 and 4842 describe in detail the various types of circuit breakers manufactured by this company. The first contains a general description of the applications of circuit breakers, together with notes and diagrams descriptive of standard practice in the use of carbon break circuit breakers for various requirements as well as suggestive specifications. The remaining two bulletins, which supersede No 4550, are devoted to circuit breakers that are especially adapted to motor-driven tool applications and their use in cases where economy of space, ease of operation and distant control are the deciding factors respectively. No. 4849, superseding No. 4838A, contains brief descriptions of various sizes and styles of motor-generator sets ranging in capacity from 95 to over 7000 kw. Number 4858, superseding No. 4675, is devoted to the type R. I. single-phase motors. No. 4867 describes and illustrates electric locomotives for switching and light freight service varying in weight from 22 to 35 tons. No. 4872 describes an outfit for the purification of transformer oil of all kinds, crude petroleum for oil fired furnaces, insulating varnish and japan, benzine, cylinder oil and viscous insulating compounds. The apparatus consists of a filter press, a pump and a motor for driving, all being mounted on I-beams which form skids. The outfit may be mounted on iron wheels if desired.

Grinding and Mixing Machinery.—Charless Ross & Son Company, 148 Classon avenue, Brooklyn, N. Y. Circular No. 16. Treats of a number of new types of mills and mixers recently brought out for grinding iron, paint and colors. These mills can be supplied either singly or in gangs and are both belt and motor driven. Mention is also made of a number of mixers which are either hand or power driven for various substances.

Twist Drills.—Detroit Twist Drill Company, Detroit, Mich. Booklet No. 18. Lists the various types of drills made by this company, which include taper and straight shank twist drills, drills for blacksmiths' drill presses, wood boring brace drills and bit stock drills for metal or wood. All of these are illustrated and brief tables giving the various sizes in which they are made are placed below the engravings. Instructions on the grinding and use of these drills are given, and tables of decimal equivalents and cutting speeds are also included. While the latter table includes all of the sizes of drills ordinarily used, a formula is given so that it is possible to obtain the correct cutting speed for any size of drill.

Hoists.—Erie Clutch and Pulley Company, Erie, Pa. Two circulars. Deal with two portable hoists, one of which is of the friction type and has a capacity of 600 lb., while the other is a worm and worm gear belt-driven hoist, having a capacity of one ton. The hoists are illustrated and brief specifications are given.

Lubricants.—The Chester Graphite Company, Chester Springs, Pa. Pamphlet. Shows how the Hexagon brand of flake graphite and graphite lubricants will reduce power losses. After a discussion of the advantages of flake graphite as a lubricant and instructions for its application, the various brands of graphite greases which this company makes are listed and briefly described.

Knife Grinders and Saw Sharpeners.—Samuel A. Rogers & Co. 10-16 Lock street, Buffalo, N. Y. Two circulars. Treat of the Buffalo line of automatic knife grinders which are equipped with spring cross feed and water attachments and a line of saw sharpeners for circular and band saws and band re-saws. Four different types of sharpener are illustrated, two for circular saws ranging from 6 to 40 and 8 to 72 in. in diameter respectively, an automatic sharpener for band re-saws from 2 to 8 in. wide and an automatic band saw sharpener for saws from 4 to 10 in. wide. Space is also given to a saw gummer and a brazing lamp for band saws having a maximum width of 1¼ in.

Hydroelectric Development.—Allis-Chalmers Company, Milwaukee, Wis. Bulletin No. 1623. Describes the Priests Rapids hydroelectric development at Hanford, Wash., which is interesting as illustrating a highly economical and efficient method of utilizing low-head water powers which are subject to extreme variations in head resulting from flood conditions. The entire plant is the design of the Allis-Chalmers Company, all of the machinery being supplied, and installed by it. The equipment includes vertical triplex, hydraulic turbines, electric generators and centrifugal pumps, all of which are illustrated and described at length.

Motor-Driven Pumps.—Chicago Pump Company, 1053 Fulton street, Chicago, Ill. Catalogue A. Size, 6 x 9 in.; pages, 40. Relates to a line of automatic motor-driven pumps which includes sewage ejectors; bilge, house, sprinkler and condensation pumps and a pneumatic water supply system. The special features claimed for the pumps are efficiency, economy in operation and first cost, durability and quietness of operation. All the pumps are illustrated and described and a partial list of users completes the catalogue.

Electric Locomotives.—C. W. Hunt Company, 45 Broadway, New York, N. Y. Catalogue No. 11-5. Concerned with various types of electric locomotives for industrial trains. These are illustrated and described together with their accessories.

La Belle Specialties.—La Belle Iron Works, general offices at Steubenville, Ohio, and works at Steubenville and Wheeling, W. Va. Celluloid cards. Give on one side a complete list of products, which consist of pig iron, slabs, billets, sheet bars, universal plates, special plates for stamping, agricultural and automobile purposes, grooved rolled plates, skelp, black and galvanized merchant pipe, line pipe, drive pipe, casing, tubing, cut nails, black and galvanized open-hearth sheets. On the other side is the United States standard gauge for sheets.

Automatic Screw Machines and Their Products.—The National-Acme Mfg. Company, Cleveland, Ohio. Calendar. Size, 12 x 15 in. This calendar is of the loose leaf variety, a separate leaf being devoted to each month. The first one shows the plant that the company occupied in Hartford, Conn., until 1901, the Cleveland plant and the recently completed plant at Montreal. The calendar begins on November 1 and the leaf for each month contains an illustration of one of the screw machines built by this company or some of its products. On the back of the sheets is some additional information regarding the machine or the products illustrated on the face.

Alternating-Current Generators.—Triumph Electric Company, Cincinnati, Ohio. Bulletin No. 481. Illustrates and describes a line of direct-connected alternating-current generators, which are intended to be driven by steam engines or water wheels. These machines are of the revolving-field type. The construction of the various parts is gone into in some detail and there are a number of half-tone engravings supplementing the text.

Drilling and Boring Machines.—Hoefer Mfg. Company, Freeport, Ill. Catalogue Q. Relates to a line of drilling and boring machines which includes drilling machines in the bench, stationary and sliding head and gang types together with vertical or horizontal drilling and boring machines and combination horizontal and vertical machines.

Milling Machines.—The Ingersoll Milling Machine Company, Rockford, Ill. Two bulletins. The first, No. 24-A, describes the operation of milling 12 sets of four-cylinder en-bloc castings in one pass through the company's fixed rail machine in approximately 50 min. The text is supplemented by a half-tone engraving of the operation being performed. Bulletin No. 26-A contains other examples of rapid milling of automobile crank cases and engine cylinders. In addition to illustrations of the different operations there are half-tone engravings of a four-head adjustable rail and a three-head fixed rail machine.

Bridge Builders' Tools.—Standard Bridge Tool Company, Bessemer Building, Pittsburgh, Pa. Folder. Relates to the Thomas spacing table. Illustrations are given showing a 48-in. Thomas automatic spacing table and large multiple punch, and also showing a Thomas spacing table with 48-in. automatic carriage handling two pairs of 8 x 8-in. angles, 80 ft. long, equipped with variable speed motor.

Internal Combustion Engines.—The Root & Van Dervoort Engineering Company, East Moline, Ill. Catalogue No. 11. Size, 7 x 10 in.; pages, 56. Presents terse descriptions of the R & V engines using gasoline, gas, naphtha, distillate and alcohol as fuel and shows their outline and general construction. These engines are built in both the vertical and horizontal styles and are also mounted on trucks.

Byers Wrought Iron Pipe.—Bourne-Fuller Company, Cleveland, Ohio, selling agents. Booklet. Size, 4 x 7 in.; pages, 30. Illustrates and explains the manufacture of wrought iron pipe in the plant of the A. M. Byers Company from the time the metal enters the plant as ore, including the puddling process, rolling the muck bar, making of skelp, the making of the lap weld and the finished pipe.

Elevator Guide Lubrication.—The Peterson Engineering Company, 50 Church street, New York, N. Y. Catalogue. Describes a new method of lubricating elevator guides with the Economy elevator guide lubricator. This device applies a thin strip of grease exactly where the shoes bear on the rails for each trip of the car. Several different types of lubricator are made so that the device is suitable for steel and wooden rails and also for counter weight guides. Interesting data are given of tests made on elevators equipped with this lubricator. Among those mentioned are the one at the 168th street station of the New York subway where one of these devices reduced the grease consumption from 480 to 30 ounces per month, and another installed in the Washington monument. In the case of the latter installation a complete analysis of the cost of lubrication is included.

Flaming Arc Carbons.—Thompson Electric Company, Superior avenue, N. W., Cleveland, Ohio. Price list of Planier brand of flaming arc carbons.

Current Metal Prices.

The following quotations are for small lots, New York. Wholesale prices, at which large lots only can be bought, are given elsewhere in our weekly market report.

IRON AND STEEL—

Bar Iron from Store—

Refined iron:
1 to 1½ in. round and square.....₤ lb 1.70¢
1½ to 4 in. x ⅛ to 4 in.....
⅜ to 1 in. x ¼ to 0.1 in.....₤ lb 1.80¢
½ to 1 in. and 11/16 to 1 in. wide and ⅛ to ⅜ in. thick.....Obs. 2.05
⅝ in. x ¼ in. and larger.....1.80¢
⅝ in. x 5/16 in. and ¼ in.....2.20¢
1¼ to 2½ in. x ⅛ in.....1.95¢
1¼ to 2½ in. x 5/16 in. and thicker.....1.85¢
1 to 1¼ in. x 5/16 in.....1.95¢
1 to 1¼ x ⅜ in.....2.00¢
⅞ x ⅜ in.....2.10¢
⅞ x ½ in.....2.15¢
½ x ½ in.....2.25¢
½ x 3/32 in.....1.40¢
Tees:
1 in.....2.25¢
1¼ in.....2.10¢
1½ to 2½ x ¼ in.....1.90¢
1½ to 2½ x 5/16 in.....2.00¢
3 in. and larger.....1.85¢
Beams.....1.80¢
Channels, 3 in. and larger.....1.80¢
Bands—1½ to 6 x 6 16 to No. 8.....2.00¢
Borden's "H. B. & S." iron, base price.....2.95¢
"Burden's Best" iron, base price.....3.15¢
Norway bars.....3.60¢

Merchant Steel from Store—

per lb

Bessemer machinery.....1.70¢
Toe calk, tire and "cotch shoe".....2.50@3.00¢
Best cast steel, base price in small lots.....7¢

Sheets from Store—

Black	One pass, soft steel	C R cleaned	G
No. 16	₤ lb 2.35¢	2.75¢	
Nos. 18 to 20	₤ lb 2.40¢	2.80¢	
Nos. 22 and 24	₤ lb 2.45¢	2.85¢	
No. 26	₤ lb 2.60¢	3.05¢	
No. 28	₤ lb 2.65¢	3.25¢	

Russia, Planished, &c.

Genuine Russia, according to assortment.....₤ lb 12 @14½
Patent planished, W. Dewees.....
Wood.....₤ lb A, 10¢; B, 9¢ net

Galvanized

Nos. 12 and 14.....₤ lb 2.65¢
No. 24.....₤ lb 3.00¢
No. 26.....₤ lb 3.20¢
No. 28.....₤ lb 3.50¢
No 20 and lighter 36 inches wide, 25¢ higher

Genuine Iron Sheets—

Galvanized

Nos. 22 and 24.....₤ lb 5.50¢
No. 26.....₤ lb 6.00¢
No. 28.....₤ lb 7.00¢

Corrugated Roofing—

2½ in. corrugated	Painted	Galvd
No. 24	₤ 100 sq. ft. $2.15	$4.75
No. 26	₤ 100 sq. ft. 1.85	3.90
No. 28	₤ 100 sq. ft. 2.50	3.65

Tin Plates—

American Charcoal Plates (per box)

A A A quality:
IC, 14 x 20.....$6.25
IX, 14 x 20.....7.00
A quality:
IC, 14 x 20.....$5.10
IX, 14 x 20.....5.40

American Coke Plates—Bessemer—

IC, 14 x 20.....107 lb.....$4.20
IX, 14 x 20.....5.20

American Terne Plates—

IC, 20 x 28 with an 8 lb. coating.....$8.10
IX, 20 x 28 with an 8 lb. coating.....10 1

Seamless Brass Tubes—

List November 15, 1909. Base price, 18¢

Brass Tubes, Iron Pipe Sizes—

List November 15, 1909. Base price, 18¢

Copper Tubes—

List November 15, 1909. Base price, 21¢

Brazed Brass Tubes—

List February 1, 1911. 19½¢ ₤ lb

High Brass Rods—

List February 1, 1911. 14½¢ ₤ lb

Roll and Sheet Brass—

List February 1, 1911. 14½¢ ₤ lb

Brass Wire—

List February 1, 1911. 14½¢ ₤ lb

Copper Wire—

Base price, Carload lots mill 14½¢

Copper Sheets—

Sheet copper hot rolled 16 oz. quantity (18).....₤ lb 17½¢
Sheet copper cold rolled, 1¢ ₤ lb advance over hot rolled.
Sheet copper polished 20 in. wide and under, 1¢ ₤ square foot.
Sheet copper polished over 20 in. wide, 2¢ ₤ square foot.
Planished copper, 1¢ ₤ square foot more than polished.

METALS—

Tin—

Straits pig.....₤ lb 46 @47 ¢

Copper—

Lake ingot.....₤ lb 14 @14½¢
Electrolytic.....₤ lb 14 @14½¢
Casting.....₤ lb 13½@14 ¢

Spelter—

Western.....₤ lb 7 @7½¢

Zinc—

No. 9, base, casks.....₤ lb 9¢ Open. ₤ lb 9½¢

Lead—

American pig.....₤ lb 5½@5¾¢
Bar.....₤ lb 6¾@6¾¢

Solder—

½ & ½, guaranteed.....₤ lb 26½@26¾¢
⅜ & ½.....₤ lb 24 @24½¢
Refined.....₤ lb 22½@23¢
Prices of solder indicated by private brand vary according to composition.

Antimony—

Cookson.....₤ lb..@10¾¢
Hallets.....@10 ¢
Other brands.....9@ 9½¢

Bismuth—

Per lb $2.00@$2.25

Aluminum—

No. 1 aluminum guaranteed over 99% pure, in ingots for remelting.....35¢
Rods and Wire.....Base price 51¢
Sheets.....Base price 33¢

Old Metals—

Dealers' Purchasing Prices Paid in New York

	Cents.
Copper, heavy and crucible	11.50
Copper, heavy and wire	11 00 to 11.25
Copper, light and bottoms	10 00 to 10.25
Brass, heavy	7.75 to 8.00
Brass, light	6 00 to 6.25
Heavy machine composition	9.75 to 10.00
Clean brass turnings	7.75 to 8.00
Composition turnings	8.25 to 8.75
Lead, heavy	3.50
Lead, tea	3.25
Zinc, scrap	4.75

NICHOLSON U.S.A. TRADE MARK

NICHOLSON

NICHOLSON U.S.A. TRADE MARK

Time is not the only saving effected through the use of **Nicholson Files.**

Their hard cutting surface and perfect temper gives them a **lasting quality** that makes them by far the most **economical** of all files to use.

Our Book, "File Filosophy," tells how best to use them.

NICHOLSON FILE COMPANY

PROVIDENCE, R. I., U. S. A.

THE IRON AGE

Established 1855 | New York, December 14, 1911 | VOL. 88: No. 24

Published Every Thursday by the

DAVID WILLIAMS COMPANY

239 West 39th Street, New York

Entered at the New York P[illegible] as Second Class Mail Matter.

Subscription Price, United States and Mexico, $5.00 per Annum; to Canada, $7.50 per Annum; to Other Foreign Countries, $10.00 per Annum. Unless receipt is requested, none will be sent. Credit for payment will be shown by extending the date on the wrapper of your paper

W. H. Taylor, - - - - - - President and Treasurer
I. A. Mekeel, - - - - - - - First Vice-President

Geo. W. Cope, - - - - }
A. I. Findley, - - - - } Editors
W. W. Macon, - - - - }

M. C. Robbins, - - - - Manager
Charles S. Baur, - - - Assistant Manager

Branch Offices

Philadelphia, Real Estate Trust Building
Pittsburgh, Park Building
Boston, Compton Building
Chicago, Fisher Building
Cleveland, American Trust Building
Cincinnati, 807 Andrews Building

CONTENTS.

Increasing Demand for Steel 1273
Getting Steel Costs Down 1274
Scale Contracts in the Iron Trade 1274
The Coming Demand for Machine Tools 1275
Scientific Management in Government Shops 1276
Molding Machine Patent Decision 1276
The Rebate Plan in the British Steel Trade 1277
The Tennessee Company and Convict Coal Miners 1277
South Chicago Rail Mill Not Closed 1277
Large Riter Conley Contracts 1277
The Steel Corporation's Unfilled Orders 1277
The Use of Intoxicants by Steel Workers 1277
The Iron and Metal Markets 1278
The DeBats Crucible Steel Company 1288
Increased Operations at Aliquippa 1288
Personal 1289
The National Gas Engine Association 1289
High Grade Small Tools in Demand 1289
The Mechanical Engineers Convention 1290
Cincinnati Metal Trades Dinner 1295
The Philadelphia Foundrymen's Association 1295
November Copper Production and Stocks 1295
Briquetting Flue Dust 1295
Two New Lackawanna Open-Hearth Furnaces 1295
Great Iron-Making Nations 1296
A Corporation Commission 1297
The Lumen Bearing Company Expands 1297
Obituary 1298
Pittsburgh and Vicinity Industrial Notes 1298
West Penn Steel Company Improvements 1298
The Carnegie Veterans 1298
Western Steel Corporation 1298
New Mills for Steel Company of Canada 1298
The New Corrigan-McKinney Steel Works 1298
Duplex Facing Machine 1299
The International Congress of Navigation 1299
The American District Steam Company 1300
Standard Bridge Tool Equipment 1304
The Jones Process for "Metallizing" Ore 1305
A Highly Reputable French Steel 1305
Titanium and Low Carbon Basic Steel 1306
New Fueling Lighter 1308
The Flat-Top Fuel Company 1308
Improved Contractor's Light 1309
New Bituminous Gas Producer 1310
A New Soaking Pit Cover 1311
The Largest By-Product Coke Oven Plant in the World 1311
A New Structural Shop at Massillon 1311
Foundry Cold Saw 1312
Accidents in German Iron and Steel Works 1313
Motor Trucks 1314
The Allis-Chalmers Company to Reorganize 1315
Improved Power Hack Saw Machine 1315
Motor-Driven Disk Grinder 1316
Proposed Federal Compensation Bill 1316
The Murphy Mold Sprayer 1316
Engine Lubrication 1317
The N. & G. Taylor Company's Improvements 1317
The Cross Creek Coal Company 1317
The Machinery Markets 1318
Baltimore Industrial Notes 1327
Tin Plate Imports and Exports 1327
Employees' Compensation for Accidents 1327

Increasing Demand for Steel

Price Advances in Several Finished Products

Heavy Buying in Bars to Build Up Stocks—Expanding Mill Operations

The surprising statement of the Steel Corporation showing 447,000 tons increase in November in its unfilled orders for finished and semi-finished steel has added to the favorable sentiment which has gained ground in the past two weeks. The extremely low prices on which much of the business was done indicate that the old time formula for lifting the market by getting under it is still in force. That the lifting process has made some headway appears from several price advances announced this week.

In wire an advance of $1 a ton made by the American Steel & Wire Company, effective Monday, is now general. Important sheet producers have put up their prices $2 a ton, or to 1.90c. for No. 28 black sheets and 2.90c. for galvanized. In bars leading mills are now holding for 1.15c. as minimum both for prompt shipment and first quarter of 1912.

Since the beginning of this month the Steel Corporation's bookings have been at a much greater rate than in November, considerably exceeding 50,000 tons a day.

That both merchants and manufacturers have been trying to build up their ragged stocks at the low prices explains, in part, what has happened in bars, and the same applies, though to a less extent, to plates and shapes. The mills have now a considerably larger bar tonnage booked than at any time this year and all are practically filled up for the first quarter, with a considerable percentage of capacity taken up in some cases for the second quarter.

The second half of December will show no great expansion in operations, owing to the holidays, but at the opening of the year several steel companies will start up plants now idle. The Steel Corporation, in view of the increased activity of its sheet and tin plate plants, particularly the latter, will start its Columbus, Ohio, steel works January 2—a plant that is operated only under unusual demand. At Aliquippa, Pa., the leading independent interest at Pittsburgh will start up additional steel and finishing mill capacity. After January 1 the Steel Corporation will have between 85 and 90 per cent. of its steel capacity active.

The advance in wire products to $1.55 for nails and $1.35 for fencing wire still leaves them $3 a ton below the basis of last January. At the recent $1.50 price for wire nails no heavy business was done, though that represented the lowest point since early 1899. A further advance in wire is probable.

Railroad buying has been small this week and in the Steel Corporation's bookings for November it amounted to only 10 per cent. Some of the larger rail orders are impending, however, and there are intimations that the

Pennsylvania Railroad car order will be much larger than the 20,000 originally proposed. The Great Northern order for 40,000 tons of rails and the Northern Pacific contract, variously estimated at 35,000 to 50,000 tons, are about to be closed. The South Carolina Railroad is in the market for 4400 tons.

Steel car wheel business has been good, recent orders being placed for 11,000. The Pennsylvania Railroad is reported to be figuring on 20,000.

Prices for structural steel are stiffening. Fabricators have been notified that they cannot safely base their estimates on less than 1.15c. for shapes, and some mills are asking more than this on manufacturers' orders for plain material. An Eastern mill has taken a contract for 10,000 tons of shapes for car work. The Hub building at Chicago, 6000 tons, and the Barr building, St. Louis, 10,000 tons, have been closed.

Plate mills have been helped not only by car works business but by the large business closed and pending for shipyards. Seaboard shipbuilders are so well filled that they are by no means eager for Government work. On the lakes there is figuring for three or four freighters and the lake yards may build several boats for the coastwise trade.

The foundry pig iron market has slowed down after two weeks of heavy buying at prices over which the furnace companies were far from cheerful. Southern iron has come up to a $10, Birmingham, basis for No. 2 and some sellers are asking more for the first half of 1912. The recent buying of basic iron in the Pittsburgh district, about which reports have varied, amounted to 30,000 tons at $12.10 and $12.15 at furnace.

Getting Steel Costs Down

The inroad the unlimited competition of the past six months has made upon the profits of iron and steel manufacturers has been dwelt upon as though it were absolutely without mitigation. Comparisons have been made with the low levels in other times of severe competition and it has been shown that in more than one product recent prices have been unprecedented for lowness, taking into account the higher wages and the higher raw material costs of to-day.

What has been ignored in all the outcry over the disappearance of profits in steel is the extent to which ways have been found to lower costs of manufacture. It has been assumed, since wage rates were not reduced, that, as so many dollars a ton have been cut off the selling price, earnings have suffered by just that much. Such a view takes no account of an economizing campaign that has been under way in the steel industry, one that has been as effective as it has been unadvertised. Referring first to the Steel Corporation as the largest producer, it is known that a movement for increased efficiency in every department of every subsidiary was undertaken early in the present year and that the results have figured in no small way in the balance sheets of the past six months. With all that had been previously accomplished through committee work, through liberal expenditure for labor saving equipment, through the saving of by-products and through the standardizing of operations, tending to pull the efficiency at all plants in a given line up to that of the best—the work put on the problem under the pressure of this year's necessities has brought excellent results. As is only too well known, this has been no year for spending money on new construction, but the Steel Corporation has made many small appropriations for plant changes or for new equipment where such expenditure would increase output and reduce unit cost.

In one large independent company the reductions in cost this year, without any reduction in the wage rate, have made up for no small part of the decline in the price of its product. One expedient resorted to, when, after serious consideration of wage reductions, it was decided to postpone such action, was a horizontal reduction in the number of men in all operating departments. The situation was put squarely up to managers, superintendents and foremen, with the urgent necessity of reducing cost by getting out the same product with a smaller force. It was not many weeks before ways were found, by increasing efficiency all along the line, to more than equal the former output.

It will be seen, when the reports of the various steel companies for 1911 can be studied, that the industry has only repeated familiar history in enforcing economies under stress of severe competition. It has found some compensation for conditions which appear all calamitous, in being able to set its house in order for the new régime—one under which so-called normal prices for iron and steel products will be several dollars a ton below the cent-and-a-half level of recent years for bars, plates and structural shapes.

Scale Contracts in the Iron Trade

The making of a scale contract has long been a favorite recourse in the iron trade and its allied industries when buyer and seller wished to tie up with each other for a period of time and yet avoid the prospect of loss to the one party or the other through a material change in the market price of the commodity involved. These contracts may be divided into two classes, the one based upon the price of the commodity ruling in the open market from time to time, and the other basing the price of the given commodity upon the price of some other commodity. Thus contracts have been made for the delivery of pig iron, a tonnage within a specified maximum and minimum per month, to be paid for at the ruling price in the month, or in the month preceding the month of delivery. Again, steel billets and sheet bars have been sold upon scale contracts, the basis being not the price of steel in the open market, but the price of pig iron. The favorite form for such contracts has been that of providing a variable "spread" between the pig iron and the steel, this spread increasing as the price of pig iron advances. An unusual contract was made a few years ago, involving a large tonnage, and in this case pig iron was bought, to be paid for in accordance with the fluctuations of the billet market. Particularly in recent years, Connellsville furnace coke has frequently been sold on a "ratio" basis, the settlement price from month to month being a predetermined fraction of the monthly average price of Bessemer or basic pig iron. What economic function do these sliding scale contracts perform? It is true they give the seller an advantage if the market advances, and they give the buyer an advantage if the market declines. In some cases such protection is needed. When both pig iron and coke are high priced, for instance, the furnaceman has excellent reason for making such a coke contract, because he is thus assured a supply of coke for the period, and at the same time he is protected in case the mar-

ket declines. This is to the advantage of both parties. The seller profits, in that when the market is high he can sell coke more readily on a scale contract than at a flat price; if the market declines, the furnace can continue operating and taking the coke, whereas if hung up on a high coke price it might be forced to blow out.

While scale contracts appear simple, a great many complications can arise in making and interpreting them, and they should promise great benefits to warrant their adoption. It is questionable whether in the long run they do. If they belong to the class in which the price is made dependent upon the price of some other commodity, they are very likely to carry the settlement price above or below the prevailing market price of the commodity sold. In the case of coke, very complicated contracts have sometimes been drawn to avoid this distortion, the ratio of coke to pig iron varying as the price of pig iron varies, and a minimum price for the coke being introduced. If on the other hand they belong to the class in which the adjustment is made according to the prevailing market price of the commodity traded in, they are confessedly a makeshift because they are impossible of general adoption. Were all the tonnage of the market thus handled, there would be nothing left to make a market price. Something of this sort has actually occurred in recent months in the case of a number of sheet bar contracts, the open market price resting upon such an uncertain foundation that consumers objected to being governed by it; and the justice of their claim was recognized by producers consenting to other means of settlement. In this case the scale contract system became topheavy.

In the willingness of the trade to make these scale contracts in so many instances, despite their obvious drawbacks, may possibly be found an argument in favor of the suggestion which has been so generally criticized, that a government board should actually regulate or fix prices. The scheme has been called chimerical; yet it really would require no great stretch of the imagination to conceive a government board, armed with adequate information, fixing prices of certain commodities with as much justice as is now done through the medium of some of the scale contracts which find favor with many buyers and sellers.

If the definite trend of these various scale contracts were to mitigate the extremes of fluctuation in the market they would be of economic advantage; but it is patent that they do not do so, for two reasons. In the first place, the effort is made in arriving at the terms to make them duplicate if possible that which has been found to occur in actual practice. Thus in fixing a coke-to-pig iron ratio, historic prices are scrutinized to ascertain how coke has usually advanced when pig iron has advanced. Thus the contract aims to correspond with market fluctuations, not to mitigate them. In the second place, when a portion of the total tonnage is taken out of the market in which periodic bartering occurs, the remainder must bear the entire brunt of increases and decreases in the total demand, and thus the price tends to fluctuate more than were the entire tonnage involved in the bartering.

While in the iron trade the scale contract has not been found of such striking advantage as to make its adoption at all general, it is interesting to note that in certain branches of the metal trade the periodic settlement basis has been found of great convenience. We refer to the settlement upon drosses, particularly from tin and spelter. Practice varies at different plants, so that drosses are not all alike, though the general method of production may be the same. Refiners are not equally easy to get along with, and it becomes desirable for both the manufacturer conducting tinning or galvanizing operations and the refiner of drosses to select in advance those with whom they will do business. The fluctuations in the new material market make this extremely difficult if settlement is to be at a flat price, but the difficulty vanishes when the contract provides that settlement shall be made for each carload on the basis of a fixed percentage of the price of new metal upon the date of shipment. The refiner must sell his product in relation to this market, while the producer finds the price realized upon the dross varies according to the price he has paid for the metal which makes the dross; and thus both parties are enabled to pursue their business, confident that the price paid and received from time to time will be in accord with the prevailing conditions. In this case the inherent advantage of the arrangement is obvious.

The Coming Demand for Machine Tools

When the trade shall have revived in a large way, an important element in the machinery market will be that of replacements. A very great percentage of the equipment of American machine shops, taking the country over, at the end of the last very prosperous period, could not even then be classed as really modern. Since that time buying for the most part has been confined to immediate needs resulting from extensions of business enterprises. If an older type of machine could be made to do work even in a moderately satisfactory manner, it has usually been called into use for the purpose, for the conservation of financial resources has been carried out in every possible way since the middle of 1907. In other words, four and one-half years have elapsed since shop owners have been modernizing the equipment of their plants. What was old then is still nearer obsolete now. There are some exceptions to the rule, of course, the most notable being the automobile builders whose business has averaged so great that they could afford what all manufacturers should carry out, whenever possible, the providing of equipment which will materially reduce cost of production. With progressive houses, when times are good, the practice is to throw out old tools and buy the latest models if the exchange promises a substantial return on the additional investment.

By the time the condition of general business shall have revived, five years at least will have passed since replacements on a large scale have been attempted. In fact, as already stated, the number of machines which have been sold to effect a greater economy has been very much smaller than would seem to be the case at first thought. The buying which will result from this long delay should be tremendous. The railroads must be large customers, both for additional equipment and for replacements. The average railroad repair shop is equipped almost wholly with machinery that was much too old five years ago, and the additional years have accentuated the antiquity of the methods which must be employed where such tools are used.

In this half decade the machine tool people have made very important advances in design. This factor naturally is not so important as for the period which

preceded 1907, for those years marked the extraordinary development of machinery made possible by the introduction of the high speed steels. Nevertheless, the more recent changes constitute an element which owners of shops cannot afford to overlook. In many details machines have been refined and new types and improvements in types have been added to the list.

In considering the stocks of machinery in the storehouses of the builders and in the warerooms of the dealers, some observers are prone to speak with doubt as to the ability of the market to absorb such a great surplus. On the contrary, a change in conditions, such as that of 1906, would take out of stock every machine in the country in a very short time, in spite of every effort that the manufacturers could make in rushing production in their shops. It is not generally understood, perhaps, that certain lines of machinery are even now being absorbed so rapidly that a small percentage of increase in demand would send deliveries well into the future.

Users of metal working machinery realize much better than formerly that the most expensive thing they can have in their works is an antiquated machine. If the expenditure of $1000 be necessary to replace it, the advantage in production cost would pay the whole bill in comparatively few months. With some modern machines, usually of the high-priced class, the saving is so radically great that the initial cost becomes almost a negligible quantity. At present, progressive manufacturers are either studying such problems as these or have already completed their plans for equipment changes, which they will carry into effect as soon as they feel that they can release the money for the purpose. It is good advice to the man whose financial resources would warrant it to buy now. Not only would he be able to get immediate deliveries but he would avoid the higher price which will undoubtedly come with a larger demand. He would enjoy the important advantage of being ready in advance to meet the big market for his own goods. With the improved facilities he will produce more goods at less cost and probably of a better quality.

Scientific Management in Government Shops

WASHINGTON, D. C., December 10, 1911.—The report of the special committee appointed last August to investigate the subject of scientific management of government workshops will not be ready for submission to the House of Representatives until March 10. The resolution under which the committee was appointed provided that its report should be made not later than December 10, but on Friday last the chairman, Mr. Wilson, of Pennsylvania, requested an extension of 90 days. This request was granted.

Mr. Wilson will now endeavor to put through the House another resolution appropriating $10,000, or as much of that sum as may be necessary, to pay the traveling and per diem expenses of witnesses in order that the remainder of the committee's work may be performed here. Owing to the lack of any appropriation whatever the committee's activities, during the recess of Congress, were limited to seven days in Boston and two in New York. In other words, so long as they could not call witnesses before them, at the witnesses' own expense, they were required to visit the places where the witnesses lived. This the chairman found no easy matter, inasmuch as one of his associates, Mr. Redfield, of New York, is a manufacturer and a many-sided business man who could not absent himself from home for the long periods of time necessary to cover the places it was desired to visit. When this plain statement of the facts has been laid before the Committee on Accounts, to which the resolution asking for an appropriation has been referred, Mr. Wilson has no doubt that the resolution will be favorably reported back to the House and that the House will pass it without material delay.

Within the next 10 days the committee will doubtless resume its sessions—this time in Washington—in the committee room of the House Committee on Labor of which Mr. Wilson is chairman. Many witnesses will be called. Some of them will be experts in shop management and others will be workmen employed by the government and private manufacturing concerns. Mr. Wilson hopes to have before the committee Mr. Taylor, whose system has been so generally discussed, and who has not yet testified, and a number of workmen from Philadelphia, Stamford, Bethlehem and Rock Island, the latter being the employees of the arsenal. Employees of the Midvale Steel Works, where the Taylor system was developed, will also be present. General Crozier and other War Department officials will be given an opportunity to be heard as well as the originators of other systems which follow the lines of the Taylor system.

Mr. Wilson says the workmen do not oppose the systematizing of the work or eliminating the elements of waste energy, but that they do oppose those elements which result in greater productivity as a result of greater expenditure of energy. The battle to be fought out before the committee, therefore, will doubtless be an interesting one. Upon the conclusion of its labors here, the committee will visit several establishments where the Taylor and other systems of like character are in effect in order to study their workings at close range. J. G.

Molding Machine Patent Decision

A decision recently given by the United States Circuit Court of Appeals for the Third Circuit finally disposes of litigation which has been going on for several years involving patents on molding machine improvements. In the original suit which was brought in the Circuit Court of the United States for the eastern district of Pennsylvania, the Tabor Mfg. Company alleged that the defendants, the E. H. Mumford Company et al., in the vibrator molding machines which they had brought out infringed patents No. 533,401, No. 582,325 and No. 654,292, owned by the Tabor Mfg. Company. The decree of the Circuit Court dismissed the complaint, holding that there had been no infringement. This decree the Circuit Court of Appeals in a decision given at the October term has now affirmed.

In patent No. 533,401 only claim 1 was involved. The court pointed out that this claim was amended by the inventor, after the original filing, by restricting the movability of the pattern plate to lateral movability. Without this restriction, the claim would have been stricken out, the court says, as one anticipated by Teeter in patents Nos. 397,316 and 494,570. In the case of the defendants' machine the pattern plate "is rigidly and firmly bolted down to upright posts that are integral with the heavier castings." The result is, the decision says, "that while the pattern plate of the defendants may be jarred, as the pattern plates of the prior art could have been and were, it is not, in the sense of the claim in suit 'movable laterally in a horizontal plane.'"

In patent No. 582,325 the suit involved claims 8 to 11, all having as an element in each of the combinations therein set forth a pattern plate "having mortises or apertures between the patterns and away from the margins of the patterns." The limiting phrase beginning with the word "between" was inserted by amendment, the court says, "to distinguish it from the French patent No. 157,852 of 1883 to Montagne, on which it had been rejected." The apertures in the defendants' machine, it was pointed out, adjoin the patterns. Since the complainant's claims mean that the apertures are so located that all their edges are away from the edges of the patterns, it was held that the defendants' machine was no infringement.

Claim 1 of patent No. 582,325 was also in suit. One element in its combination is guard-strips at the sides of the fingers which support the flask-supporting frame, whose function it is to prevent the entry of sand between the frame and the upper ends of the fingers. The decision says: "It is questionable whether the combination of this

claim is a patentable one. In any event, upon the strict construction which must be given it, the defendants do not infringe."

Claims 9, 10 and 11 of Patent No. 654,292 set forth combinations in each of which is "means for maintaining said carrier and pattern in parallelism with themselves." On this the decision says: "The defendants have no such means. Their machine is equipped with the pegs or dowel pins of the old art instead of the V-shaped guide bars which constitute the complainant's means for maintaining the parallelism referred to, and these pegs or pins do not prevent tilting of the plate as it is withdrawn. Consequently there is no infringement here."

The Rebate Plan in the British Steel Trade

Iron and steel dealers in Great Britain, particularly those carrying warehouse stocks, have been much exercised over the plan recently adopted by manufacturers of plates and structural shapes in England and Scotland, by which a rebate of five shillings a ton is given to all consumers who buy only the plates and shapes of the associated manufacturers. The object of the arrangement, as has been heretofore explained, is to secure the home market to home manufacturers and particularly to cut down the imports of German and Belgian steel. Some of the leading steel merchants of London, Glasgow, Manchester, Leeds, Hull, Bristol, Liverpool and Birmingham attended a conference at Birmingham November 30 to discuss the question. The opposition to the rebate arrangement has been partly due to the fear that when the associated manufacturers have tied up consuming interests they will make advances in prices more than recouping the 5s. rebate. Those in the trade who want the plan to fail look to see foreign manufacturers offer plates and shapes so much below the prices of home manufacturers as to tempt buyers to break their agreement even to the forfeiture of the rebate. There has been some talk of taking the matter into the courts on the ground that the rebate plan is illegal, as being in restraint of trade. It is pointed out, however, that to invoke the law would mean a long delay with no certainty of upsetting the manufacturers' arrangement.

The Tennessee Company and Convict Coal Miners

Announcement is made by the Tennessee Coal, Iron & Railroad Company, Birmingham, Ala., that after January 1 it will cease to work State convicts in its Alabama coal mines. It will transfer all such convicts to the Banner coal mines, where the State will work them and sell the coal to the mine owners, the Pratt Consolidated. Some county convicts will necessarily be retained longer in certain of the Tennessee Company's coal mines, as under existing contracts they cannot be turned over until their terms expire at various dates later. But the company has decided to eliminate the convicts as rapidly as possible. The Tennessee Company prior to this last action had adopted the semi-monthly payday and begun the work of eliminating the sub-contract system from its mines. Its policy is to build good homes for its workingmen, to establish night schools, give prizes for the best gardens, establish recreation grounds, baths and reading rooms, and maintain wages. These policies have done much to reconcile union labor to the open shop system. In fact, the Tennessee Company's workmen are stated by local observers to be better off now than they have ever been.

South Chicago Rail Mill Not Closed.—President E. J. Buffington of the Illinois Steel Company has given out the following statement at Chicago: "The report in circulation of the closing down of our rail mill at South Chicago for lack of orders is entirely erroneous. The Illinois Steel Company has to-day 250,000 tons in steel orders more than a year ago, and will continue the plant in operation as long as orders are forthcoming. The Gary plant would have closed down a few weeks ago were it not that sufficient orders were received to keep it in full operation. The mill at South Chicago, because of necessity for repairs, will close for a week or two some time during the winter; but it is impossible to say when that time will be, owing to many orders which come unexpectedly on the prevailing low prices in the steel market."

Large Riter-Conley Contracts

The Riter-Conley Mfg. Company, Pittsburgh, fabricator of structural steel and builder of blast furnaces, tanks, etc., has recently booked contracts for work running between $2,500,000 and $3,000,000. Its plant at Leetsdale, Pa., has started work on riveted steel pipe up to 10 ft. in diameter for the Los Angeles aqueduct, which aggregates close to 10,000 tons, while another order calls for galvanized steel transmission towers for the Southern California Edison Company, which will carry current from the power houses in the mountains to Los Angeles. For the Mond Nickel Company, northern Ontario, Canada, it will furnish 2000 tons of steel for new buildings, on which erection will commence in the spring. It is also building a duplicate of the present plant of the Saginaw Plate Glass Company, Saginaw, Mich., and within a week will start work on the new plant of the Penn Motor Company, New Castle, Pa.

The company has done considerable work in Brazil over the last year and has erecting crews there now. Another contract recently received from Brazil is for a large power house at Rio das Lages. For use on the Amazon River, Brazil, it will fabricate the steel for six steamboats. Work will soon be started on galvanized steel transmission towers for an American interest, 150 to be special and 900 standard, with an aggregate weight of about 4000 tons. For large interests in Mexico it will furnish 24 oil storage tanks, aggregating 3500 tons of material, each to have a capacity of 55,000 barrels. It is furnishing the structural material, 1000 tons, for the new soil pipe foundry to be built at Tuscaloosa, Ala., and will shortly start erecting a viaduct, about 500 tons, for the Tuscaloosa Mineral Railroad Company. Ground was recently broken for a new gas holder of 6,000,000 cu. ft. capacity for the Allegheny Heating Company, North Side, Pittsburgh. The Riter-Conley Company erected there several years ago the first gas holder of 5,000,000 cu. ft. capacity. A 6,00,000-cu. ft. gas holder for Detroit is also under construction. The contract for fabricating the steel work for the additions to the First National Bank, Pittsburgh, aggregating about 2600 tons, the first of which was delivered November 3, is expected to be completed before the holidays. Contracts for new work and recently started jobs will insure steady operations of the company over the next six months.

The Steel Corporation's Unfilled Orders

The bulletin of the United States Steel Corporation's unfilled orders for mill products given out December 9, showed a total of 4,141,955 tons, a gain in the month of 447,627 tons. The increase in October was 83,011 tons, while September showed a decrease of 84,668 tons. The large increase in November indicates freer sales ahead at the low prices prevailing in that month. The low point in the unfilled tonnage records of the corporation was 2,674,757 tons, shown in the report for December 31, 1910. The amounts reported for the various months of this year are as follows:

Nov. 30, 1911	4,141,955	May 31, 1911	3,113,187
Oct. 31, 1911	3,694,328	April 30, 1911	3,218,704
Sept. 30, 1911	3,611,317	Mar. 31, 1911	3,447,301
Aug. 31, 1911	3,695,985	Feb. 28, 1911	3,400,543
July 31, 1911	3,584,085	Jan. 31, 1911	3,110,919
June 30, 1911	3,361,058		

The totals at the close of the various years have been as follows: 1902, 5,347,523 tons; 1903, 3,215,123 tons; 1904, 4,696,203 tons; 1905, 7,605,086 tons; 1906, 8,498,719 tons (the high record); 1907, 4,624,552 tons; 1908, 3,603,527 tons; 1909, $5927,031 tons; 1910, 2,674,757 tons.

The Use of Intoxicants by Steel Workers.—Dr. Thomas Darlington, secretary of the Welfare Committee of the American Iron and Steel Institute, 30 Church street, New York, is sending an inquiry to the membership on the subject of regulating or diminishing the use of alcohol by employees in iron and steel works. Manufacturers who have put in force any method which directly or indirectly bears upon the regulation of the use of intoxicants by employees are asked to send details to the Welfare Committee.

A plan is being considered by the Army and Navy Board to consolidate the New York, Boston and Portsmouth navy yards into one large yard at Narragansett Bay.

The Iron and Metal Markets

A Comparison of Prices

Advances Over the Previous Week in Heavy Type. Declines in Italics.

At date, one week, one month and one year previous.

	Dec. 13, 1911.	Dec. 6, 1911.	Nov. 8, 1911.	Dec. 14, 1910.
PIG IRON, Per Gross Ton:				
Foundry No. 2 standard, Philadelphia	$14.85	$14.85	$15.00	$15.50
Foundry No. 2, Valley furnace.	13.00	13.00	13.25	13.75
Foundry No. 2 Southern, Cincinnati	**13.25**	13.00	13.25	14.25
Foundry No. 2, Birmingham, Ala.	**10.00**	9.75	10.00	11.00
Foundry No. 2, at furnace, Chicago*	14.00	14.00	14.10	16.00
Basic, delivered, eastern Pa.	*14.25*	14.50	14.50	14.75
Basic, Valley furnace	12.25	12.25	12.50	13.50
Bessemer, Pittsburgh	14.90	14.90	15.15	15.90
Gray forge, Pittsburgh	13.40	13.40	13.40	13.90
Lake Superior charcoal, Chicago	16.50	16.50	16.50	18.00
COKE, CONNELLSVILLE,				
Per Net Ton, at Oven:				
Furnace coke, prompt shipment.	**1.55**	1.50	1.50	1.45
Furnace coke, future delivery.	**1.65**	1.60	1.55	1.75
Foundry coke, prompt shipment.	1.90	1.90	1.80	2.00
Foundry coke, future delivery.	**2.15**	2.10	2.00	2.10
BILLETS, &c., Per Gross Ton:				
Bessemer billets, Pittsburgh	19.00	19.00	20.00	23.00
Open-hearth billets, Pittsburgh.	19.00	19.00	19.00	23.00
Forging billets, Pittsburgh	24.00	24.00	24.00	28.00
Open hearth billets, Philadelphia.	21.40	21.40	22.40	25.50
Wire rods, Pittsburgh	*24.50*	25.00	25.50	28.00
OLD MATERIAL, Per Gross Ton:				
Iron rails, Chicago	14.50	14.50	14.50	15.50
Iron rails, Philadelphia	15.50	15.50	15.50	17.00
Car wheels, Chicago	**13.00**	12.75	12.00	13.50
Car wheels, Philadelphia	**12.50**	12.00	11.25	13.25
Heavy steel scrap, Pittsburgh.	12.25	12.25	12.00	13.75
Heavy steel scrap, Chicago	**10.00**	9.75	9.50	12.00
Heavy steel scrap, Philadelphia.	12.00	12.00	11.50	12.50
FINISHED IRON AND STEEL,				
Per Pound to Largest Buyers:	Cents.	Cents.	Cents.	Cents.
Bessemer rails, heavy, at mill.	1.25	1.25	1.25	1.25
Iron bars, Philadelphia	**1.25**	1.22½	1.20	1.35
Iron bars, Pittsburgh	**1.25**	1.20	1.20	1.40
Iron bars, Chicago	1.15	1.15	1.15	1.35
Steel bars, Pittsburgh	1.10	1.10	1.10	1.40
Steel bars, tidewater, New York	1.26	1.26	1.26	1.56
Tank plates, Pittsburgh	1.15	1.15	1.15	1.40
Tank plates, tidewater, New York	1.31	1.31	1.31	1.56
Beams, Pittsburgh	1.15	1.15	1.15	1.40
Beams, tidewater, New York	1.31	1.31	1.31	1.56
Angles, Pittsburgh	1.15	1.15	1.15	1.40
Angles, tidewater, New York.	1.31	1.31	1.31	1.56
Skelp, grooved steel, Pittsburgh	1.12½	1.12½	1.15	1.25
Skelp, sheared steel, Pittsburgh	1.20	1.20	1.25	1.30
SHEETS, NAILS AND WIRE:				
Per Pound to Largest Buyers:	Cents.	Cents.	Cents.	Cents.
Sheets, black, No. 28, Pittsburgh	**1.90**	1.85	1.85	2.20
Wire nails, Pittsburgh	**1.55**	1.50	1.55	1.70
Cut nails, Pittsburgh	**1.50**	1.45	1.50	1.60
Barb wire, galv., Pittsburgh	**1.90**	1.85	1.85	2.00
METALS,				
Per Pound:	Cents.	Cents.	Cents.	Cents.
Lake copper, New York	**13.75**	13.37½	12.75	13.00
Electrolytic copper, New York.	**13.62½**	13.12½	12.62½	12.75
Spelter, St. Louis	*6.25*	6.55	6.45	5.75
Spelter, New York	*6.40*	6.70	6.60	5.85
Lead, St. Louis	4.37½	4.37½	4.15	4.35
Lead, New York	4.45	4.45	4.25	4.50
Tin, New York	*44.35*	45.50	43.15	38.55
Antimony, Hallett, New York.	*7.60*	7.65	7.65	7.75
Tin plate, 100-lb. box, New York	$3.64	$3.64	$3.64	$3.84

*The average switching charge for delivery to foundries in the Chicago district is 50c. per ton.

Prices of Finished Iron and Steel f.o.b. Pittsburgh

Freight rates from Pittsburgh in carloads, per 100 lb.: New York, 16c.; Philadelphia, 15c.; Boston, 18c.; Buffalo, 11c.; Cleveland, 10c.; Cincinnati, 15c.; Indianapolis, 17c.; Chicago, 18c.; St. Paul, 32c.; St. Louis, 22½c.; New Orleans, 30c.; Birmingham, Ala., 45c.; Pacific coast, 80c. on plates, structural shapes and sheets No. 11 and heavier; 85c. on sheets Nos. 12 to 16; 95c. on sheets No. 16 and lighter; 65c. on wrought pipe and boiler tubes.

Plates.—Tank plates, ¼ in. thick, 6¼ in. up to 100 in. wide, 1.15c., base, net cash, 30 days. Following are stipulations prescribed by manufacturers, with extras:

Rectangular plates, tank steel or conforming to manufacturers' standard specifications for structural steel dated February 6, 1903, or equivalent, ¼ in. thick and over on thinnest edge, 100 in. wide and under, down to but not including 6 in. wide, are base.

Plates up to 72 in. wide, inclusive, ordered 10.2 lb. per square foot, are considered ¼-in. plates. Plates over 72 in. wide must be ordered ¼ in. thick on edge, or not less than 11 lb. per square foot, to take base price. Plates over 72 in. wide ordered less than 11 lb. per square foot down to the weight of 3-16-in. take the price of 3-16-in.

Allowable overweight, whether plates are ordered to gauge or weight, to be governed by the standard specifications of the Association of American Steel Manufacturers.

Extras.	Cents per lb.
Gauges under ¼ in. to and including 3-16 in. on thinnest edge	.10
Gauges under 3-16 in. to and including No. 8	.15
Gauges under No. 8 to and including No. 9	.25
Gauges under No. 9 to and including No. 10	.30
Gauges under No. 10 to and including No. 12	.40
Sketches (including all straight taper plates) 3 ft. and over in length	.10
Complete circles, 3 ft. in diameter and over	.20
Boiler and flange steel	.10
"A. B. M. A." and ordinary firebox steel	.20
Still bottom steel	.30
Marine steel	.40
Locomotive firebox steel	.50
Widths over 100 in. up to 110 in., inclusive	.05
Widths over 110 in. up to 115 in., inclusive	.10
Widths over 115 in. up to 120 in., inclusive	.15
Widths over 120 in. up to 125 in., inclusive	.25
Widths over 125 in. up to 130 in., inclusive	.50
Widths over 130 in.	1.00
Cutting to lengths or diameters under 3 ft. to 2 ft., inclusive	.25
Cutting to lengths or diameters under 2 ft. to 1 ft., inclusive	.50
Cutting to lengths or diameters under 1 ft.	1.55

No charge for cutting rectangular plates to lengths 3 ft. and over.

Structural Material.—I-beams, 3 to 15 in.; channels, 3 to 15 in., and angles, 3 to 6 in. on one or both legs, ¼ in. and over, 1.15c. Other shapes and sizes are quoted as follows:

	Cents per lb.
I-beams over 15 in.	1.20 to 1.25
H-beams over 18 in.	1.30 to 1.35
Angles over 6 in.	1.20 to 1.25
Angles, 3 in. on one or both legs, less than ¼ in. thick, plus full extras, as per steel bar card Sept. 1, 1909	1.20 to 1.25
Tees, 3 in. and up	1.20 to 1.25
Zees, 3 in. and up	1.15 to 1.20
Angles, channels and tees, under 3 in., plus full extras as per steel bar card Sept. 1, 1909.	1.20 to 1.25
Deck beams and bulb angles	1.45 to 1.50
Hand rail tees	2.00 to 2.15
Checkered and corrugated plates	2.00 to 2.15

Sheets.—Makers' prices for mill shipments on sheets of U. S. Standard gauge, in carload and larger lots, on which jobbers charge the usual advances for small lots from store, are as follows:

Blue Annealed Sheets.

	Cents per lb.
Nos. 3 to 8	1.30 to 1.35
Nos. 9 and 10	1.40 to 1.45
Nos. 11 and 12	1.45 to 1.50
Nos. 13 and 14	1.50 to 1.55
Nos. 15 and 16	1.60 to 1.65

Box Annealed Sheets, Cold Rolled.

	One Pass.	Three Pass.
Nos. 10 to 12	1.55 to 1.60	.....
Nos. 13 and 14	1.60 to 1.65	.....
Nos. 15 and 16	1.65 to 1.70	1.75 to 1.80
Nos. 17 to 21	1.70 to 1.75	1.80 to 1.85
Nos. 22, 23 and 24	1.75 to 1.80	1.85 to 1.90
Nos. 25 and 26	1.80 to 1.85	1.90 to 1.95
No. 27	1.85 to 1.90	1.95 to 2.00
No. 28	1.90 to 1.95	2.00 to 2.05
No. 29	1.95 to 2.00	2.05 to 2.10
No. 30	2.05 to 2.10	2.15 to 2.20

Galvanized Sheets of Black Sheet Gauge.

Nos. 10 and 11	1.90 to 1.95
Nos. 12, 13 and 14	2.00 to 2.05
Nos. 15, 16 and 17	2.15 to 2.20
Nos. 18 to 22	2.30 to 2.35
Nos. 23 and 24	2.40 to 2.45
Nos. 25 and 26	2.60 to 2.65
No. 27	2.75 to 2.80
No. 28	2.90 to 2.95
No. 29	3.00 to 3.05
No. 30	3.20 to 3.25

All above rates on sheets are f.o.b. Pittsburgh, terms 30 days net, or 2 per cent. cash discount in 10 days from date of invoice, as also are the following base prices per square for painted and galvanized roofing sheets, with 2½-in. corrugations.

Corrugated Roofing Sheets, Per Square.

Gauge.	Painted.	Galvanized.	Gauge.	Painted.	Galvanized.
29	.....	$2.30	23	$2.35	$3.45
28	$1.30	2.45	22	2.55	3.65
27	1.45	2.50	21	2.75	4.00
26	1.55	2.60	20	3.00	4.30
25	1.80	3.00	18	4.00	5.65
24	2.05	3.10	16	4.85	6.45

Wire Rods and Wire.—Bessemer, open-hearth and chain rods, $24.50. Fence wire, Nos. 0 to 9, per 100 lb., terms 60 days, or 2 per cent. discount in 10 days, carload lots, to jobbers, annealed, $1.35; galvanized, $1.65. Carload lots, to retailers, annealed, $1.45; galvanized, $1.75. Galvanized barb wire to jobbers, $1.85; painted, $1.55. Wire nails, to jobbers, $1.55.

The following table gives the price to retail merchants on wire in less than carloads, including the extras on Nos. 10 to 16, which are added to the base price:

Fence Wire, Per 100 Lb.

Nos.	0 to 9	10	11	12 & 12½	13	14	15	16
Annealed	$1.50	$1.55	$1.60	$1.65	$1.75	$1.95	$1.95	$2.05
Galvanized	1.80	1.85	1.90	1.95	2.05	2.15	2.55	2.65

Wrought Pipe.—The following are the jobbers' carload discounts on the Pittsburgh basing card on wrought pipe, in effect from December 1, 1911:

Butt Weld.

	Steel—Black.	Steel—Galv.	Iron—Black.	Iron—Galv.
⅛ and ¼ in	74	54	68	48
⅜ in	75	65	69	59
½ in	78	68	72	62
¾ to 1¼ in	81	73	75	67
2 to 3 in	82	75	76	69

Lap Weld.

1" and 1¼ in	79	72	68	61
2 in	79	72	73	65
2½ to 4 in	81	74	74	67
4½ to 6 in	80	72	73	65
7 to 12 in	78	68	71	61
13 to 15 in	58		47	

Butt Weld, extra strong, plain ends, card weight.

⅛, ¼, ⅜ in	70	60	65	55
½ in	75	69	70	64
¾ to 1¼ in	76	73	74	68
2 to 3 in	80	74	75	69

Lap Weld, extra strong, plain ends, card weight.

1" in			66	60
2 in	76	70	71	65
2½ to 4 in	78	72	73	67
4½ to 6 in	77	71	72	66
7 to 8 in	70	60	65	55
9 to 12 in	65	55	60	50

Butt Weld, double extra strong, plain ends, card weight.

½ in	65	59	60	54
¾ to 1½ in	68	62	63	57
2 to 3 in	70	64	65	59

Lap Weld, double extra strong, plain ends, card weight.

2 in	66	60	61	55
2¼ to 4 in	68	62	63	57
4½ to 6 in	67	61	62	56
7 to 8 in	60	50	55	45

Plugged and Reamed.

1 to 1½, 2 to 3 in. Butt Weld
2, 2½ to 4 in. Lap Weld
} Will be sold at two (2) points lower basing (higher price) than merchants' or card weight pipe. Butt or lap weld as specified.

The above discounts are for "card weight," subject to the usual variation of 5 per cent. Prices for less than carloads are three (3) points lower basing (higher price) than the above discounts.

Boiler Tubes.—Discounts on lap welded steel and charcoal iron boiler tubes to jobbers in carloads are as follows:

Steel.		*Charcoal Iron.*	
1¾ to 2¼ in.	65	1½ in.	48
2½ in.	67½	1¾ to 2¼ in.	50
2½ to 3¼ in.	72½	2½ in.	55
3½ to 4 in.	75	2¾ to 3 in.	60
5 to 6 in.	67½		
7 to 13 in.	65		

2½ in. and smaller, over 18 ft., 10 per cent. net extra.
2¾ in. and larger, over 22 ft., 10 per cent. net extra.

Less than carloads will be sold at the delivered discounts for carloads, lowered by two points for lengths 22 ft. and under to destinations east of the Mississippi River; lengths over 22 ft. and all shipments going west of the Mississippi River must be sold f.o.b. mill at Pittsburgh basing discounts, lowered by two points.

Pittsburgh

PITTSBURGH, PA., December 13, 1911.—*(By Telephone.)*

Pig Iron.—The total purchases of basic iron by the Jones & Laughlin Steel Company amount to not over 30,000 tons, most of the business being taken by two interests, and the prices paid were $12.10 to $12.15 at furnace, the freight rate running from 40c. to 80c. per ton. The iron is for prompt shipment, and it will probably all go to Aliquippa. Some fairly large sales of forge iron have been made, one consumer buying 1500 tons for first half at $12.50 Valley furnace, another 3000 tons and also one lot of 2500 tons for first quarter at the same price. A sale of 2000 tons of No. 2 foundry iron, first quarter, was made at about $13 Valley furnace. Prices of basic iron are reported firmer, some sellers asking as high as $12.50 at furnace. A sale of 2000 tons of Bessemer iron for first half is reported at $14.25, Valley furnace. Inquiries for pig iron are better, and more is being sold than for some time. We quote: Bessemer, $14 to $14.25; malleable Bessemer, $12.50 to $12.75; basic, $12.25; No. 2 foundry, $13 to $13.10, and gray forge, $12.50, all at Valley furnace, the freight rate to the Pittsburgh district being 90c. a ton.

Billets and Sheet Bars.—Steel mills report that specifications against contracts for billets and sheet and tin bars have been quite heavy so far this month, and shipments in December to consumers will show a large increase over November. Prices are firmer, higher figures being asked on Bessemer sheet and tin bars. We quote: Open-hearth and Bessemer billets, $19 to $19.50; open-hearth sheet bars, $20 to $20.50; Bessemer sheet bars, $20.50 to $21; forging billets, $24, Pittsburgh or Youngstown.

Ferromanganese.—New inquiries are in the market, one for 100 tons, another for 250 tons and a third for 300 tons. A sale of 25 tons of 50 per cent. ferrosilicon has been made at $70, Pittsburgh.

(By Mail.)

The feeling is growing stronger that the turn has been made. Conditions are better than for a long time, with the outlook for the future much more encouraging. Leading events of the week have been the purchase of at least 30,000 tons of basic pig iron by the Jones & Laughlin Steel Company; an advance of $1 a ton on wire products and an advance of $2 a ton on black and galvanized sheets from the minimum prices of 1.80c. for No. 28 black and 2.80c. for No. 28 galvanized. Sales managers of the leading steel companies report that specifications have been much heavier in the past week and that a very large volume of business is being offered by jobbers and consumers for delivery over next year, but which in most cases is being turned down. The market seems to have reversed itself in the fact that there is more anxiety among jobbers and consumers to cover ahead than on the part of the mills to sell. Several leading steel companies state that they are trying to take on as little tonnage as possible at present prices, absolutely refusing to book contracts for long delivery. There is no doubt that the average of prices on finished iron and steel to-day is higher than two or three weeks ago. There is also a firmer tone in prices on pig iron, steel billets and sheet bars and on coke and scrap.

Ferromanganese.—Importers of standard English ferromanganese are still quoting $38.50, Baltimore, but only small sales have been made at this price. About 100 tons of standard English 50 per cent. is reported sold at $38 to $38.50, Baltimore. The freight rate for delivery in the Pittsburgh district is $1.05 a ton.

Ferrosilicon.—The inquiry of the Carnegie Steel Company for 6000 tons of 50 per cent. for delivery over all of 1912 has not yet been closed. Sales of two cars, or about 50 tons, of 50 per cent. are reported at $70, Pittsburgh, and it is claimed that the price will go still higher. We quote 10 per cent. at $21; 11 per cent., $22, and 12 per cent., $23, f.o.b. cars at furnace, Ashland, Ky., or Jackson, Ohio.

Muck Bar.—Prices are said to be slightly firmer and one maker reports sales of about 500 tons at about $28, Pittsburgh, for bar made from all pig iron. We quote best grades of muck bar, made from all pig iron, at $27.50 to $28, Pittsburgh.

Skelp.—A mill outside the Pittsburgh district has sold 1000 tons of narrow grooved steel skelp at about 1.12½c., delivered buyer's mill, Pittsburgh. One leading maker of skelp reports that it is filled up for 60 days and cannot promise deliveries before February or later. We quote grooved steel skelp at 1.12½c. to 1.15c.; sheared steel skelp, 1.17½c. to 1.20c.; grooved iron skelp, 1.40c. to 1.45c., and sheared iron skelp, 1.60c. to 1.65c., all for delivery at consumers' mills in the Pittsburgh district.

Wire Rods.—As yet the advance of $1 a ton on wire products is not reflected in wire rods, which continue very dull, with prices rather weak. Most consumers are covered by contracts and specifications are only fair. We quote $24.50 to $25 for Bessemer, open hearth and chain rods, f.o.b. Pittsburgh.

Steel Rails and Steel Car Wheels.—In the past week the Carnegie Steel Company has received three or four fairly large contracts for light rails. The coal mining interests are placing orders quite freely for light rails and specifications against contracts are good. It is understood that several large contracts for standard sections have been placed by Eastern roads, details of which will be given out in a few days. The rolling schedule of the Edgar Thomson rail mills is better now than it has been at any time this year. New orders for splice bars and car wheels are heavier. The Carnegie Steel Company has sold 2500 steel car wheels to the Berwind-White Coal Mining Company, 4000 to the

Norfolk & Western Railroad and 4000 to the Transit Development Company, Brooklyn, N. Y., while the Pennsylvania Railroad is reported to be in the market for upward of 20,000. We quote standard sections at 1.25c. per lb.; 8 and 10-lb. light rails, 1.25c.; 12 and 14-lb., 1.16c.; 16, 20 and 25-lb., 1.12c.; 30 and 35-lb., 1.10c., and 40 and 45-lb., 1.08c., f.o.b. at mill.

Structural Material.—There are more evidences of stiffening in prices on plain material. Local structural fabricators have been advised by leading mills not to bid on jobs in the future based on plain material at less than 1.15c. at mill. Some large jobs are being figured on with good prospects of being placed in a short time. The McClintic-Marshall Construction Company is the lowest bidder on the New York Central Terminal in New York City, requiring about 3500 tons of steel. The Riter-Conley Mfg. Company has taken 2000 tons of steel for new buildings for the Mond Nickel Company of northern Ontario, 1000 tons for a foundry for Tuscaloosa, Ala., and 500 tons for a viaduct for the Tuscaloosa Mineral Railroad. The American Bridge Company has taken about 3000 tons of bridge work for a Western road and 2200 tons for a Southern road. We quote beams and channels up to 15 in. at 1.15c., Pittsburgh.

Plates.—The Pennsylvania Railroad has inquiries out for 1000 to 2000 composite gondola cars, with 70-ton trucks, rated at 140,000 lb. capacity, also 1000 to 2000 type H-21 all-steel coke cars, with 70-ton trucks, and 1000 to 2000 type H-22 coke cars, with 70-ton trucks and equipped with side doors. The exact plans for these cars have not as yet been furnished by the railroad company, and so far no bids have gone in on them. It is said that 70-ton truck cars have already been built by several of the steel car companies, a Southern railroad having had some of this type in service for several years. Reports are that the Pennsylvania Railroad may buy upward of 20,000 such cars if the right prices are made. Orders for steel cars in the past two weeks have been light, but the Baltimore & Ohio is reported to be figuring on the purchase of a large number. Bids have been asked by the United States Government on the building of two battleships, each requiring 13,800 tons of plates and shapes, exclusive of the armor plate, and proposals are to be filed January 4. Mill operations are heavier, the Homestead plate mills of the Carnegie Steel Company running practically full for the first time in nearly a year. Makers are much stronger in their ideas on prices, and some low quotations have been withdrawn. We quote wide sheared plates at 1.15c., at mill, but on narrow sizes several of the smaller mills are still quoting 1.10c.

Sheets.—Effective December 11 several of the leading sheet mills advanced their prices to the basis of 1.90c. for No. 28 black and 2.90c. for No. 28 galvanized, following this with the statement that these prices are absolutely minimum and nothing less will be accepted. Putting former minimum prices at 1.80c. and 2.80c., respectively, this means an advance of $2 a ton. The generally better feeling in nearly all lines of finished iron and steel is strongly shown in sheets, new demand and specifications being heavier in the past two or three weeks than at any time since early in the year. Jobbers and consumers have been trying to tie the mills up with contracts at recent low prices covering their entire requirements through the first half of 1912, and in some cases through all of next year, but these offers have been turned down. We quote No. 28 black sheets at 1.90c. and No. 28 galvanized at 2.90c., at mill, for delivery over the first quarter and first half of 1912. Jobbers charge the usual advances over these prices on small lots from store.

Tin Plate.—New business is coming in at a very good rate. The mills are increasing their rate of operations. Within a week or two the American Sheeet & Tin Plate Company expects to have all of its 30 hot mills in its Shenango Works and the 22 mills in its New Castle Works in full operation. It will also start on December 18 the remaining five hot mills in its Sharon Works, when, and for the first time in some months, this plant will be in full operation. Its National Works, containing 25 hot mills, will be in full operation December 18. Last week the McKeesport Tin Plate Company started up 12 more hot mills at its plant in McKeesport, Pa., and its 22 mills are now in operation and will run full during December at least. The Jones & Laughlin Steel Company expects to start its second unit of 12 hot mills at Aliquippa, Pa., early in January. The leading mills have a very large amount of new business on their books. The open market on small lots of tin plate remains at $3.40 per base box for 14 x 20 coke plates.

Bars.—A heavy volume of new business and specifications against contracts for steel bars has been received by the mills in the past two or three weeks, and one leading mill reports that it is now 60 days behind in deliveries. The tone of the steel bar market is firmer. The minimum price on steel bars for delivery up to January 1 is now 1.10c. One or two mills will sell for first quarter at this price, but others ask 1.15c. The market on iron bars is also looking up, the new demand being heavier and prices are firmer. We quote common iron bars at 1.25c. to 1.30c., maker's mill, Pittsburgh.

Hoops and Bands.—Buyers realize that the bottom of the market has probably been reached, and are now trying to cover ahead for the next six months or more, but, as a rule, makers will not sell so far ahead at present prices. New demand is heavier, and specifications are coming in better than for some time. We quote steel bands at 1.10c. for prompt shipment and 1.15c. for first quarter delivery. We quote steel hoops at 1.30c., maker's mill, Pittsburgh.

Merchant Steel.—Jobbers and consumers are buying more freely. Both new demand and specifications are heavier than for some time. We quote: Iron finished tire, 1½ x ⅜-in. and larger, 1.15c., base; planished tire, ⅛-in. and larger, 1.35c.; channel tire, ¾, ⅞ and 1-in., 1.65c.; toe calk, 1.70c., base; flat sleigh shoe, 1.25c.; concave or convex, 1.55c.; cutter shoe tapered or bent, 2.15c.; spring steel, 1.75c.; machinery steel, smooth finish, 1.50c., all f.o.b. at mill.

Railroad Spikes.—The railroads are now trying to specify as far ahead as they can for spikes, but makers are not willing to accept contracts for delivery over all of next year at present prices. The New York Central, Erie, Baltimore & Ohio and Boston & Albany railroads have recently sent in specifications for railroad spikes for delivery over the next three months. We quote railroad spikes at $1.40 base in standard sizes in carload and larger lots, f.o.b. Pittsburgh.

Rivets.—Makers report that new demand and specifications against contracts are running heavier than at any time for some months. The tone of the market is said to be slightly stronger. We quote structural rivets at 1.45c. to 1.50c. and boiler rivets at 1.55c. to 1.60c., f.o.b. Pittsburgh. On a very desirable order for large tonnage these prices might be shaded $1 a ton.

Shafting.—Specifications and new orders are coming in more freely. One leading maker reports specifications for 1500 tons of shafting from a large implement maker. We quote cold-rolled shafting at 60 and 10 per cent. off in carload and larger lots and about 60 per cent. off in small lots delivered in base territory.

Spelter.—This metal has declined very fast and seems to be somewhat demoralized. Some of the makers of galvanized sheets and galvanized pipe in the Youngstown district have been considering the erection of a zinc smelter in the Mahoning Valley to be operated on a co-operative basis. Possibly this report has had something to do with the recent heavy decline in spelter. We now quote prime Western at 6.10c., East St. Louis, equal to 6.22½c., Pittsburgh.

Wire Products.—Effective December 11, leading makers of wire and wire nails announced an advance of $1 a ton in prices. This is in sympathy with the stronger market on other lines of finished products. New demand and specifications for wire nails are reported as slightly better. We quote: Wire nails, $1.55; cut nails, $1.50; galvanized barb wire, $1.85; painted, $1.55; annealed fence wire, $1.35; galvanized fence wire, $1.65, f.o.b. Pittsburgh, usual terms, freight added to point of delivery.

Merchant Pipe.—It is expected that this week a contract will be placed for 125 to 150 miles of 12-in. line pipe for the Southern Gas Company of California. A local mill reports a sale of 15 miles of 6-in. steel pipe for prompt delivery. The mills expect that December will be a heavier month in volume of new orders than November. The new prices on black and galvanized steel pipe which went into effect December 1 are reported as being maintained.

Tubes.—The demand for locomotive tubes is fairly active. Two of the leading railroads are figuring on contracts to be placed after the first of the year. New demand and specifications for merchant tubes are only moderate and prices are more or less shaded.

Iron and Steel Scrap.—The scrap list of the Pennsylvania Lines West closed December 13 and reports are that the company secured very close to $12.75, Pittsburgh, for its heavy steel scrap. While new purchases are not heavy the market is firmer and small sales of heavy steel scrap of special quality are re-

ported as high as $12.75, Pittsburgh. Dealers report that consumers are willing to pay present prices for good-sized tonnages for delivery over first quarter and first half of next year, but that it is difficult to buy in large lots at to-day's prices. The demand at present is mostly for heavy steel scrap, cast iron borings and wrought iron turnings, but a fair tonnage of bundled sheet scrap is also moving. The embargo on scrap destined for the Pittsburgh Steel Company, Monessen, Pa., is still on. Sales are reported of 500 tons of cast iron borings at $9, delivered in the Pittsburgh district, and 850 tons of wrought iron turnings at $9.15, delivered. Dealers quote as follows, per gross ton, f.o.b. Pittsburgh, unless otherwise noted:

Heavy steel scrap, Steubenville, Follansbee, Sharon, Monessen and Pittsburgh delivery	$12.25 to $12.75
No. 1 foundry cast	11.75 to 12.00
No. 2 foundry cast	10.75 to 11.00
Bundled sheet scrap, f.o.b. consumers' mill, Pittsburgh district	10.25 to 10.50
Rerolling rails, Newark and Cambridge, Ohio, Cumberland, Md., and Franklin, Pa.	12.50 to 12.75
No. 1 railroad malleable stock	11.25 to 11.50
Grate bars	9.00 to 9.25
Low phosphorus melting stock	15.25 to 15.50
Iron car axles	20.50 to 21.00
Steel car axles	16.00 to 16.25
Locomotive axles	22.00 to 22.50
No. 1 busheling scrap	11.00 to 11.25
No. 2 busheling scrap	7.00 to 7.25
Old car wheels	12.00 to 12.25
*Cast iron borings	8.75 to 9.00
*Machine shop turnings	9.00 to 9.25
†Sheet bar crop ends	13.75 to 14.00
Old iron rails	14.50 to 14.75
No. 1 wrought scrap	12.00 to 12.25
Heavy steel axle turnings	9.75 to 10.00
Stove plate	9.00 to 9.25

*These prices are f.o.b. cars at consumers' mills in the Pittsburgh district.
†Shipping point.

Coke.—A number of blast furnace operators have not yet covered for their supply of coke for delivery in first half and negotiations are on for a fairly large tonnage. Prices of standard makes of furnace coke for prompt shipment are higher, largely due to the scarcity of labor in the coke regions. Inquiries are also in the market for a round tonnage of foundry coke for delivery over the first half. The output of coke in the Upper and Lower Connellsville regions last week was 315,931 net tons, a decrease over the previous week of about 15,000 tons. We quote best grades of furnace coke for prompt shipment at $1.60 and for first half of 1912 at $1.65 to $1.70 per net ton at oven; best makes of 72-hr. foundry coke for spot shipment at $1.90 to $2 and for first half of next year at $2.10 to $2.25 per net ton at oven to consumers. Some makes of furnace and foundry coke not running as high in quality are obtainable at slightly lower prices.

Chicago

CHICAGO, ILL., December 12, 1911.

The market pendulum continues to swing away from that position in which the buyers have enjoyed predominant advantage. The level of prices is slightly higher and consumers are showing a willingness to contract for three and six months ahead at these advances. Reports became public during the week of the purchase by Western railroads of an aggregate approximating 5000 additional cars, with inquiries for 1250 more. One of the principal makers of steel bars is standing firmly on the 1.15c., Pittsburgh, basis, or 1.33c., Chicago, although this price is $1 a ton above the most favorable quotation. Local plate mills are heavily booked up on plates and can hardly accept further business for prompt shipment. Structural business, while not so heavy, is in good volume. Architectural work contracted for during the week aggregated 8500 tons, of which the principal item was the Hub Building, Chicago, requiring about 6000 tons. An advance of $1 a ton in wire prices is noted. The demand for pig iron continues active with moderately heavy selling. No immediate advance in open quotations is anticipated. The scrap situation is about on the same basis as a week ago, with dealers strongly supporting the market by speculative buying.

Pig Iron.—Activity in the buying of pig iron has continued unabated, and the balance of inquiry unfilled gives promise of important tonnage to come. Aside from purchases of malleable by a large consumer, individual transactions were under 2000 tons rather than over. Typical sales include one of 2000 tons to a Chicago stove manufacturer, 1000 tons to a northern Indiana agricultural machinery builder, 500 tons to a Wisconsin company, 500 tons to a malleable foundry near Chicago and 500 tons to a maker of heating furnaces. The price of $9.50, Birmingham, for No. 2, made on some recent analysis and split delivery orders apparently has entirely disappeared, and even $9.75 for immediate shipment is now exceptional. While the market for Southern iron again rests at $10, at least two large interests who have sold freely are now asking $10.50 for first half delivery. A Northern furnace which offers an iron in competition with Southern grades is understood to have placed a considerable tonnage in the aggregate. Northern furnaces have taken their share of the business, for which orders it was sometimes necessary to shade the price of $14 at the furnace, which, however, represents the current market. We quote for Chicago delivery, except for local irons, which are f.o.b. furnace, the following prices on prompt shipments:

Lake Superior charcoal	$16.50 to $17.00
Northern coke foundry, No. 1	14.50 to 15.00
Northern coke foundry, No. 2	14.00 to 14.50
Northern coke foundry, No. 3	13.50 to 14.00
Northern Scotch, No. 1	16.00
Southern coke, No. 1 foundry and No. 1 soft	14.85
Southern coke, No. 2 foundry and No. 2 soft	14.35
Southern coke, No. 3	14.10 to 14.35
Southern coke, No. 4	13.85 to 14.10
Southern gray forge	13.60 to 13.85
Southern mottled	13.60 to 13.85
Malleable Bessemer	14.35 to 14.50
Standard Bessemer	16.75
Basic	14.75
Jackson County and Kentucky silvery, 6 per cent.	16.40
Jackson County and Kentucky silvery, 8 per cent.	17.40
Jackson County and Kentucky silvery, 10 per cent.	18.40

Rails, Track Supplies and Railroad Equipment.—The situation as regards rails is unchanged, with no current orders but a large prospective tonnage. Buying of track spikes and bolts is fairly heavy, but rail joints are not so much in demand. Purchases of cars reported the past week included 750 box cars by the Soo line from the American Car & Foundry Company and 150 from the same company by the Live Poultry Transportation Company, Chicago. In addition to the 2500 cars mentioned last week, the Chicago & Northwestern ordered 600 automobile cars from the Western Steel Car & Foundry Company and 500 flat cars from the Standard Steel Car Company. The Missouri Pacific is reported to have bought from the American Car & Foundry Company 1000 gondolas, 500 box cars, 500 automobile cars and 500 furniture cars and from the Standard Steel Car Company 500 box cars. Inquiries pending include 750 all-steel, bottom dump cars for the Elgin, Joliet & Eastern and 500 refrigerator cars for the Chicago & Northwestern. The tendency of car builders to ask higher prices is said to arise not so much because of their well-filled order books as because of their inability to buy steel at as low prices as formerly. We quote standard railroad spikes at 1.50c., base; track bolts, with square nuts, 1.90c., base, all in carload lots, Chicago; standard section Bessemer rails, 1.28c.; open hearth, 1.34c.; light rails, 40 to 45 lb., 1.16c. to 1.20½c.; 30 to 35 lb., 1.19½c. to 1.24c.; 16, 20 and 25 lb., 1.20½c. to 1.25c.; 12 lb., 1.25c. to 1.30½c.; angle bars, 1.50c., Chicago.

Structural Material.—With the exception of the 6000 tons for the Hub building at Chicago, bids for which were opened last week with the Vierling Steel Works low bidder, the architectural tonnage was light, aggregating less than 2500, of which the largest item was 1383 tons for the new rail mill of the Minnesota Steel Company, Duluth, awarded to the American Bridge Company. The Decatur Bridge Company will fabricate 154 tons for the University of Illinois; the Minneapolis Steel & Machinery Company, 363 tons for a high school building in Minneapolis; the Wisconsin Bridge & Iron Company, 165 tons for bridge spans for the Chicago, Indianapolis & Louisville Railroad at Lafayette, Ind. E. S. Hall also let the contract for a factory building in Chicago. General structural tonnage continues satisfactorily heavy and structural prices have been bolstered up in a measure by the strength of bars and plates. Prices for fabricated material are still low. We quote for mill shipment, Chicago, 1.30c. to 1.33c., and from store 1.60c.

Plates.—Western plate mills have booked an exceedingly heavy tonnage of plates and the accumulation of orders would interfere with the acceptance of prompt delivery specifications. It is understood that the mills making only boiler and tank plates have taken much less business proportionately than the mills supplying material for car building. Where the mills are willing to do so customers show an inclination to contract ahead for three and six months, paying an advance over prompt shipment prices. We quote for

Chicago delivery, mill shipment, prompt, 1.30c. to 1.33c., and for delivery through the first half 1.38c. From store we quote 1.60c.

Sheets.—Concessions and irregularities in the sheet market continue despite a good current business to such an extent that the smaller mills, particularly those buying billets and sheet bars, are scarcely a factor in the market. As regards sheets, the market shows less possibility of returning strength than in other lines. We quote Chicago prices as follows: Carload lots, from mill, No. 28 black sheets, 2.03c. to 2.08c.; No. 28 galvanized, 3.03c. to 3.08c.; No. 10 blue annealed, 1.53c. to 1.58c. Prices from store, Chicago, are: No. 10, 1.90c.; No. 12, 1.95c.; No. 28 black, 2.30c.; No. 28 galvanized, 3.35c.

Bars.—The first steps toward higher prices have been taken by two manufacturers of bars in advancing their quotations to the full Pittsburgh basis of 1.15c., or 1.33c., Chicago. As other mills are still glad to take desirable orders a rather wide spread in prices exists and as low as 1.23c. is made, with the market for the average order resting at 1.25c. to 1.30c. Bar iron tonnage shows little improvement and the market is soft at 1.15c., Chicago. We quote as follows, f.o.b. Chicago: Soft steel bars, 1.23c. to 1.33c.; bar iron, 1.15c. to 1.20c.; hard steel bars rolled from old rails, 1.15c. to 1.20c. From store: Soft steel bars, 1.55c. to 1.60c., Chicago.

Wire Products.—A reaction of $1 a ton on plain wire and wire nails from the low quotations is announced, making the base quotations $1.35 and $1.55 respectively, Pittsburgh. Much depleted stocks of wire products at all distributing points have brought out some additional business and manufacturers in anticipation of spring trade have been contracting to a limited extent. We quote: Plain wire, No. 9 and coarser, base, $1.53; wire nails, $1.73; painted barb wire, $1.73 to $1.78; galvanized, $2.03 to $2.08; polished staples, $1.78 to $1.83; galvanized, $2.08 to $2.13, all Chicago.

Cast Iron Pipe.—The demand for cast iron pipe at this season is very limited, and an absence of municipal lettings of importance is not unexpected. Several orders from the smaller towns are noted. We quote as follows, per net ton, Chicago: Water pipe, 4-in., $26.50; 6 to 12-in., $24.50; 16-in. and up, $24, with $1 extra for gas pipe.

Old Material.—Under the conditions now prevailing in this market it is difficult to determine closely what may be considered the market price of each grade of material. The railroads are receiving prices reckoned on the basis of what the market is expected to be 30 or 60 days hence, while the scrap consumers decline to buy except on a considerably lower basis. There is a sharp demand for foundry scrap, and a considerable tonnage of heavy melting steel has been bought at $10.25, but rolling mill grades show less activity. There is a moderate aggregate tonnage moving but it is in small lots, the consumers contenting themselves with scattered purchases that represent only their minimum requirements. The situation is not likely to change from gradually advancing prices while the tonnage of finished material continues heavy, or to a rapid advance until the prices of finished material improve. We quote for delivery at buyers' works, Chicago and vicinity, all freight and transfer charges paid, per gross ton, as follows:

Old iron rails	$14.50 to $15.00
Old steel rails, rerolling	12.25 to 12.75
Old steel rails, less than 3 ft.	10.75 to 11.25
Relaying rails, standard section, subject to inspection	24.00
Old car wheels	13.00 to 13.50
Heavy melting steel scrap	10.00 to 10.50
Frogs, switches and guards, cut apart	10.00 to 10.50
Shoveling steel	9.50 to 10.00
Steel axle turnings	8.00 to 8.50

The following quotations are per net ton:

Iron angles and splice bars	$12.25 to $12.75
Iron arch bars and transoms	13.25 to 13.75
Steel angle bars	9.25 to 9.75
Iron car axles	17.00 to 17.50
Steel car axles	15.25 to 15.75
No. 1 railroad wrought	10.75 to 11.25
No. 2 railroad wrought	9.75 to 10.25
Steel knuckles and couplers	9.75 to 10.25
Steel springs	9.75 to 10.25
Locomotive tires, smooth	13.25 to 13.75
Machine shop turnings	6.00 to 6.50
Cast and mixed borings	5.25 to 5.50
No. 1 busheling	8.25 to 8.75
No. 2 busheling	5.75 to 6.25
No. 1 boilers, cut to sheets and rings	6.75 to 7.25
Boiler punchings	12.00 to 12.50
No. 1 cast scrap	10.75 to 11.25
Stove plate and light cast scrap	9.00 to 9.50
Railroad malleable	10.00 to 10.50
Agricultural malleable	8.50 to 9.00
Pipes and flues	7.50 to 8.00

Philadelphia

PHILADELPHIA, PA., December 12, 1911.

While there has been less large lot buying the volume of moderate orders has been fully maintained. In foundry pig iron speculative buying has developed to some extent. Pig iron asking prices have in instances been advanced. Statistics compiled by the Eastern Pig Iron Association show a marked increase in orders. Stocks of foundry grades are lower, but overbalanced by an accumulation of other grades, making a slight increase in the total as compared with the previous month. Virginia furnaces show a decrease in stocks due to shipments being heavier than the current production. The low range of recent quotations in practically all classes of rolled products is less in evidence. There is considerable railroad business, particularly in the way of rolling stock, under negotiation. The Philadelphia Rapid Transit Company has placed orders for 500 "near side" cars and may increase the order to 800. The Pennsylvania Railroad has not yet formally announced its 1912 rail requirements. A considerable quantity of furnace coke is under negotiation, but contracts develop slowly. There is a better feeling in old material. Rolling mills are showing more interest in the situation, but the strength in heavy melting steel is largely due to efforts of dealers.

Pig Iron.—A large volume of business is moving in foundry grades. The aggregate for the week, while not up to the record totals of the last few weeks, has been very satisfactory when the character of the business closed is taken into consideration. The bulk of the large inquiries recently before the trade have been closed, although the same buyers would take additional quantities for more extended deliveries if sellers generally would take on the business. In this way some speculative buying covering the second quarter of the year has been put through at prices quoted for first quarter shipment. The Pennsylvania Railroad has closed against its recent inquiry for 5000 tons for first quarter, the bulk of the business, it is said, going to Central Western furnaces. A number of lots of No. 2 X and No. 2 plain foundry grades, ranging from 500 to 1000 tons, have been taken by various classes of consumers at prices ranging from $14.85 to $15.10 for No. 2 X, delivery over the first quarter and half. While a slightly lower price, $14.75, delivered, for No. 2 X is occasionally heard, the quotation is confined to exceptional transactions. In the same manner $15.25 has been done, but is usually confined to consumers who pay the slight advance rather than drop a particular brand from their mixtures. Several Eastern furnaces are now holding to $15.25 as a minimum quotation. Cast iron pipe makers have not been taking on any large quantities of iron, only small purchases of off irons being noted. These consumers are still in the market for a considerable amount for forward delivery, but makers have not met their ideas as to prices. Southern No. 2 foundry has been sold to stove interests in this district in lots ranging from 200 to 500 tons for first half at $10, Birmingham. Virginia foundry grades have been moving more freely. Several round lots of No. 2 X, for delivery over the first half, have been sold at $12.50, furnace, although for prompt and first quarter delivery $12.25 is pretty generally done. More interest is shown in forge iron for rolling mill purposes; inquiries for 500-ton lots for early delivery are out, while sales of the same quantities have been made at $14.25, delivered. While there is no demand for basic iron from consumers in this immediate district melters in the central part of the State have been making purchases for near future and more extended delivery. These transactions have been without definite confirmation, although it is reported that in addition to the sale of 7500 tons reported last week a purchase of several thousand tons of Southern basic has been made by another interest in that district. The consumer who was in the market for 1000 tons of basic, for Western shipment, purchased 1500 tons and will probably take on an additional 1000 tons for April and May shipment. Western basic was taken. A better movement in standard analysis low phosphorus iron is noted, sales of lots ranging from a few hundred up to 1000 tons having been made at $19.25 to $19.50 for local as well as Western delivery. Quotations for standard brands, delivered in buyers' yards in this vicinity, during the first quarter and half of the year, range as follows:

Eastern Pennsylvania No. 2 X foundry	$14.85 to $15.25
Eastern Pennsylvania No. 2 plain	14.60 to 15.00
Virginia foundry	15.00 to 15.50
Gray forge	14.25
Basic	14.25 to 14.50
Standard low phosphorus	19.25 to 19.50

Iron Ore.—Reports of tentative negotiations in connection with both foreign and domestic grades are heard of, but no developments have resulted. Importations during the week include 8250 tons from Cuba, 4069 tons from Sweden and 5900 tons from Newfoundland.

Ferroalloys.—Little demand is noted in this vicinity, although sales for Western delivery are being more freely made. Small lots of 80 per cent. ferromanganese have been sold at $38.50, Baltimore, which price now appears firmly established. A sale of 150 tons of 50 per cent. ferrosilicon is reported at $70, delivered. No inquiry of importance for 11 to 12 per cent. ferrosilicon is reported.

Billets.—A slightly better run of orders for early shipment encourages the makers. Considerable inquiry for requirements during 1912 is before the trade, and one sale of 1000 tons of open-hearth rolling billets has been made for shipment over the first half at $21.50, delivered. Low quotations recently noted have been withdrawn and, while $21.40, delivered, for prompt shipment can still be done, some makers are holding for $22.40, on which delivery extends over the first quarter. Forging billets are in fair demand, with sales usually in small lots at $26.40 to $27.40, delivered here.

Plates.—Eastern mills continue to book a fair amount of moderate sized business, which, together with specifications on old orders, enables mills to hold their recent productive rate. While there is considerable business in sight in boat, bridge and tank plates, orders of any size develop slowly. Mills in this district still refuse to accept contracts on which deliveries are extended and maintain their minimum quotation for ordinary plates at 1.30c., delivered, this quotation applying only on desirable business. On the usual run of small, miscellaneous business they quote 1.35c. to 1.40c., delivered.

Structural Material.—While there is some good building work under negotiation, immediate business in this vicinity has been less active. Awards on the steel work for the Dock street pier, 1000 tons, will be made in the near future, while bids for the general contract on the Stock Exchange building go in this week. A decision in the matter of the new erecting shop of the Baldwin Locomotive Works at Eddystone is expected this week. Several good bridge projects are under negotiation, while orders for several small bridges have been placed. The demand for plain structural shapes has been somewhat quieter, and some of the mills in this district are less actively engaged. Prices for plain structural shapes are on a better basis, 1.30c., delivered, being the usual minimum quotation, with 1.35c. named for small lots.

Sheets.—Mills are actively engaged with the usual rush of year end business to cover requirements over the usual holiday idleness. Efforts to get makers to accept contracts to cover the first half of the year are still being made, but mills refuse to accept such business. Most orders are for small lots on which deliveries are being urged. Prices are firm at 2c. to 2.05c., delivered here, for Western sheets, while Eastern mills making smooth, loose rolled sheets, obtain ¼c. to ½c. per lb. advance.

Bars.—While the volume of business has not materially increased, the situation regarding prices has improved in that the low quotations for iron bars which have been quoted by some mills have been withdrawn. For early delivery the minimum quotation for iron bars is named at 1.17½c., mill, while leading producers, who have not met the recent low prices, maintain a minimum of 1.20c., mill. The range of prices for iron bars, in moderate lots, delivered in this territory, is from 1.25c. to 1.32½c. Steel bars are firm at 1.25c. to 1.30c., delivered here, with a moderate business moving.

Coke.—Negotiations are still pending for several large blocks of furnace coke, for first half and all of 1912 shipment. Producers are not inclined to meet consumers' views as to prices, and meanwhile furnaces take odd lots of prompt coke to cover near future needs. The movement in foundry coke is light, few contracts having been placed, although deliveries are going forward freely on orders in hand. Prices are unchanged, the following range per net ton being named for deliveries in buyers' yards in this district:

Connellsville furnace coke	$3.65 to $4.05
Foundry coke	4.15 to 4.50
Mountain furnace coke	3.40 to 3.65
Foundry coke	3.95 to 4.40

Old Material.—Rolling mills show more interest in the market, moderate purchases of various grades being made, with slightly higher prices paid in instances. The situation in heavy melting steel is unchanged. Mills are not openly in the market, while dealers are not offering this grade at present prices. Dealers pay $12 to $12.25, delivered, for No. 1 heavy melting steel, while mills would probably not offer over $12 were they in the market, unless the material was exceptionally high grade. Borings and turnings show a better movement, as do also old car wheels and wrought scrap. The demand for machinery cast is increasing, with numerous moderate lot sales reported. The following range of prices about represents quotations at which the ordinary current business for prompt shipment can be done for delivery in buyers' yards, eastern Pennsylvania and nearby points, taking a freight rate from Philadelphia varying from 35c. to $1.35 per gross ton, for shipment ranging from prompt to the remainder of the year:

No. 1 heavy melting steel scrap	$12.00 to $12.50
Old steel rails, scrap (nominal)	13.00 to 13.50
Low phosphorus heavy melting steel scrap	15.50 to 16.00
Old steel axles	17.00 to 17.50
Old iron axles	21.00 to 21.50
Old iron rails	15.50 to 16.00
Old car wheels	12.50 to 13.00
No. 1 railroad wrought	14.75 to 15.25
Wrought iron pipe	11.50 to 12.00
No. 1 forge fire	10.25 to 11.00
No. 2 light iron (nominal)	6.75 to 7.25
Wrought turnings	9.00 to 9.50
Cast borings	8.25 to 8.75
Machinery cast	13.00 to 13.50
Railroad malleable (nominal)	11.50 to 12.00
Grate bars, railroad	10.00 to 10.50
Stove plate	10.00 to 10.50

Cleveland

CLEVELAND, OHIO, December 12, 1911.

Iron Ore.—On December 1 there was 9,270,341 tons of ore on Lake Erie docks as compared with 9,426,681 tons on the same docks December 1, 1910, or a decrease of 156,341 tons. The ore that will be on Lake Erie docks and in furnace yards May 1, 1912, counting on the present rate of consumption, is estimated at 19,500,000 tons. This estimate assigns 14,300,000 tons to the Steel Corporation and the remainder, 5,200,000 tons, to the independent furnace companies. In view of the fact that it has been customary for the Steel Corporation to keep nearly a year's supply of ore on hand to protect itself in case of labor troubles at mines or on the lakes, this tonnage is not regarded as large. Ore sellers regard these figures as pointing to a healthy condition in the trade next spring. While the tonnage of ore on docks December 1 is practically the same as a year ago, stocks in furnace yards on December 1, 1910, were heavy, being estimated at 23,174,000 tons, making a total tonnage on that date on docks and in furnace yards of 32,600,000 tons. While figures are not now available, it is known that the tonnage in furnace yards on December 1 was considerably less than on the corresponding date a year ago. The figures on the estimated tonnage on Lake Erie docks and in furnace yards May 1, 1912, bear out former statements regarding the fact that consumers bought very sparingly during the present year and indicate that with smaller stocks on the docks and in the furnace yards May 1, 1912, than on May 1, this year, the outlook in the ore trade the opening of next season will be much better than it was early this year. We quote prices as follows: Old range Bessemer, $4.50; Mesaba Bessemer, $4.25; old range non-Bessemer, $3.70; Mesaba non-Bessemer, $3.50.

Pig Iron.—While the demand in this immediate territory has fallen off somewhat as compared with the two previous weeks local selling agencies report a good volume of sales of foundry iron in surrounding territories. These sales are mostly in lots of 500 tons and under, although one sale of 2000 tons is reported. Nearly all the buying has been for delivery through the first half. A moderate volume of inquiry is still pending, mostly from small consumers. While the recent buying movement has not resulted in any general strengthening of prices one interest which is now well sold up on the output of its Valley furnace is quoting to its trade at a minimum of $13.25, Valley furnace, for No. 2 foundry. Prices for Cleveland delivery are firm at $13.25, delivered, for No. 2. For outside shipment local furnaces are selling No. 2 foundry at $12.75 to $13. Buyers are able to get the same price for the entire first half as through the first quarter, so that as a rule they are buying a six months' supply. There is a scattering inquiry for Southern iron in lots of 100 to 500 tons for the first half delivery, for which a mimimum price of $10 for No. 2 is generally maintained. Southern Ohio producers have advanced minimum quotations on Ohio

silvery iron 50c. a ton, $15.50 now being generally maintained for 8 per cent. silicon for spot shipment and for the first half. We quote as follows for prompt shipment and for the first half, delivered Cleveland:

Bessemer	$14.90 to $15.15
Basic	13.25
Northern foundry, No. 2	13.25
Southern foundry, No. 2	14.35
Gray forge	12.50
Jackson County silvery, 8 per cent. silicon	17.05

Coke.—A local furnace has purchased furnace coke for its first half requirements, amounting to about 8000 tons a month. There is little demand for foundry grades, there being practically no inquiry for contracts. We quote standard Connellsville furnace coke at $1.50 to $1.55 per net ton, at oven, for spot shipment and $1.60 to $1.65 for the first half. Standard Connellsville foundry coke is held at $2 to $2.15 for spot shipment and $2.15 to $2.40 for contract.

Finished Iron and Steel.—Mill agencies all report a good volume of orders in steel bars, plates and structural material. The price situation has further improved and there appears to be a strong disposition among sellers to adhere strictly to the general quotations. Steel bars are firm at 1.10c., Pittsburgh, for prompt shipment and in most cases at 1.15c. for the first quarter. Carload sales for prompt shipment have been made at the higher price. Structural material and plates are generally sold at 1.15c., Pittsburgh, for prompt shipment and 1.20c. for the first quarter. Mills are generally avoiding sales for delivery beyond the first quarter. The American Bridge Company has taken the steel for the Lawrence hotel, Erie, Pa., 1200 tons, and 525 tons for a new building for the Republic Rubber Company, Youngstown, Ohio. The demand for sheets is fairly active and prices are firmer, although the recent low prices of 1.80c. for No. 28 black and 2.80c. for No. 28 galvanized have not entirely disappeared. Rivet prices continue weak. Local makers quote structural rivets at 1.45c. to 1.50c., Pittsburgh, and boiler rivets at 1.55c. A local maker has sold 8000 tons of open hearth billets to a nearby consumer for the first half delivery on the basis of $19, Youngstown. There is some demand for forging billets, which are quoted at $26, Cleveland, although some sellers are shading this price 50c. The demand for iron bars is light and only one of the local mills is running. We quote iron bars at 1.20c., Cleveland.

Old Material.—The market has taken on a firmer tone during the week owing to a spurt of activity in steel making scrap, which appeared to have been confined mostly to dealers. Some dealers who had sold short wanted to cover in a hurry and this forced prices up, the advance in heavy steel scrap amounting to 50c. a ton. Local consumers are now offering $11.75 to $12 for heavy steel scrap. Sales of turnings to dealers are reported at $7. Railroad lists during the week brought out good prices, practically all of this scrap going to consumers, who offered better prices than the dealers. The only additional railroad list reported is from the Norfolk & Western, which will close December 20. Dealers' prices per gross ton, f.o.b. Cleveland, are as follows:

Old steel rails, rerolling	$12.25 to $12.75
Old iron rails	14.00 to 14.50
Steel car axles	17.00 to 17.50
Heavy melting steel	11.50 to 12.00
Old car wheels	11.75 to 12.25
Relaying rails, 50 lb. and over	22.50 to 23.50
Agricultural malleable	10.50 to 11.00
Railroad malleable	11.75 to 12.00
Light bundled sheet scrap	9.50 to 10.00

The following prices are per net ton, f.o.b. Cleveland:

Iron car axles	$18.50 to $19.00
Cast borings	6.25 to 6.50
Iron and steel turnings and drillings	6.75 to 7.00
Steel axle turnings	7.25 to 7.75
No. 1 busheling	9.00 to 9.50
No. 1 railroad wrought	11.00 to 11.25
No. 1 cast	11.00 to 11.50
Stove plate	9.00 to 9.25
Bundled tin scrap	11.00 to 11.50

Birmingham

BIRMINGHAM, ALA., December 11, 1911.

Pig Iron.—There is a marked disposition to hold more firmly to the $10 schedule for any delivery up to July 1. Undoubtedly there has been a very large tonnage of Southern foundry and basic iron sold since November 1, but a great deal of this iron has been sold at a concession below the $10 schedule. During the past week sales have been made at $10.25 for No. 2 foundry, but the generally quoted prices for any delivery up to July 1 are as follows, f.o.b. furnace, Birmingham:

No. 1 foundry	$10.50
No. 1 soft	10.50
No. 2 foundry	10.00
No. 3 foundry	9.50
No. 4 foundry	9.25
Gray forge	9.00
Standard basic	10.00
Off basic	9.50

Cast Iron Pipe.—The makers report but little change in the situation. All foundries now in operation will doubtless shut down for a week or ten days for the Christmas holidays, taking advantage of this shutdown to take their inventory for the close of the year. Prices are as follows, per net ton, f.o.b. cars here: 4 to 6 in., $23; 8 to 12 in., $22; 12 in. and over, $21, with $1 per ton extra for gas pipe. Special fittings may be quoted at $45 to $50 at foundry.

Old Material.—The scrap market has not shown any improvement in price. Notwithstanding the large sales of pig iron there is so little interest noted in old material that it is really hard to say what is the market price. Dealers continue to quote, f.o.b. yard here, per gross ton, as follows:

Old iron axles (light)	$12.00 to $12.50
Old steel axles (light)	11.00 to 11.50
Old iron rails	11.00 to 11.50
No. 1 railroad wrought	9.50 to 10.00
No. 2 railroad wrought	8.00 to 8.50
No. 1 country wrought	6.00 to 6.50
No. 2 country wrought	5.50 to 6.00
No. 1 machinery cast	8.00 to 8.50
No. 1 steel	7.50 to 8.00
Tram car wheels	7.00 to 7.50
Standard car wheels	9.00 to 9.50
Light cast and stove plates	5.50 to 6.00

Cincinnati

CINCINNATI, OHIO, December 13, 1911—(*By Telegraph*).

Pig Iron.—Interest continues centered on Southern iron, and prompt shipment prices are firmer. The recognized quotation for December movement is now $10, Birmingham basis, for No. 2 foundry. However, at this same figure there is some business being booked for shipment through the first half. Several producers are asking $10.25 to $10.50 on strictly second quarter business but no sales at the last named figure can be reported in this territory. More open inquiries are coming in, and customers are doing considerable shopping round before placing their orders. Local agencies are working on two nice sized prospective orders in the Northwest for Southern Nos. 1 and 2 foundry for last half shipment. For the same delivery 500 tons of Southern No. 2 foundry is wanted by a southern Ohio melter, and an Indiana consumer is asking for 1000 tons each of Northern and Southern foundry grades. Numerous other scattered inquiries are before the trade, and December will probably make a better showing, so far as the tonnage booked is concerned, than the corresponding month of last year. Among recent sales are 2000 tons of No. 1 soft for a Northwestern melter, booked at $10.50, Birmingham, for first half movement. A southern Ohio melter took 400 tons of No. 2 foundry at $10 and Illinois consumers placed several fair-sized orders, all for delivery through the first half. An Indiana manufacturer bought 500 tons of 6 per cent. Ohio silvery at $14 at furnace. Malleable is in fair demand and is quotable at $13, Ironton, which is also the ruling price on Northern No. 2 foundry for any delivery until July 1. For shipment during the next six months a central Western firm booked 1200 tons of Southern gray forge at $9.25, Birmingham. Based on freight rates of $3.25 from Birmingham and $1.20 from Ironton we quote, f.o.b. Cincinnati, as follows for prompt shipment:

Southern coke, No. 1 foundry and 1 soft	$13.75 to $14.00
Southern coke, No. 2 foundry and 2 soft	13.25 to 13.50
Southern coke, No. 3 foundry	12.75 to 13.25
Southern coke, No. 4 foundry	12.50 to 13.00
Southern gray forge	12.50 to 13.00
Ohio silvery, 8 per cent. silicon	16.95 to 17.20
Lake Superior coke, No. 1	14.70 to 14.95
Lake Superior coke, No. 2	14.20 to 14.45
Lake Superior coke, No. 3	13.70 to 13.95
Basic, Northern	14.20 to 14.45
Standard Southern car wheel	25.25 to 25.50
Lake Superior car wheel	19.00

(By Mail.)

Coke.—A contract calling for about 6000 tons of furnace coke for a Southern consumer was closed by a Wise County producer last week. Sales of foundry coke are light, and those foundries not already covered with contracts are simply buying to fill immediate re-

quirements. Furnace coke continues to show signs of strength, so far as prices are concerned, and is quotable in the Connellsville field around $1.55 to $1.65 per net ton at oven, with Wise County and Pocahontas brands bringing 5c. to 10c. per ton advance over these quotations. Foundry grades, in all three fields, are quotable at about $1.90 to $2 for prompt shipment, with some of the better brands bringing as high as $2.25 on future shipment business.

Finished Material.—In many lines a spurt of activity is reported, but the near approach of the holiday season will probably soon put the market back into the same old rut. Prices continue firm, and 1.10c., Pittsburgh, is considered minimum on steel bars. Structural material is quoted at 1.15c., Pittsburgh. The local warehouse price on steel bars remains around 1.60c. base, and that on structural material, cut to lengths, 1.70c. Sheets are in a trifle beter demand.

Old Material.—Sentimentally, the market is in better shape, but consumers generally are unwilling to pay maximum prices demanded by dealers, and there is not very much business being done. The railroads are reported to be offering scrap material as fast as it is accumulated. The rolling mills in this section are probably using a slightly increased tonnage over requirements a few weeks ago. The minimum figures given below about represent what buyers are willing to pay for delivery at their yards in southern Ohio and Cincinnati, and the maximum quotations the selling prices f.o.b. at yards:

No. 1 railroad wrought, net ton	$9.75 to $10.50
Cast borings, net ton	4.50 to 5.00
Steel turnings, net ton	5.50 to 6.00
No. 1 cast scrap, net ton	9.50 to 10.25
Burnt scrap, net ton	6.50 to 7.00
Old iron axles, net ton	16.25 to 16.75
Bundled sheet scrap, gross ton	6.25 to 6.75
Old iron rails, gross ton	13.00 to 13.75
Relaying rails, 50 lb. and up, gross ton	20.75 to 21.50
Old car wheels, gross ton	10.50 to 11.00
Heavy melting steel scrap, gross ton	9.50 to 10.00

St. Louis

ST. LOUIS, MO., December 11, 1911

The feeling in the market here continues to grow measurably better and there is a belief that prices will show improvement soon. The growing tendency to anticipate requirements and the prompt shipment demands indicate a more profitable business in the near future.

Pig Iron.—Most of the large buyers seem to have filled their requirements, at least for the first quarter, and some for the first half, and the buying by foundrymen is now the bright indication of the market. In some instances there are requests for shipments in anticipation of contracts and in practically all cases there is demand for prompt shipment on specifications. There is more melting in this district that at any time during the current year and on the other side of the situation come advices from furnaces that capacity has been completely booked for the first quarter. The sales to the smaller buyers are improving. Sales during the week include 3000 tons of different grades to the United States Radiator Corporation and 500 tons of Lake Superior car wheel iron. There are inquiries out for 500 tons more of the Lake Superior iron and still another for 2000 tons from the American Car & Foundry Company. Prices remain at $10 for No. 2 Southern, Birmingham basis, but there is a disposition to put No. 2 Northern up from $13 to $13.50, Ironton, because of demands upon capacity.

Coke.—The market remains in a rather quiet condition, with a good aggregate movement, but few large individual orders, about the largest being for 1000 tons for first quarter delivery.

Finished Iron and Steel.—Buyers are anxious to contract for considerable tonnage. Most of the orders are for comparatively small lots for immediate use, though there is a considerable demand from fabricators for stock. The bids were received to-day for the Barr building with requirements of 10,000 tons of structural material and 1800 tons of reinforcing bars. In bars the specifications have been liberal, all for quick shipment. The price is more steadily maintained than for a long time. In standard section steel rails there is no activity, owing largely to the between seasons period. Plates have been moving up to the normal requirements and the price has been on a par with structural material, which is pretty well held at 1.15c., Pittsburgh. Light rails have shown some demand from the coal mines, but not so much as the season usually warrants. The lumber roads are taking nothing. Track fastenings have been in seasonable request at steady prices.

Old Material.—The better feeling noted in the scrap market last week continues and the lists reported last week were closed later at considerably better prices than has been the case in some time. There is a better demand from the steel producers and foundries than for rolling mill uses. No new lists have appeared in this district during the past week. In general dealers have the optimistic spirit well established. We quote dealers' prices, f.o.b. St. Louis, as follows, per gross ton:

Old iron rails	$12.50 to $13.00
Old steel rails, re-rolling	12.00 to 12.50
Old steel rails, less than 3 ft.	11.00 to 11.50
Relaying rails, standard section, subject to inspection	21.00 to 21.50
Old car wheels	12.00 to 12.50
Heavy melting steel scrap	11.00 to 11.50
Frogs, switches and guards cut apart	11.00 to 11.50

The following prices are per net ton:

Iron fish plates	$10.50 to $11.00
Iron car axles	17.50 to 18.00
Steel car axles	15.50 to 16.00
No. 1 railroad wrought	11.00 to 11.50
No. 2 railroad wrought	10.00 to 10.50
Railroad springs	9.75 to 10.25
Locomotive tires, smooth	13.50 to 14.00
No. 1 dealers' forge	7.50 to 8.00
Mixed borings	6.00 to 6.50
No. 1 bushelling	9.00 to 9.50
No. 1 boilers, cut to sheets and rings	7.50 to 8.00
No. 1 cast scrap	10.00 to 10.50
Stove plate and light cast scrap	7.50 to 8.00
Railroad malleable	8.00 to 8.50
Agricultural malleable	7.00 to 7.50
Pipes and flues	8.00 to 8.50
Railroad sheet and tank scrap	7.50 to 8.00
Railroad grate bars	7.00 to 7.50
Machine shop turnings	7.00 to 7.50

ST. LOUIS, December 13.—(*By Telegraph.*)—The Barr building contract has been awarded to the Jones & Laughlin Steel Company.

The German Iron Market

A Strong Situation With Further Price Advances

BERLIN, December 1, 1911.

The strength of the iron market continues unabated. The indications are that business is growing better from week to week. The newspapers are daily printing news showing the activity prevailing at various works. It is mentioned, for example that the great Phoenix concern, which holds much the largest allotments in the Steel Works Union, has received such heavy orders for steel bars, plates and wire rods that it has already sold out its capacity into next summer and is now rejecting orders. At the end of last week the heavy plate pool voted an advance of 5 marks and renewed the organization to the end of 1912. The new prices range between 127 and 129 marks. On the other hand, the Siegerland ore association at the last moment abandoned its decision to raise ore prices for 1912 and decided instead that the mining companies should try to increase their output to the full extent of their allotments.

Conditions in the pig iron market are very active. The new syndicate has already taken orders for the first half of 1912 in excess of the total allotments. It is understood that consumers have been especially eager to contract for iron, as they look for higher prices for the second half of the year. They are mostly buying now to the end of June. There is also considerable buying of supplementary amounts for delivery before the end of this year.

Work in the heavy lines of the Steel Works Union continues at about the pace previously described—great activity in semi-manufactured material, but a quiet tone in structural shapes and rails, with considerable business in rails for foreign account. In bars and plates, too, the activity has grown more pronounced. The improvement in band iron continues. There is better business also in piping and in wire products. Steel castings are in considerably better demand at higher prices.

Increase in Steel Works Allotments

Surprise over the heavily increased allotment demands in the Steel Works Union continues. The figure given last week, 4,500,000 tons, as the amount of the new allotments asked for, will probably have to be increased somewhat, as one concern has only this week come forward with its allotment demand. It is understood that of the 4,500,000 tons increase not less than 3,500,000 tons falls in Class B products (bars, plate, rods, axles, piping, castings and forgings). It

is reported on good authority, however, that a sentiment is gaining ground in the Union in favor of leaving the Class B products entirely outside the combination's scope. Hitherto the Union has only made allotments in them, leaving it to each concern to market its product at its own terms. Now there is a strong disposition to abolish even the allotments and give the works a free hand in the fullest sense of the term. This tendency is evidently due to the fact that the chief obstacles in the way of the renewal of the Union will be found precisely in connection with Class B products for it is seen that, if they be wholly eliminated from the discussions, the problem of prolonging the organization will be greatly simplified. In accordance with this state of things it is reported that the works are now considerably more hopeful regarding the renewal of the Union. Meanwhile probably nothing new will develop in this connection until the next meeting of the combination on December 19. The committee is still working on its task of visiting works to verify their allotment claims.

Expansion is still going on with the iron companies. This week it is announced that the Gutehoffnungshütte, which has just again declared a dividend of 20 per cent., has bought land near Diedenhofen, Lorraine, for the purpose of building another big iron and steel plant. The company reports that it has increased its ore properties abroad, probably referring to purchases in the Briey district across the French border.

The Belgian market continues to send in good news. Two days ago it was announced that the Belgian Steel Works Union had just voted an increase of 1.50 francs per ton for all classes of semi-manufactured steel material; and yesterday's telegrams from Brussels stated that the chief iron producers had just decided to raise the price of foundry iron by 2.50 francs.

The month of November was one of the best for iron shares the Berlin Stock Exchange has had in many months, some of them rising more than 15 points. The removal of political anxieties by the settlement of the Morocco question gave a very strong impulse to the stock market, and this was materially supported by better news from the iron trade.

Buffalo

BUFFALO, N. Y., December 12, 1911.

Pig Iron.—Orders for over 30,000 tons of foundry iron have been booked the past week besides good sized tonnages of malleable and basic, with some large business pending in foundry and malleable grades for first half shipment, decision on which is likely to be soon forthcoming. The booking of heavy tonnages in recent weeks has practically taken up the capacity of some furnace interests over the next few months. With this condition existing some furnaces are advancing prices. While No. 3 and No. 4 iron are still being taken at $13 at furnace by some interests, the higher silicon irons are not being taken except at higher prices than have prevailed for the past few weeks. Stocks continue to be steadily reduced on furnace yards, with some interests having no stocks at all. The heavy requisitions received involve full capacity of their production for a number of weeks to come. We quote as follows for first half delivery, f.o.b. Buffalo:

No. 1 X foundry	$13.75 to $14.00
No. 2 X foundry	13.50 to 13.75
No. 2 plain	13.25 to 13.50
No. 3 foundry	13.00 to 13.25
Gray forge	13.00
Malleable	13.50 to 14.25
Basic	14.00 to 14.25
Charcoal	16.00 to 17.25

Finished Iron and Steel.—The increased buying movement reported last week has continued and practically all the principal buyers in tributary territory have covered for their first quarter requirements. Mills limit delivery to that period except in special instances where customers contracting have been accustomed to make six-month contracts and in such instances, where contracts were closed for a longer period than first quarter, they were made at an advance of $1 to $2 per ton over first quarter prices. For steel bars 1.10c., Pittsburgh, is the minimum for remainder of year delivery and 1.15c. for first quarter. For plates and shapes 1.15c. is the ruling price for immediate specification and 1.20c. for contracts for shipment after the first of the year. An advance has been made of $1 per ton on wire nails and wire products, effective December 11. Orders in these commodities received by the leading interest during the past three months have been the heaviest known for a like period. In fabricated structural lines business continues good for the season and a large amount of work is under way on local structures. The C. F. Ernst Sons Iron Works has received contract for fabrication and erection of steel for the G. H. Poppenberg Company's building, Buffalo, 150 tons, and the Buffalo Structural Steel Company was lowest bidder and received contract for the Lawrence Hotel, Erie, Pa., on the revised plans calling for 900 tons. The National Construction Company, Syracuse, received the contract for the fabrication and erection of the 500 tons of steel required for the plant extension of the Bagley & Sewall Company at Waterbury, Conn. It is stated that the Grand Trunk Railroad Company is having plans prepared for the rebuilding of the International Bridge between Buffalo and Fort Erie, providing for double tracks, a roadway and footways, requiring a large tonnage of steel and also considerable sheet piling for pier, cofferdams, etc.

Old Material.—Consumption is increasing both locally and from outside districts. Quite a few inquiries are in the market for forward delivery, but dealers are not inclined to take short orders at the prevailing prices. The tonnage of scrap held in yards by dealers is decreasing. A good proportion of the scrap materials listed by railroads is being bought direct by consumers. Greater activity is being shown in car wheels, malleable scrap and steel scrap, on which prices are advancing, as shown by the revised schedule given below, which is per gross ton, f.o.b. Buffalo:

Heavy melting steel	$13.00 to $13.25
Low phosphorus steel	15.75 to 16.25
No. 1 railroad wrought	14.00 to 14.50
No. 1 railroad and machinery cast scrap	13.50 to 14.25
Old steel axles	18.50 to 19.00
Old iron axles	22.00 to 22.50
Old car wheels	12.75 to 13.00
Railroad malleable	12.75 to 13.00
Boiler plate, sheared	13.75 to 14.25
Locomotive grate bars	11.00 to 11.25
Pipe and tank	9.75 to 10.25
Wrought iron and soft steel turnings	7.25 to 7.50
Clean cast borings	6.75 to 7.00

Boston

BOSTON, MASS., December 12, 1911.

Old Material.—A better feeling is evidenced by an advance of 50 cents a ton on wrought turnings and cast borings. The conditions which have produced this result are not local, for buying here shows no increase. It is rather the influence of the Pittsburgh market reflected here from eastern Pennsylvania. The prices quoted below are those offered by the large dealers to the producers and to the smaller dealers and collectors, per gross ton, carload lots, f.o.b. Boston and other New England points, taking Boston rates from eastern Pennsylvania points. In comparison with Philadelphia prices the differential for freight of $2.30 a ton is included. Mill prices are approximately 50c. a ton more than dealers' prices:

Heavy melting steel	$9.50 to $10.00
Low phosphorus steel	11.45 to 11.95
Old steel axles	14.00 to 14.50
Old iron axles	17.00 to 18.00
Mixed shafting	12.75 to 13.25
No. 1 wrought and soft steel	10.50 to 10.75
Wrought iron pipe	8.75 to 9.00
Skeleton (bundled)	7.00 to 7.50
Cotton ties	7.00 to 7.50
No. 2 light	4.50 to 5.00
Wrought turnings	5.50 to 6.00
Cast borings	5.00 to 5.50
Machinery, cast	12.50 to 13.00
Malleable	9.25 to 9.75
Grate bars	6.00 to 6.50
Stove plate	8.00 to 8.50

New York

NEW YORK, December 13, 1911.

Pig Iron.—Business has fallen off from the rate of the two preceding weeks. Several transactions have been closed in New Jersey, including one of 1000 tons of No. 2 foundry iron, another of 600 tons, and several lots ranging from 300 to 500 tons. New England seems not to have been much of a buyer in the past week. Less is heard of the low prices on shipments from Buffalo furnaces, and in that district as well as in Eastern Pennsylvania some sellers have all the iron they care to take for the present at the sharply competitive prices recently ruling. The situation seems to be that with enough business to occupy their present furnace capacity for a number of weeks these sellers prefer to wait and see how the situation develops. It should be said, however, that at $13.25 and $13.50 for No. 2 X iron at Buffalo and at $14.25 and $14.50 for No. 2 X iron at Eastern Pennsylvania furnace, which are the new asking prices of some sellers, busi-

ness is not being booked. The activity of one important seller in Eastern Pennsylvania has made an impression on prices which still lasts and counts in an important way against the expectation of establishing higher prices in the near future. It is evident that the influence of the year end is being felt and that a quieter market may be looked for. Recent sales of basic iron for delivery in the Harrisburg district were at a figure slightly above $14 delivered. Some pipe iron is still being figured on. Quotations are as follows for northern iron at tidewater: No. 1 foundry, $15 to $15.25; No. 2 X, $14.75; No. 2 plain, $14.50 to $14.75. For southern iron we quote $15 to $15.25 for No. 1 foundry and $14.50 to $14.75 for No. 2 foundry.

Finished Iron and Steel.—Prices seem to have retained their backbone though there has been no noticeable increase in the volume of business. Different offices have decidedly different views of the present conditions, based largely on the activity of mills they represent. It is intimated by some sellers that buyers who hesitate too long concerning even first quarter business may, particularly if they wait until after the first of the year, find a range of prices slightly higher than now obtains. The effect of the steady influx of orders on the stiffening process is likely to be accentuated through the reduced rate of mill production commonly experienced in severe weather. One interesting development is noted in the structural field having a bearing on present prices. Bids are asked for work which cannot possibly be erected for months, the projects sometimes requiring the demolition of the structures to be replaced. A leading source of encouragement seems to be the pleasing aggregate of the small orders for relatively prompt shipment. There is no new inquiry of import in the car building line; a number of very large Western rail contracts are at this writing still pending, and a report that prices on standard types of car have been advanced seems to be without foundation. The market for steel bars remains at 1.10c., Pittsburgh, with some sellers willing to sell at 1.10c. for first quarter. Plates are sold for 1.15c. and upward, with a surprising range between the minimum and the maximum, influenced no doubt by the business relations between buyer and seller. There is no special activity in plates, and inquiry in structural lines is still scarce. The largest new project, for which bids will soon be asked, is the Auerbach candy factory, 2500 tons; a marine hospital at Sailors' Snug Harbor, Staten Island, 500 tons, and inquiries are about to be made by the Delaware, Lackawanna & Western Railroad for 1912 bridge-work requirements. Of structural awards since the last report mention may be made of the Monahan Express building, 1000 tons, to Milliken Brothers; bridge at Lynn, Mass., for the Boston & Maine, 150 tons, to the New England Structural Company; trolley platform bridge for New York at St. George, S. I., 1700 tons, to the American Bridge Company, and the steel work for the Guaranty Trust building on Broadway, 1200 tons, to Post & McCord. It is interesting to add that in the last week or ten days the Eastern Steel Company has contracted to furnish 10,000 tons of plain material for car manufacturing purposes. Quotations remain as follows: Steel bars, 1.26c. to 1.31c.; plates and plain structural material, 1.31c. to 1.36c.; bar iron, 1.25c. to 1.30c., all New York. Plain material and plates from store, New York, 1.60c. to 1.70c.

Old Material.—Notwithstanding the better feeling recently prevailing in the old material market, it is difficult to secure higher prices. Heavy melting steel scrap is but a trifle stronger, consumers not being disposed to pay more than a slight advance for future delivery. Transactions seldom reach beyond moderate sized quantities in any class of scrap. Dealers' prices, per gross ton, New York and vicinity, are as follows:

Old girder and T rails for melting	$[illegible] to $[illegible]
Heavy melting steel scrap	[illegible] to [illegible]
Relaying rails	20.00 to 21.00
Rerolling rails (nominal)	11.25 to 11.75
Iron car axles	[illegible] to 18.50
Old steel car axles	15.00 to 15.50
No. 1 railroad wrought	[illegible] to 12.25
Wrought iron track scrap	10.50 to 11.00
No. 1 yard wrought, long	10.25 to 10.75
No. 1 yard wrought, short	9.25 to 9.75
Light iron	[illegible] to [illegible]
Cast borings, clean	[illegible] to [illegible]
Mixed borings and turnings	[illegible] to [illegible]
Wrought turnings	[illegible] to [illegible]
Wrought pipe	[illegible] to [illegible]
Old car wheels	11.00 to 11.50
No. 1 heavy cast, broken up	[illegible] to [illegible]
Stove plate	8.50 to 8.75
Locomotive grate bars	[illegible] to [illegible]
Malleable cast	[illegible] to [illegible]

Cast Iron Pipe.—The Quebec inquiry referred to in *The Iron Age* of November 9 is considerably larger than mentioned at that time, being for 18,000 tons instead of 12,000 tons. It is almost entirely for 40-in., a small quantity being 44-in. Bids will be opened December 20. The Public Service Corporation, Newark, N. J., is in the market for 4800 tons of gas pipe; New Haven Gas Company, New Haven, Conn., 2150 tons; Scranton Gas & Water Company, Scranton, Pa., 1400 tons. The city of Lynn, Mass, will open bids on 425 tons of 4 to 16-in. water pipe December 14. That low prices have not entirely disappeared is shown by the purchase by Lowell, Mass., of a comparatively small quantity of 30-in. pipe at $21.45 per net ton, delivered. Inquiries continue very good for pipe for spring delivery. Carload lots of 6-in. are quoted at $22 to $23 per net ton, tidewater.

Ferroalloys.—New York dealers quote 80 per cent. ferromanganese at $38.50, Baltimore, and firm at that price. For 50 per cent. ferrosilicon $70, delivered at buyers' works, is asked. Leading consumers in the market for 6000 to 8000 tons of ferrosilicon have not yet placed their orders.

Metal Market

NEW YORK, December 13, 1911.

The Week's Prices

Cents Per Pound for Early Delivery

	Lake.	Electrolytic.	New York.	New York.	St. Louis.	Spelter New York.	Spelter St. Louis.
Dec. 7	13.37½	13.12½	45.10	4.45	4.37½	6.45	6.30
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
13	13.75	13.62½	44.35	4.45	4.37½	6.40	6.25

The demands in all metals are seasonable. Copper is firm at higher prices, largely because of the very favorable showing made by the November statement of the Copper Producers' Association. Tin shows a little weakness and spelter prices have declined sharply.

New York

Copper.—The showing of the November statement of the Copper Producers' Association, issued December 8, is the cause of strength in the copper market both here and abroad. The figures show a reduction in unsold stocks to the smallest since February, 1910. It is now asserted that conditions indicate a sellers' market. Buying has not been excessively heavy in the domestic market, a better proportionate amount of business having been done with foreign consumers. Electrolytic copper is quoted to-day at 13.62½c., spot delivery. Lake is quoted at 13.75c. Spot copper is quoted in London at £60 16s. 3d., futures at £61 13s. 9d. The exports of copper to date this month have been 12,796 tons.

Pig Tin.—Pig tin was quiet until the end of last week, but since then has been a little more active, the buying being mostly for future delivery. The demands are seasonable, but transactions of last week represented a fair tonnage. In New York 44.35c. is quoted. London quotes spot tin at £200, futures at £191 10s. Arrivals of tin this month have been 1382 tons and the amount now reported afloat is 2215 tons.

Tin Plates.—The recent heavy demand for tin plates for next year's delivery has subsided to a considerable degree. More activity is looked for after the holidays. The New York price for 100 lb. coke plates is unchanged at $3.64. Tin plates laid down at Swansea, Wales, are unchanged at 13s. 6d.

Lead.—The lead market is very quiet and devoid of special features. The belief prevails among dealers that the trade will hold steady at present prices. In New York 4.45c. is quoted and in St. Louis 4.37½c.

Spelter.—This metal is in very little demand, despite greatly reduced prices. The situation has been a cause of a wide divergence of opinion during the week. Ten days ago spelter was quoted near 7c. and much was said as to its reported scarcity and other causes which might justify a high price. A sudden break a week ago brought prices down with a rush and in some quarters manipulation is boldly charged. Prices have shown no tendency to revive to any great degree, probably due to very dull market conditions. New York dealers are quoting 6.40c. and in St. Louis 6.25c. is asked.

Antimony.—Dullness and inactivity characterize the situation. Cookson's is quoted at 7.75c. to 7.87½c., Hallett's at 7.60c. to 7.70c. and Hungarian and Chinese grades at 7c. to 7.12½c.

Old Metals.—The market is strong. Dealers' selling prices are as follows:

	Cents per lb.
Copper, heavy and crucible	12.75 to 13.00
Copper, heavy and wire	12.50 to 12.75
Copper, light and bottoms	11.50 to 11.75
Brass, heavy	9.00 to 9.25
Brass, light	7.00 to 7.25
Heavy machine composition	11.25 to 11.50
Clean brass turnings	8.25 to 8.50
Composition turnings	9.00 to 9.50
Lead, heavy	4.20
Lead, tea	3.95
Zinc, scrap	5.25

Chicago

DECEMBER 11.—In keeping with a stronger tone and the reduction in producers' stocks, copper has advanced ¼c. Tin and spelter showed recessions in value and zinc is off 25 cents per cask. We quote at Chicago as follows: Casting copper, 13.50c.; Lake, 13.75c., in carloads, for prompt shipment; small lots, ¼c. to ⅜c. higher; pig tin, carloads, 45c.; small lots, 48c.; lead, desilverized, 4.40c. to 4.45c., for 50-ton lots; corroding, 4.55c. to 4.60c. for 50-ton lots; in carloads, 2½c. per 100 lb. higher; spelter, 6.30c.; Cookson's antimony, 8.75c.; and other grades, 7.75c. to 8.25c., in small lots; sheet zinc is $8.25, f.o.b. La Salle or Peru, Ill., less 8 per cent. discount, in carloads of 600-lb. casks. On old metals we quote buying prices for less than carload lots: Copper wire, crucible shapes, 11c.; copper bottoms, 9.75c.; copper clips, 10.75c.; red brass, 10c.; yellow brass, 7.75c.; lead pipe, 4c.; zinc, 4.50c.; pewter, No. 1, 26c.; tinfoil, 33c.; block tin pipe, 38c.

St. Louis

DECEMBER 11.—Spelter is now quotable at 6.10c. Lead is firm at 4.37½c. to 4.40c. Tin is held at 45.35c. Lake copper is quoted at 13.60c. and electrolytic at 13.47½c. Antimony stands at 8.10c. In the Joplin mining district, responding to the decline in spelter, offerings of zinc blende in the open market were off $1, the top basis for lots carrying 60 per cent. metallic zinc being $47 per ton, ranging down to $42. Choice grades commanded as high at $50 per ton. Ores selling on contract, based on the average of the preceding week's daily quotations on spelter, brought $52.46 per ton, assay basis of 60 per cent. metallic zinc, with the choicer lots going as high as $55.50. The sharp demand during the week for lead ore pushed the price up to $64 per ton, which was $1 higher than the previous record for the year. The heavy buying of the St. Louis Smelting & Refining Company caused the advance. Calamine continued in good demand at $24 to $26, basis of 40 per cent. metallic zinc, with a top price of $32. On old metals we quote: Light brass, 4.50c.; heavy brass and light copper, 8.50c.; heavy copper and copper wire, 9.50c.; zinc, 3.50c.; lead, 3.50c.; pewter, 20c.; tin foil, 29c.; tea lead, 3c.

The DeBats Crucible Steel Company

The DeBats Crucible Steel Company, which built a plant for experimental purposes at Zelienople, Pa., to try out a new process of steel making, has secured financial backing and has purchased five acres of ground at Tylerdale, a suburb of Washington, Pa., where it will build a new plant. The company has a Pennsylvania charter, with a capital stock of $125,000, and will ask bids in a short time on the buildings and equipment. N. A. Vandervort, Oliver Building, Pittsburgh, is preparing the plans. The main building will be 60 x 100 ft., and another 40 x 60 ft., both of steel construction, while a smaller building will contain a converter and cupola. Two steam hammers and other equipment will be required. Two annealing furnaces and two tempering pits will be erected. The company will manufacture tool steel and small steel castings. It is expected that the plant will be ready for operation about March 1. Louis DeBats is president, A. G. Zehner vice-president, Charles Snyder secretary, and W. C. Hagan treasurer.

The United States Supreme Court December 11 upheld the federal eight hour law as applied to levee work on the Mississippi River. The defendant, a government contractor, was prosecuted for working employees more than eight hours in violation of the statute. He defended on the ground that the work was of an extraordinary character amounting to emergency work. The court holds that the only cases exempted from the statute are those arising from "accidental or uncommon causes."

Iron and Industrial Stocks

NEW YORK, December 13, 1911.

For a portion of the week under review depressing influences prevailed, such as the announcement of an impending reorganization of the Allis-Chalmers Company, the financial difficulties of the Wabash Railroad and other occurrences which were somewhat disquieting. Their effect was but temporary, and the continued reports of improving general business, favorable court decisions on railroad cases and other encouraging developments caused a decided upward movement in securities. Great Northern Ore certificates, however, declined steadily because of the expectation that earnings from the Hill ore properties will shrink decidedly with the termination of the lease to the United States Steel Corporation. The range of prices on active iron and industrial stocks from Wednesday of last week to Tuesday of this week was as follows:

Allis-Chalm., com...	17⅝ - 23¾	Railway Spring, pref.....	98½
Allis-Chalm., pref...	7 - 10⅛	Republic, com.....	22⅜ - 23⅞
Beth. Steel, com.....	29	Republic, pref.....	81 - 83¾
Beth. Steel, pref...	58 - 58¾	Sloss, com.....	39 - 40
Can. com.....	10¾ - 11⅛	Pipe, com.....	15 - 15¼
Can. pref.....	90 - 92½	Pipe, pref.....	48 - 50
Car & Fdry., com....	52 - 54½	U. S. Steel, com....	60¾ - 64½
Car & Fdry., pref...	116½-117	U. S. Steel, pref...	108¾-109¾
Colorado Fuel.....	25¾ - 28	Westinghouse Elec..	64 - 65
General Electric....	151½-154	Va. I. C. & C.....	70 - 76
Gr. N. Ore Cert....	34 - 42	Am. Ship. com.....	40¾
Int. Harv., com....	104½-107	Chic. Pneu. Tool....	45¾ - 47½
Int. Pump. com....	32 - 34¼	Cambria Steel	43½ - 44
Int. Pump. pref.....	83¼	Lake Sup. Corp.....	25 - 26½
Locomotive, com....	32 - 37	Pa. Steel, pref.....	102½
Locomotive, pref.....	102⅝	Warwick	10½
Nat. En. & St., com.	14 - 14⅜	Crucible Steel, com..	11⅛ - 11⅝
Nat. En. & St., pref.....	96	Crucible Steel, pref.	81⅜ - 81¾
Pressed Steel, com..	32 - 33	Harb. Wk. Ref., com.....	40
Pressed Steel, pref.....	100	Harb. Wk. Ref., pref.....	99
Railway Spring, com.	31 - 31½		

Dividends Declared

The International Harvester Company, regular quarterly, 1¾ per cent. on the common stock, payable January 15.

The American Can Company, regular quarterly, 1¾ per cent. on the preferred stock, payable January 2.

The La Belle Iron Works, regular quarterly, 2½ per cent., payable December 31.

The Canadian Westinghouse Company, Ltd., regular quarterly, 1½ per cent. and an extra dividend of 1 per cent., payable January 10.

The Underwood Typewriter Company, regular quarterly, 1¾ per cent. on the preferred stock and 1 per cent. on the common stock, payable January 1.

The McCrum-Howell Company, regular quarterly, ¾ of 1 per cent. on the common stock, payable January 1.

The American Brake Shoe & Foundry Company, regular quarterly, 1¾ per cent. on the preferred and 1¾ per cent. on the common stock, payable December 30.

The Sloss-Sheffield Steel & Iron Company, regular quarterly, 1¾ per cent. on the preferred stock, payable January 2.

Increased Operations at Aliquippa

Owing to the increase in new business and the better outlook for the future, the Jones & Laughlin Steel Company, Pittsburgh, has decided to start up more departments of its plant at Aliquippa, Pa. The work actually finished at Aliquippa embraces four blast furnaces, four Talbot open-hearth furnaces, blooming and billet mill, rod, wire and wire nail mills and two units of 12 hot mills each in the tin plate departments. For some months the company has been operating the first unit of its tin plate mills, one rod mill and the wire and wire nail mills. The second rod mill was started up November 1 and it is the intention of the company to put in operation as soon as possible the second unit of tin plate mills, making 24 in all that will be running, also the four open-hearth furnaces and the blooming and billet mills, which will roll down sheet bars for the tin plate mill and billets for the rod mill.

It will have in operation soon after January 1 four Talbot open-hearth furnaces, with an output of about 1000 tons of steel a day; the blooming and billet mill and double rod mills, built by the Morgan Construction Company, with a capacity of about 800 tons a day; 24 tin plate mills, and the wire and wire nail mills. This will mean the employment of a large force of men, and conditions at Aliquippa will be much more active after the first of the year than at any time since the company built this plant.

Personal

William H. McIntyre has been elected vice-president and general manager of Manning, Maxwell & Moore, Inc., New York. Following Mr. McIntyre's election to his new office, November 24, a conference was held of branch managers and field men of the company for the purpose of permitting them to meet Mr. McIntyre and for the discussion of business activities of 1912. The meeting was notable for the enthusiasm displayed by the representatives of the company and the unanimous expressions of confidence in its future under the management of Mr. McIntyre. The new vice-president and general manager comes to the machinery field from the insurance world. After leaving the New York public schools Mr. McIntyre entered the employ of the Equitable Life Assurance Society and rose to become fourth vice-president, which office he resigned to take his present position.

The Republic Iron & Steel Company, Youngstown, Ohio, announces changes among officials as follows: J. E. Perry, formerly secretary to President T. J. Bray, has been appointed assistant to president and will have charge of the coal and coke properties of the Northern district. Frank C. Cunningham, formerly superintendent of the finishing mills at Haselton, Ohio, has been made superintendent of the Brown-Bonnell mills, succeeding Harry Parrock, who becomes a city official January 1. H. J. Steinbecker, superintendent of the Mahoning Valley plant, succeeds Mr. Cunningham and Oscar Black, formerly assistant superintendent of the same plant, succeeds Mr. Steinbecker.

C. A. Hamilton, who for the past six years has been vice-president and general manager of the Wisconsin Engine Company, Corliss, Wis., has resigned his position to take an interest in the Lavigne Gear Company, a new corporation organized for the purpose of manufacturing automobile steering gears and accessories. Mr. Hamilton has been elected vice-president and general manager of this company, with general offices at Milwaukee, Wis.

The Adams Bagnell Electric Company, Cleveland, Ohio, has made the following changes in its sales department: J. G. Pomeroy, former Western sales manager, has been made sales manager with headquarters in Cleveland. C. L. Eshleman has been appointed publicity manager, with headquarters in Cleveland. The company has opened an office in Boston in charge of E. R. Bryant, who has been connected with the New York office.

William Breeden has been appointed Philadelphia district sales agent for the Lackawanna Steel Company and will open an office at 501 Morris Building, Philadelphia, Pa., January 1. His district will comprise that part of Pennsylvania lying east of Altoona, with Maryland, Delaware and that part of New Jersey south of but including Trenton. Mr. Breeden for the past four years has been connected with the Philadelphia office of the Carnegie Steel Company, and previous to that was for eight years in its general offices at Pittsburgh.

Theodore Geissmann & Co., direct mill representatives in iron, steel and wire, Commercial National Bank Building, Chicago, announce that the vacancies created in their selling organization, mentioned in a previous issue, are being competently filled by Joseph W. Thurston, formerly with the Bethlehem Steel Company, and G. Elton Studebaker, for years with Joseph T. Ryerson & Son, both of whom are thoroughly capable steel salesmen.

Homer A. Wessel, 13 East Second street, Cincinnati, Ohio, has been appointed Central Western agent for William Jessop & Sons, Ltd., Sheffield, England, and the Jessop Steel Company, Washington, Pa., manufacturers of crucible steels.

Sydney Jessop Robinson, president William Jessop & Sons, Ltd., Sheffield, England, who has been in America for some time on business, will return to England December 16 on the Mauretania.

H. Kleinhans, formerly with the American Locomotive Company, New York City, has engaged in business for himself as a dealer in railroad and contractors' equipment, engines, electrical machinery, etc. Besides his office at 415 Oliver Building, Pittsburgh, a branch office is maintained at 428 East Twenty-third street, New York.

Anton Getz, formerly with the engineering department of the Indiana Steel Company, is now general superintendent of the Pittsburgh Emery Wheel Company, Pittsburgh, with plant at Rochester, Pa.

The Empire Iron & Steel Company, Niles, Ohio, announces that J. D. Waddell has resigned as treasurer and manager of sales, effective December 1. He will be succeeded as manager of sales by J. Charles Wicks, and his successor as treasurer will be elected at the annual meeting of the board of directors in January.

H. M. Moore, who had charge of the Cincinnati Punch & Shear Company's office and later engaged with that company's successor, the Ironton Punch & Shear Company, Ironton, Ohio, has severed his connection with the company.

F. E. Bachman has resigned as general manager of the Northern Iron Company, operating furnaces at Port Henry, N. Y., and Standish, N. Y., the position he has occupied since the formation of the company in 1902.

J. A. Schloss, who is connected with L. Vogelstein & Co., 42 Broadway, New York, has just returned from a business trip to Mexico.

C. H. Halcomb has been made vice-president and general manager of the Swedish Iron & Steel Corporation, 12 Platt street, New York. He has had a long experience in the steel trade, having been president successively of the Sanderson Steel Company, Crucible Steel Company of America and Halcomb Steel Company.

H. A. Severson, manager of the Barber-Colman Company, Rockford, Ill., sailed for Europe December 9. He will be absent until the latter part of January.

Charles F. Barth, whose resignation as manager of the West Allis works of the Allis-Chalmers Company, Milwaukee, Wis., became effective December 1, was the guest of honor at a dinner given by 150 of his associates at the Allis-Chalmers clubhouse.

Peter Donaldson, of James Watson & Co., Glasgow, Scotland, sailed from New York December 13 after a stay of several weeks in this country.

The National Gas Engine Association

At the annual convention of the gas and gasoline engine men held at the Hollenden Hotel, Cleveland, Ohio, December 5 to 8, it was decided to change the name of their association from the National Gas and Gasoline Engine Trades Association to the National Gas Engine Association. Milwaukee, Wis., was chosen as the next meeting place. A plan for holding a national gas engine exhibition in the Coliseum in that city next June, when the convention is in session, was discussed but no action was taken.

Among the matters discussed were the hiring of a paid secretary, increasing the annual dues and engaging in a general publicity campaign. These were all referred to the Executive Committee. C. O. Hamilton, Elyria, Ohio; H. W. Bolens, Port Washington, Wis., and O. B. Iles, Indianapolis, were elected to the Executive Committee, composed of nine members, the first two being re-elected. The Executive Committee elected the following officers: President, O. C. Parker, Racine, Wis.; vice-president, H. W. Jones, Chicago; secretary, Albert Strittmatter, Cincinnati, Ohio; treasurer, Otto M. Knoblock, South Bend, Ind.

High Grade Small Tools in Demand.—The Irvington Mfg. Company, Irvington, N. J., manufacturer of Red Devil tools, comprising pliers, nippers, etc., has completed a large extension to its drop forging plant and hardening room and contemplates another addition. The company reports its business as very good; in fact, better than might have been expected under existing conditions. Since its connection with the Smith & Hemenway Company, 150-152 Chambers street, New York, the Irvington Company's business has grown automatically. A gratifying fact in this connection is that the tools insisted upon by the New York house are of such a high class line that they show conclusively that room was to be found at the top for high grade tools.

The Mechanical Engineers Convention

Thirty-Second Annual Meeting, New York, December 5 to 8, 1911

The differentiation taking place in the development of recognized branches of mechanical engineering was emphasized at the annual gathering of the American Society of Mechanical Engineers in New York last week, as was also the need and plans to continue integration of the varied interests so they may come under the influence of the society and profit by its capacity to further progress. Probably the most important thought engendered by the meeting related to the potential ability of the mechanical engineer to prevent strained relations between capital and labor, to improve efficiency of production and generally to relieve the social unrest experienced throughout the country. It is interesting that this thought emanated from both the retiring president, Col. E. D. Meier, and the incoming president, Dr. Alex. C. Humphreys, and the reader is respectfully urged to read the important extracts from Colonel Meier's address, printed on page 1219 of last week's issue.

The humanitarian aspect of mechanical engineering to industrial life as well as professional service to fellow engineers were conspicuous at the meeting in the Engineering Societies Building, New York, last week, of the American Society of Mechanical Engineers. What may be accomplished for the well-being of the general public is referred to in the heading to this account. The mechanical engineering of the textile industry, the mechanical engineering of the cement industry and the problems of the oil and gas engine came in for special consideration at three separate sessions. The special attention given to these divergent lines is an illustration of the effort to deal, as the opportunity offers, with the detail problems which up to the moment have not been well taken care of in a broad way. Committees on definite subjects, it will be recalled, are appointed as may be expedient and through their activities, as in the cases of the committees on textiles and cement manufacture at the present meeting, data and experiences are massed for consideration at future meetings.

In the following report it is intended to touch on some of the high spots of last week's convention. Members in contributing to the discussions have in increasing numbers developed the habit of preparing written comments. They are often so voluminous in the aggregate that they are merely acknowledged without reading, being left for publication in the Society's monthly journal. As has been the practice of *The Iron Age*, these will be reviewed as issued when containing information which it is thought will be of interest to its readers, so that the data may be obtained, if desired, at first hand from the Society. The leading points covered are, however, here given.

In last week's issue were mentioned the incidents of the reunion of Tuesday evening, December 5. Wednesday morning was given over largely to a business session; there were two simultaneous professional sessions on both Wednesday afternoon and Thursday morning; Thursday afternoon was left open to visit the Steamship Olympic of the White Star Line; Thursday evening witnessed the leading social function of the meeting, the reception and dance at the Hotel Astor; the concluding professional session occurred Friday morning, and a number of excursions, including the Edison laboratory at Orange, N. J., the Brooklyn Navy Yard, the Bush Terminal Company, Brooklyn, the E. W. Bliss plant in Brooklyn and the Ward bread-making factory in Brooklyn, were arranged for Friday afternoon.

Financing New York Entertainments

In the business session was announced an unusually large class of accessions to membership, and the report of the Council then given showed that the Society is enjoying a happy financial status, briefly expressed by stating that it has total assets of about $750,000 and an outstanding indebtedness of about $81,000 held in 4 per cent. bonds by its own members. The mortgage on the Society's portion of the land occupied by the Engineering Societies Building has been liquidated. A large amount of time was taken up with discussing ways and means of financing the entertainment of the New York meetings. A constitutional amendment had been proposed requiring increased dues to the amount of $3 annually from members of New York and vicinity, but this was amended by a substitute which takes away the compulsory payment provision and leaves the raising of funds about the way it now stands. The amended amendment will be voted on by mail in the usual way as a matter of record against a recurrence of the agitation. It may be said that it was felt wrong to write into the constitution anything of a local character.

A Turret Equatorial Telescope

The first paper read before the meeting was presented Wednesday morning by James Hartness, president Jones & Lamson Machine Company, Springfield, Vt. It described a new type of astronomical observatory which was designed to protect the observer from the cold to which he is exposed in most of the observatories now in use. It accomplishes this purpose by the use of a revolving turret. It has been possible to avoid the use of the large reflecting mirrors. The paper touched on the delicate subject of patent rights for scientific instruments and the adverse effect to science of the present policy of allowing such things to go unprotected by patent rights.

Mr. Hartness was highly commended for the courage he had shown in applying the turret principle to apparatus which must work as accurately as the telescope. Dr. F. R. Hutton dwelt particularly on the mechanical achievement of the use of a large diameter of revolving mechanism of considerable weight with but a short length for controlling the articulation involved in driving and revolving the turret. He injected a note of humor into the discussion by suggesting the use of an electrically warmed coat for the unfortunate astronomer who does not enjoy the warm observatory of the author's design. Dr. Hutton led his listeners to believe that no other covering than the electric coat might be necessary, and mentioned that it should be kept at about 98 deg. or body temperature. From this suggestion *The Iron Age* must dissent, as the air envelope immediately surrounding the human body must be sufficiently lower than body temperature to allow for the proper dissipation of heat or otherwise cause discomfort owing to the heat of the human engine not getting proper escape.

Ethics of Patents on Scientific Instruments

Mr. Hartness's attitude on the patenting of scientific instruments was highly approved by Prof. William Kent. It was in brief as follows: Machinery cannot be successfully and economically built without the concentration of the energies of a number of men for a given purpose, and this cannot be accomplished without patent protection. It has been thought best to apply for patents on the new features of the turret telescope. Although this will be done without dedicating it outright to the public, it is needless to say that no barrier will be allowed to prevent these instruments being built by any one until some business arrangement is made for the exclusive manufacture of some one size by some builder, and even then, others may be permitted to build other sizes; but all such permission will be given only by letter and not in a broadcast way that would in any way handicap the main purpose of making these machines available at a low cost to anyone who may desire them. It goes without saying that with patents there is always the thought of the exclusive right and profit of the patentee and manufacturer, but regarding this point it is well known that the low cost of such things, as well as the

best workmanship and results, can be obtained only by concentrating all of the work in one plant. The writer does not contemplate manufacturing these instruments. More may be built experimentally, but not for the market. If others wish to build instruments of this kind, permission will doubtless be freely given, but with certain restrictions; but all this must be arranged in each case by correspondence. If patent is granted no charge of any kind will be made for license to build until some arrangement has been made for manufacture on an efficient scale, and then only such restrictions as in the opinion of the patentee will be for the best interests of the science.

The Expense Burden in Manufacturing Costs

A paper on the distribution of the expense burden in manufacturing was contributed by Sterling H. Bunnell of New York. It is the intention to review it at length in these columns. The author's object was to outline a rational method of distributing expense burden to stabilize the cost of product against the effect of temporary changes in the expense schedule, while providing a definite standard of running expense as a measure of the efficiency of the supervising department.

Standard Cross Sections for Drawings

A brief paper was presented by Prof. H. deB. Parsons of New York offering a set of cross-section linings for drawings to indicate graphically the materials covered by the drawings. His suggestion was that the Society issue uniform cards covering not only the subject taken up by Professor Parsons himself, but those of other committees like that on flange proportions. Then such uniform cards could be framed or otherwise used in the drafting room. The question was referred to the Council to decide whether it would not be wise or feasible to issue such cards.

Tests of Large Boilers at Detroit

The first paper of the general session of Wednesday afternoon held simultaneously with the cement session was that of Prof. D. S. Jacobus, advisory engineer of the Babcock & Wilcox Company, describing tests made on two boilers at the plant of the Detroit Edison Company. Each of the boilers has a rated capacity of 2365 hp. on the basis of 10 sq. ft. of boiler heating surface per horsepower, and in every day practice carry a load of 6000 kw. and in the evening from 7000 to 8000 kw. The preliminary and regular tests required that the boiler room of a large power house be under the control of the observers for three months and for six weeks over 50 men worked in 8-hour shifts night and day, exclusively on the tests. The magnitude of the undertaking may be appreciated when attention is drawn to the total quantities measured, which aggregated about 5000 tons of coal weighed and 45,000 tons of water. One of the boilers tested was fitted with Roney stokers and the other with Taylor stokers. The test results secured indicated that the efficiency obtainable with each stoker is about the same. The combined efficiency of the boiler and furnace varied from about 80 per cent. at slightly below rating to about 76 per cent. at double rating, on the basis of 10 sq. ft. of boiler heating surface per rated horsepower. The steam used for driving the stokers and for producing the forced blast in the Taylor stokers was not deducted from the total steam generated by the boiler.

An active discussion followed the presentation of Prof. Jacobus' paper. R. H. Rice, of the General Electric Company, expressed his belief that the large boiler is a step in the right direction and gives credit to E. D. Leavitt as the first to recognize the fact. The advantages of the large boiler lay in part in the reduced cost of operation. He took the opportunity to emphasize the absurdity of the unit "boiler horsepower," believing in referring to boiler capacity in units of 1000 lb. of steam. He felt there was a field for invention in the matter of a graduated feeding of water and suggested the desirability of having means for introducing cold feed water in the event of an accident to the boiler when the escape of a large volume of steam is imminent.

Among others who discussed the paper were R. D. De Wolf, of the Rochester Railway & Light Company, who showed a number of curves he had deduced from the data of the test, one indicating that the loss of pressure in the superheater is different in two identical boilers and Prof. W. D. Ennis, who mentioned that the plant was producing a kilowatt-hour for 1.9 lb. of coal. He accounted for the good boiler performance largely on the reduced radiation loss because of the size of the boiler in comparison with the outside surfaces. Prof. William Kent and Prof. R. C. Carpenter both commented very favorably on the tests, the former stating that they showed the highest values for high and low rates of firing with coal having over 25 per cent. volatile matter. Prof. Carpenter regarded the test as the most perfect in completeness that has yet appeared before any society and considered that the good results were attributable in part to the way the furnace was handled and to the use of good coal and the close control of the air supplied. J. C. Parker, general manager Parker Boiler Company, Philadelphia, was inclined to take the results with some caution, referring to the tables to show the possibilities of errors in the sampling of the coal. As regards the double end setting of boilers he mentioned that W. S. Twining had so installed them about eight years ago in connection with the Philadelphia traction power station. He compared the Jacobus tests with tests made by H. G. Stott on large boiler units indicating that with the same rate of firing the boilers tested by Mr. Stott would have to give over 40 per cent. more steam to show the same steaming rate.

Mr. Stott, in entering the discussion, commented on the elaborateness of the tests and the high reputation for the author of the paper and also his ability to get high results, or, as Mr. Stott informally remarked, to get results about 5 per cent. higher than anybody else has been able to. He said that very large furnaces are not to be used as a panacea of combustion troubles. The height of the combustion space depended on a knowledge of the kind of coal to be used; that there is no universal furnace for coal. He expressed particular pleasure at Prof. Jacobus' announcement that he is working on a boiler along the lines explained in the conclusion of his paper, giving a high percentage of efficiency from a range of about 80 per cent. of ordinary rating to even four times this rating. Prof. Jacobus showed a chart, intimating that the boiler must take in the features of the Detroit construction for the lower range of operation and of the marine boiler for the high loads. Mr. Stott emphasized that the value of such a boiler comes from the fact that at low loads the fixed charges on the boiler plant are sometimes two and three times the operating charges and that a boiler can be operated at 200 and 300 per cent. overload with satisfactory efficiency. A boiler plant should not have to include a unit left for hours at a time under banked fires.

Strain Measurements of Boilers Under Pressure

Hydrostatic tests made upon two horizontal tubular boilers which had been in service for a period of 27 years were described in a paper read Wednesday afternoon by James E. Howard, engineer-physicist of the Bureau of Standards, Washington, D. C. It is intended to review this later in these columns as space allows. Gaged lengths were established on different parts of the boilers by means of holes 10 in. apart and about 0.05 in. in diameter, reamed to a conical shape. The deformations of the boilers at different pressures were determined by a 10-in. micrometer strain gage with conical points to fit the reamed holes laid out on the boilers.

Wuest System of Herringbone Gears

A paper on herringbone gears with special reference to the Wuest system was presented Wednesday afternoon by Percy C. Day, engineer with the Falk Company, Milwaukee, Wis. It brought out the opinion that the herringbone gear has its own field, as it was expressed by Luther D. Burlingame, of the Brown & Sharpe Mfg. Company, Providence, that the earlier disfavor in which such gearing was held was due to noise of operation and should not now be maintained. It was explained that they can be economically cut by the hobbing process, and that the offsetting in the gear design had reduced the cost of manufacture. F. E. Rogers, of Machinery, reported that he had seen the hobbing process applied to a 9-ft. gear, which was completed in 20 hr.

Equipment and Management of the Core Room

A most elaborate paper opened the Thursday morning general session. It was contributed by Henry M. Lane and discussed the equipment and management of the core-

room. It is hoped to devote some space in these pages to some of its features, but the paper in full was printed in the Society's Journal for October and may be purchased in this shape on application to the Society. H. L. Gantt, who occupied the chair during the session, commended the paper highly and there was an active discussion with a considerable number of written contributions which had to be briefly referred to with the intimation that the points brought out would be printed in the Society's Journal. Alexander E. Outerbridge, Jr., referred to his method of having a standard sand and oil for comparing purchased material for use in the foundry and also referred to the fluorescent test for the adulteration of linseed and similar oils by mineral oils, this discovery by Mr. Outerbridge of testing for fluorescence having already been described at length in these columns. Thomas D. West dwelt on the importance of grinding sand. Among others who contributed to the discussion were Benjamin E. Fuller, who thought that grinding sand by means of hand manipulation of a pipe as described by the author was all right for small amounts, but for large amounts of sand, mixing as with paddles was the better way. E. H. Mumford paid a tribute to Mr. Lane's paper and showed two views of a jolt rammer for making cores, mounted on a concrete base which itself was intended for transporting as needed about the coremaking room. It was capable, he said, of making cores of 350 to 380 lb. in weight and emphasized the value of the jolt ramming method to get the highest degree of smoothness in the inside of a casting, now particularly important in the automobile industry.

Tests of a Sand-Blasting Machine

Prof. Wm. T. Magruder, of the Ohio State University, Columbus, Ohio, contributed a paper giving the records and results of quantitative tests of a sand-blasting machine under the actual conditions of commercial practice. The rough surfaces of pieces of cast iron, which had been cast in one mold, were blasted by air, from which the moisture had been separated, with dried and screened new Cape May grit by a Pangborn sand-blasting machine, and with the sand valve wide open. The quantity of air used was measured by a pitometer; the quantities of iron removed, of sand used, and of sand consumed, were measured for each test. The air pressure was varied from 20 lb. to 70 lb. The angle between the surface of the test bar and the nozzle was varied from 30 to 90 deg. The distance from the nozzle to the test bar was varied from 4 to 10 in. The results show that (*a*) for distance of 8 in. and angle of 45 deg., the equivalent amount of free air delivered per minute, the iron removed, the sand discharged, the sand used up, per 100 cu. ft. of free air flowing per minute, vary directly with the pressure; the amount of usable sand remaining and the amount of sand discharged per pound of iron removed vary inversely with the pressure; (*b*) for 60-lb. pressure and 8-in. distance, the largest amount of iron was removed and the least amount of sand was required to do it, when the angle between the nozzle and the work was from 45 to 60 deg.; (*c*) for 60-lb. pressure and 45-deg. between the nozzle and the work, the largest amount of iron was removed and the least amount of sand was required to do it, when the distance was 6 in.; (*d*) the sand used varies with the directness of the blast, and (*e*) inversely with the distance from the test bar.

Part of the discussion regarding sand-blasting machines related to the pressure required for the air supplied. On one side of the question were those who felt that 15, 20 or 30-lb. pressure was sufficient and that what was desired was a large volume of air. The other side held that the sand-blasting operation was not a scouring action but a hammering action. That being the case, it was necessary to depend on the kinetic energy of the impinging sand. Therefore, sand with the largest individual grains would give the most effective hammer blows. It was admitted that as regards the distance the nozzle is held from the casting and the angle which it makes with the casting, there is great room for variation and the process depends largely on the operator. It was felt that the value of the angle lay in the fact that there would be minimum interference with the rebounding particles of sand, and it was agreed that casting should be so located, or so positioned, that the used sand would readily flow away. One advocate of pressure no higher than necessary to clean referred to the success in the bath-tub industry, which was the first to take hold of sand-blasting apparatus. With a pressure of 15 to 25 lb. and nozzles of ⅝ to 1 in. diameter, 65 sq. ft. of surface, both the inside and the outside of the bath-tub, is cleaned in less than 1 hr. time. In answer to the claim that relatively large sand grains were desirable, it was held by another speaker that fine sand has good cutting effect. Another argument against the high pressure was that the sand blasting should not cut the casting and the existence of the high-pressure apparatus meant the presence of an engine of potential destruction. A number of suggestions for further information were made and the author offered to reply at length through the Journal.

A paper by Amasa Trowbridge, factory manager of the Veeder Mfg. Company, Hartford, Conn., on die castings and a joint paper by George H. Barrus, Boston, and Charles M. Manly, vice-president of the Manly Drive Company, New York, covering tests of a hydraulic variable-speed power transmission were also presented Thursday morning. The Manly apparatus, which was described in principle some time ago in these columns, was exhibited with its testing rig, including an absorption dynamometer of unusual construction capable of withstanding severe shocks.

Electric Machine Driving

The textile session held Friday morning was centered in a paper by Frank W. Reynolds, of Lockwood, Greene & Co., Boston, and in two papers on air conditioning. A considerable discussion on the power problems of the textile mill was precipitated by Mr. Reynolds' paper. Several features relating to structure and equipment were also brought out. For example, C. T. Main of Boston mentioned that as large window glass surface could be obtained in brick buildings as with concrete, mentioning a case of his own where the glass surface was 56 per cent. and another as much as 63 per cent. of the total wall area, which area could be increased to 80 per cent. if the window sills were lowered. He had encountered difficulties with water collecting on the second floor of a concrete building and waterproofing of floors was a necessity sometimes overlooked. He outlined a large number of questions of mill construction which needed solution, including the heating and ventilation of dye houses with the attendant fog from the dye kettles and collection of moisture on the ceiling. Mr. Arthur Herschmann contributed to objections made to concrete floors by his experience of the softening of concrete work especially of the foundations of machines from oil.

Charles F. Scott, of the Westinghouse Electric & Mfg. Company, discussed at some length the advantages of electric driving. His observation has shown that with an engine drive the speed late in the day is 2 to 3 per cent. less than that at the beginning of the day, due to such conditions as the softening of the belts and increase in their slippage. As a mill is intended to turn out so much of a specific product, he felt that the power question itself is likely to be foreign to the main problems of the mill, but as power has itself attained to the dignity of an independent industry and needs experts, it is better to consider purchase of electric power from a central source rather than each mill provide its own power plant and experts.

With regard to the individual motor drive as compared with group driving, he mentioned a hypothetical case in which one 50-hp. motor might do the work of 130 individual motors. The one motor would cost less than $500, while the 130 would total about $8,000. When, however, the cost of shafting and belting is taken into consideration the total cost comes about the same with the disadvantage that there is power lost in shafting. He emphasized that the power cost itself is only a few per cent. of the cost of the product and that, after all, it is quality and not cost that is the deciding point, and the quality of the electric drive rests in the constancy of speed, reliability and the like. Mention was also made of the fact that better attention is usually given to electric driving, while almost anybody is allowed to adjust belts and generally take care of a belt transmission system.

J. I. Lyle, of the Carrier Air Conditioning Company, called attention to the fact that large glass window areas are not serious as transmitters of heat to the outside atmosphere, for the reason that in mills such as the textile mill there is a very considerable amount of heat given off by the machinery. He took the opportunity to mention two

mills identical in size, location, manner of driving and product, one having conditioned air and cooled 12 to 15 deg. below the temperature of the other mill. The mill with the conditioned air was found capable of handling second-grade material with satisfactory results, both in quality of product and cost of operation.

George M. Brill of Chicago explained that in an application of motor driving to the Studebaker wagon and carriage works, the use of the motors increased the output of the work without the workman hardly apprehending it. He felt that there was another advantage not mentioned with regard to the electric drive and that is there is no great momentum stored up and that a given section of electrically driven machinery may be relatively quickly shut down. There is also with the absence of belting less tendency for stirring up dust.

Air Conditioning

The subject of air conditioning came in for two papers on Friday morning. These covered humidity tables, the theory of the warming of air on passing over heated surfaces and apparatus available for the so-called conditioning process. One was contributed by Willis H. Carrier, of the Carrier Air Conditioning Company, and was particularly important in submitting a new psychrometric chart of high utility to those having problems in humidity to solve. The other was contributed under the joint authorship of Mr. Carrier and Frank L. Busey and treated of the construction, application and operation of apparatus used in the artificial production and control of atmospheric conditions as applied in various processes of manufacture and in heating and ventilation. The rate of heat transmission in indirect surface air heaters and coolers was considered and a new theory of heat convection under forced circulation developed and established by experiment. A rational formula for calculating the rate of heat transfer and temperature rise at various air velocities and temperature differences was given in conformance with these experimental data.

Conveying Coal by an Air Blast

Frank H. Kneeland, of the United States Coal & Coke Company, Gary, W. Va., presented a paper relating to the use of the Pitot tube for the measurement of flow of large volumes of air. The tests were made largely in connection with the flow of air through an experimental pipe line erected for the study of the problem of conveying coal by means of an air blast. Other tests were made in mine headings and in measuring the discharge from fan chimneys. The author stated that the use of air currents for carrying away coal had resulted in his company being able to run a heading in a coal mine for a distance of 300 ft. in 10 hr., the heading measuring 10 ft. in hight and 7 ft. in width. He said that 200 ft. in the 10 hr. was not at all uncommon.

Gas Power Section

A session of the Gas Power Section of the Society was held on Thursday morning, Chairman R. H. Fernald presiding. He briefly reviewed what progress had been made during the past year in the field of gas power work along the lines of increasing the size of gas and Diesel oil engines and the use of tar as fuel in oil engines of that type, the utilization of the waste heat of gas engines for heating buildings, the use of internal combustion locomotives, the attempt made to generate producer gas from low-grade fuels and illuminating gas from sewage as well as the progress made in the design of small power gas producers for bituminous coal and the crude oil producer. Mention was also made of the discovery of flameless incandescent surface combustion made by Prof. William A. Bone, a description of which appeared in *The Iron Age*, December 7, 1911.

Prof. W. D. Ennis presented the report of the committee on the election of officers, which announced the election of H. J. K. Freyn as chairman for the ensuing year and Irving E. Moultrop as a member of the executive committee for five years and Max Rotter and H. F. Smith as members of the same committee for one year.

OIL ENGINES

A paper was presented by H. R. Setz, Warren, Pa., dealing with Diesel engine and its modifications which are commonly known under the collective name of constant-pressure engines. Charts were exhibited showing that for the ordinary operating conditions, viz., 3000 hr. per year, the Diesel engine was better than either the low-pressure oil type or the gas-producer plant, but could not compete with the natural gas engine.

TEST OF AN 85 H.P. OIL ENGINE

Two tests of a type F H De La Vergne oil engine were described in a paper by Forrest M. Towl, New York City. In one of the tests the engine drove an oil pump and in the other the load was applied by a prony brake instead of a pump. The efficiency of the pump and the transmission gears was 92.1 per cent., the total station efficiency 25.52 per cent., and the duty per 1,000,000 B. t. u. 198,664,000 ft.-lb.

A written discussion on the first paper, submitted by Charles E. Sargent, was read by George A. Orrok, secretary of the section. Steam turbines, Mr. Sargent held, have come to stay for very large units, but the oil engine was nearly as economical in a small as in a large unit and for this reason its advent should be welcomed by power users. The constant-pressure oil engine was, in his opinion, superior to the gas engine, as it had a longer range of economical load.

Prof. Arthur J. Frith, of the Armour Institute of Technology, contributed to the discussion in writing. He desired to learn how the difficulty of mechanical delivery of liquid fuel at a high temperature through a valve without air pressure had been overcome and how the difficulty of deposits of carbon had been obviated. In some of the indicator cards from the Setz engine there was a rise of pressure above that of compression which indicated an explosion at the commencement of burning, and the experience of users of the Diesel engine had been that these results followed the introduction of liquid fuel imperfectly broken up by the spray.

A contributed discussion received from Lewis Doelling, vice-president of the De La Vergne Machine Company, explained that the combustion chamber of that company's engine was made cone shape with the oil injection valve at the small end and the igniter in the form of a hot bulb or plate at the opposite end. The air supplied was compressed in this chamber to 250 lb. per square inch and the oil injected in finely divided form by an air blast. The combustion chamber was placed transversely with reference to the axis of the cylinder, an arrangement which had proved advantageous especially where crude oil was burned. These oils contain about 6 per cent. of solid matter and was deposited in the hot bulb and left the exhaust valve without entering the cylinder where it produced wear.

L. B. Lent, of the Riverside Engine Company, New York, regarded both papers as valuable contributions to the literature of oil and gas engine operation. The first paper pointed out to designers and users of Diesel engines the difficulties incident to the manufacture and proper operation. In was his opinion that both oil and gas engines would have to be built with multiple vertical cylinders where large power is demanded with limited floor space, thus following the European practice. Although oil engines of the type described in both papers showed excellent fuel economy and high thermal efficiency, after all the cost of fuel was the determining factor in the cost of a horsepower hour of work, and this would vary according to the location of the plant. The consumption of 0.5 lb. of oil per brake-horsepower hour was a creditable performance in regular operation and could be compared to a fuel consumption of 1 lb. of coal per brake-horsepower in a gas engine and a producer.

H. J. K. Freyn, of the Allis-Chalmers Company, said that so far as he was aware there are no data in existence which show a thermal efficiency based on the brake horsepower as high as 42 per cent. Results as high as 45 per cent. based upon the indicated horsepower had been secured, but these when reduced to the brake-horsepower basis gave a figure of only 32 per cent. The figure of $65 per horsepower for the cost of engines which was given by Mr. Setz in the addendum to his paper was correct for the United States, although the price abroad was lower. The expiration of the patents on the engine had caused a fall in price in Europe, figures of $45, $35 and $33.60 having been given in a paper read before one of the

French engineering societies for engines of 1000, 400 and 500 hp. respectively. Another factor which contributed to the low cost of these engines abroad was the fact that every builder of internal combustion engines had added a Diesel engine to his line and the speaker believed that the same condition would very shortly prevail here. Comparing the operating cost of this type of engine both in this country and abroad he stated that while the fuel expense was only a small percentage of the cost here and in some cases was as low as one-fifth of that in Europe, the wages paid the attendants abroad were lower and consequently balanced the higher fuel cost. He concurred with Mr. Setz regarding the relatively high cost of attendance for a Diesel engine, because of the character of labor required and this factor would operate against the use of the engine in this country. He believed that there was a wide field for oil engines to propel ships on account of the small amount of space required for fuel storage.

E. D. Dreyfus, of the Westinghouse Machine Company, said that the gas producer and the Diesel engine fields were practically parallel as regards the interest of numerous manufacturers and he believed that this would contribute to lower the cost of that type of engine.

Mr. Setz in closing did not altogether agree with the speaker who predicted that within a few years there would be a large number of manufacturers in the field, as the manufacture of oil engines required extreme care.

DESIGN CONSTANTS OF SMALL GASOLINE ENGINES

A paper was presented by Prof. Ennis dealing with the rating of engines for automobiles and the formulas commonly employed for rating these engines. The paper included diagrams illustrating the relation among tractive force, horsepower and speed in the steam engine, the electric motor and the internal-combustion engine.

A 1000 KW. NATURAL GAS ENGINE

Edwin D. Dreyfus and V. J. Hulquist, Schenectady, N. Y., presented a paper centering about the manner in which a test was conducted of a 1000-kw. generating set supplied with natural gas and recently placed in service at Allegheny plant of the American Locomotive Company, Supplementing the paper, Mr. Dreyfus spoke of the records made by the engine in handling a 20 per cent. overload, which was 10 per cent. more than the usual capacity of an engine of this type. This in his opinion was due to the richness of the fuel used. While natural gas was the ideal fuel for an internal-combustion engine, it was impossible to secure as good results as have been obtained abroad on account of the difference in labor conditions.

Irving E. Moultrop questioned some of the cost figures given in the paper, particularly that of $2.50 per kilowatt for engineering work, which would be about 3 per cent. on the investment. The total cost, however, of $80.18 per kilowatt he considered remarkably low and it compared favorably in his opinion with the cost of turbo-electric central stations.

George A. Orrok stated that he had figures on the engineering cost of a large power plant which showed the cost to be about 1½ per cent. of the total cost and that in his experience it ranged from that figure to as high as 20 per cent. in the case of some smaller plants.

H. J. K. Freyn said that cost was the determining factor between gas engines and steam turbine plants. His experience has been that the cost of gas power plants using blast furnace gas was less than $100 per kilowatt and that the difference between blast furnace and producer gas plants was not great.

Mr. Dreyfus said there was sufficient natural gas to enable the plant to run for 15 years and that by that time they could replace the engine economically. With reference to the cost of engineering work, the figure given was correct, although he knew it to be exceptionally low. This he attributed to the fact that the engineer of the locomotive company did not have to devote his entire time to this one plant, as was the case in central station construction; and besides, the construction of the plant was very simple and no drawings and extensive drafting room work were needed.

No Need for Steel Corporation Investigation

The usual entertaining scientific address provided for Wednesday evening of the week of the annual meeting was presented this year by Dr. Robert Simpson Woodward, president of the Carnegie Institution of Washington, D. C., under the title "Geo-Dynamics, or the Mechanics of the Formation of Worlds." No attempt was made to report accurately the dimensions, constitution or physical phenomena of the atmosphere, hydrosphere and lithosphere which constitute this planet nor to outline how the many millions of meteorites falling to the earth each year, or the heat given off by the earth itself or one or two other important happenings are likely to affect many years hence the accuracy of the earth itself as a timekeeper. There was one point, however, brought out by Dr. Woodward which is calculated to discourage investigation by the Department of Justice into the crimes of the steel business. This related to the lithosphere, which, it is proper to say, is the crust of the earth. It is made up of 50 per cent. oxygen, 25 per cent. silicon, 7 per cent. aluminum and 5 per cent. iron. Dr. Woodward intimated that this low percentage of iron might, if generally known, deter Federal activity of the kind mentioned. It is also of interest to the steel industry to state that the lithosphere cannot be regarded as a self-supporting arch structure resisting the inward pull toward the earth's center. Instead it must be regarded as a fluid resting on a nucleus and servant of the same physical laws as affect the atmosphere. To indicate that this is so, Dr. Woodward had calculated that if the earth crust depended on its own strength to resist deformation, it would have to have a crushing strength equal to thirty times that of the finest steel.

The Olympic's Machine Shop

The most popular excursion of this year's meeting was the visit to the gigantic liner of the White Star Line, the 45,000-ton triple-screw Olympic. The steamship was boarded a few hours after being warped in at the Chelsea docks. One point of not a little interest was the ship's machine shop. The White Star Line takes quite a little pride in its success in maintaining its vessels in prime mechanical condition. It points, for example, to the Britannic, which, after running for about a quarter of a century, actually commenced to make record passages, and the present Oceanic, which recently achieved a similar performance after 11 years' service.

In the Olympic the workshop is placed on the starboard side between the middle and lower decks. The space contains the following machine tools: One gap lathe, with 12½-in. centers and 14-ft. bed; one 30-in. double-geared vertical drilling machine; one 10-in. shaping machine, with self-acting feed and circular motion; one 36-in. grindstone; one emery wheel. The machines are driven by electric motors through counter shafts. For the lathe, drilling and shaping machines, cone-speed pulleys are fitted direct to this shaft, and can be stopped and started by means of friction clutches. The grindstone and emery wheel are fitted with fast and loose pulleys, and driven from the same shaft. Vise benches are also fitted convenient to the machines.

In addition to the foregoing there are electrical lifting gear and facilities in the engine room for lifting heavy parts. There are two overhead electrically driven cranes for dealing with the heavy parts of the reciprocating engines, and two electric winches at the engine room floor level for the same purpose. These winches can also be used for dealing with heavy weights in the turbine room, tunnels, etc. For lifting the turbine cover and rotor, a powerful electrically driven gear is specially installed.

Evidently no bill to create a permanent tariff board will get through the present Congress. At a meeting of the Ways and Means Committee of the House of Representatives December 7 Representative Payne of New York called up the bill which passed the Senate and House at the last regular session of Congress and was killed when it emerged from conference by a filibuster headed by Representative Fitzgerald of New York. The committee rejected the bill by a strict party vote of 14 to 7.

The American office of C. A. MacDonald, Ltd., ice machinery, has been removed from Chicago to 72 Trinity Place, New York City, owing to the increased volume of export business. The United States business of this company will be continued on similar lines as in the past.

Cincinnati Metal Trades Dinner

The Cincinnati branch of the National Metal Trades Association held its regular quarterly meeting and annual dinner at the Business Men's Club on Thursday evening, December 7. The speakers were: Hon. Emmet O'Neal, Governor of Alabama; John A. Hill, president the Hill Publishing Company, New York; M. C. Robbins, manager *The Iron Age;* Charles E. Carpenter, with E. F. Houghton & Co., Philadelphia, and William H. Stackhouse, general manager the French & Hecht Company, Springfield, Ohio. At the close of the banquet, John W. Neil, the toastmaster, proposed a toast to J. M. Manley, present secretary of the association, who will assume the position of civic secretary of the Business Men's Club of Cincinnati on January 1, while continuing to have supervision over the local office of the Metal Trades Association.

Governor O'Neal, who is a Southerner of the old school and about sixty, a forceful and brilliant speaker, talked for about an hour and chiefly devoted himself to an argument against the initiative, referendum and recall. He dwelt at some length on the principles laid down by the framers of our Constitution, who were far sighted enough to provide for a representative republican government divided into three parts—executive, legislative and judicial. He argued that the referendum, recall and initiative are absolutely against the principles thus laid down. Present methods of state legislation are well hedged about, since two separate bodies pass upon a bill and it is usually referred to a committee to investigate, while the Governor has the right of veto. All these precautions are lost when the initiative is used. One pointed remark he made on the recall of judges was that any community that contained men good enough to recall a corrupt judge had men good enough to elect an honest judge.

Mr. Hill spoke in his characteristically happy manner. He was optimistic as to the business outlook, believing that conditions are steadily improving and that there are hopeful signs for the future. Referring to the suggested increase in the postal rate on periodical publications he said he was willing to have the government establish a fair rate for second-class matter and he was willing to pay it, but he hoped they would not restrict the amount of business he would be allowed to do.

Mr. Robbins discussed the various factors in the business situation, citing the following significant facts: Bank clearings outside of New York between May and November inclusive, the largest on record for that period; increases in railroad gross earnings, with totals not far behind those of 1907 and 1910; favorable conditions of money supply and rate; steadily increasing exports, with the foreign trade balance mounting higher; decreasing financial failures in the past eight months; crops in 1911 only 0.4 per cent. less than the average for the five years 1905-1909. He believed the present trust agitation would result in a surer basis for trade and industry. In the iron and steel and metal working trades he attributed part of the existing condition to overbuilding and suggested that the volume of business is nearer normal than is generally appreciated, recommending that some manufacturers might come nearer to the real trend of things by readjusting their viewpoint.

Mr. Carpenter's theme was advertising. His principal point was that success in selling consists in "advertising plus"—. The "plus" consists of good copy, good follow-up letters, organization, salesmen, etc. His stories were witty and well illustrated his points.

Mr. Stackhouse, who was called upon to represent the visiting guests, was not on the regular programme. He made an excellent address, principally on the pending questions relating to large corporations. He protested against the readiness of politicians to prosecute big business interests—a policy bound to discourage industrial development.

Chicago papers reported a fire in the plant of the Massey Vise Company, 9 to 11 West Michigan street, Chicago, on November 14. This was an error, as the company had no fire. The plant is running as usual and there has been nothing to interfere with its regular routine of business nor to handicap its usual delivery of orders.

The Philadelphia Foundrymen's Association

The Philadelphia Foundrymen's Association held its regular monthly meeting at the Manufacturers' Club on the evening of December 6, Horace L. Haldeman occupying the chair. A discussion as to conditions in the foundry trade disclosed that considerable variation prevailed in the activity of foundries, some jobbing foundries are busier, but those making machinery and special castings were reported as finding an irregular demand for their product. A committee consisting of C. D. Matthews, George C. Davis and A. A. Miller, appointed by the presiding officer to make nominations of officers for the coming year, named the entire list of present officers, as follows: Thomas Devlin, president; Elmer E. Brown, vice-president; Josiah Thompson, treasurer, and Howard Evans, secretary.

The paper for the evening's discussion was on "Motor Trucks in the Foundry Trade," by C. R. Hoyme, sales manager Motor Truck Company, Inc., Philadelphia. Mr. Hoyme's paper concluded with illustrations by lantern slide of the experience of the Saurer "pioneer freighter," the first motor truck to cross the American continent. Many hardships were encountered.

November Copper Production and Stocks

The statement of the Copper Producers' Association for November is by far the best from the standpoint of the producing interests for many months. A large reduction in stocks of copper had been foreshadowed but the actual figures proved to be far greater than given in any forecast. The statement is as follows:

	Pounds.
Stock of marketable copper of all kinds on hand at all points in the United States, November 1	134,997,642
Production of marketable copper in the United States from all domestic and foreign sources during November	111,876,601
Deliveries of marketable copper during November:	
For domestic consumption	68,039,776
For export	67,049,279
Total	135,089,055
Stock of marketable copper of all kinds on hand at all points in the United States, December 1	111,785,188

It is thus shown that the shrinkage in stocks in November was 23,212,454 lb., having been the largest reduction made in any month of this year. The stocks of copper are now the smallest since February, 1910. The factors contributing to the month's heavy decrease in stocks were large deliveries, both for home and foreign consumption, and an unusually small production. The November output was the smallest with one exception for the entire year. If the reduction in stocks had been entirely due to the small production the result would have been much less encouraging to copper producers than the fact that the deliveries have heavily increased, thus showing a noteworthy expansion in trade.

Briquetting Flue Dust.—At the present time, when there is so much interest and discussion as to the best method of treating flue dust and iron ores that they may be converted into the best physical and chemical condition for future use in blast furnace operations, it is interesting to note that the Cambria Steel Company, Johnstown, Pa., has about completed the installation of an experimental plant in which it is going to apply the Schumacher and Ronay briquetting processes which are in such successful operation in Germany, Belgium, Russia, etc., where over 1,000,000 tons are now annually briquetted. The General Briquetting Company, 25 Broad street, New York, is the owner of the American rights.

Two New Lackawanna Open-Hearth Furnaces.—The Lackawanna Steel Company, Buffalo, N. Y., is adding two open-hearth furnaces, each having a capacity of 120 tons per day, to its open-hearth steel plant. This will give the company 13 open-hearth furnaces, with a total capacity of 1560 tons daily. The erecting of the new furnaces is being done by the company's own force of men. Piles for the foundations are now being put in.

Great Iron-Making Nations

They Also Have First Places Among World Powers—The Situation To-Day and in Other Periods

BY R. H. SWEETSER.*

The international iron and steel conference held in Brussels last summer called forth from the press much that was skeptical; and some newspapers have expressed grave doubts as to the results of a co-operative movement of iron and steel makers whose influence would be greater than that of many leading nations of the world. The possibilities of such an international organization as was considered at the conference are so great and so far-reaching that many writers have been stunned by contemplating the magnitude of the power that could be wielded by such an association; and some alarmed writers have expressed much fear because of the possible domination of the iron and steel makers in the affairs of the world.

It is no new thing that the iron makers should dominate in the affairs of the world. The new thing is that hope expressed by Judge Gary "that representatives of the steel industry throughout the world, acting in harmony and presenting an undivided front, may be of use in assisting to bring about universal peace." History plainly tells us that the greatest world powers in all ages have been those nations making the most iron and steel. These world powers have reached and have maintained their position through victorious wars; and nations having the most and best iron makers have thus far been the victors. Hitherto much of the skill and energy of the iron men has been directed toward armaments and ammunition. It may reasonably be affirmed that their success would be as great if they were devoted to peace.

Earlier World Powers Pre-eminent in Iron

What are the qualifications of a world power? "World powers are those nations that are directly interested in all parts of the world and whose voices must be listened to everywhere," says Professor Coolidge in his book, "The United States as a World Power." The three greatest world powers at the present time are without doubt England, Germany and the United States; they also are the greatest makers of iron and steel. The greatest world powers during the sixteenth century, beyond contradiction, were Spain, France and England, and in these three countries the manufacture of iron flourished more than in all the rest of the known world. At the beginning of the Christian era the Roman Empire was the one great world power, and the Romans made more iron and steel than all the rest of the nations put together. The history of the world previous to the time of the Roman Empire and the history of all the years since then show that at any period the dominating nations were those having the most and best makers of iron and steel.

When the ships of Spain were sailing all the then known seas and the Spanish adventurers were penetrating to the very ends of the earth, when the Spanish rule extended over much of Europe and most of the new world, there were burning in the mountains of Catalonia the fires of a thousand forges. For hundreds of years after the Romans obtained a foothold in the country, Spain ranked first in the manufacture of iron and steel, and during all that time Spain was the foremost world power.

During all the time that England ruled the seas and was first among the powers whose influence was felt all over the world, and up to within a comparatively few years, the iron and steel works of Great Britain produced a greater tonnage than those of any country in the world. The time when the United States first surpassed all other nations in the manufacture of iron and steel was also the time when this country took its place among the greatest world powers.

Actual Manufacture of Iron the Test

It is not enough that a country should possess large iron ore deposits within its borders; the country which manufactures the iron and steel from the iron ore is the country that becomes a world power. The countries of northern Africa have exported much iron ore from their vast deposits, but they do not manufacture any iron; they are not world powers.

National affairs in our country have been greatly influenced by those States leading in the production of iron and steel, from the time of the earliest iron works in Virginia and New England down to the present. It is no accident that the great political influence of Ohio should be coincident with its position in second place as an iron producer and that the present geographical center of the iron business of the country should be within the boundaries of Ohio.

What is true of nations in this respect is also true of groups of men. As an illustration of the powerful influence of the iron business in large affairs, I quote from the speech of Judge Gary, of the United States Steel Corporation, at the international meeting of iron and steel manufacturers held in New York in October, 1910. Judge Gary said: "I regard our meeting as being of the highest importance. It is just as though three or four of the leading monarchs of the world had come together to discuss the affairs of their respective nations with a view to friendly relations, but without the power to enter upon binding treaties."

Possibilities of China and Canada

So much for the past; so much for the present; now let us look into the future and consider the probable results of the awakening of the iron industry in two great nations on opposite sides of the earth. The two countries that promise most in the way of undeveloped and unexplored iron ore deposits are China and Canada; and, strange as it may seem, both countries in the past year have shipped iron ore and pig iron into the United States, even though in relatively small quantities.

To the north of us, stretching from the Great Lakes to the North Pole, and from ocean to ocean, is a wonderful country, one that three centuries ago was better known than our own. Up to the time of this present generation Canada was practically a few provinces along our northern border. It was provincial in every sense of the word. Its tendencies outside the activities of the Hudson Bay Company were agricultural and piscatorial. Previous to the opening of this present century its mineral wealth had scarcely been more than prospected, except for considerable activity in the Maritime Provinces. Realizing the necessity of developing the iron resources of the Dominion, and recognizing the need of governmental protection for the making of iron, some of the Canadian statesmen brought about, against much opposition from the farming districts, a system of protective tariff and bonuses for iron and steel manufactures. A thin line of iron and steel plants now dots the shore line of the Great Lakes system from Nova Scotia up to the head of Lake Superior. But even in this year of 1911 these few steel plants look to the United States for a large part of their iron ores.

So far Canada and the mother country have failed to grasp the opportunities that lie so abundantly just across our northern border, and much of the development of the iron resources has been due to American capital and enterprise. If the British empire ever regains its supremacy as an iron-making nation it will be due to the future iron works of Canada. If Canada ever takes its place as a world power it will be when it manufactures within its borders the iron and steel necessary for the extension of its thousands of miles of railroads.

The position of China as an iron producer was well described by Sir Robert Hadfield when on his tour around the world last year. He said: "'If he who owns the iron of the world rules the world,' as an old proverb says, then the future of China is indeed of the greatest importance."

*Superintendent Columbus Iron and Steel Company, Columbus, Ohio.

For hundreds of years some iron has been made in China, but the annual production is not yet of much importance.

It is not the intention of this article to discuss the reasons why the leading iron-making nations should be the greatest world powers; history gives us the fact that the iron makers have been the victors. Then, since the iron makers have been such powerful helpers in war, is it not as reasonable to believe that they can be just as powerful as peacemakers? The metallurgical and mechanical skill now devoted to making armor to withstand the shocks of the projectiles from ever greater guns could be devoted to making rails and bridges that would stand the wear and tear of ever-greater locomotives and cars. The iron structures of peace, instead of the iron destroyers of war, would make the market for the iron and steel of the world, and then, even as in the past, the iron-making nations would still be the world powers.

A Corporation Commission

Chairman Gary's Further Suggestions on Government Supervision

Chairman E. H. Gary, of the United States Steel Corporation, appeared again December 7 before the Senate Committee on Interstate Commerce, having been asked to develop more in detail the proposal for Government regulation of large corporations. He said that industrial corporations must have some means of finding out authoritatively what is an unreasonable restraint of trade, so that they may not take steps which will make them liable to Federal prosecution. Among other things he said:

No corporation has the right to object to the Sherman law if it means, as I think it does, that no combination shall be created with the purpose of creating a monopoly, or the necessary result of which shall be the creation of monopoly; or which shall be carried on for the purpose or with the result of unduly restraining trade. If corporations are prevented from creating monopolies or unduly restraining trade, then the public is protected.

The Sherman law leaves every one in that position, but the trouble is that no one, not even the courts, knows what will be in undue restraint of trade. In the daily management of our business we are uncertain what is opposed to the public interest, in the meaning of the Sherman law.

If the United States Steel Corporation has not done business in a fair way, if it is not doing business fairly now, I am willing to concede that there ought to be a law to compel it to do so. It was formed to do in a business way what I think has been done fairly and honestly since it was organized. If we have not done that, or are not doing that, if we are of injury to anybody, I concede that Congress or the courts ought to stop us.

As to Over-Capitalization

Senator Pomerene asked whether the Steel Corporation subsidiaries were not over-capitalized, to which Judge Gary replied:

On the basis of the original cost of the plants they were, undoubtedly, and so was the United States Steel Corporation. But, on the basis of actual values and the cost of reproduction of the plant at that time, if it could have been reproduced, I believe the value of the properties of the corporation was very little, if at all, under the capitalizations. The Bureau of Corporations of the Government has said that we were over-capitalized some $500,000,000 or $600,000,000, but no allowance was made for the fact we were a going concern, or for the cost of reproduction; and the value of the ore and coal properties was based on their original cost and not upon the values which they now have.

Federal Steel Company Needed Capital

Chairman Gary was of the opinion that separate and individual companies could not have achieved the results secured by the Steel Corporation, even with the same amount of money put into them, either in the home or the foreign trade. Referring to the considerations leading up to the organization of the Steel Corporation, he said:

At the time I was president of the Federal Steel Company and we were making a success of our business, one of the largest in the trade. It was then evident to me that we were too limited as to our financial resources to meet the demands of the business upon us. I was one of those who were urging the necessity of large additional capital to enable us to properly carry on and protect the steel business. Probably the organization of the United States Steel Corporation started from this agitation.

After Andrew Carnegie offered to sell his large holding to Morgan, the latter sent a partner to me asking me to meet him at his bank. I went and told Mr. Morgan that I believed that the plan of organization of the Steel Corporation would take the place of raising additional capital for Federal Steel which would be necessary to meet the opportunities before it for additional business. I called in H. H. Rogers, H. H. Porter, Marshall Field, and N. R. Reams, directors of our company, and laid the plan before them. After an all-day conference, they agreed with me. Upon a report of this fact reaching Mr. Morgan, he replied: "If you gentlemen think this a good business proposition and can organize and carry on a company which will result as suggested, I will undertake to finance it."

The leading purpose and motive was to form a corporation for business purposes which would be a real and substantial benefit to the business interests of the country and not for the purpose of being inimical to any business interest or any one else. I don't deny that the syndicate which financed the plan realized a large profit from its work, and I do not deny that some of those interested in the plan received financial benefit; but I do not think it right and fair to say that the transaction was a Wall Street exploitation.

How a Federal Commission Could Work

The members of the committee appeared to consider that Judge Gary had not been as explicit as they desired, in detailing how he would provide in a bill for a Federal Commission with power to pass in advance on acts proposed by corporations. He thought that there might be cases, in times of financial distress, when the commission should be authorized to suspend the operation of the law, and when agreements between manufacturers to maintain prices or limit output might be approved by the commission for a limited period, but those agreements, he thought, should not be of such a character as to constitute an undue restraint of trade.

Judge Gary said that he believed in co-operation as against the old-style competition, but he did not believe in co-operation which would result in undue restraint of trade or be inimical to the public interest. Co-operation would still be competition, but a commission should have the power to fix maximum prices. That power was especially necessary in such times as the panic of 1907, when corporations in the same line of business should be allowed to make agreements among themselves under the supervision of the commission.

He said that until the filing of the recent suit against the Steel Corporation he had supposed that it was perfectly lawful for competitors to get together to discuss their business, tell each other their prices and their customers, and form such friendly relations as would maintain the equilibrium of trade. He had not believed that this was against the law and he was quite certain that it was not in restraint of trade, but the opposite. Such co-operation as that does not fix prices, but establishes a decent kind of competition, leaving every competitor free to name his own prices.

The Lumen Bearing Company Expands

The business of the Lumen Bearing Company, brass founder, Buffalo, N. Y., and Toronto, Canada, is growing to such an extent that it has been found necessary to materially enlarge the organization both in its selling and operating forces. Recent additions and improvements have been made in both the Buffalo and Toronto plants. The changes made in the organization are as follows: H. P. Parrock, formerly Western representative, has been appointed sales manager, succeeding Allen Kendall, resigned. H. F. Russell, formerly purchasing agent, has been appointed sales representative covering central and western New York and eastern Pennsylvania, Albert Lockwood succeeding him in the office of purchasing agent. Louis S. Jones, for many years with the Prentiss Tool & Supply Company, has been appointed sales representative in New England. H. O. Schwaner has been appointed sales representative in the Pittsburgh district. Fred Ganderton, formerly with the Aluminum Castings Company, has been appointed sales manager of the Toronto plant.

Obituary

Harry R. Hall

Harry R. Hall, who has been superintendent of the Crane Iron Works furnaces of the Empire Steel & Iron Company at Catasauqua, Pa., for the past six years, died in the German Hospital, Philadelphia, December 10, having undergone an operation there a few days before. He was born at Magadore, Summit County, Ohio, attended the Cleveland public schools and was a graduate of the Ohio State University at Columbus. His first work as an analytical chemist was with the Carbon Iron & Steel Company at Parryville, Pa. He resigned that position to become chief chemist at the Crane Iron Works in 1890. A year or so later he resigned this position to take charge of the furnace at Parryville as superintendent and remained there until the furnace was closed down on account of business depression. He then went to Middlesboro, Ky., and was in charge of the Watts furnaces later acquired by the Virginia Iron, Coal & Coke Company; and afterward at Dunbar, Pa., was superintendent of the plant of the Dunbar Furnace Company. He was for a time connected with the Wellman-Seaver-Morgan Company at Pittsburgh and Cleveland and later was superintendent in charge of the Sault Ste. Marie furnaces of the Lake Superior Corporation for two years and for two years following was superintendent of the Delaware & Hudson Company's furnace at Standish, N. Y. Soon after resigning his position with the Delaware & Hudson Company he was engaged as superintendent of the furnaces at Catasauqua. In the administration of his duties there he showed marked ability, public mention frequently being made of the record of the furnaces he was operating. Mr. Hall was a member of the American Institute of Mining Engineers and of other professional societies and had a wide acquaintance in the iron trade, being highly regarded in his profession. He leaves a widow, a son and a daughter.

Pittsburgh and Vicinity Industrial Notes

In 24 hours last week, No. 3 open-hearth department of the Homestead Works of the Carnegie Steel Company put 3961 gross tons of ingots, the best previous record having been 3717 tons. This plant contains 24 50-ton furnaces.

The Youngstown Sheet & Tube Company has placed a contract with the Westinghouse Electric & Mfg. Company, East Pittsburgh, for 99 motors for cranes, charging machines, transfer tables and blooming mill for the new open-hearth plant. Fifty-six of these cranes call for a new type of direct-current motors. This is said to be the largest single contract of this kind ever placed.

The Pittsburgh Valve & Fittings Company has awarded a contract to the Jones & Laughlin Steel Company for the steel for a one-story addition, 60 x 560 ft., to its foundry at Barberton, Ohio.

The Standard Steel Tank Company has broken ground for an addition to its plant at Girard, Ohio.

H. A. Reed, of the Baird Machinery Company, Pittsburgh, has been appointed temporary receiver of the Pittsburgh Automatic Air Pump Company on application of the Brown & Zortman Machinery Company, creditor.

P. H. Meighen, Waynesburg, Pa., auditor in the settlement of claims against the Waynesburg Forge Sheet & Tin Mills, made his report to the court December 1, which shows that the claims amount to $203,000, while the available cash is $35,000. Of this amount about $20,000 will be paid to the receiver of the Farmers' and Drovers' Bank. The report shows that the creditors will receive 17 per cent. of their claims.

The Union Drawn Steel Company, Beaver Falls, Pa., manufacturer of cold drawn steel shafting and bright drawn steel shapes, has opened an office in 801 Fulton Building, Pittsburgh, with Joseph A. Simonton in charge.

Among contracts recently received by W. N. Kratzer & Co., structural steel fabricators, Pittsburgh, is one for the erection of a steel frame factory building for Hubbard & Co., shovel and tool makers, Pittsburgh, requiring 160 tons of steel; contract from Moorhead, Brother & Co. for a 165-ft. crane runway, with 32-ft. span; train shelter sheds for the Baltimore & Ohio at Clarksburg, W. Va., one 508 ft. long and the other 775 ft., and a steel frame factory building, 50 x 82 ft., for the Buck-Hannah Chemical Company.

West Penn Steel Company Improvements.—The West Penn Steel Company, Brackenridge, Pa., will make extensive improvements. An extension is to be added to the main building providing 50,000 sq. ft. more of floor space. The building is to be made 1000 ft. long. It is 80 ft. wide. There will also be a lean-to of 50 x 350 ft. for warehouse and shipping purposes. The new buildings will be of steel frame construction. The company now has 7 hot mills and 7 cold mills in its sheet mill equipment and will add 3 hot mills and 3 cold mills, and will roll sheets up to No. 10 gauge, 48 in. wide x 144 in. long. When the new mills are added it is the intention to run the cold mills separately, and they will be driven by turbine engine with exhaust steam. The open-hearth steel works and sheet mills are being operated to full capacity, with good orders ahead for the company's high-grade black and galvanized steel sheets. A northern Ohio sales office has been opened in the Chamber of Commerce building, Columbus, Ohio, with Thomas Beard in charge as assistant sales manager.

The Carnegie Veterans.—Andrew Carnegie entertained the Carnegie Veterans' Association at dinner at his home in New York, Friday evening, December 8. It was the tenth annual reunion. Of the 48 men associated with Mr. Carnegie in the old Carnegie Steel Company, all but four are living, and of the 44 only eight were absent from this year's reunion. These were: John G. A. Leishman, American Ambassador to Germany; P. T. Berg, Stockholm, Sweden; Millard Hunsiker, Paris; and William L. Abbott, James G. Hunter, J. A. Potter, George H. Wightman and E. F. Wood. Informal remarks were made by Mr. Carnegie, D. M. Clemson, George E. McCague, Gibson D. Packer and Charles M. Schwab. W. B. Dickson, the poet laureate of the Veterans' Association, read his annual poem. Mr. Carnegie was elected president for the new year, C. M. Schwab, vice-president, and Charles L. Taylor, secretary.

Western Steel Corporation.—Creditors of the Western Steel Corporation at Seattle held a meeting at Seattle, Wash., December 12, and elected the following trustees: Lester Turner, Sutcliff Baxter and Edgar Ames. The first two have been serving as receivers of the company. A representative of the Metropolitan Trust Company of New York proposed an immediate reorganization of the company, and it is stated that if the creditors will agree to an early sale the trust company will undertake the formation of a new company and have the steel plant in operation in the early part of 1912.

The New Corrigan-McKinney Steel Works.—The new steel plant that Corrigan, McKinney & Co. recently announced that they intend to build in Cleveland, Ohio, in connection with their two blast furnaces in that city, will include a slabbing and blooming mill, in addition to 8 open-hearth furnaces, according to present plans, but no finishing mills. The products of the plant, as now proposed, will include billets, slabs, blooms, ingots and sheet bars.

New Mills for Steel Company of Canada.—The Morgan Construction Company, Worcester, Mass., has been appointed engineer for the construction of a blooming mill, continuous billet mill and continuous bar and rod mill by the Steel Company of Canada. The new mills will be added to the latter company's Hamilton, Ont., plant.

The Toledo Shipbuilding Company, Toledo, Ohio, has taken an order from the Thousand Islands Steamboat Company for a passenger boat to be delivered June 1, 1912, for the St. Lawrence River trade. The boat will be 175 ft. long, with a 32-ft. beam.

The Anderson Engine Company, manufacturer of gas and gasoline engines, Shelbyville, Ill., has decided to move its main office to Chicago for the purpose of taking better care of its trade. The location of the office will be announced at an early date.

Duplex Facing Machine

A Recently Developed Tool for Machining Both Surfaces of Castings Simultaneously

A special motor-driven, double-head facing machine for operating on the inside and outside of castings simultaneously has been recently constructed by the Rochester Boring Machine Company, Rochester, N. Y., for use at the Erie works of the General Electric Company. Fig. 1 is a front view of the machine, while an end elevation showing the position of the facing arms and the driving motor, which is mounted on the same base as the machine, is given in Fig. 2.

As will be noticed from Fig. 2 the two facing arms are located in different vertical planes and are of different lengths. The shorter arm, which has a radius of 15 in., is designed to be inserted into the bore of the casting and face the inner surface, while the longer arm, which has a maximum radius of 25 in., operates simultaneously on the outside. Since the surfaces to be machined are not continuous and as a consequence the cutting is intermittent, it is pointed out that it is especially important to have the surfaces true, straight and smoothly finished. The rigidity of the entire machine and the ample section of the facing arms in combination with the general construction of the tool, it is claimed, have produced a machine that is very satisfactory for doing the work required. The tool holder is so arranged as to be able to feed at right angles in either direction, or if desired it can be swiveled to any angle, the exact amount being indicated by graduations. A star wheel is employed to control the feed for facing.

The standard drive is by a single pulley having a constant belt speed, although in this particular case an adjustable speed motor is employed and, in combination with the mechanical speed changes provided by the gearing in the machine, gives a speed range of from 8 to 1 or from 1½ to 12 r.p.m. The machine and the motor are mounted on a single platen or base to make the tool self-contained and portable and in this particular case it is arranged to be used in connection with one of the builder's floor type horizontal boring machines, which was illustrated in *The Iron Age*, June 20, 1910. In the operating position the facing machine is located on the floor plate of the machine with which it operates and the two machines work simultaneously on the same casting.

The hardened nickel steel driving worm and worm gear run in oil and all the gears and running parts are inclosed and fully protected. The machine is started and stopped and the speed changed by manipulating the lever located as shown in Fig. 1 on the front of the column. This arrangement enables the operator to control the machine easily without leaving his regular position.

While this machine is built especially for double facing it is possible to secure one which will do both boring and facing. In a machine of the latter type the spindle will bore holes having a maximum diameter of 6 in. It has separate bearings in the housing and is driven by spline keys fitted into the sleeves upon which the main driving gear is mounted. Various feeds are provided for the spindle when boring and a large hand wheel provides a quick longitudinal traverse. To meet the requirements of any special case suitable feeds and speeds can be provided.

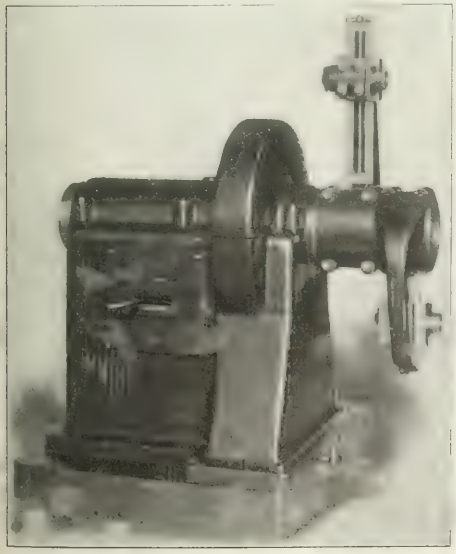


Fig. 1—Front View of a New Duplex Facing Machine Built by the Rochester Boring Machine Company, Rochester, N. Y.

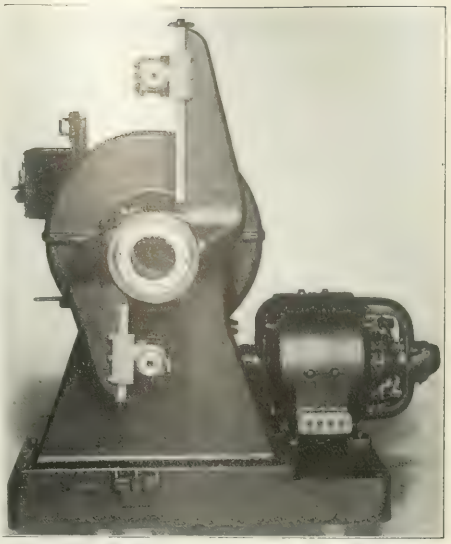


Fig. 2—An End Elevation Showing Position of Arms and Driving Motor

The International Congress of Navigation

The Twelfth International Congress of Navigation is to be held in Philadelphia in 1912 under the official invitation of the United States Government. The problems of both inland and ocean navigation are to be considered. The one comprehends questions of river regulations, dredging, dimensions of canals for heavy traffic, operating canals, locks, and freight transfers at ports. The subject of ocean navigation is to include docking and repairing vessels, dredges and submerged rock removal, application of reinforced concrete, ferry bridges, tunnels under waterways and safety of navigation, including lighted buoys. The date is to be announced by the permanent international commission, composed of representatives of different countries. The United States members are Brig.-Gen. Charles W. Raymond, Brig.-Gen. William H. Bixby, Lieut.-Col. Harry F. Hodges and Lieut.-Col. J. C. Sanford of the United States Army, and E. L. Corthell and John Bogart, consulting engineers.

The greatest cotton crop on record, 14,885,000 bales, is the Department of Agriculture's official estimate of the country's total production this year. This is greater by 1,447,000 bales than the record crop of 1904. Unofficial estimates made monthly during the year, using the department's condition figures as the basis, were greatly exceeded by the official estimate just announced.

William A. Roome, sales agent for boiler and tank plate and iron and steel boiler tubes, has removed to 608 Commercial National Bank Building, 72 West Adams street, Chicago, owing to increased business and the necessity for larger quarters.

The American District Steam Company

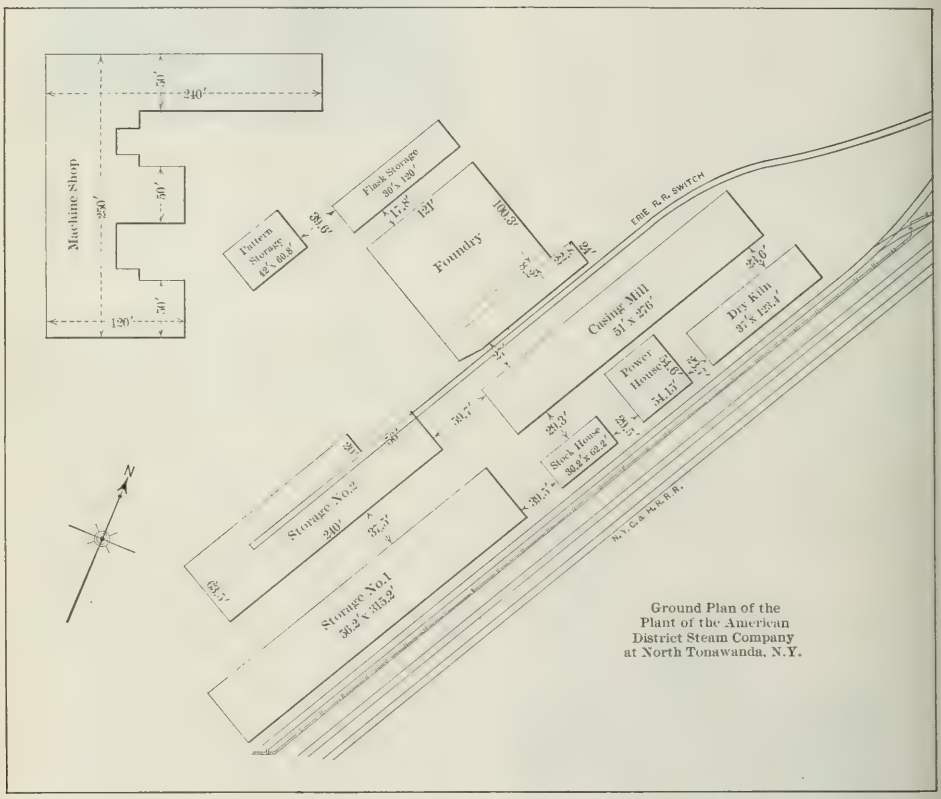
Description of the New Plant at North Tonawanda, N. Y.

With the removal of its machine shops and offices from Lockport, N. Y., the various departments of the plant of the American District Steam Company are now located together at North Tonawanda, N. Y. This plant is designed and equipped for the manufacture of the material, devices, etc., necessary for the complete installation and operation of central steam heating systems. Since the introduction of this method of supplying heat by the famous engineer Holly of Lockport in 1877, there has naturally been a great development in the various methods and materials used. The American District Steam Company has been responsible for most of this development, which has led to its well organized plant and its present "standard" equipment for these systems.

In the accompanying ground plan of the plant the dimensions and positions of the various buildings are given. The offices are located on the second floor of the machine shop. It will be seen from this plan that the plant is served by both the New York Central and Erie railroads.

Steam Mains Are Insulated

The method to be used for insulating the steam pipes of a central heating system, which lead underground from the central station, has been the subject of a great deal of experiment. For the steam pipes themselves the best wrought iron is employed, as this has been found to give the best service. This pipe is purchased from pipe manufacturers under most rigid specifications.



Ground Plan of the Plant of the American District Steam Company at North Tonawanda, N.Y.

The idea of central station heating has also experienced rapid growth, until now there are over 300 systems in operation scattered over this country, and with many in Canada. The highest development is a central station furnishing light, heat, and power to a community—the light and power by means of electricity from steam-driven generators, and heat by means of the exhaust steam from the engines. This exhaust steam is distributed through properly designed and insulated mains, and taken through service pipes to the residences, office buildings, etc., in which radiators are installed. Here the steam is condensed and its heat made use of, together with that of the hot water produced, the water being at room temperature when discharged into the sewer. Suitable provision is made to admit live steam to the mains if it is found to be necessary.

The method of insulation finally adopted is the use of specially designed wooden casing. In standard practice this casing is 4 in. thick. Its internal diameter is 2 to 3 in. greater than that of the iron pipe to be covered, which is centered in the casing by means of cast-iron guides and rollers placed about 7 ft. apart. In this way an annular air space is produced which is a very important factor in the heat insulation. The interior of the casing is lined with the best 30 lb. AAAA charcoal tin plate. This is used because the bright surface reflects back the heat waves to the steam pipe and also protects the casing.

The insulation is done in the casing mill, where the greatest attention is given to every detail. The basic material is carefully selected live white pine timber. It is first thoroughly air dried, approximately 1,500,000 ft.



Fig. 2—View in the Casing Mill, Showing the Binding Machine and Other Equipment

being kept in stock. From the piles it goes to a kiln, through which it takes about three weeks to pass. The timber then goes to the north end of the casing mill. Here it is sawed and planed into radial staves of the proper angle for the different sizes of casing, a tongue and groove being cut running the length of each stave. These are then



Fig. 3—Interior of the Iron Foundry



Fig. 4—North Wing of the Machine Shop, Looking Toward the Incoming Platform

placed in the banding machine shown in the foreground of Fig. 2, where they are automatically bound together with 3/16ths galvanized steel wire. The pressure used is sufficient to embed the wire in the wood, and leave a practically smooth surface.

The casing is next taken to the mortise and tenon machine seen in the background. Here a mortise and tenon are cut on each end respectively, the tenon being 4 in. long and the mortise 4½ in., to allow of the joints being tightly driven together. These parts are treated with creosote, and the casing is revolved, horizontally, on rollers that allow the surface to just dip into a bath of liquid asphalt.

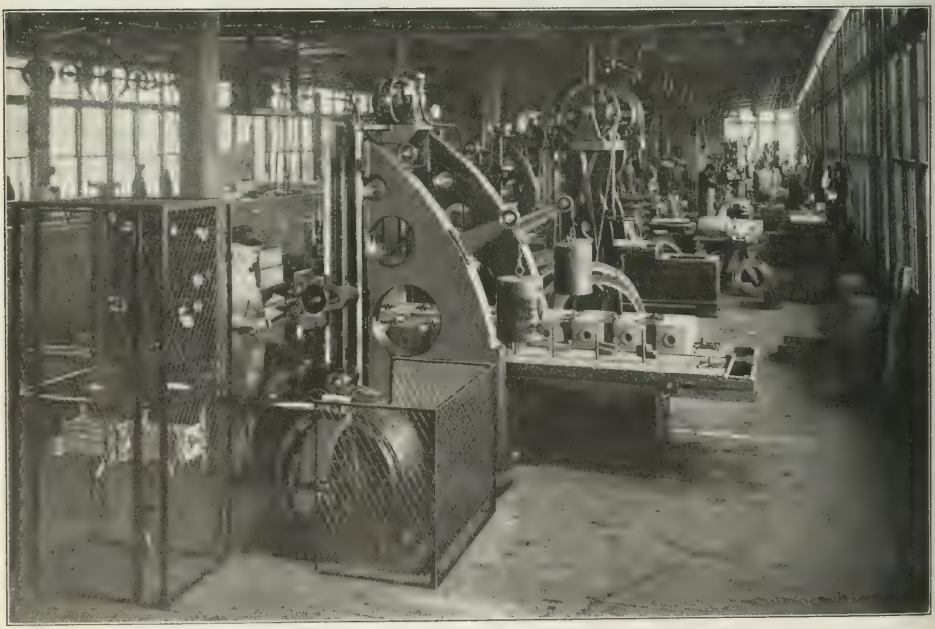


Fig. 5—North Wing of the Machine Shop, Looking from the Incoming Platform

This is continued until the surface is covered with a considerable thickness, then while still hot it is rolled in sawdust which sticks to the asphalt and leaves a surface that enables the casing to be readily handled. Before leaving the casing mill the tin plate lining is put into place.

Casing with walls only 2 in. thick is made for insulating hot water lines, and also wooden stave pipe with a shell about the same thickness.

This pipe is made to stand cold water pressures up to 200 lb., special banding being used when the pressure is above 40 lb. It is extremely suitable for carrying water, for sewers, irrigation lines, and chemical fluids. When kept filled with water it is practically indestructible. A very large stock of casing with internal diameter from 3 to 27 in. is kept on hand in storage house No. 1.

The Foundry

The next part of the plant to be described is the foundry. Its position in relation to the casing mill and storage houses is shown in the ground plan. An interior view showing the cupola and part of the molding floor of the iron foundry is given in Fig. 3. The cupola is a 60-in. diameter Whiting, which by means of a thick lining has been reduced to 48 in. About 50 per cent. of the molding is done by machines, which are all Tabors except one Bryan Vacuum machine. They are in a row behind the columns to the right of the picture. By trial, one iron mixture has been found that gives the requisite good results, and this alone is used. The work consists almost entirely of steam fittings and condensation coils, and the iron is purchased from the neighboring Tonawanda blast furnace plant. Very good arrangements are made for storing the molding sands used.

In a bay separated from the iron foundry is the brass and alloy foundry in which is a coke-fired crucible furnace holding four pots. The brass, bronze, aluminum, and white metal parts that are needed in the manufacture of the company's products are cast here. Very careful provision is made for storing and using the different turnings, etc., from the machine shop and the scrap from the foundry.

The pattern storage and flask storage buildings are conveniently near to the foundry, as may be seen in the ground plan. The well equipped pattern shop is on the upper floor of the machine shop building.

The Machine Shop

This is a large two-story building of peculiar shape, as shown on the ground plan. The entire lower floor and much of the upper floor are given over to the various departments coming under the machine shop superintendent. These include the machine shop, tool room, brass shop, meter shop, tin and copper shops, carpenter shop, assembling, testing and meter testing rooms, and finally the packing department. At the east end of the lower floor is the shipping and time keepers' office, and immediately outside this is the shipping dock, served by a railroad switch.

The machine shop building is fireproof throughout, being built of reinforced concrete. The castings and material to be machined and made into the many articles necessary for complete steam heating systems are received on a platform at the end of the long wing near the foundry. A view looking down this wing toward the platform is shown in Fig. 4, where the frequent use of individual motor drive for the machines can be clearly seen. A view of this same wing looking from the platform end is given in Fig. 5, where the electric drive used for the big planer is very noticeable in the foreground. At the left of this picture the tool room can be seen, separated from the rest of the machine shop by a low brick partition and a metal grating. This tool room is also evident at the right hand side of Fig. 4.



Fig. 6. The Copper Shop

The superintendent's office is glassed in, and from its interior an excellent oversight of practically the whole lower floor of the shop can be had. Painted floor lines are used which clearly define the broad gangways, inside which no material is allowed to be placed.

The meters are a very essential part of the equipment of a central station steam heating plant. By them the condensed water produced from the steam used in a house or office building is accurately measured. This, of course, gives a measure of the steam supplied and furnishes a just basis for the charge for service. It has been proved to be much more satisfactory than any kind of a flat rate. Fig. 6 gives a view in the copper shop where the special measuring buckets used in the meters are made, together with diaphragms, gaskets, etc. A number of these buckets can be seen on the bench near the center of the room. This shop is situated on the second floor at the end of



Fig. 7—The Meter Testing Department

the long east wing. Immediately opposite to it in the short north wing is the meter testing room shown in Fig. 7, with a number of finished standardized meters on the floor. Attention may be drawn here to the splendid natural lighting found in all departments of the machine shop.

Before briefly describing the office part of the building the power house must be visited. Its position near the drying kiln is shown on the ground plan. Steam is furnished by two 150 hp. Stirling boilers, and provision is made to use the shavings, etc., from the casing mill for steam raising. From here the plant is supplied with power, light, and heat, the exhaust steam being used for this latter purpose. The main load is carried by a Skinner tandem compound engine operating a 185-kw generator. The other two units are an Atlas Corliss engine driving a 125-kw generator and a Mackintosh & Seymour high speed engine with a 150-kw generator. The mains are connected with those of the Tonawanda Light & Power Company for use in case of emergency.

The general office is located in the machine shop building. A visitor from the street entrance comes into a main room, around which the private offices, directors and consultation rooms, etc., are arranged, and so have efficient outside lighting. The engineering department is situated in the north wing. This department is equipped with a spacious vault for storing tracings and records, and has a well arranged blue print room where artificial light is used.

Throughout the plant evidences are many of the care that has been taken to supply the needs and look after the comfort of the employees. This reaches its culmination in a lunch room, having a kitchen thoroughly modern in its equipment, electricity being used for heating. Lunch is provided for the officers and heads of departments, the members of the engineering department, and the office force.

The whole plant shows the result of careful thought and is designed to give the best quality possible in the various products. These products are themselves very interesting, many of them being the final results of over 30 years' experience. Each building is so arranged that expansion is possible with which to meet future increased demands.

Standard Bridge Tool Equipment

The Standard Bridge Tool Company, Pittsburgh, Pa., has completed the installation of special machinery in the Canadian Bridge Company's works at Walkerville, Ontario, Canada. In this equipment is a 48-in. Thomas spacing table fitted with a multiple punch, designed for the heavier class of work. It is arranged to handle two pairs of angles up to 8 x 8 in. and 80 to 90 ft. long, two plates up to 36 in. wide or one wide plate and beams and channels for web punching. This type of machine is adapted for boiler plates, tanks, sheets and similar work. The operation is entirely automatic except the control of the gags on the punch, for which hand levers are provided. The punch is especially designed for working in connection with a spacer. Fixtures are provided for guide angles in pairs, and the entire arrangement is designed with a view of setting it in the shortest possible time. A variable-speed motor on the punches provides variation in the speed from 15 to 30 strokes per minute, permitting speeding up on short spacing and slowing down on the longer spacing to take each stroke of the punch.

The Standard Bridge Tool Company also has an order for four large and two small spacing tables for the Haskell & Barker Car Company, Michigan City, Ind. The four large tables are to be operated automatically throughout and the multiple punch is equipped with gag control mechanism by which each punch can be controlled individually and any combination can be operated at any stroke desired, at 24 strokes per minute. Each of these machines will be driven by a 40-hp motor. They will have 10 ft. clearance between housings, and will handle at one time eight angles 50 ft. long, four car sills or four plates up to 30 in. wide. The two smaller tables are designed to handle two angles each up to 50 ft. long, two channels up to 15 in. or one beam up to 24 in.

More than 150 Russian workmen were plunged into ice floes in the Volga River December 8 through the collapse of a railroad bridge under construction near Kazan. A large number were drowned.

The Jones Process for "Metallizing" Ore

What Has Been Accomplished by the "Step" Furnace—A New Plant About to Be Started at Republic, Michigan

Various references have been made in these columns to the tube furnace built by John T. Jones at Iron Mountain, Mich., for the treatment of iron ores and nonferrous ores by what is known as the Jones "Step" process. As has been previously explained, this process as applied to iron ores provides for metallizing the oxides by subjecting them to heat treatment in a reducing atmosphere without fusion. It is thus offered as a substitute for the blast furnace, and the claim has been that it prepares a metallic product, 97 per cent. pure iron, suitable preferably for briquetting and charging into the open hearth, or for melting and pouring into castings. That the desired amount of carbon may be added by proper handling in the cupola is said to have been demonstrated by experiments made at Pittsburgh.

The tube furnace at Iron Mountain was erected so as to rotate in an inclined plane, but this arrangement was the cause of the final abandonment of the plant. It was found that regardless of the speed of rotation the larger pieces of ore traveled through the tube in much too short a time and the finer particles in a correspondingly excess time. With the abandonment of this plant the plan of making muck ball was also given up. It was found impossible to hold a lining in the reducing atmosphere at the temperature necessary. The Iron Mountain furnace consisted of one long tube, while a plant which has been under construction at Republic, Mich., is quite different in form, being composed of three sets of two short tubes each, arranged in tandem. This plant will be ready to fire about January 1.

Features of the Republic Operation

Mr. Jones acquired the old Kloman mine at Republic, a deposit which can be mined by quarrying and consisting of a banded silicious ore averaging in the neighborhood of 40 per cent. in iron. In preparation for the furnace this ore is crushed and passed over a ¾-in. mesh, the object being to promote a physical uniformity of the product and eliminate differences of effect due to the varying size of the pieces charged. It is proposed to charge into the first of the pair of tubes 2½ tons of the silicious ore, which being of 40 per cent. iron, should yield an even ton of metallic iron when reduced. The cost of the ore delivered at the furnace is 50 cents per ton, which would make a charge for ore of $1.25. Coal, such as is used, will cost $2.50 for each charge of ore. The elementary material cost for a ton of metallized iron is thus $3.75. The mixture of coal and ore composing the charge may be preheated to a temperature of 700 deg. by an oil flame. At this temperature the reducing action between the hydrocarbons in the coal and the oxygen in the ore is shown to begin, and the preheating flame is shut off. The subsequent operations are outlined by the inventor substantially as follows:

The first stage of the process is largely one of heating the ore to a temperature of 1500 deg. with the attendant volatilization of the hydrocarbons in the coal, partial reduction of the ore and the formation of CO gas. The pressure in the furnace due to the development of this gas is sufficient to establish a circulation and also to force the gas over into the second furnace of the pair, where a reducing atmosphere is established for a new charge of coke and stone. When the action in the first tube is completed, which fact is established by a time limit, this furnace is cut off from the second, the charge is dumped and quenched to save the coke formed. Following the quenching, the metal, associated with the silicates and the coke, is jigged to bring about a separation of the coke from the metallic product. The metallized ore is then run through crushing rolls to be prepared for magnetic separation, which frees the metal from the silicate. Where the ore is a banded type this separation is practically complete; but where the nature of the ore is such that the gangue is intimately mingled with the metallic oxide a loss of from 10 to 15 per cent. is entailed.

The crushed metal is then formed into briquettes, either by pressure which causes the interengaging of the sharp, irregular particles or where desirable a tar binder may be used. The metallized ore, after the reduction, is at no time subjected to a fusing temperature; and it is stated that in the experiments thus far, in the course of which 1000 tons of ore has thus been reduced, subsequent oxidation is negligible and is in no sense an obstacle to the completion of the process.

The Field of the Jones Process

The conclusions available from what has been demonstrated by the "Step" process thus far, as regards iron ores, are reasonably obvious. An apparatus has been devised for isolating the operations and reactions occurring in the upper zones of the blast furnace and of recovering the product at that stage. The cost of so doing corresponds approximately to the cost of the incomplete blast furnace operations. The perfection of this apparatus mechanically to provide for the handling of this product in quantity should be comparatively simple. If the cost of the process could be brought sufficiently low to permit of handling the metallized product in competition with high grade ores, a large field might be presented for the output of the "Step" process as raw material for the blast furnace. Thus far the practical operation of the process, with the exception of the one cupola experiment mentioned above, seems to have been confined to the metallizing of the oxide. Concerning the operations necessary to incorporating in the metallized ore those ingredients desirable in pig iron (either for foundry purposes of for supplying heat and other proper conditions in the making of steel) and the facilities required for controlling the analysis of the iron, no definite substitute appears to have been offered for the work performed in the boshes and crucible of the blast furnace.

A Highly Reputable French Steel

The Chatillon, Commentry & Neuves-Maisons Steel Corporation, with offices at 19 Rue de la Rochefoucauld, Paris, France, is one of the oldest manufacturers of war implements and railroad equipment. It operates 11 large and modern plants, owns several coal and ore mines and employs about 12,000 men. Naturally it was called upon by the pioneers of the automobile industry to supply them with special steels that would meet the difficult conditions required by the new mode of locomotion. After years of experience in making these steels, the company has acquired such a reputation that to-day its plants are supplying the leading manufacturers of America, Belgium, England, France, Germany, Italy, etc. Tests have been made in its specially equipped laboratories to give each part of a machine a special steel, fit for the work it is called upon to perform. Among others the brands BFM and Incassable are widely used for all kinds of forgings, gears, bearings, shafts, cams, etc. A large quantity of these brands in round shape is carried in stock and samples will be furnished on request by Maurice Goedman, 32 Broadway, New York, who represents the company in this country and Canada and is also representative for T. Inman & Co., Ltd., Sheffield, England, manufacturers of high speed and other tool steels.

The William B. Pollock Company, Youngstown, Ohio, has issued Supplement No. 22 to its general book of views of modern blast furnaces which it has built. The new publication shows views of D furnace of the Central furnaces of the American Steel & Wire Company at Cleveland, Ohio. The Pollock Company built furnaces B and C of this group in 1905.

Titanium and Low Carbon Basic Steel

The Effect of Varying Additions of the Former to Open Hearth Furnace Heats

BY G. B. WATERHOUSE, PH.D.

The object of this article is to give the results obtained with four basic open-hearth heats, to which varying amounts of ferrotitanium had been added. They were all to the usual way when making this kind of steel. The usual additions were made in the ladle when the heat was tapped, and were followed by the proper amount of ferro-

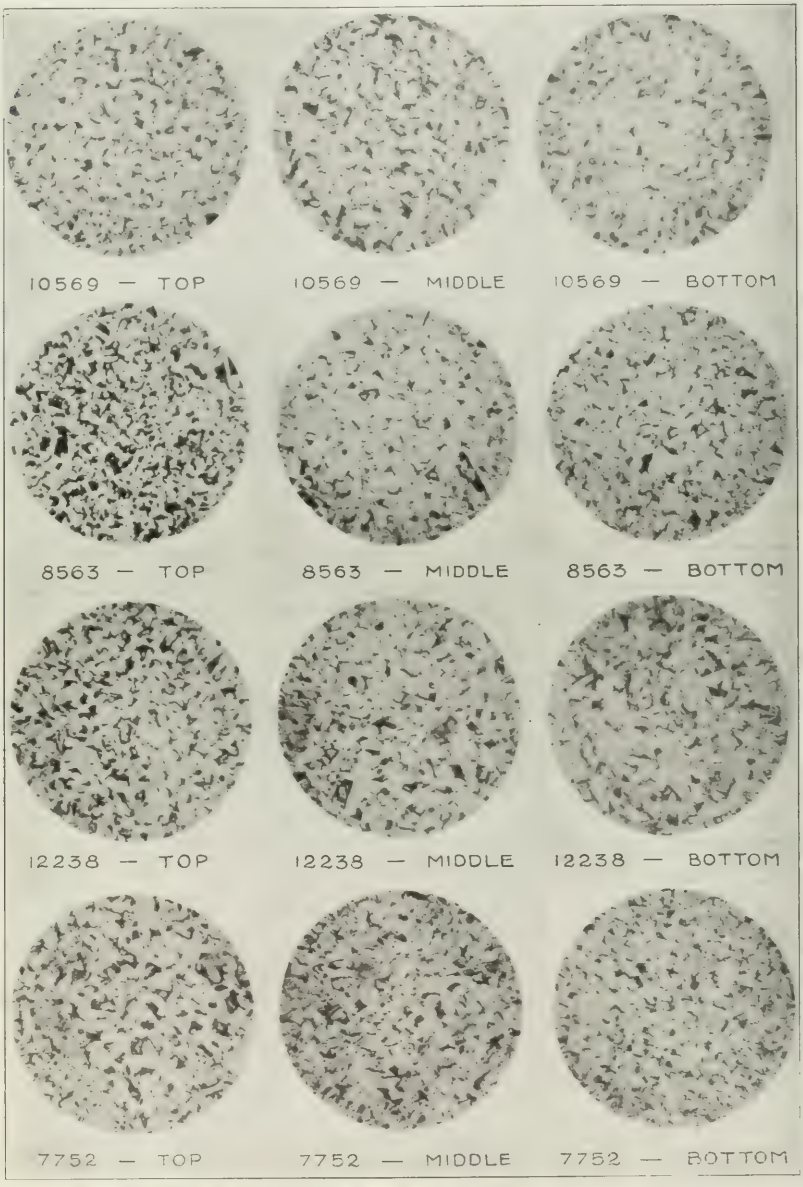


Fig. 1. Reproductions of Microphotographs of Round Bar Specimens. Magnification, 80 Diameters

low carbon, and it was the intention to make steel suitable for working up into tin and galvanized plate. The bath of metal was worked down in the open hearth according

titanium. In each case all the alloy had been introduced before the slag came. There was only a slight reaction.

The alloy used was the 10 per cent. ferrotitanium sold

by the Titanium Alloys Company and contained 10.9 per cent. titanium. The steel was held for 8 minutes in the ladle and then bottom poured into 19½ x 23-in. ingots. In order to obtain comparative tests two plain heats were also taken.

Analyses

The analyses of the ladle tests taken when about one-third of the heat was poured were as follows:

Heat No.	Kind.	Amt. Met. Ti. Added.	C.	S.	P.	Mn.	Si.
2,686	Plain	None	.082	.062	.048	.40	.026
3,824	"	"	.100	.041	.066	.38	.016
10,569	Fer.-Ti.	.025%	.102	.044	.067	.44	.018
8,563	"	.050%	.107	.039	.063	.33	.028
12,238	"	.075%	.124	.030	.059	.38	.015
7,752	"	.100%	.148	.034	.066	.35	.012

The carbon was carefully estimated by combustion; the sulphur by an evolution method; the phosphorus by solution and reduction of the yellow precipitate, and final titration with standard potassium permanganate. The manganese was estimated by the ammonium persulphate method, and the silicon by the use of a mixture of nitric and sulphuric acids.

Tests on Rounds

The steel was stripped while hot, placed in the soaking pits and heated in the usual way. One ingot from each of the special heats and one plain heat were rolled down to 4 x 4-in. billets. The ingot was taken from the middle part of the heat so as to give average material. From each of these ingots three billets were taken—from the top, middle and bottom respectively. They were carefully marked and after reheating were rolled down to ¾-in. rounds, from which samples were taken for testing. In the following table are given the results of tensile and Brinell hardness tests on the bars as rolled. They are the average of two closely agreeing determinations. The Brinell tests were made with a 10-mm. ball and 3000-kg. pressure, the pressure being exerted in a direction parallel with the rolling:

TENSILE AND BRINELL TESTS ON ROUNDS.

No.	Kind.	Place.	El. Lt.	T.S.	El. % in 8 in.	Red. Area %.	Brinell.
2,686	Plain	Top	38,200	56,375	29.6	52.9	118
		M.	38,360	55,930	30.2	61.6	102
		B.	37,020	53,730	33.7	64.8	95
10,569	Ti. .025%	Top	40,000	61,230	27.1	52.3	121
		M.	38,560	59,580	28.7	56.4	112
		B.	39,800	58,470	30.6	58.9	112
8,563	Ti. .05%	Top	39,160	58,740	27.7	55.5	131
		M.	38,600	58,120	31.6	63.6	110
		B.	37,890	56,890	30.0	63.1	104
12,238	Ti. .075%	Top	36,850	60,080	27.7	56.1	136
		M.	38,350	61,000	29.7	64.3	113
		B.	40,180	61,150	30.0	64.7	116
7,752	Ti. .10%	Top	40,300	64,940	26.3	52.8	131
		M.	40,180	62,810	30.6	60.0	115
		B.	39,160	61,500	28.1	58.6	114

Tests on Sheet Bars

Three of the special heats and one plain heat were rolled first into billets and then directly into sheet bars. This was with the exception of the one ingot that went into 4 x 4-in. billets. The last special heat, No. 7752, was too high carbon for sheet bars. The sheet bar is the semi-finished product. In making it the ingot is rolled to a billet 7 x 4¾ in. and then goes direct to a Morgan continuous mill. Here it is rolled to a bar 8 in. wide and of the required thickness to give the right weight per foot. In this case the thickness was a little over 0.5 in. The bars are cut into 30-ft. lengths by means of a flying shear. In this case also an ingot was chosen from near the middle of the heat and samples were cut at the flying shear from the finished sheet bar at the top, middle and bottom. These pieces, as mentioned before, were 8 in. wide. Three pieces were cut longitudinally from them about 2½ in. wide, one directly in the middle and one at each side. These were machined for tensile tests. The results are given in the following tables, where those given on pieces from the side are the average of the two determinations on pieces from each side. The Brinell tests were made in the same manner as before.

TENSILE AND BRINELL TESTS ON SHEET BARS.

Heat 3824, Plain:

Place.	Width, In.	Thickness, In.	Elas. Limit.	T.S.	Elon. % 8 in.	Red. Area %.	Brinell.
Top cent.	1.710	.525	36,040	58,720	29.6	48.5	140
side	1,705	.520	35,970	57,600	30.9	59.0	135
M. cent.	1.710	.520	34,810	56,110	34.4	62.5	124
side	1.710	.520	35,870	57,260	32.3	61.2	130
B. cent.	1.710	.525	35,150	54,760	33.8	51.0	122
side	1.710	.525	35,460	55,600	34.1	62.6	123

Heat 10,569, Ti. 0.025%:

Place.	Width, In.	Thickness, In.	Elas. Limit.	T.S.	Elon. % 8 in.	Red. Area %.	Brinell.
Top cent.	1.710	.525	40,050	63,100	24.3	40.8	165
side	1.710	.525	39,910	60,130	30.0	54.9	141
M. cent.	1.710	.515	38,210	59,910	29.4	57.2	132
side	1.710	.515	40,000	60,600	30.0	56.1	135
B. cent.	1.715	.520	38,290	58,200	31.2	61.0	131
side	1.715	.515	39,030	59,060	30.3	57.0	131

Heat 8,563, Ti. 0.05%:

Place.	Width, In.	Thickness, In.	Elas. Limit.	T.S.	Elon. % 8 in.	Red. Area %.	Brinell.
Top cent.	1.715	.545	38,150	59,590	29.1	47.0	160
side	1.710	.545	37,600	57,210	29.4	58.2	140
M. cent.	1.710	.540	36,530	57,950	30.6	60.9	144
side	1.715	.540	37,600	58,270	29.9	60.3	137
B. cent.	1.710	.540	38,230	57,760	28.1	53.3	—
side	1.710	.540	37,960	57,250	31.3	60.8	134

In the case of 8,563 the bottom center piece was slightly laminated.

Heat 12,238, Ti. 0.075%:

Place.	Width, In.	Thickness, In.	Elas. Limit.	T.S.	Elon. % 8 in.	Red. Area %.	Brinell.
Top cent.	1.710	.520	36,450	60,450	30.0	52.9	152
side	1.710	.515	37,180	58,740	30.3	60.0	139
M. cent.	1.710	.520	37,070	59,870	30.0	58.1	136
side	1.710	.515	37,000	60,570	30.1	58.9	139
B. cent.	1.715	.520	38,370	59,370	30.0	50.1	—
side	1.715	.520	38,600	60,580	30.7	59.9	137

In this case also the bottom center piece was slightly laminated. The microphotographs made were magnified 100 diameters. (In the accompanying illustrations, Figs. 1 and 2, they are somewhat reduced.) They were taken in a direction transverse to the rolling and the samples were etched with picric acid.

Consideration of Results

The analyses show a gradual rise in carbon with increasing amounts of alloy, which is due to the steel absorbing carbon from the alloy. In the case of heat 7752 the resultant carbon was too high for tin plate, so the steel was rolled into 4 x 4-in. billets and rolled finally into other orders.

The first tests to be considered are those on the ¾-in. rounds. Here it may be plainly seen that the titanium treated steel has a higher ultimate stress than the plain steel. At the same time, the ductility as shown by the elongation and reduction of area is only slightly lower. The Brinell tests closely follow the results of the ultimate stress. It would be interesting to work this comparison out closely, both in the case of the rounds and of the sheet bars. This the writer hopes to do in the near future, also considering much more extended tests now being executed.

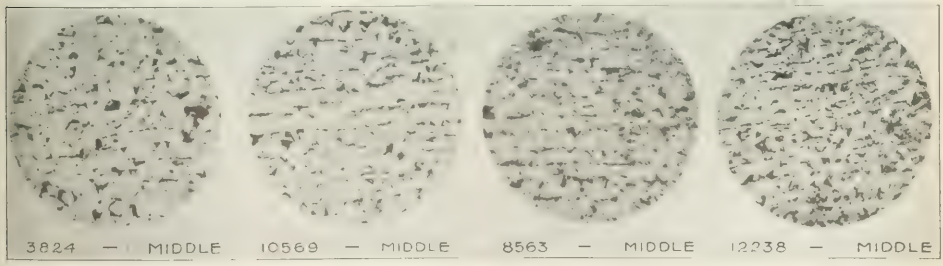


Fig. 2—Reproductions of Microphotographs of Sheet Bar Specimens. Magnification, 70 Diameters

The pieces marked "top" show a lower ductility than the rest of the steel, and in the case of 7752 the tenacity is markedly higher, which would indicate some segregation.

The results of the tensile tests on the sheet bars are in general similar to those on the rounds, the tenacity as shown by the elastic limit and ultimate stress being distinctly raised and the ductility only slightly lowered.

The general effect of the titanium seems to have been to give solid clean steel that gives evidence of being very uniform throughout the ingot.

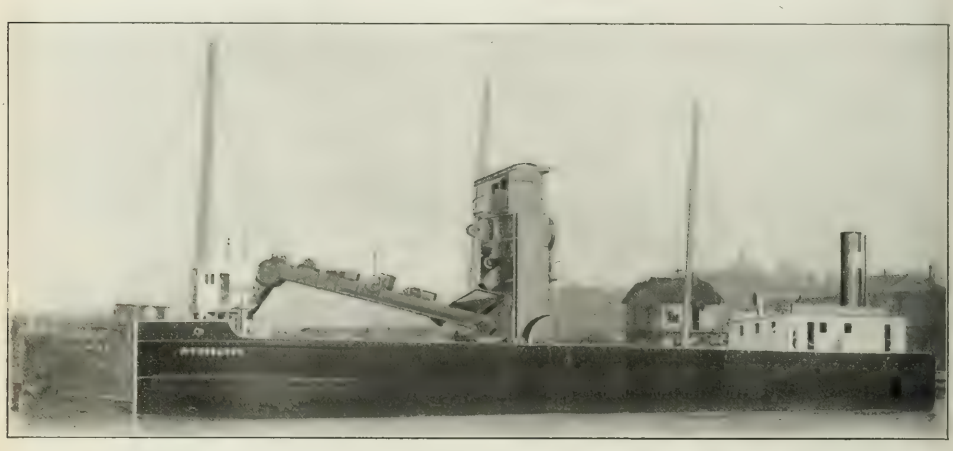
New Fueling Lighter

At the Great Lake ports the rapid loading and unloading of vessels have also made the rapid coaling of steamers necessary, and as the result of this demand many types of fueling lighters have been brought out. The most recent, and what is also claimed to be the most rapid, vessel of this type that has ever been built was recently constructed for the Pittsburgh Coal Company and used in the Cleveland harbor during the past season. The boat portion of the lighter is a steel hull having a length of 156 ft. over all and an over-all width of 40 ft. which with the engines was constructed by the American Shipbuilding Company. Twin screws propel it at a speed of approximately 12 miles per hour and the vessel has a twin rudder so that it can be easily handled in the narrow and crooked channels of the Cuyahoga River, at the end of the harbor at Cleveland. The carrying capacity is 1000 tons and it will load 400 tons of coal in the bunkers of a steamer in an hour.

A series of 20 pockets arranged ten on either side of the hull carry the coal. These pockets each have a capacity of 50 tons and are provided with two gates so arranged that the flow of coal to the reclaiming conveyors is accurately controlled. These conveyors operate toward the center of the boat, where they discharge into an elevator which lifts the coal to a swinging boom provided with a drag conveyor. A swinging and telescoping chute is fastened to the end of the boom and is so arranged that it is possible to discharge coal into the bunkers of the larger steamers without trimming. This arrangement enables the lighter to be operated with a minimum crew, only four men being required beside the captain. Independent motor drive is used to operate the conveyor and the coal handling machinery, which is controlled from the operator's house placed on top of the elevator. The machinery, which was built by the C. O. Bartlett & Snow Company, Cleveland, Ohio, is of the automatic switch type and is interlocked so that the various conveyors and elevators cannot choke up if the fuse in the supply line between the Ridgeway generator set placed in the after cabin and any one of the seven motors should blow out. Three motors are required to operate the boom and the chute and one for each conveyor and elevator.

The regular way of loading the lighter is to have a swinging boom equipped with buckets similar to those on the vessel let out from the docks. Coal is fed into these pockets from a hopper beneath elevated tracks, into which the fuel is delivered directly from hopper bottom cars. In addition the lighter can also be loaded directly through an ordinary car dumper.

Safety devices are provided for the entire equipment, which is rigidly constructed and arranged with a view of securing easy operation of all parts. Another feature of it is the design which tends to give stability to the boat, the list being only about 6 in. under the extreme conditions of loading and the swinging of the boom to the maximum outward position.



A New Lighter for Handling Coal Constructed by the C. O. Bartlett & Snow Company, Cleveland, Ohio.

The Flat-Top Fuel Company

The Thomas-Cooper coal interests in the Pocahontas region have been combined. Edward Cooper, of Coopers, W. Va., has acquired an interest in the Flat-Top Fuel Company, and, effective April 1, 1912, that company will distribute, in addition to the coal and coke from the mines of Col. W. H. Thomas, the widely-known Cooper coal mined at Mill Creek, McDowell and Coaldale operations. These mines were opened by the late John Cooper, a pioneer in the Pocahontas region, are now owned by the Cooper Estate and are under the personal management of Edward Cooper, who had years of training under his father. The coal from the Cooper mines has formerly been handled through the William C. Atwater agency. The Flat-Top Fuel Company will now be enabled to develop new territory into which it may make shipments of Pocahontas coal.

At a meeting of the directors held December 2, Edward Cooper was elected a vice-president of the company. The other officers are as follows: President, Col. W. H. Thomas; vice-president and general manager, O. M. Deyerle; secretary and treasurer, W. J. Pritchard; Western manager, Holly Stover, Chicago; Ohio and Indiana representative, Edward K. Shera, Richmond, Ind. The company will, as heretofore, maintain its general offices at Bluefield, W. Va. At that point an office for the proper handling of cars and supervision of inspection will be maintained, with McDowell Smith in charge.

The punching and shearing machines exhibited at the Turin Exposition by Henry Pels & Co., 90 West street, New York, were awarded two grand prizes. The exhibit included nine power machines for heavy duty and a number of hand machines. Among the power machines exhibited were a one-stroke beam shear, a beam shear combined with punch, a single-ended coping machine, a large bar shear, a triple combined punch, plate shear and bar cutter, a scrap shear and a newly patented beam shear for cutting structural shapes without waste of material.

Improved Contractor's Light

A Recently Developed Headlight for Use on Building, Subway and Street Work

Recently the Pyle-National Electric Headlight Company of Chicago, Ill., has placed on the market an improved type of electric headlight for use by contractors on buildings and subway and street work where night shifts are employed. Some of the requirements for an outfit of this character are that the light shall be capable of being diffused or concentrated readily while the generating equipment will withstand hard usage and at the same time not be dangerous for the men working around it, all of which are said to have ben met by this light. The distribution of the light from one of these headlights together with a view of the light itself is shown in Fig. 1 and Fig. 2 illustrates the turbo-generating set supplying the current.

The lighting outfit consists of a small arc lamp and a special reflector which is shown in the upper left hand corner of Fig. 1, and a small steam turbine directly connected to a dynamo which furnishes current for the lamp. This current is generated at a potential of approximately 35 volts and this low figure is said to eliminate all danger of electric shock, regardless of how carelessly the apparatus is handled. Steam from the boilers, hoisting engine, shovels or other machines can be used to run the turbine, a ¾-in. pipe being all that is required to supply steam to the turbine. But little attention, other than an occasional oiling, is required by the turbine and the use of a governor keeps the speed constant even though there may be sudden variations in the steam pressure. As an additional safety precaution a centrifugal brake that is set to act when the speed at which the governor operates is exceeded is also provided.

A dynamo is directly connected to the turbine and is mounted on the same base as illustrated in Fig. 2, both portions of the set being inclosed in a weatherproof case

The dimensions of the entire outfit are 30 in. long and 18 in. high and wide. The weight is approximately 320 lb. and no special foundation is required. It is thus possible to place the outfit in any convenient location since the amount of space required is small. The dynamo is of sufficient capacity to furnish current not only for the headlight but for several incandescent lamps in addition.

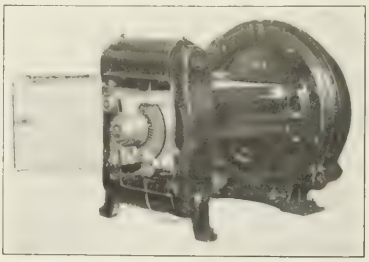


Fig. 2—The Turbo-Generating Set Used with the Headlight

The lamp and reflector which are shown in the upper left corner of Fig. 1 have been specially designed for construction work and are both inclosed in a waterproof casing, the complete weight being 92 lb. A flexible cable connects the dynamo with the lamp case, which can be readily removed. The carbons used will burn between 8 and 9 hr. without change. The reflector is built to diffuse and distribute the light over a wide area, but by employing a sliding base the position of the lamp with reference to the reflector can be changed to secure concentration within a small area. A view of the distribution of the light is given in Fig. 1. When the reflector is set to diffuse the light an area within the radius of 150 ft. is brilliantly illuminated.

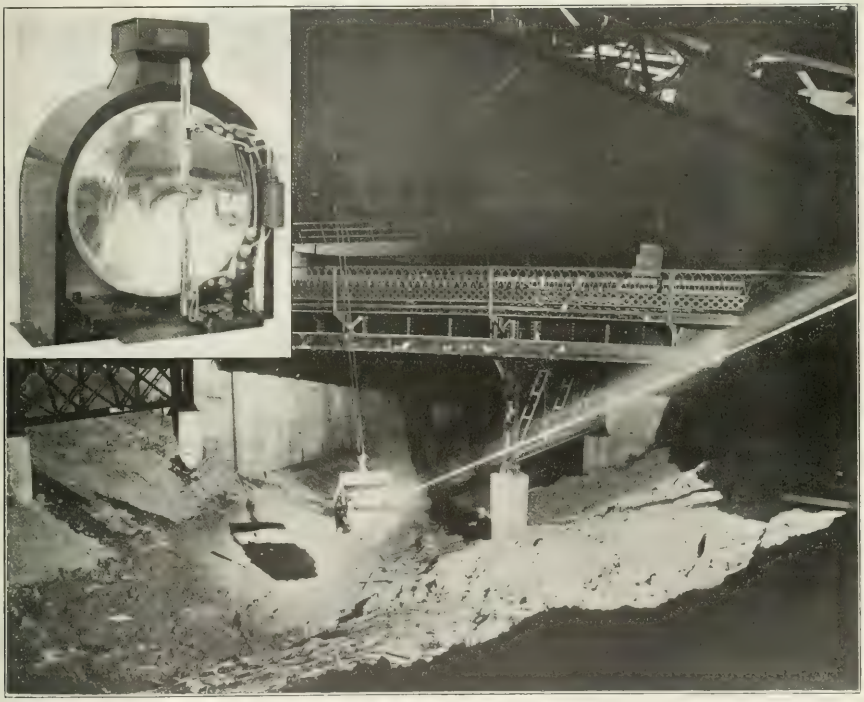


Fig. 1—View Showing the Distribution of Light From a New Contractor's Headlight Manufactured by the Pyle-National Electric Headlight Company, Chicago, Ill.

New Bituminous Gas Producer

The Nordensson Type Developed by the Standard Gas Power Company

With a view to embodying those features of gas producer design that contribute to simple and economical operation without using any complicated attachment, the Standard Gas Power Company, 604 Walton Building, Atlanta, Ga., has placed on the market its type F bituminous furnace gas producer which is constructed according to the Nordensson system. Some of the special features of the producer are the elimination of the burning of gas in the producer to the greatest possible extent, a regular distribution of the fuel supply, convenient inspection and poking of the fire, the absence of any grate upon which clinkers and ashes can accumulate and stop the draft and the use of a simple and cheaply replaceable brick lining. Fig. 1 is a sectional elevation of the producer, while Fig. 2 shows two of the producers in operation at a brick kiln which is one of the fields in which this producer is claimed to be especially efficient.

Constructional Details

Referring to Fig. 1 it will be noticed that the producer shell is a simple steel cylinder, supported on piers in a water seal, *a*. These piers are so placed that they will not interfere with the ready removal of ashes through the water which can be done at will, without interrupting the continuity of operation. The shell has a straight lining of fire brick, *b*, which is free from slopes and projections, an arrangement which it is pointed out lessens the chances of an uneven draft being produced and resulting in a reduction in capacity, or in some cases placing the unit out of commission until the accumulated clinker could be

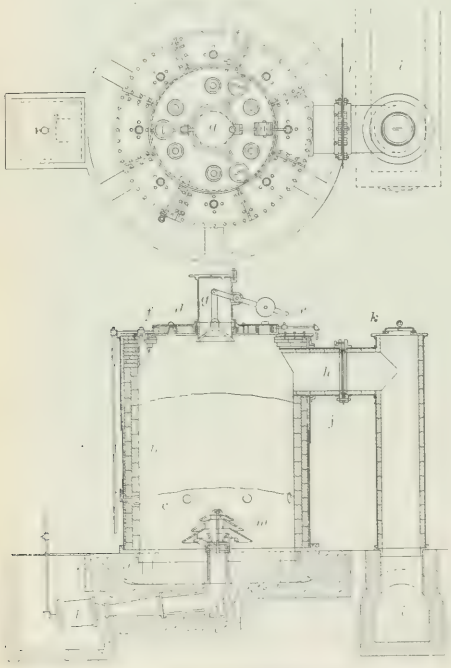


Fig. 1—Sectional Elevation of the Nordensson Furnace Gas Producer Built by the Standard Gas Power Company, Atlanta, Ga.

removed. For poking and inspection, poke holes *c* are conveniently arranged along the top and the sides.

The top of the producer is water cooled with a plate, *d*, over the cooling trough to provide a cool, dry place for the operator to stand on and further protection is afforded by the brick lining which is arched on the inside. Several doors *e*, having water sealed covers are located in the lining and these are large enough to be used for inspection purposes as well as for poking while the covers which are loose enable them to be employed as relief doors. Additional poke holes *f* are placed where they will take care of average operating conditions without using the larger doors and one of the special features of these holes is their location close to the inner face of the brick lining so that the fire can be poked from this point.

The charging hopper *g* is of the double valve type and the fuel is distributed by dumping through the opening made by lowering a bell. With this hopper the fuel is charged in equal quantities at regular intervals and the bell distributes the fuel in an advantageous manner away from the center and this distribution has been shown by experience to be consistent with the area of most rapid combustion and most accessible poking. The capacity of the hopper is the same as the fuel consumption of the producer for a certain period so that it gives the advantages of continuous automatic feeding without using the expensive and complicated mechanisms generally employed, it being only necessary to charge the hopper at periods when previous charge of fuel has been consumed. One of the special features of this arrangement is that before the bell drops the hopper is closed at the top so that there is no escape of gas when the fuel is being charged.

From the producer the gas is led off through a large brick-lined outlet, *h*, which is connected with the main gas flue *i*. The general method of connecting the outlet with the flue is a straight vertical downtake connected as illustrated, but this arrangement is subject to the conditions prevailing at the particular plant where the producer is installed. For cutting the unit out of service a plate valve, *j*, in the outlet neck is employed. This valve consists of a steel plate sliding between flanges and having at one end a hole equal in area to that of the gas outlet while the other is solid. Set screws which loosen the plate by forcing the flanges slightly apart and bolts which lock it in position render the manipulation of this valve easy so that the producer can be quickly cut in or out of service according to whether the hole in the valve plate is opposite the outlet or not. If it is necessary for a unit to deliver waste gas to a stack or waste flue, this can also be easily and quickly done, because when these conditions prevail, the producer is designed with the outlet opening into a tee in which a double throw sand sealed valve is located, the flow of gas either way being diverted by a movement of the valve. In many cases this arrangement will be found convenient for putting the individual units of a producer battery into commission and cutting them out of service. When the former is being done the gas is wasted until the fire is in proper condition and then it is diverted to the main flue by a single movement of the valve.

Gas Purification

For reducing the amount of impurities carried over with the gas, a section of the main gas line is sometimes led directly downward from the outlet into a water seal pit, the gas being taken off through a horizontal connection between the neck and the lower end of this section. The vertical section is carried into the water seal with a full sized opening at the bottom. The object of this is to avoid as far as possible the accumulation of soot and tar in the main gas flue, while a large proportion of this matter which is suspended in the gas is caught in the trap and can easily be removed from the pit which is always open for cleaning. While it is not claimed that the periodical shutdowns for burning out the flues and cleaning them from accumulated soot and tar are entirely done away with by this arrangement, it is pointed out that a large part of the suspended matter is caught in the trap and removed during operation, thus prolonging the period during which the flues will be clean and free for carrying a full volume of gas. Another advantage claimed for this arrangement is that the trap outlet fulfills the function of a relief or explosion door and an explosion in the line is relieved through the water seal without admitting air, since the outlet is again automatically sealed as soon as sufficient gas has escaped. Inspection doors are provided at convenient locations which are held in place by specially designed clamps and are easily removable by hand. The vertical downtake shown at the right of Fig. 1 is capped by a loose door, *k*, resting in a sand seal, and kept in position by its own weight. If any excess pressure is present in the flue, it can be relieved by lifting the door.

The air blast is furnished by a blower, *l*, which gives the proper proportions of steam and air and is controlled by a single valve in the steam line. The blast is introduced



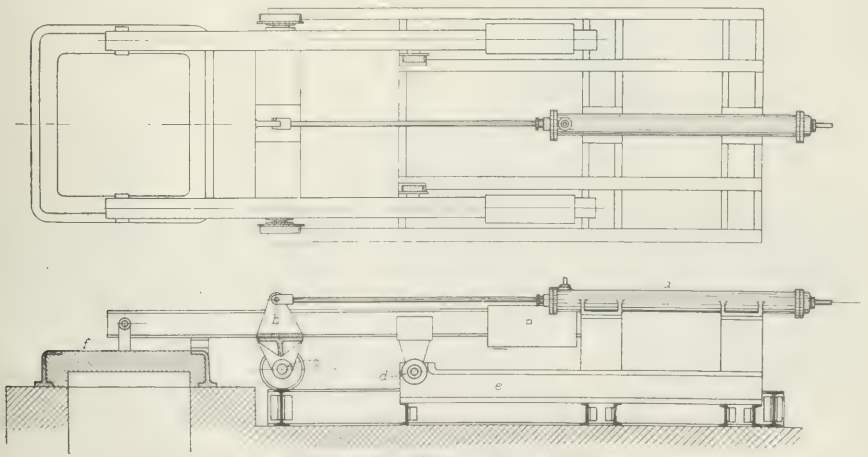
Fig. 2—Two Producers in Operation at the Legg Continuous Brick Kiln, Calhoun, Ga.

into the lower section of the producer through a sectional blast hood, *m*, which distributes the air and steam mixture uniformly over the gas making area. One of the special features of this hood is that it is renewable part by part, which reduces repair expense, while at the same time its design is such as to prevent the draft being choked by an accumulation of clinkers or ashes with the resulted deadening of one section of the fire and a consequent overburning of another section which results in lean or uneven gas being made.

This producer is made in a number of different sizes with working diameters ranging from 2 to 12 ft. and is rated conservatively for continuous operation. Among the special fields where this producer is intended to be used are in the steel industry; in glass furnaces, where the supply of natural gas formerly used as fuel has become exhausted; in brick, lime, terra cotta and cement kilns; boilers and wood distillation retorts.

A New Soaking Pit Cover

The Pittsburgh soaking pit cover embodies a number of distinctive features, the most noteworthy of which is that when the cover has to be drawn back for charging or withdrawing an ingot it does not scrape on the top of the pit and thus in time cause serious damage to the brick work. The escape of gas is prevented by piling sand around the outside of the cover to keep it tight, as the cover lifts easily out of the sand and drops into it without scraping it away. It is stated also that if the top of the pit burns off the cover will follow after it and keep it tight. The construction and method of operation are shown in the accompanying cut. The hydraulic cylinder *a* acts on the lever arm *b*, thereby swinging the cover around the shaft *c*, lifting it upward. At the same time this causes the wheel *d* to drop down in the slot *e* where it is made to travel. This in turn carries the cover suspended while it is being pulled back. The cylinder itself has a by-pass, permitting a slow start while the cover is being lifted and this also permits a gradual lowering at the end of the stroke. The manufacture and sale of this type of cover have been taken up by the Schlieper-Daae Company, 714 Ferguson Building, Pittsburgh, iron and steel works engineer and contractor.



Plan and Elevation of the Pittsburgh Soaking Pit Cover

The Largest By-Product Coke Oven Plant in the World

H. Koppers, constructor of by-product coke and gas ovens, Joliet, Ill., has issued a large sheet giving a 24-in. panoramic view, reproduced from a photograph, of the Koppers ovens erected at Gary, Ind., by the Indiana Steel Company, subsidiary of the United States Steel Corporation. This plant is stated to be the largest and most complete by-product coke oven plant in the world. It comprises 8 batteries of 70 ovens each, making a total of 560 ovens. The capacity per charge of each oven is 12¾ tons. The type is the regenerative coke oven with the Koppers direct process of ammonia recovery. The coking time is 18 hours. The daily coal consumption is 9500 net tons and the yield of coke is 84 per cent., or 8000 tons, the by-products consisting of ammonium sulphate and tar. The gas evolved daily is 95,000,000 cu. ft., of which 50,000,000 is used in the steel mills and 50 per cent. in heating the ovens. The cost of this plant is placed at $6,000,000. The circular states that the number of Koppers ovens erected since 1902 or under construction November 1, 1911, is 7230. The repeat orders number 2727 ovens. Since the introduction of these ovens at Joliet in 1907, 1411 Koppers ovens have been erected in America.

A New Structural Shop at Massillon.—The Massillon Bridge & Structural Company, Massillon, Ohio, will erect a new plant on a site formerly occupied by a local rolling mill of the Republic Iron & Steel Company. It will consist of a steel building 156 x 400 ft., and an addition of 200 ft. will be added shortly after the plant starts up. The new plant will give employment to about 275 men and will double the capacity of the company's old works. City officials of Massillon have agreed to give the company $10,000 when the new plant is finished and put in operation.

Foundry Cold Saw

A Recently Developed Cutting-Off Machine of the Espen-Lucas Machine Works, Inc.

Extreme simplicity of construction, easy access to the working parts, great strength for the work it has to perform and durability of the various parts were the particular features considered in the design and construction of a new steel foundry cold saw cutting-off machine recently built by the Espen-Lucas Machine Works, Inc., Philadelphia, Pa. This machine was built for export, and as it is intended for cutting off steel risers measuring 30 x 36 in. and gates 30 in. in diameter, a tool of extreme rigidity combined with high power was essential. Fig. 1 is a view of the machine, while Fig. 2 illustrates a typical casting that is handled by it.

The machine, in addition to embodying the customary standard features of the builder's line of cold saw cutting-off machines, embraces a number of additional points. This particular machine is belt-driven, having a driving pulley 36 in. in diameter and 8 in. wide, although if desired motor drive can be readily attached. The drive is through a main shaft and phosphor bronze worm and worm wheel located at the rear of the machine, and the former runs in a bath of oil. The pinions and the pinion shafts together, with the main spindle, which is 8 in. in diameter and 36 in. long, and the gears are made in single pieces cut from solid forgings. All of the gears are incased in suitable covers and the important bearings are of the roller type.

The saw blade, which is said to be the largest in diameter of any used in steel foundry work in connection with the cutting of solid sections, is 1½ in. thick and is attached to the main spindle by six 2-in. countersunk bolts. A feed of 40 in. is provided for the machine carriage by the builder's standard ratchet mechanism operating through a long screw. There is a quick forward movement through tumbler gears to bring the saw blade up to the work, while for withdrawing the blade a quick return is available. This is obtained by a friction plate clutch operated by a hand lever. An automatic stop for controlling the depth of the cut at any point is provided. The range of feeds is from 0 to 6 in.

Accessibility of the working parts is one of the special features of this machine. Removing the cast-iron bracket at the driving end of the machine enables the principal internal working parts to be withdrawn through that end so that repairs and renewals can be easily and rapidly made.

A supplementary table 42 in. wide, 36 in. high and 60 in. long is furnished in addition to the regular table provided on the bed of the machine. This supplementary table is held in position on foundation rails on a cast-iron base by T bolts and can be moved toward or away from the main table as may be desired by a hand screw feed.



Fig. 2—A Typical Casting Ready to Be Cut by the Machine

Both of the tables have T slots for holding the work in position.

In operation steel bars 6 in. in diameter have been cut in 1½ min., 9-in. bars in 3½ min. and 12-in. bars in twice that time. Steel sections 10 in. square have been sawed apart in 5 min.

The labor journals in Great Britain report a falling off in the number of the unemployed as reported to them by trade unions, showing that industry is improving.

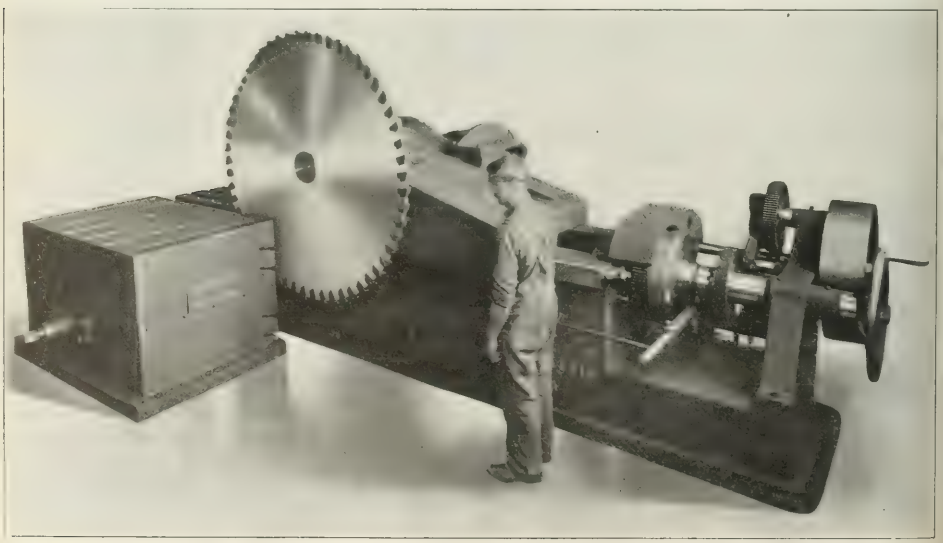


Fig. 1—A New Steel Foundry Cold Saw Cutting-Off Machine Built by the Espen-Lucas Machine Works, Inc., Philadelphia, Pa.

Accidents in German Iron and Steel Works

A Digest of Recent Government Reports

The German Imperial Insurance Office makes a practice of issuing at 10-year intervals special studies of the salient facts regarding industrial accidents. The principal object of these studies is to indicate the possibilities of improvement in the prevention of accidents as well as the best medical and surgical treatment of the injured workmen for the purpose of restoring the largest possible measure of their earning capacity. The first two reports were based on data secured in 1887 and 1897, and the last, the contents of which have just become available, upon information obtained in 1907.

Accident Rate for Iron and Steel Workers Comparatively Low

As regards the iron and steel industry, this study of industrial accidents included 40,276 iron and steel manufacturing establishments having a total of 1,211,881 full-time workers who were under the national workingmen's industrial insurance law. The industry, as compared with other branches of mining and manufacturing, shows a comparatively low accident rate. Nine other industries—teaming, hauling, flour milling, mining, quarrying, woodworking, brewing, engineering, construction work, and inland navigation—have a higher accident liability for each 1,000 employees. When the iron and steel industry is considered independently, however, an increase in the accident rate for each 1,000 wage-earners becomes evident.

Of the total number of iron and steel workers studied, accidents of all kinds were reported for 97.26 workmen out of each 1,000 employed in 1907 and 84.87 for each 1,000 employed in 1897. The proportion of iron and steel workers, however, actually killed or who underwent a disability of 13 weeks duration in 1907 was 11.62 as compared with 8.92 in 1897. Of the adult iron and steel workers 12.24 males and 5.36 females for each 1000 employed were injured. In the case of employees under 16 years of age, 6.98 boys and 5.18 girls in each 1000 met with accidents. The increase in the accident rate in German iron and steel plants for all employees may be readily seen in the comparative statement below which shows for the period 1897-1907 the number of persons killed or injured for each 1000 employed.

Number of Full Time Workers Killed or Injured per 1000.

Year.		Year.	
1897	8.92	1903	11.25
1898	9.76	1904	11.62
1899	10.05	1905	11.45
1900	10.07	1906	11.55
1901	11.39	1907	11.62
1902	11.45		

Causes of Accidents

The largest proportion of males, both men and boys, had the highest accident rate in boiler and engine works, blast furnaces, structural iron and steel plants and machine shops. The female employees were most frequently injured in engine and sheet iron works and blast furnaces, The highest proportion of all accidents in all industries was caused by machinery. In accidents of this kind the iron and steel industry, which had 25 per cent. of the total number, showed a higher proportion than any other industry. The proportion of workmen in iron and steel plants meeting with accidents from specified causes in 1897 and 1907 was as follows:

Per Cent. Killed or Injured by Specified Causes

	1897	1907
Motors, engines, etc.	2.34	0.87
Transmission apparatus	1.85	1.24
Working machinery	26.00	23.49
Elevators and hoists	6.63	8.52
Steam boilers	0.38	0.19
Explosives	0.17	0.15
Inflammable or hot substances	6.99	6.77
Collapse of objects	9.44	9.82
Falls from ladders, etc.	7.57	8.17
Loading and unloading materials	14.83	16.10
Operation of railroads	4.26	6.45
Tools, hand apparatus, etc.	4.16	5.65

As regards the results of the injuries in terms of loss of earning power to the employee, about 6 per cent. of the wage-earners injured in the iron and steel industry in 1908 died and the injuries of about 1 per cent. of those meeting with accidents resulted in permanent disability and loss of earning power. Two-fifths of the injuries resulted in partial permanent disability with a loss of earning power from 25 to 75 per cent. Almost one-half of the accidents were followed by a temporary disability of the wage-earners and a loss of earning power of 25 to 75 per cent. during a short period of time. In the case of a small proportion, about 8 per cent., of the iron and steel workers injured there was a temporary disability but no loss of earning power.

Duration of Disability

According to the German system, compensation for accidents is paid in the form of annuities or pensions during the period of disability. The wage-earner, however, who has met with an accident must undergo an examination at intervals during the receipt of his pension and the amount paid to him annually is increased or decreased by the decision of the examining board as to any increase or decrease in his earning power. If the condition of the workman with the lapse of time becomes worse, he is entitled to make request for an increased pension. On the other hand, if he improves, the employers' associations may ask for a decrease in his annual pension.

This system of periodical examinations throws much light on the duration of disability and on the effect of industrial accidents in reducing the earning power of the workmen. Of the 15,012 iron and steel workers injured in 1907 25 per cent. ceased to receive pensions after an interval of one year, because of complete recovery of earning power. In 1906 38 per cent. returned to work with full earning powers restored after receiving a pension for three years, and, in 1904, 44 per cent of the injured employees after having had a pension for four years recovered their earning powers completely. After an interval of five years 2 per cent. of the injured iron and steel workers still are being paid pensions because of a loss of 75 to 100 per cent. of their earning power; 3 per cent. because of a loss of earning power of 50 to 75 per cent.; 10 per cent. on account of a loss of earning power between 25 and 50 per cent., and 35 per cent. of those injured are receiving pensions after a period of five years because of a loss of less than 25 per cent. of their earning power.

The German System of Industrial Insurance

Under the German system, mutual associations of employees administer the accident insurance. These mutual organizations of employers make provision only for those accidents which result in death or in disability lasting longer than 13 weeks. Another system has charge of accidents of sickness causing disability for a shorter period than 13 weeks. The accidents referred to in the preceding discussion are only those administered by the employers' association, or, in other words, those which caused death or a loss of earning power for a longer period than 13 weeks.

The employers' accident associations pay the cost of accident insurance by assessments on the amounts of their payrolls, modified by a system of risk rating based on the number of accidents occurring in the various plants. Consequently it is to the interest of each employer to adopt all possible means for the prevention of accidents. Furthermore, since the injured workman receives compensation during the entire period of his disability, any improvement in his physical condition results in a decreased pension to him and a corresponding reduction in the outlay of employers. The mutual associations of employers have consequently been led by their own pecuniary interests as well as by humanitarian considerations to make heavy appropriations for the purpose of preventing accidents and in the medical treatment of injured workmen. In 1907 the outlay of all kinds of associations for medical expenditures had increased to $505,250, as against $237,747 in 1897. During the same period the expenditures for preventive measures had increased from $246,769 to $355,400.

The Standard Oil Company's pension system for employees, which has been in force for many years, will not be affected by the recent disintegration. It has always been managed by the subsidiary companies for their respective employees, so that the new order necessitates no change in its operation. Payments under the plan have been carried as current charges against earnings.

Motor Trucks*

Can They Be Adapted to the Foundry Trade?

BY C. R. HOYME†

Before this question can be answered, there are a number of conditions that must be investigated. We must first determine the length of the hauls; second, the general condition of the foundry transportation department; third, the amount of material handled; fourth, the present cost of transportation. We can then determine whether motor trucks can be utilized in a particular foundry business to an advantage.

The Midvale Steel Company started the ball rolling by placing one 3-ton truck in its department for the hauling of car wheels, tool steel, billets and general castings to its downtown customers. This was previously done by hired teams This truck to-day is doing the largest part of the company's hauling. The Tioga Steel Company is also using a truck of 5-ton capacity, which is being operated at a much lower cost than that of the old-style method, making from two to three trips a day more than could ordinarily be done with the work of four horses, which proves again that the motor truck can be utilized in the foundrymen's trade.

Choice Between Electric and Gasoline Trucks

Motor trucks to-day are manufactured with capacities from 1,000 lb. to 10 tons, both in the electric and the gasoline power. This brings up a point that is well to be considered right here: that electric trucks can be utilized to better advantage in a great many instances than gasoline trucks. We will take, for instance, the foundry that hauls about, say, three miles from its plant and having a great many stops. An electric truck can be then used more economically than a gasoline truck, as the distance covered is not particularly great and the many stops naturally require time for starting and increased use of fuel. This illustration does not necessarily mean that electric trucks can be only used for a three-mile trip, but it is merely to show that they are to be preferred for some classes of service.

The electric truck is the logical choice for some classes of city service by reason of the fact that the roads to be traveled are usually passable. The better the roads, the better the performance of the car, for it must be borne in mind that the electric truck is, in a sense, limited. Hard roads pull down the batteries, which feature does not have the same effect in gasoline cars, where sufficient fuel can be carried for a long run.

We have looked at the transportation problem from the short-haul standpoint. Now in taking up the question where the gasoline truck can be utilized, I would say that where you have a long freight haul a gasoline truck would naturally be the power to use, or where you have hauls to the suburbs and nearby towns where the roads are hilly, muddy and sandy.

In investigating your transportation department it will often be found that neither the electric nor gasoline truck can compete with horses. Take, for instance, a foundry situated three blocks from a railroad siding; the double team could then be utilized to a better advantage than either of the trucks mentioned, as the length of the haul is not beyond the ability of the horse and the investment is much less for the short distance.

A Preliminary Investigation Needed

As a motor truck representative, I believe that before a business man buys a truck he should compile figures showing the average cost of hauling his material or finished product per year, then find out whether his particular work calls for an electric or gasoline truck, comparing the cost of up-keep of the two latter modes of transportation with that of his present cost, taking in consideration the increased service and the possibilities of new business. I have seen instances where business houses have installed motor trucks of five-ton capacity where requirements call for three-ton. This is a big mistake and is a matter that business men should consider seriously. The right truck in the right place, operated with a degree of care, certainly cannot help but be economical.

The construction of a good motor truck should be as follows: A four-cylinder motor with ample power to pull the load at a speed of 10 to 15 miles per hour over all kinds of roads; good, substantial transmission with heavy enough gears to stand the strain and shocks of the average cobblestone street and rutty roads; a clutch that can be engaged freely and gently so as not to strain the motor or transmission; the right kind of jackshaft, preferably of the full floating type; substantial frame with enough resiliency to give with the condition of the road bed; large tires, heavy springs, yet resilient enough to carry the load as easily as possible; wheels necessarily of heavy construction; the axles, both front and rear, preferably of solid composition to withstand road shocks.

The tire problem seems to be the bugaboo in economical up-keep of a motor truck at this time, but there is no doubt that this will be overcome in a few years.

Cost of Up-Keep

Nothing has been said as to the general cost of up-keep of motor trucks, and it might be well to dwell upon this point to show or to outline the general estimated cost of operating a three or five-ton truck for the period of one year on a basis of 50 miles per day. First, we must consider the initial investment. Assuming that a three-ton truck for the chassis only cost $3,500 and body $250, the complete investment would be $3,750. We must now figure on the fixed charges per year.

Interest on the investment at 6 per cent. a year	$225.00
Depreciation of body at 20 per cent. per year	50.00
Storage, including washing, polishing and inspection	300.00
Driver's wages at $15 a week	780.00
Insurance; fire, $99; liability, $80; property, $32; collision, $108; total	319.00
Annual expenditure for overhauling, renewing of worn parts, which make life of car indefinite	500.00
Total fixed charges per year	$2,174.00
Total fixed charges per day, practically	$6.00

The operating charges would be as follows:

Gasoline at 8½ cents per gal., operating 7 miles to the gal.	$0.0121
Oil at 30 cents per gal., operating 200 miles to the gal.	0.0015
Tires at approximately $470 a set, 8,000 miles guaranteed	0.0587
Total cost per mile	$0.0723
Cost on a basis of 50 miles per day	$3.6150

These figures are approximate and give you an idea as to what it costs to operate a truck of that capacity.

The capacity of trucks that could be economically used in the foundry business would be those of one to five tons and the cost of operating is proportionately according to the capacity and investment. The average cost of a one-ton truck is $2,150; two-ton, $3,000; three-ton, $3,500; four-ton, $4,000; five-ton, $5,000.

The tire companies guarantee tires on the larger trucks from 8,000 to 10,000 miles, depending largely upon the route they cover, loads they carry, etc.

The Operator

The question of the operator should be considered very seriously, as the general cost of up-keep, length of time out of service, depreciation and tire expense largely depend upon him. Experience has shown that it is a great deal cheaper to put on a man of some mechanical ability and to pay him, say, from $15 to $18 a week, than to get a cheap man for $9 a week who knows absolutely nothing about machinery. The latter man will be a ceaseless worry to the owner, often operating the truck without the proper lubrication and attention that a piece of machinery doing this kind of work must have.

The motor truck must have a certain amount of attention. It requires rest like a human being. The truck that is operated day in and day out without attention will soon end up in the junk heap..

Another matter that is very important in connection with the use of motor trucks by foundrymen is the construction of the body. Experience has shown that a substantial platform lined with sheet steel, built as close to the ground as possible, has proved the most satisfactory, as there is a tendency when loading the truck with heavy castings to block them, nailing them to the floor boards of the body, which would soon crack it and put it out of commission. The use of the steel covering allows the loading

*From a paper read before the Philadelphia Foundrymen's Association, December 6.

†Sales manager of the Motor Truck Company, Philadelphia.

to be done much quicker and better, as it is very much easier to move a heavy casting over a smooth surface.

A Power Winch

One of the most useful accessories that can be applied to commercial cars for such work as the loading of heavy machinery and castings is the power winch. The cost of a power winch is considered a little high, but the disregard of power winch efficiency from the standpoint of increased cost of the equipment alone is very shortsighted. To one who has made a study of commercial cars, their application and use, some of the present-day methods of handling loads are farcical. Why kill oneself moving a load when under the hood is a husky four-cylinder motor that can do the trick in the turn of a handle? The power winch can be used in any number of cases where loads are bulky and heavy, the shifting of which would consummate time and mean strenuous human effort. There is a limit to human endurance, whereas the winch, when properly cared for, can go on doing the work without a skip. The winch can be operated either by turning a crank or operated directly from the motor, either for hoisting or unloading. The operating of a motor truck equipped with this device will often save a good many hours at both ends.

In summing up the entire motor transportation problem, I would say that where a business firm is using two or more horse wagons, transporting its materials from points to exceed one mile, the motor truck could be utilized, if the problem is worked out from every point, and if each concern that adopts the motor truck should operate it with the proper system, giving it the attention that all machinery must necessarily have, there is no question that it will show on the profit side of the ledger and have a tendency to increase the dividends.

The Allis-Chalmers Company to Reorganize

In connection with the proposed reorganization of the Allis-Chalmers Company, which the directors are considering, a protective committee of the company's 5 per cent sinking fund bonds has been organized. The committee consists of James N. Wallace, president Central Trust Company, chairman; R. Walter Leigh, of Maitland, Coppell & Co.; Charles W. Cox, of Robert Winthrop & Co.; Fred Vogel, Jr., president First National Bank of Milwaukee, and John R. McClement. F. L. Babcock is the secretary, at 54 Wall street, New York. The Central Trust Company, New York, is to be the depository of the bonds.

The directors, it is stated, propose to put the company on a more substantial basis financially and physically, but some time must elapse before the details can be worked out. It is said that a receivership will not be necessary. The company has a capitalization of $50,000,000, of which $19,820,000 is common and $16,050,000 preferred, and $11,148,000 first mortgage bonds are outstanding.

The first step in effecting the contemplated reorganization will be taken by securing the funds needed to provide on January 1 for a semi-annual bond interest of $287,000, interest on floating debt amounting to $130,000 and a guarantee of $31,500 dividends on the stock of the Bullock Mfg. Company, as well as for additional working capital with which to reduce the floating debt and to enable the company to accept such business as may be offered to it. In order to secure the funds thus needed, the directors have decided to co-operate with the other stock and bond holders and will form special committees and sub-committees through which to conduct the reorganization.

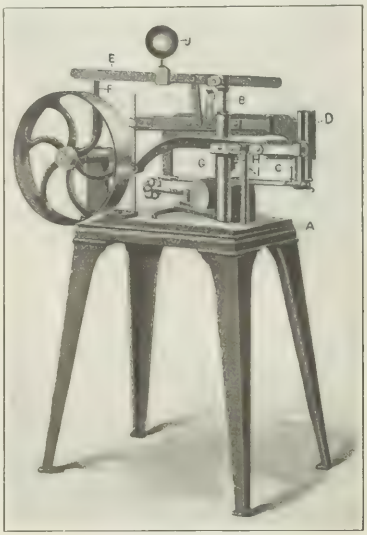
No dividends on the preferred stock have been paid since 1904, and although there was a surplus of $1,117,161 earned in 1910 fixed charges were not earned in the last fiscal year owing to the slack demand for heavy machinery, which is the company's principal product.

With but one month still to be heard from in 1911, the gross sales of the Western Electric Company promise to total between $66,000,000 and $67,000,000 this year. Last year the gross sales totaled $61,000,000 and in the preceding year $46,000,000, while 1906 holds the high record with $69,000,000.

The lockout of metal workers in Germany, which began November 30 and affected between 50,000 and 60,000 men, ceased December 6. A compromise was arranged.

Improved Power Hack Saw Machine

Small floor space, reduction of friction and the firm supporting of the saw frame and the saw guide to give a true vertical cut are some of the special features claimed for an improved power hack saw marketed by L. H. Olmstead's Son, Hasbrouck Heights, N. J. Other special features of the machine are ability to swivel the work with a pointer or indicator running over a graduated segment to indicate the various angles and a low power consumption. In this machine the hack saw is secured in a frame which is reciprocated horizontally by a revolving crank and a connecting rod. The bed piece A supports a column, B, which is embraced by a vertically adjustable sleeve, G. The horizontal slideway upon which the saw frame slides is fastened securely to this sleeve. The head C moves on a slide that is supported by the post I and extends



An Improved Power Hack Saw Machine for Sawing Metal Built by L. H. Olmsted's Sons, Hasbrouck Heights, N. J.

into a deep vertical groove D in the saw frame. This head is connected with the crank by the connecting rod so that when the machine is in motion the movement of the saw frame is the same irrespective of its height above the table. The saw guide H is attached to the adjustable sleeve G close to the work and is adjustable in all directions. This arrangement, it is emphasized, prevents the saws from breaking and at the same time assures a true vertical cut in the work. The stud upon which the saw is hooked in the reciprocating frame holds the blade in a vertical position at all times without adjustment.

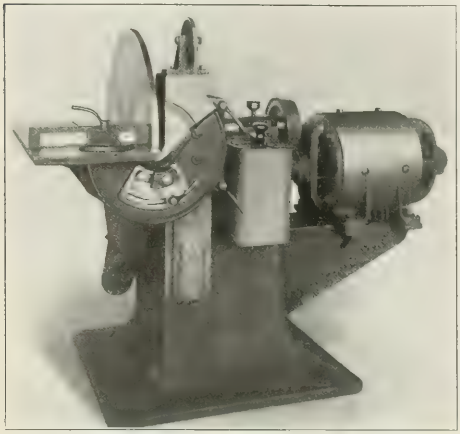
The lowering and raising lever E, the starting lever F and the wheel controlling the adjustment of the vise jaws are conveniently located at the front of the machine. The ball weight J can be adjusted on the lever controlling the position of the saw frame to give any desired pressure and is held fast in position by turning the ball. No counter shaft is required for operating the machine, a clutch operated by the lever F for starting and stopping the saw being attached to the machine. In this way it is possible to locate the saw under a main line shaft and drive it by belt connection from one of the overhead pulleys.

Three sizes of saw having capacities for stock 2, 3 and 4½ in. square respectively are built.

The grand prize for the exhibit of abrasive materials has been awarded by the Jury of Awards of the Turin Exposition to the Carborundum Company, Niagara Falls, N. Y. The exhibit showed a complete line of Carborundum wheels, Aloxite wheels, Carborundum dental wheels, Carborundum sharpening stones and razor hones of all descriptions.

Motor-Driven Disk Grinder

Recently the Gardner Machine Company, Beloit, Wis., has equipped its No. 17 patternmaker's disk grinder, which was illustrated in *The Iron Age*, August 17, 1911, with a new motor drive. The special advantages of this drive are the elimination of end play in the spindle due to the



The No. 17 Motor-Driven Patternmaker's Disk Grinder Built by the Gardner Machine Company, Beloit, Wis.

mounting of the motor apart from the grinding spindle and driving the latter through gears and the ability to operate the grinder in shops not equipped with a dust exhausting system by belting a small fan directly to the machine spindle.

It will be noticed from the accompanying engraving that the motor is mounted separately from the grinding spindle, which is said to overcome the end play of the spindle carrying the disk wheel. It is pointed out that where a motor is mounted so that its amature shaft acts as the spindle of the grinding machine end play is bound to result since the shaft should have end play to secure magnetic balance and consequently the disk wheel would have the same amount of play.

The drive is through spur gears, the pinion being of rawhide. A semi-inclosed guard covers these gears but if desired a fully inclosed cover can be furnished so that the gears can run in oil. The controller is attached to the front of the machine and offers a convenient and compact arrangement, since the machine can be started or stopped by the operator without leaving his working position. The size of motor required is 5 hp. and it can be used with either alternating or direct current.

A dust box in the base of the machine enables the grinder to be used in pattern shops not equipped with exhausting systems, or where the machine is placed in an isolated part of the factory, as a small exhaust fan can be belted to the machine spindle and blow the dust into this box.

Proposed Federal Compensation Bill

The Federal Employers' Liability and Workmen's Compensation Commission has prepared a bill for submission to Congress which, in effect, abolishes the present common law and statutory liability for the personal injury and death of employees in the service of interstate railroads, and substitutes definite compensation in all such cases, irrespective of negligence.

The employer is to furnish medical and surgical aid, not to exceed $200, in all cases of injury.

In case of total and permanent disability the employee shall receive 50 per cent of his wages during the remainder of his life. In case of the loss of one arm, a leg or one eye he is to receive 50 per cent of his wages for a term of years extending from 30 months to 72 months. For temporary total disability he is to receive a like amount during the continuance of the disability; for temporary partial disability 50 per cent of the impairment of his earning capacity.

Payments are to be made monthly. In case of death periodical payments are to be made to the widow, children or dependents.

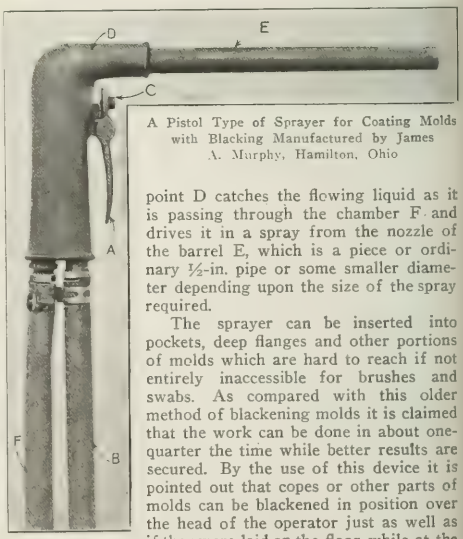
Provision is made for settling controversies by agreement or by committees. In default of such settlement the district judge is to appoint an adjuster, who is to be a salaried officer of the United States. His findings are to be filed in the district court, and unless excepted to automatically become a judgment of the court. If each party excepts within 20 days the case is to be tried and determined by the court, provision being made for a jury trial upon demand.

The Murphy Mold Sprayer

For spraying blacking on molds an ingenious device has been invented by James A. Murphy, foundry superintendent of the Hooven, Owens Rentschler Company, Hamilton, Ohio. Some of the special advantages claimed for the sprayer are light weight, trigger control, economy in the use of air and ability to blacken parts of molds easily regardless of their position.

As will be noticed from the engraving the sprayer is of the pistol type and is made of bronze and iron. The valve is bronze resting on a cast iron seat with a pressure of the air behind the valve. The intake and the suction holes are made larger than are really necessary so that reducers can be inserted to which the lines of holes fasten. This arrangement concentrates all the wear from the coupling and uncoupling of the hose on the reducer and when the threads of this part are worn away it can be thrown away and a new one inserted at a trifling cost.

When the trigger A is pulled air is brought in from the air hose through the branch B and rushes through the valve C. It travels at greater velocity through a small orifice in the portion of the sprayer designated by D where it expands. Its further expansion in the barrel E creates a suction in the chamber F to which the suction hose is attached. The air coming through the orifice near the



A Pistol Type of Sprayer for Coating Molds with Blacking Manufactured by James A. Murphy, Hamilton, Ohio

point D catches the flowing liquid as it is passing through the chamber F and drives it in a spray from the nozzle of the barrel E, which is a piece or ordinary ½-in. pipe or some smaller diameter depending upon the size of the spray required.

The sprayer can be inserted into pockets, deep flanges and other portions of molds which are hard to reach if not entirely inaccessible for brushes and swabs. As compared with this older method of blackening molds it is claimed that the work can be done in about one-quarter the time while better results are secured. By the use of this device it is pointed out that copes or other parts of molds can be blackened in position over the head of the operator just as well as if they were laid on the floor, while at the same time, the amount of waste blacking is reduced. The force with which the blacking is thrown against cores or molds forces the wet material into the pores of the facing sand where it is retained and gives a greater depth of fireproof coating with less material. Blacking put on in this manner will not, it is said, flake off cores or molds on account of the hold it has among the pores of the sand as a result of the force with which it is applied.

Engine Lubrication

In order that small plants can secure the benefit of the scientific lubrication employed in large central stations and power plants, the Richardson-Phenix Company, Milwaukee, Wis., has designed and is now manufacturing an individual oiling system. The special advantages of this system are that the various pipes, receivers, filters, pumps, etc., can be located either upon or very close to the engine. With a view to making it easy for the engineer to equip his engine with this automatic lubricating system it has been brought to such a state of perfection that all the information required is the horsepower of the engine and its

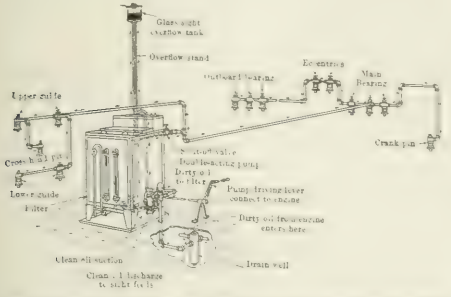


Fig. 1—Diagram Showing the Location of the Apparatus Required by a 14-Point Richardson Engine Lubricating System Made by the Richardson-Phenix Company, Milwaukee, Wis.

type and make. With this data in its possession the company is in a position to supply a complete system with all the necessary appurtenances which can be readily attached to the engine by an ordinary mechanic. This has been brought about as the result of considerable experimenting and careful study of the standard makes of the different engine manufacturers. Two standard systems are now being built known as the Richardson system and the Phenix system, which are illustrated in Figs. 1 and 2 respectively.

The former system is designed primarily for large Corliss engines and is furnished in various sizes for lubricating engines of from 100 to 1500 hp. and with filters having an hourly capacity of from 4 to 35 gal. The other system which is intended for engines of smaller sizes, namely, 10 to 200 hp., is built in a number of different sizes and has a correspondingly reduced filtering capacity, the maximum being 4 gal. In general the essential parts of

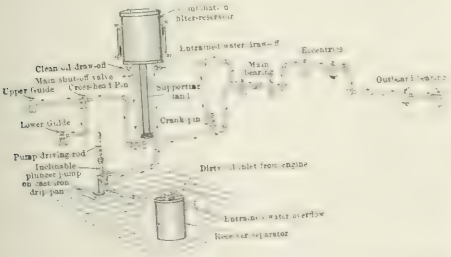


Fig. 2—Apparatus and Material for a 10-Point Phenix Individual Oiling and Filtering System

these two systems are identical, although their details vary slightly. These individual systems are designed as units so that all parts fit together and operate satisfactorily. The filter and the pump have the right capacity for a particular number of feeds and the necessary amount of piping is supplied for each type of engine. The use of a novel device known as the Union-Cinch fittings is said to eliminate all trouble from pipe fittings in connecting up either of the two systems.

In both systems at each point of lubrication a sight-feed oiler is provided so that the amount of oil fed to that particular bearing can be accurately adjusted regardless of the amount of lubricant supplied to all of the others. The gauge glass in each feed provides a means by which the attendant can see just exactly how much oil is being fed. The scheme of operation of these systems is to collect the used oil from the various points of lubrication in a suitable receptacle. This reservoir is located at some point so that all the oil flows into it by gravity and is pumped from there to the top of the filter. After all the impurities and any entrained water have been removed in the filter the oil either flows by gravity as is the case in the Phenix system or is forced by a pump driven by the engine to the various feeds.

The installation of these systems is claimed to reduce the steam consumption of the engines from 2 to 20 per cent. from that required when hand oiling is employed, and it has been figured out that the minimum reduction in the amount of steam consumed which it is pointed out is due to a decrease in the amount of power consuming friction is sufficient to pay for the necessary oiling system in one year. Another point upon which the maker lays special emphasis is the lessened oil consumption which is said to be not less than 40 per cent. and may run as high as 75 per cent.

The N. & G. Taylor Company's Improvements

Contracts have been let by the N. & G. Taylor Company of Philadelphia, manufacturer of tin plate, for the erection of a complete tin house at its plant at Cumberland, Md. The Cumberland plant has hitherto produced black plate only, which has been tinned at the company's Philadelphia works. The new addition will comprise the latest ideas in tin-house construction, especial attention having been given to ventilation, lighting and the mechanical transportation of materials within the building. A new electric generating set is being added to the power plant. The present laboratory is being doubled in size, and a large warehouse for the storage of black plate will adjoin the new tin house.

With the completion of these improvements and additions, the N. & G. Taylor Company will pursue at Cumberland every process of the manufacture of tin plate. Open-hearth furnaces will convert pig iron, scrap and ore into steel; the steel ingots go through the large blooming and bar mills and emerge as sheet bars; these in turn are rolled into thin sheets in the two black-plate mills, and the dipping and finishing will follow in the tin house. Coincident with the commencement of these improvements comes the announcement that the Cumberland City Council has granted the company free water to the extent of 200,000 gal. a day and immunity from taxes for the period of 10 years.

The N. & G. Taylor Company is the oldest house in the tin-plate business in America, having been established in 1810, and therefore entering next year on its 103d year of continuous business activity. It is among the largest tin plate makers in the country. In the early days the company imported its tin plate from Wales, but since 1892 has operated its own tinning works at Philadelphia, drawing the supplies of black plate chiefly from the Cumberland plant. The company is well known by its specialty, the Target and Arrow brand of roofing tin, formerly known as Taylor Old Style, and its high-grade bright plates for special purposes. With tinning facilities at Cumberland as well as at Philadelphia, the company is now in position to compete in markets heretofore beyond its reach by prohibitory freights. Work on the new construction is being pushed actively and it is expected to be in operation within three or four months.

The Cross Creek Coal Company.—George Z. Hosack, vice-president of the Pittsburgh Coal Company, will retire January 1 to form a new coal company, of which he is to be the president. It will operate in Washington County, Pa., will have a capital stock of $250,000 and will be known as the Cross Creek Coal Company. The headquarters will be in Pittsburgh. The company owns 1700 acres of coal land south of Burgettstown, near the village of Cross Creek. Work has been started on the shaft. Mr. Hosack has been in charge of the operating department of the Pittsburgh Coal Company since its absorption of the New York & Cleveland Coal Company, of which he was president.

The Machinery Markets

The nearness of the holidays is the prime cause of a general state of quietness in the machinery field. Little complaint is heard, as it is admitted that the season does not call for great activity. At the same time the volume of small orders has continued good. The taking of inventories and making of plans for 1912 are engrossing much of the attention of machinery users. Buying naturally is expected to come later. In New York and elsewhere anticipation of buying by the railroads does much to keep the trade cheerful. A list of good size is expected from the Delaware & Hudson in a week or ten days and another from the Delaware, Lackawanna & Western in the near future. Chicago reports considerable activity, specifying one sale of $15,000 worth of equipment, also sales of large tools for heavy duty. The South shows a continuation of favorable conditions and business there seems unaffected by the approaching holiday season. New England dealers are much encouraged by their November business, but are not over busy at present. Philadelphia conditions resemble those in New York. Detroit has had the usual booking of single tool orders and some good inquiries are out for next year's business. Cleveland has a fair volume of live inquiries pending which probably will not be closed this year. Cincinnati has had some minor inquiries from the New York Central Lines and its export business continues good. St. Louis, like the rest of the country, reports a good run of small orders. On the Pacific coast the feature of trade has been a movement of second-hand equipment. The coast has had some business from the railroads and conditions are somewhat improved.

New York

NEW YORK, December 13, 1911.

With the approach of the holidays, inventory taking and the time when many enterprises formulate plans for the new year, the machinery market is quiet, yet with a total volume of sales that is not unpleasing. It is pointed out, however, that trade could be much better. The demands are scattered and from widely diversified industries. The greatest interest is centered in probable developments of the near future. The Delaware, Lackawanna & Western and the Delaware & Hudson railroads have not issued their lists of requirements previously referred to. That of the Delaware & Hudson is expected within a week or ten days, as it is understood to be in the hands of the road's purchasing agent. The tools required are for the new shop at Watervliet, N. Y. The Delaware, Lackawanna & Western list is also expected at an early date. The new York Central and the Pennsylvania railroads have purchased a few machine tools but not enough to arouse more than passing interest. Ship yards on the Atlantic seaboard are busy, and New York machinery men believe that business may be looked for from that source in the not distant future as a result of the stimulation of shipbuilding in preparation for the opening of the Panama Canal. Industrial plants, through extensions and new building, are contributing fairly well to the general machinery trade.

D. Auerbach & Sons, candy manufacturers, 339 West Thirty-ninth street, New York, have begun the erection of a new plant at Eleventh avenue and Forty-sixth street. The building will be 200 x 200 ft., 11 stories, of fire proof construction. The power plant will include 2500 hp. in boilers, and as the machinery is to be electrically driven 1100 kw. in electric generators will be provided. The machinery requirements besides the power plant include elevator equipment, ice machines, and a complete line of candy making machinery.

The Brooks Typeline Casting Machine Company, New York, has been incorporated with $25,000 capital stock to manufacture type setting and type casting machinery. Byron Brooks, 111 Broadway, George H. Cook, 74 Broadway, and William T. Hoornagle, all of New York, are the incorporators.

Fire covering almost a block destroyed the paper box factory of the James Leo Company at Colden and Varick streets, Jersey City, N. J., December 4. The company, pending the adjustment of its losses, will equip temporary quarters at 111 First street, Jersey City, for the manufacture of its products. It is not yet determined whether the old site will be used or a new location selected for a new plant.

The Niagara Searchlight Company, Niagara Falls, N. Y., has been incorporated with $25,000 capital stock The company is equipping a building at Third and Falls streets for the manufacture of electric lights, fixtures, lamps, etc. The officers of the company are Robert H. Gittins, president; R. Ross Gessford, vice-president and R. Max Eaton, secretary-treasurer.

The Hardman Tire & Rubber Company, Belleville, N. J., has had plans prepared for an addition to its power plant and will install two new boilers and an engine of 250 hp.

Additions and enlargements are being made to a number of factories and manufacturing plants at Falconer, an industrial suburb of Jamestown, N. Y. Among the companies which have recently started work or are soon to begin work on such additions are the following: Odsonia Worsted Mills, Falconer Mirror Company, Lyndon Mirror Company, Elk Furniture Company, Supreme Furniture Company, Queen Mfg. Company, Jamestown Mantel Company and Chautauqua Planing Mill Company.

The New York Radiator Company, Utica, N. Y., is taking figures for a foundry building, 80 x 118 ft.; a machine shop 75 x 80 ft., two stories, and a warehouse 65 x 218 ft., two stories, all of brick and hollow tile, which it will erect on Turner street, that city.

A boiler house and laundry building, 43 x 120 ft., one story, is to be built and equipped by the Vassar Brothers Hospital, Poughkeepsie, N. Y.

The Beechnut Packing Company, Canajoharie, N. Y., is preparing plans for an addition to its plant, to be of reinforced concrete construction.

The Little Falls Felt Company, Little Falls, N. Y., has plans under way for the erection of a brick addition to its present plant.

The North Buffalo Hardware Foundry, a newly incorporated concern at Buffalo, N. Y., with temporary office at 28 Erie street, has completed plans for and will build and equip immediately a one-story foundry building 65 x 250 ft. at Hertel avenue and the Erie Railroad. The new company will specialize in small gray iron castings for the hardware trade.

The Augustine Rotary Engine Company, Buffalo, has completed a three-story addition to its plant at Elmwood avenue and the Erie Railroad, which it will equip with iron working machinery at once. Plans for a testing and pattern shop building have also been drawn, which the company will erect shortly.

The International Auto League Tire & Rubber Company, 270 North Division street, Buffalo, has commenced erection of its new plant for the manufacture of rubber tires at Northland avenue and the New York Central Railroad belt line.

Samuel C. Rogers & Co., Buffalo, have been incorporated with a capital stock of $50,000 by Oliver Cabana, Jr., M. J. Cabana and E. G. Mansfield to manufacture hardware supplies, etc.

New England

BOSTON, MASS., December 12, 1911.

The dealers feel a great deal encouraged by the totals of their November business. With some of them it is the largest month in the year, as was stated last week. There is a strong feeling that the conditions have really begun to improve, though it is not expected that December will be relatively large as compared with October and November, this being an inventory month when the natural tendency is to conserve resources in order that the statement for the year shall make a good showing. Some of the machine builders are do-

ing a very fair business, both at home and abroad. This report comes to Boston from various parts of the country. However, the older standard types of machinery are not affected by whatever improvement may have reached business as a whole.

The industrial stocks of Connecticut are showing an improved market. The Colt Patent Firearms Mfg. Company, Hartford, which lost 2 points in October, rose 5 in November and now stands at the highest of the year, 155 bid. The Union Mfg. Company, New Britain, gained 5 points in November to 70. The American Hardware Corporation rallied 4½ points to 137½ bid, 146 asked. The New Britain Machine Company advanced 3 points to 60; Landers, Frary & Clark, New Britain, 2 points to 92; Eagle Lock Company, Terryville, 1 point to 97; Stanley Works, New Britain, 1 point to 56; International Silver Company, Meriden, ½ to 113. The public service and bank stocks show an average increase which is equally a good sign.

While Boston and Portsmouth, N. H., would be seriously affected by the proposed concentration of navy yards at Narragansett Bay, the New England territory as a whole would be benefited by the change. The selling agencies of this section would become more important under their exclusive territorial rights. The idea of the Secretary of the Navy, as embodied in a recommendation to Congress, is that the navy would be much better served by three naval stations of the highest rank, than by a long list of small yards. The subject has been agitated for a number of years, but it was presumed that Boston would be one of the survivors as a main station, instead of as an auxiliary yard, as now planned. Narragansett Bay provides an ideal site because of the fact that the largest possible fleet could be given anchorage, and the harbor is already strongly fortified. Considered from the standpoint of economical production of navy yard work the concentration in modern shops conducted on a high class efficiency basis, would yield a tremendous saving. Narragansett Bay is in the territory of the Boston and Providence dealers who already supply the torpedo station at Newport. Their market should be largely increased if this change is made, for the one station would be much larger than the combined Boston and Portsmouth yards.

Some signs indicate a revival of the textile machinery industry but not on a large scale at present. The shops are somewhat more active, especially on certain rush orders. The textile industry itself is more prosperous in practically all of its branches so that the expectation is that the textile machinery people will be affected to an important extent before many months.

Much interest has been shown in the schedule of increase in wages for workmen as posted at the Boston Navy Yard. This is not a final settlement of the wage question, the list being in the nature of information to men in order that any protest or suggestion may be received from them. Various ratings are abolished, among them being anchor makers, reamers, iron rollers, tool makers, tool sharpeners and ore workers. The changes include the following:

Boilermakers—Now $3.60, $3.44, $3.20, $3.04; proposed, $3.76, $3.52, $3.28, $3.04.
Iron calkers and chippers—Now $3.12, $2.88, $2.64, $2.40; proposed, $3.36, $3.12, $2.88, $2.64.
Coppersmiths—Now $3.84, $3.60, $3.36, $3.12; proposed, $4, $3.76, $3.52, $3.28.
Drillers—Now $2.80, $2.56, $2.24, $2; proposed, $3.04, $2.80, $2.56, $2.32.
Millmen—Now $3.04, $2.80, $2.56, $2.32; proposed, $3.25, $3.28, $3.04, $2.80.
Pipefitters—Now $3.60, $3.36, $3.12, $2.88; proposed, $4, $3.76, $3.52, $3.28.
Riveters—Now $3.12, $2.88, $2.64, $2.40; proposed, $3.36, $3.12, $2.88, $2.64.
Shipwrights—Now $3.52, $3.28, $3.04, $2.80; proposed, $3.76, $3.52, $3.28, $3.04.
Tooldressers—Now $3.36, $3.12, $2.88, $2.64; proposed, $3.52, $3.28, $3.04, $2.80.
Tool machinists—Now $3.76, $3.52, $3.28, $3.04; proposed, $4.00, $3.76, $3.52, $3.28.

The Kerite Insulated Wire & Cable Company, Seymour, Conn., has awarded the contract for an addition to its factory, 20 x 120 ft., one story and basement.

The Sprague Meter Company, Bridgeport, Conn., will erect a factory building, 60 x 168 ft., three or four stories, of steel construction.

The B. T. Green Shipbuilding Company, Chelsea, Mass., has taken a lease of the Nat's Point shipyard at Stonington, Conn., and will operate the plant for shipbuilding. The yard was recently used by the Atlantic Shipbuilding Company. It is said that the new lessees will build a marine railway on the property.

The Fish Indicator Company, New London, Conn., has been incorporated with a Connecticut charter and a cash capital of $20,000, and has established a factory in that city for the manufacture of marine indicators. The incorporators are Edwin A. Fish, New London, who is president; George E. Fellows and Lewis R. Church, Norwich, Conn. The company states that it has purchased all the equipment that it will need at present.

The United States Metal Screen Company, Norwalk, Conn., which has taken floor space in the factory of the Joseph Loth Company on Grand street, is having machinery built for the manufacture of metal screens and expects to install it in the near future. The company will start business on a moderate scale with the expectation of increasing its output in a large way as time goes on. The product is the invention of F. S. Banks of Wilton, Conn.

Harry G. Stoddard, the retiring president of the Trenton Iron Company, Trenton, N. J., who has acquired an interest in the business of the Wyman & Gordan Company, Worcester, Mass., manufacturer of drop forgings, will be made a director and vice-president of the corporation, and will occupy the office of sales manager. Lyman F. Gordan continues as president and treasurer and George F. Fuller remains as secretary and will hereafter be the general manager, instead of superintendent as at present.

The Waterbury Metal Products Company, 23 Jefferson street, Waterbury, Conn., has established a factory for the manufacture of small metal goods such as are turned, cut and drawn and stamped. John B. Wallace, Jr., is the president and F. A. Coppelt, Jr., secretary and treasurer.

Philadelphia

PHILADELPHIA, PA., December 12, 1911.

As the year end approaches the volume of business transacted gradually eases off, prospective buyers in many cases deferring the actual placing of orders until after the turn of the year. The contrary is noted in reference to inquiries. A very fair amount of what is considered bona fide inquiry for various classes of equipment is being received, not so much for the general line of machine tools as for special equipment, including cranes, particularly of the larger electric traveling type. In addition there is about the usual amount of inquiry covering probable early 1912 needs, for which data are being gathered to be presented to officers and directors, in connection with the usual annual reports.

Buying during the week has not been very active, transactions having been confined to small lot and single tool purchases, mostly in the smaller lines of equipment. While the movement in special tools has been light, indications for a better volume of business are observed. There is still an absence of anything of importance from the railroads, although the trade is encouraged by the continued activity of railroad buying in other directions, which will ultimately have some bearing on the machinery market.

Second hand machinery merchants report a fair run of miscellaneous buying. Considerable business in power equipment is before the trade, but closes slowly. Little new demand is reported in connection with the export trade. The situation in the foundry trade is still irregular, some of the jobbing foundries have taken a fair amount of work, but the demand for machinery castings continues light. Steel casting plants report unchanged conditions.

A building used for the storage of patterns at the foundry of the Niles-Bement-Pond Company at Nicetown was destroyed by fire December 8. A number of the patterns were saved. No damage was done to any other department of the plant, operation of which will not be interrupted.

The Hershberger Removable Calk Horseshoe Company, Wilkes-Barre, Pa., has been incorporated with a capital stock of $25,000 to manufacture horseshoes, metal implements, drop forgings and electrical appliances. It is the intention of the company to equip a plant in the very near future. The officers are: President, F. A. Wiltraut; vice-president, J. H. Hershberger; secretary, J. W. Thomas; treasurer, A. S. Hershberger.

The Reading Steel Casting Company, Reading, Pa., which has let a contract for the erection of a new pattern shop and office building, advises that it is not in the market for any new equipment for the pattern shop.

The Baldwin Locomotive Works, which has in contemplation the erection of a considerable addition to its erecting shop at Eddystone, Pa., has been sending out inquiries for its crane equipment.

The New Process Steel Company, Lancaster, Pa., has in contemplation the erection of a considerable ad-

dition to its plant. Developments have not advanced sufficiently to state what the improvements will cover.

The Sweets Steel Company, Williamsport, Pa., has recently increased its capital stock to $340,000 and has made extensive improvements to its plant, including a new power plant, two new mills and two continuous heating furnaces, together with the necessary equipment of shears, conveyors, etc. This company advises that it is now prepared to turn out a complete line of bars and special shapes.

The Fidelity Machine Mfg. Company, of this city, has been incorporated with a capital stock of $25,000 and will engage in the manufacture of textile as well as general special machinery. A plant has been acquired in Frankford and it is expected that it will be in operation at an early date. John J. Higginbottom, 2021 East Huntington street, is interested in the new concern.

The Lancaster Foundry Company, Lancaster, Pa., has completed arrangements for the installation of a nickel-plating plant and has under consideration the addition of several special lines to its present range of products.

The C. H. A. Dissenger & Bro. Company, Lancaster, Pa., notes an improved demand for its line of stationary as well as portable gasoline engines. This company has practically completed the construction and equipment of its new plant. The foundry department has not yet been operated, but is expected to be started at an early date. The purchase of general equipment for the foundry is now being considered.

The Tabor Mfg. Company reports a decided improvement in the demand for molding machinery and has booked sufficient business to enable it to resume plant operations at full time. The demand for its line of Taylor-Newbold inserted tooth cold saws continues very good. The erection of its proposed new plant in the northwestern section of the city will be started, it is stated, early in the spring.

Rowland, Firth & Son, Phillipsburg, N. J., have about completed the erection of their new steel foundry department, which has been equipped with a 10-ton open hearth furnace and which they expect to have in operation by January 1.

The Lancaster Machine & Structural Works, Lancaster, Pa., is operating its plant at about 50 per cent. of its capacity, although the foundry department is more fully engaged. This company has a large amount of work under way in connection with fire escapes in Washington, D. C., involving work on 25 apartment houses. The company has a well equipped structural shop and its foundry has a capacity of 18 tons a day. It is now considering the installation of a sand blast cleaning system in its foundry department.

Catalogues Wanted.

The Hudson Supply Company, Wilmington, Del., desires catalogues from manufacturers of mill supplies, comprising packing, belting, files, emery wheels, bolts, nuts, washers, etc.

Chicago

CHICAGO, ILL., December 12, 1911.

The local demand for machine tools continues to improve. The purchase of a complete machine shop equipment for the new manual training school at Guthrie, Okla., from Jos. T. Ryerson & Son is noted. In addition to this sale, which totaled in the neighborhood of $15,000, the same company has disposed of several smaller lots of tools. Some of the railroads are still hampered by lack of money to purchase needed equipment for their shops, but the tendency seems to be toward a general financing of their needs, and during the past week one road which has had a large list under consideration for several weeks past is understood to have made a considerable advance toward closing. The Illinois Central requirements remain unfilled. In Chicago and the neighboring suburbs the week witnessed the buying of an encouraging number of large tools for heavy duty.

Chas. F. Borvey has taken out a permit to erect a two-story brick factory at 401 West Superior street to cost $25,000.

The F. A. L. Auto Company, Chicago, has been incorporated, with a capital stock of $2,500, to manufacture and deal in motor vehicles, etc. The incorporators are Frederick C. Harboer, Clinton S. Lamb and E. E. Lundberg.

The capital stock of the Palmetto Metal Company, East Moline, Ill., has been increased from $100,000 to $500,000.

Simkin Mfg. Company, Chicago, has been incorporated with a capital stock of $25,000 to manufacture and deal in automobiles, automobile accessories, etc. The incorporators are Albert J. Elliott, H. Prather Elliott and John T. Evans.

C. E. Whitehead Time Recorder & Supply Company, Chicago, has been incorporated with a capital stock of $2,500 to manufacture time recording machines. The incorporators are Charles W. Whitehead, James B. Phelan and Helen L. Smith.

The Keokuk Electric Railway Company, Chicago, has been incorporated with a capital stock of $650,000 to operate railways and produce and distribute gas, electricity, etc. Incorporators are George Higginson, Jr., Joseph L. Valentine and Robert H. Van Deusen.

Duplex Motor Plow Company, Chicago, has been incorporated with a capital stock of $5,000 to manufacture agricultural implements, machinery, etc. The incorporators are Howard W. Lewis, Herschel V. Shepard and Joshua H. Lewis.

American Sheet Metal & Machinery Company, Chicago, has been incorporated with a capital stock of $10,000 to do a general iron and steel foundry business. Incorporators are Albert W. Schulz, Hans C. Rosnes and Harry C. Kinne.

The Atchison, Topeka & Santa Fé Railroad has acquired a site at Peoria, Ill., for a terminal, at which point machine shops will be built.

E. J. LeHew, Galesburg, Ill., is seeking a franchise to supply light and power to the village of Williamsfield, Ill. He contemplates installing a $6,000 steam and electrical plant.

The Kaiserman Shade Roller Company, Kankakee, Ill., has been awarded a factory site by the Commercial Association of that city and a new plant will be erected.

The Hackney Mfg. Company, St. Paul, maker of farm implements, has acquired property at University avenue and Houston street, upon which a factory building will be erected at a cost of $100,000.

The Hamm Brewing Company, St. Paul, Minn., is to erect a machine and blacksmith shop on Cable avenue, in that city, at a cost of $12,000.

The Hay Tool Mfg. Company, Council Bluffs, Iowa, whose plant was recently destroyed by fire, has had plans prepared for a new building, 40 x 100 ft., which will be equipped with electric motors.

The city of Decatur, Ill., will receive bids until December 28 for furnishing engine and 100-kw. generator, switchboard and other equipment. Albert Leach is city clerk.

Cleveland

CLEVELAND, OHIO, December 12, 1911.

Business with the local machine tool dealers the past week has been confined mostly to single tools, for which there is a fair demand. Larger sales were limited to 2 or 3 tools. No new inquiries of any size have appeared. The railroads are doing very little buying, although the New York Central Lines have an inquiry out from Cincinnati for 3 or 4 bolt cutters and drill presses. The demand for second hand tools is not active. Orders for turret lathes have improved this month, the demand coming from scattered sources outside of the automobile trade. The automobile builders, some of whom bought considerable machinery during the fall, appear now to be well supplied with machinery, and very little business is now coming from this source.

The demand for power plant equipment is quiet as far as the placing of orders. A good volume of live inquiries is pending but very little of this business is expected to be placed until after the first of the year.

The Ohio Machine & Boiler Company, Cleveland, builder of boilers, tanks, clam shell buckets and other work, has commenced the erection of a new plant on a new site at 1503 University avenue. The building will be 120 x 245 ft. One section will be used as a machine shop and the other as a boiler shop. The machine shop portion will be two stories. The new plant will enable the company to largely increase its output. No new machinery will be required.

The Cleveland Foundry Company, maker of oil stoves, is completing a large addition to its plant. The company reports a very satisfactory volume of business. The plant is being run full with some overtime work to keep up with orders.

The Defiance Pressed Steel Company, Defiance, Ohio, has completed additions to its plant, which will practically double its capacity. The plant now has a capacity of 1200 steel boxes per day. Further improvements are under consideration.

The National Electric Lamp Company, Cleveland, is planning the erection of a new plant in Youngstown, Ohio.

Plans for a new shoe manufacturing plant to be erected by the G. Edwin Smith Shoe Company, Columbus, Ohio, are being prepared by Richards, McCarty & Bulford, architects, of that city. The company expects to build an eight-story reinforced concrete fireproof structure on a site recently purchased on Water street. The company has increased its capital stock from $200,000 to $350,000.

The Water Commissioners, Erie, Pa., will build a shop and storage building, 60 x 100 ft. and two stories. A crane will be installed for handling pipe and other material. Armin Schottee is the architect.

The Erie Forge Company, Erie, Pa., will enlarge its plant. Plans provide for a machine shop of steel construction, a pattern shop and other buildings.

James M. Ashley, Toledo, Ohio, has been elected president of a company that proposes to build a dam across the Ohio River at Lotart Falls, Meigs County, and build a large power plant to furnish electrical power in the southern part of the State.

The Columbus, Urbana & Western Railway has applied to the Public Service Commission for authority to issue $50,000 additional in stock and $5,500,000 in bonds for extensions of its lines from Columbus to Findlay, Ohio, and from Kenton to Wapakoneta.

The Scherzer Rolling Lift Bridge Company, Chicago, is the low bidder on a bascule span on the Cherry street bridge, Toledo, Ohio.

The Pittsburgh Valve & Fittings Company will erect a one-story addition, 60 x 560 ft., to its foundry at Barberton, Ohio.

The Attwood Wrench, Tool & Stamping Company, Conneaut, Ohio, has increased its capital stock from $25,000 to $150,000.

The Myers Nonspreading Rail Company, Toledo, Ohio, has been incorporated with a capital stock of $10,000 by Wellington T. Huntsman and others.

The Cleveland Wire Fence Company, Cleveland, Ohio, has been incorporated with a capital stock of $75,000 by Elmer G. Derr and others.

The American Metal Specialties Company is the name of a concern just incorporated in Columbus, Ohio, with a capital stock of $10,000 by Arthur M. Crumrine and others.

The General Steel Products & Supply Company, Toledo, Ohio, has been incorporated with a capital stock of $100,000 by E. J. Marshall and others.

A large central power plant for operating a number of coal mines will be built at Shelby, Ky., by the Consolidation Coal Company, Fairmont, W. Va. It is stated that it is the intention to eventually have a plant of 5000-kw capacity. Among the purchases already reported for the plant are six 430-hp Rust vertical boilers, stokers from the Detroit Stoker Company, Detroit, Mich., and Foster superheaters from the Power Specialty Company. The buying of the equipment is in the hands of A. T. Watson, purchasing agent.

Cincinnati

CINCINNATI, OHIO, December 12, 1911.

As the holiday season approaches there is a reported slackening in the buying of machine tools, but inquiries on file indicate that an excellent business may be expected soon after the first of next year. The export trade continues to hold its own, and many manufacturers in this section are making plans for going after this particular business in a more vigorous manner.

There is a lull in the second-hand machinery demand, which is usual at this time of the year. The foundries are operating at about the same rate of capacity as has been reported for the past four weeks.

The Superintendents and Foremen's Club of Oakley, Ohio, held a meeting on the evening of December 5 in the newly finished auditorium hall of the Cincinnati Milling Machine Company. In addition to the regular routine business transacted, an amendment to the by-laws was passed admitting members who were not connected with the Oakley plants. This amendment enabled C. W. Moon, secretary of the club, who has lately gone with the R. K. LeBlond Machine Tool Company, in East End, to retain his membership in the organization.

The Springfield Tire & Rubber Company, Springfield, Ohio, has increased its capital stock from $50,000 to $150,000, and it is rumored will make some additions to its factory some time next year.

The Prince Motor Car Company has been incorporated at Warrensville, Ohio, with $200,000 capital stock, for the purpose of manufacturing motor cars. Among the incorporators are W. F. Kehnes, Thomas J. Atkinson and J. A. Hecker, all of Warrensville.

The Ashland Steel Company, Ashland, Ky., has had plans made up for some improvements to its plant at that point.

It is rumored that the Ironton Electric Company, Ironton, Ohio, intends purchasing the Ohio Valley Electric Company, and will construct a large central generating plant some time next year.

The Bluffton Mfg. Company, Bluffton, Ohio, has been incorporated with $60,000 capital stock to manufacture tools and implements. Among the incorporators are A. D. Lugibihl and H. D. Zehrbach, both of Bluffton.

C. A. Kurz, formerly local manager at Dayton, Ohio, for the C. C. Kaven Company, Chicago, has opened a chemical and metallurgical laboratory in the Patterson Building, Dayton, under the name of the C. A. Kurz Chemical Laboratories. A little later some special apparatus will be required to fit up a department for making physical tests of different metals.

One of the largest cigar factories in the country is now under construction at Evansville, Ind., for H. Fendrich. The new structure will be 241x464 ft., of brick, and mill construction. The main part of the building will be three stories. In addition to heating equipment, some electrical machinery will be required.

The Dresden Mill Company, Dresden, Ohio, was recently incorporated with $15,000 capital stock, and will probably erect a small flour mill. T. P. Perkins is named as one of the principal incorporators.

The Standard Pulley Company, Cincinnati, has acquired additional property adjoining its plant, and it is reported that some extensions will soon be made to its factory in Cumminsville.

The Jolliffe Coal & Coke Company, Fairmont, W. Va., has been incorporated with $150,000 capital stock, with the announced intention of mining coal and manufacturing coke. M. A. Jolliffe and Jacob S. Hayden are named among the incorporators.

Detroit

DETROIT, MICH., December 12, 1911.

The market for the first week in December bears out the indications that the present inactivity in the machine tool trade will continue until after the first of the year. The usual run of single tool orders are being booked but no propositions of importance are in sight. Some inquiries for future requirements from local manufacturers are noted and merchants are hopeful of renewed activity early in January. A better volume of business is being noted among the manufacing machinists in the way of special equipment for the automobile accessory companies. A seasonable dullness is noticeable in the demand for boilers. The second hand machinery trade, reflecting the general trade, is not active and dealers' stocks are piling up.

The automobile and accessory plants are busy, and are steadily adding men to their payrolls, with a resultant increase of output which presages future machinery requirements. Local railway equipment companies are receiving their share of orders for building new cars and the shipbuilding companies have bookings which will keep their plants busy throughout the coming year. Other lines of industry are under full headway and skilled mechanics are in demand. New construction is of negligible quantity.

The Briggs-Detroiter Company has been incorporated with a capital stock of $200,000 to manufacture automobiles. The principal stockholders are John A. Boyle and Claude S. Briggs. The new company has secured a site of about two acres in the Hamtramck factory district on which a large building has already been erected and consideration is now being given to the question of equipment, in order that manufacturing operations may be begun in the near future.

The Chevrolet Motor Company has filed amended articles of incorporation increasing its capital stock from $100,000 to $2,500,000. Officials of the company state that, contrary to current rumors, the increase in capital will not be utilized to acquire other companies but to enable the original company to engage in business on a more extensive scale.

The Wolverine Motor Supplies Company, manufacturer of automobile accessories, has increased its capital stock from $10,000 to $25,000.

The Weir-Horton Mfg. Company has been incorporated with a capital stock of $25,000 for the purpose of manufacturing and dealing in automobiles, motor cycles and gasoline engines.

The Prince Nut Lock Company has been incorporated with a capital stock of $150,000 by John D. Prince and others for the manufacture of nut locks.

The Lockwood-Ash Motor Company, Jackson, Mich., has purchased the business of the Never-Miss Mfg. Company, of Lansing, manufacturer of gas engine ignition specialties, and will move the plant to Jackson where it will occupy a new addition, 60 x 80 ft., to the Lockwood-Ash factory.

The plant of the National Chicory Company at Bay City, Mich., recently destroyed by fire, will be rebuilt on a larger scale, and the new factory will be of fireproof construction.

The Apex Horseshoe Company, Albion, Mich., which has heretofore had its products manufactured by contract, is contemplating the erection of a factory building at Albion.

Anderson Bros., owners of the electric lighting plant, Hartford, Mich., are seeking a renewal of their franchise. The new franchise will contemplate improvements, amounting to a complete remodeling of the power plant.

The Nichols & Shephard Company, Battle Creek, Mich., manufacturers of threshing machines, is about to build a new iron foundry.

The Commonwealth Power Company which owns a chain of power companies in central Michigan cities, with headquarters at Jackson, has been authorized by the State Railway Commission to issue bonds to the amount of $1,860,000. One million dollars of the issue is for refunding purposes and the remainder is for the stated purpose of making improvements in the several plants of the company, as follows: Saginaw Power Company, $90,000; Bay City Power Company, $27,000; Pontiac Power Company, $36,000; Flint Power Company, $54,000; Consumers Power Company, Owosso, $36,000; Commonwealth Power Company, Jackson, $72,000; Grand Rapids-Muskegon Power Company, $450,000. It is announced that the company expects to spend at each plant amounts in excess of the bond issues proposed therefor.

The Grand Trunk Railroad will double the capacity of its car shops at Port Huron, Mich. A large part of the machinery to be installed will be brought from the shops of the company in other cities.

The plant of the defunct Ypsilanti Underwear Company at Ypsilanti, Mich., has been sold to the Oak Knitting Company of Syracuse, N. Y. The plant comprises four large buildings and a considerable amount of new equipment will probably be required as a large part of the machinery has been heretofore disposed of by the receiver for the Underwear Company.

The P. J. Smith Machine Company, Monroe, Mich., manufacturer of glue presses and special veneering machinery, will transfer its business to Bay City, Mich., and merge its plant with that of the MacKinnon Boiler & Machinery Company. The company will erect several new buildings. The first, a foundry, about 50 x 200 ft. will be begun in the early spring.

The I. Stephenson Lumber Company, Escanaba, Mich., lumber manufacturer, has increased its capital stock from $600,000 to $800,000.

The Ottawa Leather Company, tanners, Grand Haven, Mich., has increased its capital stock from $100,000 to $200,000 with a view of extending the scope of its business.

George M. Winegar and H. Van de Greyn of Lowell, Mich., have organized a company for the manufacture of manual training benches and other furniture specialties. A factory has been secured and will be equipped at once.

The Board of Education, Hancock, Mich., is in the market for a boiler to be installed in the high school of that city.

The Washed Gravel & Sand Company, Dayton, Ohio, has purchased a large tract of gravel land near Jackson, Mich., and will erect a plant to cost, it is stated, about $75,000 for the preparation of building and road-making materials.

A new company to be known as the Saginaw Gas & Oil Company is being organized by L. K. Davis and H. L. Thompson of Ulrichville, Ohio, to develop a large tract of oil land near Saginaw, Mich.

Robert J. Hill Houghton, Mich., is interested in the organization of a new company to establish a beet sugar factory in that city.

The Saginaw Wood Products Company, Saginaw, Mich., is in the market for motors from 3 to 30 hp., alternating current 250-volt 60-cycle three-phase, either new or second hand.

The Standard Foundry & Mfg. Company, Alma, Mich., recently mentioned as having been incorporated, has had plans prepared for a foundry building, 44 x 60 ft., one story, and a machine shop, 40 x 200 ft., one story. The company will be in the market soon for an electric crane and a steam or gasoline engine.

Indianapolis

INDIANAPOLIS, IND., December 12, 1911.

The J. Q. Clarke Tank Company, Parksville, Ind., recently incorporated to manufacture tanks, fountains, silos, etc., has had plans prepared for a factory building, 60 x 100 ft., of brick construction, and will equip it with modern machinery for the manufacture of its product.

The T. W. Warner Company, Muncie, Ind., has had plans prepared for a factory building, 60 x 100 ft., two stories, and a power house, 25 x 30 ft., one story, to cost approximately $20,000.

The Empire Gear Company, Indianapolis, recently organized with $20,000 capital stock, has elected the following officers: President, Frank S. Clark; vice-president, Charles H. Hurd; secretary, Howard M. Talbott; treasurer, Albert H. Off; general superintendent, Wesley Haufler. The advisability of increasing the capital stock to $250,000 is being discussed. Motors, transmissions and other automobile parts will be manufactured.

The Orinoce Furniture Company, Columbus, Ind., has increased its capital stock from $25,000 to $50,000.

The Indiana Brass Company, Frankfort, Ind., has been incorporated with $10,000 capital stock, to manufacture brass and iron goods. The directors are J. A. Johnson, C. E. Williams and A. J. Johnson.

The S. S. Cox Show Case Company, North Manchester, Ind., has issued $5000 of preferred stock, increasing its total issue from $65,000 to $70,000.

The Industrial Board of Newcastle, Ind., is negotiating with the McDonald Brothers Pitless Scale Company to move its main factory at Pleasant Hill, Mo., to this city and consolidate it with the branch here.

The Muncie Ornamental Iron Works, Muncie, Ind., has been incorporated with $10,000 capital stock, to manufacture structural iron, etc. The directors are C. W. Hanika, John Fitzgibbons and C. B. Fitzgibbons.

The South

LOUISVILLE, KY., December 12, 1911.

More favorable conditions continue to be reported by the leading machinery manufacturers. Not only are inquiries coming in as rapidly as ever, but orders are being closed with apparent disregard of the usual tendency to wait until the first of the new year. Power equipment, including motor installations, are probably the leading factors at present, while the number of wood-working developments in this section seems to offer assurances of heavy business for the manufacturers of equipment of this character.

The Board of Commissioners for the new city hospital of Louisville will receive bids until January 4 for the construction and equipment of the plant. In addition to power machinery, the hospital requirements include refrigerating apparatus, a steam heating plant, electrical equipment and laundry machinery.

The Jefferson Woodworking Company, Thirtieth street and Grand avenue, Louisville, is erecting an addition to its plant. A brick and frame building is being put up, and a considerable amount of wood-working machinery will be bought, the estimated cost of which is $5,000. A contract for a 150-hp. boiler has been let to C. J. Walton & Son of Louisville, and an order will be placed shortly for a 90-hp. engine. The company manufactures table slides.

The James Clark, Jr., Electric Company, Louisville, reports heavy business at present. It has been given the contract for a generator and engine to be installed in the plant of the Jellico Light, Heat & Power Company, Jellico, Tenn., the equipment consisting of a 200 k.v.a. alternator, 2300-volt, 3-phase, direct connected to a Skinner engine. The company has also received the order for 57 individual motors to be installed in the planing mill and wood-working plant of the Alfred Struck Company, Louisville, which is converting its plant from steam to electric current. An aggregate of 500 hp. is involved.

The American Automobile Mfg. Company, New Albany, Ind., is now installing machinery in connection with the proposed manufacture of a line of motor trucks ranging in load capacity from 500 pounds to

three tons. The first named will be a three-wheeled package car. George A. Buckley is now superintendent of the plant, having succeeded C. D. Norris.

D. C. Mullins & Son, Partridge, Ky., have announced plans for the construction of an electric light and power plant at Whitesburg, Ky. This town is situated in Letcher county, in the extreme eastern part of the state, and is some distance from a railroad. The firm has stated that ample capital for the undertaking has been provided.

Anderson & Frankel, Lexington, Ky., have been retained for the purpose of designing the electric light plant of Falmouth, Ky., for which the proceeds of a $7,500 bond issue will be spent.

Work has been begun on the main turbine power station of the Lexington Utilities Company, a subsidiary of the Kentucky Traction & Terminal Company, Lexington. The plant is of the design of Sargent & Lundy, Chicago. Most of the machinery has been bought.

The Harlan Coal Company, Harlan, Ky., is building a power plant and purchasing equipment in connection with the development of its property on Clover Fork, near Harlan. A daily capacity of twenty cars of coal is to be provided for.

The Huntington Handle Company, Huntington, W. Va., will build a hickory handle factory at West Liberty, Ky., the site for the plant having been secured. W. O. Smith, superintendent, is in charge of the erection of the factory.

The Waller Mfg. Company, Lexington, Ky., is increasing its capital stock and plans to enlarge its factory for the manufacture of furniture, tobacco hogsheads, etc.

The plant of the Ritchey Mfg. Company, McMinnville, Tenn., which was recently burned, is to be rebuilt. The company wants a boiler and engine as well as wood-working machinery especially adapted to the manufacture of telephone pins.

The Allen Engineering Company, Memphis, Tenn., has been awarded a contract for the construction of the water works and electric light plant of Trenton, Tenn. The cost of the plants will be a little over $17,000.

Craig & Fisher, Covington, Tenn., have the contract for the construction of the water system of Union City, Tenn., the cost being $18,000.

The power plant of the Jackson Railway & Light Company, Jackson, Tenn., is to be enlarged in the near future. A steam turbine is to be installed. The estimated cost of the new building is put at $30,000.

The Improved Brick Stone Company, Memphis, Tenn., has been organized, and a plant is to be erected for manufacturing a new process brick. The probable cost of the plant is $10,000, and it will have a capacity of 10,000 bricks a day. W. L. Sanderson is manager of the company.

The Emory & Henry College, Johnson City, Tenn., is planning the installation of a lighting plant, as well as heating facilities. S. E. Vaught is in charge of the work.

J. B. Short, Humboldt, Tenn., and other have raised subscriptions amounting to $75,000 for the erection of a cotton oil mill to take the place of that recently burned at Trenton, Tenn.

H. B. Lindsay, an attorney of Knoxville, Tenn., is responsible for the statement that the Aluminum Company of America has purchased power rights on the Little Tennessee river in Tennessee and North Carolina and will shortly proceed with the erection of several immense hydro-electric plants. Mills for producing aluminum in Eastern Tennessee are also in contemplation, Mr. Lindsay has stated.

The Chattanooga Manufacturers' Association, Chattanooga, Tenn., is interested in the extension of manual training courses in the public schools of that city and recently arranged a lecture on the subject of "The Duty of the Public to Industrial Education," which was delivered by Prof. Carroll G. Pearse. Manual training courses were recently put in operation in the Chattanooga high schools.

The Southern Ice Company of Delaware has been incorporated with a capital stock of $5,000,000 for the purpose, it is reported, of building a chain of ice factories in Tennessee and other states. It has filed its charter also at Nashville, Tenn. J. H. Howe and others of that city are interested.

It is reported from Nashville, Tenn., that the Nashville Railway & Light Company has planned the expenditure of several hundred thousand dollars during 1912, a power-house being one of the projects under consideration.

The Great Falls Power Company, Nashville, Tenn., expects to begin work in the next few months on the development of a power project at Caney Forks Falls.

J. Frank White and others, Knoxville, Tenn., have purchased 800 acres of coal land near Jellico, Tenn., and are now forming a company which will develop the property.

The Board of Trustees for the Central Hospital for the Insane of Tennessee, with offices at Nashville, will let contracts shortly for an 8-ton refrigerating plant, a 75-kw. generating unit and fire equipment, including a service pump, mains, hydrants, etc. C. S. Brown, Nashville, is consulting engineer.

The Knoxville Wonder Gas Plant Company, Knoxville, Tenn., plans the erection of a plant to manufacture machines for treating kerosene. C. K. Vance, W. S. Needham and G. J. Dominick are interested.

Work is soon to begin on the new millwork factory of the Southern Mfg. Company, Gadsden, Ala. A sawmill is to be erected later on.

The Stapp-Bass Lumber Company, Chelsea, Ala., is erecting a planing mill. Besides wood-working equipment, boilers will be wanted.

The Sisal Hemp & Development Company, Jacksonville, Fla., is in the market for a 200-hp. electric power plant for installation in a rope mill.

Charleston, S. C., is considering putting into effect plans for a $2,000,000 water plant, including the erection of a pumping station, reservoir, etc., and the laying of 9½ miles of 24-in. cast-iron pipe.

Work has been begun on the new plant of the Oklahoma Rolling Mill Company, Guthrie, Okla. The plant is to have a daily capacity of 40 tons. C. H. Martindale, vice-president of the company, is in charge of the erection of the plant.

The Amalgamated Phosphate Company, Chicora, Fla., plans the erection of a plant with a daily output of 1500 tons of phosphate. In connection with the development, an electric light plant, water works and sawmill are to be erected. Anton Schneider, Bartow, Fla., is manager of the company.

The Mayor and Council of Unadilla, Ga., will receive bids until December 20 for the construction of a sanitary sewerage system. The bids call for 1½ miles of 6 and 8-in. water mains and appurtenances, an 80-hp. boiler, pumping engine and air lift installation. The J. B. McCrary Company, Atlanta, Ga., is engineer in charge.

The Hickory Chair Mfg. Company, Hickory, N. C., has been incorporated with $150,000 capital stock to take over the business of the Surry Chair Company, Elkins, N. C. The company is having buildings erected at Hickory and will remove its equipment as soon as they are completed.

St. Louis

ST. LOUIS, MO., December 11, 1911.

The approach of the close of the year has had some slight effect on the machine tool market, although there is still a fairly good run of buying of the character which has been noted in recent weeks. The large buyers remain persistently out of the market except for occasional single machine needs. The smaller buyers are doing very well, all things considered, but comparatively little business out of what has come to be considered the ordinary, of the present day, is expected until after the first of the year and the balancing of the books for 1911.

The Pope Tin Plate Company, Steubenville, Ohio, is considering the matter of establishing a large branch manufacturing plant in St. Louis to take advantage of the freight rates in distribution.

The Inland Type Foundry, one of the largest manufacturers of type and other printers' supplies in the country, will remove January 1 to Jersey City, N. J. The company employs about 300 hands, most of whom will remove with the factory.

The Southern Mining Company, with offices in Williamsburg, Ky., has acquired under lease all the coal land and mine holdings of the Asher Coal Company of Wasioto, Ky., and will increase the equipment. About $500,000 will be spent for equipment, and among the purchases of machinery will be a central electrical plant with a 500-kw. generator.

The D. F. McCarthy Coal Company, Cairo, Ill., has been incorporated with $25,000 capital stock by R. L. and D. F. McCarthy and F. J. Walter and will equip a mine in the vicinity with machinery.

The Spring Valley Gas & Electric Company, with $300,000 capital stock, has been incorporated at Spring Valley, Ill., by C. and C. H. Brown, Harry E. Brown and

Roy W. Brown for the development of public service plants at that point.

The Norman Land & Mfg. Company, Huntersville, Mo., has been incorporated with a capital stock of $20,000 by W. W. Norman and J. R. Kinder. The company will equip a manufacturing plant at once.

The Lilbourn Screen & Power Company, Lilbourn, Mo., has been incorporated with $50,000 capital stock by L. L. Thompson, Oscar Crosne and S. L. Trisley, and will equip a plant for the manufacture of patent screens.

The Long Silent Motor Company, Kansas City, Mo., has been incorporated with $12,000 capital stock by Elmer C. Long, Frank R. Tate and Theodore Moreno for the manufacture of a new type of gasoline motor for automobiles.

The Joplin Novelty Mfg. Company, Joplin, Mo., has been incorporated by John Odell, Charles L. Moon and Charles Odell with $20.000 capital stock, and will equip a manufacturing plant soon.

The Swanson-St. Louis Plow Company, St. Joseph, Mo., has been incorporated with $175,000 capital stock by G. H. Vineyard, H. S Swanson, William Kelley and others for the manufacture of plows and other agricultural equipment.

The Union Special Machine Company of Illinois, with $500,000 capital stock, has been authorized to use part of its capital in a plant at St. Louis.

The Quincy Motor Company, Quincy, Ill., with $50,000 capital stock, has been incorporated by Carl Becker, John Weisenborn, D. F. Hunaker and Thomas Quinlan for the manufacture of motors.

The Akin Steel Tire & Mfg. Company, Sumner, Mo., has been organized with $300,000 capital stock by J. H. Akin, J. D. Stoner and C. M. Hooper, and will equip a plant for the manufacture of a new type of tire.

The New Dividend Mining Company, Joplin, Mo., has been incorporated with $48,000 capital stock for the purpose of equipping mining property owned by the company. The incorporators are E. C. Dunmeyer, E. H. Reseuer, S. A. Smith and others.

The Everlasting Fence Post Company, Kansas City, has been incorporated with $100,000 capital stock by J. T. Smith, Edwin L. Miller and F. P. Van Hook for the manufacture of a metal post. A manufacturing plant will be built.

The prison factories at Huntsville, Texas, which were burned recently, will be rebuilt and equipped with machinery by the state at a cost of $250,000, which will be raised on deficiency warrants issued without calling the legislature together.

Hert Eichkorn and George Cederwall, St. Louis, have purchased ground on which they will build a plant for the manufacture of stairs, staircases, window sashes, etc. The mechanical equipment will be placed shortly. The building will cost $15,000.

John T. Milliken & Co., manufacturing chemists, will build a $100,000 manufacturing plant and laboratory in St. Louis. The mechanical equipment required will be placed shortly.

The Kansas Flour Milling Company, Topeka, Kan., has been incorporated with $9,000.000 capital stock, and will merge plants at Wellington, Great Bend, Arkansas City, Enterprise and Kansas City, Kan.

Mountain Grove, Mo., voted last Monday to issue bonds for the construction of a water works system in that city. The Mayor and the City Council will let the contract shortly.

The Boyd-Prigmore Milling Company, Sarcoxie, Mo., has been incorporated with $90,000 capital stock by Richard Prigmore, J. J. and C. A. Boyd and will equip a mill at once.

Barnhart Bros. & Spindler, a New Jersey type founding concern, has been authorized to use $250,000 of its $3.000,000 capital stock in a branch plant in St. Louis and for other purposes in Missouri.

The Hall & Brown Woodworking Machine Company has absorbed the Yerkes & Finan Woodworking Machine Company, both of St. Louis, and has increased its authorized capital stock to $250,000 to perfect the deal. Heavy machinery will be manufactured at the Hall & Brown plant and lighter machinery at the Yerkes & Finan plant. The forces of both plants will be readjusted and enlarged to handle the business. The Hall & Brown Company was organized in 1877 and incorporated in 1888. It is one of the largest factories of the kind in the country. The president is Charles S. Brown, John F. Judd is vice-president and sales manager, and William Woltering, secretary and treasurer.

Henry Leschen, St. Louis, Mo., has had plans prepared for a 10-story loft building to be erected at the corner of Locust street and Jefferson avenue at a cost of $1,000,000. The building will be 155 x 400 ft. deep. The building is to be used for manufacturing purposes and power will be supplied.

The City of Springfield, Mo., will receive bids until January 15, through G. E. Arnold, engineer, for the construction of a sewage disposal plant.

The Avard Mfg. Company, Avard, Okla., has been incorporated with $5000 capital stock. The company has in course of erection a new plant and is in the market for drops, dies, drill, gasoline engine and other special machinery.

The Pacific Coast

SAN FRANCISCO, CAL., December 5, 1911.

The machine tool market shows some improvement, values involved in individual sales being somewhat larger than in October, and including one complete shop equipment of some importance. Some fairly good single tool orders have come from local shops and the volume of small business through the country continues satisfactory. There is nothing in the situation, however, to cause anticipation of any general revival, at least for several months to come. A number of small railroad inquiries are noted, but the larger roads are buying nothing at present, and other prospective buyers are in no hurry to place their orders.

A feature of the local trade for some time past has been the comparatively large movement of second-hand tools. Small inquiries for this class of equipment are coming up constantly, and several large sales have been closed within the last few months, though more used tools are still offered for sale than there is any market for. Some of the largest tools have been taken over by the Union Iron Works, which is one of the few local concerns in a position to take advantage of the bargains available. The latest purchase by this firm is the complete equipment of the Abner Doble Company's large shop, which has been operated in a limited way for some years past.

Among the local sales recently reported are a milling machine for the Federal Telegraph Company and a Schuchardt & Schutte gear-hobbing machine for the Pacific Gear & Tool Works.

The largest sale of the past month, and the only one closed in the oil fields for some time, is a complete shop equipment for the Esperanza Consolidated Oil Company, Taft, Cal., the sale being made by the San Francisco office of Manning, Maxwell & Moore. The outfit, which will be one of the most modern in the oil district, will include special oil-well tool lathes, heavy drill presses and steam hammers. The same company has ordered from the Railway Materials Company, 249 Monadnock Building, a large Ferguson furnace, designed to use oil fuel.

Several gas engine manufacturers around San Francisco have recently placed orders for Steinlee turret lathes.

Woodworking machinery has been extremely quiet for several months past, and few sales are likely to be closed before the end of the year, but numerous inquiries have recently been received, and a season of considerable activity is expected during the early spring.

Notwithstanding the comparatively light demand for mining machinery in the past season, there is a good outlook for improvement next year. The introduction of electric power and lighting has greatly reduced mine operating expenses, as well as in the operating cost of ore mills, and modern types of mill construction and pumping machinery also tend to reduce expenses. It is accordingly predicted that active development will soon be resumed at many mines which have been partially abandoned owing to the heavy cost of mining by older methods.

It is reported that a new addition will soon be erected at the Pullman car shops near Richmond, Cal.

The Bohm-Rugaard Rotary Engine Company, San Francisco, has been incorporated with a capital stock of $100,000, by E. A. Bohm, C. F. Klitgaard, H. F. Roberts, J. J. Barnes and L. Rugaard.

The Electric Rotary Drill Company, Los Angeles, Cal., has been incorporated, with a capital stock of $50,000, by H. A. Bardeen, A. M. Strong and H. G. Palmer.

The Brisco Iron Works, Porterville, Cal., has been incorporated, with a capital stock of $300,000, by T. A. Brisco, G. V. Reed, H. E. Redmond and M. A. Millbury.

Plans have been drawn for a new power house at Stanford University, Palo Alto, Cal. Additional shop room will also be provided for the engineering department.

It is reported that the Giant Valve Company will install a plant at Richmond, Cal.

The Pacific Porcelain Company, Richmond, Cal., manufacturer of plumbing fixtures, is preparing to double its capacity, and has already let contracts for the buildings.

Several new machines are being installed by the Oakland Paving Brick Company, Decoto, Cal.

The Oakland Brewing & Malting Company is planning to install new machinery in its bottling department at an expense of about $15,000.

The Oakland Gas Light & Heat Company is completing a large installation in Oakland, including a 16,000 hp. Curtiss steam turbine direct connected to a 12,000 kw. generator.

The American Tool & Specialty Company has been incorporated at Los Angeles, with a capital stock of $1,000,000, by L. S. McCoy, G. T. Ashley, F. B. Mollski and J. T. Curran.

The California Machinery & Equipment Company has been incorporated at Los Angeles, with a capital stock of $25,000, by W. V. and A. L. Lewis and others.

V. Etienne & Bro., this city, have taken a contract for equipping a new ice plant at Petaluma, Cal.

The Pacific Mfg. Company, operating one of the largest general woodworking plants in the state at Santa Clara, Cal., is installing an electric motor system throughout its mill, and it is reported that a private generating plant will be installed.

The Fellows Boat Works is installing a large shop at San Diego, Cal. The machines will be operated by individual electric motors.

The Union Ice Company is preparing to install a large hydroelectric plant near Boca, Cal., on the Truckee River.

Texas

AUSTIN, TEXAS, December 9, 1911.

General business conditions seem to be improving over the State and the Southwest. This is perhaps due largely to the activity that usually takes place just prior to the holiday season. Prospects for an unusually large machinery trade during the early part of the coming year are considered very promising. While money is somewhat scarce in the ordinary channels of business promoters of industrial enterprises of any considerable size are so far meeting with no difficulty in the matter of making financial arrangements for their projects. The new law authorizing the creating of irrigation districts and the construction of such works by means of bond issues is proving a great success in the matter of bringing about land reclamation in the southern and western parts of the State. Many such districts are now in course of formation and the consummation of these projects will involve the purchase of large quantities of machinery.

Travis F. Jones and James A. Logwood, of San Antonio, will install a canning factory near El Campo.

The Texas-Caddo Oil & Development Company has been organized at Dallas with a capital stock of $50,000. The incorporators are H. T. Taylor, Ephraim Garonzik and H. W. Cutshall.

The Waxahachie Gas Company, Waxahachie, has increased its capital stock from $125,000 to $150,000. It will enlarge the scope of its proposed plant.

The Mission Cotton Company, Mission, has increased its capital stock to $80,000 from $60,000 and will enlarge its cotton seed oil mill.

The Greenville Boosters' Club is promoting the establishment at Greenville of a large meat packing plant. Considerable progress has been made in the matter of securing the enterprise.

The Temple Gas Light Company, Temple, has let the contract for erecting its engine house and other buildings to D. A. McAlexander, of Temple. The company is laying the pipe for its new distributing system.

The city of Cross Plains is constructing a large dam one mile north of town for the purpose of forming a reservoir for a municipal water supply.

The Price-Booker Mfg. Company, San Antonio, will establish a canning and pickling factory at Alvin. S. D. Price is president.

The City Council of Lone Oak has granted a franchise to J. M. Carsey, of Greenville, W. J. Simpson and J. C. Simpson, of Kaufman, to install an electric light and power plant there.

The Commercial Club of Slaton is promoting the installation here of an electric light plant. It is also arranging for the establishment of an ice factory.

The Farmers' Union Gin & Milling Company, of Stephenville, has been formed with a capital stock of $15,000. The incorporators are Jonce Lewis, F. F. McInroe, J. R. Rucker and others.

Eastern Canada

TORONTO, ONT., December 9, 1911.

The state of the import trade is a fair criterion of the general commercial condition in Canada. The imports keep on increasing. In the month of September last their aggregate value was $42,337,716, as against $37,312,695 in September, 1910. In the six months ending with September they amounted to $246,710,687, as against $219,055,695 in the corresponding period last year. In these totals machinery and equipment from the United States figure largely as also do articles that are themselves the product of manufacturing industry and the material for further manufacturing. Advantage seems to have been taken of lower prices across the line when business there was least active. The purchases of material made by Canadian manufacturers will be helpful in the turning out of contracts booked here at about the same time for finished products that are to be delivered in months to come. There seems reason to believe that Canadian manufacturers gained rather than lost as a consequence of the temporary depression in the United States, as though they had much competition from that quarter, they have still kept up operations to the full capacity of their works. They gained in the lower price of their material. Christmas holidays are approaching, but so far little is heard of the slackening of operations that is usual at this season. The demand seems to be hard to sate. Yet new manufacturing industries continue to spring up and increase competition. Not more, however, than they increase demand, as the new works mean new plant and orders therefor. It begins to appear as if the new unknown quantity of national growth were large enough for any increase of productive capacity the manufacturers of machinery and equipment could bring about. It is to be added that capital shows no hesitation. The influx of it from abroad keeps on, and it is being freely ventured into enterprises of every kind. Ideas of curtailment or retrenchment seem to be very inappropriate at the present time.

The Schacht Motor Car Company of Canada has established its works in a building it has obtained in Hamilton, Ont. It intends to go largely into the manufacture of commercial cars.

The City Council of Kingston, Ont., is asked by the Canadian Locomotive Company to grant it a fixed assessment of $100,000 for the next ten years. It is preparing to double its plant there. The ratepayers will have a chance to vote on the question about January 15.

At the City Council meeting of Stratford, Ont., a by-law was given its first two readings and will be submitted to the electors in January, providing for a loan of $10,000 to Paul Bennewitz, of West Toronto. He has purchased the Perth Flax & Cordage Company's factory there and will engage in the manufacture of musical accessories, and will employ forty persons.

The Bell Telephone Company is preparing to erect a building in Guelph, Ont., to cost $40,000.

The plant of O'Keefe & Drew, meat packers, is now in operation at Chatham, Ont. The storehouses, refrigerating system, etc., cover about twenty acres.

The improvements to be made in the plant of the E. B. Eddy, Hull, Ont., at a cost of $500,000, and for the employment of several hundred additional men, include the electrification of the whole plant by means of a hydroelectric power system the company is to establish. Every machine in the company's mills will be run by electricity instead of by water power. The company has also decided to build a new mechanical pulp mill in place of a ground wood pulp mill. This mill will be located adjacent to Ottawa and Hull.

Owing to the success of the Dominion Canners' Company since consolidation a new company with Montreal capitalists on the board of directors is being formed. The name of the company has not yet been decided, but it probably will be the British Canadian Canners' Company, Ltd., and it will start with a capital stock of $500,000. Those identified with the company include C. H. Cahan, H. A. Lovett, John Black, of the local cotton companies, and Sir H. S. Bate of Ottawa, and H. L. Perchard, of the Lake-of-the-Woods building. The company will erect five canning factories in Ontario.

A. & P. Steven, Ltd., Montreal, has been incorporated with a capital stock of $50,000 to carry on a general business in elevators and machinery.

The Dominion Rock Drill & Foundry Company,

Montreal, will build a large factory this winter in which to make hoisting engines, etc.

The ratepayers of Exeter, Ont., will vote on a by-law for water works extensions.

The Tuttle-Vailey Mfg. Company is negotiating for a factory site for a foundry in Bridgeburg, Ont.

The Dominion Mahogany & Veneer Company, Montreal, will build an additional factory at Lachine, Que.

Up to December 31, tenders will be received by John Robinson & Sons, Niagara Falls, Ont., for garage equipment, including a small belt-driven air compressor.

The works of the O'Gorman Carriage Company, Preston, Ont., which were recently burned, will be rebuilt in the spring.

P. McCullough, Sherbrooke, Que., is preparing to build a factory in which to make brake shoes for cars, etc.

The Tilbury Handle Company, Tilbury, Ont., is building a factory there.

The O'Keefe Brewing Company, Toronto, is about to build another brewery in that city to cost $100,000.

The F. C. Burroughs Furniture Company, Toronto, will build a warehouse to cost $25,000.

The R. S. Williams Piano Company, Toronto, will put up a new building to cost $65,000.

The Wingham Implement Company is a new company that proposes to establish a factory in Wingham, Ont.

The Conduit Company, Toronto, has given out the contract for building its new factory.

The Lightning Furnace Company, Montreal, is about to build a new foundry at St. John's, Que.

The London Township Council, London, Ont., will install a hydroelectric power service.

The contract for constructing the power house of the hydroelectric plant on Magog River, Magog, Que., has been awarded to the Bishop Construction Company, Montreal, for $125,000.

The packing factory of the St. Thomas Packing Company, St. Thomas, Ont., has been damaged by fire to the extent of $12,000. The building will be restored.

Conduits, Ltd., Toronto, has been incorporated with a capital stock of $1,000,000 to manufacture and deal in wire conduit and other tubing, electrical and gas fixtures.

The Eastern Canada Power Company, Montreal, has been incorporated with a capital stock of $1,000,000 to carry on business in electric lighting, heating and power.

The Architectural Metal Company, Ottawa, has been incorporated with a capital stock of $75,000.

Fire on December 6 gutted the premises of the Canadian Cereal & Milling Company's Bloomfield Mills, at Fergus, Ont. The total loss will be about $10,000, fully covered by insurance. Work will be commenced immediately to rebuild the mill.

The Brunswick-Balke-Collender Company of America, engaged in the manufacture of billiard tables, bowling alleys, etc., will shortly build an $80,000 factory, employing 150 men, in Toronto.

The Grand Trunk Pacific Railway have awarded a contract to John S. Metcalf & Co., Ltd., Montreal and Chicago, for the design and construction of a 2,500,000-bushel concrete storage elevator at its Mission Island terminal for Fort William, Ontario. The estimated cost of the structure is $500,000. This is the second storage unit of the new Grand Trunk Pacific grain terminal at the above point, and will bring the storage capacity of the elevator up to a total of 5,750,000 bushels. The ultimate capacity of the grain terminal as laid out by John S. Metcalf Company, Ltd., contemplates a total storage capacity of 40,000,000 bushels.

Western Canada

WINNIPEG, MAN., December 9, 1911.

The weather is quite mild since the first of December, and had it not been for the cold spell in November it is likely that many lines of industrial work that usually experience a lull in the winter would have continued farther into the winter than they have. The principal drawback to general trade in this part of the country recently has been the congestion in traffic. It has been for some weeks impossible to move freight with any degree of promptness, although the mild conditions of the last couple of weeks has afforded some relief. The outlook for next spring seems to loom up brighter as the year-end approaches. Payments are improving gradually, but the farmers have been badly delayed in marketing the crop.

A by-law has been carried in Moose Jaw, Sask., to expend $17,000 on fire alarm extension and the purchase of a steam pumping engine.

A by-law is to be submitted to the ratepayers of Scott, Sask., to raise money for a waterworks plant.

Cushing Bros., Ltd., Calgary, Alberta, will establish a sash and door factory at Red Deer, Alberta in the spring.

It is announced that the Dominion Bridge Company is going to locate its western shops at Calgary Alberta. It is said that this plant will be larger than the one at Winnipeg.

The Council of South Vancouver, B. C., has granted to the South Vancouver Lumber Company permission to erect a sawmill on the Fraser River at that place.

The Coquitlam Lumber Company, Ltd., Coquitlam, B. C., has been incorporated with a capital stock of $10,000, to carry on business as timber merchant and sawmill proprietor.

George Craddock & Co., Ltd., wire rope and steel manufacturers, Wakefield, Sheffield and London, England, have taken out a license in British Columbia, and have opened an office in Vancouver.

It is again reported that the Hines Lumber Company, which owns a large plant at Virginia, Minn., will build a sawmill at Fort Frances, Western Ontario.

J. A. McAllister, of the North Vancouver Lumber Company, North Vancouver, B. C., has men at work preparing the foundation for a sawmill near that place.

The Belmont Buildings, Ltd., is erecting a building at Victoria, B. C., to cost $400,000. The Norton Griffiths Company has the contract.

Up to December 15 tenders will be received by the City Council of Victoria, B. C., for the construction of the Sooke Lake water system at a cost of about $1,500,000.

Up to December 27 tenders will be received by the secretary-treasurer of Lethbridge, Alberta, for the work of constructing a sewage disposal plant.

Gorman, Clancev & Gridley, machinery merchants, have begun to build a warehouse in Bassano, Alberta.

The Riverdale Lumber Company is about to build a box factory in Calgary, Alberta.

A power development to cost $1,000,000 on Bull River, Fernie, B. C., is contemplated for M. A. Devitt and H. W. McCoy, Chicago. A six-strand duplicate line on steel towers from the plant at Bull River Falls, over Lizard Pass to Fernie and on through Crow's Nest Pass to Frank, $5,000 per mile Installation of power plant to generate 10,000 hp. at once.

The ratepayers of Lethbridge, Alberta, will vote on a by-law to raise $450,000 for a street railway system, $150,000 to be expended on power plant.

The City Council of Fort William has authorized the Mayor and City Clerk to sign a provisional agreement with W. J. Lindsay, who is forming a company that will trade under the name of the Port Arthur Stove & Mfg. Company with a capital stock of $500,000. The plant to be erected will be of solid brick and is expected to cost over $200,000. If the city comes to an agreement, work on the erection of the buildings is to be commenced on June 1 and the plant is to be in full operation within 18 months from that date.

The area to be covered by the new Canadian Pacific Railway shops in Calgary will include 120 acres of land, the large locomotive shop alone, with stalls and pit for 35 engines, will cover six acres of land. There will be 20 buildings, including freight car and engine repair shops and other buildings comprised in a large railway shop yardage, which will make the Calgary shops one of the largest and most up-to-date on the continent of America.

Government Purchases

WASHINGTON, D. C., Dec. 11, 1911.

The Bureau of Supplies and Accounts, Navy Department, Washington, will open bids January 2, 1912, under schedule 4147, for two water-tube boilers, one for delivery to Norfolk, Va., and one to Puget Sound, Wash., and under schedule 4151, one set coaling gear equipment for delivery to Brooklyn, N. Y.

The office of the Commissioners of the District of Columbia will open bids December 18 for furnishing labor and material to install complete electric lighting system in the James Ormond Wilson School, Washington.

The depot quartermaster, Army Building, New York

City, will open bids December 16, under schedule 267 for furnishing one water tube boiler.

The office of the supervisor of anchorages, Custom House, New York City, will open bids January 12 for furnishing and delivering one new marine type water tube boiler for the United States revenue cutter Hudson.

The United States Engineer Office, Custom House, San Francisco, Cal., will receive bids until December 27 for constructing and equipping two steel hull 20-in. pump dredges.

Baltimore Industrial Notes

Contractors and fabricators are figuring on a new building for the Virginian Hotel, Lynchburg, Va. The structure is to be of concrete and steel.

The Canton Box Company has awarded a contract for the erection of a brick addition 53 x 90 ft., two stories, to its plant on Boston street. The building will be used for storage purposes and no additional equipment or machinery will be required.

Elliot, Ottenheimer & Elliot have taken permits for the erection of a two-story addition at 2113 to 2117 East Oliver street 45 x 140 ft., of concrete, brick and stone, and to be heated by steam. It will be used for the manufacture of cigars.

The United Railways Company has purchased a tract of land on Harford road, on which it will erect a large car barn and station. Tentative plans call for an expenditure of $100,000 for the new building and equipment.

Haskell & Barnes have completed plans and contractors are figuring on the cost of erection of a two-story fireproof garage to be erected at North and Fulton avenues for W. J. Tickner & Sons. Plans call for a brick, stone and concrete structure with cement floors.

It is reported that the Terminal Freezing & Heating Company, successor to the Baltimore Refrigerating & Heating Company, will shortly make extensive improvements to its plant on South Eutaw street.

A. S. Goldsborough, secretary of the Municipal Factory Site Commission, reports negotiations pending by Pittsburgh interests for a site for the erection of a steel casting plant. Several locations are being considered, but he feels assured that the new industry will be secured by Baltimore. A large concern engaged in the fertilizer business is also considering the purchase of a site of 16 acres on which to erect a new plant.

The Baltimore Gas Appliance & Mfg. Company started operations during the month at its plant at Bayard and Nanticoke streets. The foundry department is operating at comparatively good capacity, while the various other departments are being put in operation as fast as the work goes forward. Practically all the equipment needs have now been acquired. By January 1 the company expects to have all departments in full operation. Regular deliveries of gas heaters, ranges, etc., are expected to be made during the current month.

The Baltimore Water Board has decided to go ahead with plans for the construction of a new dam 186 ft. high, 2100 ft. north of the present Lock Raven dam. It will give a storage capacity of 2,000,000,000 gal. and the foundations will be constructed of such size as will enable them to support a dam at an elevation of 275 ft. and having a storage capacity of 65,000,000,000 gal., should it be necessary to increase the city water supply to that extent.

Dietrich Brothers report inquiries for structural work quieter, those coming out being confined to propositions of the smaller class. The firm has practically completed the structural work on the Baltimore Bargain House and has the steel work of the Maryland Casualty Company's addition 60 per cent. completed. Contracts for several small buildings, requiring from 25 to 50 tons for local construction, have been closed, together with some small work in the South.

The Interstate Chemical Corporation of Virginia, with a capital stock of $7,250,000, has been organized and will acquire the interests of A. B. Chisholm, a prominent fertilizer operator at Charleston and Greenwood, S. C., and Tampa, Fla., the Germofer Mfg. Company of South Carolina, and the Tilghman Phosphate Company of Florida. Plans have been made for the erection of additional fertilizer plants at Charlotte, N. C., and Macon, Ga. A. B. Chisholm, Charleston, S. C., is president of the corporation and can furnish information regarding the proposed new plants.

Frank & Cavanaugh, architects, have completed plans for the erection of a large building to be used as a warehouse and paint factory by Hirshberg, Hollender & Co. on Warner street near Ostend street. The building will probably be but 19 x 71 ft., one story, although built to enable additional stories to be added. While no additional equipment will be required at this time, purchases of mixing machinery are contemplated in the near future.

The Chesapeake Iron Works, while busy in its estimating department, finds resultant orders light. The bulk of the demand has been for small building and ornamental iron work. One order for a moderate sized mill building in Norfolk, Va., is noted. Plant operations continue on an irregular basis.

Tin Plate Imports and Exports

The figures of the Bureau of Statistics, Department of Commerce and Labor, show a marked change in the trade movements of tin plate. The October imports and exports, stated in pounds, in the last three years were as follows:

October.	Imports.	Exports.
1909	11,117,035	1,414,110
1910	3,737,997	1,236,141
1911	1,286,877	15,941,893

The marked decline in the imports in the last two years, as explained in a statement recently issued by the Bureau of Statistics, is due to the high price of tin plates in foreign countries, coupled with relatively lower prices in the United States. In October, 1911, the average import price of tin plates was 3.8 cents per lb., against 3.2 cents in October of last year, and 2.7 cents in October, 1909. As the value of imported articles is based upon their actual wholesale price in the country from which exported to the United States, the figures quoted would seem to indicate a steady rise in the foreign price of tin plates, due in part to the rapid growth of the canning industry in all parts of the world. In the United States alone the value of canned and preserved products has increased from $38,000,000 in 1890 to $157,000,000 in 1909.

Most of the tin plate imported in the recent years has been for use in the manufacture of cans and other articles used in the export trade, in which case 99 per cent of the duty was refunded under the drawback law. The marked advance in price of tin plates abroad has apparently led to the substitution of domestic tin plate for the foreign article for use in exportation.

Employees' Compensation for Accidents.—The National Civic Federation expects to bring before the various State legislatures this winter its model bill for the compulsory compensation of employees for injuries due to industrial accidents. The Federation is co-operating with the Workmen's Compensation Committee of the Uniform State Law Commissioners and a similar committee of the American Bar Association. Special activity in this matter is reported in West Virginia, Texas, Colorado, California, Maryland, Michigan, North Dakota, Montana, Connecticut, Rhode Island, Missouri, Indiana, and Iowa. The principles of the bill have been adopted by the Congressional Commission on Employers' Liability and Workmen's Compensation.

S. Weber & Son, dealers in scrap, Louisville, Ky., have purchased the old Belknap cement plant of the Union Cement & Lime Company. The purchase includes a large quantity of second-hand machinery, steel rails, locomotives, carriers, cement plant equipment, a large incline, and a considerable tonnage of scrap. The plant is one of the historic industries of Louisville. A large force of men will be put to work to wreck it. The purchase is one of the many transactions of a similar character which this firm has put through in the past few months. S. Weber & Son are among the largest dealers in scrap material of all kinds

Current Metal Prices.

The following quotations are for small lots, New York. Wholesale prices, at which larger lots only can be bought, are given elsewhere in our weekly report.

IRON AND STEEL—

Bar Iron from Store—

Refined iron:
1 to 1⅞ in. round and square.... ₤ lb 1.70c
1¼ to 4 in. x ⅝ to 4 in.... ₤ lb 1.80c
1¼ to 4 in. x ¼ to 5 in.... ₤ lb 1.80c
Rods ⅜ in. and 11-16 in. and over, round and square ₤ lb 1.80c

Angles:	Cts ₤ lb.
3 in. x 3 in. and larger	1.80c
3 in. x 3-16 in. and 1¼ in.	2.20c
1¼ to 2½ in. x ¼ in.	1.95c
1¼ to 2½ in. x 3-16 in. and thicker	1.85c
1 to 1¼ in. x 5-16 in.	1.95c
1 to 1¼ x 1¼ in.	2.00c
⅞ x 1⅛ in.	2.10c
¾ x 1¼ in.	2.15c
⅝ in. x 1¼ in.	2.25c
1¼ x 3-32 in.	4.40c

Tees:

1 in.	2.25c
1¼ in.	2.10c
1¼ to 2½ x ¼ in.	1.90c
1¼ to 2½ x 3-16 in.	2.00c
3 in. and larger	1.85c
Beams	1.80c
Channels, 3 in. and larger	1.80c
Bands—1¼ to 6 x 6-16 to No. 8	2.00c
Burden's "H. B. & S." iron, base price	2.95c
Burden's Best" iron, base price	3.15c
Norway bars	3.60c

Merchant Steel from Store—

per lb

Bessemer machinery 1.70c
Toe calk, tire and sleigh shoe..... 2.50@3.00c
Best cast steel, base price in small lots..... 7c

Sheets from Store—

Black	One pass, soft steel.	C R	R G cleaned
No. 16	₤ lb 2.55c		2.75c
Nos. 18 to 20	₤ lb 2.40c		2.85c
Nos. 22 and 24	₤ lb 2.45c		2.95c
No. 26	₤ lb 2.60c		3.05c
No. 28	₤ lb 2.65c		3.25c

Russia, Planished, &c.

Genuine Russia, according to assortment ..... ₤ lb 12 @14½
Patent planished, W. Dewees Wood..... ₤ lb A, 10c; B, 9c net

Galvanized

Nos. 12 and 14	₤ lb 2.65c
No. 24	₤ lb 3.00c
No. 26	₤ lb 3.20c
No. 28	₤ lb 3.50c

No 20 and lighter 36 inches wide, 25c higher

Genuine Iron Sheets—

Galvanized

Nos. 22 and 24	₤ lb 5.50c
No. 26	₤ lb 6.00c
No. 28	₤ lb 7.00c

Corrugated Roofing—

2½ in. corrugated	Painted	Galvd
No. 24	₤ 100 sq ft $3.70	$4.70
No. 26	₤ 100 sq ft 2.85	3.90
No. 28	₤ 100 sq ft 2.50	3.65

Tin Plates—

American Charcoal Plates per box

"A A A" charcoal:
IC. 14 x 20..... $6.35
IX. 14 x 20..... 7.60
A. charcoal:
IC. 14 x 20..... $5.30
IX. 14 x 20..... 5.40

American Coke Plates Bessemer—
IC. 14 x 20..... 107 lb..... $4.20
IX. 14 x 20..... 5.20

American Terne Plates—
IC. 20 x 28 with an 8 lb coating..... $8.10
IX. 20 x 28 with an 8 lb coating..... 10.10

Seamless Brass Tubes—

List November 13, 1908. Base price, 18¢

Brass Tubes, Iron Pipe Sizes—

List November 13, 1908. Base price, 18¢

Copper Tubes—

List November 13, 1908. Base price, 21¢

Brazed Brass Tubes—

List February 1, 1911. 19½¢ ₤ lb

High Brass Rods—

List February 1, 1911. 14⅝¢ ₤ lb

Roll and Sheet Brass—

List February 1, 1911. 14⅞¢ ₤ lb

Brass Wire—

List February 1, 1911 14⅝¢ ₤ lb

Copper Wire—

Base price, Carload lots mill 14½¢

Copper Sheets—

Sheet copper hot rolled, 16 oz (quantity lots) ..... ₤ lb 17½¢
Sheet copper cold rolled, 1c ₤ lb advance over hot rolled
Sheet copper polished 20 in. wide and under, 1c ₤ square foot.
Sheet copper polished over 20 in. wide, 2c ₤ square foot.
Planished copper, 1c ₤ square foot more than polished

METALS—

Tin—

Straits pig ..... ₤ lb 48 @49 ¢

Copper—

Lake ingot ..... ₤ lb 14¼@14⅜¢
Electrolytic ..... ₤ lb 14¼@14⅜¢
Casting ..... ₤ lb 14 @14¼

Spelter—

Western ..... ₤ lb 7½@ 7⅝¢

Zinc—

No. 9, base, casks... ₤ lb 9c Open... ₤ lb 9¾¢

Lead—

American pig ..... ₤ lb 5½@ 5⅝¢
Bar ..... ₤ lb 7 @ 7¼¢

Solder—

½ & ½, guaranteed..... ₤ lb 26¾@27½¢
No. 1 ..... ₤ lb 24½@25 ¢
Refined ..... ₤ lb 23 @23¾¢
Prices of solder indicated by private brand vary according to composition

Antimony—

Cookson ..... ₤ lb..@10¼¢
Hallets ..... @10 ¢
Other brands ..... 9@9 9½¢

Bismuth—

Per lb $2.00@$2.25

Aluminum—

No. 1 aluminum (guaranteed over 99% pure), in ingots for remelting ..... 23¢
Rods and Wire..... Base price 31¢
Sheets ..... Base price 33¢

Old Metals—

Dealers' Purchasing Prices Paid in New York.

	Cents.
Copper, heavy and crucible	11.50
Copper, heavy and wire	11.00 to 11.25
Copper, light and bottoms	10.00 to 10.25
Brass, heavy	7.75 to 8.00
Brass, light	6.00 to 6.25
Heavy machine composition	9.75 to 10.00
Clean brass turnings	7.75 to 8.00
Composition turnings	8.25 to 8.75
Lead, heavy	3.90
Lead, tea	3.60
Zinc, scrap	4.75



NICHOLSON U.S.A. Trade Mark

It has seemed to some men that the files used in their shops were of little productive importance, but

NICHOLSON FILES

have proved the difference between **file efficiency** and **inefficiency.**

Stroke for stroke they cut faster and cleaner than any others. File for file they last longer in a condition fit for hard service.

NICHOLSON FILES rise to the emergencies of modern usage. They are made in more than 3500 styles—a kind for every need.



Nicholson File Company

Providence, Rhode Island, U. S. A.

THE IRON AGE

Established 1855

New York, December 21, 1911

VOL. 88: No. 25

Published Every Thursday by the

DAVID WILLIAMS COMPANY

239 West 39th Street, New York

Entered at the New York Post Office as Second-Class Mail Matter.

Subscription Price, United States and Mexico, $5.00 per Annum; to Canada, $7.50 per Annum; to Other Foreign Countries, $10.00 per Annum. Unless receipt is requested, none will be sent. Credit for payment will be shown by extending the date on the wrapper of your paper

W. H. Taylor, - - - - - - President and Treasurer
I. A. Mekeel, - - - - - - - First Vice-President
Fritz J. Frank, - - - - - - - - Secretary

Geo. W. Cope, - - - - }
A. I. Findley, - - - - } Editors
W. W. Macon, - - - - }

M. C. Robbins, - - - - Manager
Charles S. Baur, - - - Assistant Manager

Branch Offices

Philadelphia, Real Estate Trust Building
Pittsburgh, Park Building
Boston, Compton Building
Chicago, Fisher Building
Cleveland, American Trust Building
Cincinnati, 807 Andrews Building

CONTENTS.

Large Rail Orders Pending 1329
American Steel Prices Below Foreign 1330
The Improvement in the Steel Trade 1330
The Demand for Second-Hand Machinery 1332
The Wrought Pipe Industry 1332
Eastern Steel Company to Lease Warwick 1333
The Proposed Michigan Corporate Excess Tax 1333
Pittsburgh and Valley Freight Rates on Raw Materials 1333
Allis-Chalmers Protective Committees 1333
Electric Steel Castings 1333
The Iron and Metal Markets 1334
Personal 1346
Obituary 1346
Customs Decisions 1346
Pittsburgh and Vicinity Industrial Notes 1347
The Panama Canal Hydraulic Equipment Contract 1347
The Baldwin Works to Have a Western Plant 1347
New Publications 1348
The House Passes an Eight-hour Bill 1348
Judicial Decisions of Interest to Manufacturers 1348
Pittsburgh Steel Company Furnaces 1348
The Production of Oil in 1910 1349
The Dwight & Lloyd Ore Sintering Process 1349
The Newark Foundrymen's Association 1349
What the Foundry Thinks of the Machine Shop 1350
Engineering Data 1355
An Effective Advertising Device 1353
A 15,000-hp. Coke Oven Gas Engine Plant 1354
New Double-Acting Cam Press 1356
Plant of Gardner Machine Company 1357
Coal-Handling Crane 1359
American Association for Labor Legislation 1359
Follansbee Electrical Steel Sheets 1359
A Factory Fire Fighting System 1360
The Blake Specialty Company 1361
Wire Flattening Mill 1362
Herringbone Gears 1364
The M. Rumely Company's Expansion 1366
Shop Erection and Testing of All Important Work 1367
Portable Molder's Bench 1367
American Rolling Mill Company Entertains Culvert Manufacturers 1367
Diffusing Noxious Chimney Gases 1367
The Turret Equatorial Telescope 1368
The Winona Technical Institute 1369
New Tools and Appliances 1370
Trade Publications 1371
The Machinery Markets 1372

Large Rail Orders Pending

Increased Mill Operations in January—Pig Iron Buying Lessening

The steel companies have made some further progress in establishing higher prices for their products in the past week and now look for railroad buying to reinforce the position in which the recent heavy volume of low-priced business has put them.

Unlike the movements which in other periods have proved to be definite turnings of the tide, the present one comes at a time in the year when demand lags; thus it lacks the usual accompaniment of mill resumptions and of increased working forces. What is counted on by those who predict large things for 1912 is that orders now on hand will carry them well into March at a high rate of output and that spring business will then be sufficient to fill up their books beyond the middle of the year. It is contended that speculative buying has entered little into the movement thus far, though it is known that in bars the rebuilding of merchant stocks has figured somewhat.

The accumulation of large forward orders at low prices has operated in contrary ways—it has enabled producers to take a stand for higher prices and at the same time has led doubters to question why more space was not reserved for the higher priced business predicted for 1912. The crux of the situation is, as always, the country's consumptive requirements. Some of the current reasoning based on dammed-up needs may require revision. In rails, for example, 3,600,000 tons was produced last year, and probably 2,700,000 tons this year. The country's use of steel has not been small, as was the case before the movement of 1909.

Actual market developments have plainly modified selling policies, as indicated by the establishment of 1.15c., Pittsburgh, for steel bars in the past week, and by the disappearance of recent low prices for structural shapes and plates.

It had been expected that a number of blast furnaces of the Steel Corporation would be banked over the holidays, but the order has been given to operate them as usual. Several additions to the list of the Corporation's active furnaces are scheduled for January.

Heavy buying by the railroads is impending. In rails announcements of contracts for 500,000 to 600,000 tons are expected within the next fortnight, the buyers including the New York Central, Pennsylvania, Baltimore & Ohio, Atchison, Southern Railway and several Western lines. In the Chicago district about 100,000 tons is pending and likely to be closed within the week. The Nickel Plate has bought 4000 tons of Bessemer rails. A Brazilian road has ordered 22,000 tons from the Steel Corporation. Spike orders have increased under low prices, three lines having contracted for 75,000 kegs in the past week.

The Pennsylvania car order, it is now definitely

stated, will be for 24,000 cars, which will require fully 300,000 tons of steel.

Wire and sheet and tin plate mills will operate on increased schedules after January 1. At present tin plate plants are running at about 70 per cent. of capacity against 50 per cent. a few weeks ago. The wire and tin plate operations of the Steel Corporation and the steel production of the Carnegie Steel Company will be on a 90 per cent. basis in January.

Pig iron markets are quieting down after a month of heavy buying, the marked feature of which was that it left prices practically unchanged. However, Southern iron, in which the weakness was pronounced, is firm on the $10 basis, while $10.25, Birmingham, is asked for the entire first half of the year.

Bessemer iron is stronger, and $14.25 at Valley furnace is now maintained. A sale of 25,000 tons for January and February is reported at that price, but there is an accompanying ore transaction.

Foreign producers of ferromanganese, who have had that market well in hand for some time, announce an advance from $38.50 to $41, Baltimore.

Conditions in German, British and Belgian markets show steady improvement. Pig iron warrants touched 49s. 10½d. this week, an advance of more than 2 shillings in two weeks. German advices from high sources are that the renewal of the Steel Works Union next year is now practically assured.

Lake Superior ore interests have given no warrant for the reports concerning a definite reduction in prices for 1912. There has been no action, and the real measure of the present improvement in the steel trade cannot be taken thus early. Stocks of Lake ore in furnace yards and on docks December 1 were 33,821,000 tons, or about 550,000 tons less than one year previous.

The Improvement in the Steel Trade

The personal equation, individual experience and local conditions have entered largely into the reception given the very cheerful views of the iron trade outlook which have had so much publicity in the past week. With surprising readiness the opinion of a leader in the steel trade that 1912 would be a year of unusually large demand for iron and steel was caught up and made the basis of highly favorable forecasts. The peculiar temperament which flourishes in the southern precincts of Manhattan Island and which demands that conditions be either very good or very bad is naturally allied at present with the prosperity propaganda, and judging from some of the product of the week the whole face of the situation has changed. On the other hand, as showing the effect of local conditions, we have the skepticism of Philadelphia, for example, whence comes the intelligence that the pig iron trade has changed but little in the past few weeks; that mills in Eastern Pennsylvania are still running at much less than full capacity, and that judging from the slight decrease in the rate of pig iron production in the country in November, there is no electrifying revival in progress in any other district.

The extent to which the psychological element enters into the "business situation" is well known. The contagion of fear has many times brought financial disaster and then has operated to prevent recovery. In what has happened in the past week we have the opposite influence and the opposite effect. Concurrently with an advance of $1 a ton in bars, wire and sheets, and with the publication of facts which had not been generally known, of the extent to which large steel companies have taken contracts for forward delivery, came the statement concerning Mr. Frick's very hopeful views of business in iron and steel for 1912. This expression by an individual was taken to represent to a degree the attitude of large financial and industrial interests, and straightway there was a multitude of followers.

It was natural that such a sharp transition from a condition in which no one was willing to make a favorable forecast of 1912 should encounter skepticism. But some current comments on the simple facts as they have developed in iron and steel markets have failed to recognize the possibility that the foundation was being laid in the very low prices of recent weeks for at least a moderate forward movement. So much has been made of the political features of the situation that some instructive iron trade history has been neglected. There is no discrepancy between the booking of large orders for forward delivery and a practically unchanged schedule of mill operations for November and December. The instinct of the merchant has again asserted itself and we have had, thus far on a much smaller scale than in 1909, a repetition of the buying for the rebuilding of stocks that made memorable the upward movement of that year. The restocking of 1909 culminated in the early months of 1910. Many thought then that the country was asserting the establishment of a new high rate of iron and steel consumption which might be maintained for many months. But when stocks of finished steel had been repaired at the low prices the real rate of consumption showed itself. There should be no haste to conclude now that the business of the country has started on an unbroken upgrade. Prices have improved on some forms of finished material; on pig iron the improvement in that respect is scarcely measurable as yet. The mills with some exceptions, as in plates and rails, have a good winter's work ahead and some of them are well sold into the late spring. If the necessities of the railroads are what they have long been represented to be, that business, added to what is now on the books, will mean that the first half of 1912 has been fairly provided for. Whether next year's profits will be even on the scale of 1910 is still much of a question. And as for a boom in the steel trade, whether measured by profits or volume, signs of anything which may truthfully warrant that name have not yet put in an appearance.

American Steel Prices Below Foreign

Statements that steel prices in the United States have fallen below those obtaining abroad are sometimes received with incredulity, perhaps because it is not realized how great a decline there has been in the American market in the past four years, while the foreign markets have declined but little. Inasmuch as our prices have shown a rather sharp advancing tendency in the past two or three weeks it is well to make comparisons, not with the shifting level of the present, but with the recent low prices, which it is possible may pass into history as constituting an important turning point; and prices prevailing on large and desirable orders should be used for comparative purposes, rather than prices on relatively small lots. We shall, then, use as a basis billets at $18.50 per gross ton, sheet and tin plate

bars at $19 per gross ton, merchant bars, plates and shapes at 1.05 cents per lb., tin plates at $3.30 per base box, etc.

The decline in American prices since the sudden let-up in activity after the panic of October, 1907, may be shown briefly by the statement that a careful averaging of prices of all finished steel products outside of rails, having regard to the relative importance of the different classes of material, indicates that from October, 1907, to the recent low point there was a decline of between $12.50 and $13 per net ton, or between $14 and $15 per gross ton. Comparing prices in England at the middle of October, 1907, and at present, we find that there has been an advance of about 50 cents per ton in iron ore, while pig iron has declined from $1.50 to $2.50 and finished steel prices as a rule are from $2.50 to $5 lower. Tin plates, however, have declined only 6d. per box, say $2.50 or $2.75 per ton. For our prices at present to be above those ruling abroad would require a very great disparity to have existed in 1907, which was not the case. The low point in American prices of ore, pig iron, unfinished steel and finished steel was in the years 1897 and 1898, when labor and all commodities were at their lowest. The advances in the decade following were due in part to prosperity in the American iron trade, but were also due in part to heavy advances in labor and commodities. Whether the prosperity caused the advances in wages or the advances in wages caused higher prices is not a matter of consequence in this connection. It is sufficient to observe that the average value of all commodities did advance strikingly; and however wage advances were brought about, higher wages were a necessity because the cost of living had greatly increased. Bradstreet's index number, for instance, advanced about 50 per cent. from its low point in the nineties to 1907. The advance in wages and commodity prices was not confined to the United States, but was world wide. As a necessary consequence, prices of iron and steel abroad also advanced, and if they did not advance altogether as much as prices in the United States, they advanced very greatly, while on the other hand it is emphatically the case that since the close of 1907 they have not declined nearly as much as prices in the United States. British prices of finished steel, as just indicated, have declined only from one-fifth to one-third as much as American prices since 1907.

It is in the finished products, rather than in the mineral products and pig iron, that our prices are now below those obtaining abroad. Since the great increase in the efficiency of American labor through the introduction of improved machinery and processes, our handicap is in the assembling of raw materials, a fact which is recognized in the present agitation for lower freight rates on the raw materials of the blast furnace. Thus we find that pig iron is higher in the United States than in England, and as England exports about 1,200,000 tons of pig iron annually, 12 to 13 per cent. of her make, British pig iron quotations may be taken as fairly representative of the best that is done abroad. Middlesbrough No. 3 foundry iron, comparable with our ordinary No. 2 foundry iron, is now quoted at 48s. 3d., or $11.75, comparing with prices ranging from $13 to $14 f.o.b. our Northern furnaces, but with $10 at Birmingham, Ala., where our general handicap of high cost of assemblage does not obtain.

To consider another case which possibly may also be considered an exception, rails should be mentioned. The price of rails in the United States has not declined, when other finished steel products have declined $14 to $15 a gross ton, but the quality of rails has been improved. The regular English quotation on rails for the domestic market, at Middlesbrough, is £5 12s. 6d., or $27.37.

In all other finished steel products, prices abroad are uniformly above those which have lately obtained in the United States. Merchant bars at 1.05 cents in the United States compare with German prices for the domestic market of 1.16 cents for basic Bessemer and 1.20 cents for open-hearth, while in England merchant qualities bring 1.46 cents, delivered at Birmingham. Plates at 1.05 cents in the United States compare with 1.40 cents in Germany for ordinary grades, and with 1.50 cents in Great Britain for ship plates at Glasgow. The nominal export price on the continent is about 1.30 cents.

In tin plate, which has a much higher labor cost than any of the other ordinary finished steel products of the steel industry, the high standard of wages in the United States has prevented the price from falling as low as the foreign basis, but the approach is astonishingly close when we consider the wide spreads which used to exist, ranging around $1 a box, and even more. The regular tin plate quotation per box f.o.b. South Wales is now 13s. 6d., or $3.24, subject to a discount of 4 per cent., making $3.11 net. In large lots tin plate has lately sold in the United States at $3.30, or $3.45 for I. C., which is quoted in South Wales. With the customary 2 per cent. discount the latter makes $3.38 net, putting the American price only 27 cents a box above the British price, this being probably the closest approach to a parity that has ever obtained.

While pig iron prices are higher in the United States than abroad, prices of unfinished steel abroad approximate more nearly to finished prices, so that they exceed American prices just as do the finished steel prices abroad. In South Wales tin plate bars, recently advanced, command £5 or $24.33, compared with a price of $19 or less recently obtaining in the United States. The Belgian export price for sheet and tin plate bars is 90s., or $21.90, while the corresponding price for billets, 4 in. and up, is $84s., or $20.44, billets below 4 in. commanding a considerably higher price. The German price for wire rods in the domestic market is about $30, against $24 lately obtaining in our own market.

There was a time in the nineties when the United States found itself with some commodities selling at lower prices than those ruling abroad, and an export business of large proportions suddenly started. The ability to export, however, was confined almost entirely to the cruder materials, upon which the cost of assembling the raw materials bore much less heavily than at present. In 1898, for example, we exported 28,600 tons of billets, sheet bars, etc., and 291,038 tons of rails. Exports of the more finished products were relatively very light. In that year 249,357 tons of pig iron was exported, but this came almost wholly from Alabama, which still has a low cost of assemblage, but does not export because a domestic demand for its pig iron has developed of sufficient proportions. In the past decade an export movement has been built up in the more finished forms, there being a heavy movement in such items as merchant bars, sheets and plates, structural material, pipes and fittings, and even tin plates. Considering the lowness of American prices as compared with those ruling abroad, it is by no means surprising

to observe from the statistics of exports during the first 10 months of this year that the total tonnage of iron and steel exported in the calendar year bids fair to exceed the best previous record, made in 1910, by 42 per cent., and to exceed the best record before 1910, which was made in 1906, by 63 per cent.

The Demand for Second-Hand Machinery

In connection with the coming increased demand for machinery, referred to last week, dealers call attention to the change which has come over the market for second-hand equipment. It will be recalled that in 1906-7 this class of machinery was in tremendous demand. The depleted stocks of the builders compelled users to resort to every possible means of meeting their requirements. It made no difference if machines were very old indeed. The prices which they commanded compared very favorably with their original cost. Newer types occasionally sold at a premium over the new prices of the very latest models and in excess of the original cost to the user. Some of the tools which were absorbed by the trade were curiosities of antiquity.

The dealers point out that this condition has been greatly changed in the five years which have intervened since the high tide of prosperity. The average price of a machine tool which dates back of the introduction of high speed steels has decreased materially, according to the experience of some of the largest houses which specialize in second-hand tools. In 1906, when the hight of the boom was first felt, the average user of machine tools was not thoroughly familiar with the great economic advantages of powerful machinery driving the new steel cutting tools. It was not fully recognized that to employ older methods meant a vastly greater cost of production. Of course there must always be makeshifts when the market is confined to machinery for delivery many months in the future. But, as one dealer puts it, a modern machine shop with a good cost system would as soon put in a wood-turning lathe to accomplish a given piece of work as to install an obsolete metal-working machine. This means that the progressive manufacturer has learned that inadequate machinery is worse than none. Therefore, the average second-hand tool which will be purchased will be years younger than the average of 1906 and 1907. The supply of such equipment is exceedingly small and there seems to be no promise that it will increase in any material way.

If these are the facts, the user will be more dependent upon new machinery than ever before. This in itself will constitute a material increase in demand for the products of the American machine shops. To go back again five years, if at that time users had had the present day attitude toward second-hand machinery the market for new machines would have been correspondingly greater, and deliveries would have been, if possible, worse than they were.

The reasons why the buyer of machine tools should avail himself of the present market are accumulating. If he waits for the rush which is inevitable, he will have to take his chance of getting equipment, with a strong probability that he will meet with serious and expensive delays. Few people realize the tremendous total of machine tools which has been specified in the United States. Considerations of expediency have up to the present withheld the necessary funds for the purpose. The moment the change comes and business revives in a large way, a condition which may be more or less sudden, funds will be released and the manufacturers and dealers will be deluged with hurry-up orders. A few weeks will probably eliminate the large stocks now on hand and then deliveries will fade into the future. It is a significant fact that most orders for machinery now being placed are on condition of immediate shipment. These are among the first specifications to be released after long months of holding back.

The Wrought Pipe Industry

In response to requests for specified information regarding the wrought pipe industry, the following is presented. No exact figures are available for the production of wrought pipe except those of the United States Steel Corporation. Its annual reports regularly present the quantity of wrought pipe its mills have turned out during the year. The other manufacturers of this class of product do not make public their production of pipe, but they furnish to the American Iron and Steel Association, Philadelphia, their production of skelp for conversion into pipe and the figures of skelp production published by that association are the nearest approximation to the production of pipe which can be obtained. They show the following output of all skelp mills, including those of the corporation, for the past two years:

Production of Skelp in the United States—Gross Tons.

Years.	Iron.	Steel.	Total.
1909	370,151	1,663,230	2,033,381
1910	350,578	1,477,616	1,828,194

The reports of the United States Steel Corporation show that in 1909 its mills produced 1,013,071 tons and in 1910 they produced 868,550 tons of wrought pipe. Comparing these figures with the totals given in the above table, after making allowance for loss in converting skelp into finished pipe, it will be found that the corporation made about 55 per cent. of the total wrought pipe output of the country in 1909 and about 53 per cent. in 1910.

The leading manufacturers of steel pipe are the following:

National Tube Company, Pittsburgh, Pa.
Youngstown Sheet & Tube Company, Youngstown, Ohio.
La Belle Iron Works, Steubenville, Ohio.
Wheeling Steel & Iron Company, Wheeling, W. Va.
Spang, Chalfant & Co., Inc., Pittsburgh, Pa.
Mark Mfg. Company, Chicago, Ill.
Republic Iron & Steel Company, Youngstown, Ohio.
Monongahela Tube Works, Pittsburgh, Pa.
Harrisburg Pipe & Pipe Bending Company, Harrisburg, Pa.
South Chester Tube Company, South Chester, Pa.
Crane Company, Chicago, Ill.

Although by far the greater part of the wrought pipe now manufactured and sold in this country is steel pipe, the manufacturers of wrought iron pipe maintain a firm footing in the trade as shown by the figures of skelp production given above. The leading makers of wrought iron pipe, such as the Reading Iron Company, Reading, Pa., and the A. M. Byers Company, Pittsburgh, Pa., have not only refrained from adding steel pipe to their product but have also steadily extended their manufacturing operations in recent years. Other manufacturers of wrought iron pipe are as follows:

Spang, Chalfant & Co., Inc., Pittsburgh, Pa.
Harrisburg Pipe & Pipe Bending Company, Harrisbug, Pa.
Longmead Iron Company, Conshohocken, Pa.
Monongahela Tube Company, Pittsburgh, Pa.
South Chester Tube Company, South Chester, Pa.
Susquehanna Iron Company, Columbia, Pa.
Wheeling Steel & Iron Company, Wheeling, W. Va.
La Belle Iron Works, Steubenville, Ohio.
Youngstown Sheet & Tube Company, Youngstown, Ohio.
Cohoes Rolling Mill Company, Cohoes, N. Y.

The St. Louis Foundrymen's Association, St. Louis, Mo., has elected J. P. Pero, president; B. Roy Mook, secretary, and W. S. Gemmer, treasurer. The vice-presidents are R. A. Bull, J. W. Kelly, William Schaelich, J. E. Gilbert, T. H. Smith, J. E. Cartwright, E. E. Squier, Jr., A. W. Phelps, Sanford Mitchell, P. Henningsen, J. W. Schroen and Paul Lindecker.

Eastern Steel Company to Lease Warwick

Negotiations are pending for the lease of the Warwick Iron & Steel Company, Pottstown, Pa., to the Eastern Steel Company, Pottsville, Pa., for a term of 99 years, the rental to be sufficient to pay 8 per cent on the Warwick Company's stock, which is the same dividend that has been paid on this stock recently. The Warwick Company is a manufacturer of pig iron, with two furnaces owned and one leased, and another stack under construction. It has a rated productive capacity of 275,000 tons of pig iron per year. The Eastern Steel Company has an open-hearth steel plant and manufactures billets and finished steel products, and the consummation of such a lease would put it in a position to control its supply of raw material.

The Warwick Iron & Steel Company has an authorized capital stock of $1,500,000, of which $1,486,714 is outstanding, par being $10. Last June the company issued three-year 6 per cent. notes to the amount of $300,000 to take up an $180,000 first mortgage, the 5 per cent bonds of which were called in June 1, and to retire the floating debt. Last year the Warwick Company earned upward of 18 per cent. on the stock, but its earnings have since fallen off in common with the experience of other iron manufacturers, although the report for the current year will probably show approximately 8 per cent. earned, or enough for dividend requirements.

The Eastern Steel Company manufactures shapes for structural buildings and bridge work and has an annual capacity of about 190,000 tons of finished rolled material. The company has acquired large iron ore interests in the Moa district of Cuba, amounting to 11,000 acres, and in addition has a lease on 1200 acres, in which there is estimated to be over 43,000,000 tons of iron ore. It has an authorized stock issue of $4,700,000 common, of which $3,650,000 is outstanding, and $4,700,000 7 per cent cumulative preferred stock, of which $2,000,000 is outstanding. The company on March 1 last had an outstanding funded debt of $2,429,000 first mortgage 5's due August 1, 1931.

The annual meeting of the Eastern Steel Company will be held January 24, while that of the Warwick Iron & Steel Company will be held February 12. It is expected that the lease will come before the respective stockholdrs for ratification at these meetings.

The Proposed Michigan Corporate Excess Tax

W. A. Dwyer, vice-president and general manager of the Art Stove Company, Detroit, Mich., is quoted as follows by the Detroit Free Press in regard to the proposed change in the Michigan tax system:

"The blow that a corporate excess tax would deal the stove industry of Michigan would be severe. There are about 125 stove factories in the country. The factories of Detroit compete with those of the Middle West. We contest the Middle West and the South with large factories in Aurora, Ill.; Piqua, Ohio, a number in Pennsylvania and some in Missouri. There are other factories, but these are the most important.

"The Eastern factories take care of the Eastern trade. Though there are factories in Massachusetts that are subject to the corporate excess tax of that State, those factories do not compete with the Michigan concerns to any extent. Their territory is practically limited to New England. But when we come into our own territory we find that our competitors are situated in States which are as favorable, so far as taxes are concerned, as Michigan now is, and in respect to labor they are even better situated.

"No one can say that Detroit is a cheap labor market. Most of our competitors, however, have the advantage of being able to draw a less costly labor supply. As to taxes an examination of the tax laws of the States in which our competitors are located will show how they are favored in that respect."

Mr. Dwyer referred to the Pennsylvania law which exempts domestic corporations engaged in manufacturing from taxation on that part of their capital stock employed in business within the State. This means that the stove factories pay little or no taxes to the State.

Illinois has a general property tax which demands that property be placed on the rolls at one-third of its actual value. There is a so-called corporate excess tax, but in practice it amounts to nothing. In Ohio, which now has the most strict laws in the Union, with the possible exception of Massachusetts, corporations pay, in addition to the general property tax, a tax of $1.50 a thousand on the par value of their outstanding capital stock. Missouri has a general property tax which does not fall heavily on manufacturers.

A corporation in Ohio which pays taxes amounting to $11,500 a year—$10,000 in general taxes which are limited by the statute to 1 per cent. of the valuation, and $1,500 capital stock tax—would in Michigan, under the proposed corporate excess tax law, pay about $20,000, figuring the average State rate for all purposes at $20.

Pittsburgh and Valley Freight Rates on Raw Materials

It is now expected that the case of the Mahoning and Shenango Valley iron and steel manufacturers who have asked for lower freight rates on ore, coal and coke will eventually be brought before the Interstate Commerce Commission. It was the intention of the manufacturers to deal directly with the railroad companies, and their argument as presented at a recent conference with the railroad officials in New York City was given in *The Iron Age* of November 23. Within the past week the railroads have replied that the reductions asked for cannot be granted.

In this connection interest attaches to the testimony given before the Stanley Committee at Washington, December 15, by United States Senator George T. Oliver of Pittsburgh. Senator Oliver contended that the rate on iron ore from Lake Erie to Pittsburgh district furnaces, which is now 96 cents, should be 50 cents a ton. In connection with his testimony reference was made by members of the committee to the division of the ore freight rate from Lake Erie to the blast furnaces of the Carnegie Steel Company and the Jones & Laughlin Steel Company, with the connecting railroads of these two companies. The amount they received of the 96-cent rate was said to be 26 cents a ton. His attention being called to the testimony of Charles M. Schwab that the net rates on ore to certain Pittsburgh consumers were relatively lower than on Lake ores to South Bethlehem, Senator Oliver said that a Bethlehem plant would naturally obtain its ores from abroad or in the East and that no one would think of building a steel plant at Bethlehem based on a Lake Superior ore supply.

Allis-Chalmers Protective Committees

Protective committees have been formed for both the preferred and common stockholders of the Allis-Chalmers Company. The preferred stock will be represented by Charles Allis, chairman; G. W. McGarrah, president of the Mechanics and Metals National Bank; W. E. Roosevelt of Roosevelt & Son; M. N. Buckner, vice-president of the New York Trust Company, and H. W. Falk, president of the Falk Company, Milwaukee. The New York Trust Company will act as depositary for the stock, for which receipts will be issued.

Alexander J. Hemphill is chairman of committee to look after the common stockholders and the Guaranty Trust Company the depositary. Associated with Mr. Hemphill are Frederick Strauss, J. Horace Harding and Albert H. Wiggin.

Electric Steel Castings.—The Treadwell Engineering Company, Easton, Pa., has installed an electric furnace of its own design for the manufacture of steel castings. It is believed that this company is now the only manufacturer of this type of steel castings in the United States. Vice-president W. E. Farrell, of this company, has made a special study of the electric furnace not only in the United States but abroad, and the manufacture of the new product is therefore entered upon with confidence. Special attention will be given to the requirements of those users of steel castings who are desirous of procuring such products in which the physical character and chemical analysis can be absolutely guaranteed.

The Iron and Metal Markets

A Comparison of Prices

Advances Over the Previous Week in Heavy Type, Declines in Italics.

At date, one week, one month and one year previous.

	Dec. 20, 1911.	Dec. 13, 1911.	Nov. 22, 1911.	Dec. 21, 1910.
PIG IRON, Per Gross Ton:				
Foundry No. 2 standard, Philadelphia	$14.85	$14.85	$14.90	$15.50
Foundry No. 2, Valley furnace.	13.00	13.00	13.25	13.75
Foundry No. 2 Southern, Cincinnati	13.25	13.25	13.25	14.25
Foundry No. 2, Birmingham, Ala.	10.00	10.00	10.00	11.00
Foundry No. 2, at furnace, Chicago*	14.00	14.00	14.00	16.00
Basic, delivered, eastern Pa....	14.25	14.25	14.50	14.75
Basic, Valley furnace	12.25	12.25	12.35	13.25
Bessemer, Pittsburgh	**15.15**	14.90	14.90	15.90
Gray forge, Pittsburgh	13.40	13.40	13.40	13.90
Lake Superior charcoal, Chicago	16.50	16.50	16.50	18.00
COKE, CONNELLSVILLE,				
Per Net Ton, at Oven:				
Furnace coke, prompt shipment.	**1.60**	1.55	1.55	1.45
Furnace coke, future delivery...	1.65	1.65	1.65	1.75
Foundry coke, prompt shipment	1.90	1.90	1.90	2.00
Foundry coke, future delivery..	2.15	2.15	2.10	2.10
BILLETS, &c., Per Gross Ton:				
Bessemer billets, Pittsburgh....	19.00	19.00	19.00	23.00
Open hearth billets, Pittsburgh..	19.00	19.00	18.50	23.00
Forging billets, Pittsburgh....	**25.00**	24.00	24.00	28.00
Open hearth billets, Philadelphia.	21.40	21.40	21.40	25.50
Wire rods, Pittsburgh	24.50	24.50	25.00	28.00
OLD MATERIAL, Per Gross Ton:				
Iron rails, Chicago	**14.75**	14.50	14.50	15.50
Iron rails, Philadelphia	**16.00**	15.50	15.50	17.00
Car wheels, Chicago	13.00	13.00	12.00	13.50
Car wheels, Philadelphia	12.50	12.50	11.25	13.00
Heavy steel scrap, Pittsburgh....	12.25	12.25	12.00	13.50
Heavy steel scrap, Chicago.....	**10.25**	10.00	9.50	12.00
Heavy steel scrap, Philadelphia.	**12.25**	12.00	11.50	12.50
FINISHED IRON AND STEEL,				
Per Pound to Largest Buyers:	Cents.	Cents.	Cents.	Cents.
Bessemer rails, heavy, at mill..	1.25	1.25	1.25	1.25
Iron bars, Philadelphia	1.25	1.25	1.20	1.35
Iron bars, Pittsburgh	1.25	1.25	1.20	1.40
Iron bars, Chicago	1.15	1.15	1.15	1.35
Steel bars, Pittsburgh	**1.15**	1.10	1.05	1.40
Steel bars, tidewater, New York.	**1.31**	1.26	1.21	1.56
Tank plates, Pittsburgh	1.15	1.15	1.10	1.40
Tank plates, tidewater, New York	1.31	1.31	1.26	1.56
Beams, Pittsburgh	1.15	1.15	1.10	1.40
Beams, tidewater, New York...	1.31	1.31	1.26	1.56
Angles, Pittsburgh	1.15	1.15	1.10	1.40
Angles, tidewater, New York...	1.31	1.31	1.26	1.56
Skelp, grooved steel, Pittsburgh	**1.15**	1.12½	1.12½	1.25
Skelp, sheared steel, Pittsburgh	1.20	1.20	1.20	1.30
SHEETS, NAILS AND WIRE:				
Per Pound to Largest Buyers:	Cents.	Cents.	Cents.	Cents.
Sheets, black, No. 28, Pittsburgh	1.90	1.90	1.85	2.20
Wire nails, Pittsburgh	1.55	1.55	1.55	1.70
Cut nails, Pittsburgh	1.50	1.50	1.50	1.60
Barb wire, galv., Pittsburgh...	1.90	1.90	1.85	2.00
METALS,				
Per Pound:	Cents.	Cents.	Cents.	Cents.
Lake copper, New York	**14.00**	13.75	13.00	13.00
Electrolytic copper, New York.	**13.87½**	13.62½	12.87½	12.75
Spelter, St. Louis	*6.15*	6.25	6.60	5.65
Spelter, New York	*6.30*	6.40	6.75	5.75
Lead, St. Louis	*4.35*	4.37½	4.27½	4.35
Lead, New York	4.45	4.45	4.35	4.50
Tin, New York	**45.00**	44.35	43.35	37.90
Antimony, Hallett, New York..	**7.75**	7.60	7.65	7.75
Tin plate, 100-lb. box, New York	$3.64	$3.64	$3.64	$3.84

*The average switching charge for delivery to foundries in the Chicago district is 50c. per ton.

Prices of Finished Iron and Steel f.o.b. Pittsburgh

Freight rates from Pittsburgh in carloads, per 100 lb. New York, 16c.; Philadelphia, 15c.; Boston, 18c.; Buffalo, 11c.; Cleveland, 10c.; Cincinnati, 15c.; Indianapolis, 17c.; Chicago, 18c.; St. Paul, 32c.; St. Louis, 22½c.; New Orleans, 30c.; Birmingham, Ala., 45c.; Pacific coast, 80c. on plates, structural shapes and sheets No. 11 and heavier, 85c. on sheets Nos. 12 to 16; 95c. on sheets No. 16 and lighter; 65c. on wrought pipe and boiler tubes.

Plates.—Tank plates, ¼ in. thick, 6¼ in. up to 100 in. wide, 1.15c., base, net cash, 30 days. Following are stipulations prescribed by manufacturers, with extras:

Rectangular plates, tank steel or conforming to manufacturers' standard specifications for structural steel dated February 6, 1903, or equivalent, ¼ in. thick and over on thinnest edge, 100 in. wide and under, down to but not including 6 in. wide, are base.

Plates up to 72 in. wide, inclusive, ordered 10.2 lb. per square foot, are considered ¼-in. plates. Plates over 72 in. wide must be ordered ¼ in. thick on edge, or not less than 11 lb. per square foot, to take base price. Plates over 72 in. wide ordered less than 11 lb. per square foot down to the weight of 3-16-in. take the price of 3-16-in.

Allowable overweight, whether plates are ordered to gauge or weight, to be governed by the standard specifications of the Association of American Steel Manufacturers.

Extras.	Cents per lb.
Gauges under ¼ in. to and including 3-16 in. on thinnest edge	.10
Gauges under 3-16 in. to and including No. 8	.15
Gauges under No. 8 to and including No. 9	.25
Gauges under No. 9 to and including No. 10	.30
Gauges under No. 10 to and including No. 12	.40
Sketches (including all straight taper plates) 3 ft. and over in length	.10
Complete circles, 3 ft. in diameter and over	.20
Boiler and flange steel	.10
"A. B. M. A." and ordinary firebox steel	.20
Still bottom steel	.30
Marine steel	.40
Locomotive firebox steel	.50
Widths over 100 in. up to 110 in., inclusive	.05
Widths over 110 in. up to 115 in., inclusive	.10
Widths over 115 in. up to 120 in., inclusive	.15
Widths over 120 in. up to 125 in., inclusive	.25
Widths over 125 in. up to 130 in., inclusive	.50
Widths over 130 in:	1.00
Cutting to lengths or diameters under 3 ft. to 2 ft., inclusive	.25
Cutting to lengths or diameters under 2 ft. to 1 ft., inclusive	.50
Cutting to lengths or diameters under 1 ft.	1.55

No charge for cutting rectangular plates to lengths 3 ft. and over.

Structural Material.—I-beams, 3 to 15 in.; channels, 3 to 15 in., and angles, 3 to 6 in. on one or both legs, ¼ in. and over, 1.15c. Other shapes and sizes are quoted as follows:

	Cents per lb.
I-beams over 15 in.	1.20 to 1.25
H-beams over 18 in.	1.30 to 1.35
Angles over 6 in.	1.20 to 1.25
Angles, 3 in. on one or both legs, less than ¼ in. thick, plus full extras, as per steel bar card Sept. 1, 1909	1.20 to 1.25
Tees, 3 in. and up	1.20 to 1.25
Zees, 3 in. and up	1.15 to 1.20
Angles, channels and tees, under 3 in., plus full extras as per steel bar card Sept. 1, 1909	1.20 to 1.25
Deck beams and bulb angles	1.45 to 1.50
Hand rail tees	2.00 to 2.15
Checkered and corrugated plates	2.00 to 2.15

Sheets.—Makers' prices for mill shipments on sheets of U. S. Standard gauge, in carload and larger lots, on which jobbers charge the usual advances for small lots from store, are as follows:

Blue Annealed Sheets.

	Cents per lb.
Nos. 3 to 8	1.30 to 1.35
Nos. 9 and 10	1.40 to 1.45
Nos. 11 and 12	1.45 to 1.50
Nos. 13 and 14	1.50 to 1.55
Nos. 15 and 16	1.60 to 1.65

Box Annealed Sheets, Cold Rolled.

	One Pass.	Three Pass.
Nos. 10 to 12	1.55 to 1.60	.....
Nos. 13 and 14	1.60 to 1.65	.....
Nos. 15 and 16	1.65 to 1.70	1.75 to 1.80
Nos. 17 to 21	1.70 to 1.75	1.80 to 1.85
Nos. 22, 23 and 24	1.75 to 1.80	1.85 to 1.90
Nos. 25 and 26	1.80 to 1.85	1.90 to 1.95
No. 27	1.85 to 1.90	1.95 to 2.00
No. 28	1.90 to 1.95	2.00 to 2.05
No. 29	1.95 to 2.00	2.05 to 2.10
No. 30	2.05 to 2.10	2.15 to 2.20

Galvanized Sheets of Black Sheet Gauge.

Nos. 10 and 11	1.90 to 1.95
Nos. 12, 13 and 14	2.00 to 2.05
Nos. 15, 16 and 17	2.15 to 2.20
Nos. 18 to 22	2.30 to 2.35
Nos. 23 and 24	2.40 to 2.45
Nos. 25 and 26	2.60 to 2.65
No. 27	2.75 to 2.80
No. 28	2.90 to 2.95
No. 29	3.00 to 3.05
No. 30	3.20 to 3.25

All above rates on sheets are f.o.b. Pittsburgh, terms 30 days net, or 2 per cent. cash discount in 10 days from date of invoice, as also are the following base prices per square for painted and galvanized roofing sheets, with 2½-in. corrugations:

Corrugated Roofing Sheets, Per Square.

Gauge.	Painted.	Galvanized.	Gauge.	Painted.	Galvanized.
29	....	$2.30	23	$2.35	$3.45
28	$1.30	2.45	22	2.55	3.65
27	1.45	2.50	21	2.75	4.00
26	1.55	2.60	20	3.00	4.30
25	1.80	3.00	18	4.00	5.65
24	2.05	3.10	16	4.85	6.45

Wire Rods and Wire.—Bessemer, open-hearth and chain rods, $24.50. Fence wire, Nos. 0 to 9, per 100 lb., terms 60 days, or 2 per cent. discount in 10 days, carload lots, to jobbers, annealed, $1.35; galvanized, $1.65. Carload lots, to retailers, annealed, $1.45; galvanized, $1.75. Galvanized barb wire to jobbers, $1.85; painted, $1.55. Wire nails, to jobbers, $1.55.

The following table gives the prices to retail merchants on wire in less than carloads, including the extras on Nos. 10 to 16, which are added to the base price:

Fence Wire, Per 100 Lb.

Nos.	0 to 9	10	11	12 & 12½	13	14	15	16
Annealed	$1.50	$1.55	$1.60	$1.65	$1.75	$1.85	$1.95	$2.05
Galvanized	1.80	1.85	1.90	1.95	2.05	2.15	2.55	2.65

Wrought Pipe.—The following are the jobbers' carload discounts on the Pittsburgh basing card on wrought pipe, in effect from December 1, 1911:

Butt Weld.

	Steel—Black.	Steel—Galv.	Iron—Black.	Iron—Galv.
⅛ and ¼ in.	74	54	68	48
⅜ in.	75	65	69	59
½ in.	78	68	72	62
¾ to 1¼ in.	81	73	75	67
2 to 3 in.	82	75	76	69

Lap Weld.

1¼ and 1½ in.	..	..	68	61
2 in.	76	70	72	65
2½ to 4 in.	81	74	74	67
4½ to 6 in.	80	72	73	65
7 to 12 in.	78	68	71	61
13 to 15 in.	55	..	47	..

Butt Weld, extra strong, plain ends, card weight.

⅛, ¼, ⅜ in.	70	60	65	53
½ in.	75	69	70	64
¾ to 1½ in.	79	73	74	68
2 to 3 in.	80	74	75	69

Lap Weld, extra strong, plain ends, card weight.

1¼ in.	..	..	66	60
2 in.	76	70	71	65
2½ to 4 in.	78	72	73	67
4½ to 6 in.	77	71	72	66
7 to 8 in.	70	60	65	55
9 to 12 in.	65	55	60	50

Butt Weld, double extra strong, plain ends, card weight.

½ in.	65	59	60	54
¾ to 1½ in.	68	62	63	57
2 to 3 in.	70	64	65	59

Lap Weld, double extra strong, plain ends, card weight.

2 in.	66	60	61	55
2½ to 4 in.	68	62	63	57
4½ to 6 in.	67	61	62	56
7 to 8 in.	60	50	55	45

Plugged and Reamed.

1 to 1½, 2 to 3 in. Butt Weld
2, 2½ to 4 in. ..... Lap Weld

} Will be sold at two (2) points lower basing (higher price) than merchants' or card weight pipe. Butt or lap weld as specified.

The above discounts are for "card weight," subject to the usual variation of 5 per cent. Prices for less than carloads are three (3) points lower basing (higher price) than the above discounts.

Boiler Tubes.—Discounts on lap welded steel and charcoal iron boiler tubes to jobbers in carloads are as follows:

Steel.		*Charcoal Iron.*	
1¾ to 2¼ in.	65	1½ in.	48
2½ in.	67½	1¾ to 2¼ in.	50
2¾ to 3¼ in.	72½	2½ in.	55
3½ to 4 in.	75	2¾ to 5 in.	60
5 to 6 in.	67½		
7 to 13 in.	65		

2½ in. and smaller, over 18 ft., 10 per cent. net extra.
2¾ in. and larger, over 22 ft., 10 per cent. net extra.

Less than carloads will be sold at the delivered discounts for carloads, lowered by two points for lengths 22 ft. and under to destinations east of the Mississippi River; lengths over 22 ft. and all shipments going west of the Mississippi River must be sold f.o.b. mill at Pittsburgh basing discounts, lowered by two points.

Pittsburgh

PITTSBURGH, PA., December 20, 1911.—*(By Telegraph.)*

Pig Iron.—The purchase of 25,000 tons of standard Bessemer iron by the Youngstown Sheet & Tube Company from the Ohio Iron & Steel Company, Lowellville, Ohio, for January to March delivery, at $14.25, Valley, which includes a sale of a large tonnage of basic ore by the former to the latter, has had the effect of strengthening the market on Bessemer iron, and all the Valley furnaces are now quoting $14.25 at furnace. This transaction should not be considered strictly as a conversion deal, as such was not the case. There is a heavy inquiry for basic, foundry and malleable Bessemer iron, and large tonnages have been sold for first quarter delivery. The Pittsburgh Steel Company is in the market for 600 to 800 tons of basic iron per day, running over the first half of next year. Since July 1 it has been taking its entire requirements of basic pig iron from one producing interest, but the contract expires December 31, so that the company will probably be a large buyer of basic pig iron in the open market. The Westinghouse Machine Company is in the market for 1000 tons or more of foundry iron for first quarter, but will probably buy a much larger tonnage. A sale of about 7000 tons of Bessemer iron was made last week to a local consumer for first half at $14, Valley furnace. A dealer reports a sale of 2000 tons of Bessemer for delivery in the Cleveland district at $14.25, Valley furnace. We quote: Bessemer iron, $14.25; basic, $12.25 to $12.50; malleable Bessemer, $12.75; No. 2 foundry, $13 to $13.25; gray forge, $12.50 to $12.75, all at Valley furnace, the freight rate to Pittsburgh being 90c. a ton.

Billets and Sheet Bars.—Prices on both open-hearth and Bessemer are firmer, and mills report inquiries heavier. A leading maker of billets and sheet bars is practically out of the market on sheet bars for the first half of next year. The Carnegie Steel Company has made contracts with sheet and tin plate mills for a very heavy tonnage of bars for first quarter. Specifications against contracts for billets and sheet and tin bars are heavier this month than in November, and shipments will be much larger. We quote: Open-hearth and Bessemer billets, $19 to $19.50; open-hearth sheet bars, $20 to $20.50; Bessemer sheet bars, $20.50 to $21; forging billets, $25 to $26, Pittsburgh or Youngstown.

(By Mail.)

The committee of Mahoning and Shenango Valley iron makers which appeared before the officials of the railroad systems covering the Pittsburgh and Valley districts, with a request for lower rates of freight on ore and coke, has been advised by these officials that its request will not be granted. James A. Campbell, chairman of this committee, states that the case will now be taken before the Interstate Commerce Commission and a determined effort will be made to secure reduced rates on ore, coke, pig iron and other products. Reports of a reduction of 50c. per ton in prices of ore for next year are not confirmed. The new demand for finished iron and steel is heavier and prices are strong and in some cases higher. Unless prices are advanced too rapidly, thus shutting off the demand to some extent, the volume of new business for the first half of next year should be quite heavy. In fact, most of the leading steel interests are pretty well booked up on their products for such delivery, most of this business having been taken at the very low prices ruling three or four weeks ago.

Ferromanganese.—Numerous small sales, ranging from 50 to 200 tons, aggregating about 600 tons, have been made of standard English 80 per cent. at $38.50, Baltimore, but the price has since been advanced to $41. The freight rate for delivery in the Pittsburgh district is $1.05 a ton.

Ferrosilicon.—The Carnegie Steel Company, which put out an inquiry several weeks ago for 6000 tons of 50 per cent., for delivery over all of 1912, has not yet bought any, despite reports that it has done so. The market is very strong, and the minimum price of 50 per cent. is $70, Pittsburgh, sales of three or four cars, or about 100 tons, for prompt delivery, being reported at this price. We quote 10 per cent. at $21; 11 per cent., $22, and 12 per cent., $23, f.o.b. cars at furnace, Jackson, Ohio, or Ashland, Ky.

Muck Bar.—Prices are stronger, and best grades made from all pig iron are now quoted at $28 to $28.50, Pittsburgh. The A. M. Byers Company has started up 66 of its 88 puddling furnaces at Girard, Ohio, which had been shut down for some time by a labor dispute, and the others will be started as soon as puddlers can be obtained to operate them. The Wheeling Steel & Iron Company has started up 24 puddling furnaces at Wheeling, W. Va.

Skelp.—There is more inquiry for grooved steel plates and sheared iron plates than for some time, and the mills are pretty well filled up for the next two months. Prices are strong and slightly higher. We quote grooved steel skelp at 1.15c. to 1.17½c.; sheared steel skelp, 1.20c. to 1.22½c.; grooved iron skelp, 1.42c. to 1.45c., and sheared iron skelp, 1.62½c. to 1.65c., all for delivery at buyer's mills in the Pittsburgh district.

Wire Rods.—The market on wire rods continues dull and prices, while stronger, are not higher. Consumers are covered by contracts but are not specifying very freely. We quote Bessemer, open-hearth and chain rods at $24.50 to $25, Pittsburgh.

Steel Rails.—On December 16 the three Edgar Thomson rail mills of the Carnegie Steel Company were shut down for usual annual repairs, but will be started again January 2. No definite information has been received here as to reported large contracts for rails for 1912 delivery. In the past week the Carnegie Company received new orders and specifications for about 3500 tons of light rails, inquiries from the coal mining companies being quite heavy. We quote standard sections at 1.25c. per lb.; 8 and 10-lb. light rails, 1.25c.; 12 and

14-lb., 1.16c.; 16, 20 and 25-lb., 1.12c.; 30 and 35-lb., 1.10c., and 40 and 45-lb., 1.08c., f.o.b. at mill.

Structural Material.—Inquiries have quieted down somewhat, but there is still a good deal of new work under way. The McClintic-Marshall Construction Company has taken 3500 tons for New York Central work in New York City and the American Bridge Company about 500 tons for new buildings for the Armstrong Cork Company, Lancaster, Pa., and about 800 tons for new buildings at Norfolk, Va. The Henry Shenk Company, Pittsburgh and Erie, Pa., has placed 900 tons with the Buffalo Structural Steel Company, Buffalo, N. Y., for the new Lawrence Hotel at Erie, Pa. While the mills are quoting higher prices on plain material, it is stated that large jobs are being taken at as low prices as have ruled at any time in some months. The two leading mills are now holding plain material at 1.15c. minimum on the very largest orders and 1.20c. on smaller business. We quote beams and channels up to 15 in. at 1.15c. to 1.20c., at mill, Pittsburgh.

Plates.—There has been a lull in the placing of new car orders. The report that the Pennsylvania Railroad has sent out inquiries for 40,000 to 50,000 steel cars is untrue. As stated last week, it is inquiring for prices on 1000 to 2000 70-ton truck cars, of three different types, and if the prices named are satisfactory it may buy 20,000 to 30,000. The Cambria Steel Company has received an order for 300 all-steel coal cars from the Berwind-White Coal Company. The Chicago & Northwestern has ordered 600 automobile cars from the Western Car & Foundry Company and 500 flat cars from the Standard Steel Car Company. The Missouri Pacific has placed contracts for 2000 gondola and box cars, the Minneapolis & Sault Ste. Marie 750 steel underframe box cars and the Norfolk & Southern 500 box cars, all with the American Car & Foundry Company. Operations among the plate mills are heavier and they have a fair amount of work ahead, mostly from steel car companies. The city of Quebec may decide to use cast iron pipe for its new water line, but if riveted pipe is used it will require about 12,000 tons. We quote narrow and wide plates at 1.15c. to 1.20c., f.o.b. at maker's mill.

Sheets.—Some of the leading independent sheet and tin plate mills have been holding meetings in Pittsburgh with the object of forming an association along the lines of the National Hardware Association. Strong efforts will be made to put conditions in these lines on a better basis, but it is claimed that no attempt will be undertaken to control prices. The sheet trade is very much improved, the demand being heavy and specifications against contracts coming in at a satisfactory rate. The leading mills are well filled through the first quarter and have sold a good deal into second quarter. Their operations are on a heavier basis and it is said that prices are being well maintained at 1.40c. for Nos. 9 and 10 blue annealed sheets, 1.90c. for No. 28 black and 2.90c. for No. 28 galvanized in carload and larger lots, f.o.b. maker's mill.

Tin Plate.—The report that the American Sheet & Tin Plate Company would add three hot sheet mills to its works at Chester, W. Va., and would change some of the present tin mills to sheet mills is officially denied. The company is now operating all of the 30 hot mills in its Shenango Works at New Castle, Pa., the 20 hot mills in its New Castle Works at the same place, all of the 25 hot mills in its National Works at Monessen, Pa., and has started 5 of the 10 hot mills at its works at Sabraton, W. Va. The Pope Tin Plate Company is operating its 12 hot mills full time and the McKeesport Tin Plate Company is running all of its 22 hot mills. Operations among the leading mills are now on the basis of about 70 per cent., being an increase of fully 20 per cent. in the last two months. They have booked an enormous amount of business for delivery through the first half and in some cases through all of next year. The regular price of tin plate remains at $3.40 per base box for 14 x 20 coke plates, and it is said that this price is being better observed. We quote $3.40 per base box for 14 x 20 coke plates, f.o.b. at mill.

Bars.—New orders and specifications for steel bars continue heavy. Leading makers are now quoting 1.15c. for prompt shipment or through the first quarter, and one of them is reported to be holding at 1.20c. for first quarter. The new demand and specifications for iron bars are also reported to be better and prices are firmer. We quote steel bars at 1.15c., for delivery through the first quarter, and common iron bars at 1.25c. to 1.30c., maker's mill.

Hoops and Bands.—Prices are firmer, with new orders and specifications coming in at a heavier rate than for some time. We quote bands at 1.15c., for delivery through first half, and hoops at 1.25c. to 1.30c., maker's mill, Pittsburgh.

Railroad Spikes.—The very low prices ruling on spikes and the advancing tendency on other products have caused the railroads to come in the market with a rush to cover their requirements. In the past week the Pennsylvania, Baltimore & Ohio, Norfolk & Western and others have placed contracts for first half delivery for fully 75,000 kegs, and specifications have come in from other roads for 10,000 to 15,000 kegs. These contracts were placed on the basis of $1.40 per 100 lb. for base sizes, and the leading makers are now pretty well filled through the first half. We quote railroad spikes at $1.40 base, in standard sizes in carload and larger lots, f.o.b. Pittsburgh.

Rivets.—New orders and specifications on contracts for both boiler and structural rivets are reported better and prices are stronger. We quote structural rivets at 1.40c. to 1.45c. and boiler rivets at 1.50c. to 1.55c. for large lots, f.o.b. cars, Pittsburgh.

Shafting.—Implement makers and automobile builders are specifying more liberally against contracts and the new demand is also reported heavier. We quote cold rolled shafting at 65 per cent. off in carload and larger lots and 60 and 5 per cent. off in small lots, delivered in base territory.

Spelter.—The market has firmed up slightly and prime grades of Western are now held at about 6.15c., East St. Louis, equal to 6.27½c., Pittsburgh.

Wire Products.—The new demand for wire and wire nails is larger and specifications against contracts are also coming in more freely. Mills report that the higher prices on nails and wire, which went into effect December 11, are being firmly held. We quote: Wire nails, $1.55; cut nails, $1.50; galvanized barb wire, $1.85; painted, $1.55; annealed fence wire, $1.35; galvanized fence wire, $1.65, f.o.b. Pittsburgh, usual terms, freight added to point of delivery.

Merchant Pipe.—Leading pipe mills are now operating to about 75 per cent. of capacity. The new demand for merchant pipe so far this month has been heavier than in the same period in November. The order of the Southern Gas Company of California for 150 miles of 12-in. line pipe has not yet been placed. Mills state that the new discounts on steel pipe which went into effect December 1 are well held, being shaded only in a few cases.

Tubes.—A local maker reports having entered some large contracts for locomotive tubes in the past week and there is a good deal of new inquiry. The demand for merchant tubes is quiet, being mostly in small lots to cover actual needs. Some low prices continue to be made on both locomotive and merchant tubes.

Iron and Steel Scrap.—The demand for scrap from consumers is reported heavier and prices are stronger. Dealers who have scrap in their yards are not inclined to sell it at present prices. Heavy steel scrap, bundled sheet scrap and borings and turnings are very firm. A number of contracts have been made in the past week or two between makers and dealers on bundled sheet and tin scrap and it is reported that slightly higher prices than ruled in the summer months have been paid. Dealers quote as follows, per gross ton, f.o.b. Pittsburgh, unless otherwise noted:

Heavy steel scrap, Steubenville, Follansbee, Sharon, Monessen and Pittsburgh delivery	$12.25 to $12.75
No. 1 foundry cast	11.75 to 12.00
No. 2 foundry cast	10.75 to 11.00
Bundled sheet scrap, f.o.b. consumers' mill, Pittsburgh district	10.25 to 10.50
Rerolling rails, Newark and Cambridge, Ohio, Cumberland, Md., and Franklin, Pa.	12.50 to 12.75
No. 1 railroad malleable stock	11.25 to 11.50
Grate bars	9.00 to 9.25
Low phosphorus melting stock	15.25 to 15.50
Iron car axles	20.50 to 21.00
Steel car axles	16.00 to 16.25
Locomotive axles	22.00 to 22.50
No. 1 busheling scrap	11.00 to 11.25
No. 2 busheling scrap	7.00 to 7.25
Old car wheels	12.00 to 12.25
*Cast iron borings	8.75 to 9.00
*Machine shop turnings	9.00 to 9.25
†Sheet bar crop ends	13.75 to 14.00
Old iron rails	14.50 to 14.75
No. 1 wrought scrap	12.00 to 12.25
Heavy steel axle turnings	9.75 to 10.00
Stove plate	9.00 to 9.25

*These prices are f.o.b. cars at consumers' mills in the Pittsburgh district.
†Shipping point.

Coke.—Negotiations which have been on for a week or more for large lots of furnace coke for shipment over the first half have not yet been closed. The coke trade is better, the output and shipments showing slight gains, while prices, especially on furnace coke for spot shipment, are higher. Owing to the shortage of labor in the coke regions, the stocks of coke that

were piled up several months ago have been pretty well cleaned up, and spot furnace coke is scarcer and higher. We note sales of about 5000 tons of standard furnace coke for spot shipment at $1.60 at oven, while several other sales, one of 2000 tons, are reported at $1.65. There is a fairly active demand for foundry coke, some consumers not yet having covered their requirements for the first half. The output in the Upper and Lower Connellsville region last week showed an increase over the previous week of about 12,000 tons. We quote best grades of furnace coke for prompt shipment at $1.60 and for first half of 1912 at $1.65 to $1.70 per net ton at oven; best makes of 72-hr. foundry coke for spot shipment at $1.90 to $2 and for first half of next year at $2.10 to $2.25 per net ton at oven to consumers. Some makes of furnace and foundry coke not running as high in quality are obtainable at slightly lower prices.

Chicago

CHICAGO, ILL., December 20, 1911.—(*By Telegraph.*)

Pig Iron.—The tonnage of the pig iron business under consideration and closed in this territory has continued large, but at this writing evidences are appearing that the buying movement is waning. The fact that prices for both Northern and Southern iron have failed to show material advances and that quotations for full first half delivery are on the same basis as obtained at the beginning of the buying movement tends to support the belief that the tonnage purchased has not been so heavy as the trade had been led to believe. Some of the Southern interests still display eagerness to obtain orders on the basis of $10, Birmingham, to the extent that attractive analysis offers are still being made. Other interests are sold up to a greater extent for first quarter delivery and are asking an advance for second quarter shipment. For local iron the price is still $14 at the furnace, and the idle capacity is a restraining influence as regards a higher market. We quote for Chicago delivery, except for local irons, which are f.o.b. furnace, the following prices on prompt shipments:

Lake Superior charcoal	$16.50 to $17.00
Northern coke foundry, No. 1	14.50 to 15.00
Northern coke foundry, No. 2	14.00 to 14.50
Northern coke foundry, No. 3	13.50 to 14.00
Northern Scotch, No. 1	16.00
Southern coke, No. 1 foundry and No. 1 soft	14.85
Southern coke, No. 2 foundry and No. 2 soft	14.35
Southern coke, No. 3	14.10 to 14.35
Southern coke, No. 4	13.85 to 14.10
Southern gray forge	13.60 to 13.85
Southern mottled	13.60 to 13.85
Malleable Bessemer	14.35 to 14.50
Standard Bessemer	16.75
Basic	14.75
Jackson County and Kentucky silvery, 6 per cent.	16.40
Jackson County and Kentucky silvery, 8 per cent.	17.40
Jackson County and Kentucky silvery, 10 per cent.	18.40

(By Mail.)

The market shows an upward trend as regards finished steel products and old material, based on the substantial tonnages purchased. The attitude of buyers is now entirely changed from one of reluctance to take on any more material than is absolutely necessary to a decided interest in covering for the next six months' requirements. The question is no longer whether the market has turned but to what extent the requirements of the first half year should be engaged, as complete assurance of the continued advance in prices is not yet established. In the Northwest, one railroad is understood to have closed for 30,000 tons of rails and a parallel system is about to place its orders for an aggregate of 40,000 tons. Car buying from the West has slackened somewhat, purchases in the week aggregating about 2000, the Chicago & Northwestern and the Illinois Central being the principal buyers. The decidedly firmer attitude taken by Pittsburgh makers on prices for plates, structural shapes and bars has not been exactly paralleled in this market although prices of all are moving upward. Business in bars and plates, both specifications and new orders, continues to come in heavily but the demand for structural material is only moderate. A marked improvement in sheet tonnage was apparent during the week. The advance in wire products brought in a large proportion of buyers who hastened to cover at the low price. In the past week the advancing market for scrap has been supported by general and extensive buying on the part of the melters.

Track Supplies and Railroad Equipment.—The Northern Pacific Railroad, whose inquiry for rails has been up for some time, is understood to have placed an order for 20,000 tons with the Colorado mill and to have divided 10,000 tons between a Chicago and a Buffalo maker. The Great Northern Railroad at this writing is on the eve of closing for 40,000 tons. The demand for track fastenings is light and prices are far from firm. The largest car order of the week was for 750 for the Chicago & Northwestern Railway to be built by the Pullman Company and 500 for the Illinois Central Railroad to be built by the American Car & Foundry Company. This last company also took orders for about 500 cars of miscellaneous description. We quote standard railroad spikes at 1.50c., base; track bolts, with square nuts, 1.90c., base, all in carload lots, Chicago; standard section Bessemer rails, 1.28c.; open hearth, 1.34c.; light rails, 40 to 45 lb., 1.16c. to 1.20½c.; 30 to 35 lb., 1.19½c. to 1.24c.; 16, 20 and 25 lb., 1.20½c. to 1.25c.; 12 lb., 1.25c. to 1.30½c.; angle bars, 1.50c., Chicago.

Structural Material—The rate of booking by the mills has fallen somewhat behind that of other finished materials This is particularly true of architectural shapes. Local fabricators, with possibly one exception, are in a position to accept business promptly. The American Bridge Company will furnish 1500 tons for two apartment buildings in Chicago to be built for Benjamin H. Marshall, and also 275 tons of transmission towers for the Great Northern Power Company. at Duluth. The McClintic-Marshall Construction Company was awarded 497 tons for an extension to the plant of the American Car & Foundry Company and the St. Paul Foundry Company will fabricate 400 tons for a factory building at St. Paul to be erected by Griggs-Cooper & Co. We quote for mill shipment, Chicago, 1.30c. to 1.35c. and from store 1.60c.

Plates.—Plate business on the mill books continues to mount up in this market as in the East, but the competitive situation here continues to prevent as marked advances in prices as are reported from Eastern points. For mill shipment, depending upon the desirability of the order, quotations range from 1.30c. to 1.38c., delivered, Chicago, applying on material to be shipped in from three to six months. Buyers are disposed to cover for six months to a limited extent, but a strong feeling still remains that no marked increase in prices will be established in the first half of the year. We quote for Chicago delivery, mill shipment, prompt, 1.30c. to 1.35c., and for delivery through the first half 1.38c. From store we quote 1.60c.

Sheets.—Sheets, which have been one of the weakest departments of the market, have shown a marked improvement in the past week. Orders have increased and prices are much firmer. We quote Chicago prices as follows: Carload lots, from mill, No. 28 black sheets, 2.03c. to 2.08c.; No. 28 galvanized, 3.03c. to 3.08c.; No. 10 blue annealed, 1.53c. to 1.58c. Prices from store, Chicago, are: No. 10, 1.90c.; No. 12, 1.95c.; No. 28 black, 2.30c.; No. 28 galvanized, 3.35c.

Bars.—Both specifications on contracts and new orders for steel bars are being booked by the mills in large volume. Eastern makers are now asking 1.15c., Pittsburgh, for delivery at Chicago, but the local market has not yet advanced to that basis and business is being placed at between 1.25c. and 1.30c. Iron rolling mills also have assumed a firmer position and bar iron is strong at 1.15c., Chicago. We quote as follows, f.o.b. Chicago: Soft steel bars, 1.23c. to 1.33c.; bar iron, 1.15c. to 1.20c.; hard steel bars rolled from old rails, 1.15c. to 1.20c. From store: Soft steel bars, 1.50c. to 1.55c., Chicago.

Wire Products.—The recent advance of $1 a ton in wire products resulted in a sharp increase in buying as usual. Dealers, whose stocks of wire and nails have been very small, have hastened to protect themselves on the basis of the low price. Fence wire has not shared to any extent in this activity. We quote: Plain wire, No. 9 and coarser, base, $1.53; wire nails, $1.73; painted barb wire, $1.73 to $1.78; galvanized, $2.03 to $2.08; polished staples, $1.78 to $1.83; galvanized, $2.08 to $2.13, all Chicago.

Cast Iron Pipe.—The tonnage of pipe being considered by a number of cities and gas companies is assuming large proportions. The purchases immediately following the first of the year are being anticipated with decided interest. At Portland, Ore., bids have been taken on 12,000 tons and at San Diego, Cal., between 500 and 600 tons has been awarded to the United States Cast Iron Pipe & Foundry Company. We quote as follows, per net ton, Chicago: Water pipe, 4-in., $26.50; 6 to 12-in., $24.50; 16-in. and up, $24, with $1 extra for gas pipe.

Old Materials.—The support which the advancing scrap market has lacked prior to this week has now been supplied in the extended and liberal buying by

melters. A general advance of 25c. a ton on all grades is recorded this week, with consumers quite willing to buy, while those holding material are inclined to part with it only in small quantities and at an advance. Rolling mill scrap, which has been in little demand for some time, is being sought in fair volume. Foundry grades continue strong and local buyers of railroad malleable are taking all that is offered. We quote for delivery at buyers' works, Chicago and vicinity, all freight and transfer charges paid, per gross ton, as follows:

Old iron rails	$14.75 to $15.25
Old steel rails, rerolling	12.50 to 13.00
Old steel rails, less than 3 ft	11.00 to 11.50
Relaying rails, standard section, subject to inspection	24.00
Old car wheels	13.00 to 13.50
Heavy melting steel scrap	10.25 to 10.75
Heavy switches and guards, cut apart	10.25 to 10.75
Shoveling steel	9.75 to 10.25
Steel axle turnings	8.25 to 8.75

The following quotations are per net ton:

Iron angles and splice bars	$12.50 to $13.00
Iron arch bars and transoms	13.50 to 14.00
Steel angle bars	9.50 to 10.00
Iron car axles	17.25 to 17.75
Steel car axles	15.50 to 16.00
No. 1 railroad wrought	10.75 to 11.25
No. 2 railroad wrought	9.75 to 10.25
Steel knuckles and couplers	9.75 to 10.25
Steel springs	10.00 to 10.50
Locomotive tires, smooth	13.25 to 13.75
Machine shop turnings	6.25 to 6.75
Cast and mixed borings	5.50 to 6.00
No. 1 busheling	8.50 to 9.00
No. 2 busheling	6.00 to 6.50
No. 1 boilers, cut to sheets and rings	6.75 to 7.25
Boiler punchings	12.50 to 13.00
No. 1 cast scrap	10.75 to 11.25
Stove plate and light cast scrap	9.00 to 9.50
Railroad malleable	10.25 to 10.75
Agricultural malleable	8.75 to 9.25
Pipes and flues	7.75 to 8.25

Philadelphia

PHILADELPHIA, PA., December 19, 1911.

The bulk of the business transacted during the week has been in small and moderate sized lots, although some good negotiations, both in crude and finished materials, are in progress. The movement in pig iron has been confined to foundry grades. Eastern plate and structural mills still refuse, as a rule, to accept forward business at minimum quotation. Iron bars are firm, while 1.30c., delivered, is becoming more general for steel bars for forward shipment. More interest in billets is noted. The old material market is decidedly stronger, higher prices being obtained in a number of grades. A sale of 7000 tons of cast scrap, unbroken tunnel plate sections, is reported. Furnace coke is decidedly more active, several contracts for 1912 shipment having been closed and others covering fully 160,000 tons are pending. The quotation for 80 per cent. ferromanganese, for next year's delivery, has been advanced to $41, Baltimore.

Iron Ore.—Little business is moving either in foreign or domestic grades, both buyers and sellers awaiting developments in the pig iron market. Importations during the week included 5785 tons from Sweden, 6304 from Spain, 6450 from Newfoundland and 4800 from Cuba. The aggregate amount of ore imported through this port in 1911 will be close to 1,000,000 tons, somewhat less than was imported in 1910.

Pig Iron.—Consumers are coming into the market freely for foundry grades for near as well as forward requirements, and although there has been but little large lot buying the aggregate volume of business has been satisfactory, particularly when the season is taken into consideration. Several producers have taken on about all the business wanted at present prices. The question of blowing in some of the idle furnaces is being seriously contemplated by some producers. Sheridan and Carbon are expected to blow in, while consideration is being given to the blowing in of Saxton in Pennsylvania and Princess in Virginia. On the other hand, it is stated that the Thomas Iron Company has ordered Hellertown and Alburtis to be blown out. At least two producers in this district are now holding firmly at $15.25, delivered, for No. 2 X foundry, but the general market ranges from $14.85 to $15.10. Sales recently have been mostly in lots up to 300 tons, with an occasional 500 tons and a few of 1000 tons, the larger quantities covering, as a rule, deliveries over first quarter or first half. Negotiations are pending for several 1000-ton lots, both No. 2 X and No. 2 plain. The cast iron pipe makers are again showing more interest in the market, a sale of 1000 tons of low grade iron at $13.85, furnace, being reported, the freight on which will be about 10 to 15 cents a ton. One Delaware interest is inquiring for 5000 tons, half No. 3 and half foundry forge, for March shipment, while another will take on several thousand tons if satisfactory prices can be made. Moderate sales of Southern No. 2 foundry have been made in this district at $10, Birmingham. Sales of Virginia foundry iron have been moderately active. One sale of 1000 tons for New England delivery, shipment over the next five months, has been made at $12.50, furnace. For first quarter delivery Virginia No. 2 X is available at $12.25 to $12.50, furnace. Little inquiry for rolling mill forge iron is noted. Small sales of Lehigh Valley malleable have been made at about $15.50, delivered here. The steel making grades are quiet; no important inquiry for basic has developed, while the recent heavy movement in low phosphorus iron has about come to an end. The following range of quotations is named for standard brands, delivered in buyers' yards in this district, during the first quarter and half:

Eastern Pennsylvania No. 2 X foundry	$14.85 to $15.25
Eastern Pennsylvania No. 2 plain	14.60 to 15.00
Virginia foundry	15.00 to 15.50
Gray forge	14.25
Basic	14.25 to 14.50
Standard low phosphorus	19.25 to 19.50

Ferroalloys.—While small sales of 80 per cent. ferromanganese were made last week at $38.50, Baltimore, this price has been withdrawn by foreign producers. In one instance a firm offer for 1200 tons at that figure was refused. Importers now quote $41, Baltimore. An inquiry for 75 tons of 50 per cent. ferrosilicon is reported. It continues to be quoted at $70, delivered. The demand for 10 to 12 per cent. ferrosilicon has been unimportant.

Billets.—Considerable effort is being made by consumers to place contracts covering a supply of rolling billets for extended delivery. Inquiries are out for lots running up to several thousand tons, but mills are not disposed to accept forward business at to-day's inside quotation, which is $21.40, delivered, for basic open-hearth rolling billets, although some fair business for early shipment has been placed on that basis. For extended delivery mills are holding at $22.40, delivered. A fair business in forging billets is being offered, but sales have not been heavy. Ordinary forging billets are quoted at $26.40 to $27.40, delivered here.

Plates.—The volume of orders has been somewhat larger, as Eastern mills are now accepting contracts on which deliveries run through the first quarter of the year, business of this character having been taken in some instances at 1.35c., delivered. Consumers would place contracts for even more extended shipment if mills would accept. A large amount of business is under consideration, including an inquiry for 3500 tons, covering both plates and shapes, from one of the local ship builders. A very fair run of miscellaneous orders for prompt shipment is noted, but not sufficiently large to enable mills to increase their productive rate. Quotations cover a rather wide range; 1.30c. is still done on desirable business, while for miscellaneous orders 1.35c. to 1.40c., delivered, is now generally named.

Structural Material.—Fabricators in this district have not taken on any important new contracts, although some good business is pending. The Baldwin Locomotive Works has decided to go ahead with its addition to its Eddystone erecting shop and will place orders in a few days for the structural work, requiring about 4500 tons. The contract for the Stock Exchange Building has not yet been placed. Very little bridge work is before local builders. Estimates are going in on several small buildings, while plans for some larger propositions are under way. Plain shapes are in fair demand, being quoted at 1.30c. to 1.35c., delivered in this vicinity.

Sheets.—A very fair business has been done. Eastern mills are operating at full capacity and are being rushed for deliveries prior to the usual holiday suspension of operations. Consumers are making strong efforts to place contracts for extended shipment at present prices, but Eastern mills refuse to accept such business. Prices are firm at 2.05c., delivered here, for Western sheets, although Eastern mills making smooth loose rolled sheets obtain ¼c. to ½c. per lb. advance.

Bars.—The market has a much firmer appearance. Buying has been a shade more active and sellers refuse to make concessions. Iron bars in round lots have been sold by some makers for delivery over several months at 1.17½c., mill, equal to 1.25c., delivered here, although others are holding firmly at 1.20c., mill, or 1.27½c., here, as a minimum for ordinary business. Steel bars are more generally on a 1.25c., delivered, basis with 1.30c. asked for forward deliveries.

Coke.—Sharp activity in furnace coke for delivery over the first half and even the entire coming year is now being experienced. Several furnaces have closed for a good portion of their requirements for 1912, while fully 160,000 tons are under negotiation. Producers endeavor to obtain $1.75 at oven for extended shipment, but business has been put through at $1.65. Small lot business has been moving in foundry coke at unchanged prices, although deliveries on contract are being freely made. Prices show practically no change, the following range, per net ton, being quoted for deliveries in this vicinity:

Connellsville furnace coke	$3.65 to $4.05
Foundry coke	4.15 to 4.50
Mountain furnace coke	3.40 to 3.65
Foundry coke	3.95 to 4.40

Old Material.—More interest is being shown in nearly all grades of scrap. Mills are becoming more alive to the situation, although in certain grades a dealers' market largely prevails. Material on the railroad lists went at considerably higher prices, $12.75 having been paid, it is reported, for No. 1 heavy melting steel. One Eastern mill bought 1000 tons of prime No. 1 heavy melting steel at $12.50, delivered, also small odd lots at lower prices. A fair movement in rolling mill grades is reported. Small lots of iron axles have been sold at $22, delivered. Sales aggregating 7000 tons of cast tunnel plate sections, at a trifle under $13, delivered, are announced. These will have to be broken to chargeable size by the purchaser. The market generally appears stronger, with advances in quite a few grades. The following range of prices about represents quotations at which the ordinary current business for prompt shipment can be done for delivery in buyers' yards, eastern Pennsylvania and nearby points, taking a freight rate from Philadelphia varying from 35c. to $1.35 per gross ton, for shipment ranging from prompt to the remainder of the year:

No. 1 heavy melting steel scrap	$12.25 to $12.75
Old steel rails, rerolling (nominal)	14.00 to 14.50
Low phosphorus heavy melting steel scrap	15.50 to 16.00
Old steel axles	17.50 to 18.00
Old iron axles	22.00 to 23.00
Old iron rails	16.00 to 17.00
Old car wheels	12.50 to 13.00
No. 1 railroad wrought	15.50 to 16.00
Wrought iron pipe	11.75 to 12.25
No. 1 forge fire	10.25 to 10.75
No. 2 light iron (nominal)	6.75 to 7.25
Wrought turnings	9.00 to 9.50
Cast borings	8.25 to 8.75
Machinery cast	13.25 to 13.75
Railroad malleable (nominal)	11.75 to 12.25
Grate bars, railroad (nominal)	10.00 to 10.50
Stove plate	10.25 to 10.75

Cleveland

CLEVELAND, OHIO, December 19, 1911.

Iron Ore.—Ore sellers are finding satisfaction in the figures of the estimated tonnage on the docks May 1, 1912, and the recent improved condition of the pig iron market further encourages them in the belief that ore shipments will be considerably heavier in 1912 than in the present year. The amount of ore on docks and in furnace yards December 1 is estimated at 33,821,000 tons, as compared with 34,376,000 tons a year ago. While this is a reduction of only slightly over 500,000 tons the consumption from December 1 to May 1 will be considerably heavier than during the corresponding period of 1910-11. Reports are circulated from time to time about the readjustment of ore prices for the coming season at a lower basis, but these reports so far are nothing but guesses and are misleading. Ore sellers themselves do not know what they will do about prices for 1912 and are not likely to come to any decision on the matter for some time. One furnaceman who has been trying to feel out the market for prices is understood to have received no satisfaction. Out of the total ore movement of 32,130,411 tons by water in 1911, the receipts at Lake Erie docks were 25,531,550 tons. We quote prices as follows: Old range Bessemer, $4.50; Mesaba Bessemer, $4.25; old range non-Bessemer, $3.70; Mesaba non-Bessemer, $3.50.

Pig Iron.—The demand for foundry grades in lots of 500 tons and under continues fairly active although sales in this immediate territory the past week were light. Some new inquiry from northern Ohio, however, has developed. Some of the furnace companies having two stacks, with only one in operation, have the output of the active furnace sold up for the first half and do not care to take on tonnage that will necessitate the blowing in of the second stack except at quite an advance in prices over current quotations. The conditions of the trade lead furnacemen to believe that prices will shortly be somewhat better. The market on foundry grades as a whole is firm. One Valley interest is now holding No. 2 at $13.25 for the first half and another Valley producer is so well sold out that it has withdrawn from the market for the first quarter and has advanced its price to $13.25 for No. 2 for the second quarter. For Cleveland delivery local furnaces are firmly adhering to $13.25 delivered for No. 2. Low quotations, however, are still made for shipments from Cleveland to outside points, the price depending upon the location. An Erie, Pa., boiler concern has bought 500 tons of No. 2 foundry, one-half of which went to Cleveland furnaces, at $12.50 at furnace. Some consumers are trying to take advantage of present low prices to cover their entire year's requirements but it is doubtful whether any maker will sell for delivery beyond July 1. We note the sale of 800 tons of No. 2 foundry to a local foundry for the first half. An Ohio engine builder is in the market for 800 tons of Nos. 2 and 3. About 2000 tons of No. 3 is wanted for an Ohio pipe plant. A Toronto, Ontario, pipe company that sent out an inquiry two weeks ago for 4000 tons of analysis iron for first half delivery has not yet bought but has increased its inquiry to 5000 tons. A large malleable interest is figuring on the purchase of a round tonnage of malleable iron. We quote as follows for prompt shipment and for the first half, delivered Cleveland:

Bessemer	$14.90 to $15.15
Basic	13.25
Northern foundry, No. 2	13.25
Southern foundry, No. 2	14.35
Gray forge	12.50
Jackson County silvery, 8 per cent. silicon	17.05

Coke.—The local coke market is quiet. Many consumers have not covered for their first half requirements in foundry coke, but will probably follow their present policy of buying in small lots for spot shipment. We quote standard Connellsville furnace coke at $1.60 per net ton, at oven, for spot shipment and $1.65 to $1.70 for first half. Standard Connellsville foundry coke is held at $2 to $2.15 for spot shipment and $2.15 to $2.40 for contract.

Finished Iron and Steel.—The general condition of the local market is regarded as very satisfactory by mill agencies. While orders are not so plentiful since the advance in prices, some business is coming out at the advance and good specifications are being received on contracts. The market is generally firm. On steel bars the minimum quotation is now 1.15c., Pittsburgh, this price being for spot shipment and first quarter delivery. One producer is quoting 1.20c. for the second quarter. Plates are firmer. While the quotation of 1.15c. is still being made, most mills are asking 1.20c. for prompt shipment and first quarter. Mills are quoting structural material at 1.20c. for immediate and first quarter delivery, and it is doubtful if much tonnage is available at a lower price. New structural work that has developed or been placed in this market the past week aggregates over 20,000 tons. The McMyler-Interstate Company, Bedford, Ohio, has taken from John Gill & Sons, Cleveland, the general contractors, the contract for 5000 tons for the new Washington, D. C., postoffice building. The contract for the steel has not been placed. The Michigan Central Railroad has sent out specifications for 10,000 tons for its new depot and train sheds in Detroit, for which it is expected that the contract will be closed early in the year. Bids are also being received for 5000 tons for the 20-story building to be erected in Detroit by the Dime Savings Bank. In Cleveland bids have been received for the Eagle school, 250 tons. Sheet prices appear fairly firm at the new level, although some of the low quotations made before the advance have not been withdrawn. We quote sheets at 1.90c., Pittsburgh, for No. 28 black, 2.90c. for No. 28 galvanized and 1.40c. for No. 10 blue annealed. Following the advance of soft steel bars, makers of hard steel bars have advanced their price to 1.15c. The demand for iron bars continues light, with no change in prices. We quote iron bars at 1.20c., Cleveland.

Old Material.—The market is quieter. Local steel mills, having bought a large tonnage of heavy steel scrap, are now well covered for their requirements until April 1. They are now practically out of the market, although they are willing to take odd lots at low prices. The absence of demand has resulted in the weakening of heavy steel prices. One local mill that had been buying steel scrap at $11.75 to $12 is now making its maximum quotation $11.50. Prices on other grades are fairly firm. There is some demand from dealers for borings and turnings, but other grades are inactive. Recent railroad offerings generally brought

good prices. Dealers' prices, per gross ton, f.o.b. Cleveland, are as follows:

Old steel rails, rerolling	$12.25 to $12.75
Old iron rails	14.00 to 14.50
Steel car axles	17.50 to 18.00
Heavy melting steel	11.25 to 11.50
Old car wheels	12.00 to 12.50
Relaying rails, 50 lb. and over	22.50 to 23.50
Agricultural malleable	10.50 to 11.00
Railroad malleable	11.75 to 12.00
Light bundled sheet scrap	9.50 to 10.00

The following prices are per net ton, f.o.b. Cleveland:

Iron car axles	$18.50 to $19.00
Cast borings	6.25 to 6.50
Iron and steel turnings and drillings	6.75 to 7.00
Steel axle turnings	7.25 to 7.75
No. 1 busheling	9.00 to 9.50
No. 1 railroad wrought	11.00 to 11.25
No. 1 cast	11.00 to 11.50
Stove plate	9.00 to 9.25
Bundled tin scrap	11.00 to 11.50

Cincinnati

CINCINNATI, OHIO, December 20, 1911.—(*By Telegraph.*)

Pig Iron.—The firmer attitude on prices assumed by Southern producers has brought on what might be termed a delayed buying movement, and practically all local pig iron merchants report a much better business than has been placed at this season for a long time. Quite a number of melters who have found it impossible to place orders at prices prevailing three weeks ago have deemed it expedient to contract at the present minimum quotation of $10, Birmingham, for No. 2 foundry, and, although several furnace interests are holding out for advances of 25c. to 50c. a ton on first half business, the majority are willing to take orders for this delivery at $10. At this price 500 tons was booked for a central Ohio melter and a nearby consumer took about the same quantity for first quarter shipment. Indiana and Illinois furnish several orders for assorted grades of Southern iron and Michigan buyers have also proved to be good customers during the last few days. Northern foundry iron is rather slow, but is held at $13, Ironton, but malleable, quotable at the same figure, is more active and a Michigan and a central Ohio melter recently booked 1500 tons each for first half movement. About 5000 tons of mixed Northern and Southern foundry grades will probably be bought soon by a central Ohio manufacturer, and there are a number of smaller inquiries before the trade. Late telegraphic advices to a local agency advance the price of ferromanganese from $38.50 to $41, f.o.b. Baltimore or New Orleans. Based on freight rates of $3.25 from Birmingham and $1.20 from Ironton we quote, f.o.b. Cincinnati, as follows for prompt shipment:

Southern coke, No. 1 foundry and 1 soft	$13.75 to $14.00
Southern coke, No. 2 foundry and 2 soft	13.25 to 13.50
Southern coke, No. 3 foundry	12.75 to 13.25
Southern coke, No. 4 foundry	12.50 to 13.00
Southern gray forge	12.50 to 13.00
Ohio silvery, 8 per cent. silicon	16.95 to 17.20
Lake Superior coke, No. 1	14.70 to 14.95
Lake Superior coke, No. 2	14.20 to 14.45
Lake Superior coke, No. 3	13.70 to 13.95
Basic, Northern	14.20 to 14.45
Standard Southern car wheel	25.25 to 25.50
Lake Superior car wheel	19.00

(By Mail.)

Coke.—In addition to two or three smaller inquiries for furnace coke before the trade, there is one from a Southern consumer for a total of about 30,000 tons, deliveries to run throughout the next six months. Foundry coke is only in moderate demand. Prices in all three districts are firmer and Connellsville 48-hr. grades are quoted around $1.60 to $1.65 per net ton at oven for prompt shipment, with the better brands of Pocahontas and Wise County coke bringing about 5c. per ton higher. Foundry coke in all three fields ranges from $2 for prompt shipment to $2.25 on contract business. Some grades of furnace coke are held as high as $1.75 at furnace for first half delivery in all the three producing districts.

Finished Material.—Considering the season, business in almost all finished material lines is remarkably good. No large contracts are being placed, but the small buyers are coming in at a satisfactory rate. This is probably attributable to the stiffening of mill prices, which generally brings on a buying movement. Local agencies are quoting steel bars at 1.15c. to 1.20c. Structural material is quoted around 1.20c. to 1.25c., Pittsburgh, the last named figures representing what the mills are asking on future shipment business. The local warehouse price on steel bars is unchanged at 1.60c. and on structural material at 1.70c.

Old Material.—Dealers continue to talk more encouragingly, and while quotations are unchanged, they are being adhered to more strictly No improvement is expected in the buying movement until about the middle of January The minimum figures given below about represent what buyers are willing to pay for delivery at their yards in southern Ohio and Cincinnati, and the maximum quotations the selling prices f.o.b. at yards:

No. 1 railroad wrought, net ton	$9.75 to $10.50
Cast borings, net ton	4.50 to 5.00
Steel turnings, net ton	5.50 to 6.00
No. 1 cast scrap, net ton	9.50 to 10.25
Burnt scrap, net ton	6.50 to 7.00
Old iron axles, net ton	16.25 to 16.75
Bundled sheet scrap, gross ton	6.25 to 6.75
Old iron rails, gross ton	13.00 to 13.75
Relaying rails, 50 lb. and up, gross ton	20.75 to 21.50
Old car wheels, gross ton	10.50 to 11.00
Heavy melting steel scrap, gross ton	9.50 to 10.00

Boston

BOSTON, MASS., December 19, 1911.

Old Material.—The scrap market is showing a real improvement. Local transactions have not been important but the dealers believe the situation to be considerably stronger. Wrought iron pipe and No. 1 wrought and soft steel lines advanced 50c. per ton. The prices quoted below are those offered by the large dealers to the producers and to the smaller dealers and collectors, per gross ton, carload lots, f.o.b. Boston and other New England points, taking Boston rates from eastern Pennsylvania points. In comparison with Philadelphia prices the differential for freight of $2.30 a ton is included. Mill prices are approximately 50c. a ton more than dealers' prices.

Heavy melting steel	$9.50 to $10.00
Low phosphorus steel	11.45 to 11.95
Old steel axles	14.00 to 14.50
Old iron axles	17.00 to 18.00
Mixed shafting	12.75 to 13.25
No. 1 wrought and soft steel	11.00 to 11.25
Wrought iron pipe	9.25 to 9.50
Skeleton (bundled)	7.00 to 7.50
Cotton ties	7.00 to 7.50
No. 2 light	4.50 to 5.00
Wrought turnings	5.00 to 5.50
Cast borings	4.50 to 5.00
Machinery, cast	12.50 to 13.00
Malleable	9.25 to 9.75
Grate bars	6.00 to 6.50
Stove plate	8.00 to 8.50

Birmingham

BIRMINGHAM, ALA., December 18, 1911.

Pig Iron.—The better feeling continues. Sales have been fairly good the past week, but the aggregate has not been comparable with the few weeks previous. It was not, however, to be expected that the buying movement which developed in the latter part of November should continue at the heavy rate experienced for two or three weeks. An effort is now being made to mark up prices. Some brands are being held at $10.25, Birmingham, for No. 2 for first quarter, and $10.50 second quarter. Some iron is still available for shipment through the first half of 1912 on the $10 schedule. Shipments continue to move at a fair rate, and it is not thought that any increase in stock will be shown January 1, as compared with December 1, despite the fact that a good many foundries will be shut down the last week in this month for the holidays and to take inventory. Special brands of pig iron are bringing premiums as usual. For regular fracture grade iron, however, prices remain quotable, f. o. b. cars at furnaces. Birmingham, for shipment through to July 1, as follows, per gross ton:

No. 1 foundry and No. 1 soft	$10.50
No. 2 foundry and No. 2 soft	10.00
No. 3 foundry	9.50
No. 4 foundry	9.25
Gray forge	9.00
Standard basic	10.00
Off basic	9.50

Cast Iron Pipe.—Manufacturers of water pipe seem more interested now in summing up the results for the year than in actively seeking new business. Prices continue to be held very firmly. Production is at about the same rate, and the current make is being shipped day by day. This industry is in a very healthy condition, though the margin of profit is rather small. Prices continue to be quoted, per net ton, f. o. b. cars here as follows: 4 to 6-in., $23; 8 to 12-in., $22; 12-in. and over, average, $21. Gas pipe continues to take the usual differential of $1 per ton higher. Special fittings are quoted at prices ranging from $45 to $50 per net ton at foundry.

Old Material.—Shipments are moving at a better rate than for many months. The increased interest

has not yet had a tendency to improve prices, though the market is undoubtedly firmer. Quotations remain as follows, f. o. b. dealers' yards here, per gross ton:

Old iron axles (light)	$12.00 to $12.50
Old steel axles (light)	11.00 to 11.50
Old iron rails	11.00 to 11.50
No. 1 railroad wrought	9.50 to 10.00
No. 2 railroad wrought	8.00 to 8.50
No. 1 country wrought	6.00 to 6.50
No. 2 country wrought	5.50 to 6.00
No. 1 machinery cast	8.00 to 8.50
No. 1 steel	7.50 to 8.00
Tram car wheels	7.00 to 7.50
Standard car wheels	9.00 to 9.50
Light cast and stove plates	5.50 to 6.00

Coal and Coke.—Quite a demand is springing up for all grades of steam and domestic coal. This has had a tendency to slightly advance the spot price on steam coal, and extends to coke to some degree. Some furnace coke has changed hands at $2.25 at oven; but good grades of foundry coke continue to bring $3 to $3.50 per net ton at oven.

St. Louis

ST. LOUIS, MO., December 18, 1911.

A very generally optimistic tone prevails in the market and the pig iron aggregate of sales continues to encourage the furnace representatives. There is a very general belief that the first of the coming month will see a renewal of the activity which has been noted in recent weeks. Prices are stiffening materially and in some instances advances are to be noted.

Pig Iron.—The knowledge that a considerable number of furnaces are booked up for the first quarter complete and the inability to take orders for some brands being emphasized in some quarters have had the effect of stiffening prices for both Northern and Southern iron. The 50c. advance referred to last week in connection with Northern iron has become more general, while in the Southern field one furnace, which has been accused of selling pretty low, is holding its product at $10.25, Birmingham basis. Another and larger furnace makes the same quotation and is refusing business for the first quarter at any price and will not take it below $10.25 for the second. The tonnage of the week has been heavy, but the individual orders have not been so large as in recent weeks. The business of the week includes 1800 tons of No. 3 Southern and better, part being for high silicon, 1500 tons of No. 2 Southern and 2000 tons of malleable, the latter for a St. Louis casting company. Inquiries, for the most part for small amounts, include two for 500 tons each of coke car-wheel iron and charcoal car-wheel iron. There is a tendency to request anticipation of shipments, indicating an increase in consumption.

Old Material.—There is a much stronger feeling in the scrap market and the shorts are running to cover. The dealers are buying all they can get hold of and the mills are in the market for any bargains they can pick up. While the foundries are, perhaps, the heaviest purchasers, the rolling mills are not far behind. In all divisions of the market there is a generally upward tendency which is aided by a decided scarcity of the material. The only list out here is a small one of 150 tons from the Mobile & Ohio, which will close later in the week. We quote dealers' prices per gross ton, f.o.b. St. Louis, as follows:

Old iron rails	$13.50 to $14.00
Old steel rails, rerolling	11.50 to 12.00
Old steel rails, less than 3 ft.	11.00 to 11.50
Relaying rails, standard section, subject to inspection	22.00 to 22.50
Old car wheels	12.50 to 13.00
Heavy melting steel scrap	11.00 to 11.50
Frogs, switches and guards cut apart	11.00 to 11.50

The following prices are per net ton:

Iron fish plates	$12.00 to $12.50
Iron car axles	18.00 to 18.50
Steel car axles	16.00 to 16.50
No. 1 railroad wrought	11.00 to 11.50
No. 2 railroad wrought	10.00 to 10.50
Railroad springs	9.75 to 10.25
Locomotive tires, smooth	13.50 to 14.00
No. 1 dealers' forge	7.50 to 8.00
Mixed borings	6.00 to 6.50
No. 1 busheling	9.00 to 9.50
No. 1 boilers cut to sheets and rings	8.00 to 8.50
No. 1 cast scrap	10.50 to 11.00
Stove plate and light cast scrap	8.00 to 8.50
Railroad malleable	8.50 to 9.00
Agricultural malleable	7.00 to 7.50
Pipes and flues	8.00 to 8.50
Railroad sheet and tank scrap	8.00 to 8.50
Railroad grate bars	7.50 to 8.00
Machine shop turnings	7.00 to 7.50

Coke.—No large contracts are being placed, consumers preferring to take as needed. By-product coke is commanding $5.10, delivered, in this market and there is considerable consumption of this grade by foundries.

Finished Iron and Steel.—Most of the buyers of structural shapes are covered for the first quarter and prices are stiffening, the quotation being 1.20c. to 1.25c., Pittsburgh, according to conditions. The plate market is slightly under a parity with the structural, but is stiff at the quoted figures of 1.15c. In bars there is a good tonnage moving and the prices have advanced. The market is stiff at 1.15c. In standard rails nothing is expected until after the first of the year. Track fastenings are in fair demand at firm prices. In light rails there is some tonnage moving to the lumber roads, but not in quantity to justify the statement that a buying movement has set in. The coal mines are purchasing liberally, but not up to what can be considered normal for this period of the year.

San Francisco

SAN FRANCISCO, CAL., December 12, 1911.

The dullness usually felt with the approach of inventory season is greatly intensified by the continued depression in prices and the possibility of obtaining prompt delivery on nearly all lines of steel products. Purchases by large buyers are almost entirely of the hand-to-mouth character, and stocks are being worked down to as small a condition as possible. Merchants, however, are beginning to figure on providing for the requirements of the coming year, and it is expected that a good many contracts will be closed within the next few days for delivery in the first quarter. On the other hand, mill representatives do not appear anxious to take such business on the basis of present prices. Numerous good-sized inquiries are coming from manufacturing interests along the coast.

Bars.—A large volume of business is more or less definitely in sight for next year, including much reinforcing material, though the present movement is rather slow. The general jobbing trade is very quiet. While a little firmer feeling is noted in prices, merchants are unwilling to increase their stocks before the end of the year. Any distinct upward movement of values would doubtless cause the closing of a number of contracts. Bars from store, San Francisco, are quoted at 2c. for steel and 1.90c. for iron.

Structural Material.—The only important contract recently left was the bridge at Portland, Ore., taken by the Pennsylvania Steel Company. The general building situation is fairly satisfactory, the November record being $1,617,800, compared with $1,255,892 for October, and $992,258 for November, 1910. In Oakland November values were more than double those of the same month of either 1909 or 1910, and the record at Portland, Ore., is the best so far this year. No great volume of work, however, is in immediate prospect. The steel contract for the Beck apartment house, about 250 tons, has been taken by Milliken Bros. Figures will be taken shortly on the State armory, which will require a heavy tonnage, and the Geary street car barn will probably be up about the first of the year. An inquiry is expected about the same time for the Garland Theater, Los Angeles, and a building for the Pacific Telegraph & Telephone Company at Portland, Ore. Plans will also be out shortly for the Sharon Estate building, this city. Other projects for which plans are under way are: A $900,000 hotel for the Grand Trunk Pacific Railroad at Prince Rupert, B. C.; a hall for the Elks at Seattle, Wash.; a large building for Cohn Bros., in Oakland; and a municipal office building at Los Angeles. Santa Barbara County, Cal., will open bids for a steel bridge February 5.

Rails.—The principal requirements for immediate construction have been provided for, and current business is of a small and scattered nature. Plans for extensive construction have been completed by many of the smaller coast concerns, and a considerable tonnage is in sight for the first or second quarter. More inquiry from logging interests is expected after the first of the year, especially in the north coast states. Light rails are moving in a limited way only.

Sheets.—Orders for black and galvanized sheets for immediate shipment are coming out rather slowly, though some increase in the consuming demand is expected. Merchants and large consumers are taking more interest in the market, and there is some disposition to place contracts for extended delivery,

though it is doubtful whether any heavy tonnage will be booked until the market exhibits more firmness.

Plates.—Aside from tank plates, the demand is limited, ship and car building operations on the coast being mostly of an unimportant character. Tank manufacturers report a fair amount of general work, and a heavier movement is expected next month. The jobbing movement is quiet, and merchants are keeping out of the market.

Merchant Pipe.—The total tonnage placed this year has been considerably below normal. Oil-country goods continue to find but a limited demand, and the distributive movement in small pipe is seasonably quiet. Merchants are buying in a very small way, but they feel that prices have reached bottom, and considerable business covering requirements of the first quarter is said to be pending.

Cast Iron Pipe.—Bids are being opened this week for quite a large quantity, including the 12,500 tons for Portland, Ore., and about the same amount in small lots for California interests. Among the latter are 600 tons for San Diego and 400 tons of light gas pipe for the Los Angeles Gas & Electric Company. Exeter, Cal., is taking bids on a complete water system, figuring on both cast iron and steel pipe, and bids will be taken on 360 tons for Las Cruces, N. M., December 15. The city of Seattle, Wash., has in contemplation a large pipe line, which, if of cast iron, will require about 24,000 tons. It has not been decided whether cast iron, riveted steel or wood stave pipe will be used.

Pig Iron.—The only recent purchase of any importance was made by the Pacific Coast Steel Company, which took a considerable tonnage of the stock held at Irondale, Wash. While nothing is being shipped from China at present, there is no shortage of Chinese iron here. Prices stand as before, No. 2 Southern foundry iron being quoted at $20, and Chinese iron at $23.

Old Material.—A number of new contracts for rerolling rails are expected to come out about the first of the year, but at present all lines of old material are dull, the only movement of steel melting scrap being small ballast shipments to Europe. Country wrought scrap is in a little better shape, with a steady though rather light demand. Prices are quoted as follows: Cast iron scrap, per net ton, $14; steel melting scrap, per gross ton, $11.50; wrought scrap, per net ton, $12.50 to $15; rerolling rails, per net ton, $11.

Buffalo

BUFFALO, N. Y., December 18, 1911.

Pig Iron.—Orders booked in this market for the week totaled 25,000 to 30,000 tons of foundry irons, about 10,000 tons of malleable and a fair tonnage of basic for first half delivery but largely for second quarter. Inquiry, while perhaps not so large in the aggregate as for any of the preceding three weeks, is of good volume and several large consumers whose inquiries are being quoted on have not as yet decided as to their purchases. Furnaces are holding firmly to their recently advanced schedules, being in a much stronger position now than for a long period and prompt shipment business is not of much interest to them on account of their capacity being sold for a considerable time ahead. Sales are not confined to the foundry and malleable trade, as consumers are also buying the specialties such as charcoal, high phosphorus and high silicon irons. Under active offering the price of charcoal iron has fallen off considerably and the tonnage of sales has increased materially. A local malleable and steel company specializing in railroad castings closed contract this week for about 5000 tons of malleable castings for brakebeam equipment, etc. Stocks on furnace yards continue to diminish from day to day. For first half delivery we quote as follows, f.o.b. Buffalo:

No. 1 X foundry	$13.75 to $14.00
No. 2 X foundry	13.50 to 13.75
No. 2 plain	13.25 to 13.50
No. 3 foundry	13.25
Gray forge	13.00
Malleable	13.75 to 14.25
Basic	14.00 to 14.25
Charcoal	15.50 to 16.50

Finished Iron and Steel.—There is continued improvement in the market, the volume of business being large and satisfactory. Consumers are now more anxious to place contracts for future delivery than mills are to enter them and a fair amount of contracting is being done for the first quarter. Many mills and agencies are declining to make contracts for second quarter. Such manufacturers as are closing contracts for second quarter are taking business only at an advance of $1 to $2 per ton over first quarter. Specifications on bar contracts are good for the season of the year and 1.15c., Pittsburgh base, is now the absolute minimum so far as can be ascertained. Some of the leading producers have declined desirable tonnage offered them at 1.10c. Prices on plain structural material and plates show a minimum of 1.20c. with 1.25c. asked on the less desirable specifications. The above prices on both bar and structural material are limited to immediate orders and first quarter tonnages. There has been an advance on sheets of what would amount to practically $2 per ton; the minimum asking price now being 1.90c., base, for No. 28 one pass cold-rolled and annealed. An order is reported as placed this week for 300 tons of black sheets per week for the first six months of 1912 for a local user. Nail and wire prices are also firmer and tonnage has been refused by producers at the price formerly ruling, $1.55, Pittsburgh, now being the minimum quoted on nails. There is very strong evidence that the heavy buying of these products will lead to a further advance in the near future. Very active conditions prevail in fabricated structural lines. The price situation is a little stronger and the prospects for early 1912 business are good. Bids for the steel for the Niagara Chocolate factory, Niagara Falls, N. Y., will be called for this week with a tonnage of about 300 tons. Bids went in this week for steel for the First Church of Christ, Scientist, Buffalo, 250 tons, and bids were received last week by Architects Esenwein & Johnson, Buffalo, for the 1000 tons of steel for the 12-story and basement Bancroft Hotel, Worcester, Mass. It is understood that financial arrangements have been completed for the construction of the Terminal Building, Syracuse, and that contract for construction will soon be awarded. 1300 tons of steel being involved. The Syracuse Bridge Company has received contract for a small quantity of steel for remodeling the Consumers brewery.

Old Material.—Market conditions are stronger than a week ago, although consumers are not showing so much activity in placing orders as at that time, evidently fearing the tendency to raise prices which might result from their coming too actively into the market. Dealers are now paying as much or more for scrap on railroad lists as consumers were offering and in consequence are taking the bulk of railroad offerings for the month. Prices are unchanged but are very firm. We quote as follows, per gross ton, f.o.b. Buffalo:

Heavy melting steel	$13.00 to $13.25
Low phosphorus steel	15.75 to 16.25
No. 1 railroad wrought	14.00 to 14.50
No. 1 railroad and machinery cast scrap	13.50 to 14.25
Old steel axles	18.50 to 19.00
Old iron axles	22.00 to 22.50
Old car wheels	12.75 to 13.00
Railroad malleable	12.75 to 13.00
Boiler plate, sheared	13.75 to 14.25
Locomotive grate bars	11.00 to 11.25
Pipe and tank	9.75 to 10.25
Wrought iron and soft steel turnings	7.25 to 7.50
Clean cast borings	6.75 to 7.00

The German Iron Market

The Situation Growing Stronger

BERLIN, December 8, 1911.

The iron market has commenced the final month of the year with a fresh accession of strength. The reports from the trade are growing better from week to week, and they begin now to read like "boom" literature. The trading on the Düsseldorf Exchange a week ago brought out higher prices for several products. Soft steel bars were raised from 104 to 106 marks and iron bars from 130 to 132 marks. The Band Iron Association has advanced prices again by 2.50 marks.

The strongest evidence of the activity of the trade is furnished by the statistics. Pig iron production for November reached 1,313,896 metric tons. This is about 21,000 tons less than for October, but the month was a day shorter. The daily rate of production was 734 tons greater than in October. For 11 months the production amounted to 14,046,586 tons, a gain of 670,345 tons over last year. The shipments of the Steel Works Union are given out provisionally at 489,000 tons, or about 17,000 tons more than in October. The best production statistics for some months are those given out by the Union for shipments of class B products (bars, plates, rods, tubes, castings and forgings) for

October, which showed a crude steel equivalent of 598,212 tons, against 553,643 tons in the previous month and 487,490 tons in October, 1910. Each branch registered record figures. When the allotments were last made by the Union, upon its renewal in 1907, the amounts assigned were regarded as highly extravagant; but the October figures show that the allotments in bars were actually exceeded by above 20 per cent., in plates by nearly 19 per cent., in wire rods by above 16 per cent., and in tubes by more than 9 per cent. In view of these figures another attempt will be made at this month's meeting of the Union to advance allotments. Motions have already been sent in for a 20 per cent. increase in bars and rods, and it is reported that a similar increase will be asked for in all the other products. In view of the activity of the trade it is said in some circles that the increases are likely to be voted. This seems doubtful, however, as it is known that some of the most powerful of the big mixed concerns are opposed to making any changes pending the renewal of the Union, since they believe that this would only complicate the negotiations still further.

The ore market is in good shape, both for home and foreign ones. Buying for next year in the Siegerland region has been very heavy, and some establishments have even placed contracts for two or three years ahead. Calls for ores on contract have grown more urgent. Foreign ores are quite firm. Imports in November were heavier than for a month or two.

Heavy Pig-Iron Contracts for Next Year

The contracts for pig iron on next year's account are so far beyond what was looked for that explanations are forthcoming. It is asserted that considerable speculative buying has taken place in anticipation of higher prices for the second half of 1912. This expectation is based on rumors that coke prices are to be advanced next spring. The calls for delivery of pig iron are also unusually heavy because it is assumed that the new syndicate will charge on unfilled contracts on January 1 the new prices adopted by it. The market for scrap is firm. More old material has been coming on the market, but the demands of the open-hearth works have increased in still greater proportion. Export sales of shop scrap are very heavy.

Steel material for further manufacture is being specified for on contracts so rapidly that the mills are often unable to fill orders with the desired promptness. Not a few of the big mixed concerns, too, are now consuming so much of their steel in turning out the more finished products that they are not able to come up to their allotments in the Union; nevertheless, the latter is still able to ship in excess of allotments, thanks in part to an active export demand, which shows no signs of abating. Business in beams and other structural shapes is rather quiet, but very satisfactory relatively to other years. The home demand for steel rails shows the same slackness that has prevailed for many months, but export trade remains active. South American countries continue to send in big orders, and further good contracts from there are in sight.

Bars Never More Active

The bar market has perhaps never shown such activity as now. Some works are sold four or five months ahead; other reports say that all mills are sold out to the second quarter of 1912. Specifications on contracts are being sent in urgently, particularly from the export trade, but the mills in many cases require six to eight weeks for delivery. Prices for export have further risen. In view of the extreme activity in this specialty it is suspected that considerable speculative ordering has been undertaken in anticipation of higher prices next year.

In band iron most of the mills have sold to the end of March, and they appear not to be taking orders beyond that date. The export demand is very good, and prices have recently been raised several times. The prospects for employment on ship plates have further improved, as a number of orders for new steamers have just been reported. The wire rod association has been able to assign orders to its members that will keep them busy for several months. The foreign market is a good, steady buyer. Wire mills have considerable work to do, but their prices remain unsatisfactory, and this is also true of wire nails. In the latter, however, heavy selling for the March quarter has occurred, and prices have been lifted 2 or 3 marks from the lowest level prevailing after the old trade combination was dissolved. In tubes the demand is increasing and prices are somewhat firmer. In gas pipe the greater part of the capacity of the mills for the first quarter has been sold. Cast-iron pipe is more active, with slightly better prices. The hardware trade is well employed in all its branches.

The Fried. Krupp Company has announced a dividend of 10 per cent. This is the same as last year, but it could easily have been increased to 14 per cent. Net earnings rose to 28,712,000 marks, as against 21,265,000 last year. This year the amount carried to the reserve has been increased by above 7,000,000 marks. In thus adding to its reserve the company is imitating the example of several other big concerns. They are all evidently equipping themselves financially for whatever eventualities may come if the Steel Works Union is not renewed.

The Aumetz-Friede Company, which is situated near the French frontier, and has recently grown into a prominent position among southwestern works, is negotiating for the absorption of the well-known Mannstaedt Façoneisenwerk, situated at Kalk near Cologne, and also the Düsseldorfer Eisen und Drahtindustrie. Meetings of the three concerns are called for the end of next week to perfect the arrangements.

New York

NEW YORK, December 20, 1911.

Pig Iron.—After a month of good buying the market has quieted. One interest which buys its pig iron in New York for plants at Uniontown, Pa., and Norwich, Conn., manufacturing heating apparatus and some special products, has been in the market for 7000 tons, chiefly No. 2 iron, and is believed to have closed for the greater part of it. Deliveries extend into the second quarter of 1912. A sale of 1000 tons to a New Jersey foundry is reported for delivery in the first quarter. Sales by Buffalo furnaces have fallen off so far as the New England trade is concerned. Apart from some inquiry from a large pump manufacturer, which has been asking for prices at intervals for some weeks, no important business is known to be under negotiation in this market. The situation seems to be that most of the large consumers have bought such iron as they expect to melt in the first quarter and some of them have covered for the greater part of the second quarter. The smaller foundries prefer to buy on a rising market, since the advance in the price of castings under such conditions is usually more than compensation for any increase in pig iron. Such buyers have not been on the hunt for bargains and will come into the market from time to time in reasonable anticipation of their wants. While Buffalo furnaces are asking from 25 cents to 50 cents more no advance has been actually established except perhaps on small lot business. The situation in Eastern Pennsylvania does not gain strength, one merchant furnace and a steel company with a surplus of pig iron being rather active competitors for what business is going. One of the pipe companies is expected to buy 3,000 tons in addition to considerable purchases in the early part of the month. Quotations are as follows for northern iron at tidewater: No. 1 foundry, $15 to $15.25; No. 2 X, $14.75; No. 2 plain, $14.50 to $14.75. For southern iron we quote $15 to $15.25 for No. 1 foundry and $14.50 to $14.75 for No. 2 foundry.

Finished Iron and Steel.—A good run of business continues and prices are if anything stiffer. One of the features is a greater hesitancy on the part of sellers to close on buyers' demands for anything for future delivery, even for the first quarter. For example, a fair tonnage of plates is now pending because the mill representative has not yet agreed to take it for the second two months of the quarter at 1.15c., Pittsburgh basis. A greater number of mills than was the case last week are standing out for the higher prices of 1.15c. for bars and 1.20c. for plates and shapes, and the asking price for large lots for one large company is even 1.25c., Pittsburgh. Only the most attractive specifications and for immediate shipment, in plain structural material, will command 1.15c., Pittsburgh, although, for the exception which proves the rule, a case is known of large tonnage which will probably be closed for at least 1.10c. for delivery early in 1912. Low prices are also disappearing in bar iron and 1.20c. at mill is now more generally asked, with shading where there is much competition. It should be stated that some buyers hold the view that the recent high rate at which business in the steel business has been conducted is not of long duration, but it is a widespread belief that prices will remain firm, without strong evidence of an advance. The large rail inquiries which are expected early in the year will, of course, have an uplifting effect. New activity of large size in the structural field is practically absent and some of this amounts to bidding on redesigned build-

ings on which bids have already been received, like the Allyn House Extension, Hartford, Conn., 1500 tons, and the Portsmouth, N. H., navy yard bridge, 400 tons. There are still pending, of the projects regarded as particularly alive, the 2000 tons for the Graphic Arts Building, West Twenty-fifth street, New York; New York Central Terminal Area, 1000 tons; bascule bridge, New York, New Haven & Hartford Railroad at Buzzard's Bay, 500 tons, bids on which go in December 28; the Auerbach candy factory, 2000 tons; the Hess loft building, Twenty-sixth street and Fourth Ave., 3000 tons. The Delaware, Lackawanna & Western Railroad will take bids on 8000 tons of bridge work for 1912 on December 23, and the Grand Trunk is in the market for 7000 tons of bridge material. Among recent awards may be mentioned the Eagle Silk mill, 3000 tons, to Hay Foundry & Iron Works, for which the Eastern Steel Company will supply the structural shapes; New York Central Terminal Area, 3500 tons, to McClintic-Marshall Construction Company; the Royster Hotel, Norfolk, Va., 1200 tons, to the American Bridge Company; addition to the Hudson Terminal Building, 900 tons, to the American Bridge Company; Bloomingdale Construction Company's apartment house, West 104th street, 400 tons, to Milliken Brothers; the Fifty-fourth Street & Park Avenue Company's building, 650 tons, to Harris H. Uris Iron Works. Quotations are: Steel bars, plates and plain structural material, 1.31c. to 1.36c.; bar iron, 1.27½c to 1.32½c., all New York. Plain material and plates from store, New York, 1.60c to 1.70c.

Cast Iron Pipe.—The city of New Bedford, Mass., will open bids December 21 on 700 tons of 6, 8 and 12-in. The Sewage Disposal Commission, Pittsburgh, Pa., will open bids January 1 for 750 tons of 30-in., class A. Although hardly as heavy as two or three weeks ago, a good volume of inquiry is being received from private buyers. An encouraging feature is that these buyers almost invariably desire larger quantities than when they were in the market a year ago. Car load lots of 6-in. are quoted at $22 to $23 per net ton, tidewater.

Old Material.—A better movement is reported in heavy melting steel scrap. Consumers of steel scrap are conservative in their views and offer but a trifle more than they were willing to pay two or three weeks ago, but dealers apparently need good quantities to fill contracts, as they are bidding higher than the prices named by the mills. Practically no steel scrap is available except at full prices, all holders being quick to appreciate the improving conditions and desiring to get for themselves as much of the advance as possible. Rolling mill material is in somewhat better demand and prices are slightly higher. Cast scrap is fairly active. Dealers' prices, per gross ton, New York and vicinity, are as follows:

Old girder and T rails for melting	$10.25 to $10.50
Heavy melting steel scrap	10.25 to 10.50
Relaying rails	20.50 to 21.00
Rerolling rails (nominal)	12.00 to 12.50
Steel axles, journals cut off	20.00 to 20.50
Old steel car axles	15.50 to 16.00
No. 1 railroad wrought	13.50 to 14.00
Wrought iron track scrap	12.00 to 12.50
No. 1 yard wrought, long	11.00 to 11.50
No. 1 yard wrought, short	10.25 to 10.50
Light iron	4.75 to 5.00
Cast borings, clean	6.50 to 6.75
Mixed borings and turnings	5.50 to 5.75
Wrought turnings	6.75 to 7.00
Wrought pipe	9.75 to 10.00
Old car wheels	12.00 to 12.50
No. 1 heavy cast, broken up	11.00 to 11.50
Stove plate	8.75 to 9.00
Locomotive grate bars	9.00 to 9.50
Malleable cast	10.00 to 10.50

Ferroalloys.—Dealers now quote 80 per cent. ferromanganese at $41 per ton, Baltimore, the price having advanced from $38.50 where it stood for several weeks. The advance is declared to be due to the excellent demand which has developed of late and also to conditions abroad, where a combination of manufacturers exists. In buying of recent date about 8000 tons of manganese is said to have been contracted for. Ferrosilicon is quoted at $70, Pittsburgh, in carload lots. Inquiries have been good. A transaction was closed last week in which 600 tons of ferrosilicon was sold at $68 per ton.

The Debevoise-Anderson Company, 95 Liberty street, New York, has been appointed sole agent for the sale of Jamison selected 72-hour foundry coke in the State of New Jersey.

Metal Market

NEW YORK, December 20, 1911.

The Week's Prices

Cents Per Pound for Early Delivery.

	Copper, New York.			Lead		Spelter	
Dec.	Lake.	Electrolytic.	Tin, New York.	New York.	St. Louis.	New York.	St. Louis.
14	13.87½	13.75	43.75	4.45	4.35	6.40	6.25
15	13.87½	13.75	44.05	4.45	4.35	6.40	6.25
16	13.87½	13.75	.....	4.45	4.35	6.35	6.20
18	14.00	13.87½	45.00	4.45	4.35	6.30	6.15
19	14.00	13.87½	45.00	4.45	4.35	6.30	6.15
20	14.00	13.87½	45.00	4.45	4.35	6.30	6.15

Moderate demands exist for all metals. With no large business in either copper or tin, the prices of these metals are higher and well maintained. Spot copper has been sold at 14c. and over, while the foreign syndicate controlling tin has indirectly fixed the price here at 45c.

New York

Copper.—The market in copper, though very dull during the week, has attained higher prices, a tendency which still continues. Prices here have been dragged up by the conditions abroad. The sales for home consumption have not been nearly equal in volume to those for export. In addition to this, all reports agree that speculators have done much to create an active market on the other side. Consumers appear to be well supplied for January but not for February. They have not believed in the advance in prices and are hoping for a reaction. On the other hand, the opinion is strong that present prices will hold good for some time to come and may advance. The next report of the Copper Producers' Association, to be issued in January, is generally expected to show another substantial decrease in stocks. While Lake is generally quoted to-day at 14c. and electrolytic at 13.87½c., dealers have made some sales of prime Lake copper at 14.12½c. to 14.50c. and electrolytic at 14c. to 14.12½c. Spot copper is quoted in London to-day at £62 10s., and futures at £63 7s. 6d. Exports have been heavy this month, reaching a total of 22,776 tons.

Pig Tin.—Business the past week has been quiet in pig tin, although foreign influences have caused an advance in price. The last three days it has stood at 45c. There is usually little buying at this season, and what has been done has been almost entirely for future delivery. On Monday last the English syndicate, which has firm control of the tin supply, raised the price in London £5 10s. per ton, equal to about 1c. a lb. here. The price jumped to 45c. on that day and has been maintained since, although a little weakness developed this morning. There is a feeling in some quarters that more tin has been sold than actually exists in stock, and that the attempt to cover when settlements are made is a cause of the fluctuations in price. In London spot tin is quoted to-day at £205 10s., with futures at £193 10s. Arrivals of tin during the month have been 3005 tons and the amount afloat is 1645 tons.

Tin Plates.—There has been little change in the tin plate situation, except that an increased number of mills have been put in operation and specifications on contracts for future delivery are coming a little more freely. Prices remain about the same, $3.64 being quoted in New York for 100-lb. coke plates. Tin plates laid down in Swansea, Wales, are quoted at 13s. 7½d., an advance of 1½d. Prospects for good business after the holidays are excellent.

Lead.—Prices are firm. The market is dull and without feature. In New York 4.45c. is quoted and in St. Louis 4.35c.

Spelter.—There is very little activity in the spelter market. During the week there was evidence of weakness in the West, due to the very light demand for the metal. There is a feeling that during the recent season of high prices buyers became scared and kept out of the market and have not yet recovered. Prices quoted are: New York, 6.30c. and St. Louis, 6.15c. Some dealers quote slightly higher figures.

Old Metals.—The market continues strong. Dealers' selling prices are as follows:

	Cents per lb.
Copper, heavy and crucible	13.25 to 13.75
Copper, heavy and wire	13.00 to 13.25
Copper, light and bottoms	11.75 to 12.00
Brass, heavy	9.25 to 9.50
Brass, light	7.25 to 7.50
Heavy machine composition	11.25 to 11.50
Clean brass turnings	8.75 to 9.00
Composition turnings	9.25 to 9.50
Lead, heavy	4.20
Lead, tea	3.95
Zinc, scrap	5.25

Antimony.—The only change in the antimony market, which continues dull and inactive, is an advance in the price of Hallett's, which is now quoted at 7.75c. to 7.80c. and in Cooksons, which is now 7.87½c. to 8c. The prices of Hungarian and Chinese grades are so far unaffected.

Chicago

DECEMBER 18.—The market has been decidedly active, with a generally strong undercurrent and a trend distinctly in the direction of higher prices for copper. Tin fluctuated to both higher and lower prices during the course of the week with a net advance over last week's quotation of 1c. We quote at Chicago as follows: Casting copper 14c.; Lake, 14.25c., in carloads, for prompt shipment; small lots, ¼c. to ⅜c. higher; pig tin, carloads, 46c.; small lots, 48c.; lead, desilverized, 4.40c. to 4.45c., for 50-ton lots; corroding, 4.55c. to 4.60c. for 50-ton lots; in carloads, 2½c. per 100 lb. higher; spelter, 6.30c. to 6.40c.; Cookson's antimony, 8.75c., and other grades, 7.75c. to 8.25c., in small lots; sheet zinc is $8.25, f.o.b. La Salle or Peru, Ill., less 8 per cent. discount, in carloads of 600-lb. casks. On old metals we quote buying prices for less than carload lots: Copper wire, crucible shapes, 11c.; copper bottoms, 9.75c.; copper clips, 10.75c.; red brass, 10c.; yellow brass, 7.75c.; lead pipe, 4c.; zinc, 4.50c.; pewter, No. 1, 26c.; tinfoil, 33c.; block tin pipe, 38c.

St. Louis

DECEMBER 18.—The metal market in spots shows weakness and in others strength, the spelter quotations having taken the hardest fall during the week. The price to-day is easy for lead, ranging from 4.25c. to 4.30c. The spelter quotation is steadier than during the closing days of last week, an upturn from the low point having taken place to 6.25c. Tin is decidedly off at 44.45c. Copper is considerably higher, lake being quoted at 14.35c. and electrolytic at 14.22½c. Antimony is unchanged at 8.10c. The sudden slump in spelter from 6.85c. to 6.10c., which was the bottom of the drop, caused a slump in the Joplin ore market in the offerings for zinc blende, and the best price $45 with a range down to $40 per ton. The choicest lots brought $48 per ton. On the contract basis the 60 per cent. grade brought $49.55, with the choicest lots commanding $52. The terms of the contract system of buying have been so changed that the ore producer is not receiving the same liberal price paid heretofore and as a result several companies have decided to discontinue selling on that basis. Calamine brought $22 to $25 per ton, choice lots commanding as high as $30. Lead ore was 50c. weaker per ton, the price being $63.50. On miscellaneous scrap metals we quote as follows: Light brass, 4.50c.; heavy brass and light copper, 8.50c.; heavy copper and copper wire, 9.50c.; zinc, 3.50c.; pewter, 20c.; tin foil, 29c.; tea lead, 3c.

Iron and Industrial Stocks

NEW YORK, December 20, 1911.

With the exception of a few stocks in which special influences were operative to affect values adversely, all kinds of securities have shown marked strength in the period under review. The range of prices on active iron and industrial stocks from Wednesday of last week to Tuesday of this week has been as follows:

Allis-Chalm., com....	11¼- 2¾	Pressed Steel, com...	32⅜- 34
Allis-Chalm., pref...	68¾- 8[illegible]	Railway Spring, com.	31½- 32
Baldwin Loco., pref.	107	Railway Spring, pref.	101
Beth. Steel, com....	29½- 31½	Republic, com.....	34 - 35
Beth. Steel, pref....	59 - 60	Republic, pref.....	84 - 85
Can. com.....	10¾- 11	Sloss, com.....	49 - 50
Can. pref.....	37¾- 39	Pipe, com.....	13 - 15
Car & Fdry., com..	53¾- 55¾	Pipe, pref.....	49½- 51
Car & Fdry., pref....	117	U. S. Steel, com....	67⅞- 68⅜
Steel Foundries.....	33 - 33¾	U. S. Steel, pref...	109¼-110
Colorado Fuel.....	27¾- 29	Westinghouse Elec..	65 - 66
General Electric....	153¾-155¾	Va. I. C. & C.....	68 - 73½
Gr. N. Ore Cert....	33½- 36¼	Am. Ship, com.....	52
Int. Harv., com....	107 -110	Chic. Pneu. Tool...	46½- 46⅝
Int. Harv., pref....	120¼-120¾	Cruc. Steel.....	13½- 14½
Int. Pump, com....	33¾- 35	Lake Sup. Corp....	26½- 27
Int. Pump, pref.....	88	Pa. Steel, pref.....	102¾-
Lackawanna Steel.....	30	Wash. S. [illegible]	[illegible]
Locomotive, com....	36¾- 37½	Crucible Steel, com.	11½- 12
Locomotive, pref....103 -104		Crucible Steel, pref.	79¾- 82
Pittsburgh Steel, pref.....102		Harb. Wk. Ref., pref.....	67

Dividends Declared

The Western Electric Company, regular quarterly, $2 per share, and an extra dividend of $2 per share, payable December 30.

The Standard Coupler Company, regular semi-annual, 4 per cent. on the preferred stock and 2 per cent. on the common, payable December 23.

The Otis Elevator Company, regular quarterly, 1½ per cent. on the preferred stock and 1 per cent. on the common, payable January 15.

Directors of the Empire Steel & Iron Company at their regular semi-annual meeting December 12, took no action on the dividend on the preferred stock.

The American Locomotive Company, regular quarterly, 1¾ per cent. on the preferred stock, payable January 22.

The Yale & Towne Mfg. Company, regular quarterly, 1½ per cent., and a special dividend of 1 per cent., payable January 2.

The American Iron & Steel Mfg. Company, regular quarterly, 1¼ per cent. on the preferred and common stock, payable January 1.

The Baldwin Locomotive Works, regular semi-annual, 3½ per cent. on the preferred and 1 per cent. on the common stock, payable January 1.

The Nova Scotia Steel & Coal Company, regular quarterly, 1½ per cent. on the common stock, payable January 15.

The Sharon Steel Hoop Company, regular quarterly, 1¾ per cent., payable December 22.

The American Seeding Machine Company, regular quarterly, 1½ per cent. on the preferred stock and 1 per cent. on the common stock, payable January 15.

The Westinghouse Air Brake Company, 2½ per cent. regular quarterly, 1½ per cent. extra and 1 per cent. special, payable January 10.

The Union Switch & Signal Company, regular quarterly, 3 per cent. on the common and same on the preferred stock, payable January 10.

The Dominion Steel Corporation, regular quarterly, 1 per cent., payable January 2.

The E. W. Bliss Company, regular quarterly, 2 per cent. on the preferred stock, payable January 2.

The Hydraulic Press Mfg. Company, Mount Gilead, Ohio, pioneer manufacturer of hydraulic cider and grape juice machinery, has in recent years made great strides into various lines of heavy hydraulic machinery. This company has just completed arrangements for establishing a new brass foundry in the plant for the purpose of making at home the many brass castings on the hydraulic machinery. The new foundry will have capacity to meet not only the home needs but many outside calls as well.

The Alabama Consolidated Coal & Iron Company, Birmingham, Ala., announces that, beginning with January 1, Mathew Addy & Co., Cincinnati, Ohio, will have the exclusive sale of its pig iron in the territory north of the northern boundary of the following States: North Carolina, Tennessee, Arkansas, Oklahoma, New Mexico, Arizona and California. The company's principal brands are Clifton, Ironaton and Etowah.

The December meeting of the New York Section of the American Institute of Mining Engineers was held in the Engineering Societies Building, 29 West Thirty-ninth street, New York, on Wednesday, December 20, at 8.15 p. m. Dr. R. W. Raymond, secretary emeritus, gave an account of the Institute party in Japan, on the recent trip following the California meeting. On January 5, 1912, Gardner F. Williams, Washington, D. C., will deliver an illustrated lecture on "The South African Diamond Fields."

The Carnegie Steel Company has awarded a contract to the Master & Muller Construction Company, Cleveland, Ohio, for the remodeling and enlargement of its Cleveland warehouse. A one-story extension will be built, 166 x 266 ft.

The Engineers' Club of St. Louis, Mo., has elected A. S. Langsdorf, Washington University, president; John Hunter, Union Electric Light & Power Company, first vice-president; H. H. Humphrey, second vice-president; W. W. Horner, secretary, and W. E. Rolfe, treasurer.

The Buffalo Union Furnace Company, Buffalo, N. Y., contemplates building a blast furnace next spring at Port Colborne, Ontario, at the entrance to the Welland Canal, to supply its Canadian trade.

Personal

E. L. Messler, for the past twelve years general superintendent of the Jones & Laughlin Steel Company's Pittsburgh coke ovens and blast furnaces, has tendered his resignation to accept the position January 1 of assistant to the president of the Riter-Conley Mfg. Company, Pittsburgh. During his connection with the Jones & Laughlin Steel Company, a record on blast-furnace dismantling and rebuilding was made. The No. 3 furnace of the Eliza group was torn down, a 400-ton salamander taken out, foundations put in and a new 22 x 96 ft. furnace erected with top rigging, downcomer, dust catcher, gas mains and cast house in 73 days. A year previous No. 1 furnace of the same group was rebuilt, which involved the same work, in 95 days. Previous to that connection he was assistant superintendent of the Duquesne furnaces of the Carnegie Steel Company, and was one of the heads of the construction force in the building of these furnaces, the first of the very large, economically producing blast furnaces in the country.

The statement is made that President J. C. Maben of the Sloss-Sheffield Steel & Iron Company will remove from Birmingham, Ala., to New York City. J. C. Maben, Jr., has been elected vice-president of the company in charge of operations. J. W. McQueen continues as vice-president in charge of sales and financial operations.

James G. Heggie, boiler manufacturer, Joliet, Ill., sailed Saturday, December 16, to spend the winter in Scotland.

William H. Wilson of the Chicago sales office of the Jeffrey Mfg. Company, Columbus, Ohio, in charge of the conveying department, will sever his connection with that company at the end of the year to engage in business in Chicago as a general advertising agent for technical advertising.

Albert Ladd Colby, consulting engineer, 165 Broadway, New York, has returned from a three months' study of the latest developments in German by-product coke manufacture.

James L. Gough, for the past seven years assistant manager of the Marshall & Huschart Machinery Company, Chicago, severed his connection with that company December 16.

Obituary

WILLIAM J. CARLIN, Pittsburgh, died December 14, after a long illness, aged 54 years. He was born in Allegheny City, and was a son of Thomas Carlin, who in 1860 established the firm bearing his name to deal in machinery, and eventually took his sons, William J. and John H., into partnership. On the death of the elder Carlin in 1884, the business was continued under his name by the sons until 1899, when it was incorporated as the Thomas Carlin's Sons Company, with William J. Carlin as president, and he continued to hold that office until his death. He leaves a widow and one son, David N. Carlin.

Customs Decisions

Old Sugar Mill Shafts

The Board of United States General Appraisers has made a ruling in favor of a contention raised by A. D. Strauss & Co. regarding the classification of broken bull shafts collected from broken-down machinery in sugar mills. The appraiser at New York reported that, from an examination of the merchandise, he found it to be second-hand shaftings varying in size and fitted to be rerolled or hammered, and better than scrap iron fit only for remanufacture by remelting. The collector assessed duty at the rate of 45 per cent. under the tariff act of 1909, as "manufactures of metal not specially provided for." The importers claimed that the importations are junk within the meaning of the law, and as such entitled to free entry. Several other claims are made, but they are not deemed applicable by the board. Judge Fischer sustains the contention as junk and reverses the collector.

Book Sewing Machines

The American Type Founders Company succeeded in securing a reduction in the duty assessed on so-called thread book sewing machines. The testimony showed that the machine sews the signatures together preparatory to binding. The customs officials held that the machines are not the kind of sewing machines contemplated by Congress in framing paragraph 197 of the present act, which specifies "sewing machines." The government contention was that the sewing machines enumerated in the paragraph refer to the article for domestic use and not to machines for general purposes. Duty was accordingly assessed at 45 per cent. as manufactures of metal. This classification is reversed and the articles allowed to enter as "sewing machines" at 30 per cent. ad valorem.

Steel Strips in Coils

The board has sustained the action of the customs officials in assessing a high duty on steel strips in coils used in the manufacture of corset steel, clasps, etc. The case stands in the name of Strouse, Adler & Co., and is in the nature of a test of the act of 1909. The merchandise was assessed at the rate of 35 per cent. under the provision for "steel in strips and coils." The importers alleged the goods subject to tax at applicable specific rates as "steel not specially provided for." Judge Fischer says in his decision overruling the importers' claim that there is nothing in the official record to disturb the assessment as made by the customs officials.

Manganese Metal

The Goldschmidt Thermit Company failed to obtain relief from an assessment made on importations of manganese metal. The collector exacted duty at 20 per cent. ad valorem under the provision in the present tariff act for "metals unwrought, not specially provided for." The protestant relied on the claim that the importations are dutiable at $2.50 a ton under paragraph 118 as "ferromanganese." The testimony, it is held, does not substantiate the claim. The collector is affirmed.

Forged and Turned Steel Shafts

The collector at New York has been reversed in cases dealing with the classification of steel shafts which have been forged and subsequently turned in a lathe. Duty was exacted at the rate of 45 per cent. as "manufactures of metal." This classification is held erroneous by the board and duty granted as "forgings" at 35 per cent. on the value. The importers include the American Locomotive Automobile Company and the Hewitt Motor Company. Crank shafts imported by Peter A. Frasse & Co. and claimed to be forgings were denied entry as such, the collector's assessment at 45 per cent. under the metal schedule of the tariff being upheld.

Japanned Sheets

Adverse action has been taken on a protest filed by the American Button Works in a protest dealing with the classification of japanned sheets, which were returned as "manufactures of metal" with a duty of 45 per cent. It was alleged that the merchandise is dutiable at 12/10 cents a pound under paragraph 130, which refers to sheets or plates of iron or steel. The decision says that the sheets are not tinned and are coated with lacquer. In the opinion of the board they do not fall within the paragraph claimed. The assessment is affirmed.

Iron Sand

Acting under instructions from the Department of Justice, Charles D. Lawrence is preparing a test case under the tariff act of 1909 to have determined judicially the proper classification of so-called iron sand used in the cutting and polishing of granite. Under previous tariffs, merchandise of this character has been classified under "manufactures of metal" and paid duty at the rate of 45 per cent. The present law, however, contains a specific provision for iron sand and allied products. With a view to clearing up uncertainty regarding the classification, the government has ordered importations assessed at the rate of 1 cent per lb. under the provision in the present act for "grit, shot and sand made of iron or steel that can be used only as abrasives." The Harrison Supply Company, which figures in the test litigation, maintains that the iron sand can be used otherwise than as an abrasive. It is claimed to be entitled to enter at 10 per cent. as a crude artificial abrasive, or in the alternative as a manufacture of metal at 45 per cent. Most of the sand is manufactured in England and Scotland.

Pittsburgh and Vicinity Industrial Notes

W. J. Greer, Pittsburgh representative of the Van Dorn Electric Company, Cleveland, Ohio, has secured a repeat order from the McClintic-Marshall Construction Company for a number of portable drilling and reaming machines to be used in the fabrication of the structural steel work on the Panama Canal, and has also received an order for various sizes of machines to be used in the wood and steel car departments of the Cambria Steel Company.

The Pennsylvania Casting & Machine Company, North Side, Pittsburgh, is making some additions to its power plant, and is installing a Jones underfeed stoker to operate a 150 h.p. boiler.

The Anterior Coal & Coke Company, Pittsburgh, has been chartered, with a capital stock of $1,000,000, to mine coal and manufacture coke. The incorporators are Henry W. Jacob, W. H. Wessels, Pittsburgh, Pa.; W. C. Wessels, Greenock, Pa.

Samuel W. Hay's Sons, Keenan Building, Pittsburgh, are installing two 15 x 18-in. Corliss and one single valve engine, manufactured by the Ridgway Dynamo & Engine Company, in the municipal electric light plant of the borough of Etna, Pa. They have also sold a 15-ton Whiting crane, to be installed in the electric light plant of Sistersville, W. Va., tumbling barrel and other equipment for the Union Steel Casting Company, Pittsburgh.

The Bessemer Gas Engine Company, Grove City, Pa., reports sales during November of several engines and compressors to operators in the Joplin district, Missouri, also to Mack Brothers, Titusville, Pa., a 40-hp. engine; Pacific Gasoline Company, Los Angeles, Cal., two 85-hp. direct gas driven compressors for manufacturing gasoline from natural gas; Avery Stamping Company, Cleveland, Ohio, two engines, one of 110 and one of 165-hp.; Carter Oil Company, Sistersville, W. Va., 80-hp. gas driven compressor; borough of Conway, Pa., 50-hp. engine for waterworks.

The Morgantown Board of Trade, Morgantown, W. Va., is winding up the guarantee fund for securing new industries for the town. Owing to its offer for a time of free factory sites, which have the advantage of being located close to cheap fuel, several railroads and good river transportation, it has received many requests for information from new manufacturing propositions and old ones which are crowded in present locations. It is expected that several of these will be secured for the town, whose products along the line of window glass, tableware, brick, stone, etc., are already well known, but the board desires to add other branches of industry, such as foundries, machine shops, iron and steel works, and specialty factories.

The Brownfield-Connellsville Coke Company, First National Bank Building, Uniontown, Pa., put in service last week 32 coke ovens at its Meyers plant, the output being foundry coke.

The bid of the United Engineering & Foundry Company, Pittsburgh, has been accepted by the United States Government for furnishing fenders for the Panama Canal locks. About 1000 tons of material will be required. This is the second Panama contract taken by this company, it having been the successful bidder on the anchorages for the lock gates on which all material was shipped some time ago and is now practically in position. The fenders are protective devices, to ward off the blows of ships swinging against the locks and the main gates.

The turbine reduction gears as installed by the Westinghouse Machine Company, East Pittsburgh, Pa., on the United States Government collier Neptune have operated very satisfactorily, and so far show no signs of undue wear or deterioration. This ship is fitted with a control gear by means of which the turbines can be started, stopped or reversed from the bridge without requiring any action whatever on the part of the engineer.

Five of the 10 hot mills in the Sabraton Works of the American Sheet & Tin Plate Company at Morgantown, W. Va., were started up December 18, and the other five will be started December 26. This plant had been shut down for some time.

A large steel barge under erection for some months at the Keystone Works of the Jones & Laughlin Steel Company, Pittsburgh, was launched last week. It is 200 ft. long, 26 ft. wide, 10 ft. deep, has a carrying capacity of 1100 tons, and has been put in use to carry coal from the mines of the company at California, Pa., to its American Iron & Steel Works, Pittsburgh. This is the second barge of that size which the company has built, and a number of others will be turned out during the winter and spring for its own use.

The Westinghouse Electric & Mfg. Company, East Pittsburgh, has the contract for furnishing the electrical equipment for the 14 steel steamers being built by the James Rees & Sons Company, Pittsburgh, for the Para Rubber Company, a French corporation, which will operate the boats on the Amazon River, Brazil. Two are nearly completed and the others will be built as rapidly as possible. F. C. Ellison, formerly of Pittsburgh, is the general manager of the company.

The statement of the Crucible Steel Company of America for the quarter ended November 30, 1911, is as follows: Profits for September, $306,452.15; October, $459,570.06; November, $374,985.27; total, $1,141,007.48. Deduct charges and appropriations for depreciation and repairs, $339,814.92 and contingencies, corporation tax, etc., $71,482.32, leaves net profit, $729,710.24. This is an increase over the corresponding quarter of 1910 of $65,464.83. Necessary for dividend, $437,500.

On account of increased operations of its Bessemer steel plants and larger consumption of ferromanganese, the Carnegie Steel Company has started up No. 2 Isabella furnace at Etna, Pa., on ferromanganese. The two Lucy furnaces at Pittsburgh are also running on this material.

The Panama Canal Hydraulic Equipment Contract

The Pelton Water Wheel Company, San Francisco, Cal., has been awarded the contract for the hydraulic equipment in connection with the hydroelectric plant at Gatun for operating the Panama Canal. The installation will provide power for operating the lock and gates, lighting, for shops and other purposes. The contract calls for three 3600-hp. Pelton-Francis turbines with Pelton oil-pressure governors; three 10½-ft. pipe lines, three 10½-ft. special gate valves with electrical operating mechanism, and all the necessary hydraulic accessories. The plans provide for vertical shafts with roller bearings on top; the exciters to be mounted on the generator shaft below the rotor of the main generator on each unit. The General Electric Company has the contract for the electrical equipment. J. V. Kunze, manager of the Atlantic department of the Pelton Water Wheel Company, 90 West street, New York, who went to the Isthmus in the interest of his company, has just returned to New York by way of Seattle and San Francisco. He was greatly impressed by the progress which is being made with the work on the canal and the comfort that he enjoyed there.

The Baldwin Works to Have a Western Plant.—The Baldwin Locomotive Works, Philadelphia, Pa., at a meeting of its board of directors held last week, decided to go ahead with the construction of its proposed addition to its erecting shop at Eddystone, Pa., which will almost double the capacity of that plant. The building will require about 4500 tons of structural steel. It also authorized negotiations to be entered into for the purchase of land in the vicinity of Chicago for the erection of a Western plant. While no definite arrangements have yet been made, it is proposed to erect a complete works for the manufacture of locomotives, including a wheel plant, in order to better enable the company to take care of its Western business.

The Isthmian Canal Commission is erecting at Gorgona, in the Canal Zone, Panama, one 2-gross-ton Tropenas steel converter, which is to be used for the manufacture of steel castings for repairs to rolling stock and marine equipment. The commission expects to have the converter completed and ready for operation in January.

Information reached New York this week that Westinghouse, Church, Kerr & Co. have been awarded the contract for the construction of railroad shops for the Canadian Pacific Railway at Calgary, Alberta, which will entail an expenditure of about $2,500,000.

New Publications

Handbuch der Mineralchemie (Manual of Mineral Chemistry).—In four volumes, 8vo. Published by Theodor Steinkopff, Dresden, Germany. Price, 6.50 marks per part.

Each of the four volumes is divided into several parts and parts I and II of vol. I have already appeared. The others are to follow very soon and it is expected the work will be completed in 1914. Each part it sent to the subscribers as soon as published. The editor-in-chief is Prof. Dr. C. Doelter, director of the Institute of Mineralogy of the University of Vienna. Assisting him are 51 contributing editors. They are mostly from Germany and Austria, but almost every European country and the United States are represented, this country by Dr. R. Amberg, Pittsburgh. His paper is on "Graphite, Its Chemical Properties, Artificial Production, Purification and Technical Uses"

The section submitted for review is part II of vol. I. It gives a list of contents of the entire four volumes. Vol. I is divided into five parts. Part I contains a general introduction which includes articles on analytical mineral chemistry and the preparation of minerals for analysis. Next comes a section on carbon, which comprises a general article, one on the diamond, that seems very comprehensive; three on graphite, and one on schungite. Then follow articles on the carbonates, which continue until the end of part III of vol I. The articles on the analytical methods in both this and other sections are given by Dr. Dittrich, of Heidelberg.

The remainder of vol. I and vol. II takes up silica and the silicates. Among other subjects vol. III deals with iron, meteorites, iron oxides and oxyhydrates, followed by articles on the manganese minerals. Vol. IV takes up the precious metals, the minerals containing molybdenum, tungsten, uranium, radium and helium. It has sections in fluorides, chlorides, bromides and iodides, and closes with one on organic compounds.

A brief outline of the way magnesite is treated will give a good idea of the character and thoroughness of the book. In part I, vol. I is a long article by Dr. Linck, of Jena, on the formation of the carbonates of calcium, magnesium and iron, in which, of course, magnesite is considered. In part II an article of nine pages, by Dr. Dittrich, gives the methods for the analysis of magnesium and calcium carbonates. The main article which follows is by Dr. Leitmeier, of Vienna. Full analyses with references are given of 113 samples of both the amorphous and crystalline varieties. The physical properties are next taken up and then the phenomena of dissociation with heat. Following is a discussion of electrical properties, solubility, and finally two pages on the synthesis of magnesite. Dr. Leitmeier's article covers 23 pages. There are two articles of ten and eight pages respectively by Dr. Redlich, of Leoben, on the "Formation and Occurrence of Magnesite and Its Uses."

A special feature of every article is the large number of original references given. The work is evidently being prepared with great care, and will be of much use to chemists, mineralogists, mining engineers and all interested in minerals. G. B. W.

Mrs. Harriet White Fisher, owner of the Eagle Anvil Works, Trenton, N. J., has published a book entitled "A Woman's World Tour in a Motor," giving an account of her picturesque and eventful 23,000-mile trip in an automobile. The book is for sale by the J. B. Lippincott Company, Philadelphia, at $2.20, postpaid.

The House Passes an Eight-hour Bill.—The Wilson bill prescribing an eight-hour day on all work done for the Government was passed in the House of Representatives December 14 by a viva voce vote. The bill provides that every contract for work awarded by the Government shall stipulate a penalty for violation of the eight-hour provision of $5 for each laborer or mechanic required or permitted to work in excess of that time. Section 2 authorizes the President to suspend its enforcement "in time of war or at a time when a war is imminent."

Judicial Decisions of Interest to Manufacturers

ABSTRACTED BY A. L. H. STREET.

Rights Concerning Patents.—The existence here and there of resemblances between means employed in a patented device and those of prior patents does not negative patentable invention in the later combination. An inventor of a new and useful combination is not confined to his combination claims unless all the elements are old. If any of the elements are new and useful and show invention these may be claimed and patented. This may be done in a separate patent or by separate and distinct claims in the patent covering the combination, even though such parts are without utility save in combination with the other parts of the device. Upon an absolute sale of a patented device the purchaser has the right to the full enjoyment thereof and an implied license to make repairs, so long as the identity of the original machine is preserved, and such right of repair is not confined to the mere restoring of the part which is defective, but extends to replacing such part unless it is itself made the subject of a patent. (United States Circuit Court, District of New Jersey, National Malleable Casting Company vs. American Steel Foundries, 182 Federal Reporter, 626.)

Necessity for Reducing Contract to Pay Another's Debt to Writing.—If the main purpose of an oral promise by one person to pay another's obligation is to secure a direct, personal and pecuniary benefit to the promisor, the promise is original and not within the statute which requires an agreement to pay another's debt to be reduced to writing. An oral promise by an officer and stockholder of a corporation to pay for goods sold and delivered to it is void within that statute, the benefit accruing to him personally from the sale being remote. (West Virginia Supreme Court of Appeals, Hurst Hardware Company vs. Goodman, 69 Southeastern Reporter, 898.)

Liability for Injury to Visitors Upon Premises.—One in control of premises owes a duty to persons invited thereon to use ordinary care to have the premises reasonably safe. A bridge contractor is liable for injury to persons invited upon the bridge while it is still under the contractor's control, caused by its collapse, if the defective condition could have been known by the use of ordinary care. The visitor, however, must use reasonable care in avoiding danger. (Texas Court of Civil Appeals, Weatherford Machine & Foundry Company vs. Pope, 132 Southwestern Reporter, 503.)

Sufficiency of Notice by Buyer of Defects in Machinery.—If machinery is sold under agreement that, if after 10 days' trial it fails to fulfill a warranty, written notice shall be given to the seller, stating wherein it is defective, notice that the machine is unsatisfactory and that the buyer cannot make it work and desires that it be made to work is insufficient. (Iowa Supreme Court, J. I. Case Threshing Machine Company vs. Gidley, 132 Northwestern Reporter, 711.)

Statements Not Constituting Warranty by Seller.—Statements by a seller which merely recommended the goods sold do not amount to an actionable warranty. (North Carolina Supreme Court, Robertson vs. Halton, 72 Southeastern Reporter, 316.)

Contract Not to Re-engage in Business Enforceable.—The purchaser of a business can enforce the seller's agreement not to re-engage in the same business in the same city for five years. (Maine Supreme Judicial Court, Flaherty vs. Libby, 81 Atlantic Reporter, 166.)

Liability for Injury Caused by Defective Appliances, Etc.—An employer is not relieved from liability to a workman, through a defect in machinery, because he deemed the machinery safe, if the defect could have been discovered on reasonable inspection. To recover for injury or death in such case it must appear that the employee did not know, and in using ordinary care could not have known, of the defect. (Indiana Appellate Court, Ittenbach vs. Thomas, 96 Northeastern Reporter, 21.)

Pittsburgh Steel Company Furnaces

The Pittsburgh Steel Company, Pittsburgh, has placed a contract with the Garrett-Cromwell Engineering Company, Cleveland, for the erection of two 500-ton blast furnaces and a merchant mill at Monessen, Pa., where the former company's eight open-hearth furnaces and blooming, rod and wire mills are located.

The Production of Oil in 1910

More than 200,000,000 barrels of oil, with a value of nearly $128,000,000, was produced in the United States last year, according to David T. Day, of the United States Geological Survey, in an advance chapter on petroleum from Mineral Resources of the United States for 1910. He says that the petroleum industry in the United States has been characterized by a phenomenal increase each year for the last four years. Varying between 50,000,000 and 60,000,000 barrels annually in the decade between 1890 and 1900, in 1903 it passed the 100,000,000-barrel mark and in 1904 was over 170,000,000 barrels. It was 178,000,000 barrels in 1908, 183,000,000 barrels in 1909, and 209,556,048 barrels in 1910, a gain of 14 per cent. over the record output of 1909.

United States Leads the World

The United States produces more oil than all the rest of the world together. In 1910 the wells of this country yielded nearly 64 per cent. of the total production, Russia scoring a very poor second with about 70,000,000 barrels, or 21 per cent. The production of other countries is comparatively negligible, the third on the list, Galicia, contributing only 3.87 per cent. of the total.

The excess of the petroleum production of the United States over the normal demand is shown by the fact that the 209,556,048 barrels produced in 1910 brought a smaller return—$127,896,328—than the 183,170,874 barrels in 1909, which was valued at $128,328,427. The even smaller output in 1908, 178,000,000 barrels, was valued at still more—$129,079,184. As the production has increased the average price has gone down from more than $1 a barrel in 1900 to 61 cents in 1910.

These repeated increases in oil production have been due to the successive development of four great petroleum fields farther west than the old productive centers. By 1900 the country had adapted itself to the influx of oil from western Ohio and Indiana; then came in rapid succession the development of the Gulf field in Texas and Louisiana, the Mid-Continent field in Oklahoma and Kansas, and the Illinois field. In the meantime California's production had been increasing so rapidly that it became the dominant feature of 1909 and 1910, outstripping the production of any other State and promising to retain this supremacy in the future.

California the Largest Producer

California heads the list of producers in 1910, with 73,010,560 barrels of oil, an increase of 17,538,959 barrels over the production in 1909. This output is more than twice as great as that of Pennsylvania for any year, and is greater than that of any foreign country; in fact, the production of petroleum in California and Oklahoma combined is practically equal to the entire foreign production. The average price per barrel of California oil in 1910 was 49 cents. The increased use of fuel oil in 1910 over 1909—more than 23 per cent.—was due largely to California's energy in pushing the sales to the northwestern railroads.

The second among the oil-producing States in 1910 was Oklahoma, with a production of 52,028,718 barrels. The third largest producer was Illinois, with 33,143,632 barrels. Other heavy producers were West Virginia, 11,751,871 barrels; Ohio, 9,916,370 barrels; Texas, 8,899,266 barrels; Pennsylvania, 8,794,662 barrels, and Louisiana, 6,841,395 barrels. Louisiana's production has been notable, the increase over 1909 having been 123 per cent. as a result of the development of the new gushers in the Caddo field.

On petition of certain creditors, Charles B. White has been appointed receiver for Paul S. Reeves & Son, manufacturers of brass and bronze castings, Philadelphia, Pa. The receiver has been authorized to conduct the business for 60 days, after which a report of the affairs of the concern will be made to Judge Holland, of the United States District Court.

The Hamilton Iron & Steel Company's blast furnace at Hamilton, Ohio, which was offered at public auction December 14, was bid in by D. M. Peters of Hamilton, chairman of the bondholders' committee. His bid was $375,000.

The Dwight & Lloyd Ore Sintering Process

George W. Maynard, 20 Nassau street, New York, special representative of the American Ore Reclamation Company, furnishes the following information regarding the special field of usefulness for the Dwight & Lloyd system of utilizing high grade concentrates of magnetic iron ore:

The magnetite deposits in the Eastern States have their largest development in New Jersey and in northern New York. In the New Jersey Geological Survey's report for 1911 the number of magnetite mines and deposits is stated to be 366, of which a relatively small percentage produces ore of high enough grade for the blast furnace without close sorting. In the Adirondack and Lake Champlain districts there are large deposits which have been worked for many years and are still important producers of ore of high enough grade for shipment without close sorting, but the number of low grade deposits is in excess. The occurrence of apatite, lime phosphate, formerly a deterrent factor in some of the large deposits, has now become a source of profit through the adoption of magnetic separation and concentration so successfully carried on at the mines of Witherbee, Sherman & Co., near Port Henry. The percentage in the finished product ranges from 64 to 65 per cent.

The Dwight-Lloyd process for utilizing high grade concentrates is essentially automatic and continuous, the output depending upon the regularity of feed, which in the case of magnetites will average about 100 tons per day for each machine. The working costs are embraced in power, fuel intermixed with the ore, labor, repairs and royalty. The resultant product is a sintered cellular mass presenting an exceptionally large surface to the ignited blast furnace gases and an increased output over compact lump ore. The results obtained in the treatment of blast furnace flue dust have been eminently satisfactory and have been most favorably commended by a committee of the United States Steel Corporation.

Tests have been carried on for several weeks at the American Ore Reclamation Company's works at Birdsboro, Pa., where sample lots of ore may be sent for tests. The size of the grains of ore will depend upon the mesh necessary for the separation of the gangue in the magnetic concentration. About ten barrels of ordinary capacity will usually be sufficient for a test. Apart from the freight charges, the tests will be made without cost to parties intending to investigate the process. The Reclamation Company will install plants at the actual cost of erection and will furnish working drawings. The adoption of the process will be based on a tonnage royalty during the life of the patents.

Samples of the sintered ore and flue dust may be inspected at the office of the company, room 1908, 71 Broadway, or at Mr. Maynard's office, 20 Nassau street, New York.

The Newark Foundrymen's Association

The Newark Foundrymen's Association, Newark, N. J., at its meeting held December 13, was addressed by George Heggie, instructor of foundry practice in the Newark Technical School and instructor in pattern making in the Stevens Institute of Technology. Mr. Heggie had for his topic: "The Effect of the Various Constituents on the Quality, Structure and Physical Strength of Cast Iron." He said his purpose was to give the foundrymen an idea of what he is teaching his Newark class in foundry practice. The students under Mr. Heggie are actually engaged in foundry work as journeymen or apprentices, and he deplored the fact that there are so few schools of a similar character in the United States. He extended the scope of his address and also answered many practical questions from the members. He touched upon the crystallization of iron under various conditions; results of different temperatures in pouring and of fast and slow cooling; mixtures of two or more irons; proportions in cupola charges and the matter of widely differing strength in castings made from mixtures whose analyses show practically the same constituents. He showed specimens to illustrate his points.

Franklin Phillips, of the Hewes & Phillips Iron Works, president of the association, presided over the meeting.

What the Foundry Thinks of the Machine Shop*

A Frank Talk by a Practical Foundryman

BY H. M. RAMP†

I have been asked to tell, among other things, what the foundry thinks of the machine shop, and I am frank to confess that this is a question I approach with fear and trembling. I do not believe it would be either wise or judicious to tell all that the foundry thinks at all times. I am afraid the emotions held by the foundrymen when some casting had been discarded had better be suppressed.

Close Relations Between Foundry and Machine Shop

Now it probably would be a serious mistake to tell how the foundry felt part of the time, but it is not amiss and may redound to the good of all to tell how the foundry feels most of the time and during its sane moments. The relationship between the two is close and indivisible. The foundry is the father, the parent, of the machine shop, and yet I am not surprised at its offspring disowning the parentage at times. It is the greatest source from which the machine shop draws its supplies that produce the perfect machine with its exceptional performance and beautiful finish. It supplies the product in the rough, like old mother earth supplies the diamond before it reaches the cutter's tool, which releases and shows forth its true beauty. It is the foundation work for your drill, planer, milling machine or any other finished mechanism.

If your castings are good your machine has a proper foundation; if your castings are poor you have built your house upon the sand, that involves much patching and excusing, and that injures the efficiency, the sole aim and the beauty of the finished product. This the foundry knows and realizes, and yet it often falls short of what it should perform; it is often guilty of grave mistakes and criminal negligence; it often neglects points of special value to the machine shop and sometimes appears to ignore the customer's demands. All these things are true, as they are true of human nature wherever you meet it, and the reason it appears worse in the foundry than elsewhere is because more of the details of labor are done by individual effort and without the assistance of machinery that the more favored trades possess.

The Foundry Neglected as Compared with the Machine Shop

While the foundry deserves much criticism and correction, it has never had the attention, the brains, the research work, the finances poured in upon it that the machine end of the iron industry has to elevate and develop its possibility. It has been considered more as a necessary evil than as a branch of the business that could be mastered and developed and controlled. The foundry until the last few years has been the last place to receive improvements and advice, and it is not as yet burdened with a load of either.

The individual who entered the foundry as a life's business was always regarded as sinking his intellectual or mechanical abilities, if he had any. The foundry has been demeaned and often referred to as a place where the qualifications are "a strong back and a weak mind," and yet there is no business under the canopy of heaven that requires greater judgment and a more thorough knowledge of fundamental principles than the art of molding. When properly done it most certainly deserves to be classed as an art and yet this is the atmosphere in which the foundries of our country were developed and the foundrymen of our country were made until the past few years, while the machine shop was commanding the gray matter and finances of the brightest men in our land.

It is strange that you have so many complaints about your castings. It is strange that the results are not always what were anticipated. It is curious that one foundry can make a certain line of castings acceptably and completely fail on another. This prejudice against the foundry in the past, as a place of dirt and grime fit only for occupation by hewers of wood and haulers of water, has done much to retard the development of the foundry business and to keep the bright, ambitious and energetic men from mastering its science. But these are not the only reasons why the foundry fails to give the machine shop what it asks.

If you wanted a perfect job of drilling would you give the mechanic a drill that did not run true? If you wanted to plane a surface accurately would a defective planer be used? If a job had to be bored or milled to a close fit would anyone use a tool whose bearings had several hundredths play? No. It would be seen to first that the tools were accurate and true, and if they were not good enough, and could not be made good enough, money would be spent and new ones would be purchased.

Patterns Are Not What They Should Be

The machine shop is constantly adding to its standards of accuracy and efficiency by the purchase and use of the most improved tools and it is getting results. But how many buyers of castings are adding to the efficiency and quality of their pattern equipment? All are seeking better castings, and justly too, but how many are seeking to better and maintain their pattern equipment so that the foundryman can have the same assistance to make better castings in the foundry that the machinist has to make better work in the machine shop? Even among those who are trying to do this very thing how often the constructive features of the patterns are under the direction of some one who has not the knowledge of modern foundry practice or the time to acquire it, and the effort expended returns small interest on the capital. I have often heard the remark, "We made a new pattern for that casting, but we never got any better results," and investigation invariably proved the pattern was not made right.

When the machine shop seeks to improve its tools or methods it does not put blacksmiths or candy makers on the job—it uses the best educated brains and experience in the machine business that money can buy. Yet too often the pattern, the very foundation of the foundry's work, is constructed as the designer, the pattern foreman, the engineer directs, without even consulting the experience and preference of the foundry, and in as great a measure as this prevails just as great is the handicap placed upon the foundry.

We often see standard patterns made of wood for castings to be molded by the hundred, and then we see the machine shop spend much money for rubbing and filing and filler and painters. It would be far more profitable in many cases for first-class iron patterns to be made, both for machine shop and foundry, and provide a fitting and correct model for the monument of beauty and utility you are erecting.

The Machine Shop Tries to Save Too Much on Cost of Patterns

The average patterns in the average foundry to-day are not made as good as they were 10 years ago. The average customer cannot afford to spend money for good patterns to produce good castings, but he can afford to spend money for improved machinery in the machine shop to better the quality and cheapen the cost of the finished product. Too often he holds the initial cost of the pattern so close to his eye that it obscures the entire horizon of his vision, and when he fails to get the beautiful casting he pictured in his mind's eye he cannot understand why the foundry makes no progress.

The machine shop makes templates and gauges of iron and steel, with careful and elaborate provision for their care and protection. To the foundry is furnished a pattern of wood, often lightly constructed, sometimes of green lumber, and after it has been hauled from shop to shop for eight or ten years, it is stored in old sheds, or back of sand heaps. The foundryman is hauled over

*Address before the Superintendents' and Foremen's Club, Oakley, Cincinnati, Ohio, November 23.

†Superintendent Modern Foundry Company.

the carpet and arraigned, first, because the castings are not true, and, second, because the pattern has been abused. Is it any wonder that castings come out of shape at times? Many machine concerns have inspectors who check up every piece of work done in the factory. Some have inspectors who check up every gauge and template at stated periods to discover error and prevent mistakes; but did you ever see a concern check up its patterns periodically to know that they were true? Usually it will be done after having to reject a bunch of castings, and only then is the pattern found to be at fault.

There is one reason greater than all others why foundries should have much better patterns than formerly. The trend of the times is to reduce the skill demanded in the individual and put more dependence in the improved machinery of to-day. This is as true in the foundry as elsewhere. We do not make the molders we did 20 years ago, and the patterns that the foundries get are their improved machinery or the old-fashioned tool as the case may be, and are the positive foundation for their product.

I could talk of pattern troubles for an hour. I could tell you of the man who had a wooden pattern that he used almost continuously for 12 years, and he couldn't understand why it is not right now. I could tell you of another who spent over $100 in having a pattern filed up in the machine shop and couldn't understand why the castings came thin. In fact, I could go on and talk until I would gain as unenviable a reputation as Eli Perkins.

The Designer Worse than the Pattern Maker

But the pattern maker and his patterns are not the only thorn in the flesh that the foundry possesses; there is another and greater than he, one whose commands carry more grief and pain. It has been aptly said "that the pen is mightier than the sword," for where, oh where, would you find the sword with which to make the foundryman do what he does in obedience to the pen in the hands of the designer. It is fortunate, indeed, that the designer does not know all that is said of him; he wouldn't sleep well at nights; warm, indeed, would be his couch. He is regarded as the foundry's natural enemy, and the reason is not always hard to find.

I have seen many castings designed that were perfectly fitted for the purpose for which they were made, but were so designed that the molder could not make a perfect casting, for the excessive strains due to unequal proportions made the castings crack or warp, or required special treatment that kept the foundryman in hot water from the time the job came into the shop until it was out. It is easy enough to say we do not need any more metal at this or that point; it is very creditable to be able to design a machine with the maximum utility and the minimum weight, but there are certain fixed, unalterable laws in the shrinkage or contraction of cast iron that are not studied as closely by the designer, or at least considered, as they should be.

I have seen many castings command a higher price simply because they were designed with a view to saving metal, where, as a matter of fact, the saving in metal was more than lost in increased price. The foundry gets very little opportunity to protest against designs that are difficult to mold, and seldom is it consulted. The machine shop may protest and get changes because of high machining cost, but rarely does the foundry get concessions because of high molding cost. If the foundry was consulted more by the designer both would be benefited to no small degree. It may seem incomprehensible that any good could come out of the foundry, but I want to tell you the practical man in the foundry can pass better judgment on the freaks and fantasies of cast iron than the finest designer in the land, and it is to the everlasting loss of both if they do not swap stories and criticisms over every new designer.

The Quality of the Iron a Vexatious Subject

There is probably no one single item in foundry practice that gives the machine shop more anxiety and the foundryman more cause for reflection and grief than the quality of the iron that enters into their castings. By quality I do not mean a definite standard, for that has never been fixed except as to a few essentials as to strength and softness, but rather the quality demanded by the individual customer. This is likely to vary in accordance with the angle he views it from. If he has been studying shop costs and trying to get a big output, his iron is sure to be hard; if he has had breakages on his machines and had to make replacements, it is sure to be weak; if his agents have been around criticising his product it is sure to be open grained, and the immediate trouble is always the greatest, and the poor foundryman rushes from one extreme to the other trying to attain an impossible result. I have seen a customer accept an iron as all right one day that he would complain of the next. I have had customers tell me every time they talked of iron of some remarkable stuff they got from Brown some years ago, until I wondered if their comparison was not like mine with the old spring water at home.

This trouble, this uncertainty, is caused because there is no definite standard for the commercial qualities of cast iron. What is soft for one is hard for another: what is open grained for one is pronounced fine by a different user, and we are expected to grind all the different requirements out of the same mill, and this very condition I believe prevents, yes and prohibits, a definite standard being ever adopted.

The Ideal Iron for the Machine Shop

The first and greatest demand made upon the foundry by the machine shop as to the quality of cast iron is its ability to be machined easily. Some I expect will deny this, but as a broad principle I believe I am correct. Furnish a machine shop with iron that will stand 35,000 lb. tensile strain and let it add 20 per cent. to the cost of the machine operations and you would hear a mighty roar. Furnish a machine shop with iron that would necessitate the reduction of 20 per cent. in all cutting speeds and I do not care if it did show a grain like polished nickel, you would be compelled to change it. The strength and fine grain are highly desirable and the machine shop wants them both, but the finishing labor must not be affected to procure it.

The ideal iron for machine-shop purposes should possess the greatest possible strength, the finest possible grain and be easily machined at the highest possible speed. This, I say, is the ideal iron but it is impossible of attainment. Strength, closeness of grain (which I will hereafter refer to as density) and softness are not qualities that bear a close relationship. Great strength and great density represent hardness, the exact opposite of the machine shop's greatest requirement. This is controlled by the laws of nature and cannot be altered.

There are certain chemical compounds of iron and carbon that give greatest strength and greatest density. There are also certain chemical combinations of iron and carbon that give the greatest softness, but with them are invariably associated weakness and open grain. There are other elements that enter into combination with cast iron that have a bearing upon these qualities, but of these I will not burden you to-night, for the king of them all is carbon, the same element that makes the diamond and the charcoal. These chemical combinations occur along fixed lines and never vary but are so susceptible to change on account of heat treatment and the rate of cooling that no fixed standard can be made.

A casting is harder on the surface than under what the machinist calls the scale, and the deeper you go the softer and more open it becomes. This is caused by the rate of cooling. The iron that comes in direct contact with the sand cools more quickly and forms a different combination of iron and carbon that makes the increased hardness. Some machinists attribute the scale on cast iron to the sand that burns to the casting and in some cases this is true, but a casting from which every grain of sand has been removed by the sand blast will show the same variation. You have often seen a casting soft enough to machine all over except some thin corner or lug that would refuse to cut. This also was caused by the rate of cooling. The fault did not lay in the iron. The same iron was in the part that could be machined that was in the hard place.

Why Castings Cannot Be Made with the Iron Uniform

The foundry is often asked the question, "Why can't you make your iron uniform? You give us some castings that machine all right and others upon which we are compelled to reduce our speeds." If we gave you iron that

was exactly uniform you would have to design every casting with the same thickness of section throughout, and the foundry would have to make a different mixture for every variation in section. That is what absolute uniformity would mean. Of course, this is an overdrawn picture, but yet it is true. What the foundry really does is to keep as far on the soft side as possible without too much injury to the strength and density, and the lack of uniformity is often due to the rate of cooling of the different sections.

I have heard talk in machine shops the past 10 years of the adoption of some standard for testing the hardness of cast iron, and have listened to many discussions as to what was the best method to adopt, but the same condition that confronts the foundry in making castings uniform confronts the machine shop in adopting a method. What will be the standard? Every variation of section, no matter how slight, represents a different degree of hardness. One part of the casting might pass the standard and another part of the same casting fall below. On the surface it might register too hard and 1/32 in. deep prove all right; would the scale of the casting be taken as the test for hardness or under the roughing cut? These are the natural laws that govern the hardness of castings and you cannot change them, and wide, indeed, must be the range of any test that can take cognizance of this varying quality.

Hard castings in the machine shop give the foundryman a variety of emotions. He may find he received a car of inferior coke to melt his iron with; he may find a car of iron below grade; he may find his cupola tender has not followed instructions and grown careless, but these are his own particular woes. When he goes in the machine shop and finds that the steel has not been tested that is used to cut his iron, and all the satisfaction he can get from the foreman is, "We always buy Novo Superior or Double Rex A, and it is always right; we always cut 70 ft. per minute with it," he wonders why steel men are infallible and foundries never. He sees a farm hand running a machine and sharpening his tools as if he was sharpening a hoe, and he wonders if there is any science in the art of tool grinding. He sees another man deliberately crowding his machine and burning up his tools so that he can demand an allowance for hard iron and he goes back to the foundry with his heart full of tears and his mouth full of profanity. The great part of the hard iron is made in the foundry, I grant you, but there is some of it made in the machine shop and in the designer's office.

Density the Second Greatest Requirement

The second greatest requirement in cast iron—I now speak of local factories—is density, closeness of grain, and of all the elusive, uncertain qualities to manufacture, this is the worst; it also has no standard but the eye and mood of the consumer. Density and softness, as before stated, are produced through opposite combinations of iron and carbon. They are in no sense allied. As the grain grows denser the iron becomes harder. Of course, there are cases that are an exception to this rule. We have seen iron both open and hard which is brought about by another and a rare heat condition. But the natural characteristic is closer and harder.

The density of cast iron in machine-tool castings is a never ending subject for discussion and criticism. The consumer always has this issue snugly tucked away to spring at a moment's notice when he has a rainy day or the foundryman grows a little too conceited. There are many reasons for this trouble, the principal ones being as follows:

First and greatest, the foundryman tries to make his iron soft enough to satisfy the cutting speed and gets it too open. This is the most common error.

Second, the customer does not take into consideration the varying section of the castings, for what is true as a law of hardness or softness in the different sections of cast iron is just as true in regard to the density. A ½-in. section that would polish like steel would show an open-grained iron in a 2-in. section; and yet many heavy tool castings are made where a ½-in. section must be soft enough to machine and another part of the casting with a 2-in. section be expected to come dense and fine grained. Here is the place where they catch the foundry coming and going.

Third, the amount of finish plays an all important part. The less metal there is removed from a casting, the more dense will be the surface. This accounts often for the variation found in a number of similar castings poured by the same foundry. It may have been that some of the castings were strained and a little thick, and the machine shop had to remove more metal on some than others to bring them to size, or the machinist may have been careless in setting up his work and took too much finish from the show side of the casting. Both these causes would make the iron show a decided difference in density.

Fourth, the grain of the iron can be affected by the depth of the finishing cut and the cutting qualities of the tool used. I have seen iron that was torn out by an improperly ground tool until it looked frightful develop into a thing of beauty when the tool was properly ground and another cut taken. I do not presume to give any advice on tool grinding, but I do know the tool must cut, not tear, if the best finish would be obtained.

Of course, there is no question that the cupola practice and the careful mixing and blending of the different grades of iron in the foundry have much to do with the bringing together of the opposite qualities of softness and density, but the underlying principles I have stated here are the foundation work of the whole question. I have tried not to exaggerate the machine shop's criticism.

Chemical Analysis Misused

These are the two most important qualities that the machine shop demands in cast iron, but, of course, there are special castings in which the qualities of great strength, great hardness, great wearing life, or resistance to corrosion are the important features, but they occupy so small a relative portion of the output that I have not time to speak of them to-night. But one thing more about iron. To-day we are living in the age of chemical analysis. The chemist takes about as much iron as you could carry on a 10 cent piece, and tells you what a whole carload is good for. Every modern foundryman to-day uses his services, and when the customer complains he pulls out the chemist's report and says, "Oh, no; that iron can not be hard, it analyzed so and so," but there is just about as much reliance on the report of the chemist to determine this question as there is in the broad declaration of the machine shop that it buys some special brand of tool steel and it must be right.

There has never been an innovation in foundry practice that was more thoroughly misunderstood and misused than chemical analysis. Its use has obscured a dozen other things that have a direct influence upon the quality of cast iron. In the first flush of its partial attainment as a regulation of the qualities of cast iron, it has too often been accepted as the panacea for all its ills.

Chemical analysis does tell the amount of the different elements present. It does give us a compass that points the way broadly. It does tell us when the elements are radically wrong. But it does not tell whether a casting is hard or soft within the limits prescribed by the machine shop, because every man's standard of softness is different. It does not, because chemical analysis is the same if used in a ½-in. or a 3-in. section. It does not, because the varied rate of cooling has little influence on it. It does not, because it cannot take account of certain injuries that can be wrought to iron in the blast furnace in the making or in the cupola in the melting. It does not and cannot take into consideration the heat treatment and cooling influences that cast iron receives. It can only be used as a signboard to point the way upon an unbeaten prairie, not as a definite highway that leads to Rome. Understand me: I do not disbelieve chemical analysis nor seek to discredit it, but I say laboratory analysis cannot give you all you want; it must be used as a means, not as an end.

"Foundry" and "Trouble" Synonymous

A foundryman's life is particularly colored with complaints. I have often made the assertion, and still believe it true, that there is only one word in the English language that is synonymous with foundry and that is "trouble." When the foreman of the machine shop sees the foundryman coming through the shop with a smile on his face, which, however, is a rare sight, he thinks to himself, that fellow has no business to be happy, and he pours out a tale of complaints that soon reduces him to his natural condition of despair. The causes for complaints are many,

and in most cases are well founded, but is it any use to tell the foundryman that his entire product is rotten because he loses heavily on one or two castings? Is it any use to tell him that the castings you are now getting are worse than you ever got before, when both you and he know differently? So is it any use to throw up both hands and say the whole business is going to the infernal bow wows, and then turn round and use the castings you complained of?

No foundryman makes a casting bad purposely. He feels more keenly over the bad casting than the customer. He is constantly fighting to correct the complaints he hears and to improve the quality of his product, and this habit or custom which sometimes prevails of constantly complaining, constantly depreciating his work, with the idea of whipping him to greater achievements, befogs his judgment on the improvement he has made. If the customer would bestow credit when credit was earned with as free a tongue as he can give criticism, he would receive better castings and more heartfelt service. In some cases I believe the disposition of the machinist to kick against the foundry is as deeply ingrained in his disposition as the miser's love of money.

No Standards in Foundry Practice

As I have said before, there are no standards in foundry practice. Every foundryman is a law unto himself. Every man does his work differently in the essentials. The machine shop has a certain broad ground upon which things are standard. There is not a book written to-day that tells you intelligently what to do in a foundry. There is no set of rules adaptable to more than one foundry. There have been people who tried to reduce foundry operations to paper, but they have generally stayed on paper. There is no uniformity of operation. I do not say there is not a possibility of standardizing foundry performance, but I do say that the customer stands in the way as much as the foundryman. When the machine shop sets a definite and intelligent standard upon its castings; when it furnishes a suitable and a standard pattern, then one great step will be taken in the right direction. This lack of standard not only hurts the foundryman but it hurts the customer. One man wants a pattern made one way and the next one a different way, and that is why one foundry makes castings with less finish than another.

The builders of machinery are constantly seeking to surpass each other. They use high-priced experts. They watch each other's product. If they would apply a little of this treatment to their casting requirement they would force the foundries to standardize on the best practice, or the weak ones would go out of business. In the foundry itself there is a longer and a greater battle to fight. How can you standardize the strength of one man's arm behind the rammer with another? How can you standardize the clear judgment necessary in some molding operations? How can you standardize the various intellects that go to make up a foundry organization?

The answer is this: Make it a place like the machine shop where the work is done by machinery. Little progress has been made in foundry development except as to buildings and a few machines. Replace the skilled touch, the element of personal judgment, with mechanism as was done when the lathe and planer replaced the file and chisel; use money and brains as liberally as they have been spent in the machine shop, and you will see a change come in the accuracy and quality and appearance of the castings not deemed possible to-day. The foundry is in its infancy, yet it is the oldest trade recorded, dating back to the time of Tubal Cain. It has a future just as great as the machine shop, but the door to it must be opened by those who are willing to stand the expense and endure the hardships and privations of the pioneer and explorer.

After the regular semi-annual meeting of the Empire Steel & Iron Company, December 12, it was announced that no action had been taken on the dividend on the preferred stock. Nothing was said at that time of another meeting, and lack of action may mean the same as passing the payment. The company now owes 24 per cent. in back dividends. In June of this year 1 per cent. was declared, and in December of 1910, 2 per cent. On July 1, 1910, the full 3 per cent. was paid. If the dividend for the last half of the current year is not paid, it will mean that the preferred stockholders will have about $400,000 in back dividends coming to them. The low price of pig iron is given as the cause of the company's diminished profits.

Engineering Data

One of the most interesting developments that has come about with our modern systems of great industrial manufacturing combinations and immense and specialized factories has been the production of pamphlets, bulletins, etc., dealing with the technical applications and aspects of the company's products. In the main a considerable amount of thought has been devoted to the preparation and distribution of this matter. Series of bulletins are arranged which cover the use of a certain mechanical unit in the different fields. Results of authenticated tests, curves and tabulated figures are given so that the engineer utilizing the material may know what to expect under actual working conditions, aside from any selection from the lists of sizes or capacities that his judgment may indicate.

It was at first undoubtedly true that these bulletins, which must not in any way be confused with house organs or publications composed mainly of interesting or self-interest reading matter, contained material that was more advertising and laudatory in its nature than replete with concise technical information. It soon became evident, however, that the engineer desired definite, concrete statistics concerning the materials and products with which he was dealing. The bulletins accordingly comprised more and more such specialized literature until today they constitute a genuine contribution to the fund of knowledge of the world.

The very desire on the part of the manufacturer to be able to place gratuitously at the call of actual or potential customers all available data caused him to undertake many investigations along lines that might otherwise have been neglected or undeveloped. These researches have been conducted on a scale impossible for the individual or even the engineering schools, due to the lack of funds or time available. That the reasons for such endeavor are in the main selfish is undoubtedly true, but there is, nevertheless, thereby accumulated a vast amount of informing matter and the data are usually backed by the willingness of the makers to have their engineers and experts co-operate personally and fully with the staff of the purchaser concerning any questions which may arise.

For some time the Hyatt Roller Bearing Company, Newark, N. J., has made a practice of issuing bulletins covering in detail the ratings and capacities, indicated uses and actual application of its flexible roller bearings. Separate issues cover the different types, such as the long series of machine tools and similar work; short series, for automobile service; those employed in standard shafting boxes, and those for special work in cars used in the transportation of passengers, freight and mine products. Forms for the entry of questions or specifications are also provided, and with the carefully arranged tables in the bulletins make it easy to procure the proper bearing for the particular instance. These bulletins are at the call of any interested and form a collection of special information worthy of a place in any engineer's office.

An Effective Advertising Device.—The value of automatic screw machines is being very convincingly shown by the National-Acme Mfg. Company, Cleveland, Ohio. A letter referring to the subject is inclosed in an envelope provided with an eyelet fastened securely in one end of the envelope. To this is tied the model of the new Namco self-opening die for use on machines where the threading tool is revolved. It is difficult to describe the piece clearly, but a duplicate of the model can probably be had for the asking, particularly by makers of articles from bars of metal. The multiple-spindle method is employed in manufacturing the part, and it is claimed that it saves 20 to 60 per cent. of the cost of manufacture, resulting in the production of an article of potential difficulty by what is explained as one operation with one set of tools. As a telling way to emphasize a meritorious manufacturing method, the idea of a model attached to a letter is successful. It undoubtedly attracts the recipient's attention.

A 15,000-hp. Coke Oven Gas Engine Plant

Purification and Utilization of Gas from By-Product Coke Ovens at Alsdorf, Germany

BY C. A. TUPPER, MILWAUKEE, WIS.

When by-product coke ovens are located near large cities the gas can usually be sold to advantage for illumination and as fuel; but in the absence of such opportunity it can undoubtedly be best utilized for the production of power. Abroad, and particularly in Germany, the problems connected with doing so have thus far been worked out quite thoroughly.

In the accompanying reproduction of a recent photograph, Fig. 1, is shown the interior of the electric power station of the Eschweiler Mining Company, at Alsdorf, near Aachen, Germany. It is the largest power plant in the world to be operated on coke oven gas. The origin and successive development of this station, located at what is known as the Anna No. 2 shaft, form an instructive example of how a company operating by-product coke ovens, whether in connection with mines or blast furnaces, is able to cover all of its power requirements in a most economical way by taking full advantage of modern engineering progress.

For the mines and other works of this company, as in many of the European colliery districts, the gas from the coke ovens was originally used as fuel under boilers, and the steam thus generated supplied a number of isolated steam-engine plants scattered over the considerable area of the companys operations. For these comparatively small plants the running and maintenance costs were relatively high, particularly as the management felt under the necessity of carrying a spare engine in each location, and the condensing losses in the long feeder pipes from the boiler house were very heavy. The obvious remedy for such conditions lay in the construction of a central electric generating station and the complete electrification of the company's operations. When it came, however, to the question of deciding upon the type of prime mover to be installed the verdict was in favor of gas engines rather than the continued use of steam, for the reason that, with a steam engine of the most efficient type ordinarily used, it is only possible to convert into power about 15 per cent., as a maximum, of the calorific value of the gas, while with gas engines as much as 30 per cent. can be realized. The company accordingly determined to dispose of the steam engines, one after another, and gradually concentrate the production of power in a gas-engine-driven electric plant.

The gas then being used under boilers would not, however, do for gas engines, and the next problem was to secure a gas sufficiently free from impurities to serve this purpose. A by-product recovery plant having been decided upon at the same time, this would take care of the question of tar compounds, as well as some other deleterious substances; but the necessity of extracting a large percentage of sulphur remained, and to provide for its effective removal a special cleaning plant was constructed, which consists primarily of layers of bog iron ore on coarse wooden lattice work. Through this filter the gas is forced by fans, the gas forming sulphides and ferrocyanide and the noxious elements being removed. Every few weeks, as the ore becomes saturated, it is dumped from the racks into the central chamber shown by Fig. 2, where regeneration takes place from exposure to the air. The two sides of the filter are operated alternately, so as to afford opportunity for this freshening process. Tar extractors were originally used, but were found unnecessary after the installation (as

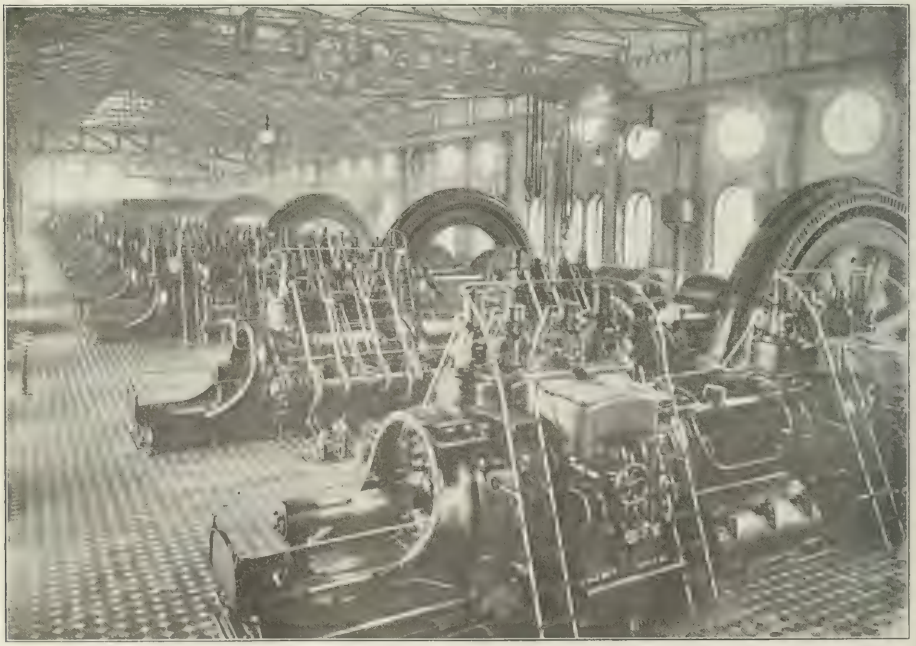


Fig. 1—Eschweiler Mining Company's Power Plant, Alsdorf, Germany, with 15,000 hp. of Augsburg-Nürnberg Gas Engines Using Coke Oven Gas

the writer recalls having been told by some one connected with the plant) of new Koppers ovens, substituted for an older type. The gas as cleaned has a composition approximately as follows:

Carbon dioxide	2.00 per cent.
Hydro carbons	1.40 per cent.
Oxygen	0.82 per cent.
Carbon Monoxide	5.82 per cent.
Methane	20.83 per cent.
Hydrogen	55.11 per cent.
Nitrogen	14.02 per cent.

It will be noted that there is a very high percentage of hydrogen, but no trouble has been experienced. From the filters the gas can be sent through the connections shown in the plan, either to the gas engine house or to one of two gas holders, having a combined capacity of 52,500 cu. ft., from each of which two separate lines lead to the power plant. To provide for the removal of water condensing in the pipes, there are two drain-off valves in each line. Each cubic foot of the gas, as cleansed, weighs about 3/10 lb. and has a calorific value of 340 to 450 B.t.u. This gas costs to produce about ⅛c. per kilowatt-hour, from the time that it is taken as coke-oven waste and delivered to the engine cylinders. To insure a supply of power when sufficient of the ovens are not in operation to provide it, gas producers have been installed as auxiliaries.

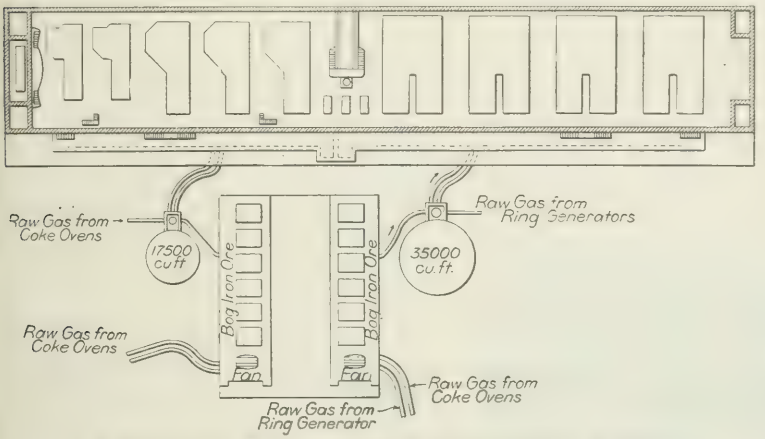


Fig. 2 Sketch of Power Plant and Coke Oven Gas Purifying and Storage Arrangements.

In the power plant, which was designed for indefinite lateral extension, there were installed, as the initial equipment, two gas engines of 500 hp., each direct coupled to three-phase alternators. These were notable at that time as the first large gas engines of the double-acting type. The units installed by the Eschweiler Mining Company were used by their builders in carrying out extended experiments and tests to determine upon a scientific basis the best conditions to be obtained for parallel operation, and these formed the basis of future practice.

The first two units were so efficient in service that three more were ordered, two of 1000 hp. each and one of 1200 hp. Later two twin-tandem engines of 2400 to 2600 hp. each, and still later two twin-tandem machines of 2600 to 2800 hp. each were installed, making the present capacity total 14,500 to 15,000 bhp. These engines are indicated by Fig. 2 in the order of their installation, beginning at the left. The small and medium-size units, or first five, were provided with separate fly-wheels, while each of the four largest has a heavy fly-wheel rotor included in the design of its electric generator.

The gas-power account is separately kept, and a charge approximately ¾ cent per kilowatt-hour is made to the mining and coking departments of the company. With operation and maintenance, including depreciation, amounting to less than 2/5 cent per kilowatt-hour and ⅛ cent for the gas as above noted, there is a handsome percentage of profit to be applied in reducing the capital investment.

The accompanying table gives the results of tests made by Professor Lange of the Technical University at Aix-la-Chapelle of the two 2400 to 2600 bhp. gas engines. Owing to these tests taking place on a Sunday, it was impossible to overload the engines, but preliminary trials had shown an overload capacity of 16 per cent. At the same time the reliable parallel running of the gas engines, combined in every possible manner and under different loads, was well proved.

Results of Tests of Two 2600-hp. Gas Engines

	Test 1	Test 2
Output in kilowatts	1530	1554
Heat consumption guaranteed in B.t.u. per i.h.p. per hour	8000	8000
Tested consumption in B.t.u. per i.h.p. per hour	6865	6862
Total efficiency, taking the efficiency of the dynamo at 0.948	0.794	0.794
Proved efficiency at full load	0.844	0.857

Following these trials Professor Lange tested one of the engines, designed for coke-oven gas, with the special object of ascertaining how it would work when driven by producer gas made from coke. The engine worked at full load without any alteration of the valves or governing gear, either with coke-oven gas of 340 to 450 B.t.u. per cu. ft. or with producer gas of 113 B.t.u. per cu. ft.

The total output stated above represents about twice the amount of power formerly obtainable in steam plants with gas from the same number of coke ovens, and it exceeds largely the local requirements. From the Anna No. 2 shaft a transmission line, which carries the current as generated at three-phase, 42 cycles and 5500 volts, extends to the Edward shaft. A second line, with the potential raised to 35,000 volts by transformers, extends to the Eschweiler shaft, about 11 miles distant, and a third to the Maria workings near at hand. Hoisting is done on the Ilgner system of electric balancing and control, through a motor generator set.

One thing which has thus far discouraged the use of coke-oven gas in this country for gas-engine cylinders has been the apparent difficulty of properly cleansing it. The problem becomes complicated by the necessity of separating both the various tar products which such gas carries in suspension, and the more intimate mixtures of sulphur and cyanogen compounds commonly found in it. The tar products, if not thoroughly removed, are the principal cause of fouling the inlet ports and valves of a gas engine, as well as its cylinder. They also frequently cause premature ignition and sticking of the regulating mechanism. Sulphur compounds turn into sulphurous acid during combustion, are converted into sulphuric acid by contact with the moisture and serve to eat away rapidly the metal of the pistons, rods, packing, exhaust valves, etc. Since it is necessary to use water in cooling and muffling, there is always danger of destroying vital parts of the mechanism if the sulphuretted hydrogen is not prevented from entering.

In European plants inspected by the writer these difficulties were encountered initially, but they have been very practically overcome. The tar products which the gas carries in the form of vapor are thoroughly removed, or may be otherwise separated by an acceleration in the cooling of the gas. Should tests develop that, from any cause, a residue remains, it can be caught and retained in a very simple form of washer. The separation of the sulphur and cyanogen compounds has proved more difficult. Several different methods of purification have been brought out in Germany, among the best of which, in addition to the above, is one used by the Gewerkschaft Minister Achenbach, with mines and oven located at Brambauer, near Dortmund, in Westphalia, Prussia, both the gas-cleaning plant and the engines for which were built by Haniel & Lueg, Dusseldorf. Another will be found at the Heinitz gas engine plant of the Prussian royal mines in the Saarbrücken dis-

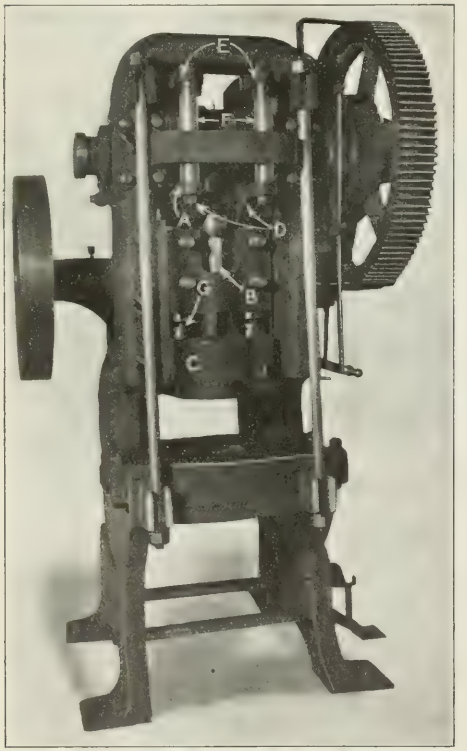
trict, where machines aggregating 11,200 hp, built by Ehrhardt & Sehmer, Saarbrücken, are operated on the gas from Koppers ovens. In all three stations clogging and cutting are conspicuously absent.

At the last named plant the writer obtained an interesting comparison, which he overlooked inquiring about in connection with the Eschweiler plant, viz., as to relative value of the gases obtained from the older types of ovens and those yielded by the new Koppers by-product ovens. At Heinitz the former gave about 3800 cu. ft. per ton of washed coal coked. The latter have been yielding in actual service over 6000 cu. ft., with the same grade of coal. This, of course, is after making allowance for heating the ovens.

New Double-Acting Cam Press

For the deep drawing at a single stroke of light and medium gauge metals and to produce the maximum draw at one stroke that stock of this nature would stand, the Standard Machinery Company, 7 Beverly street, Providence, R. I., has brought out a new double-acting cam press. Although this machine is similar in design to this company's standard line of B power presses which it has built in both plain and geared, and single and double-acting styles, the new machine was especially designed for the drawing and forming of stock with maximum flow and ductility without broaching or breaking, such as mild aluminum, brass or copper.

As will be noticed from the engraving the machine consists of an extra heavy drop forged crankshaft with two steel cams A, forced over the wings and making contact with the upper connection of the inner or drawing ram B. Some idea of the power of the press and the rigidity of the shaft as well as its power can perhaps be gained from the statement that the bore of each cam is 7⅛ in. which is the same diameter as the crankshaft



A New Double-Acting Cam Press for Drawing and Forming Aluminum, Brass and Copper Built by the Standard Machinery Company, Providence, R. I.

wings and the diameter of the wrist pin on the inner or drawing ram has a diameter of 3¼ in. The over-all length of the cams is 4⅜ in. and the actual bearing surface is 3 in. The maximum and minimum radius of the cam is 7 1/16 and 4 1/16 in. which gives a throw of 3 in. on the blanking ram C. This throw is said to be exceptionally large and has been made so to permit a piece more than 3 in. high to be produced at a single stroke without employing a raising die. The drawing stroke or that of the inner plunger is 7 in. and the press is so arranged that both the blanking and the drawing ram start on the up stroke at the same time, an arrangement controlled by setting the cams on the crankshaft.

Capped bearings 9 in. long are used on the machine which enable the shaft to be taken out without pulling it through at one end. Steel is employed for the yokes, the two lower ones D being cast, while the upper ones E are forged and are connected by steel pins relieved on the inside for clearing the cams. The lower yoke extends through bronze bushed holes in the blanking ram and controls the adjustment of it by the spanner nuts G, shown in the lower part. The four screws on the blanking ram are set in elliptical holes with bushings bearing against the shanks of the lower yokes. The supporting straps on the back and front of the press are babbitted for the purpose of securing a perfect running surface for the yoke pins. Forged steel is used for the inner plunger which runs up and down in the blanking plunger in a bronze sleeve. This arrangement, it is emphasized, makes the construction of both plungers together with the yoke and cams very simple, renders adjustment easy and insures smooth running.

A single train of cut gears is used for driving the press and the builder's standard instantaneous roller friction clutch is employed for stopping and starting. The bearings of the crankshaft are of solid construction and are provided with bronze bushings. Either balance wheel or loose pulley drive is furnished and if desired the press can be used as an inclinable one.

The following table gives the principal dimensions and specifications of the press:

Stroke of cutting slide, in.	3
Stroke of drawing plunger, in.	7
Adjustment of cutting slide, in.	1½
Adjustment of drawing plunger, in.	2
Face of cams, in.	2½
Diameter of cam rolls, in.	4
Proportion of gearing	5½ to 1
Maximum distance between slide and bolster, in.	10
Size of bottom of slide, in.	14½ x 8
Depth of bolster plate, in.	2
Distance between uprights, in.	19
Depth of bed, in.	19
Width of bed, in.	28¼
Size of hole in bed, in.	16½ x 9
Distance from center of slide to back of press, in.	7
Diameter of flywheel, in.	30
Face width of flywheel, in.	4¾
Weight of flywheel, lb.	450
Speed of press, r.p.m.	225
Weight of press, lb.	8,500
Over-all height, in.	94
Floor space required, in.	60 x 70

This press can be furnished with either a hand or foot trip as may be desired and with roll or dial feed for the production of special work.

John Hassall, Inc., Clay and Oakland streets, Brooklyn, N. Y., manufacturer of rivets, escutcheon pins and special wire nails, is making an addition to its plant on a plot 75 x 100 ft. recently purchased. The addition will give the company a frontage of 200 ft. on Clay street. Its business has been increasing yearly for the past 10 years, the increase in 1911 having been the largest. The business was established in 1850.

The Crawford Locomotive & Car Company, Streator, Ill., has received an order from the Chicago, Burlington & Quincy Railroad for 500 steel center sill constructions, which will be applied as reinforcers to old equipment by the railroad company at its own shops.

J. W. Wright & Co., dealers in machine tools and accessories, are now located at 1221 to 1223 North Broadway, St. Louis, Mo., where they carry a very complete stock.

The officers and employees of the Anderson Tool Company, Anderson, Ind., to the number of 250, held their annual banquet December 20 in the Masonic Temple.



Plant of the Gardner Machine Company

Economics, Structural Provisions for Shafting and Crane Supports and Unusual Basement Arrangement of a Reinforced Concrete Building at Beloit, Wis.

As an example of what may be worked out for a shop the requirements of which are in the neighborhood of 25,000 sq. ft. of floor space, the plant of the Gardner Machine Company, Beloit, Wis., presents much of interest. The company manufactures well-known types of disk grinders and its plant is designed for a machine shop proposition. The type of building is simple, contributing to a moderate cost of construction. The materials used insure a low maintenance cost. Economies of space are effected and primarily the well-being of the employee is conserved.

In addition to the considerations attaching to the general requirements of a machine shop, the builders had in mind to include the complete plant in one self-contained building of fireproof construction with lighting facilities adequate to promote both the comfort of the employee and a high degree of efficiency. The building was laid out with a floor plan 100 ft. wide by 200 ft. long, and is carried on concrete piers spaced 20 ft. apart along the shop and at varying distances across the shop, depending on the loads to be carried. The ground upon which the building is erected was of such a level that a slight excavation sufficed to allow the reinforced concrete floors being laid on the foundation piers with a 6-ft. air space remaining below it. This concrete floor is about 24 in. above the surrounding ground level, so that in the foundation wall narrow window panels could be inserted for lighting this air space. Not only does this space beneath the machine-shop floor afford room for the storage of a large amount of lumber and general supplies, but allows for carrying heating, water and other piping and electric wiring below the floor. In contrast to the discomforts of the ordinary cold concrete floor laid directly on the ground, the construction described provides by virtue of the heating pipes below a warm and dry floor, which has been found exceedingly satisfactory.

Forty feet from the rear end of the building this sub-floor space is separated by a concrete wall from a basement 9 ft. 6 in. deep. The excavation at this depth extends the entire width of the building. It is divided into two equal sections by a passage into which a sub-track from the yard switch enters the end of the building. In one of these basements the low pressure heating boilers, together with boiler feed, water and air pressure pumps and coal bins, are located. Coal may be unloaded directly from cars on the sub-track to the bins below. Electric current for power purposes is purchased and no provision for making power for the plant is as a result necessary. The opposite basement is used for storage purposes. Both basements have concrete walls and floors, waterproofed inside below the ground surface. This adaptation of the basement space has advantages at once apparent as regards saving in floor space and additional outlying buildings.

For the superstructure, a single monitor-type reinforced

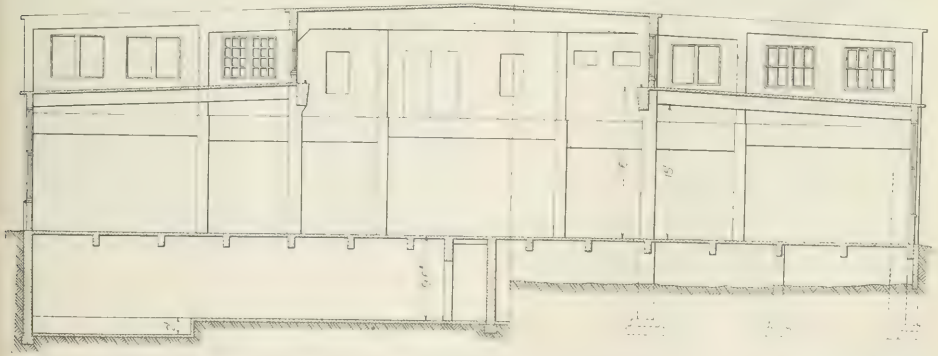


Fig. 1—Cross-section of the Reinforced Concrete Building of Gardner Machine Company Showing Basement Space and Monitor Roof

fireproof construction with a 40-ft. central bay and two 30-ft. side bays was adopted. From the standpoint of ventilation and overhead lighting for a shop of this size and type, the distance from the floor to the underside of the concrete roof beams being 22 ft. 11 in., the monitor design was favored as the most desirable. A cross-section of the building is shown in Fig. 1. The concrete columns are spaced 20 ft., with concrete roof beams in the center bay at 10 ft. intervals, and in the side bays at intervals of 7 ft. The use of concrete construction admits of a much more open overhead space than is possible with a trussed construction. The whitened concrete also provides excellent reflection for the light, and in addition offers no obstruction to the continuous radiation of light. The sides of the monitor are a continuous panel of windows made up of sash 3 ft. 6 in. x 5 ft., while in the side walls the sash are 3 ft. 6 in. x 10 ft. In the monitor lights and the upper three-fourths of the side wall lights ribbed glass is used to shut out the direct rays of the sun, but the lower portion of the side wall windows is clear, the idea being that workmen are more content and feel less shut in than when all possibility of seeing outside of the plant is denied The arrangement thus provided as regards lighting is found to preclude shadows in any part of the plant.

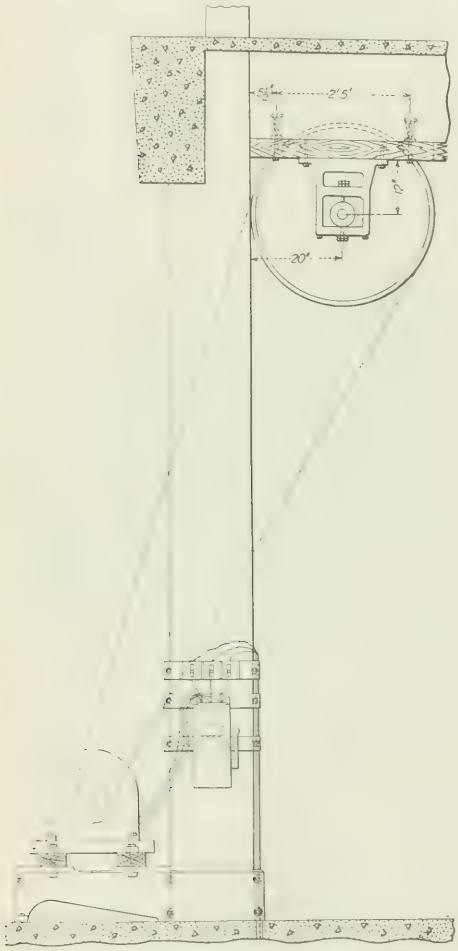


Fig. 2—Details of Support for Motors and Shafting

For a shop working in metals where the fire risk is naturally small it is possible to substitute wood frame sash for metal sash with practically no increase in the insurance premium. This has been done in this instance with a very considerable saving in cost. In general, the cost of the type of building adopted was found to be somewhat less than a fireproof steel frame building and somewhat larger than the cost of an ordinary brick and steel construction. The cost of providing the sub-floor space is estimated as a little more than $500 above the cost of preparing the ground and laying concrete floor directly on it.

The artificial lighting is by means of tungsten clusters. In the main bay these clusters are arranged in parallel rows 25 ft. apart and spaced every 20 ft. along the building, the height above the floor being about 25 ft. In the side

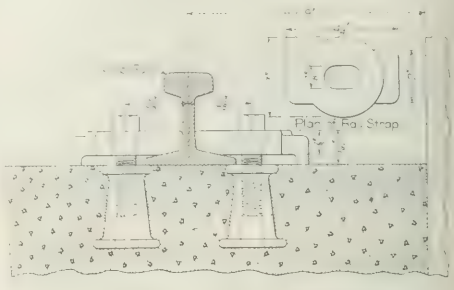


Fig. 3—Method of Supporting the Crane Rails

bays similar clusters are arranged in two rows, 15 ft. apart, with the lights staggered at intervals of 12 ft., the height above the floor being about 14 ft. The heating system is a vacuum, steam coil installation with a part of the coils carried overhead under the monitor windows and a part along the side walls under the windows. Service water for the plant is distributed under pressure from a pneumatic tank located under the floor.

The arrangement of the machine shop floor places the various machines in groups along the row of columns on one side of the center bay. The center bay floor is used for assembling and is traversed by a crane covering its full length, and the other side bay is used for testing the assembled grinders. All of the framing for the transmission equipment, which is arranged for group drive from motors, is hung from the concrete roof beams of the side bays, the line shafts being close to the columns and the countershafts farther back to give proper angle to the belts. This framing consists of I-beams for the stringers and channels for the cross-braces. Threaded sockets were inserted in the forms for the concrete before it was poured and the bolts carrying the framing are screwed into these sockets. The location of the lineshaft was fixed, but in view of the possibility of moving or increasing the countershafts these sockets were inserted in the roof beams at intervals of 4 ft. To take up possible vibration wood block separators are inserted between the I-beams and channels. Hess-Bright ball-bearing hangers are used throughout. The manner of inserting these sockets into the concrete, both for hanging the shafting and also for holding the crane runway rail, are shown in Figs. 2 and 3. Fig. 2 also shows a column bracket upon which the driving motors are carried. The half-tone engraving gives a general view of the interior of the shop.

On the ground floor at the front end a tool room is located on one side of the building and a stockroom on the opposite side, both inclosed with heavy steel screens. On the second floor are general offices, drafting-room and the pattern shop. To add somewhat to the exterior appearance of the building the front end has a stucco finish.

The Matthews-Davis Tool Company, St. Louis, Mo., moved December 15 into its new three-story concrete factory building. A floor space of nearly 16,000 ft. is provided for the exclusive manufacture of the Davis extension boring tools. The machine shop equipment includes five milling machines, four improved engine lathes, two turret lathes, two boring and tapping machines, two automatic spline milling machines for milling slots, five cutter grinding machines, one 10 x 72-in. Norton grinder, five drill presses, one 18-in. shaper, five power saws, and one special broaching machine. The tempering room has been equipped with cyanide gas and coke furnaces.

Coal-Handling Crane

One of the recently completed electric traveling crane installations made by the Northern Engineering Works, Detroit, Mich., was at the mills of the King Paper Company, Kalamazoo, Mich., for handling coal in the boiler room from plans prepared by Daniel J. Albertson of the



Fig. 1—View in the Interior of the King Paper Company's Boiler Room, Showing the Coal Handling Crane Installed by the Northern Engineering Works, Detroit, Mich.

latter city, who was the consulting engineer and architect for the entire plant. Interior and exterior views of the boiler room are given in Figs. 1 and 2 respectively.

The construction of the crane which is brought out in Fig. 1 embodies a somewhat novel principle as the operator's cab is attached directly to the crane trolley, that is



Fig. 2—The Exterior of the Plant, Showing the Hole Left in the End Wall for the Passage of the Crane

located on the side of the crane so that the amount of effective travel of the trolley is not reduced. Three motors are used on the crane and the hoist is provided with a dynamic brake and also an extra large and powerful solenoid brake having an automatic circuit breaker and limit stops, wear compensating device, etc. Steel is employed for all the gears and bearings are bronze bushed throughout. An automatic weighing device recording the weight of the load forms a part of the crane's equipment and it is so arranged that it can be released at the option of the operator and the crane operated without using the device. As the crane is used part of the time indoors and part out, the trolley is covered and the cab inclosed to protect the operator.

Coal is delivered in cars on an elevated siding outside of the boiler room and is lifted from the cars and conveyed a short distance to the coal pile alongside the track where it is stored for future consumption. If desired coal can also be taken directly from the cars and conveyed through the end of the building into the boiler room, an opening which is shown in Fig. 2 having been left in the wall to permit the passage of the crane and its load. Special doors close this opening so that the room can be inclosed in cold weather.

The elevated runway extends for a distance of 350 ft. outside of the boiler room and 72 ft. inside. The coal is taken from the yard or from the car as the case may be and is conveyed directly into the boiler room and dumped into hoppers over each boiler as shown in Fig. 1. From this point the fuel is fed into the boiler by a Detroit automatic stoker, an illustrated description of which appeared in *The Iron Age* February 9, 1911.

The span of the traveling crane is 42 ft. and the lift is 50 ft. Direct current is employed to operate the three motors. The hoisting speed of the crane is approximately 75 ft. and the bridge travel 350 ft. per minute and the capacity of the grab bucket, which is of the Williams type, is 1½ cu. yd.

American Association for Labor Legislation

Workmen's compensation, the unemployment problem in America, and safety and health in the mining industry are subjects which are to be given special attention by the fifth annual meeting of the American Association for Labor Legislation, Washington, D. C., December 28, 29 and 30, at the New Raleigh Hotel. Among those on the programme to discuss compensation and insurance legislation, on the evening of December 28, are John H. Wallace, Washington State Industrial Insurance Commission; C. H. Crownhart, Wisconsin Industrial Commission; James A. Lowell, Massachusetts Commission on Compensation; Thomas J. Duffey, Ohio Board of Liability Awards; W. C. Brown, Federal Workmen's Compensation Commission and president New York Central Railroad. On the morning of December 29 there is to be taken up the subject of the uniform reporting of industrial injuries; on the afternoon of the same day the unemployment problem in America, and on the morning of December 30 the subject of safety and health in the mining industry.

Follansbee Electrical Steel Sheets

The Follansbee Brothers Company, Pittsburgh, Pa., manufacturer of Scott's extra coated roofing tin, bright tin plate and steel sheets, is now producing electrical steel sheets of high quality, for use in making motors, transformers, etc. The works of this company are located at Follansbee, W. Va., in the Pittsburgh district, and include an open-hearth steel plant, improved motor-driven sheet mills and complete chemical, metallurgical and electrical laboratories. The Follansbee electrical sheets are made from the company's own best quality open-hearth steel. As a means of improving the permeability, the steel ingots are reduced under an 8-ton hammer instead of being rolled into billets, which is the usual custom. Two grades of electrical sheets are produced, one known as Follansbee improved electrical steel sheets and the other as Follansbee transformer sheets, the latter being rolled from high silicon steel. The company will furnish samples in quantities sufficient for making tests free of all carrying charges.

The Reading Iron Company will build three Roberts three-pass fire brick stoves at its Crumwold furnace at Emaus, Pa. Frank C. Roberts & Co., Philadelphia, are the engineers.

A Factory Fire Fighting System

Automatic Sprinklers and an Efficient Fire Department Important Factors at the Norton Companies' Plants

To reduce as far as possible, if not entirely eliminate, interruptions to the regular factory routine due to damage by fire the Norton Company and the Norton Grinding Company, Worcester, Mass., have organized factory fire departments. These bodies have been equipped and trained to such a state of perfection that they compare favorably with the corresponding municipal organizations. A description of the work done along these lines appeared in a recent number of Grits and Grinds, the companies' house organ, from which the subjoined information has been taken. In addition to the fire departments with their apparatus, the fire protection arrangements include automatic sprinklers, a special high-pressure water supply system and a number of conveniently located alarm boxes. Fig. 1 shows the hand-drawn hose reel which is kept ready for service at all hours, Fig. 2 illustrates one of the auxiliary stations which are scattered throughout the plants of both companies, and Fig. 3 is a view of one of the hose racks that are conspicuously located in convenient places. A view of the fire department in action is given in Fig. 4.

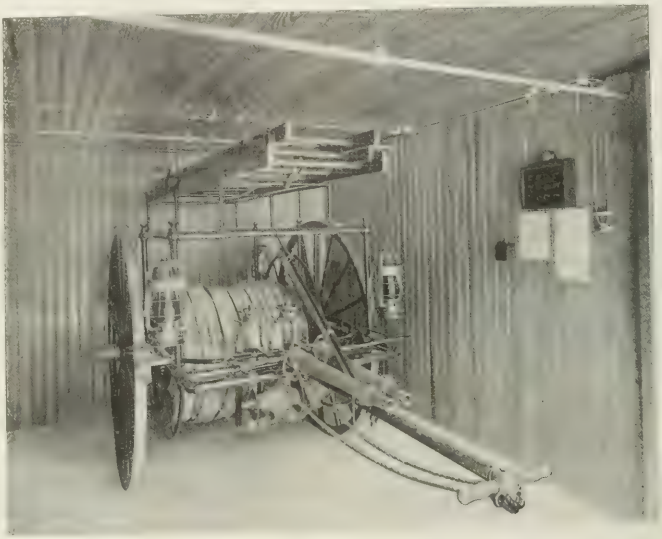


Fig. 1—The Hose Reel Used by the Fire Department of the Norton Company, Worcester, Mass.



Fig. 2—One of the Auxiliary Stations

The Norton fire department is composed entirely of picked men, all of whom live near the works, and who are ready to jump to the call of duty night or day, Sundays and holidays. These men have been trained to quick work. Frequent tests have shown they are not only able to lay lines of hose into buildings with all the speed of trained firemen, but that the chemical corps is efficient in having enough chemical extinguishers on hand within a few seconds of an alarm to drown any ordinary fire.

Fire Fighting Equipment

The fire department equipment consists of one hand-drawn hose reel, shown in Fig. 1, equipped with 600 ft. of 2½-in. water hose, a 25-ft. ladder, and a full quota of lanterns which are kept lighted at night, the same as on city fire departments, and ready for immediate service. There are also many 3-gal. hand chemical extinguishers, which contain more of the fire squelching gases than the tanks of horse-drawn chemical fire engines.

All through the works, auxiliary boxes to the city fire alarm have been installed. In addition there are eight stations for the Norton Company private alarm, and the Norton Grinding Company has three of these stations. The breaking of a small glass is sufficient to sound the private alarm, but the auxiliaries to the city alarm must be pulled in the same manner as the street boxes. Every alarm station on the Norton private system has been made a clustering place for fire-fighting tools, as is clearly brought out in Fig. 2. Close beside each station are two hand chemical extinguishers, an axe and the other things that may come in handy to the one who discovers a fire and sounds an alarm. The man discovering a fire may first break the glass with a small tapper suspended from a leash, then with his call for assistance registered, he may arm himself with an axe and chemicals without further delay.

The breaking of a glass on the private alarm system registers the box upon an annunciator in the boiler room. The number of blasts corresponding to that of the box is blown on the works whistle, and at the same time a bell call is sent to nearby stations of the city fire department, but a short distance from the main entrance to the works. Should a fire prove to have too great a headway for the Norton firemen and those of the nearby fire stations, a city alarm may be registered by pulling any auxiliary box, and assistance called while the firemen already on the scene are fighting the blaze. In cases where water or chemicals are poured into buildings, a salvage corps has been provided to

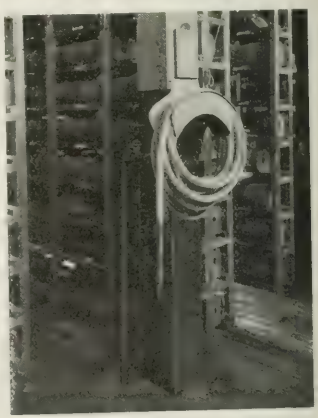


Fig. 3—Hose Racks with 2-In. Hose and Nozzle Scattered Throughout the Plant Form a Portion of the Department's Equipment

work at cleaning up and salvaging goods, that water may not be permitted to do more damage than fire. The salvage corps has been trained to save stock, order blanks, book folders and every little thing of value aside from cleaning out the water immediately after a fire, that it may not leak down on the stock and materials on floors beneath.

The fire department has good water pressure to work with. The high-pressure four-way hydrants, distributed liberally about the yards of the Norton works, have a tested pressure of from 120 to 130 lb., a pressure that would do credit to a small steam fire engine. Sketches have been made of the location of every hydrant, water cock and standpipe, and the Norton firemen have studied them diligently, until they are familiar with every station. In recent tests they have pulled their hose wagon from its station, hustled it to the nearest hydrant to the box from which the alarm registered, made connections, and had a water line laid into the building supposed to be burning, in 1½ min., then returned to the hydrant and laid a second line in 3¼ min. from the first stroke of the alarm. Taking into consideration that part of the haul of the hose-cart was over a railroad trestle, where the city fire department wagons could not go at all, the private firemen's work was satisfactory, and probably beat out the city department, starting from its house on the alarm, by from 8 to 10 min.

Auxiliary Equipment

In addition to the general automatic sprinkler service, the works are equipped with standpipes, to which 2-in. hose is attached, with the nozzle all ready for the inside hose crew. These standpipes are attached to high-pressure water service. The power house has additional protection from fire which might be caused by sparks, inasmuch as its roof is piped in a way that makes it possible to flood it with water instantly in case of fire.



Fig. 4—The Fire Department Going Into Action

The roster of the Norton Fire Department is: chief, deputy-chief, first and second assistant chiefs, the outside hose corps, which is composed of a captain, two lieutenants and 16 men; the inside hose and salvage corps, composed of two captains, one for water hose squad and one for the hand chemical and salvage corps, and a lieutenant for each. The inside hose corps has, aside from its officers, seven men, while the hand chemical and salvage corps has nine, exclusive of the officers.

Service Records

On a recent morning, in the midst of the hardest thunder and lightning storm of the year, a watchman discovered smoke in the kiln department, investigated, found a fire and sent in an alarm. The watchmen have been instructed to pull an alarm first, then go back and fight until assistance arrives. Although it was some time before daylight, and workmen not due at the works for 2 hr. or more, a captain and 10 men braved the rain, thunder and lightning to respond to the shop whistle on a fire call. The city apparatus, called on thermostat alarm, went astray, not being familiar with the shop geography. But the Norton firemen plunged into the thick of it, nipped the fire in its incipiency, and the men of the salvage corps were getting in their work by the time the city fire department came clanging up to the scene.

The good work of the Norton firemen, the interest and loyalty shown by leaving beds and braving a rain at 5 o'clock in the morning to light fire was taken up by the directors the following day, and it was decided to pay each Norton fireman responding to all alarms outside of working hours for his trouble. At a recent alarm on a Sunday afternoon, 23 Norton Company firemen responded, and 11 firemen from the 18 men comprising the department of the Norton Grinding Company.

The hose reel has been placed in a fire station especially fitted up for it, at the south end of Plant 3, a central location, and an annunciator box has been installed so that firemen who could not catch the box from the whistle may find it shown upon the wall by the time they arrive for the apparatus.

The Blake Specialty Company

The Blake Specialty Company, Rock Island, Ill., furnishes an example of an important manufacturing establishment quickly developing from a small beginning. J. D. Blake, vice-president of this company, was formerly of the local plumbing firm of Blake & Murphy. While in that business he perfected a clean-out contrivance to be used on all clean-out fittings in house drains and the company was organized in 1909 to manufacture this device. The products now include other patented articles, which are specialties with this company, comprising floor drains, running-back water traps, test tees, test plugs, drum traps, fittings, bends, brass and iron ferrules, crosses, spigots, house boiler fittings, curb boxes, etc.

Among the products manufactured is an improved earth auger for use in drilling a hole for a pipe leading from a house connection to the main in the street, enabling a plumber to make the connection without digging the usual trench for the whole distance. This auger is fitted with a hose, the water passing through which aids in the boring.

The company has just completed a large plant in the new industrial division in the west end of the city of Rock Island. The tract on which it is situated was donated by the Rock Island Industrial Commission. The tract comprises four and a quarter acres on which six buildings have been erected, comprising a foundry, 80 x 100 ft.; cupola room, 20 x 30 ft.; core room, 20 x 30 ft.; mill room, 30 x 45 ft.; machine shop, 60 x 75 ft., and heating and pumping plant, 25 x 40 ft. Individual motors are attached to each machine and everything has been done to make the plant agreeable for the workmen. The company will shortly install brass furnaces to make its own brass castings and a galvanizing plant for the purpose of galvanizing its own fittings.

J. T. Shields is president of the company and M. C. Shields is secretary and treasurer. J. J. Croft, for several years assistant superintendent of the Red Jacket Mfg. Company, Davenport, Iowa, will have the supervision of the plant. The company's devices have been adopted in not only many cities in the United States but also in the Dominion of Canada and in the Philippine Islands. A branch house is located in New York City, which will be used as a warehouse and distributing station, while plans are being considered to establish a distributing point in New Orleans.

The Thomas Furnace Company, Milwaukee, Wis., put its furnace in blast November 20. It had been out since July, 1910. Meantime the old hot blast stoves had been torn down and two J. E. Thomas patent fire brick stoves, 18 x 80 ft., erected in their places.

Wire Flattening Mill

A New German Machine for Producing Flat Strips from Round Wire

For producing flat strips from round wire without having to anneal it between the different passes, August Schmitz, Walzmaschinenfabrik, Düsseldorf, Germany, has placed on the market two types of wire rolling or reducing mill. One of these mills, which is designated as the type A, will take wire 0.314 in. in diameter and reduce it to a flat strip 0.019 in. thick, or thinner if required, while the other, the type A 1, will take wire having a diameter of 0.472 in. and reduce it to flat strips as thin as 0.039 in. or less. Fig. 1 shows the mill with the straightening device in position, and Fig. 4 illustrates it with the edger attached. The discharge side of the machine with the finished product wound on the coiler and bound is shown in Fig. 5, while Fig. 2 is a view of the coiler with the gear box open. Fig. 3 illustrates the output of the two types of mills as it appears after the different passes have been made.

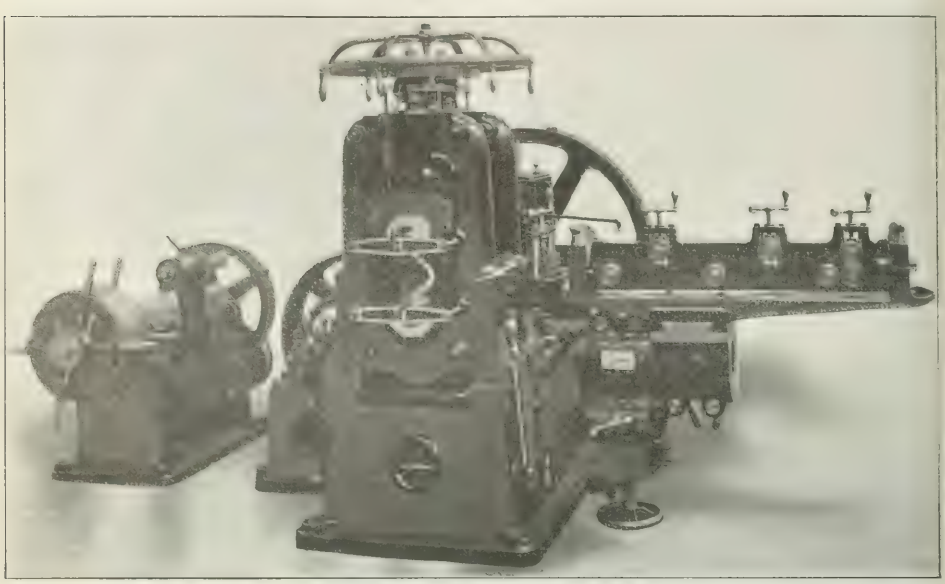


Fig. 1—A New Type of Wire Flattening Mill Built by August Schmitz, Walzmaschinenfabrik, Düsseldorf, Germany

The rolls which do the reducing can be had in two sizes, one measuring 8 in. in diameter and 5 in. across the face, while the other is 2 in. larger in diameter and 2 in. wider. These are made of blocks of steel with the surface hardened and ground to the right size and polished. To distribute the pressure evenly the necks of the rolls have a large bearing surface. Provision is made for internal water cooling and the rolls run in bearings lined with anti-friction metal. Cast steel is used for the housings and there are springs between the rolls for raising the upper roll, while in addition the necks are protected against dust and dirt by detachable covers. The upper roll bearing is held in position by brackets from the outside of the housings and the rolls can be changed in a comparatively short time by loosening the two bolts and releasing the bracket, after which the bearing and rolls can be slipped out easily.



Fig. 2—The Coiler Gear Box with the Cover Removed

The housings are kept in position by cotters to prevent vibration and side shifting. The rolls are adjusted by a central adjusting device consisting of a large hand wheel fitted on a spindle with a spur pinion which engages two large diameter gears fitted on the two pressure spindles; in this way heavy pressure can be secured without much exertion. To accommodate the mill to inaccuracies in the strip either of these spindles can be set independently by lifting the gear wheel out of mesh by a special disengaging lever. After the adjustment has been made the spur as to form a pan and the cover on top of them is regears can be re-engaged. Tool steel is employed for the adjusting spindles to avoid wear.



Fig. 3—Successive Stages in Flattening the Wire in Both Types of Machine

The rolls are driven by pinions and safety pins. The housings containing the pinions are shaped in such a way movable to give easy access to the pinions which run in oil. The pinions have staggered teeth to avoid marks on

the finished material, and the pinion bearings are fitted with bronze bushings. The driving mechanism consists of a tight and loose pulley for the smaller mill and a single pulley and friction coil clutch in the larger one.

The equipment of the mill includes feeding and delivery guides, an oil basin, oil pump and complete piping system which enables a thick film of oil to be pumped on the material being rolled as it passes into the rolls. A combined straightening and edging device is mounted turret-fashion in front of the machine so that either part can be placed instantly in the working position by a simple turn of the lever. Fig. 1 shows the mill with the straightening device in working position, while Fig. 4 shows the edger in use. In operation the round wire passes through a tubular intake and then passes through the different straightening pulleys which are adjusted by turning the corresponding levers. The edger is especially adapted for turning the edges of the material to produce half round, oval or flat sections according to the requirements of each particular case. Three different grooves can be turned in the rolls of the edger to give the various finishes.

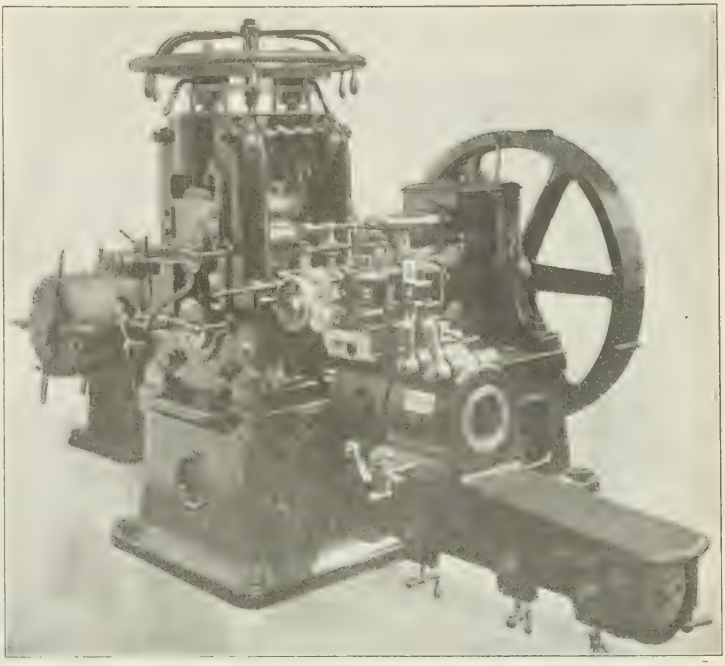


Fig. 4.—The Machine Equipped with a Device for Rounding the Edges of the Finished Product.

mill. A special type of friction pulley which compensates for variations in the diameter of the strip and prevents any sliding of the belt and a single worm and worm wheel are used. These coiling wheels are of large dimensions so that the thickest wire can be coiled easily. The winding drum possesses sufficient width and strength and can be compressed when the coiled wire is to be taken off. The coiler is provided with a mechanism that automatically imparts a reciprocating motion to the winding drum. This mechanism can be thrown in and out of gear while the machine is running by the operation of a lever. The width of the coiler is adjustable for various widths of strips. As will be noticed from Fig. 2, the shaft bearings and the driving mechanism of the reciprocating motion are of ample proportions.

The capacities of the two machines are wire ⅜ in. in diameter and smaller for the type A, while the maximum diameter of the wire handled by the type A 1 is ½ in. Typical examples of strips produced by these two types of machines are shown in Fig. 3.

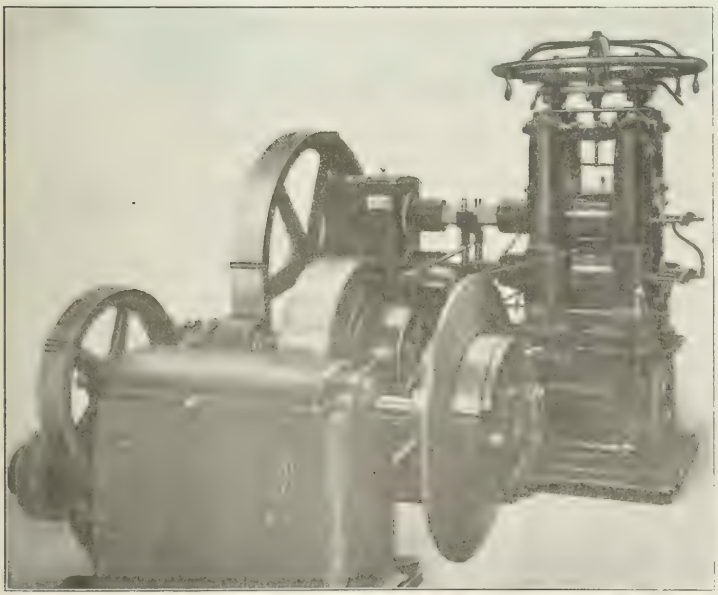


Fig. 5.—A View of the Discharge Side Showing the Strip Coiled and Bound.

The coiler which is shown in position in Fig. 5, and with the gear-box removed in Fig. 2, is an important feature. It is self-contained, and is driven by a belt from the

The strike of the puddlers at the plant of the A. M. Byers Company, Girard, Ohio, has been settled, the men returning to work on Monday, December 18.

Herringbone Gears*

With Special Reference to the Wuest System

BY PERCY C. DAY†

That the helical principle in toothed gearing is ideal from a theoretical point of view is well known. From a practical standpoint herringbone gears have been less satisfactory than straight-cut spur gears because, until recently, no method was devised for producing them with the requisite speed and accuracy. Within the last six years a method has been found and developed, in England, to a high degree of perfection. Herringbone gears made by this method are called Wuest gears, after the inventor, and can be produced with even greater accuracy than cut gears of the spur type. The distinction between these gears and those of the ordinary herringbone type is that the teeth of the former, instead of joining at a common apex at the center of the face, are stepped half the pitch apart and do not meet at all. This arrangement of the teeth does not affect the action of the gears, but it facilitates their commercial production and admits the use of precision methods in their manufacture.

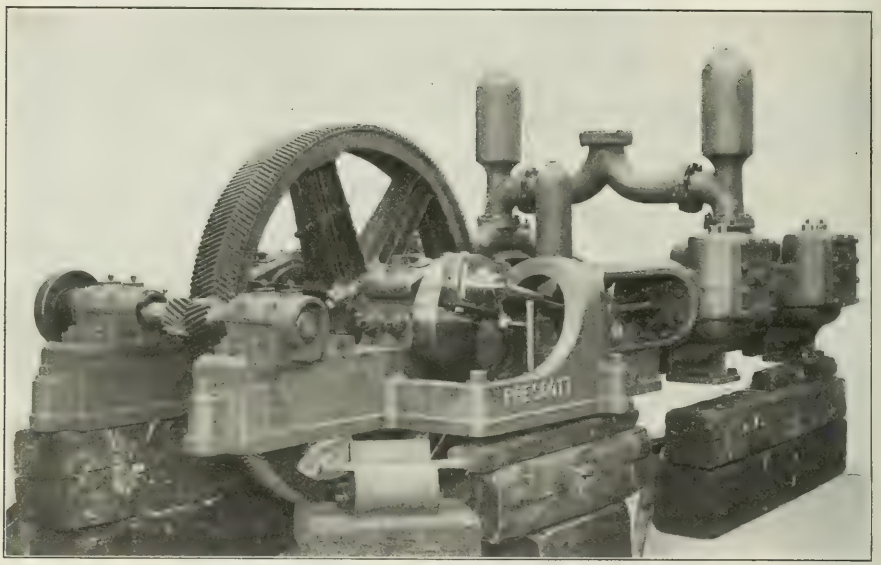


Fig. 1—A Gear Having a Ratio of 12¼ to 1 Applied to a Horizontal Pump Built by the Fred M. Prescott Steam Pump Company, West Allis, Wis.

Before describing some special applications of these gears to the needs of various industries and machines, it may be of service to summarize the salient features of the gears and the changes of viewpoint which these features have engendered. The smooth and continuous action is virtually independent of the diameter or number of teeth in the pinion. Extremely high ratios of reduction can be used without fear of uneven driving or undue wear and without need for unwieldy gear diameters which would be disproportionate to the general design. High ratio gears of this type transmit power with practically no more loss than low ratio gears. They are far more efficient than belts, ropes, worm-gears or compound trains of spur gearing, while their adoption results in a wholesale reduction of countershafts and bearings which reduces the power consumption and running costs to a remarkable degree. There are many instances where spur gears cannot be used because the vibration which they set up has a detrimental effect on the driven machine or its product. The inconvenience of a cumbersome system of belts or ropes has usually to be borne in such cases, but it is not too much to say that the requirements of almost all of them are fully satisfied by this type of herringbone gears. The application of spur gears has been much restricted by the noise which they make when run at high velocities. The use of rawhide or other soft materials has only proved moderately successful for comparatively light work and is quite unsound for heavy gear practice. Herringbone gears in combination with durable steel pinions make less noise than soft pinions and spur gears when new, and while the former become quieter with use, the latter soon begin to rattle as they become worn. It should be noted that the use of soft pinions, while mitigating the nuisance of excessive noise, does not reduce vibration or unevenness of motion. There is a limit to the pitch-line velocities at which spur gears can be operated beyond which it is unsafe to use them. This limit is far below the minimum velocities which can be used in connection with steam turbines of economical design and high power. Accurate herringbone gears operate quite smoothly at velocities which are impossible for other types. This feature would appear to reserve for them a field of application which has great possibilities and is likely to cause some great changes in the standard practice of today.

Applications of the Gears

Direct-connected steam turbines for marine propulsion have been only partially successful in a very limited field. It is only when the power required is very great and the speed of the vessel unusually high that the direct-connected turbine can be applied, and even then the application does not do full justice to either turbine or propeller, while the first cost is much higher than it need be. The use of direct-coupled turbines is confined to ocean fliers and ships of war. Ordinary vessels of commerce, which

*From a paper presented at the annual meeting of the American Society of Mechanical Engineers, New York, December 5-8, 1911.

†Engineer with the Falk Company, Milwaukee, Wis.

are built in vastly greater numbers, cannot be adapted to turbine power in this form.

Mr. Parsons has made a successful introduction of herringbone gears in combination with a steam turbine for driving a continous plate mill. The mill is of the three-high type with rolls 28 in. by 84 in. running at 70 r.p.m. The turbine is designed for mixed pressure, running at 2000 r.p.m. with exhaust steam at 16 lb. absolute or live steam at 60 lb. absolute and giving 750 b.h.p. The turbine is coupled to the rolls through a double train of herringbone gears. The first train consists of a chrome nickel steel pinion, cut solid on its shaft and cast-steel gear. Pinion and gear have 25 and 131 teeth, 3½ diametral pitch by 24-in. face. This train reduces from 2000 to 375 r.p.m. and is coupled to the second train through a flexible coupling. The second train includes a high carbon steel pinion of 23 teeth and cast steel gear of 127 teeth, 2-in. circular pitch by 16-in. face. This train reduces from 375 to 70 r.p.m. The final gear is overhung on the end of a flywheel shaft 22 in. in diameter, which carries a flywheel of about 100 tons between two bearings and is coupled to the main pinion through a pair of wobblers. Both sets of gearing are inclosed in casings and are lubricated by oil jets from a pump provided for the purpose. This mill has been running without a hitch of any kind since September 15, 1910. The gears are noiseless, the installation shows remarkable efficiency, the rolls run with extreme smoothness and the pinions do not show appreciable wear.

Geared turbines have another field of application for driving centrifugal pumps. Direct driven units of this kind have poor efficiency because a compromise has to be made between turbine and pump speed which is detrimental to both. The interposition of a set of herringbone gears allows both ends to be constructed for the highest economy, and since the loss in the gears does not exceed 2 or 3 per cent. there is a large all-round gain in efficiency. This applies also to turbine-driven blowers and fans.

The speed of hydraulic turbines in controlled by the available head of water supplied to them. The greater number of turbines are required to operate under low heads and must run at slow speed. Hydroelectric power has usually to be transmitted to a considerable distance and is produced in the form of alternating current of definite periodicity. The speed of the turbines may be as low as 50 r.p.m. or even less. A large direct-coupled alternator for this speed is an expensive proposition. Herringbone gears can be used to speed up from the slow-running turbines to generators of normal design, speed and efficiency. The smooth action of these gears is unimpaired when the wheel drives the pinion, and high ratios of speed increase can be obtained from them without noise and with less loss than direct coupled units will give.

The field for accurate herringbone gears in connection

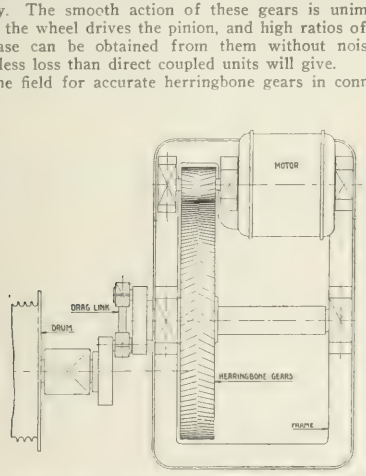


Fig. 2—A Mine Hoist Formerly Steam Driven But Now Electrically Operated Through Herringbone Gears

with machine tool driving is too extended to be considered in detail. For individual motor drives this gear gives a positive transmission which is free from vibration and less noisy than so-called silent chains or rawhide pinions, while there is no trouble from slipping belts or slack chains. But the real advantage of these gears lies in the better finish that can be obtained when they are used for the entire main transmission, and in the higher output combined with reduced maintenance which they give to heavy machine tools. Chatter is eliminated. Even the speeding

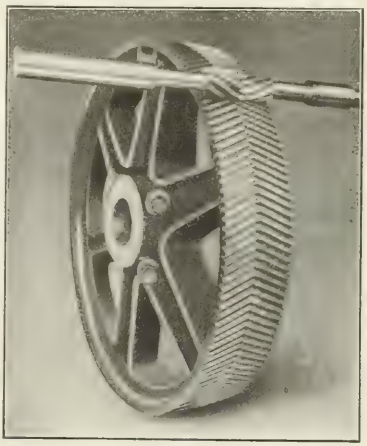


Fig. 3—A Special High Ratio Gear and Pinion, the Latter with Eight Teeth

up to the wheels of grinding machines has been successfully accomplished. Reversing gears for heavy planers are a revelation to those familiar only with the ordinary spur drive.

Electrically-driven plunger pumps have not enjoyed the popularity that might be expected, due to the noise and vibration caused by the gearing between motor and pump shaft. These objections are obviated by accurately cut herringbone gears, which not only give silent and vibrationless transmission but admit the use of high ratio single reductions with compact dimensions. The single reduction drive has a much higher efficiency than the ordinary double frame, quite apart from the lower gear losses, because at least one countershaft can be dispensed with. An example of such a drive is shown in Fig. 1. Similar drives are successful for air compressors and vacuum pumps which present similar difficulties to those met with in plunger pumps.

One of the features in the recent electrifications of the Eckstein group of mines on the South African Rand is a train of herringbone gears between motor and drum in the main hoists. These hoists are driven by reversing asynchronous motors; the geared countershafts being connected to the drums by drag links from the original crank pins that were used when the hoists were run by steam power. The arrangement is shown in diagram in Fig. 2. In installations of this type there are no slipping clutches, and the strains on the gears are very severe, some of them having to transmit 3000 to 4000 hp. at pitch-line velocities ranging from 2000 to 3500 ft. per minute. The large coal mines in Northumberland, Yorkshire and South Wales are rapidly adopting high tension three-phase current for the distribution of power below ground. Some very large main and tail, and endless, haulages are used in these and herringbone gears have become a standard for this class of work. The hoists range from 30 up to 1000 hp. and invariably use a high reduction with ratios which are sometimes as high as 15 to 1. Simplification of design and saving of space is obtained in this way, since ordinary spurs require a double train. The gain in efficiency and absence of noise are remarkable, while the first cost of the whole outfit is often less than when cheaper gears are used. The elimination of all vibration prevents crystallization of the shafts and disintegration of the insulating material in the motors. These gears offer the same advantages for endless haulages. A higher speed motor can be used when they are adopted, while no more than two trains of gears are required. An application of especial interest is for driving tipplers. These gears for this purpose have re-

placed worm gears because they stand up to the heavy strains without excessive wear. The available space for the gears is always limited in such cases. The gears have a ratio of 7 to 1 with a seven-toothed pinion and a gear of only 20 in. diameter. A typical high ratio gear is shown in Fig. 3.

The M. Rumely Company's Expansion

The M. Rumely Company, La Porte, Ind., has issued a statement giving some of the considerations that led to its acquisition of the assets and business of Gaar, Scott & Co., Richmond, Ind., and the Advance Thresher Company, Battle Breek, Mich. It is the purpose of the M. Rumely Company, by means of its larger organization and greater financial resources, to standardize its product and manufacture in larger quantities, specializing each factory to the work for which it is best adapted. In this way manufacturing costs can be reduced.

By an increase in the line of products dealt in, the sales season can be extended over more months in the year, and the sales force kept more evenly employed. Branch houses and storage facilities as well can be centralized, the size of territories reduced, traveling men brought closer together on smaller blocks, avoiding the cost and loss of time of long-distance travel, and the general sales expense, which is the most serious factor in American implement businesses to-day, can be very much reduced.

The M. Rumely Company in its new shape will be in position to enter the export markets, for which its goods are well adapted. England and Germany are at the present time taking advantage of the lack of competitive power of the scattered American threshing machine manufacturers, and are securing a stronger foothold in export fields, especially Argentina and Russia.

The company's present facilities for building steam engines are inadequate for its increasing trade. Its business in hullers is necessarily curtailed for want of manufacturing capacity. Additional shop room, equipment and storehouses seem to be imperative.

In addition to its established line, the company controls in this country the patents for the Lentz poppet-valve engine which has been successfully developed and commercialized in Germany by the Lentz Company, Mannheim, and the Wolff Company, Magdeburg. This engine, with 1½ lb. of coal, will furnish a horse power hour, thus being remarkably economical. But special facilities will be required to manufacture this engine profitably. It could be standardized to two or three sizes, and a large number of each profitably produced and marketed.

In the early days, when Meinard Rumely began manufacturing farm machinery, means of transportation were limited. Farmers requiring such machinery came in by wagon, afoot, by stage and over the short stretches of the first railroads then in use with ready cash to purchase at his shop and haul the goods away. Later he appointed local agents in various parts of Indiana and neighboring States, who at first purchased the machinery outright for cash and resold it Still later they obtained it on consignment and received a commission on its sale.

As the trade expanded over a larger portion of the United States, branch houses were established at jobbing centers like Chicago, St. Louis, Kansas City, Indianapolis, Minneapolis and various other points. In addition to their contract with local implement dealers, these branches maintained at first a few and then an increasing number of traveling salesmen, who assisted the local agents in making sales. These traveling salesmen specialized on one kind of product and were more effective, though more expensive, than the local agents. It gradually became necessary for farm machinery manufacturers to have their traveling salesmen on the ground to assist the local agent, who, unaided, could not successfully compete with the salesmen of competing concerns. The result is that the local agent lost his prime importance as a factor in business, and became merely a spotter who informed the threshing machine company of a prospective customer, leaving it to the traveling salesmen of his company to close the deal. This condition prevails at present, not only in the larger implement business, but to some extent also in the smaller implements, such as binders, mowers, gasoline engines, etc.

The result to-day is that branch houses, traveling salesmen, commissions to local representatives and advertising cost almost as much as it costs to build the machinery from raw materials into a finished product. This waste is largely due to the fact that threshing or plowing machinery is a season product, salable principally for only two or three months of each year. The sales organization must be kept throughout the entire year, which results in long periods of limited activity.

In order to withstand the competition of larger manufacturers of farm machinery who have something for their salesmen to sell at all seasons of the year in every section of the country, on account of their immensely varied lines, it has been found necessary for the M. Rumely Company to secure a broader line of products so that its sales organization may have something that is in season and salable at every period of the year.

In seeking to round out its business the company finds that it should add further products, such as corn shredders, corn huskers, ensilage cutters, road graders, sawmills, rice separators, etc., all of which require power and go advantageously with its traction engine line. An exceptional opportunity exists in the stationary kerosene engines between 2½ and 20 hp., manufactured by the Falk Company, Milwaukee, under license from the M. Rumely Company, for which preliminary investigation has disclosed a very large demand. This will add to its selling line, but will also require additional facilities at branch houses for storage, repairs, etc.

A thorough survey of the situation convinced the company that the development of its business must cease or it must immediately increase the facilities for manufacturing and marketing its products. This could be done only in two ways. One would be by building additional factories, by increasing the accommodations at branch houses and by establishing new branch houses and storage facilities, which would unavoidably involve considerable delay, tie up a large sum of money during construction and not enable the company to avail itself of the 1912 season. The other course would be to acquire manufacturing plants and branch houses already established at desirable locations. After the most careful consideration and investigation, it was decided to acquire existing plants, which resulted in the purchase of the factories and other assets and business of the two companies previously named, which have branch houses at the many points at which the M. Rumely Company has either no buildings or is using leased quarters no longer suitable or adequate for its needs. The combined sales expense of the three companies has been about $1,700,000 annually, which amount, by readjustment, would suffice to move at least 50 per cent. more product. Further, each of the three factories can be specialized to fewer products, obviating the necessity of manufacturing a great variety of things in limited quantities.

The Western Conduit & Mfg. Company.—The Youngstown Sheet & Tube Company, Youngstown, Ohio, has acquired a large interest in the Western Conduit & Mfg. Company, Chicago. The capital stock of the latter company has been increased from $50,000 to $100,000 and the following officers have been elected: L. J. Campbell, president; W. J. McKay, vice-president and general manager; J. H. Rogers, secretary and general manager of sales: C. C. Rose, treasurer. The foregoing, together with Richard Garlick, constitute the board of directors. It is the intention of the company to build at Youngstown a modern factory of large capacity for the manufacture of its well-known rigid conduit Harveyduct as well as a factory for the manufacture of Realflex, the new flexible armored conductor, which the company has recently put on the market. It is probable that the increase already made in the capital stock will not be sufficient to take care of the improvements planned; in such case, further additions will be made. It is expected to have the two new factories at Youngstown completed next spring.

At the annual meeting of stockholders of the Connellsville Mfg. & Mine Supply Company, Connellsville, Pa., A. D. Soisson was elected vice-president to succeed Clair Stillwagon, deceased.

Shop Erection and Testing of All Important Work

What reason can there be why transmission machinery, any more than any other, should be made and shipped and erected in place without shop assembling and testing to insure accuracy of dimensions and fitting and correctness of adjustment and operation? Who would buy and set up in his power house an engine whose parts had not previously been brought together and operated as a complete machine? Who would care to do the fitting and testing and adjustment and correction necessary to bring any important system of mechanism into proper operating condition? What millwright has not spent hours or days of time and possibly dollars and dollars of somebody's money in the work of installing a system of transmission equipment which came from the maker with some misfits or errors, small or large, that would certainly have been discovered if the machinery had been corrected at the factory, where every facility was at hand for quick and easy alteration and fitting, or replacement of defective parts?

The desirability of shop erection is so patent as to cause wonder that any work of importance should ever be shipped without receiving this essential attention. There is, however, a reason why it is not universally in practice, and this reason is closely related to the carelessness all too common in the design and construction of ordinary grades of transmission equipment. Of course, one would think it even more necessary to assemble equipment of mediocre sort than to take this means of making sure of correct fitting in machinery of higher grade, made with care in every detail. But this is not the way it works out. The careless manufacturer is careless also of results, and puts up to the purchaser the matter of correcting all constructive errors. Conversely, the maker of high grade equipment carries through to a proper and logical conclusion his policy of care in details and of accuracy in results.

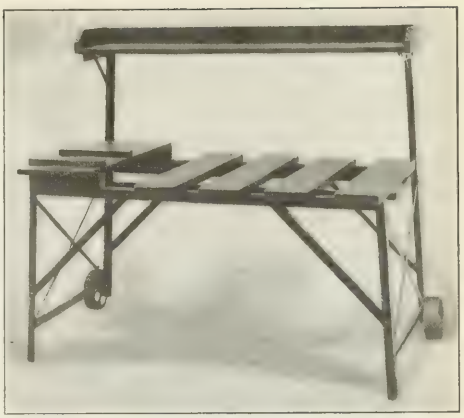
Of scarcely less importance than the complete assembling of such machinery is its thorough testing in motion, up to or even beyond the speed at which it is to be operated. Such testing affords opportunity for adjustment of clutches and bearings; for checking the "balance" and true running of pulleys and sheaves, and the action of self-oiling devices in the bearings, the location of pulleys and sheaves along the shaft, the straightness of the shafting itself, etc.

The Dodge Mfg. Company, Mishawaka, Ind., in calling attention to the points given above, states that at its factory every job of importance is erected complete and is tested for whatever period may be necessary to permit close inspection of every detail, proper adjustment of clutches, etc. This invariable and invaluable practice is a distinctive feature of the company's idea as to what constitutes really right product and service to its customers and is in no small measure responsible for the exceptional ease and speed with which Dodge equipments are installed, as well as for the absence of vexatious delays and stoppages for readjustments after operation has begun. Many an order for Dodge machinery has been placed upon this basis—sometimes as a fundamental consideration of essential importance.

Portable Molder's Bench

To enable molders to be moved away from a cold window in winter and out of the rays of the sun in the summer, a new type of portable bench has been brought out by the Sand Mixing Machine Company, 220 Broadway, New York City. Beside this feature the bench also possesses the advantage of being capable of movement to the sand pile, which is quicker and cheaper than to move the sand to the bench while in addition the expense of shoveling the sand in a pile as well as the time and labor of carrying out the molds is saved.

The bench is made of angle steel with the exception of the molding table and the equipment shelf, which are of 1¼ and ⅞-in. lumber respectively. The bench weighs about 95 lb. so that it can be easily moved by one man to any desired position. The use of iron and steel in its construction makes the bench practically indestructible and at the same time very rigid. There is a sliding shelf underneath the molding table which has a movement of about 18 in. that can be used to hold a riddle and can be slid in out of the way when not in use. It is said to be adapted equally well for either stationary or portable molding. In the former case the bench can be moved from one portion of the sand pile to another, while when portable work is being handled the bench is moved from one part of the foundry to the other as is desired.



A New Type of Portable Molder's Bench Made by the Sand Mixing Machine Company, New York City

American Rolling Mill Company Entertains Culvert Manufacturers

On December 8 the American Rolling Mill Company entertained the members of the National Corrugated Culvert Association at its works in Middletown, Ohio, following the annual convention of that body in Chicago. They were taken to Middletown in special cars, conveyed to the company's works in automobiles, and escorted through both the Central and the mammoth new East Side works. After inspecting the two mills and the company's extensive research laboratory, the party repaired to the Elks Temple, where a banquet was enjoyed. Excellent addresses were delivered, the speakers being John S. Beall, president, and Ray Frazer, secretary, of the National Corrugated Culvert Association, and R. C. Phillips, secretary, and G. H. Charls, assistant secretary, of the American Rolling Mill Company. The manufacturers who compose this association produce approximately 80 per cent. of all the metal culverts furnished in this country, and use American ingot iron exclusively for this purpose, because of its rust-resisting properties.

Diffusing Noxious Chimney Gases

\ chimney for diffusing the products of combustion into the atmosphere, the upper portion of the shaft being pierced by a large number of holes, was recently illustrated in the Zeitschrift des Vereines deutscher Ingenieure. It is designed to overcome the damaging effect on vegetation of the sulphurous products of combustion. It is felt that chimneys of lofty hight do not meet the problem altogether, particularly if the upper strata of the atmosphere are quiescent. A chimney about 100 ft. in hight was shown with the topmost part of the shaft, for a length of about 21 ft., pierced with conical holes with the larger openings in the outside face of the chimney. The wind enters freely into the chimney through these holes, diluting the smoke and developing a vortical action. Through the side opposite to the wind the quantity of gas which will escape through the holes is generally of little importance, because of the shape of the holes. It is held that the vortical action, together with the diffusion within the top of the chimney, reduces the diameter of the zone of vegetation endangered by the sulphurous gases.

The Turret Equatorial Telescope*

A New Astronomical Observatory

BY JAMES HARTNESS†

. A new astronomical observatory to allow the observer to work in comfort, independent of the outside temperature without serious handicap to good seeing and instrumental precision, involved a departure from previous forms. For the purpose of defining the relation of the new observatory to preceding types it is necessary to refer to diagrammatic illustrations, Figs. 1, 2 and 3. Fig. 2 for the purpose of this paper will be referred to as the standard observatory, since it represents a type most highly developed by reason of the greater number of instruments of this kind that have been made. This instrument is not only the most efficient optically, but is probably the most reliable in point of mechanical precision when compared with any other instruments designed for covering the whole heavens and for general purposes. Fig. 1 is known as the equatorial coudé, or elbow equatorial. This instrument was designed to shelter the observer in comfortable quarters. It is of French origin and a number of these are in use in Paris and elsewhere. Fig. 3 is a schematic sketch of the new instrument which we propose to designate as the turret equatorial.

Details of the New Telescope

In the present instrument the direction of the beam of light is changed, but instead of using a large mirror near the objective a prism is used nearer the eyepiece. The area of the bundle of the cone of rays at the prisms is approximately one-sixteenth of the area of the object glass. By avoiding the use of large mirrors there is, of course, the optical gain, and the mechanical difficulties encountered in holding these large mirrors without flexure are also obviated. The means employed to shelter the observer and provide suitable mounting and control for this telescope may be briefly described as a building having a turret-like dome, this dome being mounted to rotate on an axis parallel to the axis of the earth.

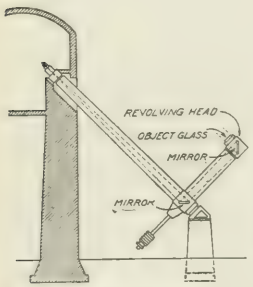
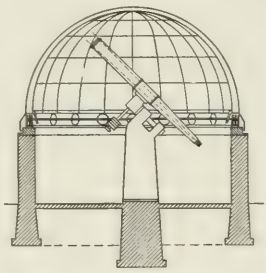
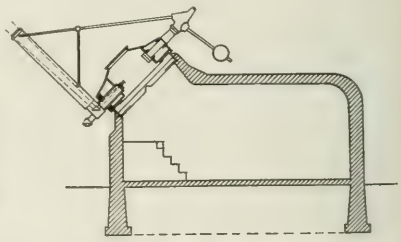


Fig. 1—Equatorial Coude


Fig. 2—Standard Equatorial


Fig. 3—Turret Equatorial

Diagrammatic Sketches of Two Common and a New Type of Telescope

It is perhaps well to bear in mind that the distances between the instrument and the celestial objects are so great as to be practically infinite; hence, in saying that the turret is mounted on an axis parallel to the earth's axis, it will be just as well for our present purpose to consider it located at the axis of the earth. Furthermore, in considering the joint between the telescope and the turret, it will be more readily understood if we regard the pivotal connection of the telescope tube to the dome as located directly in the middle of the turret instead of at one side.

Regarding the mechanical precision of the present instrument, it is very natural to question the reliability of a turret in serving the place of an arbor for the main polar axis. This axis not only provides a control of the motion of the telescope as it follows a star in offsetting the earth's motion, but it also must combine with it some means for knowing with considerable precision a reasonably exact reading of the hour position or right ascension of the object. These two things make it necessary to provide the turret with a perfectly planed surface on its under side and a truly circular track. It also requires in the building a stable mounting for rolls on which the turret rests.

There are two sets of rolls: one set on which the flat face of the turret rests must keep the axis of the turret parallel with the axis of the earth. The circular part of the turret bears on the other set of rolls. The office of the second set is to hold the axis of the turret in a fixed position relative to the building to facilitate convenience in measurement of the angular position of the telescope as to hour position or right ascension. If we can assure ourselves of the reliability of the turret for axial control and means for measuring the angular position of the tube around this axis, the author thinks we should be ready to accept the present scheme on account of its making possible the comfortable housing of the observer.

In mechanism for obtaining the greatest precision of axial control of a rotating object, machine designers invariably prefer an arbor of relatively small diameter mounted in two bearings, with the distance between the bearings of at least half a dozen diameters. Small diameters also furnish a most reliable center control around which to measure angular position. In the present case as in nearly every problem of machine design, there are other elements to be considered. The best solution is to determine what compromise to make.

Means for Controlling Movement

In all equatorial telescopes provision must be made for changing the angular direction of the telescope to and from the pole; in other words, north and south. The axis on which the telescope turns for this position of declination must stand at right angles to the polar axis. In the new instrument the telescope is not pivoted at the middle, but at a point near the focus, and it is at this point that the prism is introduced and the rays are delivered into the turret through the hollow declination axis. The scheme of counterweight resembles in some respects the old-fashioned well sweep. The counterweight is fulcrumed at the opposite side of the turret and reaches over to a point near the head of the telescope, supporting it without adding the weight to the telescope head and thus relieving a part of the weight of the declination axis and also all torsional strain.

This well sweep acts also as a brace in one direction. When the turret has been turned so that the declination axis is at the lowest part, and the tube has been pointed directly to the pole, then the counterweight is inoperative as a counterweight for the tube, but the arm becomes a brace. Therefore this scheme changes from one that is wholly a counterpoise to one that holds the telescope in position by a diagonal brace, and there are positions in which there is an equal service of each in the change from one extreme to the other. The brace always operates to

*From a paper presented at the annual meeting of the American Society of Mechanical Engineers, New York, December 6, 1911.

†President, Jones & Lamson Machine Company, Springfield, Vt.

stiffen the instrument against the action of the wind in certain positions and the exact form may be varied to get the best results. The one shown in Fig. 4 was made to use available material.

The means for controlling the declination position of the telescope is a wormwheel in which two worms engage. It will be seen that the observer sits inside the dome and receives the light coming from any celestial object above the horizon; and although it is necessary for him to change the position of the chair about 1 ft. east and west and 3 or 4 in. vertically, such a change does not constitute any serious inconvenience. The beam of light comes into the observatory in a horizontal position when the telescope is pointed along the meridian, and it changes from the horizontal position to one in which the observer looks down toward the north at an angle of about 45 deg. at this latitude. The control of the dome, both for its quick motion for changing from one position to another, and also for providing movement to offset the rotation of the earth, is all effected by levers within convenient reach of the observer.

The rotation of the dome, instead of being effected by a wormwheel or gearing directly connected to the dome, is through the means used for driving four of the supporting rolls bearing on the circular track. They are hardened and ground to the proper diameter to get the desired relation of speeds. All of the other rolls are merely idlers for maintaining the fixity of axis of dome, and all rolls are mounted in ball bearings to reduce the total power required in turning the dome. Ball bearings keep the resistance more nearly uniform than could be maintained with plain bearings.

Data Regarding the Turret Equatorial

Some of the principal points of interest about the telescope are given below:

Object glass, 10 in. in diameter, and 150 in. in focal length.

Inside dimensions of building, 6 ft. by 18 ft.

Outside diameter of dome, 7 ft. 4 in.

Weight of dome casting, about 1½ tons.

Total weight of dome with counterweight, tube, etc., about 2 tons.

Weight of ring-casting on which the dome is mounted, 1½ tons.

The optical parts were furnished by The John A. Brashear Company, Ltd. All of the other work was homemade, except the two large castings which were cast and turned in Fitchburg, Mass.

The hour circle consists of a flat ring having approximate dimensions of 52 in. outside, 48 in. inside, and ¾-in. thickness.

The inner diameter is graduated down to divisions of 1 min. These divisions are about 0.1 in. apart. Vernier edges were provided for division of the minutes into seconds, but thus far a crude substitute has been used in preference. It consists of a rotating dial driven by gearing which also turns the dome. Its connection is such that the dial makes 1 r.p.m. With the 60 graduations on dial the division of the time into seconds is very readable.

In use the hour circle may be set to the even minute of position, leaving the plus or minus of seconds to be allowed for at the zenith point by the timepiece.

The declination wormwheel is 24 in. in diameter, and is provided with two worms located on opposite sides. These are rotatively connected by means of a cross shaft and spiral gears.

To prevent conflict of action an eccentric bearing is provided for accurately gauging the depth of engagement of each worm. A separate means for turning each a very slight amount is also provided.

Graduations for minutes of degrees are carried by hubs on worm shafts.



Fig. 4 An Exterior View of the Observatory

The Winona Technical Institute

The fate of the Winona Technical Institute, at Indianapolis, Ind., has been practically settled by the decision of Judge Clark of the Circuit Court at Danville, Ind., to whom the case was taken by change of venue, that the property belongs to the school city of Indianapolis. The Institute has been in the hands of a receiver since 1909, donors to it were presenting claims against it, and the trustees began suit in court against them to ascertain what powers they had and to clear up the title to the property. The Institute has been kept in operation by the receiver and at present has about 100 students. It will take some time to learn the exact position of the Institute, as an appeal may be taken from the court's decision by the donors who have been seeking the sale of the property and the return of subscriptions. The present curriculum will be followed until all disputed points are finally settled.

The International Harvester Company's new factories at Lubertsy, Russia, were recently formally opened. These factories have been under construction a little over a year and a half and when running full force will employ about 1100 men. They comprise six buildings, which will be devoted to the manufacture of mowing machines and other agricultural implements. The equipment was obtained almost entirely in the United States. Owing to the numerous holidays in Russia, not more than 260 full working days can be counted on in each year.

Four more hot mills have been started at the Elwood plant of the American Sheet & Tinplate Company, at Elwood, Ind., making 12 now in operation. It is expected that the number of mills will soon be increased to 16, in view of the improving tendency of the tinplate trade.

New Tools and Appliances

This is essentially a news department for which information is invited.

The High Speed Adjustable Reamer.—Under the name of the Ideal adjustable high speed reamer the McCrosky Reamer Company, Meadville, Pa., has placed on the market a new type of reamer. Two solid blocks of high-speed steel with conical ends are held on the arbor by two collars and there are four left-hand spiral cutting edges milled in the solid head. By lowering the rear collar and tightening the front one, which forces the reamer head up the inclined surfaces of the arbor, the necessary adjustment is effected. With the 2-in. reamer it is possible to secure an expansion of nearly 3/32 in. in this way. If desired the right-hand spiral flutes can be furnished.

A 12-in. Back Geared Crank Shaper.—L. E. Rhodes, Hartford, Conn., has recently developed a 12-in. crank shaper especially designed for the use of high-speed steel tools. Six speed changes are available, three having a ratio of 5 to 1 and the remainder having a ratio of 10 to 1, the knob in the driving cone pulley controlling the changes. The table is fastened to the cross rail by a wedge-shaped gib, in order to insure a solid bearing surface throughout its entire length. The head is graduated, can be set at any angle and is fastened to the ram by a positive clamping device. The vise has a swivel base, and has its jaws faced with tool steel. These jaws are 9 in. long, 2 in. deep and have a maximum opening of 6 in. The finest feed is 0.005 in.

Steam Drop Hammer.—A new line of steam drop hammers has been recently designed by the Buffalo Foundry & Machine Company, Buffalo, N. Y. Open-hearth steel is used for the anvil base of the tool, the weight of which is approximately in the ratio of 20 to 1 as compared with the weight of the falling parts. The lower die holder is a hammered steel forging and is secured to the anvil base by a key. Open-hearth steel castings with recesses into which the adjustable V-guides for the hammer head are fitted are employed for the columns. Provision for taking up wear is made by inserting a taper gib between the guides and the columns. Vanadium steel is used for the hammer head, and the piston and the hammer rod are made from a solid nickel-chrome vanadium steel forging having an elastic limit of 85,000 lb. and a tensile strength of 120,000 lb. Two cross tie bolts and a steel cap plate gibbed both to the cylinder and to the frame at its outer end hold the frames together at the top. A balanced piston valve motion is employed, which has a removable sleeve in the piston valve chest. The steam and exhaust pipes have expansion joints and the latter is arranged so that no water can remain in the bottom of the cylinder.

Combination Center Drill Sets.—Combination center drills in sets have been lately placed on the market by the J. T. Slocomb Company, Providence, R. I. In this way it is possible to have drills of the proper sizes to take care of the different pieces of work without buying a dozen of each size in a box or single ones separately. These sets are packed in wooden boxes and contain one each of the eight sizes of drills regularly listed in the company's catalogue. In this way it is possible to have the right size of drill available for work without having to hunt around for it. In common with the other drills made by this company, semi-high speed steel is used and it is claimed that these drills do more work than it is possible to secure from the ordinary carbon steel drill.

A Special Three-Spindle Drilling Machine.—For drilling the three core holes in the contactor pole pieces of electric motors simultaneously and also tapping them simultaneously, the Newton Machine Tool Works, Inc., Twenty-fourth and Vine streets, Philadelphia, Pa., has recently brought out a special multiple-spindle machine. The spindles are 1⅞ in. in diameter, and are fitted with a No. 4 Morse taper, with retaining and drift key slots. The center spindle bearing is cast solid with the saddle and those for the two outer spindles are adjustable on the saddle to give a center distance varying from 3¼ to 10 in. The drive to the center spindle is by a belt connection from the motor to intermediate spur and bevel gears while the power for the other two spindles is transmitted through intermediate steel spur gears from swinging arms provided with an extension for bolting them securely in position when properly adjusted. A friction clutch controls the engagement of a 2 to 1 speed reduction and a reverse motion for tapping. Hand vertical adjustment and reversing power feed with two belt changes are also provided. The capacity of the machine is 1¼ in. for drills and ¼ in. less for taps, the maximum speed being 200 r. p. m. for drilling and 50 r. p. m. for tapping. The maximum distance from the ends of the spindles to the top of the work table, which is 18 in. wide and 30 in. long, is 20 in. A tank for lubricant is mounted in the base of the machine and the equipment includes a pump and the necessary piping.

Horizontal Cylinder Boring Machine.—For boring and facing the cylinders of steam, gas and gasoline engines; pumps and locomotives, the Barrett Machine Tool Company, Meadville, Pa., is building a new pattern machine. The new tool is mounted on heavy bed and is equipped with two facing arms mounted on the ends of sleeves. A friction drive is employed and the arms can be started and stopped at will by simply tightening or releasing a collar bolt. When work is not being done, these arms hang on the ends of the sleeves and do not interfere with the rotation of the boring bar or the longitudinal travel. A sliding block which travels at right angles to the 5-in. boring bar is fed in and out by a star feed and a secondary block is mounted upon this which carries the tool for facing off or turning the outside diameters of the cylinder flanges. The boring bar has a continuous feed travel in either direction of 48 in. and will bore a cylinder of this length at one setting. The end is fitted with a No. 6 Morse taper hole with draw and drift slots so that, if desired, smaller bars can be used. When this is being done, a sleeve is placed in the tail pedestal bearing for supporting the outer end of the smaller bar. The machine is equipped with a quick change feed box mechanism by which ten different feeds ranging from 1/32 to 7/16 in. per revolution of the boring bar are instantly available. The power for the feeding mechanism is transmitted by a Hindley type worm and worm wheel having a double left-hand thread. Either belt or motor drive can be used with the machine. With belt drive, a four-step cone pulley is employed and this number of changes is doubled by the use of two friction pulleys on the countershaft. When motor drive is used, four quick changes can be secured, the motor being mounted on a bracket bolted to the side of the machine and belted to the driving shaft. This arrangement places the motor out of the way of dirt and chips and at the same time no additional floor space is required.

Grinder Dog.—A grinder dog having a double jaw, the position of which can be reversed to adapt it to a large or small work has been developed by T. F. Barter, Holt avenue, Worcester, Mass. There are two V's in the jaw, a large one on one side and a smaller one on the other so that by simply changing the position of the jaw it is possible to hold very small work. In addition to this adjustment the dog is provided with side screws holding the two drop-forged parts which form the dog together. After these screws have been set to a given size, they are prevented from shifting by check nuts. Four sizes of dogs, having maximum capacities of 1½, 2½, 4 and 7 in., are made.

Crank Shaft Sawing Machine.—A recent product of the Newton Machine Tool Works, Inc., Twenty-fourth and Vine streets, Philadelphia, Pa., is a rapid production crank shaft sawing machine, operating two 32-in. blades, simultaneously. The capacity of this machine is a cut 9½ in. deep and when fitted with a milling cutter it will finish the cheeks of the crank shaft without sawing. As is the custom in machines of this type the spindle is supported at each end in capped bearings and the driving gear is located between the bearings. The worm and worm wheel driving mechanism are of solid bronze and hardened steel respectively and are incased to secure continuous lubrication. Six speed changes are available through a gear box and power quick return is also provided. Adjustable automatic stops are fitted to the saddle to release the feed and the fast traverse at any predetermined point. The saw blades are driven by two broad keys and together with the collar are held in place by a 4-in. hexagonal nut. The maximum gap between the saw blades is 4 in. and spacing washers are provided to give a variation of 1 in. The machine is driven by a 20-hp. motor running at a speed of 720 r.p.m.

Trade Publications

Air and Vacuum Pumps.—J. Gilmer Crowell, 296-298 Taaffe place, Brooklyn, N. Y. Two circulars. The first, No. 100, illustrates two types of positive pressure blowers or rotary air pumps which are adapted for all purposes where air at a pressure of from 1 to 10 lb. or a vacuum not exceeding 24 in. is required. The principle of construction is the same in both types, an internal drum or shaft carrying the sliding blades or pistons that operate in close contact with the cylinder wall, all springs, valves, gears or unbalanced parts having been eliminated. Nine sizes in all of blowers ranging in capacity from 6.9 to 392.3 cu. ft. of free air per minute are built. No. 101 treats of the maker's standard type D rotary air compressors which are manufactured in nine standard sizes of from 4 to 392 cu. ft., and a maximum working pressure of 25 lb. These pumps can exhaust to a vacuum of from 29 to 30 in. of mercury. One of the special features of this pump is that when it is used as an air compressor no changes are necessary to convert it into a vacuum pump. Illustrations of the various types of pumps are given in the circulars, together with dimension tables.

Portable Metal Punch.—W. A. Whitney Mfg. Co., Rockford, Ill. Mailing card. Deals with the No. 1 portable hand metal punch of this company which will punch a 9/16-in. hole through a ¼-in. boiler plate. This tool is made with drop-forged parts and was especially constructed for boiler, tank and stack work.

Oil Engines.—De La Vergne Machine Company, 1152 East 138th street, New York, N. Y. Folder. Refers to the FH and HA engines of this company which are designed for operation on crude oil, distillate and cheap fuel-oils. The various features such as no stand-by losses, space economy and low maintenance cost are briefly touched upon and illustrations of both engines are included.

Triplex Power Pumps.—The Deane Steam Pump Company, Holyoke, Mass. Bulletin No. D-205. Gives an extensive discussion of the construction of a triplex power pump of the vertical double-acting type and explains the advantages of this machine over the other types. The principal advantage claimed for this pump is that the combined discharge from the cylinders is practically uniform in quantity and pressure. The construction of the pump is analyzed at some length and stress is laid upon the simplicity, durability, accessibility and solidity of these pumps. The pumps listed are arranged for belt or gear drive and range in capacity from 11½ to 2475 gal. Nine different styles of pumps are illustrated and tables of dimensions, capacities, etc., are given.

Metal Paints.—The Western Elaterite Roofing Company, 841 Equitable Building, Denver, Colo. Pamphlet. Illustrates some of the uses of Elaterite paint. This is made in three different styles for use as a preservative for structural steel and iron, cars and car trucks, pumps, towers, tanks, pipe lines, railroad work, bridges, etc.; for heated surfaces such as smoke stacks, locomotives and boiler fronts, furnace doors, and also for use on tanks, pumps and pipe lines, in and about cyanide, chlorination and similar plants and for all acid or alkali resisting purposes.

Ore Cars.—Automatic Unloading Car Company, Sellwood Building, Duluth, Minn. Mailing card. Calls attention to a special type of automatic unloading car for handling iron ore built under the Rakowsky patents. Some of the features of the car are low unloading, maintenance and repair costs; safety of unloading and the employment of gravity in unloading and returning the car. A series of tests of these cars has shown an average unloading time of 40 sec. for a 100,000-lb. car.

Pipe Fittings and Unions.—The Kelly & Jones Company, Greensburg, Pa. Pamphlet. Describes and illustrates a line of brass pipe fittings and unions made in a number of different sizes and styles. Tables giving the prices of the various fittings are included.

Core Drills.—McKiernan-Terry Drill Company, 115 Broadway, New York, N. Y. Catalogue. Size, 6 x 9 in.; pages, 68. Describes an extensive line of core drills for inspecting, testing, blasting, etc. After a brief introduction showing the use of the drills in metal and coal mining and in contracting work, the various types of drills are taken up, followed by instructions for setting up and operating the tool. Numerous half-tone engravings showing these drills in use and the cores obtained by them are included. One of the feats described is the drilling of large holes in concrete which was illustrated in *The Iron Age* August 4, 1910.

Automatic Screw Machine Products.—The National-Acme Mfg. Company, Cleveland, Ohio. Sample piece and leaflet. This is an example of the rapid production possible with the automatic screw machine of this company. The piece is about ⅜ in. long and has a maximum diameter of the same amount. The two end portions are turned down slightly, leaving a ring ⅛ in. wide in the center and a ¼-in. hole is bored through the piece. Three of these pieces were shaved, drilled and cut off from the bar of stock in the time it took to form the three by the ability to get at the work four times and in four different positions.

Shapers.—Stockbridge Machine Company, Worcester, Mass. Pamphlet. Gives general description and specifications for the company's two-piece crank shaper. One of the special features of this machine is the patented crank motion that was illustrated in *The Iron Age*, October 3, 1911, by which a high return speed is secured. Other special features which are illustrated are the manner of supporting the driving gears, the automatic down feed to head, the gear box for constant pulley drive and a special type of support for the knee.

Lathes.—Joseph T. Ryerson & Son, Chicago, Ill. Catalogue. Shows the various types of lathes built by the Prentice Brothers Company, Worcester, Mass., for which they are the selling agents. The various types of lathes covered include high-speed geared-head lathes, high-speed geared-head turret lathes, engine lathes and a heavy-duty double back-geared lathe. The construction of these lathes is first described at length with engravings supplementing the text and this is followed by illustrations, brief descriptions and specifications of the various sizes. Various types of turret tool holders are illustrated and briefly described and space is given to the belt and all geared attachments for providing motor drive for the high-speed lathes.

Oil Engines.—The Remington Oil Engine Company, Stamford, Conn. Bulletins Nos. 2 and 3. Deal with the application of the marine stationary oil engine built by this company for electric lighting and pumping work. Views are given of the engine installed for these purposes and information as to the cost and other points is included.

Grinding Wheels.—Norton Company, Worcester, Mass. Wall hanger. Gives instructions for mounting and truing grinding wheels. A table of wheel speeds is given together with one of the circumferences in feet of various wheels, the diameters of which were measured in inches. Rules for obtaining the surface speeds per minute of a wheel with the various other factors known are also given.

Water Wheel Alternators.—Westinghouse Electric & Mfg. Company, East Pittsburgh, Pa. Circular No. 1198. Illustrates and describes the various types of vertical and horizontal alternating-current generators built by this company for water-wheel drive. The different types of rotors, each of which is adapted for a certain wheel diameter and speed range, are described, and a number of views of installations, together with engravings of the various parts of the generators, are included.

Multiple-Spindle Drilling and Boring Machines.—Moline Tool Company, Moline, Ill. Mailing card. Shows a number of the various types of multiple-spindle drilling and boring machines built by this company which range from 4 to 12 spindles.

Screw Plates.—Wiley & Russell Mfg. Company, Greenfield, Mass. Catalogue. Deals with a large line of screw plates including a number of sets in leather rolls and wooden cases for automobile repair use. Mention is also made of the company's line of taps, dies and screw cutting machinery and tools. About 20 pages of valuable data and tables for mechanics are included.

Gears.—The D. O. James Mfg. Company, Chicago, Ill. Catalogue D. This 111-page book is bound in flexible cloth and in addition to presenting descriptive lists covering the full line of gears manufactured and the O'Kelly speed reducing gears, contains numerous and complete rules and formulae for developing and cutting spur, bevel, worm and spiral gears. This information is arranged in easily accessible form with tables and illustrations and a complete index is included. An illustrated description of the new type of O'Kelly speed reducing gear appeared in *The Iron Age*, August 10, 1911.

Mechanical Stokers.—The American Stoker Company, 11 Broadway, New York, N. Y. Bulletin No. A-2. Illustrations and descriptive matter explain the operation of a line of stokers for various classes of heating furnaces. The construction of these furnaces is gone into at some length and there are a line and a half-tone engraving to supplement the text. Comparisons showing the cost of operating furnaces with oil, coal and natural gas fuels are included.

Scott's Roofing Tin.—Follansbee Brothers Company, Pittsburgh, Pa. Illustrated circular. Describes the process of making Scott's extra coated open-hearth roofing tin. The steel ingots used in making this product are hammered to give the metal the necessary working and wearing qualities, the company's plant, which is at Follansbee, W. Va., being equipped with an 8-ton hammer under which the ingots are hammered instead of being rolled in a blooming mill in the usual way. The company also issues a publication entitled "Tin Truth" for general distribution.

Recorders.—Precision Instrument Company, Detroit, Mich. Mailing card. Calls attention to the Precision dead-beat recorder which is made in over 200 ranges of vacuum and pressure in both English and metric systems.

Sheet Metal Specialties.—Eagle Glass & Mfg. Company, Wellsburg, W. Va. Catalogue A. Deals with a line of sheet metal specialties which include various types of oilers, tallow pots, supply cans, steel buckets and torches. All of these are illustrated and short tables giving the various sizes in which they are made are given below the engravings.

Corliss Engines.—The Vilter Mfg. Company, 1008 North Clinton street, Milwaukee, Wis. Catalogue E. Deals with the line of Corliss engines built by this company, which are of the horizontal type and are designed for both high-pressure and condensing operation. The construction of these engines is given at some length with engravings illustrating the different parts, and also the plant in which the engines are built. There are a number of half-tone engravings showing the engines installed in various plants and tables of dimensions and capacities, together with a partial list of users complete the catalogue.

The Machinery Markets

The movement toward more and better business which has been growing noticeably stronger almost every week in the last two months continues in most of the large centers. As was the case last week, some cities again report an end of the year dullness, but general conditions are improved. New York dealers, who are anticipating two large lists of requirements from railroads and who have had during the week an increased volume of inquiries, assert that the outlook is much better. The Chicago trade has closed negotiations on two lists of $10,000 each and the smaller sales, considered in the aggregate, are said to have been the best in some time. In Detroit a better feeling is manifested and the trend of business is reported good, with notable improvement in several special lines. New England dealers are holding their own and some plants are busy, especially those making grinding machinery and other special equipment. A fair business was done during the week in Philadelphia, although the approaching holidays seem to be affecting trade in that city. Both Cleveland and Cincinnati find business somewhat slow, which is attributed to the season. In Cleveland, however, there is a demand for sugar making equipment and Cincinnati reports a fair export business. St. Louis dealers regard the situation as satisfactory and in the South there is a demand for factory equipment, including electric motors. Municipal plants now under consideration are expected to create business throughout Texas in the course of a few months. The demand from Mexico for machinery of all types is greatly improved after having been at almos a total standstill as a consequence of political troubles.

New York

NEW YORK, December 20, 1911.

Dealers in machinery who are known to be conservative express themselves as much pleased with the outlook in New York, despite their belief a week ago in a temporary setback which they ascribed to the holiday season. Not only is business involving large figures in prospect at the present time, but there has been an increase in the number of inquiries for individual machine tools and small lots. The big list which will set forth the requirements of the Delaware & Hudson Railroad in its Watervliet shops has not been issued yet, but it is in readiness and expected to reach the trade at any moment. The list of the Delaware, Lackawanna & Western Railroad is in course of preparation, and with the Delaware & Hudson list is a cause of more than usual cheerfulness among the dealers. Other business is known to be in prospect but authorization to publish details cannot be obtained at this time. Altogether there is a feeling that very much better business is not far away and a reliable representative of one important machine tool manufacturer said he had made a requisition for extra salesmen. The Pennsylvania Railroad and the New York Central have each purchased a few tools, those ordered by the New York Central including a couple of forging machines.

The Therapeutic Lamp Company, New York, has been incorporated with $100,000 capital stock to manufacture electric lamps, appliances, etc. The incorporators are William A. Soles, Julius Becker and Mason G. Worth, 32 Broadway, New York.

The William R. Thropp & Sons Company, Trenton, N. J., has had plans prepared for a foundry building, 80 x 250 ft., which will be equipped throughout with motor driven devices and a traveling crane.

The American Welded Chain & Ring Company, New Brunswick, N. J., has been incorporated with $25,000 capital stock to manufacture welded wire chains, rings, castings, forgings, etc. The incorporators are C. C. Thatcher, Jr., J. E. Alexander and William E. Sperling, 133 Livingston avenue, New Brunswick.

The Clark Novelty Company, Rochester, N. Y., has acquired the plant of the American Drafting Furniture Company at Railroad avenue and East Main street. The company plans to make improvements and will erect a brass foundry adjoining.

Turk & Brown, Inc., Rochester, N. Y., has been incorporated with $10,000 capital stock to manufacture motors, engines, etc. The incorporators are John F. Turk, Cornell, N. Y.; A. H. Brown and S. H. Brown, Rochester.

The Pyrites Paper Mill Company, Ogdensburgh, N. Y., will erect an unloading and conveyor plant on the waterfront to transfer pulp wood from vessels to cars for switching to its mill.

The Lundstrom Mfg. Company, Little Falls, N. Y., manufacturer of sectional book cases, has plans in preparation for a four-story addition 80 x 100 ft. to be made to its plant.

The Batavia Rubber Company, Batavia, N. Y., manufacturer of pneumatic and solid rubber tires for automobiles, is having plans prepared for an extensive addition to be made to its plant. The capital stock of the company was recently increased to $500,000 from $70,000.

The Consolidated Rendering Company, Boston, has let contract for erection of a factory building 50 x 100 ft. on Syke street, Rochester, N. Y., to cost about $20,000.

Rumsey & Co., Ltd., manufacturers of power and hand pumps, have secured a new site and are having plans prepared for a larger factory. H. R. Mick is president.

The North Buffalo Hardware Foundry, Buffalo, N. Y., recently incorporated, will equip the foundry building, 65 x 250 ft., it is erecting at Hertel avenue and the Erie Railroad with the latest type of molding machines, tumblers and grinding machines. The directors of the new company are E. B. McKenna and W. A. Griffin, now connected with the Standard Foundry Company, Buffalo; B. H. Prentice, L. F. Gilbert and A. W. Sawyer.

The General Welding Company, Buffalo, has been incorporated with a capital stock of $15,000 to do a general welding business in steel and other metals. The incorporators are Edwin N. and Henry G. Smith and Charles D. Magee, Buffalo.

The Sturdy Smokeless Furnace Company, Buffalo, has been incorporated with a capital stock of $100,000 to manufacture furnaces and boilers under patents of J. Sturdy. The incorporators are J. Sturdy and F. A. Shoemaker, Buffalo; G. Sturdy, Pittsburgh, Pa., and N. H. Sturdy, Cleveland, Ohio. The offices of the company are at 21 Builders' Exchange, Buffalo.

The Little Falls Felt Shoe Company will build a six-story addition to its factory at Little Falls, N. Y., work to be commenced early in the spring.

New England

BOSTON, MASS., December 19, 1911.

The machinery dealers are holding their own in orders booked. The holiday season is rarely marked with good business, relatively speaking, and no material improvement is looked for until the middle of January. A good many men believe that general conditions are improving. They are influenced largely by the reports from the steel industry, but beyond that they feel that the period of a dull market has lasted fully the normal span of years. Various straws show the wind to be blowing from a slightly different direction. It is a significant fact that a large manufacturer of bolts, screws and a wide variety of kindred products is compelled to run a considerable part of his factory with two shifts and every other department is operating at full capacity during the regular hours of production. These products are consumed by practically every industry and the increased demand indicates a revival somewhere. The wire business has apparently recovered from what seemed to a slight let up a few weeks ago.

Manufacturers of grinding machinery, automatics

and semi-automatics are doing a very comfortable business, so, in fact, is practically every house which builds machine tools other than the older standard types, such as lathes, planers, drills and shapers. These latter concerns are finding their chief demand to be for the more powerful, more expensive models. Every indication points to an almost universal intention on the part of buyers to get equipment that will produce on the most economical labor saving basis. Considerations of a scarcity of labor which must follow a return to good times constitute a factor not to be disregarded.

The Lowell Machine Shop, Lowell, Mass., manufacturer of textile machinery, has been purchased by a company, of which Wilmot R. Evans is the president and Robert F. Herrick treasurer. The purchase also includes the Kitson Machine Company, which was owned by the Lowell Machine Shop. It is stated that the two corporations will be operated independently as to direct management. The transaction is especially interesting because the properties have been owned by a group of important cotton machinery houses, the Saco & Pettee Machine Company, Newton, Mass., the Draper Company, Hopedale, Mass., the Whiting Machine Company, Whitinsville, Mass., and the Howard & Bullough American Machinery Company, Pawtucket, R. I. These concerns have had intimate business relationships for a number of years, consequently their release, if the new transaction has that meaning, of the Lowell properties has caused considerable speculation.

The Wire Goods Company, Worcester, Mass., has acquired seven acres of land at Barbers Crossing adjacent to the property of the Worcester Pressed Steel Company. The location is a highly desirable one. The purchase means that the Wire Goods Company will eventually be added to the group of important and successful industries which have located in that suburb of Worcester. However, the management does not propose to move its works from Union street for the present. The purchase is a provision for the future. The company's business has grown very rapidly and the present site restricts any material growth of plant in the future.

The Critchley Machine Screw Company, Worcester, Mass., is about to occupy its new factory in that city. The building is 60 x 152 ft. and one story.

The report is current in Boston that another merger of automobile manufacture on a large scale is imminent. The report grew out of an invitation extended to Charles J. Glidden to head the company. It is stated that the consolidation will center in Detroit.

The Industrial Development Company of the Boston Chamber of Commerce is proceeding actively toward the establishment of a fund of $500,000, the purpose of which is to assist by loans small and growing industries. Boston is moving with a great deal of energy in the effort to attract new industries. Already considerable success has been had. The Chamber of Commerce plan, it is understood, is along the line of policy which was originally established in the South of assisting worthy enterprises to borrow beyond their borrowing capacity with banks.

The shops of the Millbury Machine Company, Millbury, Mass., were burned December 15. The company manufactures textile machines. The plant is an old one.

It is announced at Bristol, Conn., that hereafter the Bristol Brass Company and the American Silver Company will operate under separate managements. Julian R. Holley will be secretary and treasurer of the Bristol Brass Company only, while Samuel B. Harper will be secretary and assistant treasurer of the American Silver Company. President Albert F. Rockwell, of the New Departure Mfg. Company, has been elected president of both companies, while Pierce N. Welch has been made vice-president of the Brass Company and Dean Welch vice-president of the Silver Company.

Philadelphia

PHILADELPHIA, PA., December 19, 1911.

A fair volume of scattered business has been put through during the week, although transactions have been confined almost entirely to single tools and usually those of the smaller class. A somewhat better inquiry has been coming from the local railroads, but while quotations are going in it does not seem assured that purchases will be made. Some bidding of a tentative nature has been done on general machine tool equipment, for the purchase after the year end, and with the continued improvement in iron and steel lines the trade looks forward to a better buying movement after the annual accounting period has passed. Builders of tools note no important changes in general conditions; here and there some fair business develops, particularly in special tools, but instances where plants are fully engaged are few. In the second-hand machinery trade a fair business is passing, but the demand is irregular. Several fair projects in power equipment are under negotiation or in sight. Power transmission equipment continues in moderate demand. Slightly better conditions are reported in the foundry trade although average production shows little change.

The William Steele & Sons Company has begun work on the new factory building to be erected at Twenty-fourth and Locust streets, for the Lanston Monotype Company. The building will be six stories about 77 x 276 ft., with a wing 45 x 109 ft. It will be of fireproof construction.

The Pennsylvania Railroad has sent out inquiries, not under a general list, but in the nature of single inquiries for a boring mill, milling machine, several lathes, including a speed lathe, and a nut facer. No definite action as to the placing of orders against these inquiries has been taken.

J. J. Harpel, Macungie, Pa., manufacturer of stoves and light gray iron castings, advises that his plant, which was destroyed by fire about a year ago, has been rebuilt and that it is expected to be in full operation by the first of the year.

M. L. Cooke, director of public works, city of Philadelphia, will receive bids until December 26 for various supplies for the Bureau of Surveys. These will cover requirements for the grade crossing, sewage disposal, sewage and bridge divisions. General supplies and equipment are included.

Dienelt & Eisenhardt, Inc., are operating their plant at full capacity. Considerable business has been taken the past week, including an order for a large printing machine for oil cloth work. Several orders for Lovekin pipe-expanding machines have been booked, while business in Monarch motors is also reported as being good. This concern has recently added to its machine tool equipment and is still buying, although no definite purchases are being considered at this time.

The Trenton Power Company, Trenton, N. J., has had plans prepared for a brick and concrete power house 50 x 100 ft., one story. Particulars regarding equipment requirements are not available.

Ballinger & Perrot, engineers and architects, have, it is stated, invited estimates for a club house, to be erected at Twenty-third and Ludlow streets, for the Automobile Club of Philadelphia. The building will be of concrete and brick, built on concrete piling. The first story will be equipped for garage purposes with provisions for supply parts. The second story will be used for automobile storage as well as for general club purposes. Boiler and engine rooms will be located in the basement, in which will also be located a heating plant, vacuum cleaning system, compressed air system, lighting plant and pumps. One large automobile elevator, 10 x 25 ft., and two 9 x 20 ft., as well as a passenger elevator are to be installed. Pumps and storage tanks for oil and gasoline are also to be provided.

Permits were taken out a few days ago by C. F. Shivers for the erection of an ice-manufacturing and ice-storage plant to be located on the West Chester & Philadelphia Railroad near Whitby avenue, for the American Ice Company. The buildings include a three-story freezing and distributing building, 31 ft. 6 in. x 99 ft., a two-story engine and boiler house and a one-story storage building.

Chicago

CHICAGO, ILL., December 19, 1911.

Two purchases of machinery amounting to $10,000 each were made by manufacturing interests located near Chicago during the past week. These purchases were distributed to a number of manufacturers. These were the largest items in an aggregate which made the week a better one from the standpoint of volume of sales than has been enjoyed for some time past. One of the railroads which has been inquiring for a moderate list of machinery has purchased a part of them, but other railroad requirements apparently are waiting upon requisite funds. The one very large railroad inquiry which has had the attention of local machinery men for some time past seems possible of being placed in the near future although no definite purchasing plan has been arranged. Projected plans are coming to light which should bring into this market an immense quantity of machinery for railroad shops. The Lake Shore & Michigan Southern, as has

been previously reported, is preparing for a large yard and shop group near Gary, and the Pennsylvania Railroad is understood to be considering the location of yards and shops near Chicago for the Fort Wayne and Pan Handle Systems, which have their terminals here.

The Stewart & Clark Mfg. Company, Chicago, has taken out a permit for the erection of a one-story fireproof machine shop on Wolfram street, to cost $3,300.

The United Car Company, Chicago, has been incorporated with $30,000 capital stock to build, repair and deal in cars, engines and railroad equipment. Incorporators are J. R. Owens, S. C. Abbott and A. O. Berg.

The Federal Truck Company, Chicago, incorporated with $10,000 capital stock by Carrew W. Rhodes, David F. Rosenthal and Leo S. Rosenthal, will manufacture automobiles, trucks, etc.

The Ajax Forge Company, Chicago, is erecting a one-story brick pattern shop at 2499 Blue Island avenue.

John M. Jones, Chicago, will build a two-story brick foundry at 1243-1245 West Fulton street.

The Flexo Motor Company, Springfield, Ill., has been incorporated with a capital stock of $30,000 by Fred C. Miller, William Wishart and Otto Butzke. The company will manufacture mine motors, mine supplies and machinery.

The North Shore Consolidated Gas Company, Waukegan, Ill., has awarded the contract for a new $100,000 factory building in that city. New machinery will be installed.

The Carr & Adams Company, Des Moines, Iowa, is planning to spend $25,000 for new machinery to be installed in a plant recently leased and to be used in the manufacture of sash and doors.

The National Brake & Electric Company, Milwaukee, Wis., is about to prepare plans for the erection of a new iron foundry to be completed during the coming year.

The Falk Company, Milwaukee, Wis., in order to provide facilities for the manufacture of the Falk kerosene engine, is building an addition to its plant 80 x 150 ft.

The Kissel Motor Company, Hartford, Wis., has increased its capital stock from $400,000 to $1,000,000.

The American Malted Food Company will erect a factory of concrete construction at Waukesha, Wis., at a cost of $25,000.

The Kent Mfg. Company, Fort Atkinson, Wis., has been compelled because of its greater requirements of space to construct a new plant and abandon its present quarters, which are offered for sale.

The International Hoist Company, Antigo, Wis., manufacturer of contractors' equipment, is having plans prepared for an entire new plant, consisting of a machine shop, wood shop, foundry, assembling room, storehouse, office, etc. The machinery requirements have not been prepared as yet.

Cleveland

CLEVELAND, OHIO, December 19, 1911.

The local machine tool market is feeling the effect of the holiday season and sales have fallen off some since the first of the month. While buyers, as a rule, are holding off until after the first of the year, there is still a moderate volume of scattering business in small orders, mostly for small-sized tools. The demand for second-hand machinery continues fairly active and dealers are not compelled to keep good used tools long in stock. Builders of general machinery regard the outlook promising for a good volume of business early in the coming year.

The demand for sugar making machinery has been quite active recently. A local concern has taken a contract for the erection of a large sugar plant in California, and several similar projects are pending in Ohio and Michigan. Some good business in sugar making machinery has been secured from Cuba.

At a recent meeting of the directors of the Galion Iron Works Company, Galion, Ohio, it was decided to enlarge the company's plant by the erection of an addition 60 x 150 ft. adjoining the present plant. This addition will make one factory building 521 ft. long. It is stated that the present year was the most successful in the company's history and that the growing business has necessitated enlarging the plant. The company manufactures culvert pipe and road machinery.

The General Steel Products & Supply Company, Toledo, Ohio, which was recently incorporated with a capital stock of $100,000, has taken an option on a site on Belmont avenue and Thirteenth street for a plant. Plans are being prepared for some two and three-story factory buildings. The company will fabricate structural steel, reinforcing steel for concrete work and contractors' specialties, such as patented scaffolding and floor-surfacing machines.

Through the efforts of The Massillon Rolling Mill Company, Massillon, Ohio, a plant will be established in that city for the manufacture of steel silos. A factory building 50 x 160 ft. will be erected adjoining the plant of the rolling mill company. The latter company will furnish the concern with steel for the manufacture of silos. This company, the name of which at present is withheld, is now operating a plant in Kansas.

The Dyer Company, Cleveland, has taken a contract for a large sugar plant, with a daily capacity of 800 tons, to be built for the Cooperative Sugar Company, Santa Ana, Cal. Orders for the machinery equipment have been placed.

The Canton-Hughes Pump Company has placed its new plant in Wooster, Ohio, in operation and has moved its offices from Canton to Wooster. The company will continue to operate its Canton plant for a short time.

The Canton Corrugating Company, Canton, Ohio, has completed the installation of its machinery equipment and has commenced the manufacture of its products, which include siding, roofing, eaves' trough, conductor pipe, etc.

The Larrowe Construction Company, Detroit, Mich., has two lists of machine tools out for equipment for beet sugar plants. The lists include lathes, drill presses, radial drills, pipe machines and shapers.

The Imperial-Gordon Rubber Company, Canton, Ohio, has increased its capital stock from $50,000 to $300,000, and is planning plant extensions. A. V. Gordon of Trenton, N. J., has become connected with the company as vice-president.

Tentative plans for a municipal high-pressure pumping station to be erected in Toledo, Ohio, have been prepared. The erection of a plant with a daily capacity of 7,000,000 gal. is proposed, the estimated cost being $214,500, exclusive of the site.

It is stated that the New York Central Railroad is planning to erect a large plant at some point on their lines in Ohio for the repair of steel cars. The site has not yet been selected.

The plant of the Troy Co-operative Foundry Company, Troy, Ohio, was destroyed by fire December 10, the loss being about $12,000. No decision has been reached as to rebuilding the plant.

The Summit Rubber Company, Barberton, Ohio, which was recently incorporated with a capital stock of $50,000, is erecting a new three-story brick plant 40 x 90 ft. L. J. Johnson is the general manager.

The Strong Mfg. Company has decided to locate in Sebring, Ohio. There a new plant will be erected for the manufacture of enameled ware.

The Union Electric Welding Company, Toledo, Ohio, has been incorporated with a capital stock of $20,000 by J. J. Urscher and others.

The American Multigraph Sales Company, Cleveland, has placed orders for considerable additional machinery equipment, including lathes, milling machines, shapers and other tools.

Cincinnati

CINCINNATI, OHIO, December 19, 1911.

The present week shows no change in the situation with machine tool builders, and practically all manufacturers in this section are taking stock and making plans for next year. Several foreign orders have lately been received, and it is quite probable that this particular branch of the trade will make a good showing even during the holiday season.

There is a slight falling off in activity with most of the jobbing foundries, but this is seasonable and is not considered a bad sign.

Much interest is taken in the last quarterly report issued by Secretary J. M. Manley, of the Cincinnati Branch, National Metal Trades Association. Taking the report of June 15, 1907, as standard, the one issued December 15 of this year shows the association plants in this district as operating at 83 per cent., a falling off of 2 per cent. from September 15, 1911, which report showed 85 per cent. activity. The record for the last quarter in each year beginning with the one issued December 15, 1907, is as follows: 1907, 85 per

cent.; 1908, 56 per cent.; 1909, 83 per cent., and 1910, 91 per cent.

The American Rolling Mill Company, Middletown, Ohio, has let contract to the Buffalo Forge Company, through its Cincinnati office, for a hot-blast heating system to be installed in the storage warehouse of the new plant in East Middletown. The heaters are designed to burn either gas or oil and are also equipped with grate bars for burning coal in emergencies. The building is one story, 150 x 698 ft., and 3,790,000 cu. ft. of air will have to be heated.

The Lunkenheimer Company, Cincinnati, held the regular annual meeting of its outside sales agents last week. On the evening of December 12 a banquet was served at the Business Men's Club, at which time Fred. Ravens, Chicago, secretary of the National Association of Stationary Engineers, presented the Lunkenheimer Company with engrossed resolutions of thanks for the many hospitalities extended the delegates of the association during the convention held in Cincinnati last September.

The Cincinnati Precision Lathe Company, whose plans for a new factory have been previously mentioned, has been incorporated with $50,000 capital stock. The incorporators are M. H. Stewart, M. G. Stewart, M. C. Garst, J. M. Tatman and W. C. Tatman. It is understood that work on the new factory will commence at an early date.

It is rumored that the Russell Company, Dayton, Ohio, will erect a large hydroelectric plant for the city of Kimball, W. Va. No particulars are yet available.

It is reported that Bert L. Baldwin, architect, Perin Building, Cincinnati, has been selected to draw up plans for the proposed large hotel to be erected for the Gibson House Company.

O. M. Blake, Hamilton, Ohio, representing capitalists whose names have not yet been made public, bought the plant of the Columbia Carriage Company at a receiver's sale, and it is rumored that the factory will be remodeled and put in operation at an early date.

The Jones Heel Mfg. Company, Dayton, Ohio, is making some extensive alterations and additions to its plant.

The French Oil Mill Machinery Company, Piqua, Ohio, is having plans prepared for a two-story brick factory and office building to be constructed on West Ash street. Architect W. E. Russ, Dayton, Ohio, is drawing up the plans.

The Champion Carbon Company, Cincinnati, whose organization was recently noted, has been incorporated with $100,000 capital stock, and will locate a factory at Loveland, a Cincinnati suburb, for the purpose of manufacturing carbon and carbonized products. Among the incorporators are Andrew, George T. and Arthur J. Morrison, Clay B. Steele and M. L. Buchwalter.

The Whitaker Paper Company, Cincinnati, is having plans prepared by Henry N. Hooper, architect, Cincinnati, for a seven-story reinforced concrete warehouse, to be erected on a plat adjoining its plant on Eggleston avenue.

Detroit

DETROIT, MICH., December 19, 1911.

A slightly better feeling is manifest in the local machinery market and the trend of business is upward. Current sales, while confined pretty generally to single tools and small lots, are of larger volume in the aggregate than was the case early in the month. Inquiries, too, are more encouraging, a number being noted from new industries which are coming into the market for equipment and supplies for the first time. Metal working tools and special equipment lead in activity. Electrical machinery continues in good demand and a good business in water wheels is reported. More irregularity is reported in foundry operations, but the majority of gray iron foundries are booking a satisfactory volume of orders. The second-hand machinery trade is exhibiting a fair amount of activity, particularly in small metal working tools. An increased amount of factory construction work is noticeable in building circles.

The New Era Motor & Mfg. Company, with a capital stock of $50,000, has filed articles of incorporation and will engage in the manufacture of motor car supplies. William R. Smith, George Gilmore and John Scheidegger are the principal stockholders.

The Chalmers Motor Car Company is making a number of minor additions to its plant, the most extensive of which are a final inspection building 75 x 180 ft. and a large two-story storage building.

The Aeroplane Construction & Supply Company has been incorporated with $4,000 capital stock to manufacture aeroplanes and aeroplane parts. The incorporators include Josef Brantigan and Karl Marx.

The Michigan Stamping Company has completed plans for the erection of a three-story brick addition adjoining its present plant on Bellevue avenue, to cost $8,000.

The Brooks Company is the style of a new concern which has incorporated with $10,000 capital stock to manufacture electric washing machines. C. F. Murray, A. J. Walsh and C. H. Brooks are among those interested.

The Precision Instrument Company, maker of recording instruments, has increased its capital stock from $24,000 to $48,000.

The Detroit Steel Products Company has taken out a permit for the building of a one-story brick factory on Joseph Campau avenue, to cost about $6,000.

The Reynolds Roofing Company, Grand Rapids, Mich., has purchased a site of eight acres and will build an entirely new plant on a much more extensive scale than the present factory.

The Creamery Package Company is preparing to start work on its new factory building in the Highland Park district, to cost about $8,000.

The Massachusetts Laundry Company will erect a new factory building at Second and Howard streets, to cost $8,000.

The Stimson Scale & Electric Company has been incorporated with a capital stock of $50,000 to manufacture weighing scales and hardware specialties. The stockholders are Walter F. Stimson, of Detroit, and J. W. McMahon and Peter Donnelly, of Toledo, Ohio. The new concern is in the nature of a reorganization of the defunct Stimson Scale Company and will take over the latter company's plant with the intention of operating on a more extensive scale.

The Acme White Lead & Color Works has filed amended articles of incorporation increasing its capital stock from $2,750,000 to $4,000,000. It is stated that no immediate plant extensions are contemplated.

The Power Multiplex Tool Company has been incorporated with $20,000 capital stock to engage in the manufacture of special machinery. Robert M. McKenzie is the principal stockholder.

The Electric Appliance Company, Muskegon, Mich., has been incorporated with $10,000 capital stock to manufacture and deal in machinery, tools and appliances. The incorporators are C. E. Whitney, R. J. MacDonald and Peter Losby.

The Atkins Mfg. Company, Coldwater, Mich., has been organized by C. A. Bohlin and E. G. Atkins to engage in the manufacture of carburetors. The company has secured factory quarters and will at once proceed with the installation of machinery.

The Holland Carving Tool Company, Holland, Mich., has completed the erection of a new shop to take care of rapidly increasing business. The company manufactures gear cutters and carving tools.

The Simpson Mfg. Company, Homer, Mich., has been incorporated with $100,000 capital stock and has commenced work on a large plant. The new company will manufacture internal combustion engines and vacuum cleaners. The principal stockholders are Eugene Higgins, Herbert A. Simpson and W. J. McIlwain.

F. A. Anderson, Cadillac, Mich., has acquired extensive timber holdings near Alba, Mich., and will erect a large handle mill at that point.

The city of Grand Rapids, Mich., will open bids January 25 for a 350 to 375-hp. water tube boiler for the municipal lighting plant. Information may be had from Samuel A. Freshney, secretary of the Board of Public Works.

The Ruby Mfg. Company, Jackson, Mich., maker of signs, has acquired a new factory site and will erect a new building early in the spring.

The American Brass Novelty Company, Grand Haven, Mich., is erecting an addition to its factory which will double its capacity.

The City Council of Benton Harbor, Mich., has authorized the building of a new pumping station for the municipal water works. Information as to new equipment is not yet available.

The Powell Mfg. Company, Ypsilanti, Mich., has decided to increase its capital stock with a view of enlarging its factory and doubling its mechanical equipment.

The Sterlingworth Chemical Company, of Cambridge, Mass., has commenced the erection at Cadillac, Mich., of a plant for the manufacture of charcoal. The company will put up three buildings at a cost of $25,000.

The Wolverine Brass Works, Grand Rapids, Mich., has acquired additional property, 220 x 250 ft., and is having plans drawn for a factroy building of standard

mill construction and a large addition to its foundry, doubling its capacity.

The Port Huron Bread Company, Port Huron, Mich., will erect a new manufacturing building adjoining its present plant, 70 x 100 ft. and one story.

It is reported that the Michigan Sugar Company, Detroit, has purchased a large tract at Pigeon, Mich., and will erect a beet sugar factory in that city.

Gascho Bros., Bad Axe, Mich., are erecting a large factory building for the manufacture of cement products.

The Vassar Knitting Company, Vassar, Mich., has completed arrangements for the removal of its plant to Bay City, Mich. The company has secured a large factory building and will increase its equipment.

The Vassar Milk Condensing Company, Vassar, has commenced the erection of its new plant. Refrigerating and power machinery will be required.

J. W. Spooner and associates, Grand Rapids, Mich., are planning the construction of a power plant in the West Grand Rapids factory district, with an estimated capacity of 1000 hp.

King's Machine Shop & Foundry has moved from Prentice, Wis., to Sault Ste. Marie, Mich. W. B. King is the proprietor, and not W. B. Prentice, as recently published.

Indianapolis

INDIANAPOLIS, IND., December 19, 1911.

The White River Corporation, Indianapolis, has been organized with $60,000 capital stock, to take over the Noblesville Heat, Light and Power Company at Noblesville, Ind., on White River, 26 miles from Indianapolis. The directors of the company are Alex. R. Holliday, John H. Holliday, Thomas C. McReynolds, L. C. Boyd and H. McK. Landon. The articles of incorporation give power to build a dam and erect a power plant, but the corporation directors say that will not be done at present.

The Brown Bros. Mfg. Company, Nappannee, Ind., has increased its capital stock from $10,000 to $20,000.

The National Dilator Instrument Company, Anderson, Ind., has been incorporated with $50,000 capital stock to manufacture dilator instruments. M. A. Rush is president of the company.

The Fairweight Scale Company, Danville, Ill., has purchased 97 acres on the outskirts of Gary, Ind., to be used as a site for a scale factory. James Fleming is president of the company.

The Anderson Meat Slicer Company has been incorporated at Anderson, Ind., to manufature meat slicers. The incorporators are H. D. Webb, L. S. Webb and N. Baxter.

The Indiana & Michigan Electric Company, South Bend, Ind., has increased its capital stock from $1,915,500 to $2,298,600.

The International Steel & Iron Construction Company, Evansville, Ind., has purchased property which will permit it to enlarge its present plant and increase its structural fabricating business. Added machinery will be installed.

The Gary Screw & Bolt Company, Gary, Ind., which is just now completing its mill building and installing machinery is about to start work on an addition of 120 x 175 ft.

The South Bend Watch Company, South Bend, Ind., is erecting an addition to its plant 33 x 60 ft. and three stories. The addition will relieve congestion in the plant.

The South

LOUISVILLE, KY., December 19, 1911.

While purely local business has been only fair during the past week, trade in the territory at large has been holding up well, and the plants of a good many local manufacturers are running at night in order to take care of the demand. A feature of the situation in the South is the marked activity in the construction of ice factories and refrigerating plants, which require a large amount of equipment, both special machinery and power apparatus being needed. Electric motors and dynamos are in good demand, largely as the result of changes being made in the operation of manufacturing plants.

The Fossee Novelty Company, Louisville, has been incorporated with $25,000 capital stock to manufacture electrical mechanical devices. Lewis Fossee, E. A. Ryans and C. B. Mullen are the incorporators.

The Henry L. Koehler Mfg. Company, Louisville, is establishing a new plant at 431 South Center street, and is installing a good deal of additional equipment. The concern manufactures brass dies, chiefly for use in the box making business.

The Louisville Railway Company is building a large car barn at Broadway and Thirtieth street. Car repair shops are to be located there a little later on.

T. W. Jenkins and W. N. Morris, Atlanta, Ga., have purchased a site in Bowling Green, Ky., and will erect a 40-ton ice factory. The building is now being erected. Those interested have stated that most of the machinery has been ordered.

Plans have been completed by the Midway Ice & Supply Company, Midway, Ky., recently organized, for the erection of an ice factory and cold storage plant. John A. Steele, H. L. Martin, Sr., and others are interested.

The electric plant to be built at Cadiz, Ky., by Alexander Bros., which recently purchased a franchise, will be operated by water power.

The Harlan Town Coal Company, Harlan, Ky, is being organized by B. A. Morton, J. K. Griffin and others of Knoxville, Tenn., for the development of a large tract of coal land near that city.

M. J. Moss, Pineville, Ky., is at the head of a company which has leased coal lands in Letcher County, Ky., near Whitesburg, for the purpose of immediate development.

The Universal Nut & Bolt Lock Company, Newport, Ky., has been incorporated with $50,000 capital stock by George H. Martin, E. F. Brock and Edward Elston.

Plans are being matured by the Eastern Tennessee Power Company, which is completing its hydroelectric plant on the Ocoee River near Cleveland, Tenn., for the construction of an additional plant a short distance up the river, where 60,000 hp. will be developed. The present plant, which is to begin operations January 1, will develop 25,000 hp.

The Southern Trunk Company, Knoxville, Tenn., the plant of which was recently destroyed by fire, is to rebuild in the immediate future. H. L. Ingles is president of the company.

The Allen Mfg. Company, Rogersville, Tenn., has been incorporated with $15,000 capital stock by E. R. Allen, Worth B. Quillan, S. L. Pennington and others.

Meadors, Vaughn & Halleran, Nashville, Tenn., will build a large addition to their ice plant, increasing the capacity to 115 tons a day. The cost of the addition will be $40,000.

The Paris Coal & Ice Company, Paris, Tenn., will erect an ice factory at a cost of $15,000. Work is to be begun shortly after January 1.

The Southern Ice Company, reference to the organization of which, with $5,000,000 capital stock, was made recently, has taken over the plant of the Howe Ice Company, Nashville, Tenn., and has announced plans for the erection and operation of plants in Atlanta and Augusta, Ga.; Jacksonville, Fla., and other Southern cities. The Nashville plant is to be enlarged considerably, a total output of 1500 tons a day being contemplated.

The Cumberland Cedar Pencil Company is reported to be establishing a plant for the manufacture of cedar pencil slabs at Unionville, Tenn.

F. C. McGee is erecting a planing mill at West Point, Tenn. The cost of the mill and machinery will be $12,000.

The Sprague Dairy Company, Chattanooga, Tenn., is erecting a new plant and will install equipment for the manufacture of ice cream.

The Lodge Mfg. Company, South Pittsburg, Tenn., has taken over the assets and good-will of the Blacklock Foundry Company, the plant of which was recently burned, and has erected a new plant for the manufacture of sad irons, grates and special castings.

The South Pittsburg Foundry, South Pittsburg, Tenn., which manufactures soil pipe, reports a considerable increase in business and has enlarged its plant somewhat of late.

The Union Ice Cream & Sanitary Milk Company, Nashville, Tenn., has been incorporated with $16,000 capital stock for the operation of a modern dairy. A building will be erected and equipped with machinery for the handling of milk and the manufacture of ice cream. W. M. Sidebottom, W. E. Drake, F. C. Dorider and others are interested. Mr. Sidebottom has been elected general manager

An ice factory will be erected by the Mt. Pleasant Ice & Bottling Company, Mt. Pleasant, Tenn., incorporated with $10,000 capital stock by J. E. Anderson, James H. Ward, W. D. Cooper and others.

The Standard Blower & Metal Mfg. Company, which has taken over the South Atlantic Blow Pipe & Sheet Metal Company, Jacksonville, Fla., and the Savannah Blow Pipe Company, Savannah, Ga., will continue the Atlanta and Jacksonville plants in operation as at present, but will greatly enlarge the plant at Savannah, it is announced. Blower systems and general sheet iron work will be manufactured. T. H. McMillan is president of the company, with offices at Savannah.

The power plant of the Karges Wagon Works, Evansville, Ind., was destroyed by fire recently, the loss being $3,000.

The Consolidated Canning Company, Jacksonville, Fla., will establish a cannery. Fred. S. Gray is general manager of the company.

A company is being organized at Birmingham, Ala., for the manufacture of sash, doors and other millwork. A. L. Fulenwider, president People's Telephone Company; W. A. and Ross Smith, of the St. Clair Land & Lumber Company, and W. A. Hammond, Acme Coal & Lumber Company, are interested.

The Kimball-Lacey Lumber Company, Arkansas City, Ark., has announced that its sawmill is to be rebuilt at that point.

The Hammond Lumber Company, Hammond, La., has announced plans for the erection of a planing mill at New Orleans, La.

The Danville Plow Works, Danville, Fla., is contemplating the addition of a department for the manufacture of stoves.

The Wheelock-Hammond Heating Company, Birmingham, Ala., has been incorporated with $5,000 capital stock for the manufacture of heating plants. Charles F. Wheeland is president of the company.

The Southern Automobile & Machine Company, Hattiesburg, Miss., has been incorporated with $50,000 capital stock. R. R. Boykin is manager of the company.

Following the issue and sale of bonds by the city of Cuthbert, Ga., plans are being made for the erection of an electric light plant.

Manchester, Ga., has decided to erect an electric light plant, and has authorized an issue of $15,000 of bonds for the purpose.

It is reported that F. E. King is considering the erection of a plant for the manufacture of blow-pipes at Norfolk, Va.

The Butchers' Stock Yard & Abattoir Company, Little Rock, Ark., is contemplating the establishment of a cold storage plant.

St. Louis

ST. LOUIS, MO., December 18, 1911.

The machine tool market this week showed some of the indications of the approaching holiday and inventory season, and in consequence the inquiry was not quite as active as it has been in the recent past. At the same time dealers regard the situation as satisfactory as regards the present, in comparison with what has gone before, and are quite encouraged as to the future. Not much activity is expected from now until after the first of the year.

Arrangements are being completed by Frank Lane, Little Rock, Ark., for the establishment at White Cliffs, near Little Rock, of a cement plant with a daily capacity of 3000 barrels. The financing, in which others are interested, will involve about $3,000,000 for the mechanical equipment and operation of the plant.

The Standard Reduction & Chemical Company, which has the contract for the reduction of the garbage of the city of St. Louis, has completed plans for the removal of its plant to Stallings, Ill., where it will be enlarged in equipment and located in an isolated 800-acre tract.

The Mutual Brewery Company, recently financed by the local retail liquor dealers, has completed the raising of its $150,000 capital and will begin the construction and mechanical equipment work at once.

The Trenton Gas & Electric Company, Trenton, Mo., has been incorporated with $50,000 capital stock by J. T. Menefee, Clarence O'Daniel and Jasper C. Young to equip and operate gas and electric public service plants in Trenton. The establishment of the plants will be undertaken at once.

The Farmer's Union Milling & Supply Company, Tamaroa, Ill., has been incorporated by George Kurtz, C. T. Schmalriede and S. R. Riedelberger, and will equip a flour mill at once.

The C. E. Bonner Mfg. Company, Champaign, Ill., has increased its capital stock from $250,000 to $500,000 for the purpose of increasing its plant and extending its business.

The Perry County Interurban Railway Company, with principal offices in Springfield, Ill., has been incorporated by G. W. McIntire and F. A. Spitznagel of Springfield, Isaac Black of Duluth, Minn.; A. C. Sprague of Dubois, Ill., and William Roessler of St. Paul, Minn. The company will build a road and equip a power plant for traffic through Perry county to Pinckneyville and Duquoi.

The Johnston City Connecting Railway Company has been incorporated to construct, equip and operate a railroad in Williamson county, Ill. The incorporators are W. J. Pearson and T. L. Philips of St. Louis, L. O. Whitnel, H. L. Browning and T. E. Gillespie of East St Louis It is to be a coal road.

The Mississippi River Power Distributing Company, which is to distribute the electric power generated in the hydroelectric plant being built at Keokuk, Ia., at a cost of about $20,000,000, has let the contract for the distribution system in the vicinity of St. Louis and is preparing its plans for the transforming station and equipment which will handle the high tension current received from Keokuk.

A syndicate of business men at Trenton, Tenn., has completed arrangements to build a $75,000 cotton oil mill there. The movement is headed by J. B. Short.

The citizens of Wichita, Kan., voted, December 12, $1,000,000 bonds to be expended in buying and modernizing the present private water plant supplying the city, or in building a new one, as the city officers elect. Another bond issue provided for the construction of a $200,000 public electric light plant.

The A. Braun Mfg. Company, St. Louis, compelled to move by condemnation of its property for the approach site of the St. Louis municipal bridge across the Mississippi, will construct and equip a plant of double its present capacity.

The Okmo Mining Company of Oklahoma has been licensed to utilize all its capital in equipping a zinc and lead mine at Joplin, Mo.

The Macomb Electric Company with a preliminary capital stock of $5,000 has been incorporated at Macomb, Ill., by Willard I. Savige, Edward C. Clay and Hubert B. Hainline for the construction of a plant.

Announcement is made of the completion of plans to construct a cement manufacturing plant at Demopolis, Ala., with an employing capacity of 400 men. The Alabama Portland Cement Company's plant at Spocart, Ala., has been bought by El Paso capitalists and will be remodelled.

The City Gas Company, Ardmore, I. T., has been incorporated with $100,000 capital stock by P. C. Dings of Ardmore as president, J. S. Connelly of Carthage, Mo., and others for the equipment of a gas plant at Ardmore.

The Theiling-Lothman Mfg. Company, St. Louis, has completed arrangements for a large addition to its manufacturing plant and will equip it with machinery sufficient to about double its capacity.

The well-established report is current here that the Iola Portland Cement Company, Iola, Kan., is to be utilized as the parent company for the merging of a large group of Portland cement plants in Missouri, Kansas and adjoining states, the financing involving several millions of dollars.

The Pocohontas Lead & Zinc Mining Company, with $110,000 capital stock, has been incorporated at Kansas City, Mo., by Stanley Watson, Jesse M. Short and E. M. Falk and will equip mining property in the Joplin mining district.

The Cedar Point Light & Water Company, La Salle, Ill., has been incorporated by James Stilwell, Robert W. Richards and Thomas H. Stevenson to equip a public service plant at that point.

The St. Louis Independent Packing Company, St. Louis, has completed plans for the expenditure of $65,000 in extending its plant and mechanical equipment.

The Scullin-Gallagher Iron & Steel Company, St. Louis, Mo., is building an addition to its steel foundry.

The machinery of the Western Woolen Mill Mfg. Company, Topeka, Kan., is being moved to Ellensburg, Wash., where it will be known as the Washington Woolen Mills Company. The concern has a capital stock of $60,000.

The De Soto Roller Mills Company, De Soto, Mo., with $50,000 capital stock, has been incorporated by Henry Levys, John F. Barrett and Elliot E. Crow. It will equip the mills at once.

The Christopher & Simpson Architectural Iron & Foundry Company has taken out a permit to build an addition to its plant to cost $15,000. The equipment has not been ordered yet.

The May Doo Mining Company, Joplin, Mo., has been incorporated with a capital stock of $50,000 by Frank H. St. Clair, J. Baird and S. A. Keller, to equip and operate mining property.

The Wichita Pipe Line Company, Wichita, Kan., is considering the purchase of new power and compressor equipment to replace the machinery ruined by fire recently.

The Richards-Scheble Candy Company, Hutchinson, Kan., is about to rebuild on the site of its former plant, which was destroyed by fire, a three-story building, 66 x 110 ft., the erection and equipment of which will cost $100,000.

At Stanton, Neb., it has been decided to build an addition to the present power house to provide for the installation of a 125-hp. boiler and engine plant, and a new dynamo. C. A. Hickman is the engineer in charge.

Texas

AUSTIN, TEXAS, December 16, 1911.

It is indicated by the inquiries that have come to machinery dealers in Texas recently that there will be an unusually large amount of improvements to municipal utility plants made in the early part of the coming year. In the present year there have been many new water works plants and electric light systems installed in towns in this State. This is especially true of the smaller communities, which are having such rapid growth that they reached the stage where the demand for these public service utilities had to be fulfilled. A notable feature of the new town building in the ranch region, which is now being settled up rapidly by farmers, is the attention that is given by promoters of these enterprises to the establishment of first-class public utility plants. In many instances these are installed at the very beginning of the town's growth and are on a scale sufficiently large to meet the demands for several years.

Notwithstanding the continuation of political turbulency in Mexico there is to be noted an increase in the demand for mining and other machinery in that country.

Morgan Thomas is constructing a system of irrigation near Louise, Texas, to water 200 acres of rice land.

The Hutchings Sand & Gravel Company has been organized at Hutchings, Texas, with a capital stock of $20,000. It will install a sand and gravel plant. The incorporators are R. B. Nall, E. N. Mulkey, C. E. Boss and others.

The Transit Ice Company, Houston, has increased its capital stock from $10,000 to $30,000. It will make improvements to its plant.

The Municipal Electric Light plant at Grand Saline, which was recently destroyed by fire, will be rebuilt.

G. W. Huff, Corpus Christi, will install an electric light plant at Seadrift.

The City Council has under consideration the installation of a water works plant and distributing system at Seadrift.

The Commercial Club of Seadrift is promoting the establishment of an ice plant and a canning factory at that place.

The Breckenridge Coal Company, San Antonio, is preparing to install machinery and develop a large vein of coal near Somerset.

The Texas & Pacific Railroad has let contracts for a new 36-stall round house and other buildings at Marshall, the cost of which will be $110,000.

The Creamery-Dairy Company, San Antonio, will install a 30-ton ice factory at Yoakum.

O. N. Ponce and associates contemplate installing a cold storage and ice plant at Corpus Christi at a cost of $100,000.

The Calvert Water, Ice & Electric Light Company, Calvert, has agreed to improve its water and light system with an expenditure of $14,000.

Henry M. Halff will put down a number of irrigating wells and install pumping plants upon a tract of about 7500 acres near Midland.

The Wharton Ice & Light Company is installing additional machinery and enlarging its electric light plant at Wharton.

Joseph Myers will establish a factory at Palestine for the manufacture of brick and concrete blocks.

The Roswell Gas & Electric Company, Roswell, N. M., will soon finish the installation of a new electric power plant and the construction of a system of transmission lines to many of the farms of that section. The cost of the plant and system will be about $350,000. Its transmission lines aggregate about 80 miles of cable and will furnish power for many irrigating pumping plants.

The sale of the water works plant and distributing system of Nogales Water Company to the city of Nogales, Ariz., will soon be made. Extensions and improvements will be made following the consummation of the deal.

The Parral Power & Reduction Company, Parral, Mexico, has sold its electric power plant near Parral to the Alvarado Mining & Milling Company. The purchaser will make enlargements and improvements.

Herman Wendler and J. R. Laguahlin will install additional machinery at their Las Animas mine at San Xavier, Sonora, Mexico.

The Emajac Mines Company will remodel and enlarge its reduction plant situated at Hostotipaquillo, Jalisco, Mexico. C. A. Sidler, Sunbury, Pa., is secretary-treasurer.

The Mina Grande Company has under consideration the installation of a reduction plant at its property near Hostotipaquillo, Mexico. O. R. Henkel is general manager.

Dr. F. S. Pearson of New York and associates, who own the Mexico Northwestern Railroad and extensive timber interests in the State of Chihuahua, Mexico, will construct an electric railroad to run from Pearson in that state to Colonia Juarez. In connection with this project a large electric power plant will be installed at Pearson, not only to serve for the operation of the proposed railroad but to provide power for the large lumber mills and other industries which the Pearson interests are establishing.

The Pacific Coast

PORTLAND, ORE., December 12, 1911.

The market for metal-working tools shows little change, orders for heavy or special equipment being scarce, and usually limited to single tools, though a fair demand is noted for small tools. Little buying is being done for railroad shops, and manufacturers of logging and marine machinery are not disposed to make any important addition to their plants.

The local market for general machinery has been affected to some extent by the building activity of the past year, which is far in advance of all previous records. Not only are the buildings recently erected equipped with comparatively heavy power, heating and elevator plants, but their construction has involved the purchase of a considerable amount of contractors' equipment, and the increased volume of work offered has brought about many improvements in local fabricating, plumbing and sheet metal shops. Present conditions are unfavorable for continued activity along this line.

Orders for mill and woodworking machinery are coming out in good shape, and considerable new business is expected to develop after the turn of the year. Many logging camps are closed at present, but there is considerable figuring on improvements to be installed before the resumption of work in the spring. Many inquiries are coming out for cannery equipment, including special salmon-handling machinery of local manufacture, and an unusually heavy demand is expected in this line. Plans are being made for a large number of new salmon canneries in the Puget Sound district and some in Alaska, in addition to fruit canneries in the interior of Oregon.

The bids recently received for the construction of a sea-going dredge for use on Coos Bay were rejected. Revised specifications are being prepared, and new figures will be taken about the end of the month.

J. H. Murr, North Bend, is working on a project for the establishment of a foundry at Florence, Ore.

The Salem, Falls City & Western Railway is planning a number of improvements to its shops at Dallas, Ore.

The Smith & Watson Iron Works, this city, has taken the contract for a steel fireboat for the city of Portland.

The city of Seattle, Wash., has just received bids for a large motor-generator set.

The Pittsburgh Lumber & Mfg. Company, Pittsburgh, Pa., which recently purchased a large timber tract in the Sumpter forest reserve, Oregon, is expected to erect two mills next spring, with a capacity of 100,000 ft. per day.

The town of Bellingham, Wash., is considering plans for a municipal electric light plant.

R. A. Johnson is working on a sash, door and box-factory project at Klamath Falls, Ore.

The Snowstorm Mining Company, operating near Mullan, Idaho, is preparing to install a concentrator and other equipment.

Santa Barbara County, Cal., has closed a contract with the Orenstein-Arthur Koppel Company for a portable railroad, including 24 cars, for highway construction.

The mill of the Florence mine, Goldfield, Nev., was recently destroyed by fire, with an estimated loss of nearly $400,000, and it is reported that the equipment will be replaced in the near future.

Eastern Canada

TORONTO, ONT., December 16, 1911.

Though Canadian trade in some lines for which winter is the chief season of demand is far from active the manufacturers of machinery and equipment seem to be not less busy now than they were when the country's buying power began to feel the fresh impulse of the last harvest. The mildness of the weather keeps the trade in woollens and like articles in a backward state, but it shows little effect on the sale of stoves and furnaces, for the work of housebuilding and house equipping goes on all over the country, the mild weather being very favorable for such construction. There is a very sanguine feeling in machinery and plant manufacturing and selling circles. It is predicted that the demand for 1912 will be greater than the demand for 1911 has been.

The Canadian Salt Company, Windsor, Ont., is planning to erect at Sandwich a plant for the manufacture of soda and bleaching powder by the electrolytic process. Its salt plant at Sandwich produces 400 barrels a day, while that at Windsor produces 1200 barrels, although the capacity is considerably greater. A Sarnia concern, the Empire company, is proposing to erect a plant producing 1000 barrels a day. The Western Salt Company, of Mooretown, shipped 12,674 barrels in 1909 and proposes to build another factory at Sarnia.

According to Ottawa newspapers the Westport Mfg. & Steel Plating Company, a large manufacturer of pressed steel in Westport, will move its head offices to Ottawa and will besides install a plant there to handle local work. The company will be situated in the buildings formerly occupied by Hugh Carson & Co., on Wellington street, between Kent and Lyon. The lease has already been signed and the company will take up the stand on the first of May.

The contract for the erection of the John Deere manufacturing plant at Welland, Ont., has been awarded to the Leonard Construction Company. It calls for the entire rebuilding of the present factory, occupied by the Dain Company, a new three-story warehouse of brick and reinforced concrete, 150 ft. square, and other buildings, besides 50 to 75 new houses for the employees.

The greater portion of the D. S. Perrin Company's biscuit and confectionery plant, London, Ont., was destroyed by fire December 15. The loss is estimated at about $100,000.

Western Canada

WINNIPEG, MAN., December 15, 1911.

The large quantity of grain left in the West this winter because of the lateness of the ripening season and the failure of the railroads to provide hauling power sufficient to meet the demand has simply had its buying power somewhat deferred. There is as much readiness on the part of manufacturers to deal with Westerners as if their grain were all so much money in hand. At the same time the Western demand is somewhat kept back because of the condition mentioned. Trade, however, is as good in that quarter as it was a year ago.

Vice-President Bury, of the Canadian Pacific Railway, stated at Vancouver a few days ago that a large sum would be expended in improvements on the Pacific division, including $2,000,000 in Vancouver alone. It is also announced by the Canadian Pacific Railway from Montreal that the company will shortly raise $45,000,000 for terminals, improvements to properties and building hotels from the Atlantic to the Pacific coast, at various centers.

Announcement is made that the Dominion Match Company has secured a site for the erection of its factory on what is known as the old Shaw property, between the Canadian Pacific Railway tracks and the Pitt River road, New Westminster, B. C. The property is about two and a half acres in extent. This factory will cost about $75,000 to erect and equip, and when in running order will employ 40 hands.

The Canadian Northern Coal & Ore Docks Company has begun the enlargement of its works at Port Arthur, Ont.

Several large contracts for machinery have been given out by the Canadian Pacific Railway Company for its new coal handling plant at Fort William, Ont.

Land in the vicinity of Edmonton, Alberta, has been purchased by the Canadian Northern Railway Company, and it is stated that large machine shops are to be erected there by the company.

It is announced from Winnipeg that the contract for the Canadian Pacific Railway shops at Calgary was let by Vice-President Bury to the Westinghouse, Church, Kerr Company, New York. It will commence work on the new buildings at once and is to have them finished by the end of next year. They will be of the same size as the Winnipeg shops.

The Canadian cereal merger lost a valuable plant December 15 in the total destruction by fire of the Robin Hood mills at Moose Jaw. The loss will be $200,000. The mills had a capacity of 1500 barrels. This is the third milling plant in the West destroyed in the last 10 days. Besides the flour mill the fire destroyed the oatmeal mill, the cooperage plant, the elevator, with 100,000 bushels of grain, and smaller buildings, the total loss being estimated at $500,000, with 75 per cent. of the loss insured. Three hundred employees are out of work.

Government Purchases

WASHINGTON, D. C., December 18, 1911.

The Bureau of Yards and Docks, Navy Department, Washington, will open bids January 13 for three 200-kw. motor generator sets and controlling panels.

The Department of the Interior, office of Indian Affairs, Washington, will open bids January 18 for furnishing labor and material for the erection of an acetylene gas lighting plant at the Yakima Indian School, Yakima, Wash.

The Isthmian Canal Commission, Washington, will open bids December 28, under canal circular 668, for motor driven air compressors, steel, steel cable, soil pipe, etc.

The Paymaster General, Navy Department, Washington, will open bids December 26, under schedule 4144, for four multicoil navy type evaporators and two multicoil navy type distillers; schedule 4145, class 72, for one automatic screw machine.

The United States Reclamation Service, Boise, Idaho, opened bids December 1 for drag line excavators as follows:

F. C. Austin Drainage Excavator Company, Chicago, Ill., $11,200 and $14,250; H. Channon Company, Chicago, Ill., $7,000; Lidgerwood Mfg. Company, Chicago, Ill., $16,500; Bucyrus Company, South Milwaukee, Wis., $8,200, $12,500, $12,440 and $12,500; Cylde Iron Works, Chicago, Ill., $9,500 and $12,000; Hoy & Elzy Company, St. Paul, Minn., $5,700 and $4,200; Prest. Md. D. & C. Company, Baltimore, Md., $12,000, second-hand equipment .

The Bureau of Supplies and Accounts, Navy Department, Washington, opened bids December 12 for material and supplies as follows:

Schedule 4071, class 1, one 20-ton 4-motor, electric traveling crane in building 207, Mare Island, Cal.—Bidder 23, Cleveland, Crane & Engineering Works, Wickliffe, Ohio, $6,385 and $6,625; 93, Morgan Engineering Company, Alliance, Ohio, $7,735; 94, Manning, Maxwell & Moore, New York, $7,175; 105, Norton Engineering Works, Detroit, Mich., $6,685; 107, Niles-Bement-Pond Company, New York, $7,205; 115, Pawling & Harnischfeger Company, Milwaukee, Wis., $6,200; 137, Toledo Bridge & Crane Company, Toledo, Ohio, $6,400; 148, Whiting Foundry & Equipment Company, Harvey, Ill., $5,895; 166, Cyclops Iron Works, San Francisco, Cal., $5,200.

Schedule 4073, class 21, two oil burning furnaces for Puget Sound—Bidder 92, Monarch Engineering & Mfg. Company, Baltimore, Md., $324.50 and $350; 102, Mirc's Fuel Oil Equipment Company, Norfolk, Va., $345 and $390; 119, W. S. Rockwell Company, New York, $280.

Schedule 4082, class 51, one hand power traveling crane for delivery to Pearl Harbor, Hawaii—Bidder 14, Brown Hoisting Machinery Company, Cleveland, Ohio, $4,835; 69, Hoisting Machinery Company, New York, $1,671; 94, Manning, Maxwell & Moore, New York, $2,695; 105, Norton Engineering Works, Detroit, Mich., $1,890; 107, Niles-Bement-Pond Company, New York, $2,100; 148, Whiting Foundry & Equipment Company, Harvey, Ill., $1,787.

Schedule 4083, class 61, one surface condenser for Charleston—Bidder 8, Alberger Condenser Company, New York, $1,573; 38, M. T. Davidson & Co., Brooklyn, N. Y., $1,900; 110, Trustees of the Platt Iron Works, Dayton, Ohio, $1,496; 150, Wheeler Condenser & Engineering Company, Carteret, N. J., $2,255; 151, C. H. Wheeler Mfg. Company, Philadelphia, Pa., $1,786; 156, Williamson Bros. Company, Philadelphia, Pa., $1,820.

Schedule 4103, class 81, one universal milling machine—motor-driven with cutters for delivery to Portsmouth—Bidder 11, Brown & Sharpe Mfg. Company, Providence, R. I., $1,904.63 and $1,843.13; 16, Becker Milling Machine Company, Hyde Park, Mass., $1,589.32; 45, Fairbanks Company, Washington, D. C., $1,675.84; 48, Frevert Machinery Company, New York, $1,601.34; 94, Manning, Maxwell & Moore, New York, $1,458.45; 107, Niles-Bement-Pond Company, New York, $1,629.85; 172, Prentiss Tool & Supply Company, New York, $1,652.25 and $1,726.18.

Current Metal Prices.

The following quotations are for small lots, New York. Wholesale prices, at which large lots only can be bought, are given elsewhere in our weekly report.

IRON AND STEEL—

Bar Iron from Store—

Refined iron:
1 to 1½ in. round and square..... ₣ lb 1.70¢
1½ to 4 in. x ⅝ to 1 in..... ₣ lb 1.80¢
1½ to 4 in. x ¼ to 5-8 in..... ₣ lb 1.80¢
Rods, ⅜ and 11-16 in. and also square ₣ lb 1.80¢
Angles:
3 in. x ¼ in. and larger..... 1.80¢
3 in. x 5-16 in. and ⅜ in..... 2.20¢
1½ to 2½ in. x ⅝ in..... 1.95¢
1½ to 2½ in. x 5-16 in. and thicker.. 1.85¢
1 to 1½ in. x ¼ in..... 1.95¢
1 to 1½ x ⅜ in..... 2.00¢
⅞ x ⅛ in..... 2.10¢
⅞ x ⅜ in..... 2.15¢
⅝ x ⅛ in..... 2.35¢
1¼ x 3-32 in..... 1.40¢
Tees:
1 in..... 2.25¢
1¼ in..... 2.10¢
1½ to 2½ x ¼ in..... 1.90¢
1½ to 2½ x 5-16 in..... 2.00¢
3 in. and larger..... 1.85¢
Beams..... 1.80¢
Channels 3 in. and larger..... 1.80¢
Rounds, 1½ to 6 x 6-16 to No. 8..... 2.00¢
Borden's "H. B. & S." iron, base price 2.95¢
"Borden's Best" iron, base price..... 3.15¢
Norway bars..... 3.50¢

Merchant Steel from Store—

per ₣ lb

Bessemer machinery..... 1.70¢
Toe calk, fire and sleigh shoe..... 2.00@3.00¢
Best cast steel, base price in small lots.... 7¢

Sheets from Store—

Black

	one pass, C R soft steel	R G equals
No. 16	₣ lb 2.40¢	2.75¢
Nos. 18 to 20	₣ lb 2.45¢	2.85¢
Nos. 22 and 24	₣ lb 2.50¢	2.95¢
No. 26	₣ lb 2.55¢	3.05¢
No. 28	₣ lb 2.65¢	3.25¢

Russia, Planished, &c.

Genuine Russia, according to assortment..... ₣ lb 12 @14½
Patent planished, W. Dewees Wood..... ₣ lb A, 10¢; B, 9¢ net

Galvanized

Nos. 12 and 14	₣ lb 2.75¢
No. 24	₣ lb 3.10¢
No. 26	₣ lb 3.30¢
No. 28	₣ lb 3.60¢

No 20 and lighter 36 inches wide, 25c higher

Genuine Iron Sheets—

Galvanized

Nos. 22 and 24	₣ lb 5.50¢
No. 26	₣ lb 6.00¢
No. 28	₣ lb 7.00¢

Corrugated Roofing—

	Painted.	Galvd.
2½ in. corrugated	₣ 100 sq. ft.	
No. 24	$3.75	$4.70
No. 26	₣ 100 sq. ft.. 2.85	3.50
No. 28	₣ 100 sq. ft... 2.50	3.05

Tin Plates—

American Charcoal Plates (per box)

A A A charcoal:	
IC, 14 x 20	$6.35
IX, 14 x 20	7.60
A charcoal:	
IC, 14 x 20	$5.30
IX, 14 x 20	5.40

American Coke Plates—Bessemer—

IC, 14 x 20 ..... 107 lb.	$4.20
IX, 14 x 20	5.20

American Terne Plates—

IC, 20 x 28 with an 8 lb. coating	$8.10
IX, 20 x 28 with an 8 lb coating	10.10

Seamless Brass Tubes—

List November 13, 1908. Base price, 18¢

Brass Tubes, Iron Pipe Sizes—

List November 13, 1908. Base price, 18¢

Copper Tubes—

List November 13, 1908. Base price, 21¢

Brazed Brass Tubes—

List February 1, 1911. 19¾¢ ₣ lb

High Brass Rods—

List February 1, 1911. 14⅞@₣ lb

Roll and Sheet Brass—

List February 1, 1911. 15⅛¢ ₣ lb

Brass Wire—

List February 1, 1911. 14⅞¢ ₣ lb

Copper Wire—

Base price, Carload lots mill 14¾¢

Copper Sheets—

Sheet copper hot rolled, 16 oz. (quantity lots)..... ₣ lb 18 ¢
Sheet copper cold rolled, 1¢ ₣ lb advance over hot rolled.
Sheet copper polished 20 in. wide and under, 1¢ ₣ square foot.
Sheet copper polished over 20 in. wide, 2¢ ₣ square foot.
Planished copper, 1¢ ₣ square foot more than polished

METALS—

Tin—

Straits pig..... ₣ lb 47 @48 ¢

Copper—

Lake Ingot..... ₣ lb 14½@15 ¢
Electrolytic..... ₣ lb 14½@14¾¢
Casting..... ₣ lb 14½@14¾¢

Spelter—

Western..... ₣ lb 7½@ 7¾¢

Zinc—

No. 9, base, casks... ₣ lb 9¢ Open... ₣ lb 9½¢

Lead—

American pig..... ₣ lb 5½@ 5¾¢
Bar..... ₣ lb 7 @ 7¼¢

Solder—

½ & ½, guaranteed..... ₣ lb 26¾@27¼¢
No. 1..... ₣ lb 24½@25 ¢
Refined..... ₣ lb 23 @23¾¢
Prices of solder indicated by private brand vary according to composition.

Antimony—

Cookson..... ₣ lb..@10¼¢
Hallets..... @10 ¢
Other brands..... 9@ 9½¢

Bismuth—

Per ₣ lb $2.00@$2.25

Aluminum—

No. 1 aluminum (guaranteed over 99% pure), in ingots for remelting (ton lots)..... 21¢
Rods and Wire..... Base price 31¢
Sheets..... Base price 33¢

Old Metals—

Dealers' Purchasing Prices Paid in New York.

Copper, heavy and crucible	12.25
Copper, heavy and wire	12.00
Copper, light and bottoms	11.00
Brass, heavy	8.50
Brass, light	6.50
Heavy machine composition	10.50
Clean brass turnings	8.00
Composition turnings	8.50
Lead, heavy	4.00
Lead, tea	3.75
Zinc, scrap	4.50

Nicholson Files and Rasps



NICHOLSON
U.S.A.
*Trade Mark

Nearly half a century ago **Nicholson** Files established a reputation for exceptionally keen bite and long life. Users began to insist on the files that bore **"Nicholson"** on the tang.

Today **Nicholson** Files are always specified by men who consider efficiency and economy of paramount importance. That's because the reputation established nearly half a century ago has been and will be maintained by every **"Nicholson"** File that leaves our hands.

Nicholson File Co., Providence, R.I., U.S.A.

THE IRON AGE

Established 1855 | New York, December 28, 1911 | Vol. 88: No. 26

Published Every Thursday by the

DAVID WILLIAMS COMPANY

239 West 39th Street, New York

Entered at the New York Post Office as Second-Class Mail Matter

Subscription Price, United States and Mexico, $5.00 per Annum; to Canada, $7.50 per Annum, to Other Foreign Countries, $10.00 per Annum. Unless receipt is requested, none will be sent. Credit for payment will be shown by extending the date on the wrapper of your paper.

W. H. Taylor, - - - - - - President and Treasurer
J. A. Mekeel, - - - - - - - First Vice-President
Fritz J. Frank, - - - - - - - - - Secretary

Geo. W. Cope,
A. I. Findley, - - - - - Editors
W. W. Macon, - - - -

M. C. Robbins, - - - - Manager
Charles S. Baur, - - - Assistant Manager

Branch Offices

Philadelphia, Real Estate Trust Building
Pittsburgh, Park Building
Boston, Compton Building
Chicago, Fisher Building
Cleveland, American Trust Building
Cincinnati, 807 Andrews Building

CONTENTS.

Still an Active Market 1381
Trade Statistics 1382
Direct Metal Stimulates Construction 1383
Idle Hours in Machine Shops 1384
European Iron Trade Active 1384
Efficiency in Government Shops 1384
Why the European Copper Market Advances 1385
The Ship Canal Lock at Buffalo 1385
Steel Corporation Bonuses to Employees 1385
The Iron and Metal Markets 1386
Personal 1396
The W. Bingham Company Changes Ownership 1396
Obituary 1396
The Buffalo Union Furnace Company's Increased Radius Case 1397
Porter & Trefts and East Bay Iron Works Consolidate 1397
Pittsburgh and Vicinity Business Notes 1398
A Huge Pennsylvania Locomotive 1398
Sheet and Tin Plate Association 1398
The Eastern Steel Company's Warwick Lease 1398
A Rapid Bridge Repair 1399
Thin-Lined Blast Furnace Construction 1399
A By-Product Coke Plant for Alabama Furnaces 1401
The No. 4 Blast Furnace at Hazelton, Pa. 1402
To Drain an Arkansas Swamp 1403
Lake Shipbuilding in 1911 1403
The Pittsburgh Universal Straightener 1404
The Lea Recorder 1405
Electrical Equipment of Ocean Liner 1406
Oyster Permanent Mold Rights 1409
A Turbo-Cupola Blower 1410
The 15-In. Washburn Drill 1410
Vertical Shaper Attachment 1411
A New Pipe Wrench 1411
Machine Molding for Large Castings 1412
The Conoidal Fan 1414
The Brass Manufacturers' Annual Meeting 1414
New Molding Flask 1415
Flexible Metal Hose and Tubing 1415
The Machinery Markets 1416
Trade Publications 1420

Still an Active Market

Sustained Demand for Finished Material

Larger Outputs of Mills and Blast Furnaces—Price Advances Established

The buying of finished steel has continued on a scale that has broken the tradition of a quiet market at the end of the year and has tended to establish the higher prices recently asked, particularly for bars, plates and structural steel. Buyers are not rushing in to cover for the future in the way that has been known to bring rapid advances, and cautions against too fast a pace are gratuitous. On the other hand, the attitude of sellers is decidedly changed, and that of itself has produced business.

Mill resumptions on December 26 were general, and operations have increased this week at a number of plants, instead of waiting until after New Year's day. The Steel Corporation is putting two Ohio furnaces at Youngstown in blast and one at New Castle, Pa., and all furnaces of those groups are now active. January 1 will be no holiday at the corporation's plants.

Heavy orders have come to the steel manufacturers this week and leading interests are now so far committed for the first four months of 1912 that the question has arisen whether the railroads will find open space for such rollings as some of the trunk lines have required heretofore for spring delivery.

One of the two large rail orders now pending is expected to be placed within the week. The Chicago & Northwestern has bought 60,000 tons in the Chicago district and the Soo Line 18,000 tons. A number of smaller orders have gone to the Ensley mill. Stone & Webster have placed 6000 tons with the Pennsylvania Steel Company. The B. & O. order is 40,000 tons.

There are confident predictions by high authorities that large car buying will be seen early in the new year. The Rock Island has ordered 2500 cars and the Steel Corporation will buy 3000, of which 2000 are for the Pittsburgh, Bessemer & Lake Erie and 1000 for the Elgin, Joliet & Eastern.

The advance in steel bars to 1.15c., Pittsburgh, has been well held. There is more resistance to a higher basis for structural shapes; but 1.15c. appears to be the minimum, while 1.20c. has been secured in some cases. The persistent weakness in fabricated work is still a factor, as steel companies are called upon to back up the low bids of customers.

Plate mills in the Central Western and Chicago districts have nearly four months' work ahead, but eastern Pennsylvania mills, which share in only a small way in steel car business, are not so well off. Considerable sales have been made on the 1.20c., Pittsburgh, basis.

Sheet and tin plate mills will operate in January on better schedules than in months, and the average to-day is about 75 per cent. of capacity. The newly formed

association of manufacturers in these lines need hardly be rated a market factor. Any attempt at price maintenance is disclaimed, and thus far the larger producers have held aloof.

Wire mills are also increasing their operations, good orders having been taken on the $1.55 basis for wire nails. Wire prices are still low in comparison with those for the heavy products.

Pittsburgh district steel works are heavily committed on billet and sheet bar contracts for the first half of 1912, and $20 for Bessemer and open-hearth billets is now generally quoted, representing $1 advance. Forging billets are now $26, Pittsburgh, an advance of $2 in two weeks.

Sustained activity in pig iron in the Central West, particularly at Buffalo and Cleveland, contrasts with quiet markets in the East and at Chicago. In central Ohio 10,000 tons of basic was taken by one melter and an inquiry for 20,000 tons is up. The buying of foundry and malleable grades from furnaces on Lake Erie has also been good. Furnaces having orders for several months ahead have advanced their prices, but sellers for the first half of next year at the recent level have not all disappeared.

December pig iron production of the steel companies has been greater than in November. Merchant output has also increased, and a number of furnaces in both classes will blow in in January.

Ferrosilicon is tending upward; foreign offerings of 50 per cent. grades in this country are less, and domestic users are more dependent upon American sources of supply.

A holiday shortage of labor in the Connellsville coke regions has advanced the price of spot coke to $1.75, but normal operations are expected to make this price short-lived.

Trade Statistics

The demand for trade statistics is insatiable. They are desired on every phase of a commercial subject. If a promoter seeks to establish a manufacturing enterprise in a section where a good reason must be advanced for his choice of location, he endeavors to learn from some reputed authority the annual consumption within a reasonable radius of the product contemplated. If a manufacturer finds his regular customers taking too little of his product, so that it is necessary for him to go afield in search of markets, he tries to ascertain the extent of the requirements of an accessible section so that he can determine whether a campaign in that direction would be worth the effort. Every large manufacturing consumer is anxious to know all he can with regard to the production of his raw materials and the extent of the stocks carried by the producers, so that he can determine whether to buy cautiously or to make contracts for long deliveries. On such subjects as population, exports and imports, crops produced, railroad operations and other matters coming under the attention of departments of national, State or municipal government a wealth of statistics is available, every year seeing such inquiries more extended, while the bulk and variety of the tabulations cause the apparent impression on the minds of the public that in some way or somehow statistics on trade subjects are similarly gathered.

Apart from the figures collected by the Census Bureau, all trade statistics are purely the result of private effort in getting them together. Certain commercial statistics may be compiled for a locality by a board of trade or a chamber of commerce. Figures of production in a particular branch of manufacturing industry are collected by some association of the manufacturers interested or by a trade journal. The private agencies doing this class of work are numerous, but they do not by any means cover the entire field of productive or commercial activity. In some branches of trade, even quite important ones, no individual nor association has undertaken the work and annual statistics are therefore not available. In the iron and steel industry, admirable as has been the statistical work done by the American Iron and Steel Association, the variety of products is so great that it has been found impracticable to endeavor to get the figures for every one. Hence, even in that line, it is quite possible for one hunting for information on a certain branch of the iron trade to be disappointed because the figures regarding it are not to be had. Aside from the figures collected by the Census Bureau, all trade statistics are voluntarily furnished by the manufacturers or merchants in the several branches of industry or commerce. There is no obligation on their part to give such figures to any private agency, and when they do so it is because they are able to rise above selfish considerations for the benefit of the trade at large and in recognition of the universal desire for information showing the progress of the nation. In any branch of trade the unwillingness of a few important members to intrust secrets of their business to the gatherer of statistics would completely block the work. It is therefore greatly to the credit of American business men that the statistics of American production in so many important branches of trade are much more detailed and comprehensive than those available in foreign countries.

Those who have had experience in the collection of statistics, and are therefore most able to appreciate the difficulties encountered in securing the confidence of manufacturers whose figures are desired, have little patience with criticisms of the information that may be published. One of the latest important branches of trade to adopt a policy of publicity is the copper industry. This industry has most courageously gone further than any other, in not merely giving monthly the statistics of marketable copper produced, but also publishing the stocks of marketable copper in producers' hands at the close of each month. For many months the publication of these statistics showed stocks of copper increasing, with the natural result that consumers bought sparingly, forcing the producers to carry stocks for them, and steadily depressing the price of copper. Although they keenly appreciated the peculiar position in which they had placed themselves, in thus apparently giving buyers of copper a great advantage over them, the producers did not falter, but continued to publish their figures showing still larger stocks. At last the situation has changed, stocks of copper are decreasing, the price of copper is advancing and producers are getting some benefit from their policy of publicity. The statistics being thus in favor of the producer, an important consumer whose views are given monthly in a trade circular now assails the character of the figures published because they relate only to the refined production and do not give the quantity of copper actually mined. The circular issued for this month says: "It is not for the sake of being

overcritical that we draw attention to the fact that the mining output and the refinery production of marketable copper are two different propositions, but in order that the mind may not be allowed to become confused over the statistics by which the trade is asked to judge of the situation." As marketable copper is the only form of copper which appeals to a consumer, the statistics regarding such copper are of the highest value to him. The "mind" would be likely to be more confused if both mine output and refinery output were to be stated. The interests of this and other consumers of copper have been benefited by the information voluntarily given by the copper producers. Do the consumers of copper, who are also manufacturers of finished forms of copper, treat their customers in similarly liberal fashion by publishing their figures of output and stocks? If they do not, they are hardly in a position to criticise the copper producers, who have so quickly placed themselves in the forefront of publishers of commercially valuable trade information.

It may be merely a dream, but we hope that some day in the not distant future we may find the manufacturers of pig iron following the lead of the copper producers and giving monthly for publication their figures of pig iron carried in stock. It would be far better to have the figures accurately stated than to have wild estimates in circulation such as those current at times in the past year. When no figures are given by authority, guesses will be made and they will always be so extravagant as to upset the buyer and the market

Direct Metal Stimulates Construction

The discovery that a very material economy in the manufacture of steel could be effected by the use of molten metal direct from the blast furnace has furnished a distinct stimulus to new construction by way of blast furnace interests adding steel mills and vice versa.

When the direct metal process was first applied it was assumed to be adapted only to large plants, in which the product of several blast furnaces would be mixed, the expense of installing and maintaining one or more mixers being considered so high as to preclude the use of the process in relatively small plants. It did not require a long time, however, to develop the fact that the mixer process was adapted even to the smaller plants and it was rapidly adopted by all companies operating blast furnaces and steel works in contiguity. This spread was undoubtedly aided by improvements in blast furnace practice, whereby the iron came to run more uniform. The use of direct metal is not an invention, for it was the original, and has remained the sole, method in Bessemer practice in Sweden, where, on account of the purity of the ores, the pig iron is very uniform. The spread of the direct metal process, then, which began in the early nineties, has been due to improvements both in blast furnace practice and in the construction and operation of mixers.

When the process had been adopted at practically all plants where the contiguity of blast furnaces and steel works made it feasible, its progress appeared to come to an end through the possible field having become occupied. It develops that this is not the case, but that the economy promised is such as to be an important factor in inducing steel works to build blast furnaces instead of buying cold pig, and blast furnaces to build steel works instead of selling cold pig. The case arises only with respect to the open-hearth steel process, since on the one hand there are no Bessemer steel works, apart from steel foundries, which do not have attendant blast furnaces, while general conditions are such that no one is disposed to contemplate the erection of new Bessemer steel works.

While precise estimates cannot be made, it is generally taken that the use of direct metal in the basic open-hearth furnace effects a saving of from $1 to $1.50 per ton of steel produced, as compared with the use of cold pig iron. According to conditions, the proportions of pig iron and scrap used vary, and with such variations there is of course a variation in the economy per ton of steel accomplished with the use of direct metal.

For concrete illustrations it may be mentioned that both at Detroit and at Cleveland undertakings have recently been entered upon to build basic open-hearth steel plants in connection with existing merchant furnaces, while a steel plant in Cleveland similarly positioned was recently completed. On the other hand, a Pittsburgh district interest has just placed contracts for the building of two blast furnaces in connection with its open-hearth steel plant. In one or two other instances serious consideration has been given to similar projects.

It frequently occurs, of course, that new construction is undertaken for the purpose of linking up processes when the industry at large does not need the increased capacity and when no important economy in manufacturing is promised. In such cases the new erection is frequently undertaken because the interest which has the one link thinks the interests having the other link are making more than their proper share of the total profits; but in this case it is not so, for what is contemplated is not a redistribution of profits, but the introduction of an economy in manufacture which could not be accomplished otherwise than by new erection of blast furnaces near an existing steel works, or of a steel works near existing blast furnaces. Of linking up in existing units, however, there has been an interesting illustration in the past year in the Philadelphia district, a well established steel interest and a well established merchant furnace interest consolidating, the chief new construction involved being that of a bridge across the Schuylkill River. In view of the expense involved in this construction, it would not have been feasible to make a term contract for pig iron on a sliding scale, as is frequently done in the case of arrangements which can be terminated suddenly without inconvenience to either party.

The time appears not far distant when the manufacture of steel from cold metal and the manufacture of steel making pig iron for sale in large quantities in the pig form will be exceptional. This, of course, will remove the special profit made by reason of the economy in direct metal, for if market prices are made entirely by interests which practice this process, no specific portion of the total profit is assignable to the use of this process. This point is obvious. The blast furnaces which use regenerative stoves do not have an assured profit from the fact that the regenerative stove involves much more economical operation than the iron pipe stove, the latter having gone out of date. When the iron pipe stove was in general use there was a distinct profit involved in the use of the regenerative stove.

Idle Hours in Machine Shops

One of the simplest ways of increasing efficiency in the machine shop is eliminating the idle time of operators of machine tools. Efficiency experts recognize this as a self-evident primary principle; yet its systematized application is far from universal. The tendency to be old-fashioned has by no means disappeared. It used to be that a planer or lathe hand would start up the machine on a long task and would do little or nothing, excepting to sharpen a tool or perform some other insignificant task, until it would become necessary again to attend to the work. It was a common occurrence to see men sitting about chatting or dreaming, even reading books or newspapers. The condition has been remedied to a large degree, but large opportunity remains for economy in this direction, as is evident to those whose business takes them into shops. It is in older plants, especially those managed by men whose experience runs back into the older days, that the abuse of time is more prevalent, yet in some of the more modern shops the management would be surprised at the record of unnecessarily idle hours which a week totals.

The evil is not so easy to cure as would appear at first thought. It has much to do with the grouping of machinery and routing of work. With the more powerful machines and high speed steel tools, speeds and feeds are much higher and the longer tasks have been greatly reduced. Yet it frequently happens that a man could do more work than is apportioned him, and there is a certain amount of time which he does not employ with profit to the owner. The additional task must be found for him. A little study of these conditions enables owners to increase the average production per man, in some cases in a large way.

European Iron Trade Active

A Marked Revival in Great Britain, with Advancing Prices

British iron trade journals give highly favorable reviews of recent developments in iron and steel, both in Great Britain and on the Continent. The production of pig iron in Germany, which is an index of the situation there, is now estimated at 15,400,000 metric tons for 1911, or about 750,000 tons more than in 1910. Prices are advancing and bookings are increasing in Germany and Belgium, the indications in the former country, as shown by *The Iron Age's* report found elsewhere, being for a record year in 1912 both in profits and tonnage.

That the movement in Great Britain is becoming more extensive and more animated is indicated by reports of both the pig iron and finished material markets there. Cleveland warrants have been heavily dealt in and speculation has been increasingly active. The closing price on Friday, December 22, was 50s. 3d. and the exchange was closed on the four days following. The advance from the low price of two months ago has been about 4s., or $1.

The Iron and Coal Trades Review says that the closing months of 1911 have brought a marked improvement in iron and steel; that the demand for finished material has been on the increase and more recently pig iron has shown more animation, while prices of iron and steel have had an upward tendency, with definite advances made in some lines, while others are pending. The associated manufacturers of plates and structural material in the Midlands have put up prices 2s. 6d., while those of the Northeast Coast and Scotland have announced an advance of 5s. a ton. There has been heavy buying and the Northeast Coast makers have orders for 500,000 tons on their books, which is said to be a record in the history of that trade. The expansion in demand in these lines is spoken of as "remarkable." The Review says that "a genuine trade revival has commenced," that "works are being reopened" and that "there seems every reason to anticipate that 1912 will be a record year as regards production in Great Britain." Advances in finished material are due in part to advances in primary markets, the same saying that on the Northeast Coast the quotation for hematite (Bessemer) pig iron has advanced from something under 61s. at the end of September to 64s. for prompt and 65s. for January delivery. "This increase in its turn has been prompted by dearer rubio ore and coke, the former having risen in the same period from 19s. 3d. to about 21s. 6d. c.i.f. Tees, and furnace coke from 14s. 6d. to 16s. 6d. Add to this the increasing scarcity of labor, as shown by the Board of Trade figures—the percentage of unemployed reported in October being only 2.8, as compared with 3.3 in August last—and the increasing wages bill, and there is no difficulty in understanding the upward tendency of prices."

The Iron and Coal Trades Review says that the proposed combination among English tube makers is now revived. There is also a movement for a combination in the Scotch bar iron trade. Referring to Continental markets, it is pointed out that between the end of June and the middle of December the price of German and Belgian blooms, f.o.b. Antwerp, has advanced from 76s. to 84s., billets from 78s. to 86s., and sheet bars from 81s. to 90s., or roundly about $2 a ton. In the same time the price of basic steel bars, f.o.b. Antwerp, advanced about $3, or to £5 1s.; wrought iron bars, $2.50, or to £5, and plates, $2, or to £6 per gross ton.

The London Ironmonger of December 16 says that the rail trade is more active. An order for 80,000 tons for South Africa is expected to go to British works; that the North-Eastern Railway has ordered 25,000 tons and the East Indian Railway 13,000 tons. Business in prospect includes 8000 tons for Norway, 25,000 tons for Bahia and 4700 tons of 60-lb. rails for South Africa. The Ironmonger says of the general situation in steel products:

> Look where one will the situation in the world's iron trade seems to be working up for a development of activity such as has not been seen for years. Semi-manufactured products continue exceedingly firm and with Continental sellers out of the market for early deliveries overseas competition is confined to the United States. * * * There has been an enormous rush of buying in the steel trade this week and many works have been almost overwhelmed with the business placed before them, while the bookings have in some instances been on an almost unprecedented scale. One steel works, for instance, within the past week or so has booked between 50,000 and 60,000 tons of shipbuilding material. Naturally the heavy general booking has much strengthened the hands of makers and Scotch prices have been smartly advanced all round, while a further upward movement has been put into effect on the North-East Coast.

Efficiency in Government Shops

WASHINGTON, D. C., December 20, 1911. Representative Wilson, chairman of the select committee to investigate the subject of scientific management of Government workshops, has returned to his Pennsylvania home for the holiday recess feeling very happy over the action of the House in placing $10,000 at the disposal of his committee to continue the work it began last summer. The appropriation was provided for in a resolution reported to the House by the Committee on Accounts to which it had been referred. Although the Democratic majority in the House desires to make a record for economy (notwithstanding the passage of the Sherwood pension bill) there was no objection to the Wilson resolution and it passed unanimously. Before his return to Pennsylvania, Mr. Wilson notified certain of the workmen at the Washington and Norfolk navy yards and the Rock Island arsenal to report in this city on the morning of January 4 to give their testimony regarding the Taylor and other efficiency systems. Some of the heads of departments at these places also will appear in order that the committee may have the fullest information from every point of view.

Mr. Wilson does not purpose to lose time in collecting

his data. The committee will begin the hearings on the day after Congress reassembles and the work will be pushed to completion as rapidly as possible. In Boston the committee met at 9 o'clock in the morning and continued in session until 5 in the afternoon with a recess at noon for luncheon. Here in Washington the committee will meet promptly at 10, though it is not unlikely that an earlier hour will be substituted if it shall appear that the work is not progressing fast enough to bring it to a close by the middle of January. The witnesses will be given for their expenses a mileage allowance of 5 cents a mile and a per diem of $2. This is a rather modest allowance, but Mr. Wilson thinks it will be sufficient to cover the legitimate expenses of all the witnesses including those from Rock Island. Officials of the War and Navy Departments, particularly those having to do with construction work, will be asked to give their views and any other persons whose experience would make them competent witnesses. Upon the conclusion of its labors here the committee will visit Stamford and Philadelphia. At Stamford the employees of the Yale & Towne Mfg. Company will be heard, and at Philadelphia the employees of the Tabor Mfg. Company and the Link-Belt Company. At these plants the Taylor system has been in operation for several years and it is thought that the first hand information obtained will be valuable in enabling the committee to reach a more intelligent conclusion regarding it. At Philadelphia, also, which is F. W. Taylor's home, Mr. Taylor will appear before the committee. To him its sessions will not be new inasmuch as he attended those of last summer in Boston, but then only as an interested spectator. Returning to Washington the latter part of January the committee will at once begin a careful analysis of all the facts it has gathered with a view to having its report in readiness for the House by March 10.

The chairman of the special investigating committee, Mr. Wilson, is chairman also of the House Committee on Labor, and is now serving his third term in Congress. He was born in Scotland and came with his parents to America when he was eight years old, settling in Tioga County, Pennsylvania. Within a year he was working in the coal mines. He has always taken an active interest in trades unionism and was international secretary and treasurer of the United Mine Workers of America from 1900 until 1908. He is now engaged in farming at Blossburg. He is highly esteemed in the House. J. G.

Why the European Copper Market Advances

The report on the metal market issued by Henry R. Merton & Co., Ltd., of London, under date of December 16, has the following comment on the recent interesting developments in the European copper market:

In view of the excellent statistics published at the close of last week, it may be pointed out that the world's stock of copper since it reached the high water mark at the end of June, 1910, has decreased 70,000 tons, while during these 18 months the consumption in the United States has been smaller than during the same preceding period. The shrinkage in the stocks is therefore entirely due to the heavy consumption of the metal in the European industries, and its continuance as revealed in the latest statistics has begun to create some alarm among consumers. The ease with which manufacturers on this side have been able to purchase copper from some of the large American producers during the whole of this year and the readiness shown by sellers to make concessions in price for important quantities had lulled manufacturers into a sense of security, and encouraged them all along to cover their requirements only from hand to mouth. Now, however, it has become evident that without any undue eagerness on the part of consumers the producers have not only disposed of their current output but also of past accumulations, and they are not any more in a position to accommodate the trade with liberal offers. They have, in fact, during the past week been offering very sparingly, and have been obliged to raise their price for electrolytic copper from day to day. This attitude has naturally had the effect of frightening consumers still more, so that the demand for refined copper assumed enormous proportions and created quite a sensational advance in values, the latest quotation for electro being 13⅞c., as compared with 13⅜c. a week ago. Lake copper rules at 14 cents.

Not since the boom in copper in 1906 has such a sharp rise in prices and such activity in the consumptive business been experienced in so short a time. The demand was most eager and came from all quarters, revealing a remarkable power of absorption on the part of the trade, not only in Europe but in America also. We are informed that consumers in the States are not well supplied, and that in view of the improvement in trade a further increase in the consumption is expected. India, after remaining out of our market for some weeks past, is now also sending bids for large lines of yellow metal. Manufacturers in this country are heavily booked with orders for sheets and tubes and the electrical industry has never been busier.

The Ship Canal Lock at Buffalo

The United States Ship Canal lock at Black Rock harbor, Buffalo, N. Y., which is the largest inland-water lock in the world, constructed at a cost of $1,250,000, is completed. The lock overcomes a fall of 5 ft. in Niagara River, between the foot of Lake Erie and Black Rock harbor at the International Bridge, and is situated at the north end of the ship canal. This canal affords a safe passage down the river to the new Erie Barge Canal terminals at Tonawanda, just north of Buffalo. The interior dimensions of the lock are: Length, 650 ft., width 70 ft., minimum depth 24 ft. The capacity is sufficient for the largest freighters on the lakes. The length over all, including operating gates and valves, is 800 ft. The lock gates are each 37 ft. wide and 32 ft. deep, the freeboard being 8 ft. The gates are of steel and will be operated by electricity. It was necessary in preparing for the construction of the lock, which is of concrete, to build a coffer dam 947 ft. long and 260 ft. wide, larger even than the one around the Maine in Havana harbor. The contract for the lock was let by the Federal Government to the D'Olier Engineering Company, Philadelphia, three years ago. The lock will be placed in service next summer.

Steel Corporation Bonuses to Employees

Statements which have appeared in financial newspaper columns in the past week, evidently from authoritative sources, are to the effect that the bonus distributions made to employees in the more responsible positions are less for this year than for 1910. Last year the total was reported at $2,700,000, of which 60 per cent. was in common stock at $70 a share and 40 per cent. in cash; but earnings for this year have been considerably below those for 1910. Subscriptions to the stock of the corporation under its profit-sharing plan will be received in the next two weeks, the basis being close to 110 for the preferred and from 65 to 70 for the common stock. Between 25,000 and 30,000 employees are now stockholders of record. Since the profit-sharing plan became operative in 1903, employees have subscribed for a total of 237,362 shares of preferred and 44,437 shares of common stock, a total of 282,000 shares.

Chairman E. H. Gary gave out the following statement December 27 regarding the bonus distribution and the employees' stock subscription: "The United States Steel Corporation has made its usual distribution to the employees of the corporation and subsidiary companies under its bonus plan, which has been in force nine years. The amount distributed for 1911 is $1,450,000. The corporation will also offer to its employees the right to subscribe for about 25,000 shares of stock as usual on the basis of the plan which has been in force for the period above stated. The price has not yet been fixed, but it will probably be a little lower than the market."

Four-fifths of the excavation required to complete the Panama Canal had been done at the beginning of December. There remained only 39,669,715 cu. yd. of material to be removed, and that task is expected to be completed within the next year.

The Crane Company, Chicago, gave its employees a Christmas bonus of 10 per cent. of their annual salaries, making a total distribution of $500,000. This is the thirteenth year that a Christmas distribution has been made, bringing the total amount given to employees up to $3,750,000.

The Iron and Metal Markets

A Comparison of Prices

Advances Over the Previous Week in Heavy Type, Declines in Italics.

At date, one week, one month and one year previous.

	Dec. 27, 1911.	Dec. 20, 1911.	Nov. 29, 1911.	Dec. 28, 1910.
PIG IRON, Per Gross Ton:				
Foundry No. 2 standard, Philadelphia	$14.85	$14.85	$14.85	$15.50
Foundry No. 2, Valley furnace	13.00	13.00	13.00	13.50
Foundry No. 2 Southern, Cincinnati	13.25	13.25	13.00	14.25
Foundry No. 2, Birmingham, Ala.	10.00	10.00	9.75	11.00
Foundry No. 2, at furnace, Chicago*	14.00	14.00	14.00	16.00
Basic, delivered, eastern Pa.	14.25	14.25	14.50	14.75
Basic, Valley furnace	13.25	13.25	13.25	13.50
Bessemer, Pittsburgh	15.15	15.15	14.90	15.90
Gray forge, Pittsburgh	13.40	13.40	13.25	13.90
Lake Superior charcoal, Chicago	16.00	16.00	16.00	18.00
COKE, CONNELLSVILLE, Per Net Ton, at Oven:				
Furnace coke, prompt shipment	1.75	1.60	1.50	1.40
Furnace coke, future delivery	1.65	1.65	1.60	1.70
Foundry coke, prompt shipment	1.90	1.90	1.75	1.90
Foundry coke, future delivery	2.15	2.15	2.10	2.10
BILLETS, &c., Per Gross Ton:				
Bessemer billets, Pittsburgh	20.00	19.00	19.00	23.00
Open hearth billets, Pittsburgh	20.00	19.00	18.00	23.00
Forging billets, Pittsburgh	26.00	25.00	24.00	28.00
Open hearth billets, Philadelphia	22.40	21.40	21.40	24.50
Wire rods, Pittsburgh	24.50	24.50	25.00	28.00
OLD MATERIAL, Per Gross Ton:				
Iron rails, Chicago	14.75	14.75	14.50	15.50
Iron rails, Philadelphia	16.00	16.00	15.50	17.00
Car wheels, Chicago	13.25	13.00	12.50	13.50
Car wheels, Philadelphia	12.50	12.50	11.50	13.00
Heavy steel scrap, Pittsburgh	12.50	12.25	12.00	13.50
Heavy steel scrap, Chicago	10.50	10.25	9.50	12.00
Heavy steel scrap, Philadelphia	12.25	12.25	11.50	12.50
FINISHED IRON AND STEEL, Per Pound to Largest Buyers:	Cents.	Cents.	Cents.	Cents.
Bessemer rails, heavy, at mill	1.25	1.25	1.25	1.25
Iron bars, Philadelphia	1.27½	1.25	1.20	1.32½
Iron bars, Pittsburgh	1.25	1.25	1.20	1.35
Iron bars, Chicago	1.15	1.15	1.15	1.35
Steel bars, Pittsburgh	1.15	1.15	1.05	1.40
Steel bars, tidewater, New York	1.31	1.31	1.21	1.56
Tank plates, Pittsburgh	1.15	1.15	1.10	1.40
Tank plates, tidewater, New York	1.31	1.31	1.26	1.56
Beams, Pittsburgh	1.15	1.15	1.10	1.40
Beams, tidewater, New York	1.31	1.31	1.26	1.56
Angles, Pittsburgh	1.15	1.15	1.10	1.40
Angles, tidewater, New York	1.31	1.31	1.26	1.56
Skelp, grooved steel, Pittsburgh	1.15	1.15	1.12½	1.25
Skelp, sheared steel, Pittsburgh	1.20	1.20	1.20	1.30
SHEETS, NAILS AND WIRE, Per Pound to Largest Buyers:	Cents.	Cents.	Cents.	Cents.
Sheets, black, No. 28, Pittsburgh	1.90	1.90	1.85	2.20
Wire nails, Pittsburgh	1.55	1.55	1.50	1.70
Cut nails, Pittsburgh	1.50	1.50	1.45	1.60
Fence wire, annealed, 0 to 9, Pittsburgh	1.35	1.35	1.30	1.50
Barb wire, galv., Pittsburgh	1.90	1.90	1.85	2.00
METALS, Per Pound:	Cents.	Cents.	Cents.	Cents.
Lake copper, New York	14.25	14.00	13.25	13.00
Electrolytic copper, New York	14.12½	13.87½	13.12½	12.75
Spelter, St. Louis	6.20	6.15	6.00	5.50
Spelter, New York	6.35	6.30	6.95	5.60
Lead, St. Louis	4.35	4.35	4.35	4.35
Lead, New York	4.45	4.45	4.45	4.50
Tin, New York	45.25	45.00	45.25	38.45
Antimony, Hallett, New York	7.60	7.75	7.60	7.75
Tin plate, 100-lb. box, New York	$3.64	$3.64	$3.64	$3.84

*The average switching charge for delivery to foundries in the Chicago district is 50c. per ton.

Prices of Finished Iron and Steel f.o.b. Pittsburgh

Freight rates from Pittsburgh in carloads, per 100 lb., New York, 16c.; Philadelphia, 15c.; Boston, 18c.; Buffalo, 11c.; Cleveland, 10c.; Cincinnati, 15c.; Indianapolis, 17c.; Chicago, 18c.; St. Paul, 32c.; St. Louis, 22½c; New Orleans, 30c.; Birmingham, Ala.; 45c.; Pacific coast, 80c. on plates, structural shapes and sheets No. 11 and heavier; 85c. on sheets Nos. 12 to 16; 95c. on sheets No. 16 and lighter; 65c. on wrought pipe and boiler tubes.

Plates.—Tank plates, ¼ in. thick, 6¼ in. up to 100 in. wide, 1.15c., base, net cash, 30 days. Following are stipulations prescribed by manufacturers, with extras:

Rectangular plates, tank steel or conforming to manufacturers' standard specifications for structural steel dated February 6, 1903, or equivalent, ¼ in. thick and over on thinnest edge, 100 in. wide and under, down to but not including 6 in. wide, are base.

Plates up to 72 in. wide, inclusive, ordered 10.2 lb. per square foot, are considered ¼-in. plates. Plates over 72 in. wide must be ordered ¼ in. thick on edge, or not less than 11 lb. per square foot, to take base price. Plates over 72 in. wide ordered less than 11 lb. per square foot down to the weight of 3-16-in. take the price of 3-16-in.

Allowable overweight, whether plates are ordered to gauge or weight, to be governed by the standard specifications of the Association of American Steel Manufacturers.

Extras.	Cents per lb.
Gauges under ¼ in. to and including 3-16 in. in thinnest edge	.10
Gauges under 3-16 in. to and including No. 8	.15
Gauges under No. 8 to and including No. 9	.25
Gauges under No. 9 to and including No. 10	.30
Gauges under No. 10 to and including No. 12	.40
Sketches (including all straight taper plates) 3 ft. and over in length	.10
Complete circles, 3 ft. in diameter and over	.20
Boiler and flange steel	.10
"A. B. M. A." and ordinary firebox steel	.20
Still bottom steel	.30
Marine steel	.40
Locomotive firebox steel	.50
Widths over 100 in. up to 110 in., inclusive	.05
Widths over 110 in. up to 115 in.; inclusive	.10
Widths over 115 in. up to 120 in., inclusive	.15
Widths over 120 in. up to 125 in., inclusive	.25
Widths over 125 in. up to 130 in., inclusive	.50
Widths over 130 in.	1.00
Cutting to lengths or diameters under 3 ft. to 2 ft., inclusive	.25
Cutting to lengths or diameters under 2 ft. to 1 ft., inclusive	.50
Cutting to lengths or diameters under 1 ft.	1.55

No charge for cutting rectangular plates to lengths 3 ft. and over.

Structural Material.—I-beams, 3 to 15 in.; channels, 3 to 15 in., and angles, 3 to 6 in. on one or both legs, ¼ in. and over, 1.15c. Other shapes and sizes are quoted as follows:

	Cents per lb
I beams over 15 in.	1.20 to 1.25
H-beams over 18 in.	1.30 to 1.35
Angles over 6 in.	1.20 to 1.25
Angles, 3 in. on one or both legs, less than ¼ in. thick, plus full extras, as per steel bar card Sept. 1, 1909	1.20 to 1.25
Tees, 3 in. and up	1.30 to 1.35
Zees, 3 in. and up	1.15 to 1.20
Angles, channels and tees, under 3 in., plus full extras as per steel bar card Sept. 1, 1909	1.20 to 1.25
Deck beams and bulb angles	1.45 to 1.50
Hand rail tees	2.00 to 2.15
Checkered and corrugated plates	2.00 to 2.15

Sheets.—Makers' prices for mill shipments on sheets of U. S. Standard gauge, in carload and larger lots, on which jobbers charge the usual advances for small lots from store, are as follows:

Blue Annealed Sheets

	Cents per lb
Nos. 3 to 8	1.30 to 1.35
Nos. 9 and 10	1.40 to 1.45
Nos. 11 and 12	1.45 to 1.50
No. 13 and 14	1.50 to 1.55
Nos. 15 and 16	1.60 to 1.65

Box Annealed Sheets, Cold Rolled

	One Pass.	Three Pass
Nos. 10 to 12	1.55 to 1.60	
Nos. 13 and 14	1.60 to 1.65	
Nos. 15 and 16	1.65 to 1.70	1.75 to 1.80
Nos. 17 to 21	1.70 to 1.75	1.80 to 1.85
Nos. 22, 23 and 24	1.75 to 1.80	1.85 to 1.90
Nos. 25 and 26	1.80 to 1.85	1.90 to 1.95
No. 27	1.85 to 1.90	1.95 to 2.00
No. 28	1.90 to 1.95	2.00 to 2.05
No. 29	1.95 to 2.00	2.05 to 2.10
No. 30	2.05 to 2.10	2.15 to 2.20

Galvanized Sheets of Black Sheet Gauge

Nos. 10 and 11	1.90 to 1.95
Nos. 12, 13 and 14	2.00 to 2.05
Nos. 15, 16 and 17	2.15 to 2.20
Nos. 18 to 22	2.30 to 2.35
Nos. 23 and 24	2.40 to 2.45
Nos. 25 and 26	2.60 to 2.65
No. 27	2.75 to 2.80
No. 28	2.90 to 2.95
No. 29	3.00 to 3.05
No. 30	3.20 to 3.25

All above rates on sheets are f.o.b. Pittsburgh, terms 30 days net, or 2 per cent. cash discount in 10 days from date of invoice, as also are the following base prices per square for painted and galvanized roofing sheets, with 2½-in. corrugations:

Corrugated Roofing Sheets, Per Square

Gauge.	Painted.	Galvanized.	Gauge.	Painted	Galvanized
29	....	$2.30	23	$2.35	$3.45
28	$1.30	2.45	22	2.55	3.65
27	1.45	2.50	21	2.75	4.00
26	1.55	2.60	20	3.00	4.30
25	1.80	3.00	18	4.00	5.65
24	2.05	3.10	16	4.85	5.45

Wire Rods and Wire.—Bessemer, open hearth and chain rods, $24.50. Fence wire, Nos. 0 to 9, per 100 lb., terms 60 days, or 2 per cent. discount in 10 days, carload lots, to jobbers, annealed, $1.35; galvanized, $1.65. Carload lots, to retailers, annealed, $1.45; galvanized, $1.75. Galvanized barb wire to jobbers, $1.85; painted, $1.55. Wire nails, to jobbers, $1.55.

The following table gives the prices to retail merchants on wire in less than carloads, including the extras on Nos. 10 to 16, which are added to the base price:

Fence Wire, Per 100 Lb.

Nos.	0 to 9	10	11	12	13	14	15	16
Annealed	$1.50	$1.55	$1.60	$1.65	$1.75	$1.85	$1.95	$2.05
Galvanized	1.80	1.85	1.90	1.95	2.05	2.15	2.35	2.55

Wrought Pipe.—The following are the jobbers' carload discounts on the Pittsburgh basing card on wrought pipe, in effect from December 1, 1911:

	Steel. Black.	Steel. Galv.	Iron. Black.	Iron. Galv.
⅛ and ¼ in.	72	54	68	48
⅜ in.	75	65	69	50
½ in.	78	68	70	62
¾ to 1¼ in.	81	73	75	67
2 to 3 in.	82	75	76	69
Lap Weld.				
1¼ and 1½ in.			68	62
2 in.	79	72	72	65
2½ to 4 in.	81	74	74	67
4½ to 6 in.	80	72	73	65
7 to 12 in.	78	68	71	61
13 to 15 in.	58		47	
Butt Weld, extra strong, plain ends, card weight.				
⅛, ¼, ⅜ in.	70	60	65	55
½ in.	75	69	70	64
¾ to 1¼ in.	79	73	74	68
2 to 3 in.	80	74	75	69
Lap Weld, extra strong, plain ends, card weight.				
1½ in.			66	60
2 in.	76	70	71	65
2½ to 4 in.	78	72	73	67
4½ to 6 in.	77	71	72	66
7 to 8 in.	70	60	65	55
9 to 12 in.	65	55	60	50
Butt Weld, double extra strong, plain ends, card weight.				
½ in.	65	59	60	54
¾ to 1½ in.	68	62	63	57
2 to 3 in.	70	64	65	59
Lap Weld, double extra strong, plain ends, card weight.				
2 in.	66	60	61	55
2½ to 4 in.	68	62	63	57
4½ to 6 in.	67	61	62	56
7 to 8 in.	60	50	55	45
Plugged and Reamed.				
1 to 1½, 2 to 3 in. Butt Weld 2, 2½ to 4 in. Lap Weld	Will be sold at two (2) points lower basing (higher price) than merchants' or card weight pipe. Butt or lap weld as specified.			

The above discounts are for "card weight," subject to the usual variation of 5 per cent. Prices for less than carloads are three (3) points lower basing (higher price) than the above discounts.

Boiler Tubes.—Discounts on lap welded steel and charcoal iron boiler tubes to jobbers in carloads are as follows:

Steel.		*Charcoal Iron.*	
1¼ to 2¼ in.	65	1½ in.	48
2½ in.	67½	1¾ to 2¼ in.	50
2¾ to 3¼ in.	72½	2½ in.	55
3½ to 4 in.	75	2¾ to 5 in.	60
5 to 6 in.	67½		
7 to 13 in.	65		

2½ in. and smaller, over 18 ft., 10 per cent. net extra.
2¾ in. and larger, over 22 ft., 10 per cent. net extra.

Less than carloads will be sold at the delivered discounts for carloads, lowered by two points for lengths 22 ft. and under to destinations east of the Mississippi River; lengths over 22 ft. and all shipments going west of the Mississippi River must be sold f.o.b. mill at Pittsburgh basing discounts, lowered by two points.

Pittsburgh

PITTSBURGH, PA., December 27, 1911.

Owing to the holiday season local conditions in the iron trade in the past week were quiet as compared with the activity of the previous two or three weeks. Yet there have been no indications of weakening in prices, the market being strong all along the line, firmly holding the higher prices on some lines of finished material. The local pig iron market is quiet, but several firms report that actual sales this month have been the heaviest for any one month this year. The steel market is showing a good deal of activity, the leading producers being practically sold up for the first half of the year, prices quoted now being fully $1 a ton higher than two weeks ago. Specifications against contracts for finished material are fairly heavy, and are expected to be more active after the first of the year. Mills rolling plates, structural shapes, sheets, steel bars and tin plate have an enormous amount of business on their books for first half delivery, and, with the new business that is expected naturally to come in, no recessions in prices are expected in the near future at least. The outlook for the first half of 1912 is regarded as encouraging, but it is not believed that prices for that period will be much higher than they are now.

Pig Iron.—Prices are fairly strong, and several of the local sellers report that actual orders booked so far this month are the heaviest in any one month this year. The Pittsburgh Steel Company is still negotiating for a large amount of basic pig iron for delivery over the first half of next year, and it is understood will close for at least part of it this week. It is reported that one Shenango Valley furnace interest has quoted below $12.25 on 600 to 800 tons per day over the first half on this inquiry. Foundries have been buying heavily this month, and one local consumer has closed in the past week for about 8000 tons of No. 2 foundry iron for delivery over first half, on the basis of $13 at Valley furnace. A sale of 1000 tons of Bessemer for January and February, and 200 tons for January delivery, are reported at $14.25, Valley furnace. We also note a sale of 2000 tons of forge iron for first quarter at $12.50, Valley furnace, and 1000 tons of Northern No. 2 foundry at $13.00, Valley furnace, for first half of 1912 delivery. We quote: Bessemer iron, $14.25; malleable Bessemer, $12.75; basic, $12.25 to $12.50; gray forge, $12.50 to $12.75; No. 2 foundry, $13 to $13.25, all at Valley furnace, the freight rate for delivery in Pittsburgh district being 90c. a ton.

Steel.—The steel market has been active in the past week, the Carnegie Steel Company having closed some very large contracts for billets and sheet and tin bars for delivery over first half of 1912 on sliding scale contracts. In fact, this company is practically out of the market as a seller of billets and sheet bars for first half of next year. It reports that its actual orders in the billet and rail sales department sent to the mills for rolling this month, up to and including Saturday, December 23, were 65,000 tons heavier than in the same period in November. The new inquiry for forging billets is active and prices are higher. We quote: Bessemer and open-hearth billets, 4 x 4 in., up to 0.25 carbon, $20; Bessemer and open-hearth sheet bars, $21, and forging billets, $26; Pittsburgh or Youngstown.

Ferromanganese.—A New York importer reports a sale of 100 tons of 80 per cent. for first quarter delivery to an Eastern consumer at the new price of $41, Baltimore, the freight rate for delivery in the Pittsburgh district being $1.95 a ton.

Ferrosilicon.—The local situation is quiet, most consumers being covered for first quarter and first half of 1912. The market is very strong, and the minimum price now quoted on 50 per cent. is $70, Pittsburgh. Prices on the lower grades are not so firm, and we quote 10 per cent. at $21; 11 per cent., $22, and 12 per cent., $23, f.o.b., cars at furnace, Ashland, Ky., or Jackson, Ohio.

Muck Bar.—New inquiry is light, but prices are strong. We quote best grades made from all pig iron at $28 to $28.50, Pittsburgh.

Skelp.—The mills that roll iron and steel skelp report quite a heavy inquiry and state that prices are fully $1 a ton higher than were ruling two or three weeks ago. A sale of 2000 tons of sheared steel skelp is reported to a local pipe mill for first quarter delivery. We quote grooved steel skelp at 1.15c. to 1.17½c.; sheared steel skelp, 1.20c. to 1.22½c.; grooved iron skelp, 1.42c. to 1.45c., and sheared iron skelp, 1.62½c. to 1.65c., all for delivery at buyer's mills in the Pittsburgh district.

Wire Rods.—The local market is dull, but the price of $24 on Bessemer and open-hearth rods, put out several weeks ago by two of the leading makers, has been withdrawn and the minimum price of Bessemer, open-hearth and chain rods is now $24.50, Pittsburgh.

Steel Rails.—The Edgar Thomson rail mill at Bessemer, Pa., is still shut down for repairs, but is scheduled to start January 2. The Carnegie Steel Company reports that its actual sales and specifications received against contracts for light rails received last week were the heaviest in any one week this year. This company has sold 3000 tons of splice bars to a Southern road and 500 tons to another road. We quote splice bars at 1.50c. per lb., and repeat quotation on rails: Standard sections, 1.25c. per lb.; 8 and 10-lb. light rails, 1.25c.; 12 and 14-lb., 1.16c.; 16, 20 and 25-lb., 1.12c.; 30 and 35-lb., 1.10c., and 40 and 45-lb., 1.08c., f.o.b. at mill.

Structural Material.—New inquiry in the past week has been considerable. The McClintic-Marshall Construction Company has taken 3500 tons for new steel buildings for the Baldwin Locomotive Works at Eddystone, Pa., 500 tons of bridge work for the Baltimore & Ohio railroad at Chicago and 500 tons for new buildings for the American Car & Foundry Company at

Chicago. The American Bridge Company has taken 1200 tons for a new hotel building in the South and 600 tons for an apartment house. The Jones & Laughlin Steel Company has booked 700 tons for area work on the New York Central railroad in New York City. Prices on plain material are firmer and 1.15c. is absolute minimum, with 1.20c. being quoted on a good many inquiries. We quote beams and channels up to 15-in. at 1.15c. to 1.20c. at mill, Pittsburgh.

Plates.—Persistent reports that the Pennsylvania Railroad had active inquiries out for 20,000 all-steel cars, equipped with 70-ton trucks, are denied by two of the steel car companies here. It is only inquiring for 3000 to 6000 cars of that type. Orders for steel cars in the past week were light, but some fairly large inquiries are out. The Pennsylvania Lines West are inquiring for 1000 coke, 1000 gondola and 1000 box cars. The Grand Trunk is in the market for 500 express, 500 refrigerator and 300 ballast cars, and the Canadian Pacific Railroad for 200 refrigerator cars. The Pullman Company at Pullman, Ill., has taken a contract for 2500 steel underframe box cars for the Chicago, Rock Island & Pacific railroad, and the Delaware, Lackawanna & Western has inquiries out for 300 refrigerator cars. The Pressed Steel Car Company is operating its McKees Rocks Works to about 60 per cent. of capacity, but is doing very little at its Woods Run plant. The Standard Steel Car Company is running its Butler, Pa., steel car works full time and is pretty well filled up for the first three months of next year. We quote ¼-in. and heavier plates at 1.15c. to 1.20c. f.o.b. maker's mill, Pittsburgh

Sheets.—It is stated with regard to the recently organized Association of Sheet and Tin Plate Manufacturers that the leading sheet and tin plate interest is not identified with it, and a number of independent mills have so far declined to join it. Conditions in the local sheet trade are better than for some time, new demand and specifications against contracts being heavier, and the mills are operating to a fuller rate of capacity, said to be about 75 per cent. Prices are being well maintained on the basis of 1.40c. for Nos. 9 and 10 blue annealed sheets, 1.90c. for No. 28 black and 2.90c. for No. 28 galvanized, in carload and larger lots f.o.b. maker's mill, jobbers charging the usual advance for small lots from store

Tin Plate.—The mills are now receiving specifications against the heavy contracts placed some time ago by the meat packers and can makers, and operations have increased to about 75 per cent. of capacity, as against 50 per cent. a month ago. Three or four of the leading independent tin plate mills are operating to full capacity and advise us they expect to do so for the first three months of the year at least. The regular price of tin plate remains at $3.40 per base box for 14 x 20 coke plates, and it is said that this price is being better observed. We quote $3.40 per base box for 14 x20 coke plates, f.o.b. at mill.

Bars.—In the past week new orders and specifications against contracts for steel bars have not been so active as in the previous two or three weeks, but after the first of the year specifications are expected to be more active. The rapid advances in prices of steel bars from 1.05c. to 1.15c. and 1.20c. has naturally had the effect of curtailing new demand, some consumers waiting to find out whether the higher prices are going to hold. We quote steel bars at 1.15c. to 1.20c. for delivery through the first quarter, and common iron bars at 1.25c. to 1.30c., maker's mill.

Hoops and Bands.—New inquiries are better and specifications against contracts are also coming in more freely than for some time. We quote steel bands at 1.15c. to 1.20c., extras as per the steel bar card, and hoops at 1.25c. to 1.30c. for delivery through first half of 1912, f.o.b. cars maker's mill, Pittsburgh.

Railroad Spikes.—There has been a lull in new buying and in specifications in the past week following the activity of several weeks. Most of the leading railroads are now covered on their requirements of railroad spikes for first half of 1912, but are specifying quite freely. We quote railroad spikes at $1.40 base per 100 lb, f.o.b. Pittsburgh.

Rivets.—Makers report that new orders and specifications against contracts are coming in a little more freely, but that so far there has been little or no betterment in prices. We quote structural rivets at 1.40c. to 1.45c. and boiler rivets at 1.50c. to 1.55c. in carload and larger lots, f.o.b. Pittsburgh.

Shafting.—New buying is rather quiet, but specifications against contracts from the implement makers have been coming in quite freely for some time. Trade with automobile builders is quiet. We quote cold-rolled shafting at 65 per cent. off in carload and larger lots and about 60 and 5 per cent. in small lots, delivered in base territory.

Spelter.—The market has been fairly strong in the past week, and we quote prime grades of Western spelter at 6.15c., East St. Louis, or 6.27½c., Pittsburgh.

Wire Products.—The demand for wire and wire nails is reported to be a little better so far this month than in November. However, jobbers and retailers are still confining orders mostly to small lots to cover current needs. We quote: Wire nails, $1.55; cut nails, $1.50; galvanized barb wire, $1.85; painted, $1.55; annealed fence wire, $1.35; galvanized fence wire, $1.65, f.o.b. Pittsburgh, usual terms, freight added to point of delivery.

Merchant Pipe.—The new demand for small sizes of merchant pipe in December was heavier than in November, but line pipe is very dull and no large jobs are actively in the market aside from the inquiry of the Southern Gas Company of California for 150 miles of 12-in. pipe, and it is stated this contract may possibly be closed this week. V. Q. Hickman, of this city, has sold 25 miles of 2 to 3-in. line pipe to the High Grade Oil Company, Butler, Pa., making in all about 70 miles furnished to the company by Mr. Hickman, all of which has been rolled by the Youngstown Sheet & Tube Company. The pipe mills have recently put out new discounts on oil country goods, including the mid-continent and California districts, showing a slight reduction on most sizes and slight advances on others. Prices on oil country goods have been more or less shaded for some time, and the mills state that these new discounts are simply a readjustment of prices to represent actual conditions that have existed. Discounts on iron and steel pipe are being fairly well maintained.

Merchant Tubes.—New inquiries and orders for locomotive tubes have been very active in the past two or three weeks, and local makers have taken some large contracts for delivery in first quarter and first half of 1912. Demand for merchant steel tubes is dull and prices continue to be materially shaded. The merchant steel tube trade this year has been very unsatisfactory to the mills.

Iron and Steel Scrap.—The Jones & Laughlin Steel Company is still buying quite freely of selected grades of heavy steel scrap for delivery at Aliquippa, Pa., it being the intention of the company to start its open hearth plant at that place shortly after January 1. This company is credited with having bought 50,000 to 60,000 tons of heavy steel scrap for Aliquippa in the past month or six weeks. As usual at the holiday season the scrap trade is dull, consumers not caring to take in anything they can possibly postpone until after the turn of the year. Prices have shown no important change in the past week. Dealers quote as follows, per gross ton, f.o.b. Pittsburgh, unless otherwise noted:

Heavy steel scrap, Steubenville, Follansbee, Sharon, Monessen and Pittsburgh delivery	$12.50 to	$12.75
No. 1 foundry cast	11.75 to	12.00
No. 2 foundry cast	10.75 to	11.00
Bundled sheet scrap, f.o.b. consumers' mill, Pittsburgh district	10.25 to	10.50
Rerolling rails, Newark and Cambridge, Ohio, Cumberland, Md., and Franklin, Pa.	12.50 to	12.75
No. 1 railroad malleable stock	11.25 to	11.50
Grate bars	9.00 to	9.25
Low phosphorus melting stock	15.25 to	15.50
Iron car axles	20.50 to	21.00
Steel car axles	16.00 to	16.25
Locomotive axles	22.00 to	22.50
No. 1 busheling scrap	11.00 to	11.25
No. 2 busheling scrap	7.00 to	7.25
Old car wheels	12.00 to	12.25
*Cast iron borings	8.75 to	9.00
*Machine shop turnings	9.00 to	9.25
‡Sheet bar crop ends	13.75 to	14.00
Old iron rails	14.50 to	14.75
No. 1 wrought scrap	12.00 to	12.25
Heavy steel axle turnings	9.75 to	10.00
Stove plate	9.00 to	9.25

*These prices are f.o.b. cars at consumers' mills in the Pittsburgh district.
†Shipping point.

Coke.—The shut down in the coke regions on account of the Christmas holiday has created a decided scarcity in the supply of standard grade of furnace coke and in the last few days dealers have been asking $1.75 to $1.80 per net ton, at oven, for furnace coke for spot shipment. Sales of 2000 tons in one lot and 5000 tons in another are reported at $1.70 to $1.75, at oven, and on a large inquiry to-day a local coke maker quoted $1.80. It is not believed that this condition will last, and it is probable that after the coke ovens are going again in the regular way the market will be easier. For this week we quote best makes of furnace coke for spot

shipment at $1.75 to $1.80 per net ton, at oven. Consumers of blast furnace and foundry coke are pretty well covered for the first half, and there is very little new inquiry. We quote best makes of furnace coke for first half at $1.65 to $1.75 and 72-hr. foundry coke for first half of next year at $2.15 to $2.25 per net ton, at oven. The output of coke in the Upper and Lower Connellsville regions last week showed a decrease from the previous week of 20,000 tons or more, this being largely due to the Christmas holiday.

Chicago

CHICAGO, ILL., December 27, 1911. (*By Telegraph.*)

Because of the need in which the mills stand as regards rails, the placing of orders for 60,000 tons by the Chicago & Northwestern, 15,000 tons by the Soo and 4000 tons by the Nickel Plate were the important transactions of the week. The approaching holiday season seemed not to affect greatly the tonnage of orders for finished steel products received by local mills, but the decrease in pig iron buying, which has been gradual, was sharply accentuated. The Chicago market has assumed some of the firmer aspects prevailing more pronouncedly in the East, but the advance to higher levels seems much more difficult of attainment here. During the week scrap melters have been covering for their requirements very actively and the market for old material continues to move sharply upward. While little additional business is expected to materialize before January 1, the feeling prevails here that January and February will be months of steady buying in good volume.

Pig Iron.—Buying interest in pig iron seems to have culminated at least temporarily. A large carbuilding interest has been figuring on the purchase of sufficient tonnage to cover its requirements, but it is understood that satisfactory prices have not been offered. Despite the large tonnage sold in the past few weeks, the market for Southern iron continues at $10, Birmingham, and for the major portion of the business placed quotations were equivalent to less than this basis. Local iron remains at $14. We quote for Chicago delivery, except for local irons, which are f.o.b. furnace, the following prices on prompt shipments:

Lake Superior charcoal	$16.00 to $16.50
Northern coke foundry, No. 1	14.50 to 15.00
Northern coke, foundry, No. 2	14.00 to 14.50
Northern coke foundry, No. 3	13.50 to 14.00
Northern Scotch, No. 1	16.00
Southern coke, No. 1 foundry and No. 1 soft	14.85
Southern coke, No. 2 foundry and No. 2 soft	14.35
Southern coke, No. 3	13.90 to 14.35
Southern coke, No. 4	13.85 to 14.10
Southern gray forge	13.60 to 13.85
Southern mottled	13.60 to 13.85
Malleable Bessemer	14.35 to 14.50
Standard Bessemer	16.75
Basic	14.75
Jackson County and Kentucky silvery, 6 per cent	16.40
Jackson County and Kentucky silvery, 8 per cent	17.40
Jackson County and Kentucky silvery, 10 per cent	18.40

Structural Material.—The largest contract for fabricated steel reported in this market as awarded last week was placed with the Pennsylvania Steel Company, calling for 7270 tons for a bridge in Portland, Ore. Other contracts were for small quantities, and included 907 tons for a Soo Line ore dock extension, placed with the Milwaukee Bridge Company; 765 tons for the Greenlee Foundry Company, Chicago, taken by the American Bridge Company, and 272 tons for the William Lemp Brewing Company, St. Louis, to Christopher & Simpson, of that city. The Hurley Mason Company also bought about 320 tons of steel for a new smelter. Locally, architectural tonnage of structural material is very quiet and little is anticipated in this direction until February, when it is hoped that some of the new downtown buildings for which permits were taken out a few months ago will be ready for figures. A moderate volume of specifications and new orders for railroad bridge steel was received by the mills during the week. Mill orders for structural shapes are not so heavy as for plates and bars We quote for mill shipment, Chicago, 1.30c. to 1.35c. and from store 1.60c.

Cast Iron Pipe.—Improvement is noted in the cast iron pipe trade. At Portland, Ore., 8200 tons of 6 to 20-in. pipe was awarded to the United States Cast Iron Pipe & Foundry Company and 3800 tons to a local foundry. On December 29 the city of Minneapolis will receive tenders on 4000 tons of 6 to 24-in. pipe. The St. Paul Gas Company is also in the market for 2000 tons. We quote as follows, per net ton, Chicago: Water pipe, 4-in., $26.50; 6 to 12-in., $24.50; 16-in. and up. $24, with $1 extra for gas pipe.

(*By Mail.*)

Rails, Track Supplies and Railroad Equipment.—Rail purchases to the amount of 80,000 tons are reported for last week, including 60,000 tons for the Chicago & Northwestern, 15,000 tons for the Soo line and 4000 tons for the Nickel Plate. All of this tonnage is understood to have been placed with Chicago mills. Car buying is quiet, but apparently only for a breathing spell. The number of cars on which figures are being asked by the railroads is very large, and it is difficult to see how the prices of the materials required can be held down if the contemplated purchases materialize into orders during a short period. The specifying for track fastenings is fairly active. We quote standard railroad spikes at 1.50c., base; track bolts, with square nuts, 1.90c., base, all in carload lots, Chicago; standard section Bessemer rails, 1.28c.; open hearth, 1.34c.; light rails, 40 to 45 lb., 1.16c. to 1.20½c.; 30 to 35 lb., 1.19½c. to 1.24c.; 16, 20 and 25 lb., 1.20½c. to 1.25c.; 12 lb., 1.25c to 1.30½c.; angle bars, 1.50 c., Chicago.

Plates.—The holiday week seemed not to affect materially the tonnage of plates taken by the mills, which show increasing reluctance to contract for forward delivery. They are unwilling to do so except at an advance, and at the same time customers are being advised against anticipating market condition for next year which may not materialize. While no actual advances in prices have been made, a growing firmness in the attitude of the sellers is everywhere apparent. We quote for Chicago delivery, mill shipment, prompt, 1.30c. to 1.35c. and for delivery through the first half, 1.38c. From store we quote 1.60c.

Old Material.—Current market prices for scrap show advances of 25c. per ton on nearly all grades as compared with the quotations of a week ago. That values will continue to enhance seems inevitable. Scrap melters have been showing a very unusual activity in increasing their stocks. On the other hand, the dealers are working the market upward as strongly as possible by very conservative selling. Even rolling mill scrap, which has been quiet, is now in demand and there has been an active buying of special grades of heavy melting steel. Railroad lists of old material for which bids are being asked aggregate about 8000 tons, including 3600 tons from the Chicago, Rock Island & Pacific, 2700 tons from the Chicago, Burlington & Quincy and 1600 tons from the Soo. We quote for delivery at buyers' works, Chicago and vicinity, all freight and transfer charges paid, per gross ton, as follows:

Old iron rails	$14.75 to $15.25
Old steel rails, rerolling	12.50 to 13.00
Old steel rails, less than 3 ft	11.50 to 12.00
Relaying rails, standard section, subject to inspection	24.00
Old car wheels	13.25 to 13.75
Heavy melting steel scrap	10.50 to 11.00
Frogs, switches and guards, cut apart	10.50 to 11.00
Shoveling steel	10.00 to 10.50
Steel axle turnings	8.25 to 8.75

The following quotations are per net ton:

Iron angles and splice bars	$12.75 to $13.25
Iron car axles	13.75 to 14.25
Steel angle bars	10.00 to 10.50
Iron car axles	17.75 to 18.25
Steel car axles	15.50 to 16.00
No. 1 railroad wrought	11.25 to 11.75
No. 2 railroad wrought	10.25 to 10.75
Steel knuckles and couplers	9.75 to 10.25
Steel springs	10.25 to 10.75
Locomotive tires, smooth	13.25 to 13.75
Machine shop turnings	6.25 to 6.75
Cast and mixed borings	5.75 to 6.25
No. 1 busheling	8.75 to 9.25
No. 2 busheling	6.25 to 6.75
No. 1 boilers, cut to sheets and rings	7.00 to 7.50
Boiler punchings	12.50 to 13.00
No. 1 cast scrap	11.00 to 11.50
Stove plate and light cast scrap	9.25 to 9.75
Railroad malleable	10.50 to 11.00
Agricultural malleable	8.75 to 9.25
Pipes and flues	7.75 to 8.25

Sheets.—The improvement as regards sheets noted last week has continued in even more pronounced degree. Concessions have been entirely eliminated and the tonnage of orders placed has grown in volume. A large buyer of sheets reports that one mill declined to quote for forward shipment, although contracts can be made with others covering delivery to July 1. A much more energetic tone prevails. We quote Chicago prices as follows: Carload lots, from mill, No. 28 black sheets, to 2.08c.; No. 28 galvanized, to 3.08c.; No. 10 blue annealed, to 1.58c. Prices from store Chicago are: No. 10, 1.90c.; No. 12, 1.95c.; No. 28 black, 2.30c.; No. 28 galvanized, 3.35c.

Bars.—Western steel bar mills report their order books well filled, and this is borne out by a marked lessening in the aggressiveness with which orders are

sought on competitive business. Makers are now asking the top prices. The bar mills, while less favored in the matter of business booked, have been able to better their position in sympathy with the general market improvement, and quotations more nearly in line with their costs and the advancing prices of scrap are being obtained. We quote as follows, f. o. b. Chicago: Soft steel bars, 1.25c. to 1.33c.; bar iron, 1.15c. to 1.20c.; hard steel bars rolled from old rails, 1.15c. to 1.20c. From store: Soft steel bars, 1.50c. to 1.55c.; Chicago.

Wire Products.—Although sales the past week were hampered by the approaching holidays and the return of salesmen to headquarters, the effect of the new strength in prices was still apparent and the interest in wire products satisfactory. Current buying is largely in anticipation of spring trade, which now gives promise of considerable briskness. We quote: Plain wire, No. 9 and coarser, base, $1.53; wire nails, $1.73; painted barb wire, $1.73 to $1.78; galvanized, $2.03 to $2.08; polished staples, $1.78 to $1.83; galvanized, $2.08 to $2.13, all Chicago.

Philadelphia

PHILADELPHIA, PA., December 26, 1911.

Inquiries in nearly all branches of the iron trade have been gradually decreasing, showing the usual yearend characteristics. Pig iron purchases have been confined to small lots of foundry grades, although several fair sized quantities are still under negotiation. In finished material some business is pending, but the orders closed have been small. The old material market is quiet. Furnace coke is stronger, with $1.70 at oven more generally quoted for deliveries extending over the first half.

Iron Ore.—Importations during the week included 7658 tons of Newfoundland, 7022 tons of Swedish and 5300 tons of Cuban ore. Importations to date this year aggregate 995,189 tons.

Pig Iron.—Aggregate sales for December promise to exceed those of November, even though business has declined with the approach of the inventory period. Few large contracts were closed the past week, but negotiations for several round lots are pending. The sales were principally of the foundry grades. Local producers are less inclined to make sales for forward delivery at the present inside quotations, although there are several still quoting $14.85 to $14.90, delivered, for No. 2 X. A number of furnaces, being pretty well sold up for the first quarter, refuse to shade $15, with several holding firmly at $15.25, although they get little business. Several 1000-ton inquiries for first quarter delivery have come out, but others for deliveries into the third quarter and for the entire year, while reported, receive little attention from producers. Cast iron pipe makers are still negotiating for round lots of low grade iron, but sellers generally are somewhat stiffer in their ideas of prices. Moderate sales of Virginia foundry grades have been made for near future delivery at $12.25 and $12.50, furnace. Southern iron appears stiffer, small sales of No. 2 foundry having been made for early shipment in this district at $10.25, Birmingham. The demand for rolling mill forge iron is practically at a standstill. A sale of 3000 tons of Southern basic for first quarter delivery at $10, Birmingham, is reported. One lot of 3000 tons of standard analysis low phosphorus iron has been sold at a price equal to $19.25 delivered here, while small lots have been sold at $19.50. The general range of quotations shows no change, the following prices being named for standard brands, delivered in buyers' yards in this district:

Eastern Pennsylvania No. 2 X foundry	$14.85 to $15.25
Eastern Pennsylvania No. 2 plain	14.60 to 15.00
Virginia foundry	15.00 to 15.25
Gray forge	14.25
Basic	14.25 to 14.50
Standard low phosphorus	19.25 to 19.50

Ferroalloys.—While some few small orders for ferromanganese, which had been under negotiation, were put through early last week at $38.50, Baltimore, sellers are now quoting $41, but no business has been booked at the advanced price. Negotiations for 50 per cent. ferrosilicon, which is quoted at $70, delivered here, are still pending. Business in 10 to 12 per cent. ferrosilicon is quiet. This grade, inside the Bessemer limits as to phosphorus and sulphur, is quoted at $24.30 to $26.30, delivered.

Billets.—A fair volume of business is pending, but, as most makers are holding for slightly higher prices, consumers are slow to place orders. For forward shipment basic open-hearth rolling billets are held at $22.40, delivered here, although for prompt shipment small lots have been put through at $21.90. Forging billets have been in comparatively good demand at unchanged prices—$26.40 to $27.40, delivered.

Plates.—A moderate run of small orders have been placed. Consumers are still making efforts to contract for future delivery at inside quotations but have not been very successful. There is some further inquiry for boat plates, the aggregate tonnage before the trade being between 12,000 and 14,000 tons, but orders develop slowly. One for 700 tons was placed last week. Some good inquiries for boiler and tank plates are reported, but little actual business is expected to develop until after the turn of the year. Prices are somewhat firmer, ranging from 1.30c. to 1.40c., delivered, according to the nature of the business.

Structural Material.—The Baldwin Locomotive Works has placed the contract for its erecting shop addition, 4000 tons, with the McClintic-Marshall Construction Company. The general contract for the Stock Exchange Building will be placed, it is said, directly after the first of the year. Estimates are again being asked for the 13-story addition to complete the Bellevue-Stratford Hotel, requiring from 1500 to 1800 tons. A moderate amount of business in plain shapes has been moving, with prices unchanged at 1.30c. to 1.35c., delivered in this district.

Sheets.—While mills have largely suspended operations for the holidays, a sizable volume of business has been coming in. Consumers are placing some moderate forward orders on the basis of 1.40c., Pittsburgh, for No. 10, and would extend contracts to cover six months if mills would take the business. Western No. 28 sheets are quoted at 2.05c. minimum, delivered here, on which Eastern mills making smooth, loose-rolled sheets obtain ¼c. to ½c. per lb. advance.

Bars.—Several Eastern makers who have been accepting business under 1.20c., mill, have advanced their price to that basis, although in sharp competition 1.17½c. can still be done. The market, however, is decidedly firmer, even though the demand has not been particularly active. For first quarter shipment steel bars are quoted at 1.30c., delivered here.

Coke.—Prices of furnace coke are stiffer. Some Eastern consumers have bought against their recent inquiries at $1.65 to $1.70 at oven. In the majority of cases $1.75 is now quoted for the better grades for delivery over the first half. Prompt furnace coke is scarcer. Little new business is moving in foundry coke. Some moderate sales at $2.25 at oven, for near future delivery, are noted. The following range of prices, per net ton, is quoted for delivery in this vicinity:

Connellsville furnace coke	$3.75 to $4.05
Foundry coke	4.15 to 4.50
Mountain furnace coke	3.50 to 3.65
Foundry coke	3.95 to 4.40

Old Material.—The market has been rather quiet and prices, while strong, show practically no change. Buyers are giving little attention to the situation, being engaged with the usual mid-winter repairs and annual inventories. Greater activity is anticipated after the turn of the year. The following range of prices about represents quotations at which the ordinary current business for prompt shipment can be done for delivery in buyers' yards, eastern Pennsylvania and nearby points, taking a freight rate from Philadelphia varying from 35c. to $1.35 per gross ton, for shipment ranging from prompt to the remainder of the year:

No. 1 heavy melting steel scrap	$12.25 to $12.75
Old steel rails, rerolling (nominal)	14.00 to 14.50
Low phosphorus heavy melting steel scrap	15.50 to 16.00
Old steel axles	17.50 to 18.00
Old iron axles	22.00 to 23.00
Old iron rails	16.00 to 17.00
Old car wheels	12.50 to 13.00
No. 1 railroad wrought	15.50 to 16.00
Wrought iron pipe	11.75 to 12.25
No. 1 forge fire	10.25 to 10.75
No. 2 light iron (nominal)	6.75 to 7.25
Wrought turnings	9.00 to 9.50
Cast borings	8.25 to 8.75
Machinery cast	13.25 to 13.75
Railroad malleable (nominal)	11.75 to 12.25
Grate bars, railroad (nominal)	10.00 to 10.50
Stove plate	10.25 to 10.75

The Rogers-Brown Iron Company, Buffalo, N. Y., will blow in early in January the No. 3 furnace of its Susquehanna group at South Buffalo, which is one of the two furnaces the company has had under construction in the past 18 months.

Cleveland

CLEVELAND, OHIO, December 26, 1911

Iron Ore.—While the movement from docks is not heavy, shipments are better than they were at this time a year ago, and the liberal buying of pig iron indicates a good volume of such shipments this winter. Some new shipping orders have been received in the past few days. We quote prices as follows: Old range Bessemer, $4.50; Mesaba Bessemer, $4.25; old range non-Bessemer, $3.70; Mesaba non-Bessemer, $3.50.

Pig Iron.—There is a good buying movement in progress in foundry, basic and malleable iron. Contrary to expectations, the holiday season has not interfered with the activity. The market is firmer on all grades and sales are being made at higher prices. A consumer at Columbus who has an inquiry out for 10,000 tons of basic is understood to have bought a portion of it at $12.50, Valley furnace. Another basic sale is reported at $12.35. Other basic inquiries are pending aggregating about 20,000 tons. One local seller reports sales of iron during the week aggregating about 20,000 tons, about equally divided between foundry, malleable and basic. Another local selling agency has advanced its asking price 25c. a ton on all grades, now quoting No. 2 foundry at $13.50 and malleable at $13.25, Valley furnace. While a general advance in price has not been made by Cleveland furnaces on foundry grades, one seller has advanced its quotation to $13.25 at furnace for No. 2 foundry for outside shipment and is making sales at that price. There is still a good volume of inquiry for foundry grades. Sales have been mostly for delivery through the first half. We note the sale of 1500 tons of malleable at $13 and 2000 tons of foundry to a Tiffin manufacturer. Two sales of Northern and Southern aggregating 2500 tons are reported to consumers at Lansing, Mich. A northern Ohio furnace builder has an inquiry out for 2000 tons of Northern foundry. Southern iron is firmer, several sellers having advanced their asking price to $10.50, Birmingham, for No. 2. Some brands are still to be had at $10, however. We quote as follows for prompt shipment and for the first half, delivered Cleveland:

Bessemer	$15.15
Basic	13.25
Northern foundry No. 2	$13.25 to 13.50
Southern foundry No. 2	14.35 to 14.60
Gray forge	12.50
Jackson County silvery, 8 per cent. silicon	17.05

Coke.—The only activity is in small lots of foundry grades for prompt shipment. One local foundry just closed for its first half requirements but there are no other inquiries for contracts, although many foundries have not bought. A number of these will probably buy spot coke as needed. The scarcity of furnace coke for prompt shipment has resulted in a sharp advance, reports coming from the Connellsville region of sales at as high as $1.00 at oven. Standard Connellsville foundry coke is held at $2 to $2.15 per net ton, at oven, for spot shipment and $2.15 to $2.40 for contract.

Finished Iron and Steel.—Business has quieted down, as is usual during the holiday season, both in new orders and in specifications on contract. During the period of low prices mill agencies were very active in tying up consumers with contracts, and consumers of steel bars, plates and structural material are now mostly covered for their first quarter requirements at lower than present prices. Steel bars are firmly maintained at 1.15c., Pittsburgh, for spot shipment and first quarter delivery. A few new contracts have been closed at this price. The plate market is firmer. Mills generally are quoting plates at 1.20c., Pittsburgh, for spot shipment and the first quarter, and are getting orders at this price; the 1.15c. quotation, however, has not been withdrawn by some of the smaller mills. One leading producer has advanced its price for contracts to 1.25c. Structural material is quoted at 1.15c. to 1.20c., Pittsburgh, the former price being made by some of the sellers for round tonnages. Fabricators who have bid on some of the structural work now pending have secured protection during the past few weeks on the recent 1.10c. price, so that some of the work that will be let shortly will be based on the lower price of structural steel. Little new inquiry for structural material for building work is coming out. Bids for the 10,000 tons for the Michigan Central depot in Detroit will be received this week. The demand for sheets is fairly good. The new prices of 1.90c., Pittsburgh, for No. 28 black and 2.90c. for No. 28 galvanized appear to be firmly maintained. Railroads are buying track fastenings freely for the coming season. The demand for boiler rivets is quite active. A number of consumers have placed contracts for first half delivery at 1.55c., Pittsburgh. Structural rivets are quoted at 1.45c. to 1.50c. The demand for iron bars is not active; the price is unchanged at 1.20c., Cleveland.

Old Material.—While the market is quiet it has a firm tone. Dealers want to buy, but are not anxious to sell at present prices. They expect a good demand and an advance in prices soon after the first of the year. As a result little scrap can be had at a concession from present prices. Local steel mills are not actively in the market, although they might buy at attractive prices. Inquiry for old car wheels has caused their price to stiffen up somewhat. Dealers selling prices per ton, f.o.b. Cleveland, are as follows:

Old steel rails, rerolling	$12.75 to $12.75
Old steel rails	14.00 to 14.50
Steel car axles	17.50 to 18.00
Heavy melting steel	11.75 to 11.50
Old car wheels	13.25 to 13.50
Relaying rails, 60 lb. and over	22.50 to 23.50
No. 1 railroad wrought	10.50 to 11.00
No. 1 cast	11.75 to 12.00
Cast borings	9.50 to 10.00

The following prices are per net ton, f.o.b. Cleveland:

Iron rails	$18.50 to $19.00
Cast borings	6.25 to 6.50
Low phosphorus steel borings	6.75 to 7.00
Steel axle turnings	7.25 to 7.75
No. 1 machinery	9.00 to 9.50
No. 1 railroad wrought	11.00 to 11.25
No. 1 cast	11.00 to 11.50
Stove plate	9.00 to 9.25
Bundled tin scrap	11.00 to 11.50

Cincinnati

CINCINNATI, OHIO, December 27, 1911 (*By Telegraph*)

Pig Iron.—Considering the season the volume of business transacted the past week has been very satisfactory. For first half delivery a Kentucky melter took 1500 tons of No. 2 Southern foundry and about 500 tons each went to two central Indiana consumers. Illinois furnished several nice sized orders for Southern mixed grades and numerous smaller purchases have materially aided in promoting a more optimistic feeling. While the bulk of business transacted has been on the basis of $10, Birmingham, for first half shipment, several furnaces have withdrawn this price and are demanding 25c. to 50c. a ton more, and as those making this advance are sold several months ahead they feel justified in refusing business, even from old customers, at the prevailing prompt shipment quotation. A central Ohio manufacturer will doubtless close for 1700 tons of foundry iron this week, and a southern Ohio melter will also probably book 2000 tons of mixed Southern grades. It is rumored that an Ohio rolling mill has made a further purchase of 5000 to 10,000 tons of basic, to be shipped the first half of next year. For shipment over the next six months a southern Ohio firm bought 1000 tons of malleable, and for nearby delivery three 100-ton lots were also booked. Northern iron is stationary at $13, Ironton, for No. 2 foundry or malleable. Based on freight rates of $3.25 from Birmingham and $1.20 from Ironton we quote, f.o.b. Cincinnati, as follows for prompt shipment:

Southern coke, No. 1 foundry and 1 soft	$13.75 to $14.00
Southern coke, No. 2 foundry and 2 soft	13.25 to 13.50
Southern coke, No. 3 foundry	12.75 to 13.25
Southern coke, No. 4 foundry	12.50 to 13.00
Southern gray forge	12.50 to 13.00
Ohio silvery, 8 per cent. silicon	16.45 to 16.95
Lake Superior coke, No. 1	14.70 to 14.95
Lake Superior coke, No. 2	14.20 to 14.45
Lake Superior coke, No. 3	13.70 to 13.95
Basic, Northern	14.20 to 14.45
Standard Southern car wheel	25.25 to 25.50
Lake Superior car wheel	19.00

(By Mail.)

Coke.—It is reported that a Southern consumer contracted for a 12 months' supply of Wise County furnace coke, the quantity estimated around 5000 tons a month. While both furnace and foundry grades are not in strong demand, prices are firmer, especially in the Connellsville field, where 48-hr. brands have brought as high as $1.75 per net ton at oven for quick shipment. The average future shipment quotation is around $1.65. Pocahontas and Wise County prices are practically the same as those given for the Connellsville district. Foundry coke is quiet and is quoted at $2 for prompt movement and as high as $2.30 on contract business.

Finished Material.—Very little business is being transacted, and both mill agencies and dealers do not expect any improvement until about the middle of January. Current quotations are very firm, and 1.15c., Pittsburgh, is minimum on steel bars, with some not very desirable business booked at 1.20c. Local warehouse prices remain at 1.60c. on steel bars and around 1.70c. for structural material cut to lengths when desired.

Old Material.—The usual holiday season dullness prevails, and but little scrap material is changing hands. Dealers are not disposed to take on any further stocks just now, although a number of them look for a fairly brisk business during the remainder of the winter. The minimum figures given below about represent what buyers are willing to pay for delivery at their yards in southern Ohio and Cincinnati, and the maximum figures the selling prices f.o.b. at yards:

No. 1 railroad wrought, net ton	$9.75 to $10.50
Cast borings, net ton	4.50 to 5.00
Steel turnings, net ton	5.50 to 6.00
No. 1 cast scrap, net ton	9.50 to 10.25
Burnt scrap, net ton	6.50 to 7.00
Old iron axles, net ton	16.25 to 16.75
Bundled sheet scrap, gross ton	6.25 to 6.75
Old iron rails, gross ton	13.00 to 13.75
Relaying rails, 50 lb. and up, gross ton	20.75 to 21.50
Old car wheels, gross ton	10.50 to 11.00
Heavy melting steel scrap, gross ton	7.61 to 10.00

Birmingham

BIRMINGHAM, ALA., December 24, 1911.

Pig Iron.—Sales reported for the past week consist of 150 to 200 ton lots, with the aggregate of all engagements very small. An inquiry for 5000 tons, for delivery in the first half, has been made by a large pipe manufacturer, and a lot of 1000 tons of No. 3 foundry for shipment over the first quarter is still unclosed. There is a significant volume of business in the shape of small lots for delivery immediately after January 1, that is to be placed, but the outlook as a whole is perhaps not so encouraging as at the time of last report. There has been a very material shrinkage in the demand for foundry products, and in some instances new low levels for selling prices have been made. Such conditions have not only affected the views of melters as to providing for their future requirements, but have lessened the actual movement from furnace yards. The number of "holdups" against contracts that have recently become effective are given serious consideration and indicate that a much larger tonnage was engaged in many cases than was required. The percentage of last quarter bookings that will have to be carried over into the first quarter is not unusually large as shipments had been made at a very satisfactory rate until some 10 days ago, but instructions against first quarter engagements are being awaited with interest. Producers do not indicate any weakness in prices either for prompt or future deliveries, and the market is considered firm at a basis of $10, Birmingham. This price can be made applicable to deliveries covering the entire first half, but from certain furnaces only. With three of the furnace companies practically out of the market for any shipments after January 1, and another adhering to an advance of 25c. per ton on first quarter and 50c. per ton on second quarter shipments, only two concerns remain who are solicitous of additional business other than for spot delivery. This last can be had of practically all concerns at figures very close to the $10 basis, it being understood that some tonnage covered by warrants is obtainable at a lower figure than $10, Birmingham, in a cash transaction. We continue to quote the market for regular fracture grades as follows per gross ton f.o.b. cars, Birmingham, for shipment January through June:

No. 1 foundry and No. 1 soft	$10.50
No. 2 foundry and No. 2 soft	10.00
No. 3 foundry	9.50
No. 4 foundry	9.25
Gray forge	9.00
Standard basic	10.00
Off basic	9.50

Cast-Iron Pipe.—It is now understood that the tonnage of water pipe required at Portland, Ore., was divided between the United States Cast Iron Pipe & Foundry Company and the company located at Oswego, Ore. The latter will furnish certain sizes only, the bulk of the tonnage going to the United States Company. The figures at which this business was placed are not made public. Several small quantities of gas pipe are under consideration, and plans for some water works improvement at Southern points will soon add to the business in sight. All local plants have been closed down until after the holidays, but will resume operations with orders for sufficient tonnage on their books to warrant a steady output for 30 to 60 days. We continue to quote as follows, for water pipe, per net ton, f. o. b. cars here: 4 to 6 in., $23; 8 to 12 in., $22; over 12 in., average, $21, with $1 per ton extra for gas pipe. Special fittings are quotable at $45 to $50 per net ton at foundry.

Old Material.—The demand for all steel grades has improved and a liberal tonnage of wrought and machinery scrap is being disposed of. Very little interest in country grades is manifested, and in that particular direction the market is very weak. Some inquiry for iron and steel axles is pending, and there is a ready demand for old car wheels. Dealers' asking prices are as follows, per gross ton f. o. b. cars here:

Old iron axles (light)	$12.00 to $12.50
Old steel axles (light)	11.00 to 11.50
Old iron rails	11.00 to 11.50
No. 1 railroad wrought	10.00 to 10.50
No. 2 railroad wrought	8.50 to 9.00
No. 1 country wrought	6.00 to 6.50
No. 2 country wrought	5.50 to 6.00
No. 1 machinery	8.50 to 9.00
No. 1 steel	8.00 to 8.50
Tram car wheels	7.50 to 8.00
Standard car wheels	9.50 to 10.00
Light cast and stove plate	6.00 to 6.50

Finished Material.—Local interests report a liberal volume of specifications for bars and round iron during the week with the recent advance in prices fully maintained. The movement of wire continues very satisfactory and an advance of $1 per ton on wire nails was made effective December 15.

Formal charge of the properties of the Birmingham Coal & Iron Company will be taken January 1 by the Woodward Iron Company, the purchaser. No announcement has been made of any proposed changes in operations, but the offices of the company acquired will be moved from Birmingham to the Woodward furnace plant at Woodward, Ala.

The Bonnyman-Norman Coal & Iron Company has been organized for the sale of pig iron, coal and coke. James Bonnyman, who has been in charge of the properties of the Birmingham Coal & Iron Company for a number of years, is president; J. A. Norman, former sales manager of the same company, vice-president and treasurer; A. H. Andrew, secretary. The company will have offices at 907 Brown-Marx Building, in this city, and will establish branch offices at Atlanta, Ga., and New Orleans, La.

St. Louis

ST. LOUIS, MO., December 26, 1911.

Casting up of totals for the month and for the year has been in progress with the result that it has been found that the massed figures are larger than had been anticipated. Prices generally are more firmly held where they have not advanced during the week.

Pig Iron.—The week's business for the most part was made up of an aggregate of small tonnages, chiefly because the buyers of large quantities who are not covered evidently decided that there was not likely to be any exceptional change during the holiday week and that they could afford to wait until the first of the coming month and year. At that time considerable contracting for the second quarter is expected to make its appearance. Prices are firmer than at last report and No. 2 Southern, $10.25, Birmingham basis, is pretty generally observed, especially for second quarter delivery. Northern No. 2 is well held at $13.50, Ironton basis. Inquiries still unfilled include one for 1000 tons of malleable.

Coke.—There is a firmer tendency in coke, though it has not reached the proportions of a sharp advance. The best feature of the market is the disposition of consumers to request anticipation of their contracts in the shipments, which emphasizes the reports of increased consumption of pig iron. By-product coke is moving well at $5.10 delivered.

Finished Iron and Steel.—The aggregate tonnage of business booked runs daily into good figures in all divisions except, perhaps, the standard rails. In structural material the specifications have been very good for the period. A preliminary round-up of the year's business is reported to show a much handsomer total than was anticipated, the result of a repeated receipt of small orders pretty much all through the year whose aggregate had not been fully appreciated. A good many customers have been found to have increased their consumption over 1910 by 20 per cent. In bars the market is better and the orders have been very fair for the time of the year. In plates there has been very little doing, the needs in the car plants having been pretty well contracted for. In light rails the coal roads are taking some tonnage, but not more than 50 per cent. of what they should be taking at this season. This is believed to be largely the result of the anticipated strike of the miners April 1, the companies preferring to put themselves in the best financial position possible. The lumber interests are taking a little,

but not enough to regard it seriously. Only absolute needs are being covered, as in the coal districts. Track fastenings have been in fair demand at firm prices.

Old Material.—The scrap market is in better fettle than for weeks and prices generally are quotably higher. Inquiry is coming in from the mills direct and the dealers are still hustling to cover their shortages before the market gets out of their reach. The only list to come out the past week was that of the Chicago & Eastern Illinois, about 600 tons. This is expected to go at higher prices. A generally active market is looked for after the first of the year. We quote dealers' prices, per gross ton, f. o. b. St. Louis, as follows:

Old iron rails	$14.00 to $14.50
Old steel rails, rerolling	12.00 to 12.50
Old steel rails, less than 3 ft.	11.50 to 12.00
Relaying rails, standard section, subject to inspection	22.00 to 22.50
Old car wheels	13.00 to 13.50
Heavy melting steel scrap	11.50 to 12.00
Irregular, switches and guards	11.00 to 12.00

The following prices are per net ton:

Iron fish plates	$11.50 to $13.00
Iron car axles	18.00 to 19.00
Steel car axles	16.00 to 17.00
No. 1 railroad wrought	11.00 to 12.00
No. 2 railroad wrought	10.00 to 11.00
Railroad springs	10.50 to 10.75
Locomotive tires, smooth	14.00 to 14.50
No. 1 dealers' forge	9.50 to 9.75
Mixed borings	6.00 to 6.00
No. 1 busheling	9.00 to 10.00
No. 1 boilers, cut to sheet	8.50 to 9.00
No. 1 cast scrap	11.00 to 11.50
Stove plate and light cast scrap	8.50 to 9.00
Railroad malleable	9.00 to 9.50
Agricultural malleable	7.50 to 8.00
Pipes and flues	8.50 to 9.00
Railroad sheet and tank scrap	8.00 to 8.00
Railroad grate bars	8.00 to 8.50
Machine shop turnings	7.50 to 8.00

Buffalo

BUFFALO, N. Y., December 26, 1911.

Pig Iron.—The demand for the past week was unusually good, considering that it was the week before Christmas. It is estimated that 30,000 to 35,000 tons of foundry and malleable and a considerable tonnage of basic was sold in this territory for first and second quarter shipment. A good number of orders have also been received to-day, but producers do not expect the inquiry and placement to hold up during the mid-holiday week to as large a total as for last week, particularly as salesmen are not now aggressively in the field. Purchasers, with few exceptions, are asking for rush shipments on contracts and consumption is evidently more than keeping pace with furnace output. Price schedules remain practically unchanged, most sellers still quoting the same for second quarter delivery as for first quarter and prompt shipment. One furnace interest, however, announces that it has nothing to sell except for second quarter and its lowest price for any grade of iron is $13.75. We quote as follows, f.o.b. furnace, for second half delivery

No. 1 X foundry	$13.50 to $14.00
No. 2 X foundry	13.75 to 13.75
No. 2 plain	13.25 to 13.50
No. 3 foundry	13.00 to 13.25
Gray forge	13.00 to 13.00
Malleable	13.50 to 13.75
Basic	13.00 to 13.25
Charcoal	15.50 to 17.00

Finished Iron and Steel.—The demand continues fairly good in general lines, although the market shows some indications of holiday quiet, new buying being less in volume for the current than for the preceding week. Customers whose contracts expire at the end of the year, and who have not yet covered for first quarter and first half requirement, are now closing, and there are pronounced indications of much larger business after the first of the year. While specifications against contracts have been of fair volume, many users are deferring specifying until after inventories are completed, being now engaged in that and other work incident to the closing of the year. In sheets, both black and galvanized, the demand is increasing and more tonnage is moving. Prices are firmer, with some probability of an advance about the first of the year. In fabricated structural material business continues active, with a stronger tendency in prices. The Buffalo Structural Steel Company has secured the contract for fabrication and erection of the steel for the new cathedral for the Roman Catholic diocese of Buffalo, taking 600 tons. The Jones & Laughlin Steel Company has been awarded a contract for steel for the Lockwood store and office building, 250 tons, and the Charles F. Ernst Sons Iron Works was low bidder for the 150 tons of steel required for the remodeled Teck Theater. The New England Structural Steel Company, Worcester, Mass., has received a contract for the 1200 tons of steel required for the 12-story Bancroft Hotel in that city, for which Buffalo architects drew plans and received bids. Plans are under way for the Buffalo terminal passenger station for the Delaware, Lackawanna & Western Railroad at the foot of Main street, which, with the elevated structure for entrance, will require about 5000 tons.

Old Material.—The market shows considerable betterment in demand, and most dealers are inclined to hold for higher prices, being of the opinion that there will be a further enlargement in demand after the holiday and inventory period and a corresponding improvement in prices. We quote as follows, per gross ton, f.o.b., Buffalo:

Heavy melting steel	$11.00 to $11.50
Low phosphorus steel	13.75 to 14.00
No. 1 railroad wrought	11.00 to 11.50
No. 1 railroad wrought mixed with No. 1	10.50 to 11.00
Old steel axles	18.50 to 19.00
Old iron axles	22.00 to 22.50
Old car wheels	12.75 to 13.00
Railroad malleable	13.75 to 14.00
Boston plate, sheet	13.75 to 14.00
Locomotive grate bars	11.00 to 11.25
Pipe and tank	9.75 to 10.00
Wrought iron and soft steel pipes	7.50 to 7.75
Cast borings	7.50 to 7.50

Boston

BOSTON, MASS., December 26, 1911.

Old Material.—The market as a whole remains firm, the improvement noted a week ago continuing. Prices are unchanged. The prices quoted below are those offered by the large dealers to the producers and to the smaller dealers and collectors, per gross ton, carload lots, f.o.b. Boston and other New England points, taking Boston rates from eastern Pennsylvania points. In comparison with Philadelphia prices the differential for freight of $2.30 a ton is included. Mill prices are approximately 50c. a ton more than dealers' prices.

Heavy melting steel	$11.00 to $11.50
Low phosphorus steel	13.75 to 14.00
Old steel axles	18.50 to 19.00
Old iron axles	22.00 to 22.50
Mixed shafting	12.75 to 13.00
No. 1 railroad wrought	11.00 to 11.25
Wrought pipe	7.50 to 7.75
Stripped turnings	7.00 to 7.00
Cast borings	7.00 to 7.00
No. 1 machine cast	11.00 to 11.50
Wrought iron and soft steel pipes	7.50 to 7.75
Cast borings	7.00 to 7.00
Machine shop turnings	4.50 to 5.00
Wrought iron and soft steel tubes	6.00 to 6.00
Cast borings	4.50 to 5.00
Malleable cast	7.50 to 8.00
No. 1 machine cast	7.50 to 7.75
Grate bars	7.00 to 7.00
Stove plate	7.00 to 8.50

The Perry, Buxton & Doane Company, the new Massachusetts corporation which will conduct the iron and steel scrap and metal business formerly carried on by the William H. Perry Company, E. Burton & Sons Company, Buxton & Doane Company and F. R. Phillips & Sons Company, will after January 1 have its main office at 307 to 311 Atlantic avenue, Boston, opposite Rowe's Wharf, with a branch office in the Pennsylvania Building, Philadelphia. Yards and local offices will be continued at Chelsea and Lowell, Mass.; Providence and Pawtucket, R. I.; Portland, Maine; South Boston and Worcester, Mass. Practically no change will be made in the personnel of the management or in the methods of operation, but improved facilities will enable the company to better serve the requirements of customers.

The German Iron Market

Buyers Find Difficulty in Placing Orders

BERLIN, December 14.

The strong tone of the market continues unchanged, but there is less in the way of price improvement to report. A steady increase of orders is mentioned. The demand for crude steel of all kinds is so heavy that difficulty is experienced by buyers in getting their orders taken and this naturally causes the greater pressure among them to make their arrangements as far ahead as possible, and at as early a day as they can.

Additional evidence of the strength of the pig-iron market is at hand. At a conference several days ago between the Luxemburg-Lorraine and Essen groups of the syndicate it was reported that sales for the first half of 1912 have proceeded at an extraordinarily ac-

mated pace, and that some of the furnaces are already sold out for that period. A movement is also on foot in the syndicate looking toward the opening of sales for the second half-year at an early date, and at a still higher scale of prices. The big concerns of mixed production are in part not only unable to sell any iron but are even buying additional quantities for their own consumption. Hence supplementary orders for small amounts for delivery before the end of the year still appear in the market. The Luxemburg-Lorraine district reports quite unusual activity in foundry iron, with a heavy foreign demand. Shipments this month are unusually heavy, and the export movement has grown brisker, in view particularly of the fact that Russia has now decided to admit a certain quantity of pig duty-free into Russian Poland. The pressure of mills there to secure foreign iron is all the more remarkable when the heavy production of the local furnaces this year is taken into consideration. The production of Russian Poland for 11 months to the end of November showed an increase over last year of above 15 per cent. The market for scrap remains strong and active; most consumers have covered their requirements for the first quarter of 1912.

The calls for delivery of steel billets on existing orders are still running considerably in excess of allotments, although the Union turned over some of its orders to outside open-hearth concerns. The export demand has considerably increased and prices for foreign delivery are still rising. Billets for export are now sold at 88 to 90 marks, f.o.b. seaport, and muck bars at 90 to 92 marks. Shipments of beams and other structural shapes continue unusually large for the season. The mills are working so steadily on current orders that they have not been able as yet to begin replenishing their stocks, as they are accustomed to do at the beginning of winter. The export business in heavy steel rails continues very good, with new orders continually coming into sight. The export price ranges between 105 and 110 marks, f.o.b. seaport.

Steel bars have grown still more active, particularly for the export trade, which is sending in considerable orders for the quickest possible delivery. Prices for export continue rising. Dealers are complaining that the mills are slow in delivering, their orders having mostly been placed when prices were lower than now; the mills are giving the preference to more recent purchases at higher prices. Iron bars are being turned out at about the full capacity of the mills, and prices are firm. In band iron buying for next year has grown more active, and this applies also to cold-rolled strips. For plates the demand remains extremely active, as previously reported. Wire rods show a steadily improving tendency, with prices moving upward. Wire dealers are buying more actively, as they need considerable amounts for the spring trade.

Syndicate Affairs

The outlook for the prolongation of the Steel Works Union is reported this week to be considerably less satisfactory. The negotiations between the Coal Syndicate and outside mines, which had been proceeding for some weeks, were broken off several days ago without result, and this is expected to react unfavorably upon the Union's renewal, as the fate of the two great organizations is generally regarded as hanging together. A decidedly pessimistic tone begins to be heard in the iron trade about the future of the Union. At the annual meeting several days ago of the Rombacher Hüttenwerke (Lorraine) the president of the board expressed himself regarding the prospects in very cautious terms. He spoke of the great difficulties growing out of the heavy demands for allotments by some of the big concerns; the strongest expression of confidence that he would venture to make was that "the hope was not to be abandoned that the Union may be renewed, although in a changed, probably more restricted, form."

According to the latest information the allotment claims are now even greater than previously reported, amounting to not less than 5,250,000 tons total increase, 4,000,000 tons of which is for class B products. The increases asked for in bars alone amount to not less than 2,000,000 tons, whereas existing allotments are 3,500,000 tons. Allotments in wire-rods now amount to 750,000 tons, but the new applications would bring the total up to 1,250,000 tons, and the total asked for in tubes is 396,000 tons, against 221,800 tons now. Similarly, allotments in plates would have to be raised to 1,600,000 tons, against 1,030,000 tons at present. The heaviest demands for new allotments came from the Luxemburg-Lorraine district, which also includes the Saar region, would reach 6,500,000 tons of crude steel, or 40 per cent. of the total allotments.

It is reported that a feeling of anxious concern exists among the member companies over the state of things created by these demands. To make matters worse, applications have again been sent in to the Union for a 20 per cent. increase of allotments in bars, plates and tubes, taking effect at once and holding till the end of June. Some of the applicants even ask that the increase be made retroactive to the first of last April or July. Leading spirits in the organization are described as being exasperated to a high degree over these renewed applications, which have already been voted down several times; and it is predicted that there will be some stormy talk at the meeting of the Union next week.

It is reported that the pig-iron and coal syndicates are considering the question of abolishing the drawbacks that they give on finished products for encouraging the export trade. This means that export prices have now risen to so near the home market level that no special encouragement for export is needed.

The Belgian market has again sent in news of rising prices. This time iron bars and thin plates have risen for export, the former to 100 to 102 shillings, and the latter to 129 to 131 shillings. The whole Belgian trade is showing a steady upward movement that gains in intensity from week to week.

New York

NEW YORK, December 27, 1911.

Iron Ore.—Furnaces which use a certain percentage of New Jersey ores have been in the market in the past two weeks and sales of 100,000 to 150,000 tons have been made at practically the prices for these ores which prevailed in earlier months of this year, representing a range of 7¼c. to 7½c. a unit for ores running about 60 per cent. in iron. There is some inquiry from Eastern Pennsylvania for low phosphorus ore to be used in mixtures containing Lake Champlain ores. There has been some canvassing of the situation by Lake Superior ore sellers to ascertain what demand there may be for Lake ores in the East in 1912 Eastern furnaces companies contend that only a material reduction in the 1911 price of Lake ores would warrant their use in competition with foreign ores. Cleveland ore firms are not willing at this time to say, however, how much of a reduction, if any, they will make for 1912, and it is considered doubtful policy to make a preferential price on such ores shipped into Eastern districts, even though some precedents of this sort can be cited.

Pig Iron.—The principal buying of the past week in this district has been done by a large locomotive company which in ten days has probably bought about 10,000 tons for plants at Pittsburgh, Dunkirk, Richmond and Schenectady. It is believed further buying will be done for the last-named plant. Virginia, Eastern New York, Buffalo and Western Pennsylvania furnaces are reported to have shared in this business, rather less iron going to the Buffalo district than in some preceding contracts of this company. A sale of 1000 tons of iron for delivery in the first half of 1912 was made this week to a New York State foundry. As noted one week ago Eastern buying is considerably less than in the first half of the month and the quietness of the market is not so much due to the season as to the fact that the principal melters have supplied themselves with iron for from three to six months ahead. One Lebanon Valley furnace is about going in but one or two small furnaces in Eastern Pennsylvania are likely to go out. It does not appear that any actual advance is being paid by buyers of foundry iron, though furnaces in the Buffalo district and some in Eastern Pennsylvania have advanced their quotations 25c. to 50c. a ton where delivery throughout the first half of next year is called for. Quotations are as follows for northern iron at tidewater: No. 1 foundry, $15 to $15.25; No. 2 X, $14.75; No. 2 plain, $14.50 to $14.75. For southern iron we quote $15 to $15.25 for No. 1 foundry and $14.50 to $14.75 for No. 2 foundry.

Finished Iron and Steel.—A falling off in demands for immediate delivery and diminished attention to the price situation show that the holiday condition has arrived in the trade. There is substantially no new inquiry of size, but in the structural field it is confidently expected that a number of large pending projects will be closed before January 1. While prices remain at last week's figures, there still seems to be a

lack of stability in quotations on fabricated work and structures promising quantities of material involving few sizes are being strongly competed for. At least one other structural possibility, that of the Allyn House, Hartford, Conn., 1500 tons, has been relegated to the class being redesigned. The especially live structural work includes the Auerbach candy factory, 2500 tons; the 20-story Hess loft building, Twenty-sixth street and Fourth acenue, 3000 tons; the Bing & Bing loft at Twentieth street and Broadway, 4500 tons, and the Cooper Union building, 1200 tons. The Yale & Towne Mfg. Company, it is stated, will erect a 12-story building on East Fortieth street and John Downey is contractor. The Baldwin Locomotive Works structure at Eddystone, Pa., 3500 tons, has been contracted for by the McClintic-Marshall Construction Company; the Dock street pier, Philadelphia, 1000 tons, has been awarded to the Philadelphia Steel & Wire Company; the American Bridge Company is to supply 1300 tons of bridges for the Buffalo, Rochester & Pittsburgh; the New England Structural Company, 1500 tons, for the Gilchrist building, Boston; the Wisconsin Bridge & Iron Company, 1400 tons, for the Grand Trunk; the Phoenix Iron Company, 200 tons, for the Pennsylvania Railroad at Newark, N. J.; Cambria Steel Company, 800 tons, for the Detroit Edison Company's extension; the Virginia Bridge & Iron Company, 350 tons, for bridges for the Southern Railroad, and the Phoenix Iron Company, 200 tons, for two bridges for the Scranton & Binghamton Railroad. The New Haven road has an inquiry out for a 150-ton bridge at Ferry street, New Haven, and bids are being taken for a 12-story building on West Twenty-fifth street, New York, for the Building & Engineering Company, 900 tons. Bids were taken December 26 for the New York Central for three bridges totaling 350 tons. Quotations are: Steel bars, plates and plain structural material, 1.31c. to 1.36c.; bar iron, 1.2[illegible]c. to 1.32½c., all New York. Plain material and plates from store, New York, 1.60c. to 1.70c.

Cast Iron Pipe.—No developments of importance have occurred this week. Carload lots of 6-in. are quoted at $22 to $23 per net ton, tidewater.

Old Material.—The market is exceedingly quiet, but prices are firmly held, dealers looking forward to a much better demand after the turn of the year. As the weaker holders have been pushing their scrap on the market during the late dullness, and some of the largest dealers are no longer active factors, it is believed that the tonnage of any one class of material now being held is not very heavy, particularly good steel scrap. Dealers' prices per gross ton, New York and vicinity, are as follows:

Old girder and T rails for melting	$10.25 to $10.50
Heavy melting steel scrap	10.25 to 10.50
Relaying rails	20.50 to 21.00
Rerolling rails, unbonded	12.00 to 12.50
Standard bammered iron car axles	70.00 to 70.50
Old steel car axles	15.50 to 16.00
No. 1 railroad wrought	12.50 to 13.00
Wrought iron track scrap	12.00 to 12.50
No. 1 yard wrought, long	11.00 to 11.50
No. 1 yard wrought, short	10.75 to 10.50
Light iron	4.75 to 5.00
Cast borings, clean	6.50 to 6.75
Mixed borings and turnings	5.50 to 5.75
Wrought turnings	6.75 to 7.00
Wrought pipe	9.75 to 10.00
Old car wheels	12.00 to 12.50
No. 1 heavy cast, broken up	11.00 to 11.50
Stove plate	8.75 to 9.00
Locomotive grate bars	9.00 to 9.50
Malleable cast	10.00 to 10.50

Ferroalloys.—With large demands still unsatisfied, the ferroalloys maintain their prices firmly in New York. For 80 per cent. ferromanganese $41, Baltimore, is asked and for 50 per cent. ferrosilicon $70. Pittsburgh. Sales are reported at those figures, which, however, might be shaded in deals for large lots. The trade is quiet

---

The annual meeting of the Society of Automobile Engineers will be held in New York City January 18, 19, and 20. This is during the week of the commercial vehicle division of the automobile show at Madison Square Garden. The sessions of the society will take place in the assembly hall of the same building. Among the papers named on the advance programme of the meeting are the following: "Compound Gas Engines and Their Efficiency," by Eugene P. Batzell; "Definitions in Connection with Physical Properties of Steel," by Henry Hess; "Silent Chains," by Chester S. Ricker; "Balance of Motors," by Ernest R. Fried; "Self Starters for Gasoline Motors," by J. W. Fitzgerald; "Multiple Disk Clutches," by Joseph A. Anglada. Several divisions of the now famous Standards Committee will have reports to present. The society now has 1200 members.

Metal Market

NEW YORK, December 27, 1911.

The Week's Prices

Cents Per Pound for Early Delivery.

	Copper, New York.		Tin, New York.	Lead, New York.	Lead, St. Louis.	Spelter, New York.	Spelter, St. Louis.
Dec.	Lake	Electro-lytic					
21	14 12½	14.00	44.80	4.45	4.35	6.30	6.15
22	14 25	14.12½	44.90	4.45	4.35	6.30	6.15
23	14 25	14.12½		4.45	4.35	6.35	6.20
26	14.25	14.12½	45.00	4.45	4.35	6.35	6.20
27	14 25	14.12½	45.25	4.45	4.35	6.35	6.20

Trade in metals has assumed an almost nominal aspect as a result of the holidays, but the dullness has not affected prices, which generally are firm and steady. No special features appear in any metal.

New York

Copper.—The copper market is strong and predictions are free that prices will stiffen still more. To-day electrolytic is quoted at 14.12½c. and Lake at 14.25c., prices which have ruled firmly for almost a week. There has been fair buying. Many large consumers have been holding off, but they may have to meet the prevailing prices for there are no signs of any weakness in quotations. Publicity was given late last week to the statement that an English syndicate had practically cornered the European market and following this came a report that American interests also were heavily interested in speculation to control the market. Without question speculation has played a large part at home and abroad. Here the big holders are understood to have unloaded to a considerable extent on the weaker operators. In London spot copper is quoted to-day at £63 10s. and futures at £64 7s. 6d. Exports this month have amounted to 28,676 tons.

Pig Tin.—The market in pig tin has been almost at a standstill in all save prices during the week, made so by the Christmas holidays and the consequent closing of the London and New York exchanges from Friday until to-day. What business has been done has been subject to frequent fluctuations in price, but domestic buying has been very light. A little weakness developed a week ago to-day and became more pronounced Thursday as a result of freer offerings of both spot and futures. Following Christmas a stronger feeling has developed, and to-day tin is quoted in New York at 45.25c., an advance of ¼c. based on early London advices. No considerable activity in tin is expected until after January 1. Spot tin was quoted in London this morning at £206, futures at £191 15s. Arrivals during the months have been 3488 tons and the amount afloat 1995 tons.

Tin Plates.—There is little or no change from the conditions of last week at the sales end, although manufacturers have opened more mills and are busy with the big orders already booked. Good buying is expected in the early part of the new year. Prices are unchanged, $3.64 being quoted in New York for 100-lb. coke plates. The price of tin plates laid down at Swansea, Wales, remains unchanged at 13s. 7½d.

Lead.—The lead market is dull and stagnant and has been so throughout the week. The New York price is unchanged at 4.45c. and in St. Louis 4.35c.

Spelter.—The week in spelter has been extremely quiet, although a little more strength has developed in the last two days, due probably to the appearance in the market of independent sheet iron galvanizers. The prices, which probably are subject to shading, are 6.35c., New York, and about 6.20c., St. Louis.

Antimony.—The antimony market is dull. Cookson's is quoted at 7.75c. to 7.87½c.; Hallett's at 7.60c. to 7.70c., and Hungarian and Chinese grades at 7c. to 7.12½c.

Old Metals.—Prices continue to advance. Dealers' selling prices are as follows:

	Cents per lb.
Copper, heavy and crucible	13.50 to 14.00
Copper, heavy and wire	13.25 to 13.50
Copper, light and bottoms	12.00 to 12.25
Brass, heavy	9.25 to 9.50
Brass, light	7.25 to 7.50
Heavy machine composition	11.25 to 11.50
Clean brass turnings	8.75 to 9.00
Composition turnings	9.50 to 10.00
Lead, heavy	4.25
Lead, tea	4.00
Zinc, scrap	5.25

Chicago

DECEMBER 26.—The activity in copper continues but an apparent pressure to sell has made prices a little easier. Tin has fluctuated somewhat during the week and at the close is held less firmly. Old metals, while not in demand, have benefited as a result of better market conditions. We quote at Chicago as follows: Cast

ing copper, 14c.; Lake, 14.25c., in carloads, for prompt shipment; small lots, ¼c. to ⅜c. higher; pig tin, carloads, 45.50c.; small lots, 47.50c.; lead, desilverized, 4.40c. to 4.45c., for 50-ton lots; corroding, 4.55 c. to 4.60c. for 50-ton lots; in carloads, 2½c. per 100 lb. higher; spelter, 6.30c. to 6.40c.; Cookson's antimony, 8.75c., and other grades, 7.75c. to 8.25c., in small lots; sheet zinc is $8.25, f.o.b. La Salle or Peru, Ill., less 8 per cent. discount, in carloads of 600-lb. casks. On old metals we quote buying prices for less than carload lots: Copper wire, crucible shapes, 11.75c.; copper bottoms, 10.50c.; copper clips, 11.50c.; red brass, 10.50c.; yellow brass, 8.25c; lead pipe, 4c.; zinc, 5c.; pewter, No. 1, 26c.; tinfoil, 33c.; block tin pipe, 38c.

St. Louis

DECEMBER 25.—The metal markets for the past week have been strengthening up a bit. Lead is back to previous quotations, having reached 4.47½c. and being well held. Spelter is strong at 6.25c., with holders asking 6.30c. Tin is markedly higher at 45.40c. Lake copper is firmer at 14.72½c., and electrolytic, 14.60c. Antimony is quoted at 8.22½c. In the Joplin ore market during the week zinc blende showed a maintenance of the gain of last week and the top price was $47 per ton, ranging down to $40 with the grades offered. Higher prices are looked for. The top price for calamine was $30 per ton, with a range down to $22, according to grade. Lead ore was strong, bringing $60 to $64 per ton in the central camps, but the outlying districts quoted lower prices. On miscellaneous scrap metals we quote as follows: Light brass, 4.50c.; heavy brass and light copper, 8.50c.; heavy copper and copper wire, 9.50c.; zinc, 3.50c.; pewter, 20c.; tin foil, 29c.; tea lead, 3c.

Iron and Industrial Stocks

NEW YORK, December 27, 1911.

Prices of securities have been quite steady, the market influences now tending to sustain values. Great Northern Ore certificates advanced sharply on reports that the prospecting conducted by the United States Steel Corporation had uncovered much more ore than had been originally estimated. The range of prices on active iron and industrial stocks from Wednesday of last week to Tuesday of this week was as follows:

Allis-Chalmers, com...	15	Ry. Springs, com	30½- 31¼
Allis-Chalmers, pr...	8 - 8⅝	Republic, com	27½- 28
Baldwin Loco., pr...	103¾-104	Republic, pr	84 - 85¼
Beth. Steel, com	30 - 30½	Pipe, com	16¾- 17
Beth. Steel, pr	59¾- 61¾	Pipe, pr	51 - 52
Can. com	10¾- 11	U. S. Steel, com	68⅜- 69⅝
Can. pr	89⅜- 90	U. S. Steel, pr	111 -111⅝
Car & Fdry., com	53¾- 55	Westinghouse Elec	67¾- 70⅛
Steel Foundries	33 - 33½	Va. I. C. & Coke	69
Colorado Fuel	27½- 28	Am. Sug., com	50
General Electric	154½-156	Chi. Pneu. Tool	46½- 46⅝
Gr. N. Ore Cert	35⅝- 40⅞	Cambria Steel	44¼- 44¾
Int. Harvester, com.	109 -111	Lake Sup. Corp	26⅛
Int. Harvester, pr	120	Warwick	11½- 11⅞
Int. Pump, pr	83	Crucible Steel, com.	12¼ - 12¾
Locomotive, com	38⅜- 37⅝	Crucible Steel, pr	82 - 83
N. Enam. & St. com.	12 - 13¾	Hyde Walk. Ref., com	40
Pittsburgh Steel, pr	101		

Dividends Declared

The Westinghouse Electric & Mfg. Company, regular quarterly, 1¾ per cent. on the preferred stock, payable January 15.

The Vulcan Detinning Company, regular quarterly, 1¾ per cent. on the preferred stock, payable January 20.

The American Rolling Mill Company, regular quarterly, 1½ per cent. on the preferred stock and 3 per cent. on the common stock, payable January 15.

An independent boxboard manufacturer estimates that in the last few years shareholders of boxboard concerns in the United States have lost approximately $75,000,000. The greater portion of this loss has been due to the impossibility of making trade agreements within the Sherman law. The producing capacity is far in excess of consumptive requirements.

The litigation between the Krupps and the Midvale Steel Company relating to armor plate patents reached the United States Supreme Court last week, an appeal being filed by the Krupp interests. In the lower court the suit was dismissed for lack of evidence.

Personal

It has been for some time the purpose to establish our Pittsburgh editorial office on a footing more fully recognizing the importance of that district from the standpoint of market as well as of manufacturing and technical developments in iron and steel. We are pleased to announce that the carrying out of this plan is now made possible by the appointment of Robert A. Walker as Pittsburgh resident editor of *The Iron Age* and that after January 1 Mr. Walker will devote himself entirely to our editorial interests. He has long been connected with the publications of the David Williams Company in the Pittsburgh office, and for the past 25 years has been both business and editorial manager in that district. It need hardly be said, that in view of his thorough familiarity with the industry there and his long acquaintance with those who are making its history, the new arrangement is a distinct advance step.

W. B. Robinson, for the past year Philadelphia manager of *The Iron Age* and Iron Age-Hardware, has been appointed Pennsylvania manager of *The Iron Age*, in charge of advertising, with headquarters at both Pittsburgh and Philadelphia. Mr. Robinson is well known to the iron and steel and metal working trades in the Pittsburgh district from more than five years' successful connection with iron trade journalism in that field. The new appointment is effective January 1.

S. George Freund has opened an office as consulting engineer for foreign trade at 100 Broadway, New York. He is prepared to assist American and German manufacturers in matters relating to import, export and manufacture and the exploitation of patents. He was connected with the electrical engineering department of the Interborough Rapid Transit Company during the construction of the subway and has been engaged in other engineering work in this country. Since 1901 he has been the American correspondent for the German Electrotechnische Zeitschrift. He has just returned from Europe, where he opened an office at Grunewaldstrasse 99, Berlin.

Lionel Samuel, director and joint manager of Cammell Laird & Co., of New York, is not seeking re-election for the coming year, his personal affairs requiring his entire attention. As general agent of the English company, he established its offices here some years ago. Mr. Samuel is not only well known in New York but also in Mexico and Central and South America, with some of whose governments he has had large business relations.

C. E. Flint has resigned his position as manager of the supply department of Manning, Maxwell & Moore, Inc., to become president of Flint & Chester, Inc., which will be ready January 1 to conduct a business exclusively in railroad, machinists' and contractors' supplies at 237-239 Lafayette street, New York. A. T. Chester is secretary and treasurer.

A. R. Dwight, formerly with A. M. Castle & Co., will be connected after January 1 with Theodore Geissmann & Co., Inc., Commercial National Bank Building, Chicago, mill representatives for iron, steel and wire products.

S. T. Wellman, who has been in California for the past year, engaged chiefly in an investigation of electric smelting, was injured recently by falling from a platform, sustaining a compound fracture of the leg.

The W. Bingham Company Changes Ownership

The W. Bingham Company, Cleveland, Ohio, wholesale and retail dealer in hardware and manufacturers' and mining supplies, has been reorganized under new management, and its capital stock has been increased from $400,000 to $1,000,000. The control of the company has passed to Henry L. Thompson, vice-president and general manager of the Bostwick-Braun Company, Toledo, Ohio, and to William H. Knight, secretary of the same company. J. E. Greene, the present president of the company, and some of the other officers will retire. The officers of the reorganized company will be as follows: C. W. Bingham, president; H. L. Thompson, vice-president and general manager; William H. Knight, secretary and treasurer. The company will enlarge its present quarters considerably.

Obituary

The friends of Charles Kirchhoff, who was for so many years editor of *The Iron Age*, will be pained to learn of the death of his mother which occurred at his home, 244 Riverside Drive, New York, December 21. She had attained an advanced age, 83 years.

FREDERICK C. KLEIN, Pittsburgh, president of the Klein-Logan Company, manufacturer of railroad tools, died December 21, aged 86 years. He was born in Germany, but came to this country 65 years ago. He located first in Albany, N. Y., then removed to Cleveland, Ohio, and finally settled at Pittsburgh in 1848, when he became engaged with his brother in the manufacture of soap. At the outbreak of the Civil War he enlisted in the Fifth Regiment of Pennsylvania, heavy infantry, and served a year as lieutenant. He then became a partner with his brother in the Birmingham Tool Works, located on the South Side. In 1868 the firm of Klein & Logan was organized; incorporating in 1891. He was twice married and leaves a widow and three sons

ARNOLD TANZER, treasurer of the International Steam Pump Company, and a writer of editorials and book reviews for the magazines, died December 21, at his home in New York City, aged 71 years. He was born in Prague and was graduated from the College of the City of New York in 1859. He was one of the founders of the Standard Club, the Purim Association, and the Young Men's Hebrew Association.

ARTHUR W. PARMELEE, president of the American Card Clothing Company, and former president and treasurer of the Wire Goods Company, died December 23 at his home in Worcester, Mass., aged 69 years. He was born in Utica, N. Y., and began his career as a clerk in his father's hardware store in Buffalo.

DAVID J. THOMAS, for many years connected with the Sterret-Thomas Foundry Company, Pittsburgh, died December 12, aged 79 years.

ROBERT CHRISTIE, head of the Christie Machine Works, San Francisco, Cal., is dead.

The Buffalo Union Furnace Company's Industrial Railroad Case.—The Interstate Commerce Commission has merged the Buffalo Union Furnace order regarding its industrial railroad with the commission's general inquiry into the matter of allowances to short line railroads serving industries, docket No. 4181. At the same time it postponed indefinitely the effective date of the order, with the intimation that such date would be set as soon as there is a result in No. 4181. In the meantime, however, the complainant in the furnace case is allowed to proceed with the presentation of proof as to the amount of reparation that should be awarded in compliance with the terms of the order which, but for this action, would have become effective January 2. The postponement of the effective date is the result of agreement among counsel for the railroads and the complainant. The subject matter of No. 4181 is being inquired into by the Stanley Committee of the House of Representatives

Farrar & Trefts and East Buffalo Iron Works Combine.—The business of Farrar & Trefts, Buffalo, N. Y., builders of engines, boilers and general machinery, and of the East Buffalo Iron Works, maker of gray iron castings, has been consolidated under the name of Farrar & Trefts, Inc. The capital stock of the incorporated company is $400,000. The officers of the consolidated company will be George M. Trefts, president; John C. Trefts, vice-president; W. A. McDougal, treasurer and general manager, and Edward Oldman, secretary. Both plants will continue to be operated, and the offices will be at 60 Perry street.

Dienelt & Eisenhardt, Inc., machinists and engineers, 1504 North Howard street, Philadelphia, Pa., state that the recent death of Almon P. Wint, secretary of the corporation, has caused no interruption to the business. William F. Siegener, president, and Philip J. Mitchell, treasurer, are both men of wide practical experience and fully conversant with every detail of the corporation's business and policy.

Pittsburgh and Vicinity Business Notes

The Howard Axle Works of the Carnegie Steel Company, at Homestead, Pa., is now running to full capacity for the first time in three years, about 400 men being employed.

An action over an interest valued [illegible] in the business of Dilworth, Porter & Co., Ltd., manufacturers of railroad spikes and other products, was instituted at Pittsburgh last week by Elizabeth Louise Dilworth, widow of Charles R. Dilworth, who states that by her husband's will she was to have his interest in the firm. She asks that the members of the firm be enjoined from exercising rights in her share and that they admit her to ownership.

The Cambria Steel Company, Johnstown, Pa., is building a large addition to its electric power department located between Nos. 5 and 6 blast furnaces and the Pennsylvania Railroad. Some orders for electrical equipment have been placed and more will be needed.

V. Q. Hickman, Union Bank Building, Pittsburgh, is furnishing 25 miles of 2 and 3-in. line pipe to the High Grade Oil Refining Company, Butler, Pa. This makes a total of 70 miles of pipe furnished to this buyer by Mr. Hickman, all of which has been rolled at the pipe mills of the Youngstown Sheet & Tube Company.

Bids are being taken by the Carnegie Technical Schools, Pittsburgh, for a four-story building to be used by the School of Applied Science, which will cost $350,000. James L. Stuart, Oliver Building, Pittsburgh, is consulting engi-

A Huge Pennsylvania Locomotive.—One of the largest locomotives in the world has just been built for the Pennsylvania Railroad. It will be tried out in freight service on steep grades of the mountains in western Pennsylvania, and if it proves satisfactory this type, known as the HH1, may be adopted. It is longer than the Pennsylvania's new all-steel passenger coaches. From the point of the pilot to the pulling face of the coupler on the rear of the tender the distance is 98 ft. 3¾ in. Its weight in working order, tender loaded, is 668,900 lb., being 238,000 lb. heavier than the class K2, the heaviest passenger engine, and 272,600 lb. heavier than the class H8b, the heaviest freight engine which the Pennsylvania is now using. There are four cylinders, each having a diameter of 27 in. and a stroke of 28 in. Each of the 61 driving wheels is 56 in. in diameter. The steam pressure is 160 lb. The inside dimensions of the fire box are 12 ft. ⅛ in. x 8 ft. ¼ in. The tender will hold 9000 gal. of water and 30,000 lb. of coal.

Preparations are being made by the Grand Trunk Railroad to rebuild the International Bridge at Buffalo so as to provide an additional track and also passageways for vehicles and pedestrians. Soundings have been made to determine the locations of the piers, which have to be on bed rock because the current at this point has a velocity of eight miles an hour. The cost of the bridge will be about $1,000,000.

The Globe Foundry Company, Port Chester, N. Y., has been thrown into bankruptcy by merchandise creditors, at the request of whom the court has appointed John H. Mueller, 258 Broadway, New York, temporary receiver. In a prior reorganization of the company he had acted as one of the trustees and is therefore familiar with the business. The liabilities are placed at $150,000 and the assets at $65,000.

The Worcester Pressed Steel Company, Worcester, Mass., is erecting a foundry, 21 x 31 ft., which will require a cupola and other equipment. It will be used for producing high grade iron and steel castings for dies and the beds for the company's own use.

The [illegible] on the Maryland Steel Company at Sparrows Point, Md., resumed work December 27, after an idleness of nearly two months. The marine department at Sparrows Point is very busy with the construction of the steamers which the company contracted to build for the American-Hawaiian Steamship Company.

Sheet and Tin Plate Association

A New Organization for Objects Apart from Price Regulation

The outcome of recent meetings of sheet and tin plate manufacturers at Pittsburgh, referred to in these columns one week ago was the filing of an application on December 20 in the Allegheny County, Pa., courts for the Association of Sheet and Tin Plate Manufacturers. As has been stated, the question of price regulation is left out of the purview of the new organization; but the desirability of some medium for the collection and distribution of information has long been evident and has been expressed by various independent manufacturers in these lines. It has been felt that associated effort would assist in increasing the market for sheets and tin plates, and that the members would be aided by the gathering of statistics of production and consumption.

The headquarters of the new association will be in Pittsburgh, and the articles of charter state that there will be seven directors. The charter members are the following:

J. E. Carnahan, Carnahan Tin Plate & Sheet Company, Canton, Ohio.

W. A. Thomas, Thomas Steel Company, Niles, Ohio.

John W. Watson, Canonsburg Steel & Iron Works, Canonsburg, Pa.

Wade A. Taylor, Deforest Sheet & Tin Plate Company, Niles, Ohio.

C. F. Nieman, Parkersburg Iron & Steel Company, Parkersburg, W. Va.

C. A. Irwin, Canton Sheet Steel Company, Canton, Ohio.

Jos. B. Andrews, Newport Rolling Mill Company, Newport, Ky.

W. S. Horner, American Rolling Mill Company, Middletown, Ohio.

S. B. L. McVey, Seneca Iron & Steel Company, Buffalo.

Samuel Siddall, Empire Iron & Steel Company, Niles, Ohio.

C. T. Swaney, Massillon Rolling Mill Company, Massillon, Ohio.

J. J. O'Connor, Washington Tin Plate Company, Washington, Pa.

Geo. W. Nidringhaus, National Enameling & Stamping Company, St. Louis, Mo.

W. Langenbach, Stark Rolling Mill Company, Canton, Ohio.

R. D. Campbell, Allegheny Steel Company, Brackenridge, Pa.

By-Laws of the Association

The by-laws are as follows:

ART. I, Incorporation.—This corporation shall be known as the Association of Sheet & Tin Plate Manufacturers; same having been incorporated the.....day of....., 191..., under the laws of Pennsylvania.

ART. II, List of Members.—The following persons, firms or corporations are now members of this association, having become members thereof by signing the articles of association:

[Here follow the names given above.]

ART. III, Objects.—Sec. 1. The general welfare of the sheet and tin plate manufacturers of the United States of America.

Sec. 2. Social enjoyment of its members.

Sec. 3. To stimulate and exploit the use of their product.

Sec. 4. To better the condition of employees

Sec. 5. To collect facts relating to the industry.

Sec. 6. Generally, for the discussion of any matters of interest to manufacturers of sheet and tin plate.

ART. IV, Membership.—Sec. 1. Membership shall consist only of manufacturers of sheet and tin plate, residents of the United States of America.

Sec. 2. Applications for membership in the association must be made in writing.

Sec. 3. The name of the applicant will be presented at the next regular meeting of the board of directors, and, if approved, the applicant shall be notified thereof, whereupon he shall pay the proper initiation fee and dues.

ART. V, Initiation Fee and Dues.—The initiation fee and dues shall be as follows

Sec. 1. Each member shall pay an initiation fee of twenty-five ($25) dollars, quarterly dues of six and 25-100 ($6.25) dollars for every hot mill, and further annual membership dues of twenty-five ($25) dollars, payable in advance.

Sec. 2. If any member shall cease to engage in the business of manufacturing sheet or tin plate in the United States he shall forfeit, *ipso facto*, his membership in the association.

Sec. 3. Any member whose dues remain unpaid for sixty days after they shall become due shall be deprived of membership in this association, subject to a majority vote of directors.

Sec. 4. A member thus terminating his membership shall only be reinstated subject to such conditions as the board of directors may impose.

Sec. 5. Upon the payment of six months' dues, in advance, any member may resign at his pleasure.

ART. VI, Elections.—Sec. 1. All elections of directors shall be by ballot, and shall be held in the City of Pittsburgh the first Monday of October of each year.

ART. VII, Government.—Sec. 1. The officers of the association shall consist of seven directors, who shall select their own officers.

Sec. 2. The officers of the association shall consist of a president, vice-president, treasurer, and secretary.

Sec. 3. The secretary need not be a member of the association.

Sec. 4. The directors shall hold office until the next annual meeting or until their successors are elected.

ART. VIII, duties of President and Vice-President.—Sec. 1. The president shall preside at all meetings of the association.

Sec. 2. He may call special meetings of the association at any time, and must do so at the written and signed request of three members of the association.

Sec. 3. The vice-president shall assist the president in discharging his duties and, in his absence, shall succeed to his office and perform the duties which would devolve upon the president if present.

ART. IX, Duties of the Secretary.—Sec. 1. The secretary shall notify each member-elect of his election.

Sec. 2. He shall keep a record of all amounts received and expended for the business of the corporation.

Sec. 3. He shall make an annual report to the association at the annual meeting and shall perform such other duties as may be enjoined upon him by the board of directors.

ART. X, Duties of Treasurer.—Sec. 1. The treasurer shall receive all moneys of the association and shall deposit same in the name of the association in such bank or trust company as shall be approved by the directors.

Sec. 2. He shall give bond in the sum of five thousand ($5,000) dollars, to be approved by the board of directors.

Sec. 3. He shall have power to sign all checks, but not to issue any other negotiable paper.

ART. XI, Notice.—All notices shall be sent to every member at his place of business, and such mailing shall be evidence of the service thereof.

ART. XII, Amendments.—The by-laws may be amended only by majority vote.

At a dinner at the Fort Pitt Hotel, Pittsburgh, on the evening of December 19 attended by most of the incorporators of the new association, a number of the manufacturers spoke informally and an address was made by C. S. Trench, of the American Metal Market, New York

The Eastern Steel Company's Warwick Lease

The directors of the Warwick Iron & Steel Company and those of the Eastern Steel Company have ratified the proposed lease of the Warwick furnaces at Pottstown, Pa., to the latter company on a basis which will pay the stockholders 8 per cent. on the par value of the stock. An option to purchase the Warwick Iron & Steel Company outright is included in the lease. The present plan of the Eastern Steel Company is to supply its own requirements in basic iron from the Warwick furnaces and market the surplus, as well as to continue the manufacture and sale of foundry grades. The stockholders of the Warwick Iron & Steel Company and the Eastern Steel Company will hold special meetings on January 16 and 17, respectively, to take formal action on the proposed lease. There is no doubt of its ratification.

The Southern railroads are not likely to lower freight rates on pig iron

A Rapid Bridge Repair

Details of a Recently Completed Job on a Chicago Railroad Bridge

A recent and very interesting bridge repair job both from a mechanical standpoint as well as from that of cost was performed on the bridge of the Chicago, Milwaukee & St. Paul Railroad, spanning the north branch of the Chicago River between Division street and North avenue, Chicago, Ill. Another special feature about the work was the exceptionally rapid time in which it was done. Fig. 1 is a view of a portion of the top chord of the bridge while the work was in progress, and Fig. 2 shows a section and an elevation of the arrangement used to clamp the members together at the joint while the repairs were being made.



Fig. 1—A Portion of an Exceptionally Rapid Repair Made to a Bridge of the Chicago, Milwaukee & St Paul Railroad at Chicago, Ill.

The bridge which was repaired was of the through truss swing type and was erected in 1902. This style of bridge had to be used on account of the narrowness of the river and the necessity for keeping an open channel. The structure is 230 ft. long, is pivoted on the north bank and has unequal arms, the longer one extending over the river and being counterbalanced for overhang. As a result of the vibration to which the structure was subjected, the pins and bearings became so worn it was deemed advisable to replace them. While similar repairs had formerly been accomplished by driving piling and erecting false work to support the members which were removed to a shop and rebored, in this case even under the most favorable circumstances work of this character would have obstructed navigation for several days apart from the enormous expense involved. The river traffic at this point is great and trouble was experienced in securing permission from the War Department to shut off navigation. For this reason it was decided to attempt the scheme of boring out the pin holes and replacing the pins with larger ones without removing any of the members.

Before each pin was removed it was necessary to clamp the members at the joint securely in position. The device used for this purpose is shown in Fig. 2. Four steel plates A were used to hold the eye bars and these plates were placed on each side of the bars with a block of wood, C, fitting tightly between the inner two while the two outer ones reinforced the plates B which were directly in contact with the eye bars. The whole was bolted together with 1-in. bolts, this arrangement developing enough friction between the plates to take care of the dead load stress in the eye bars. The two plates B, one on each side, were fastened to the lower flange of the top chord and to each end post by angles and bolts and this supported the hanger by bolts as clearly shown in the section at the left of Fig. 2. In this way when the pins were driven out all the members were rigidly clamped in position.

When the pins were removed it was found that they had become considerably worn and their bearings slightly enlarged. The diameter of these holes was increased from 5 in. to 5¼ in. by using a portable boring bar made by Joseph T. Ryerson & Son, Chicago, Ill. Although designed primarily for shop boring locomotive cylinders, this device gave satisfaction even under these adverse conditions. A view of the work being done is given in Fig. 1. The boring bar was driven directly by a small air drill which operated the shaft and furnished the necessary power. All the power plant that was required was a section car on which a gasoline engine and an air compressor were mounted.

The short time required for doing this work is also a noteworthy feature. The work was begun at 6 a. m. on the morning of November 6 and by 8:15 p. m. of the same day the four pins had been removed, the holes rebored, new pins inserted and traffic was passing over the bridge.

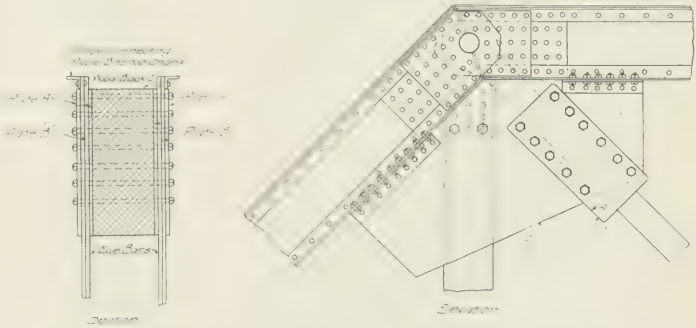


Fig. 2—Details of the Clamping Device Employed to Hold the Bridge Members Together While the Work Was Being Done

West End Furnace at Roanoke, Va., was blown in December 27.

Thin-Lined Blast Furnace Construction

Designs for Controlling Heat Losses Applicable to Both Old and New Furnaces

BY DAVID BAKER, M. E., PHILADELPHIA

The operation of the thin-lined blast furnace in this country has not been so successful as in Germany, where the idea originated, and it seems to the writer that this is due principally to the greater loss of heat resulting from the American construction.

In this country three different forms of construction have been adopted, represented, first, by the furnace in the Isabella group of the Carnegie Steel Company, namely, a rolled plate shell cooled by water troughs or pockets riveted to the shell. This furnace is provided with a 12-in. firebrick lining and there is about an inch of metal between the bricks and the water in the pockets

At South Chicago, the shell of the first thin-lined furnace consisted of cast-steel segments bolted together. On the outside of this, the cooling was effected by water flowing over the surface. A second furnace was built at South Chicago of rolled plate construction with water pockets attached, much the same as in the Isabella Furnace, except that the water, instead of circulating from one pocket to another, is kept in the pocket and allowed to evaporate, enough water being added to take the place of what is vaporized

At the plant of the Tennessee Coal, Iron & Railroad Company, Ensley, Ala., the thin-lined furnace recently constructed has a rolled steel shell 1⅛ in. in thickness cooled by water sprays, so there is a uniform film of water flowing down the outside surface of the shell.

All these forms of construction differ from the German type that has been so successful in having a comparatively thin metal plate between the cooling medium and the brick work, while in Germany the furnace shells are constructed of heavy cast-iron segments, cooled on the exterior. The effect of this difference in construction is to materially increase the loss of heat in the American furnace over what is lost in the operation of the German type.

There is another objection to the rolled plate construction of this country where the cooling pockets are riveted to the shell, and that is the danger of leakage, particularly around the rivets or bolts holding the angle irons attached to the inside of the shell, especially where the heads of these rivets or bolts are submerged in the water pockets. In the Ensley construction this danger of leaks from rivets submerged in the water pockets is avoided, but the cooling effect on the whole furnace is greater

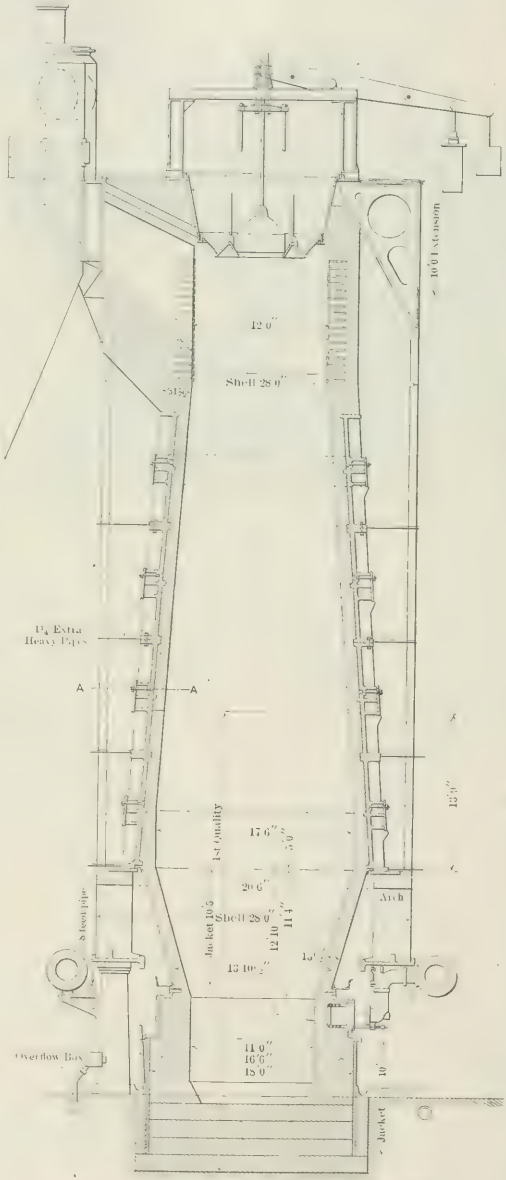


Fig. 1. Thin Lining Applied to Existing Blast Furnace

There is no question in the writer's mind that thin-lined furnace construction has come to stay, but just what thickness and what cooling will give the best results has not been demonstrated conclusively in this country. The old furnaces with their very heavy firebrick walls, were not only very expensive to reline, but, on account of the lack of proper cooling, invited the rapid destruction of the lining by permitting the brickwork, with its very heavy backing of non-conducting material, to reach the temperature of the furnace at that point

One great obstacle in the way of the general adoption of this new construction to most iron manufacturers is the cost of replacing the old furnace shell with the new construction and the risk that the change may not prove so satisfactory as anticipated. Whenever a furnace is built for a thin lining, it must be practically rebuilt to return to a comparatively thick lining, if the venture does not prove a success.

What is needed, therefore, is some construction that will permit the owner of one stack to change from a thick to a thin lining without reconstructing the shell, or to permit him to reduce the thickness of the lining in stages as the furnace is relined for each blast, if he wishes to do it in that way. In addition, some cooling should be provided for the thin-lined furnace that can be controlled as to the amount of heat removed.

The Ladd & Baker improved thin-lined furnace construction, recently patented, provides a

means of securing the advantages of thin-lined construction with controllable cooling that may be applied to an old furnace shell as well as to a new one. In Fig. 1 is shown a section of an old furnace arranged for a thin lining. Vertical cast-iron water-cooled staves are provided. These staves are constructed in sections, the first row resting on the mantel and the thrust of the stock and the firebrick lining is taken by a band which girts each section. With this arrangement not only may a thin lining of any thickness be arranged for with an old shell, but the thin lining may be used for only the lower part of the inwall, if it is so desired.

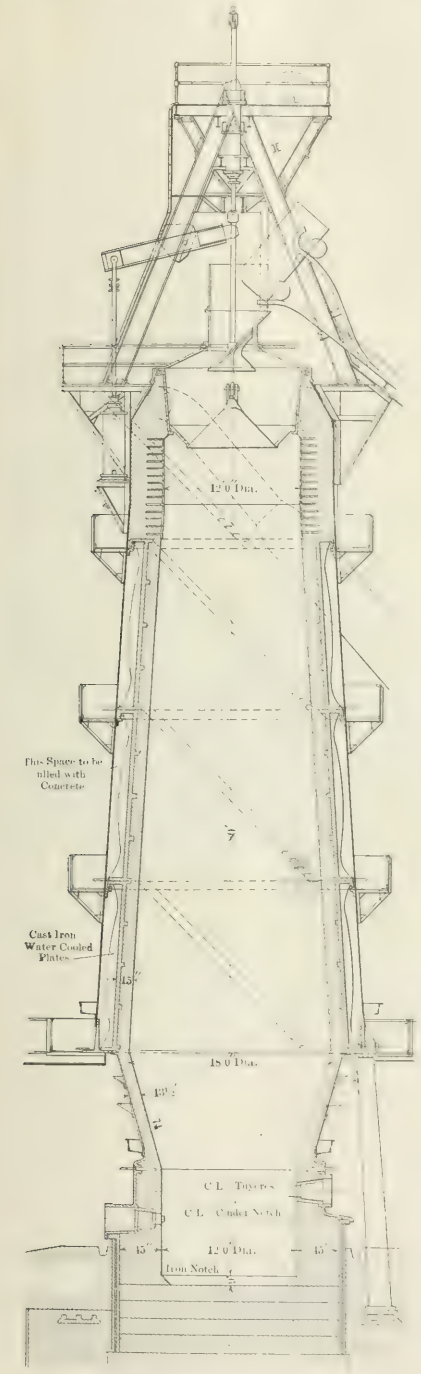


Fig. 3—Design of Thin Lining for the Blast Furnace

Fig. 2 shows the front view and a section of the cooling staves, the dotted lines showing how the cooling pipe is cast in each segment. With this construction, it can readily be seen that the amount of water circulated is under the control of the management and may be run very hot or cold as desired. This permits the cutting down of the amount of heat lost and of measuring the number of heat units carried away in this system of cooling with great accuracy.

Fig. 3 shows this improved construction applied to a new furnace shell. In this case the thrust of the stock and the lining is borne by the shell. In both applications of this thin-lined construction the space back of the cooling staves is filled with loom or granulated slag.

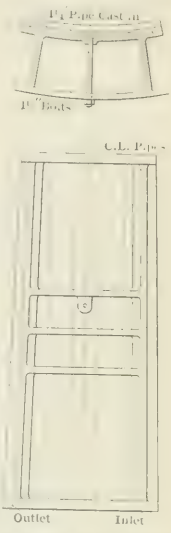


Fig. 2—One of the Water Cooled Staves or Plates

Philadelphia Metal Manufacturers' Association

The Metal Manufacturers' Association of Philadelphia held its annual meeting at the Bellevue-Stratford, December 13. The officers elected for the ensuing year are as follows: President, E. L. Langworthy, Adams & Westlake Company; vice-president, J. H. Schwacke, Wm. Sellers & Company, Inc.; treasurer, Thomas Evans, Eynon-Evans Mfg. Company. Councillors, to serve two years, Robert Biddle, John L. Gaumer Company; C. Willis Adams, Link-Belt Company, and George R. Allen. Henry Morgan is secretary. The recommendations of the president, concerning the appointment of five members to serve as a permanent membership and reception committee, and three members to serve as a committee on apprentices, were adopted. The S. J. Creswell Iron Works was elected to membership. A total of 14 new members was elected during the year, a record equaled only in 1905, when business activity resulted in a strong demand for skilled labor, and manufacturers were brought to a realization of the need of protection and assistance which a membership in the association afforded.

A By-Product Coke Plant for Atikokan Furnace

Announcement is made that the Atikokan Iron Company, Port Arthur, Ont., is to increase the capacity of its furnace and install by-product coke ovens, with the intention of furnishing gas at a reasonable rate to the cities of Port Arthur and Ft. William. The system will be identical with that of the Zenith Furnace Company at Duluth. With the alterations completed, the capacity of the stack will be approximately 200 tons of pig iron daily. The coke ovens at present operated in connection with the furnace are of the beehive type. Port Arthur and Ft. William have a combined population of nearly 40,000, and it is believed they will furnish a market for all the gas that can be produced. The iron ore used at Port Arthur is from the company's own mine in the Atikokan range, Ontario, at which 120 men are now employed.

The Pacific Coast Steel Company announces that its new open-hearth steel plant at South San Francisco, Cal., is now ready for work, and will commence active operations the first of the year.

The No. 4 Blast Furnace at Haselton, Ohio

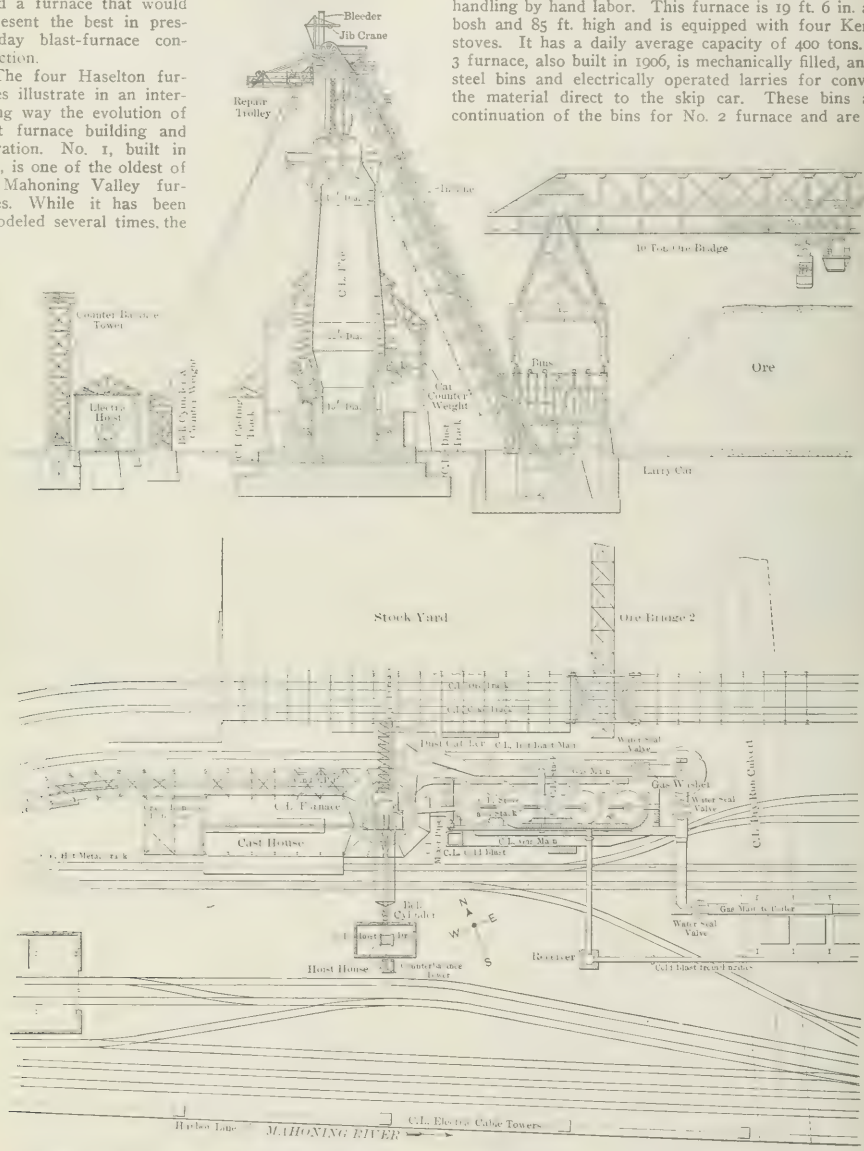
Largest and Best Equipped of the Republic Iron & Steel Company's Stacks

The new 500-ton blast furnace of the Republic Iron & Steel Company, which was blown in June 9, 1911, is the fourth and largest in the group of this company's furnaces at its Haselton, Ohio, plant. It is also the most complete in every detail of construction and equipment, the effort having been to build a furnace that would represent the best in present-day blast-furnace construction.

The four Haselton furnaces illustrate in an interesting way the evolution of blast furnace building and operation. No. 1, built in 1867, is one of the oldest of the Mahoning Valley furnaces. While it has been remodeled several times, the last time being in 1896, it is still strictly typical of the old-fashioned hand-filled furnaces. It has a bosh diameter of 16 ft. 9¾ in. and is 74 ft. 5¼ in. high. There are four Cowper-Kennedy stoves, to which a fifth is now being added. The daily average capacity is 300 tons.

No. 2 furnace was built in 1906; and while it is a hand-filled furnace it is modern in many respects, having steel bins for the receipt of all material. These bins are supplied direct from railroad cars and by a traveling ore bridge, the material for the furnace being delivered to the hand barrows by gravity, thus doing away with any handling by hand labor. This furnace is 19 ft. 6 in. at the bosh and 85 ft. high and is equipped with four Kennedy stoves. It has a daily average capacity of 400 tons. No. 3 furnace, also built in 1906, is mechanically filled, and has steel bins and electrically operated larries for conveying the material direct to the skip car. These bins are a continuation of the bins for No. 2 furnace and are similarly fed direct from railroad cars and by an ore bridge. This furnace has a 20-ft. 6-in. bosh, is 85 ft. high and is equipped with four Kennedy stoves. It has a daily average capacity of 400 tons.

No. 4 furnace embodies all that is modern in blast fur-



Figs. 1 and 2—Section and Plan of No. 4 Blast Furnace of the Republic Iron & Steel Company, Haselton, Ohio

nace practice. It is, of course, a mechanically filled furnace, having a single skip hoist, but so arranged that two skip buckets are used, one being in position for being filled while the other is being hoisted. These buckets rest on cars in the skip pit at the bottom of the incline, the cars being arranged to travel back and forth on a semicircular track. Provision is made for rotating the buckets on these cars in order to overcome any irregularity in the distribution of the stock.

The overhead bin system is a continuation of that for Nos. 2 and 3 furnaces, the ore and limestone being conveyed to the skip buckets in larry cars, while the coke



Fig. 3.—View Showing Charging Side of New No. 4 Furnace

is discharged direct from overhead bins into the skip buckets. The furnace is of very heavy construction, the shell being 1 in. thick, with all the other details in proportion. There is a Kennedy tight top with four openings leading into two downcomers, one large dust catcher, and one Mullen gas washer, through which all of the gases pass before going to the stoves and boilers. The furnace has a 22-ft. bosh, is 90 ft. high and has a daily average capacity of 500 tons.

The boilers, engines and pumps for all of the furnaces are respectively in groups, so arranged that either furnace can be served by any or all of the auxiliary machinery. By means of the company's own railroad facilities hot metal can be delivered to both the Bessemer and open hearth departments

To Drain an Arkansas Swamp.—One of the most gigantic drainage projects ever undertaken in the South has been announced by the Morgan Engineering Company, Memphis, Tenn. It involves sunken lands in northeastern Arkansas, supposed to have been caused by earthquake about 100 years ago. About 300 square miles are included in the district, almost 200,000 acres. The contract, which will be let January 25, calls for the construction of 300 miles of ditches, 280 miles of which will be 40 to 50 ft. wide and 10 to 15 ft. deep. The main ditch will be 55 miles long. The surplus water will be led into the St. Francis and Tyronza rivers. The reclamation will cost about $1,500,000

Lake Shipbuilding in 1911

The shipbuilding industry on the Great Lakes has been at a low ebb during the year now closing. In 1910 the Lake shipyards had a busy year, and large additions were made to the total vessel tonnage. In spite of the heavy ore movement in 1910, the carrying capacity of Lake vessels was greater than the demand and many of the freighters remained at port for a considerable part of the season. A halt was therefore called in the production of new boats. In the past year the American shipyards on the Great Lakes turned out only 24 vessels as compared with 51 launched in 1910. Of those built this year, only 5 were bulk freighters, as compared with 20 freight boats built in 1910. Lake yards this year built 6 steamers for the package freight trade on the Atlantic coast. Five large barges were turned out for the Standard Oil Company. Among the remainder of the 24 were several fishing tugs. Sixteen of the 24 ships were built at the yards of the American Shipbuilding Company.

The number of boats built by the Great Lakes shipbuilders, exclusive of the Canadian yards, each year for the past 10 years were as follows:

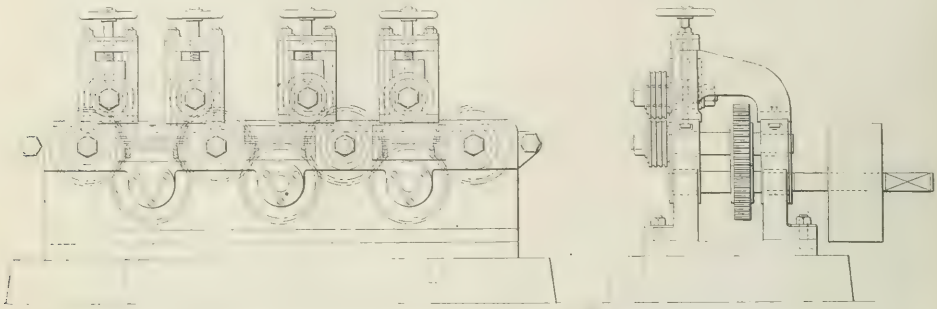
Years.	Bulk freighters.	Other vessels	Total
1911	5	19	24
1910	20	31	51
1909	17	22	39
1908	24	15	39
1907	40	16	56
1906	40	[illegible]	42
1905	25	[illegible]	33
1904	[illegible]	6	13
1903	43	[illegible]	50
1902	32	[illegible]	42

The Kerr Turbine Company, Wellsville, N. Y., announces the appointment of the following new agents: St Louis, Walter L. Flower, 312 S. Eighth street; New Orleans, C. E. Grevemberg, 1023 Maison Blanche Building

The S. K. F. Ball Bearing Company, 50 Church street, New York, has opened an office in Chicago to facilitate the handling of Western business. The new office will be in 1505 Heisen Building, and in charge of C. A. Winn.

The Pittsburgh Universal Straightener

The Schlieper-Daae Company, engineer, Ferguson Building, Pittsburgh, has recently put on the market what is known as the Pittsburgh universal straightener for straightening flats, angles, tees, channels and shapes. The method formerly used in straightening these products was to have the opposing rolls as close together as possible to take all the short kinks out of the material, and by doing this the variations in rolling and stiffness in the bars were found to cause them to leave the machine in a sweep. At the same time the finish, it is emphasized, was injured by the high pressure necessitated on account of the short distances between the opposing rolls.



Elevations of the Machine for Straightening Flats and Shapes, Made by the Schlieper-Daae Company, Pittsburgh

In the Pittsburgh universal straightener the opposing rolls are adjustable in longitudinal direction as shown in the cross section, allowing the operator to place the rolls in a position to straighten the bars of different sizes and shapes. For example, a bar 2½ x ½ in. requires a considerably longer leverage than a ¾ x ¼-in. flat bar. The cut shows also the side elevation and indicates the simplicity of construction of the straightener. It is stated that the machine, when properly operated, will straighten flat bars or other sections continuously, taking care of 1/16 in. in rolling without readjusting of machine or injuring the finished appearance of the material. The machine can be driven by electric or belt power, and, it is said, will straighten 10,000 lb. per hour. One of these machines is in operation in the plant of the Jones & Laughlin Steel Company, South Side, Pittsburgh, while another is being built for the Republic Iron & Steel Company, Youngstown, Ohio.

The American Engineering Company has been formed at Philadelphia, Pa., to take over the property and business of the Williamson Brothers Company, Philadelphia, and the American Ship Windlass Company and Taylor Stoker Company, formerly of Providence, R. I. The first steps in this consolidation were taken when in 1906 the Williamson Brothers Company purchased control of the American Ship Windlass Company. In addition to the manufacture of steering engines the company builds hoisting machinery of all kinds. This includes not only ship auxiliary machinery, such as deck winches, coal handling machinery, etc., but also contractors' hoists and other machines of similar nature. The Taylor stoker, invented by the late E. E. Taylor, will hereafter be built at Philadelphia, where the American Engineering Company has a large plant, comprising a foundry and machine shops.

The St. Louis Machine Tool Company, 1209-1211 Gratiot street, St. Louis, Mo., has sold both its Coe drill and St. Louis drill patterns to the Perry Machine Tool Company, Perry, Mich., and will now devote all its time and attention to the developing of its grinding and tapping machines, with the aim of making them the most complete lines of their class of machinery on the market. The Perry Machine Tool Company is composed of H. G. Porter and associates. Mr. Porter is a mechanic of great ability, who will develop the drill business as the St. Louis Machine Tool Company could not with its other lines

The Lea Recorder

A Recently Developed Instrument for Measuring Boiler Feed

To enable accurate and continuous measurement of the flow of water and other liquids to be secured the Yarnall-Waring Company, 1109 Locust street, Philadelphia, Pa., has developed a new type of Lea recorder. This device is applicable to the measurement of boiler feed water, condenser and pump discharges; the flow of water in springs, irrigation ditches and canals; as well as the measurement of sewage, acids and other liquids. Among the advantages claimed for the recorder are accuracy at different rates of flow, compensation for temperature changes, absence of mechanism in contact with the water and the abllity to use the same instrument in measuring both large and small quantities of liquids. The recorder operates on the V-notch principle and gives a graphic record of the rate of flow by using a recording pen which moving in direct proportion to the rate of flow traces a diagram having an area that is a measure of the total quantity of water passing through the recorder. Two types of recorder are made, namely, the atmospheric and the pressure styles which are illustrated in Figs. 1 and 2, respectively. The line drawing, Fig. 3, comprises a plan view and front and end elevations.

The following brief description of the recorder is applicable to both the atmospheric and the pressure types.



Fig. 1—The Atmospheric Type of Lea Recorder Manufactured by the Yarnall-Waring Company, Philadelphia, Pa

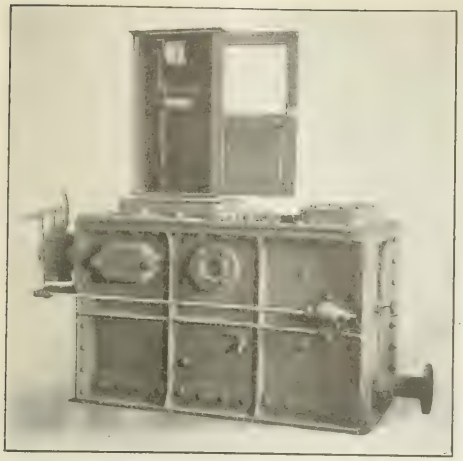


Fig. 2—The Pressure Type

A float spindle having a rack cut upon it passes through the bottom of the instrument case. This float spindle which can be seen at the left of the upper portion of Fig. 2 connects with a drum shown at about the center of the same portion of this engraving by a small pinion mounted upon the drum axis. This drum revolves between centers and upon its body is a modified helix, the pitch of which is the curve of flow of the V notch used in the recorder. The pitch of this helix increases in the same proportion that the flow through the notch increases with the depth. A horizontal slider bar supported on small pivoted rollers is mounted above this drum and carries an arm. There is a pen or pencil point at the upper end of this arm making contact with a paper chart mounted upon a clock-driven recording drum which makes one complete revolution in 24 hr. The spiral on the drum is rotated as the float in the recorder rises or falls and this motion is imparted to the recording mechanism by the saddle arm projecting from the slider bar and engaging with the screw thread at its lower end. Adjacent to the screw thread on the body of the spiral drum is a graduated scale, the divisions of which read in pounds per hour. A double purpose is served by the spiral drum as the screw thread rectifies the motion of the pen and causes it to move equal distances for equal increments in the rate of flow, while at the same time it provides a magnified scale for making accurate observations of the rate of flow at any moment.

The atmospheric type of recorder illustrated in Fig. 1 operates by having air pressure on the upper side of the water flowing through the recorder, while the pressure type shown in Fig. 2 is operated by the pressure of water in the system. As will be noticed the latter type of recorder has a tank made of cast iron similar to the standard open heater construction. This construction, it is pointed out, enables the recorder to be placed between the open feed water heater and the feed pump, and as the pressure in the recorder is the same as that in the heater, there is no loss of temperature in the feed water during its passage from the heater to the pump. As the recorder will stand any pressure or vacuum up to 10 lb. and the operating head is only 18 in. the device can be installed without any extensive changes in the piping. It will be noticed from Fig. 2 that a balanced float valve is placed on the inlet at the left end of the tank. This is operated by a float and lever mechanism placed below the weir on the discharge side, an arrangement which it is emphasized makes it practically impossible to flood the weir or the recorder. At the opposite or right end of the tank the water gauge is located so that the operation of the pump mechanism can be checked at all times. Two glass peep holes located at the sides of the tank provide means of adjusting the recorder to zero while the notch tank is under pressure. This pressure recorder is made in sizes varying from 200 to 10,000 boiler horsepower.

When the flow to be measured is so small that it would show only a depth of but 1 or 2 in. in a 90-deg. V notch, other notches having smaller angles can be employed. As the flow through these notches is approximately proportional to their width for a given depth it is possible to obtain a large float movement while only a small quantity of water is being measured and thus reduce any errors due to incorrect setting of the instrument to a minimum. Another method of measurement is to supply one recorder with a series of multiple V notches for measuring large and small quantities. When this is done any number of notches can be used, the spiral drum having a capacity equal to the maximum flow through one notch. Different numbers of notches are opened according to the amount of flow to secure a practically uniform movement of the float.

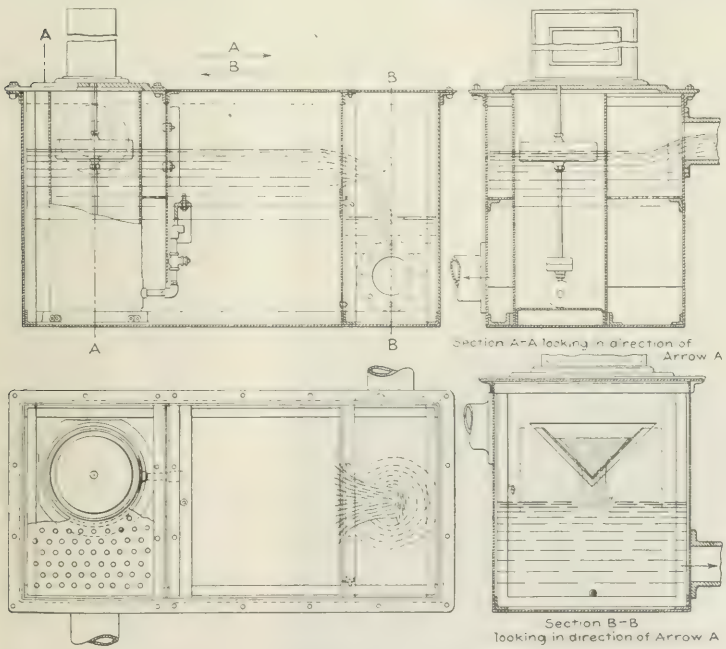


Fig. 3—View Showing Details of the Recorder's Construction

These recorders are said to produce records which are accurate within 1½ per cent. by weight and in addition they are also guaranteed by the maker to have an average error of not more than ½ per cent., due to variations in temperature over a range of 25 deg. on either side of the normal operating figure.

Electrical Equipment of Gary Coke Plant

Apparatus for Handling Coal and Making Coke at the 8000-Ton By-Product Coke Plant of the Indiana Steel Company

The largest and best equipped coal handling and by-product coke-making plant in the world is at Gary, Ind. It is of special interest because it is electrically operated throughout by motors receiving their current from the gas power plant of the Indiana Steel Company. Another claim to distinction lies in the fact that the 560 Koppers' regenerative by-product coke ovens have a total coke capacity of 8000 tons per 24 hr., and the Koppers' modern direct process for recovering ammonia from the gas in the form of ammonium sulphate is employed. This is the first coke oven plant in this country installed with the direct process for ammonia recovery.



Conveyors Between Breakers and Hammer Mills



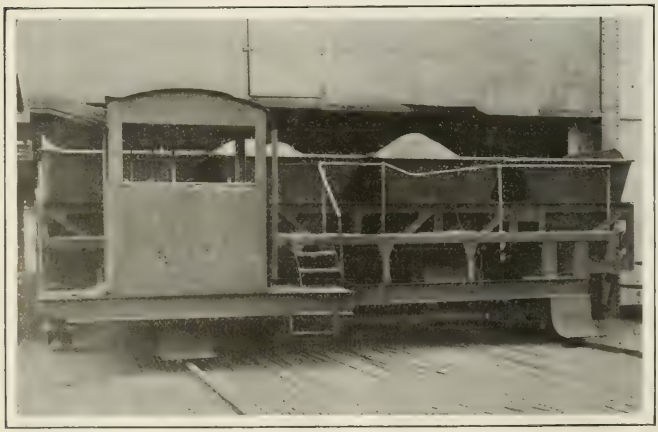
The 250-hp. Motors Driving Hammer Mills

Coal Handling

Coal for coke making is dumped from railroad cars into a concrete storage yard which has a capacity of 350,000 tons. The walls of this yard are inclined under the railroad tracks to deflect the coal away from the sides of the yard so the grab buckets of two large Wellman-Seaver-Morgan coal bridges can reach it with greater ease. The bridges are each equipped with 7-ton buckets and can load twenty 50-ton larry cars per hour. Their closing and opening lines and trolley travel are each operated by a 150-hp. motor and the two bridge trucks are operated by eight 30-hp. motors of the same type.

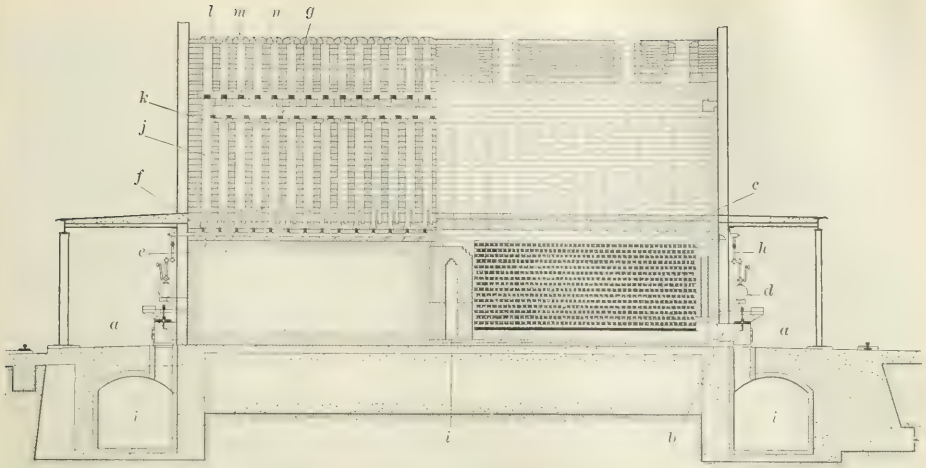
After being loaded into a transfer car the coal is dumped into one of twelve hoppers at the unloading house. These hoppers are each equipped with a shaker distributer driven by a 15-hp., 3-phase, squirrel-cage induction motor. Each of the shakers can evenly distribute 40 tons of coal per hour on the belt conveyors. A continuous supply of coal is assured by keeping one hopper full at all times.

The coal is carried from the unloading house by four belt conveyors, each of which has a capacity of 500 tons an hour. They are driven by four 30-hp., 3-phase induction motors which, together with those used to operate the Bradford breakers, hammer mill crushers and intermediate conveyors, are controlled by a special electrical interlocking system. The stopping of any conveyor or machine automatically holds up all operations prior to its own, thereby preventing waste or jamming. The unloading house conveyors carry the coal to Bradford breakers, each of which has a capacity of 500 tons an hour. It is here broken to 1-in. mesh and separated from what little slate, stone, wood, iron, etc., it may contain. Power for this operation is furnished by four 75-hp., 3-phase motors.



Larry Car Receiving Crushed Coal from Bins and Delivering into Ovens Through Holes on Oven Top.

Between the breakers and the next operation, crushing the coal in hammer mill crushers so that 85 per cent. of it will pass through a No. 64 wire-mesh screen, are four conveyors each with a capacity of 500 tons an hour, which are driven by four 30-hp., 3-phase induction motors. The eight hammer mill crushers with a capacity of 350 tons per hour are driven by 250-hp., 3-phase induction motors. As the coal crushing house is thick with coal dust floating around in the air, all motors used in it are in a separate room built on the side of the house. In many other cases, however, conveyor motors, located near conveyors in other buildings, are showered with coal dust. Crushed coal is



Longitudinal Section through Koppers By-Product Ovens and Heating Flues

carried from the crusher house to the mixer building by two conveyors, each of which has a capacity of 500 tons an hour. They are 120 ft. long, travel 580 ft. per min. and are housed over to insure protection against the elements.

In the mixer house are two 500-ton mixers run by two 15-hp. induction motors with automatic control. The unloading, breaking and crushing machinery and the mixer are connected by an electric-signal system which indicates by electrically operated air whistles any change in character or mixture of coal being sent through. The mixer building has a storage capacity of 2000 tons of pulverized coal. In it 80 per cent. Pocahontas and 20 per cent. Ronco coal are mixed, which gives a coke yield of 84 per cent. of coal charged.

From the mixer house six 500-ton conveyors carry the crushed coal to four cylindrical storage bins over the coke-oven batteries. These four bins have a capacity of 2100 tons each, and the six conveyors will completely fill them every ten hours. Conveyors are driven by two 100-hp., two 75-hp. and two 30-hp., 3-phase induction motors. It is unnecessary to run the coal handling plant at night due to its capacity and that of the storage bins.

Coke Making

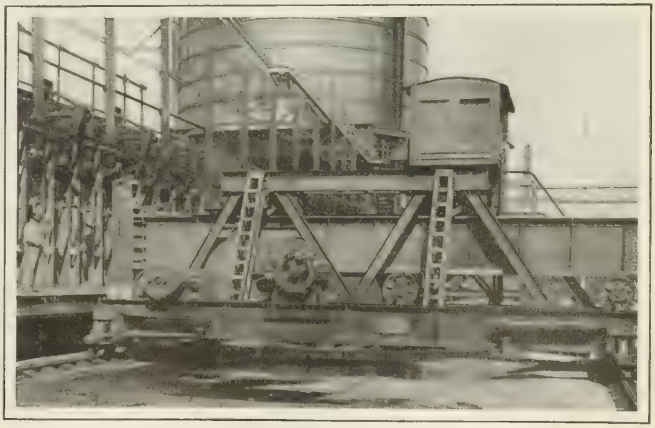
Larry cars run under the storage bins and over the tops of the coke ovens into each of which they charge 12¾ tons of coal. The coal is then levelled by a traveling leveller which is operated by four 30-hp. motors. The charging is done in a certain sequence which enables them to always have ovens ready for pushing, thus assuring continuous operation of men and equipment. The ovens are charged by larry cars, coal being dropped into ovens through the charging holes on top. Coking requires 18 hr., (5920 tons of coal will be coked in 24 hr., when the entire plant is complete) giving 8000 tons of coke per day.

The advantages of the type of oven selected for the Gary plant are interesting. The ovens are heated with gas evolved from the coal, carbonized. The coal yields from 50 to 60 per cent. more gas than the quantity necessary for its carbonization, and in the old beehive process of coking the equivalent surplus gas is wasted. A further advantage is that it is not necessary that the gas be consumed on the spot directly it is produced, because it can be conveyed to a desired point and stored for consumption in the working hours of the day.

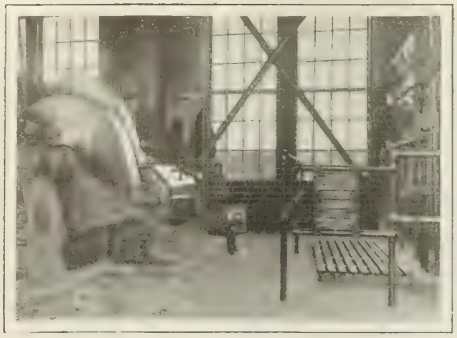
Regenerators also serve as a store for heat by means of which a whole battery of ovens can be shut down entirely for a week or so and started again without heating up being necessary. The regenerators also enable the ovens to be worked, it is explained, at less than one-quarter of their capacity without going cold.

The oven chambers are approximately 39 ft. long, 9 ft. 10⅜ in. high, and from 17 to 21 in. wide and have doors at each end operated by a traveling-door machine on the coke discharge side and a door machine attached to the coke pusher, at the other side. The top of the oven is provided with openings for charging the coal and an opening through which the gases of distillation are drawn off to the condensing plant.

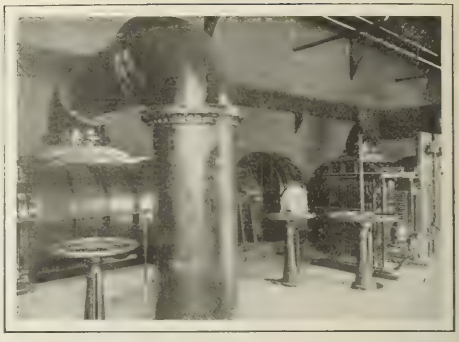
The air for combustion flows along the passage ways, *a*, at the front and back of the ovens, and thence it passes into the regenerators through inlets *b*. In the regenerators the temperature of the air rises to 1200 deg. C. (2190 deg. Fahr.). The highly heated air passes out of the regenerators into the vertical heating flues through the openings *c*. The gas from the by-product plant, freed from tar and ammonia is returned to the ovens by the mains *d*, running along the whole length of the ovens on each side. Branch supply pipes *h* conduct the gas into the gas-distributing channels *e*, which are situated directly beneath the oven walls; thence it passes through the gas nozzles *f* into each vertical flue, where it ignites with the hot air entering through the passage *c*, previously referred to. A jet is, therefore, formed on a level with



Motor-Operated Traveling Crane Coke Pusher at the Plant of the Indiana Steel Company, Gary, Ind.



Motors and Equipment Operating Hoists for Quenching Coke



Centrifugal Pumps in Pump House Driven by 1300-hp. Motors

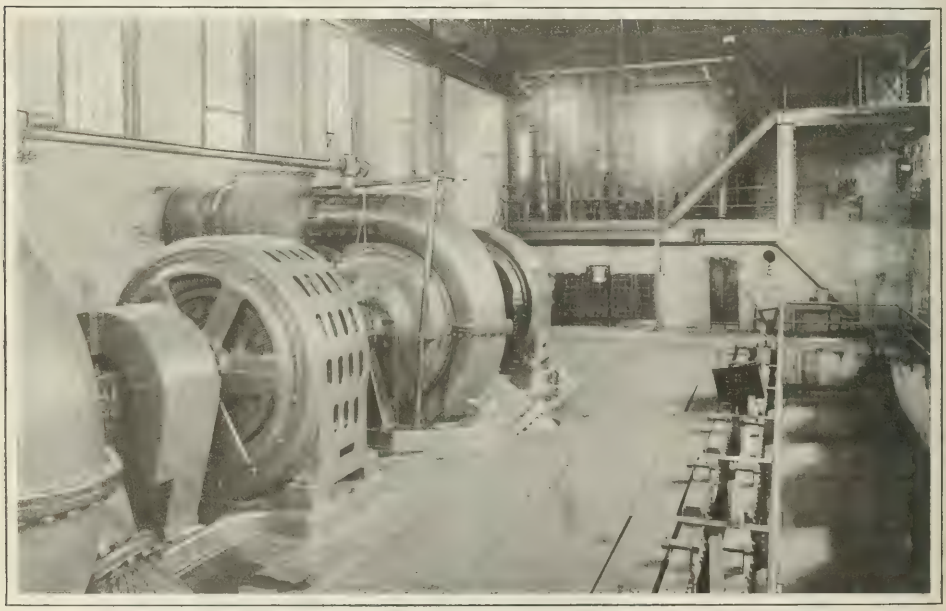
the over floor in each of the heating flues in the oven walls.

The employment of regenerators renders it necessary to reverse the heating process after a period of time, usually about 30 min. This is done automatically by a motor-operated dial-switch system which controls the gas and air valves. The system of heating flues is divided into two sections, so that combustion can take place alternately in each half of the oven wall. When the gas is burning in the flue in one-half of the length of the wall, the products of combustion pass up the flues and enter the top horizontal flue *g*, whence they make their way down the flues in the other half of the oven wall, and enter the regenerator through the same passages *c*, by which the air is admitted to the flues when the direction of combustion is reversed. On issuing from the regenerator the waste gases pass into the flue leading to the chimney *i*, after having given up their heat to the checkerwork of firebrick.

The products of combustion of the gas and air pass up the heating flues *j*, and through the openings *k* at the top of each flue. These openings are furnished with dampers *l*, which can be easily regulated, together with dampers in regenerating passages, so as to enable the exact amount of air to enter the flue necessary to effect perfect combustion. The sliding bricks are accessible from the top of the ovens through the openings *m* and *n*, which are fitted with easily removable plugs.

At this point particular attention should be directed to the sliding bricks and to the openings at the top of the ovens which give access to them, as these are two of the principal features of these ovens. The openings at the top of the ovens serve not only to provide means for regulating the dampers, but serve more particularly to give access to the gas nozzles *f* and they further permit of the flues being inspected at any time. The gas nozzles are furnished with oval orifices to allow them to be taken out by a rod having a tee end. The orifices in the nozzles vary in size, according to their position in the flues. The removal and replacing of a nozzle can be effected in a few minutes. It happens from time to time in all ovens that dark places appear in the oven walls, indicating that the combustion is defective. By means of the openings over each flue in the Koppers ovens, the cause of any irregularity in the heating can be detected.

It will have been seen that each oven wall is formed of about thirty vertical flues, and that each of these flues is provided with a heating jet, and also with means for



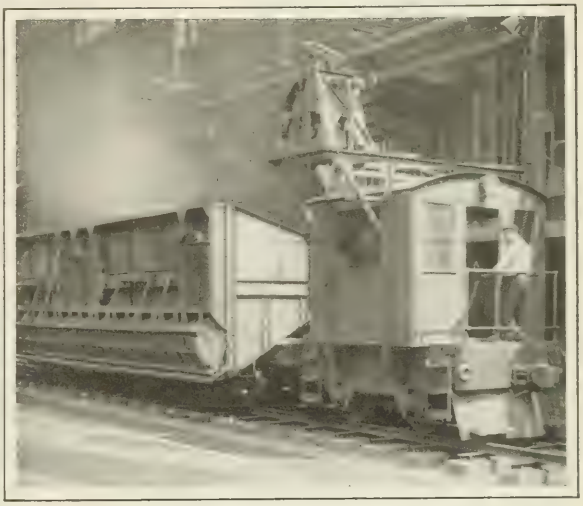
Gas Exhausters Operated by 250-hp. Motors, Taking from Gas Coolers and Delivering to Tar Extractors

regulating the admission of the gas and air, namely, by substituting the gas nozzles, and by adjusting the sliding bricks over each flue respectively. It is, therefore, emphasized that it is easily possible to control the heating so that the oven walls will be subjected to exactly the same temperature from end to end, and thus allow for the production of a coke homogeneous throughout the charge.

When coking is complete and the gas is fully given off, the doors are removed and the charge is pushed out by the traveling ram which is operated by two 50-hp. and one 7-hp. (on door opener) motors. While being pushed the coke is partly quenched by water sprinklers as it falls into a steel and cast-iron car to which is attached a 3-phase General Electric locomotive equipped with two 50-hp. motors. As soon as a charge is entirely in the car it is rushed to the shower hood where quenching is completed.



Motor-Driven Door Coke Extractor on Discharge Side of Ovens



Locomotive and Car on Discharge Side of Ovens; Partial Quenching Takes Place Here

The coke is then elevated to storage bins by two automatically controlled 30-hp., 3-phase motors, which operate elevators. In the final process the coke is run through screens operated by two 30-hp. motors of the same type. Each two batteries of coke ovens are equipped with grinding pans and clay elevators for preparing luting material for the oven doors. These are operated by 15-hp., 3-phase induction motors.

The gases from the ovens go through divided water-sealed mains, thence to coolers of the multitubular water-tube type, and after passing around the tubes they leave at a temperature of about 85 deg. Fahr. The gas is then drawn by exhausters which are driven by 250-hp. induction motors controlled to give constant gas suction and delivered to the tar extractors. The tar and ammoniacal liquors which condense here are run off along with the condensation from the coolers and separated by gravity in the tar separating tank.

From the tar extractors the gas passes to reheaters, where its temperature is raised to about 160 deg. Fahr. by the use of steam. The heated gas is then conducted to the acid saturators, lead-lined vessels, containing a solution of about 5 per cent. free sulphuric acid, and the gas leaves the saturators at about 85 deg. Fahr. At this low temperature the chemical affinity between the acid and the ammonia is so great that a neutral salt (ammonium sulphate) is easily obtained. The salt is continuously removed from this enclosed type of saturator by an ejector and delivered into a draining table from which it is run off together with the mother liquor into a centrifugal dryer in the usual way. When desired, concentrated ammonia liquor is produced instead of ammonium sulphate.

About 50 per cent. of the total daily yield of about 100,000,000 cu. ft. of gas is used at the steel plant and about 50 per cent. is used to heat the coke ovens. The ammoniacal liquor is treated with lime to decompose fixed ammonia compounds and is then heated to vaporize the ammonia which is conducted to the gas main and is absorbed in the saturators. About 1 per cent. ammonium sulphate and 2 per cent. of tar is obtained. The coke yield is approximately 84 per cent. of the weight of the coal coked. The plant is supplied with 60,000,000 gal. of water a day by two centrifugal pumps operated by 1300-hp., 3-phase motors.

All of the motors herein mentioned were furnished by the General Electric Company.

Custer Permanent Mold Rights.—The Custer Sandless Casting Company, Philadelphia, Pa., has closed a contract with the American Brake Shoe & Foundry Company, by which the latter acquires the exclusive right to manufacture brake shoes by the Custer process in the United States and Canada. It has also made a contract with the Pennsylvania Steel Company, giving that company the right to manufacture cast iron and manganese steel track accessories under the Custer process. Several other important contracts are pending for the use of this process, which involves the making of castings in permanent molds.

The Youngstown Iron & Steel Company, Youngstown, Ohio, manufacturer of black and galvanized iron and steel sheets and metal specialties, is operating its plant to full capacity.

The new plant of the Mount Union Refractories Company at Mount Union, Pa., is progressing rapidly. All foundations are completed, the building of the kilns is well under way and the structural steel is being erected. The plant will be of modern fireproof construction. The company makes silica and magnesite brick.

The Central Foundry Company, with New York offices at 90 West street, will erect a Universal cast-iron pipe plant and make other improvements on its property at Holt, Ala. The company has a blast furnace and by-product coke ovens at Holt. The contemplated improvements are to be large and costly and will include a new foundry, a feature of which will be continuous operation. The new plant will have equipment enabling every economy to be made in handling material and production generally.

A Turbo-Cupola Blower

For driving pressure blowers of any type, and more especially those employed in foundries, the Terry Steam Turbine Company, Hartford, Conn., has developed a small steam turbine-driven blower set. As compared with a blower driven by a reciprocating steam engine or an electric motor the advantages claimed for this new set are greater reliability of operation and smaller floor space, together with the elimination of trouble usually experienced with electric motors such as sparking commutators and the burning out of armatures. Fig. 1 gives a view of the new type high-pressure turbine-driven blower which has been developed by this company, while Fig. 2 shows a view of the turbine with the casing split in the horizontal plane and the cover lifted to show the interior construction.

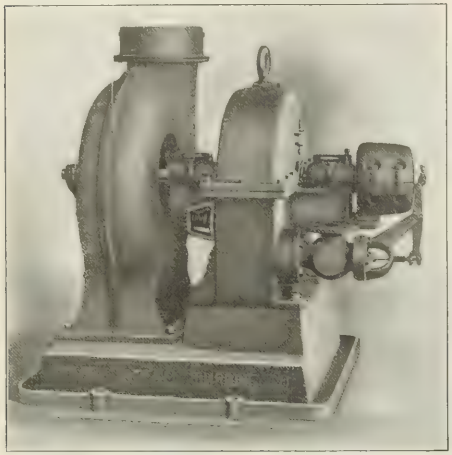


Fig. 1—The New Type High Pressure Turbine-Driven Blower for Cupola Use Built by the Terry Steam Turbine Company, Hartford, Conn.

In the low speed type of turbine it is possible to connect it directly to the fan shaft making one unit of the revolving parts from both the fan and the turbine and thus doing away with the belts, gears, adjustable belts and foundations. The elimination of the belt connection between the steam engine or the electric motor and the fan enables the blower set to be located close to the cupola, thus avoiding air losses due to long supply pipes, bends, etc., while at the same time the floor space is materially reduced, the amount required being only one-fourth that needed with a belted set. For ordinary foundry work a non-condensing steam turbine is employed which has but one wheel and therefore a minimum length between the bearings.

The steam turbine illustrated herewith is of the low-speed type which enables it to be connected directly to the blower. The rotor is mounted on a short shaft supported by bearings in brackets which are cast solid with the casing. The steam expansion takes place in the nozzles fitted around the circumference of the wheel and the casing therefore is not subjected to the pressure of the live steam. This also results in reducing the radiation loss to a minimum since the temperature of the casing is that of the exhaust steam. As no oil is taken into the steam space, the exhaust from the turbine can be piped directly to an open feed-water heater in a convenient location. It is emphasized that it is not necessary to employ any special precautions in starting the turbine as it is claimed it can be started instantly when cold without any danger.

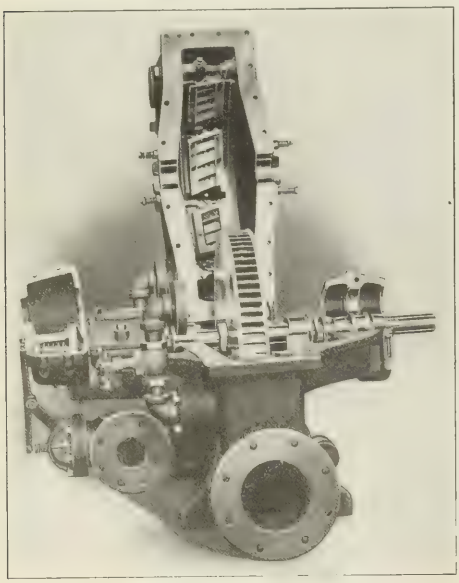
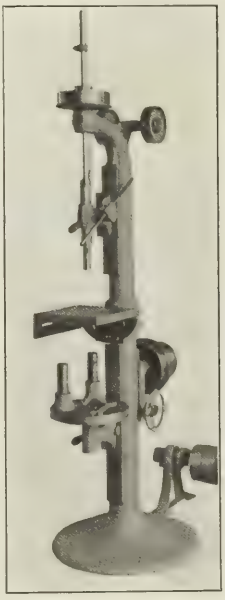


Fig. 2—View Showing the Casing Split in the Horizontal Plane

The 15-In. Washburn Drill

A new ball bearing drill having a capacity for high speed drills up to ¾ in. in diameter and known as the 15-in. size has been recently added to the line built by the Washburn Shops of the Worcester Polytechnic Institute, Worcester, Mass. The general construction of this drill is the same as the motor-driven drill and the multiple-spindle drill, illustrated descriptions of which appeared in *The Iron Age*, September 28 and October 26, 1911, respectively. The construction of the spindle pulley is such that the belt tension is carried on an independent bearing, thus relieving the spindle so that it runs absolutely free. The independent bearing is surrounded by a concentric ring which retains the lubricant supplied and at the same time prevents it from spattering.



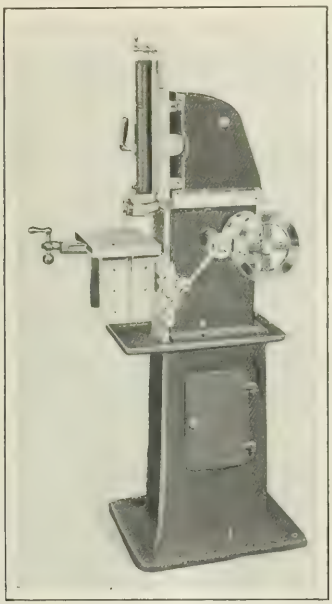
A New 15 in. Drill Press Built by the Washburn Shops of the Worcester Polytechnic Institute, Worcester, Mass.

An automatically locked belt tightener on which patents have recently been secured controls the tension. With this arrangement the cone pulley is locked in every position in which it may be left and the only labor necessary when the belt tension has to be changed is to turn the hand wheel. Both square and round tables can be furnished for the machine; the dimensions of the former are 12 x 12 in. and the apron is 12 x 4 in. The square table can be tilted on a bracket revolving around the post, an arrangement which permits this table to be swung out of the way when the round one is to be used. The diameter of the round table is the same as that of a side of the square type, namely 12 in., and this table slides on the column and can be replaced by either a cup or crotch center, both of which are furnished with the machine. The net weight of the drill including the counter shaft which is fitted with ring oiling bearing and has a loose bronze bushing for the loose pulley is 625 lb.

Vertical Shaper Attachment

To enable a 7-in. Precision shaper to be converted from a horizontal machine to a vertical one, L. E. Rhodes, Hartford, Conn., has placed on the market a vertical shaper attachment. When it is desired to make the change from one type of tool to the other the regular ram is removed and the attachment is secured in its place by the cap screws.

The attachment consists of a housing, a bell crank and a horizontal gear shaft which is shown at the right of the attachment and midway between the two cap screws. One end of the bell crank connects with the rocker arm of the shaper and obtains motion therefrom while the other end is in the form of a segment on which teeth are cut. These teeth mesh with a spur gear mounted on the horizontal shaft and this gear in turn engages with a rack on the vertical ram. The length of the stroke is adjusted in the customary way and the position of the ram is regulated by the ball handle at the top of the attachment and is held in the desired position by the binder on the left. The ram



A New Vertical Attachment for Use on Horizontal Shapers Made by L. E. Rhodes, Hartford, Conn.

is held in ways which pivot on the central horizontal shaft and the ram and the ways can be tilted to an angle for work which is to be machined in that way. The cap screws serve to clamp the ram ways at any desired angle while a positive stop is provided for setting them in a vertical position. In addition to tilting the ram and ways, the head can be swiveled to bring the cutting tool in the desired position. After the ram head has been swiveled, it is kept from moving by a set screw directly in back of it. The collar for the tool post has a projection to take the end thrust of the tool. An auxiliary table is provided which provides a hand feed at right angles to the power traverse of the main table.

The following table gives the principal dimensions and specifications for the attachment:

Maximum stroke of vertical ram, in.	3½
Maximum stroke of horizontal ram, in.	7
Maximum distance from table to ram, in.	8½
Traverse feed, in.	9

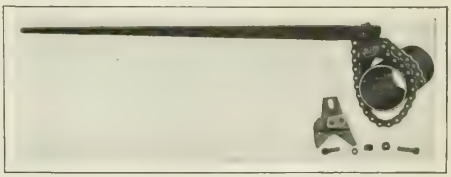
When it is necessary to convert the shaper from one type to another the change can be made in approximately 10 min.

A New Pipe Wrench

For steam and gas fitting, oil and oil well contractors, coal mine work and general contracting, the Gealy Wrench & Mfg. Company, Grove City, Pa., has brought out a chain pipe wrench in which an entirely new principle is involved. This is clearly brought out in the accompanying engraving which shows the inside of the jaw, the cam and cam thrust with release.

The wrench consists of a handle with loosely mounted alligator jaws and a flat link chain. The handle acts as a cam lever and the jaws, which are loosely mounted by a slot through which the bolt fastening them to the handle passes, act as a cam thrust. This slot permits the handle bolt to change its position and gives free play of the handle as a cam lever. The chain is fastened permanently to the handle on one side of the pipe and hooks in the jaws on the opposite or right side. The chain is tightened by the action of the cam lever which forces the engagement of the jaws and the pipe. As the jaws are mounted loosely on the handle the cam lever can play freely on the cam thrust and the release of the grip is positive and instantaneous due to the fastening of the chain to the handle on one side and to the jaws on the other. It is pointed out that in this wrench there is absolutely no strain on the bolt joining the jaws and the handle, this part merely serving to hold the parts together when the wrench is not in use.

It is claimed for this wrench that the leverage principle assures a powerful grip and that the alligator jaws with the chain give an equal pressure on the pipe and thus prevent crushing. The wrenches are made of drop-forged high carbon steel and the chain is of the usual flat link type.



A New Type of Pipe Wrench Made by the Gealy Wrench & Mfg. Company, Grove City, Pa.

Five sizes of wrench are made so that pipe from ½ to 12 in. in diameter can be handled. The over-all length of the wrenches ranges from 18 to 66 in. and the weight from 3½ to 76 lb. In the accompanying engraving next to the largest size of wrench which weighs 41 lb. and has an over-all length of 5 ft. is shown gripping a 6-in. pipe. Regularly the amount of chain furnished varies from 12 to 54 in. according to the size of the wrench, but if required special lengths can be furnished. If desired the largest size wrench can be supplied to handle 16-in. pipe instead of the regular maximum diameter which is 12 in.

The Craig Ridgway & Son Company, Coatesville, Pa., has received the contract for equipping the new bureau of printing and engraving that is now being erected by the Chinese Government at Peking with its steam hydraulic elevators. It is expected that the initial shipment will be made about the first of the year. The new bureau is to be an exact reproduction of the United States bureau at Washington which was equipped with the Ridgway elevators some years ago.

The Worth Brothers Company, Coatesville, Pa., is experimenting with a new steel railroad tie. A number of them were manufactured by the company some time ago and are now being tried out on the Wilmington & Northern branch of the Reading Railroad. So far they seem to be giving good satisfaction.

The Debevoise-Anderson Company, 95 Liberty street, New York, announces that it has been appointed sole agent east of Pittsburgh and Buffalo on the washed metal produced by the Youngstown Steel Company, Youngstown, Ohio.

Machine Molding for Large Castings

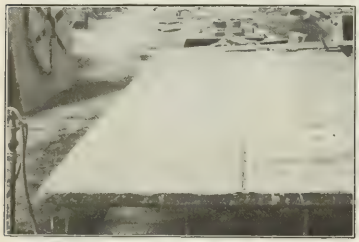
Details of Making 19,000 lb. Valve Castings. Interesting Application of the Universal Board for Large Split Patterns

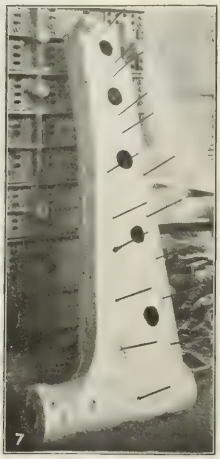
At the recent meeting in New York of the National Founders' Association, A. E. McClintock, commissioner of the association, exhibited a large number of lantern slides illustrating the accomplishments of molding machinery. Some of these views showed how successfully large castings have been molded, and through Mr. McClintock the following notes and the accompanying illustrations have been obtained:

Universal Board in the Wm. Sellers Foundry

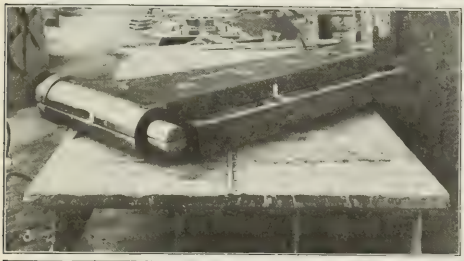
An objection raised by many manufacturers against mounting patterns for jarring machines is that too few pieces are made from a single pattern, and that for this reason it does not pay to board the pattern. To overcome this difficulty Wm. Sellers & Co. have devised a universal board, whereby both halves of any split pattern can be mounted perfectly in less than two hours' time by any intelligent workman. By this system it pays to mount a pattern to make one mold. Fig. 1 shows in the William Sellers foundry in the foreground the universal pattern board. As is indicated, there is an iron groove running both lengthwise and crosswise through the center of this board. This groove is the center line, and in the groove is drilled holes for flask pins.

In mounting the pattern the cope half

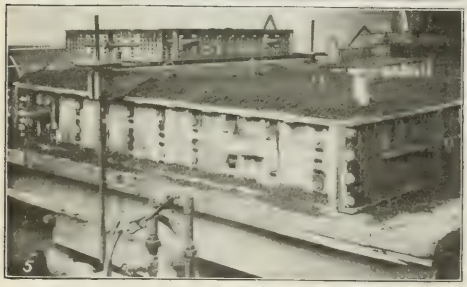


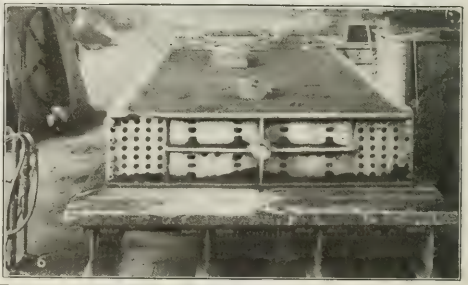












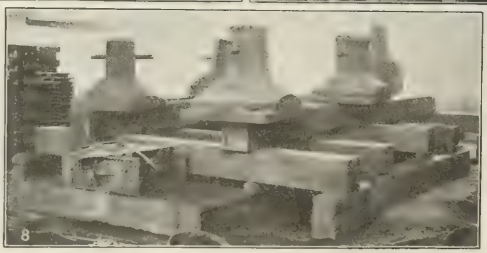


Fig. 1—The Universal Pattern Board with an Iron Groove Running Lengthwise and Crosswise. Fig. 2—Pattern Lying in Position on Board Getting Marked with Reference to the Grooves. Fig. 3—Marking Drag Half of Pattern in Reference to the Cope Half. Fig. 4—The Two Halves of the Pattern with the Four Pieces of Steel Screwed to Each One, Adapting the Method to Any Shape of Castings. Fig. 5—Flask Secured Ready to Jar, Showing the Method of Clamping, Which Fits Varying Widths and Hights of Flask. Fig. 6—The Struck-off Mold with Hooks Inserted in the Pattern and Secured to Lift the Pattern with the Mold. Fig. 7—Top View of the Casting for a 60-in. Radial Drill Arm as It Came from the Sand Without Cleaning. Fig. 8—Quick, Handy Method of Weighting the Mold for a Large Bed Plate, Weighing 40,000 Lb.

USE OF THE UNIVERSAL PATTERN BOARD IN THE FOUNDRY OF WILLIAM SELLERS & CO., PHILADELPHIA

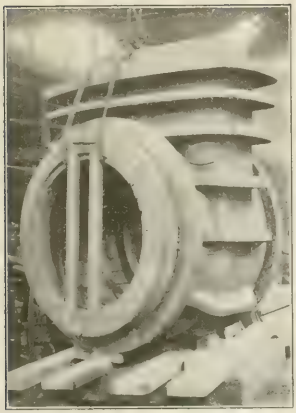


Fig. 9—Pattern of 60-in. Ludlow Gate Valve Body, Which Weighs Cleaned 19,000 lb.

is laid on the board, the flask is put on, and the pins engaged in the holes in the board. The pattern is now moved into a proper position in relation to the flask bars, and the flask carefully lifted off so as not to move the pattern. Fig. 2 shows the pattern lying in position on the board. Small pieces of flat steel which accurately fit the iron groove are now stood upright in the groove wherever the grooves cross the pattern, and the edge of the pattern is marked with a knife on each side of the pieces of steel. The pattern is now turned over, with the flat side up, and a straight-edge is used to carry the lines across the flat part of the pattern. Now, these pieces of steel are screwed to the pattern on both lines, so as to center the pattern both ways.

Fig. 3 shows the next move, where the drag half of the pattern is laid on the cope half, and brought into position. Marks are now made on the drag half of the pattern on each side of the piece of steel, which have been screwed on to the cope half. This half of the pattern is turned over, the lines are carried across as before, and the pieces of steel screwed on in the same manner as for the cope. Fig. 4 shows the four pieces of steel screwed on each half of the pattern, ready for molding. These operations never take to exceed two hours, and on plain patterns it can be done much quicker. It makes no difference how crooked the pattern may be, this method will center both cope and drag half of the pattern perfectly.

The procedure then is to place the pattern on the board, with the flat pieces of steel engaged in the groove in the board and centered. The flask is put on and filled with sand. Fig. 5 shows the flask secured ready to jar. Notice the quick method employed to clamp the flask to the table of the machine. This clamp fits all widths and hights of flask, and is very simple, and quickly put on. After ramming, the strap is removed and the mold butted and struck off. Fig. 6 shows the hooks which are inserted in the pattern and secured to the top of the mold in order to lift the pattern with the mold. The pattern is drawn by hand. The drag half of the pattern is then put on the table. The drag flask is put on, secured and rammed as before. The flask and pattern are secured, taken from the table, the pattern drawn, and the mold finished.

Fig. 7 shows the casting made from this mold, and is a view of the top or cope half. It is noticeable how smooth and true the lines are. There was not a blemish or spot in the entire casting, and this shows it just as it came from the sand, without being cleaned. The casting is that of a swinging arm for a 60-in. radial drill. It would be next to impossible to produce so fine a casting as this by hand methods, and the only skilled labor employed in the production of this casting was in the finishing of the mold and the setting of the cores—the rest being entirely performed by handy men.



Fig. 7—A 42-in. Ludlow Plain Gate Valve Body Made in Green Sand on a Jarring Machine

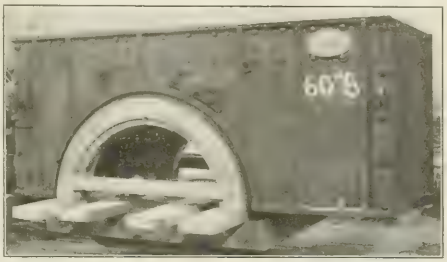


Fig. 10—Half of 60-in. Valve Pattern with Flask Ready for Ramming



Fig. 11—Ramming a 60-in. Gate Valve Body-Mold in a Pit

Fig. 8 is a view of a very quick, handy, and accurate method of weighting and securing the mold for a large bed plate, which weighs 40,000 lb. The long, square beams across the mold are cast iron. The foundry is supplied with various lengths of these beams for weighting different sized molds. These are quickly lifted into place, chaplets secured under them, and the upright weights shown are picked up by the crane and a great deal of time is saved in weighting so large a mold.

Jarring Machines for Large Ludlow Valves

The making of large gate valves on a jarring machine has been considered a difficult feat to accomplish, on account of the deep, narrow pockets which occur at the neck of the valve. This sand has no support, and there are small opportunities of securing it. It is now being accomplished at the works of the Ludlow Valve Mfg. Company, Troy, N. Y., and Fig. 9 shows the pattern of a 60-in. gate valve body, which is the extreme limit of the machine. This casting, when cleaned, weighs 19,000 lb.; the circular opening is 60 in. The casting when tested must be tight at 300 lb. water pressure. On account of the

heavy ribs, the mold is made in dry sand, and one can be cast every day by having a duplicate flask, where in hand molding in green sand it took about a week to make one.

Fig. 10 shows half of the pattern, with flask in place, ready for ramming. The flask is of very heavy construction, iron bars being used exclusively. Fig. 11 shows the operation of pouring a 60-in. gate valve body. The mold has been dropped in a pit, and rammed up to prevent run-outs. The pressure on this mold is very great, and as the core comes through the flask it is necessary to ram them up in a pit.

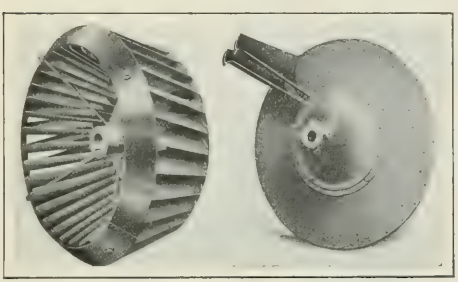
Fig. 12 shows a 42-in. plain gate valve body. The casting is made in green sand on a jarring machine. No better casting can be produced by hand methods, however skillful the molder may be. The weight of this casting is 6000 lb. The Ludlow Valve Mfg. Company makes valves from ¾ in. to 96 in. of all types and kinds, and more than 75 per cent. of the output is being produced on molding machines of various types.

The Conoidal Fan

New Multiblade Product of the Buffalo Forge Company

A new fan has been developed by the Buffalo Forge Company, Buffalo, N. Y. It belongs to the multiblade type which in recent years has proved in many ways superior to the usual centrifugal type for high-volume low-pressure service. Certain original features are claimed for which patent application has been made.

The blade construction gives the whole wheel the shape



Single Conoidal Fan Wheel Back Plate and Hub of Wheel

of the frustum of a cone, with the inlet on the side corresponding to the base of the cone. Looking straight into the inlet, the conical shape of the blades at once arrests attention. The prevalence of conical shapes in the design is responsible for the name Conoidal, which has been given the fan. Instead of blades that have parallel edges, they are slanting, so that at the inlet side the blade is much narrower than at the back.

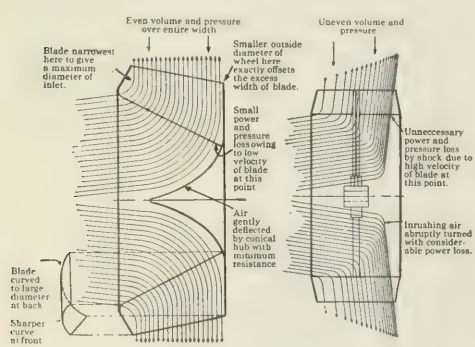


Diagram to Illustrate How the Conoidal Fan Handles Air

To understand the advantages of this design, it is necessary to bear in mind the fact that the suction produced at the inlet of multiblade fans makes the air rush in almost at right angles against the opposite side, usually referred to as the drive side, of the fan, and its course is then abruptly broken to an angle of nearly 90 deg. toward the periphery. This abrupt deflection causes loss of power and velocity. It is this very loss that it is sought to overcome in the Conoidal fan, by the increasing width of the blade from front to back. The width of blade at the drive side is large to enable it to handle the excess amount of air. A conical, gently sloping hub also deflects the inrushing air so that it describes, it is explained, an easy unbroken curve toward the periphery. The blades are curved to a varying diameter, the curve being smallest at the inlet side and easier at the drive side, just as though curved over the surface of a cone. The grade of the curve of the blades at all points from front to back is proportioned to scoop up the air with the least impact, the diameter of the curve being in proportion to the diameter of the inlet.

The diagram is to illustrate these various features. Compared with a centrifugal fan, the efficiency of the fan is understood to be considerably higher, and the headroom required very much smaller; it is therefore especially desirable where space is limited. The Conoidal fan also has, it is found, a practically constant efficiency curve over a total range of nearly 60 per cent., permitting a load of nearly 30 per cent. above or below rated capacity with all but maximum efficiency. The great width of each blade at the back, it is added, gives exceptional strength to the wheel, so that high speeds and loads can be maintained.

The Brass Manufacturers' Annual Meeting

The National Association of Brass Manufacturers held its annual meeting at the Hotel Astor, New York, December 13 and 14. The meeting was well attended. Among other matters taken up for consideration, the following resolution was passed:

Whereas, The making of net prices is harmful—tends to demoralize the market and drive prices and values to a lower level, therefore be it

Resolved, That the National Association of Brass Manufacturers hereby agree to discountenance and discontinue the making of net prices in so far as it lies in their power to do, and to urge all manufacturers to discourage and discontinue this harmful method of doing business and instead to quote, sell and invoice their goods from the regular lists and discounts, as has been the custom for years.

The following officers were elected for the ensuing year: Theodore Ahrens, Louisville, Ky., president and chairman board of trustees. Trustees—A. S. Hills, Haydenville, Mass.; D. H. Roberts, Detroit, Mich.; C. C. Hale, New Haven, Conn.; W. H. Wasweyler, Milwaukee, Wis.; Fred Sommerville, Toronto, Canada; J. W. Sharpe, Jr., Philadelphia, Pa. Delegate to the National Committee, H. M. Hoelscher. Commissioner, W. M. Webster, 64 Randolph street, Chicago. The association will hold its next meeting in Chicago March 19 and 20.

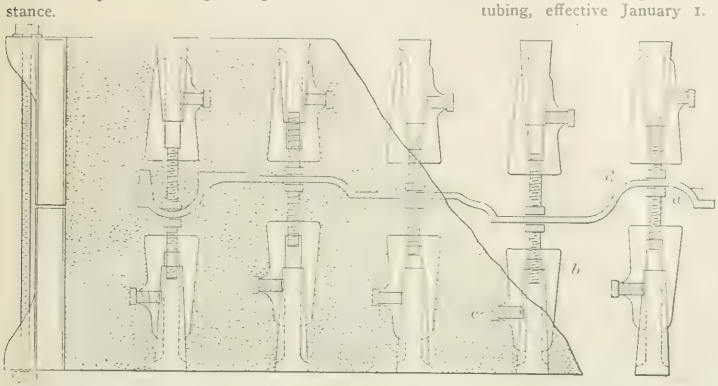
At the recent annual meeting of the stockholders of the Standard Roller Bearing Company, of Philadelphia, the following directors were elected: Lenox Smith, William D. Sloane, Isaac H. Clothier, W. B. Osgood Field, Henry DeForrest Baldwin, Edwin Packard, Herbert DuPuy, Edward B. Smith, John C. Winston, George H. B. Martin, James Boyd, and R. S. Woodward, Jr. The directors elected the following officers: Lenox Smith, president; R. S. Woodward, Jr., vice-president and general manager; S. Howard Smith, treasurer and secretary.

The Coatesville Boiler Works, Coatesville, Pa., has the contract for supplying all the "man" pipes to be used in the construction of the Panama Canal. These pipes are large steel tubes which will be built into the canal locks in such a manner as to allow a man to descend through them to inspect and lubricate the lock mechanism. Several shipments of the pipes have already been made.

The New York Central has placed an order with the American Steel Foundries for 17,000 car couplers which will be executed at the latter's plant at Alliance, Ohio. This plant will resume night and day shifts after January 1, on account of large bookings.

New Molding Flask

To prevent castings and especially those having thin walls from warping while in the mold, Henry E. Thompson, 253 Clinton avenue, Newark, N. J., is manufacturing a new type of molding flask. The special advantage claimed for this flask is that it furnishes a means of support for the castings while they are in the sand, is designed to prevent the warping which has hitherto occurred and also to provide means for reducing the tendency of the castings to warp during the cooling process. Formerly time was lost in the process of peening the castings after they were removed from the mold to correct this warping. In this way it is pointed out that by the use of this device the waste of time and labor incident to this process is avoided and that sound and perfect castings are produced in the first instance.



A New Type of Molding Flask Employing a Series of Movable Pins to Prevent Warping of the Casting. Invented by Henry E. Thompson, Newark, N. J.

The new flask is provided with stout abutments making contact with the two sides of the casting or portions thereof, while it is cooling in the sand. These abutments can be located anywhere on the flask or either of its parts to suit the particular work being done. They are made easily adjustable to suit the different castings and are supported firmly to resist any tendency to warp which the castings may develop during the period of cooling. One of the preferred forms of flask makes use of a cope and drag formed with a gridiron back composed of bars laid at right angles. These bars form a very convenient attachment for locating the abutment in any of the arrangements corresponding to the various kinds of patterns. Referring to the accompanying engraving, which is a view partly in elevation and partly in section showing the casting within the closed flask, the abutment consists of a pin, *a*, passing through and engaging threaded holes provided at various points on the flask. These pins can be screwed in more or less to adjust the point of engagement between the abutment and the casting accurately and lock nuts can be used to secure each pin more firmly in place. In another type of abutment which is also shown in this engraving the pin has a divided base, *b*, adapted to fit and straddle the gridiron part of the flask in any given position. After the necessary adjustment has been made to make contact with the pattern, set screws *c* are used to secure the abutment while as a further precaution a wedge can be inserted under each pin in the space between it and the bars of the gridiron to prevent the abutments from moving.

In use the pattern *d* is first placed upon a moulding board and the drag is then placed over it. The abutments are then adjusted by being screwed down until they make firm contact with the pattern at which time the drag is filled with sand that is tamped down. The drag is then released and turned upside down and the cope applied to it. During this part of the proceedings separators to hold the two parts of the flask slightly apart during the packing of the sand are used. Upon removing these separators when the pattern is removed and closing the mold, the sand surfaces are squeezed together so as to prevent the formation of spaces by which fins might be formed. Both portions of the flask having been united and the pattern *d*, being in place, the set screws *c* are loosened and the pins *a* are pressed into firm contact with the back of the pattern. The set screws are then tightened and the sand packed into the cope. After the pattern and separators have been removed from the mould the latter is again closed and the iron poured, the mold and the casting taking the position shown in the accompanying engraving. It will thus be seen that the castings will be firmly confined at various points by abutments which will resist the tendency to warp successfully.

Flexible Metal Hose and Tubing

The American Metal Hose Company, Waterbury, Conn., has issued a revised price list on its flexible metal hose and tubing, effective January 1. Important reductions have been made which will be appreciated by users of this hose which is adapted to steam, oil, gas, suction, air or for conduit work. It is constructed either interlocking, double groove or single groove. Regular sizes are 3/16 to 3 in. in diameter, larger sizes being made on order.

While the company has been in existence over three years, for the first year it did no manufacturing but imported all of its hose from a German metal hose factory with which it was connected. For the last two years it has been manufacturing at its new factory in Waterbury, and is to-day entirely separate from any foreign connections. The company's experience has shown that in metal hose it has a good article, the use of which even at current prices is a decided economy. In order, however, to build up a large business in it the company feels that it will be necessary to reduce the cost to the consumer to a point where it will always be attractive. It is proposed do do this as fast as reductions in manufacturing costs will allow. The new price list, with reduced prices, marks a step in this direction.

Flexible metal hose is past the novelty stage and is today a recognized commercial article. The United States navy has adopted it and some time ago drew up specifications for a manufacturing test, etc. The business is showing a constant increase; the only complaint that the company makes is that sometimes its hose lasts too long.

The Tariff Board says that in the case of a suit of clothes retailing at $23 the farmer receives for the wool $2.23, and his profit is 68 cents; the manufacturer of cloth receives for his product $4.78, and his profit is 23 cents; the wholesale clothing dealer receives for his product $16.50, and his profit is $2.18; the retail clothing dealer receives $23, and his profit is $6.50. This shows why the cost of living was less in the old days, when the process of turning wool into a suit of clothes was all done on the farm.

The English Miners' Federation will take a vote on the question of stoppage of work in all mines based on a demand for a minimum wage. If two-thirds of the members vote to stop work a national strike will be ordered for the end of February.

Immigration returns at Ellis Island for this year show a considerable decrease in the number of aliens entering the United States. Compared with 1910 there is a decrease of more than 320,000, or about 30 per cent.

Active work is now going on in the building of the new open-hearth steel plant of the Youngstown Sheet & Tube Company, Youngstown, Ohio, practically all of the contracts having been placed.

The Machinery Markets

In a general way the machinery business of the country is quiet. Various influences incidental to the closing of the year are largely responsible for the condition which exists. Despite the quietness reported from practically all of the machinery centers, there exists a decidedly healthy tone based on the anticipation with which dealers and manufacturers are looking forward to the early months of 1912. At the same time many of them have done an excellent volume of business during December, one or two prominent houses comparing the month with that of March last when they were busy. New York dealers seem to have done better than those in most other cities, two or three fairly good orders having been placed and small orders fairly numerous. New York dealers whose line of machinery is varied are working on some very encouraging prospects. The improvement in general conditions continues in New England. Detroit has many inquiries and a demand for second-hand machinery. Philadelphia has closed a few deals, but is looking forward. Cleveland has been quiet, with sales mostly of single tools. Cincinnati has some export business in hand and is interested in a rumor that a Central Western railroad is to issue a list. In the South building operations continue to be a subject of interest, and the coal fields are taking considerable machinery. Texas expects that good crop conditions will make business, while the revival of demand from Mexico continues. The Pacific coast is doing a quiet business, mostly for replacement with some tentative inquiries of a satisfactory character.

New York

NEW YORK, December 27, 1911.

The last days of 1911 find New York machinery men almost without exception in an optimistic frame of mind with regard to business prospects. They have made some good sales during December, and have reason to anticipate better ones and a larger number in the early months of 1912. The Hewitt Motor Company, which is to manufacture motor trucks, placed a substantial order for its new plant within the last few days, and the Delaware, Lackawanna & Western Railroad is understood to have bought the tools specified in its list referred to recently. This list included one 16-in. x 6-ft. Hendey geared head tool room lathe, one No. 3 universal grinding machine, one 24-in. Gould & Eberhardt high duty shaper, one 24-in. back geared vertical drill press, one No. 3 Brown & Sharpe universal milling machine and one safety emery wheel grinder. A more important list, which will include a number of heavy machine tools, has not been given to the trade by the Lackawanna Railroad, but is said to be in course of preparation. The list anticipated from the Delaware & Hudson Railroad, so often referred to, has not yet materialized, and dealers say that action with regard to it probably will go over to the new year. Buying for replacement by large manufacturing interests has added to the good feeling in the trade. Sellers who carry an extensive and varied line are busy with prospects which must produce business some time in January.

Papers have been filed with the Secretary of State at Albany for the incorporation of the Hewitt Motor Company, with offices in New York City. The original Hewitt Motor Company was one of the pioneers in the automobile industry, and especially in the commercial department, being one of the first in this country to produce light delivery wagons and heavy trucks. In January, 1910, a combination was effected between that company and the Metzger Motor Car Company, now of Detroit, Mich., and Hewitt trucks have been produced by the Metzger Motor Car Company through its truck department, 6 to 10 East Thirty-first street, New York, of which Edward R. Hewitt, the engineer of the original Hewitt Motor Company, remained in charge. The new company has acquired from the Metzger Company its interest in the truck department, and will manufacture Hewitt trucks in its own new factory and service station at West End avenue and Sixty-fourth street as soon as the equipment has been installed, about January 15. In the last few days the company has placed orders for about $30,000 worth of machine tools. Mr. Hewitt is in entire charge of the engineering and construction of the Hewitt trucks. The directors of the new company are M. F. Burns, E. C. Converse, Wm. E. Corey, E. R. Hewitt and Ambrose Monell. The company has an authorized capital stock of $1,000,000 in one kind of stock only; no bonds.

The Breeze Carbureter Company, 250-252 South street, Newark, N. J., desires quotations on the equipment for a brass composition and aluminum foundry to turn out 2000 to 3000 lb. of castings a week. The information should be given as quickly as possible, as the foundry is now in course of erection and the equipment must be purchased speedily. The equipment called for comprises two oil or coal and coke furnaces, a hand molding machine, flasks, a brass founder's three section drying stove, foundry bellows, molders' shovels, graphite crucibles, a core oven with five compartments, small sprue cutter, small metal separator and the necessary riddles, clamps, wire brushes and other small tools.

The A. V. Mfg. Company, New York, recently incorporated with $200,000 capital stock, has had plans prepared for a one-story fireproof factory building, 60 x 100 ft., to be erected on a site recently purchased at Poughkeepsie, N. Y. The company is having a list prepared of its machinery requirements for the manufacture of motor specialties. The incorporators are Allesandro Bolognesi, Aldo Bolognesi and William H. Hoppin, Jr., all of 54 Wall street.

The plant of F. E. & M. Vernon, manufacturers of blank books, Eleventh and Berry streets, Wililamsburgh, N. Y., was totally destroyed by fire December 23. The estimated loss is $500,000, partly covered by insurance.

The Vanity Mfg. Company, Buffalo, N. Y., has been incorporated with a capital stock of $50,000 and will engage in the manufacture of polishes and ointments. Manufacturing space has been secured in the Schoellkopf Power Building, Washington and Chippewa streets. The directors of the company are: Almon W. Lytle, Edward C. Koester and R. C. Long.

The Electric Wind Turbine Company, Buffalo, has been incorporated with a capital stock of $150,000 to manufacture electric machinery, etc. The incorporators are J. G. Childs and B. G. Tallman, corner of Perry and Mississippi streets.

The Buffalo Natural Fuel Company, Buffalo, will build an extensive plant, including a machine and repair shop, at Genesee, Monroe and Brown streets, to cost $100,000.

The Kendall Refining Company, Buffalo, will build an addition to its distributing plant on Rapin avenue and the Erie Railroad.

The Manzel Bros. Company, Buffalo, manufacturer of auto oil pumps, etc., is building a 1½-story brick factory, 60 x 200 ft., at Babcock street and the Pennsylvania railroad.

Business Changes.

The offices of the Vandyck-Churchill Company have been moved from 91 Liberty street and are now on the fifth floor of the Singer Building, 85 Liberty street.

New England

BOSTON, MASS., December 26, 1911.

The improvement in general conditions continues. Some of the machine tool builders report a marked increase in orders, and, while the opinion is not unanimous, the generally prevailing idea is that the opening months of 1912 will see a very good business, equal at least to the corresponding period of 1910. Usually December is not a month of increase, but rather one of quieting down for inventory. This fact adds to the confidence begot from recent experience.

A letter from a large manufacturer of small tools which enter into machine shop equipment is of exceptional interest. It states in part: "It is conceded that business has not been quite normal during the past 12 months, and we think it is true that any concern that

has been able to maintain its normal volume of business has done well. Fortunately we are able to record on our books at the close of 1911 the fact that we have made a good, substantial increase in volume during the year over that of 1910. It is true that the larger part of this increase has come from our export trade, especially in Central and South America, but there has been a good, steady increase all through our own country. We are in constant touch with our salesmen throughout all States of the Union and abroad, and through them we get a fairly accurate reflection of the general opinion of the trade on whom they call, and we are glad to say that from nearly every section there seems to be a feeling that business will be better during the coming 12 months than during the ones just passed. Crops for the year have been excellent, money is plentiful and easy, and stocks of hardware manufacturers as a rule are considerably less than normal. Railroads whose buying has been reduced during the past year are increasing their purchases, and most of the conditions that disturb business during the presidential year have already been adjusted or discussed until that coming event would be likely to have no great influence on business conditions."

The marine combustion engine builders have had an exceptional year, and signs point to fully as good a business for 1912. The development of the type has been rapid, and the cheaper kerosene, fuel oil and producer gas engines will play an important part in the next few years.

The L. S. Starrett Company, Athol, Mass., manufacturer of fine mechanical tools, has increased its capital stock to $3,500,000, of which $1,500,000 is to be 6 per cent cumulative preferred stock and $2,000,000 common stock. The officers of the company are: L. S. Starrett, president; F. A. Ball, vice-president; F. E. Wing, treasurer and secretary; W. G. Nims, assistant treasurer; with a board of nine directors consisting of the officers named and M. B. Waterman, Augustus P. Loring, John A. McGregor, J. H. Drury and W. B. McSkimmon. The last four named are officers of the Union Twist Drill Company, the second largest machine factory in Athol. The Union Twist Drill Company becomes a stockholder of the L. S. Starrett Company, and as such has representation on the board of directors, which is increased from five to nine. The L. S. Starrett Company was incorporated in 1900, succeeding to the business established by L. S. Starrett in 1880 and conducted by him individually up to the time of its incorporation. The capital stock of the incorporation was $100,000 in 1900, since which time the business has increased far out of proportion to the original capital. L. S. Starrett continues in active control of the business.

The Henry & Wright Mfg. Company, Hartford, Conn., manufacturer of drilling machines, has acquired the building of the Parker Motor Works in that city, and will continue its business there, instead of removing to Detroit, Mich., as had been contemplated. After careful consideration the company decided that, taking everything into account, it would be better to retain its residence in New England. The new works are located in the northern part of the city, in a rapidly growing industrial neighborhood. The building is excellently adapted to its purpose. It is one story, and the space is so arranged that equipment can be arranged to the best of advantage. The site includes ample land for extension in the future. The removal from the present shops on Sheldon street will be made at no distant date. The company's business is in a very prosperous condition. Recent orders have been so great as to equal production, November being the best month of the year to date, and December exceeding that.

A. Russell Dyke, owner of the Bay State Handle Company, Worcester, Mass., manufacturer of handles for small tools, has sold his business to a new Massachusetts corporation, known as the Bay State Tool Handle Company, having a capital stock of $10,000. E. C. L. Morse is the president, Annie L. Dyke treasurer, and Daniel W. Lincoln clerk. The change affords additional working capital, and the business will be expanded.

The R. T. Green Corporation has been chartered under Connecticut laws, to conduct the shipbuilding business at Nat's Point, Stonington, Conn., of the R. T. Green Shipbuilding Company, Chelsea, Mass. It is proposed to place the yard at Nat's Point on a modern basis. W. R. Green, Stonington, is the president of the new company, and R. T. Green is chairman of the board of trustees, which is made up of the officers.

Connecticut Valley industries, including those of large manufacturing centers of Connecticut, are looking to the New England Power Company to furnish them electric power from the great developments planned on the Deerfield River and other tributaries of the Connecticut. The estimate is that 40,000 hp. will be available as soon as the various hydraulic stations and storage reservoirs are completed, which will be at no distant date. Very little hydroelectric power is used in the great industrial State of Connecticut, and its introduction on a large scale would be of very great importance. This has already been proved in Massachusetts, especially in the central part of the State, which is served from the station at South Vernon, Vt., the property of the Connecticut River Power Company, which is owned by the interests having the other large projects in hand.

Philadelphia

PHILADELPHIA, PA., December 26, 1911.

Business shows a gradual slackening in practically all branches of the trade, as is to be expected at this time. Some few negotiations which buyers wished to clean up have been put through, but the majority of the business pending has been deferred until after the turn of the year. Manufacturers are giving a large share of their attention to the usual annual stocktaking, for which purpose a number of plants have and will be temporarily closed. Some scattered fresh inquiry for tools and equipment is reported, largely single tool propositions. No further railroad shop inquiries have developed, and little of the pending business has been closed.

In second-hand machinery the buying has been of desultory character, purchases covering a scattered class of equipment, and the aggregate volume of business being small. Some fair business in boilers, engines and general power equipment is in sight. Manufacturers of machine tools as well as merchants take a more optimistic view of the situation; the recent continued activity in the iron and steel trades is looked upon as encouraging, and it is believed that the betterment in those lines will result in an early improvement in the machinery business.

Otto C. Wolf & Son, engineers, are planning for the erection of a five-story brew house, a boiler house and a storage building for the Christian Schmidt Brewing Company, Second and Edward streets. Contracts for an installation of Babcock & Wilcox boilers, of 2000 hp., have been given out, and additional equipment for the boiler house will be purchased at a later date.

The Riverside Malleable Iron & Steel Works, Incorporated, of which William Austin, Scranton, Pa., is president, George Smallcomb, Pittston, Pa., is secretary, and F. W. McKown, also of Pittston, is treasurer, will locate in Scranton on or before April 1, and erect a plant for the production of malleable, gray iron, steel, bronze and gun metal castings. A line of specialties in steam and hydraulic engineering devices will also be manufactured.

It is stated that Swift & Co., Chicago, Ill., will erect a large warehouse in Chester, Pa. It is reported that a site has been purchased and that the building will be equipped with the latest improved appliances for handling meats, refrigerating machinery and other facilities required in the conduct of the business.

Irwin & Leighton, contractors and engineers, are taking bids and will probably close this week on the power equipment for the Webb Terminal Warehouse Company Building now under erection. The equipment includes three 150-hp. water tube boilers, a forced draft blower, one 150-kw., one 100-kw. and one 60-kw. generator, directly connected with compound Corliss engines.

The Hydro Mfg. Company has been incorporated with a capital stock of $25,000 and takes over the manufacture and sale of hydraulic and mechanical specialties heretofore conducted as a department of Barrett & Lawrence, Incorporated, engineers, Bullitt Building. The machine shop operated by the latter at 305 Cuthbert street will be conducted by the new corporation. No improvements or extensions in equipment are anticipated at this time.

The C. V. Stahl Motor Works, which has been engaged for some years in the manufacture of automobile engines, has been incorporated as the C. V. Stahl Motor Company, and is now erecting a factory building 40 x 90 ft. at Twenty-seventh and Diamond streets, which it expects to occupy in about a month. Additional machinery will be required for the new plant, but the requirements have not been decided upon.

The Lehigh Coal & Navigation Company announces that it has decided to go ahead with the construction of its large plant at Hauto, Pa., to furnish light and power to a number of towns and industries in the Lehigh Valley. This has been under consideration for over a year, but it has taken time to complete the necessary formalities. The project will involve an expenditure of about $3,000,000. L. B. Stillwell, consulting engineer, 100 Broadway, New York, will have charge of purchases in connection with the plant.

The Lehigh Valley Structural Steel Company, Allentown, Pa., is proceeding with the erection of additions to its plant to replace that portion destroyed by fire in November. The foundation for the new shops has been completed and the structural work fabricated. Two buildings, each 60 x 200 ft., will be erected. Orders for cranes and machine equipment for the new additions have been placed. The increased facilities will double the former productive capacity of the plant.

Chicago

CHICAGO, ILL., December 26, 1911.

The Swanson Motor Car Company, Chicago, has been incorporated with a capital stock of $50,000 to manufacture and deal in automobiles, motor cars, trucks, etc. The incorporators are Chas. E. Swanson, Elmer E. Challenger and Marshall E. Gallion.

Williams Anderson Machinery Company, Chicago, has been incorporated with a capital stock of $50,000 by J. H. Westover, Errick Waters and John Waters, all of that city. The company will engage in the manufacture of machinery.

The National Spring Tire Company, Chicago, organized to engage in the manufacture of automobile accessories, with a capital stock of $125,000, has been incorporated by Charles L. Sigman, Jr., Louis Valence, Charles H. Jackson, F. J. Karasek.

The Lee Motor Company, Chicago, incorporated by Clarence A. Anderson, Oscar J. Lee and Robert G. Henderson, with a capital stock of $50,000, will manufacture and deal in automobiles and accessories.

The Stiles Steel Bridge & Concrete Company, Chicago, contracting and construction engineer, has been organized with a capital stock of $25,000 by John W. Worthington, Byron C. Thorp and Louis W. Frank.

The Inventors Specialty Mfg. Company, Chicago, has been incorporated with a capital stock of $15,000 by James R. Glass, Henry M. Seligman and Bernice Harris, Chicago.

Fred C. Ehman & Co., Chicago, have been organized to manufacture machinery and appliances by Wilbur C. Bacon, Henry S. Blum and Mary Blum. The capital stock is $10,000.

The Double Blast Mfg. Company has been organized with a capital stock of $6,600 by N. W. Lundy, A. C. Lundy and P. C. Regan. The company is to locate at North Chicago and will manufacture soldering furnaces.

The Davis Milk Machinery Company, Chicago, has closed a contract for two acres of land at North Chicago on which a plant 118x423 ft. is to be erected at an estimated cost of $40,000.

Kirchoff & Rose are preparing plans for the erection of a four-story factory building 80 x 100 ft. to cost $60,000. This is to be located at Clinton and Oregon streets, Milwaukee, Wis.

The Edgar-Allen American Manganese Steel Company, Chicago Heights, Ill., is building an addition to its machine shop 90 x 120 ft.

At Champaign, Ill., an issue of bonds to the amount of $35,000 has been authorized to provide for an electric lighting system.

The Hackney Mfg. Company, St. Paul, Minn., recently organized, has acquired a site of 18 acres and is having plans prepared for a plant complete with foundry, machine shop, erecting rooms, etc., for the manufacture of farm implements and specialties.

The Farm Power Machinery Company, 124 East Twenty-sixth street, Minneapolis, Minn., is being organized to manufacture farming implements. The company is having plans prepared for the erection of a factory and will soon be in the market for equipment.

The Seevers Mfg. Company, Oskaloosa, Iowa, has under consideration the removal of its business to Peoria, Ill., where a tract of 21 acres has been purchased, and upon which a new plant is to be erected. This company, in addition to its fabricating shop, manufactures a line of boilers and engines.

Cleveland

CLEVELAND, OHIO, December 26, 1911.

The past week has been a quiet one in the local machinery market. There has been little call for machine tools, and orders have been mostly for single tools. Two new inquiries came out for small lots of tools, each aggregating about $3,000. Dealers are looking for little activity before the middle of January. There is a fair amount of business in prospect in steel plant equipment and in handling machinery for various purposes, but the placing of orders is being generally delayed until after the first of the year.

The foundry trade is rather quiet, as is usual at this time of the year, although the demand for steel castings has shown an improvement recently.

The Potter Mfg. Company, Geneva, Ohio, of which W. A. Potter has been sole owner for several years, has been incorporated under the same name with a capital stock of $25,000. Several leading business men in Geneva have become interested in the company, and additional capital will be provided to enlarge the factory and to add new lines of hardware specialties which the company makes. Among the men who have become interested in the company are John Hasenpflug, president of the Champion Safety Lock Company, and A. M. Ford, treasurer of the Geneva Metal Wheel Company.

The Grant-Lees Machine Company, Cleveland, manufacturer of gears, has acquired control of the Stuyvesant Motor Car Company, Cleveland, and the plant of the latter company will be moved into a new building that is to be erected adjoining the Grant-Lees plant at Quincy avenue and East Sixty-ninth street. This building will be 120 x 120 ft. and four stories. Some new machinery will be required. The plant of the motor car company will continue to be operated under its present name.

The Avenmarg & Carter Machine Company, Cleveland, has been incorporated with a capital stock of $10,000, to succeed the partnership of Avenmarg & Carter, machinists, 1734 Columbus road. The company is planning some extensions to its present line of products.

The Brook Electric Construction Company, Cleveland, has been incorporated with a capital stock of $10,000 by John L. Schreiner and others to manufacture and deal in electrical supplies.

The Doylestown Aluminum Wear Company, Doylestown, Ohio, has been incorporated with a capital stock of $10,000 by Harvey J. Heller and others.

The Weger Motor Company, Cleveland, has been incorporated with a capital stock of $100,000 to manufacture internal combustion motors. E. T. Rock, J. B. Seymour and others are the incorporators.

With a capital stock of $40,000 the Buckeye Lighting & Power Company, Covington, Ohio, has been incorporated to build and operate a gas or electric light plant or plants. Among the incorporators are J. H. Marlin, A. W. Landis and John Weaver.

The Goodlime Mfg. Company, Kent, Ohio, has been organized with a capital stock of $40,000 to manufacture novelties and office supplies. John Gatz is presitent, R. M. Vick general manager, and W. W. Rigg secretary.

The Vaughan Paint Company, Cleveland, has bought a site on Lakeside avenue, on which a new plant will be erected.

The Hydraulic Press Mfg. Company, Mt. Gilead, Ohio, will add a brass foundry to its present plant.

The Springfield Compressed Air Machine Company, Springfield, Ohio, has been organized with a capital stock of $100,000 to place on the market a new air compressor invented by L. C. Keiser, of Decatur, Ill. For the present the company will have its product manufactured by another Springfield concern.

The A. J. Clark Company, Beloit, Mahoning County, Ohio, manufacturer of acetylene gas engines and lighting plants, is planning to move its plant to Youngstown and to double its present capacity.

The Louth-Geurgens Motor Car Company, Fremont, Ohio, will enlarge its plant by the erection of an addition 60 x 150 ft. to be used in the assembling and body building departments. Another addition is contemplated in the spring.

Bids have been received by The Toledo Factories Company, Toledo, Ohio, for an industrial power building which that company will erect in Toledo.

Cincinnati

CINCINNATI, OHIO, December 26, 1911.

The holiday season has caused a natural cessation in the buying of machine tools, although there are a few export orders that will probably be closed soon. Nearly all manufacturers in this section are taking stock and making arrangements for going out after business soon after the first of the new year.

There is a report in circulation, that cannot be confirmed at this writing, to the effect that one of the large Central Western railroad systems contemplates placing orders for machine tools on a list that was issued over a year ago.

The jobbing foundries are not quite so active, and most of them welcome the chance to close down for a few days.

The Miami Valley Machine Tool Company, Dayton, Ohio, has been consolidated with the Stiles Mfg. Company, Parkersburg, W. Va., and at an early date will commence the removal of its Dayton plant to Parkersburg. The new company is incorporated under the name of the Miami Machine Company, with $200,000 capital stock. In addition to its regular line of engine lathes, drill presses and grinders, woodworking machinery will also be manufactured, as well as a full line of shaft hangers, couplings, etc. The officers of the company are P. P. H. Conover, president; James Turpin, vice-president, and Guy L. Camden, secretary and treasurer.

Architects Garber & Woodward, Andrews Building, Cincinnati, will probably be ready to receive bids the latter part of January for the construction of the proposed 27-story office building for the Union Central Life Insurance Company.

The Shartle Brothers Machine Company, Middletown, Ohio, was recently incorporated with $100,000 capital stock to take over the business of an unincorporated firm of the same name. No additions are planned to the existing plant, as has been currently reported.

The M. Marcus Building Company, Cincinnati, has been awarded contract for a six-story brick addition to the cracker factory of George A. Streitman & Sons, Canal and Twelfth streets.

For the announced purpose of manufacturing and dealing in iron and steel, the Superior Tool Company has been incorporated at Wheeling, W. Va., with $50,000 capital stock. Ed. W. Westwood and H. E. Rennard are named among the incorporators.

The Concrete Steel Company, Cincinnati, has commenced work on a three-story concrete dry house for the Clifton Springs Distilling Company.

The Richland Macadam Company, Waldo, Ohio, has recently been incorporated to operate a stone quarry, and it is quite probable some crushing machinery will be required. Thomas Carroll is one of the incorporators.

C. L. McCrea, Dayton, Ohio, is president of the recently organized American Briquetting Company, an Arizona corporation with $1,250,000 capital stock. It is the announced intention of the new company to erect a fuel briquetting plant at New Salem, N. D.

The Allyn Engineering Company, Oakley-Cincinnati, Ohio, has been appointed consulting engineer for the Milwaukee Corrugating Company, Milwaukee, Wis., and is now preparing plans for additions to the Company's Milwaukee plant that will represent an expenditure of over $500,000.

Detroit

DETROIT, MICH., December 26, 1911.

The holiday season is having its effect on the machine tool market and business the past week has been of a very ordinary nature. Inventory taking and the fact that many of the larger manufacturing concerns hold their annual meetings the first and second weeks of January also tend to hold back the purchase of equipment in large quantities. Inquiries are very encouraging and are from widely diversified sources, indicating healthy industrial conditions in almost all lines. A feature of the situation locally is the large number of new companies which are entering the field, especially for second hand machinery, mostly for small machine shop equipment and for replacements. A number of propositions calling for a considerable tonnage of structural material are pending and are expected to mature early in the year. Building conditions continue to improve.

Knell & Adams, automobile body finishers, have purchased the plant of the Stoepel Overall Company, 1045 Jefferson avenue, and will equip it for their own use. The new factory is two stories, 77 x 200 ft., and will permit a considerable expansion of the company's business.

The Nichwalds Company has been incorporated with a capital stock of $10,000 to manufacture automobile parts and accessories. The incorporators are H. W. and T. A. Nichwalds and Harry M. Lau.

The Studebaker Corporation, manufacturer of automobiles, has taken out a permit for the erection of an addition to cost $13,000 to its No. 3 plant and is constructing an addition to its No. 1 plant costing $3,000.

The Detroit Switch Lock Company has been incorporated with a capital stock of $25,000 to manufacture and deal in railroad safety appliances. The principal stockholders are Albert Kaltschmidt, M. W. Edgar and J. R. Decker.

Adam Brandau, maker of fireproof molders' shoes, has merged his business in a stock company with a capital stock of $40,000 under the style of the Brandau Shoe Company and will enlarge his operations.

The American Car & Foundry Company has purchased the Baugh steam forge plant on Clark street, which has been idle for three years, and will utilize it for the manufacture of iron parts for cars.

Frederick Kahl, manufacturer of machinery castings and structural iron, has incorporated his business under the style of the Frederick Kahl Iron Company with a capital stock of $100,000. It is probable that the capacity of the present plant will be materially increased in the near future.

The plant of the Universal Motor Truck Company has been purchased by interests headed by Howard Walton, of New York City. The company has a present capital stock of $350,000, and according to V. K. McBride, general manager of the company, plans are under way for a reorganization of the company looking toward increased capital and an enlargement of the plant.

The Lansing Abattoir Company, Lansing, Mich., has been organized with a capital stock of $30,000 by G. H. Zeigler, J. G. Reutter and G. E. Decke. The company will erect a modernly equipped packing plant.

The Witwer Baking Company and the Freeman Baking Company, Kalamazoo, Mich., have completed a merger of their interests whereby the plants of the two companies will be combined and a further addition to the capacity of the merger is contemplated, including the erection of two new buildings and the purchase of additional machinery. George Freeman will be general manager of the consolidated company.

The Commonwealth Power Company, Jackson, Mich., has completed plans for the erection of a large power plant at Battle Creek, Mich., to be used as a terminal for its high tension lines from the Au Sable River. The plant and equipment will involve the expenditure of $250,000.

The Kalamazoo Stove Company, Kalamazoo, Mich., is adding a department for the manufatcure of furnaces and is increasing its equipment heavily.

C. A. Spears & Son, Grand Rapids, Mich., are planning to build a large factory in connection with their lumber yards, for the working up of building materials. The factory will be of brick and concrete and will be modernly equipped.

The plant of the Adjustable Table Company, Grand Rapids, Mich., was destroyed by fire, December 16, causing a loss of $65,000. G. A. Hendricks, president of the company, states that work on rebuilding the plant will be commenced at once. A five-story building, with modern woodworking equipment and a complete sprinkler system, is planned.

H. E. Oliver, Detroit, is interested in the establishment of an artificial ice plant at Owosso, Mich. A building 60 x 100 ft. is planned.

The Wolfarth Baking Company, Saginaw, Mich., will build a new baking plant 85 x 98 ft. An entirely new equipment of baking machinery will be installed.

H. N. King, Adrian, Mich., will soon begin the manufacture of a new silo building block of cement for which he recently secured a patent.

The Art Mfg. & Novelty Company, manufacturer of picture frames, is removing its business from Detroit to Pigeon, Mich. A factory building has been secured and the output of the company will be considerably increased.

The Mershon & Morley Company, Saginaw, Mich., maker of portable houses, has increased its capital stock from $25,000 to $35,000 to take care of increasing business.

The Brown Machine & Engine Company, Lansing, Mich., has been organized with $25,000 capital stock to take over the tool works of H. W. Brown, who will be president of the new company. The concern has perfected a stationary gasoline engine of new design and a department for its manufacture will be equipped.

The electric lighting plant at Sparta, Mich., was destroyed by fire December 20, entailing a loss estimated at $50,000. The plant was owned by the Sparta Milling Company and it is reported that steps to rebuild will be taken at once.

The Hastings Table Company, Hastings, Mich., is erecting an addition which will add 6000 sq. ft. to its plant.

The Noyes & Frank Nut Company has been incorporated with $10,000 capital stock to manufacture nuts and burs. The stockholders include Mayhew E. Noyes, George P. and William F. Frank.

The Federal Equipment Company has been incorporated with a capital stock of $25,000 to manufacture sprinkler equipment and fire extinguishers. The principal stockholders are Milton A. McRae, J. L. Hudson and J. W. Ailes.

The Schleider Mfg. Company has filed articles of incorporation giving its capital stock as $10,000. The incorporators of the new company, which will manufacture valves and engine and auto parts, are Augustus E. Schleider, W. E. Carpenter and C. E. Sweet.

William Heap & Sons, Grand Haven, Mich., manufacturers of plumbers' woodwork, have had plans prepared for an addition to their factory, 60 x 140 ft., at an estimated cost of $8,000. The addition is to give room for expansion and is not to be used for the manufacture of fireless cookers, as was erroneously stated in our issue of December 7.

William Heap & Co., Muskegon, Mich., manufacturers of fireless cookers, are erecting a factory building at Grand Haven, Mich., and will move their business there as soon as it is completed.

The South

LOUISVILLE, KY., December 26, 1911.

The general feeling is optimistic, and it is believed that 1912 will produce a normal volume of business, at least. There has been some stimulation of the demand for machine tools in the local market. Building operations are continuing to absorb a large amount of equipment. The expansion of coal development work in eastern Kentucky is going ahead, and a lot of orders for machinery of all kinds are being placed, especially in the southeastern part of the State in the so-called Jellico district.

The Tycrete-Concrete Company, Louisville, will purchase a 12-ton hydraulic press for use in making concrete blocks.

The Sunnybrook Distilling Company, Louisville, is erecting a new building, and is contracting for a good deal of new equipment, including conveying machinery, etc.

E. D. Morton & Co., Louisville, report the sale of three Howe beam scales ranging in size from 2½ to 5 tons to the Greenbrier Distilling Company; an 11-in. lathe of the South Bend Machine Tool Company to the Henry Koehler Mfg. Company, Louisville, and a Burnham boiler-feed pump to the Louisville Soap Company.

W. H. Neill & Co., Louisville, report a heavier demand for machine tools. During the past week an upright drill press of the Rockford Drill Company and a Foster turret lathe were included in the sales.

The Norman Lumber Company, Louisville, has purchased a Hanchett-Swage grinding outfit for use in connection with its recently erected planing mill.

The Henry Vogt Machine Company, Louisville, reports the completion of its new buildings, which will double the capacity of its ice machine department, and the installation of a 10-ton electric crane by the Pawling & Harnischfeger Company, Milwaukee. Night work is the rule at this plant, which has received a lot of inquiries for boilers, refrigerating plants, ice machinery, etc.

Fred Franke, Louisville, has moved his wood-working plant to Jeffersonville, Ind., and has installed equipment for the manufacture of lawn swings and other wood specialties.

The Maysville, Ky., Public Service Company has let a contract to the General Electric Company for the installation of a 200-kw. generator.

George A. Dickel & Co., Nashville, Tenn., have purchased a site at Hopkinsville, Ky., and will erect a large distillery there, it is reported. The company has been operating a plant near Nashville.

K. U. Meguire, of the Sneat-Meguire Coal Company, Louisville, has been elected president of the Harlan Coal Company, with headquarters at Barbourville, Ky., which will develop 10,000 acres of coal lands near Caston, Ky. L. W. Farmer, Barbourville, is manager of the company, and will shortly begin letting contracts for the necessary equipment, including conveyors, engines, boilers, compressors, etc.

The Audubon Mineral Water Company, Maysville, Ky., is erecting a bottling plant, and is in the market for equipment, including power machinery. A boiler, engine and pump are wanted.

Development work is to be begun in the immediate future by the Pond Creek Coal Company, 55 Congress street, Boston, Mass., which controls 30,000 acres of coal lands in Pike County, Ky. It is reported that machinery will be purchased immediately. Thomas B. Davis, Jr., 1 Broadway, New York, is general manager of the company.

Machinery men are interested in the organization of the Kentucky Fuel Company, which has taken over 12 mines in western Kentucky. The company is to be capitalized at $1,500,000, and will be stronger financially than any concern which has had charge of the development of mining properties in that section. It is understood that considerable expansion will be provided for by the new company, of which W. G. Duncan, Greenville, Ky., is president.

The Kentucky State Reform School, Lexington, Ky., is equipping a manual training department. A machine shop, forging department and wood-working shop are among those to be provided for.

The Farmers' Loose Leaf Tobacco Warehouse Company, Carlisle, Ky., will equip its building with a hydraulic press of large capacity for the purpose of prizing leaf tobacco.

Benton, Ky., is considering the establishment of a system of water-works.

A chair factory costing $25,000 is to be erected at Loudon, Tenn. Those interested are C. H. Bacon, C. P. Taliaferro, J. H. Carmichael and others.

The Tennessee Auto Company, Nashville, Tenn., will erect a repair shop costing $3,000 on Grundy street. The company will require a fair complement of machine tools.

The plant of G. N. Mize & Son, manufacturers of mantels and school desks, Maryville, Tenn., was destroyed by fire December 16. It will be rebuilt at once.

The Nashville-Gallatin Interurban Railway, Stahlman Building, Nashville, Tenn., is in the market for a second-hand three-ton steam hoist on trucks.

The Great Falls Power Company, Nashville, Tenn., is making surveys at Great Falls of the Caney Fork River with reference to plans for a power plant. F. H. Yost is general manager.

The Nashville Railway & Light Company, Nashville, Tenn., has begun the erection of an emergency power station on Fourth avenue, North. The estimated cost of the station is $7,000.

The Cleveland Foundry & Machine Works, Cleveland, Tenn., has been incorporated with $20,000 capital stock by C. A. Horner, D. D. Triplett, J. C. Ramsey and G. T. Denton.

Announcement is made that the plant of the Tennessee Cotton Oil Mills Company, Trenton, Tenn., which was recently burned, will be rebuilt and enlarged. John Meyers is vice-president of the company.

H. B. Wood, Empire Building, Birmingham, Ala., is reported to be planning the erection of an automobile factory.

Contracts are being let by the United States Cast Iron Pipe & Foundry Company for the erection of additional buildings at its works in Birmingham, Ala. The Riter-Conley Mfg. Company, Pittsburgh, has been given the contract for 1500 tons of material.

The Atlantic Coast Line is planning the erection of car repair shops and other buildings at Thomasville, Ga. A round-house, shop building, etc., will be erected.

The Tifton Ice & Power Company, Tifton, Ga., is asking for prices on a 150-hp. boiler.

Macon, Ga., is now considering an engineer's report recommending the installation of electrical machinery, the erection of a power house and the construction of other improvements in connection with the municipal water system.

The Motor Vehicle Company, Savannah, Ga., has been incorporated with $200,000 capital stock for the purpose of manufacturing automobiles. Sigo Meyers, Seymour Stewart and others are interested.

Douglas, Ga., is to build an electric light plant and water-works system. A bond issue of $15,000 has been authorized.

The J. J. Newman Lumber Company, Hattiesburg, Miss., has begun work on the erection of a $150,000 sawmill at Sumrall, Miss. The Milwaukee Bridge Company will erect the steel portion of the building, and the Filer & Stowell Company, Milwaukee, Wis., has been given the contract for the machinery

Charlotte, N. C., will receive bids until January 16 on its new water-works system. Motor-driven turbine pumps, a pumping station, etc., will be required.

Additional engines are to be installed in the power-house of the city electric light plant at Donaldson, La. The estimated cost of the improvements is $25,000.

A power-house and 27-stall round-house are to be erected at Spencer, N. C., by the Southern Railway. B. Herman, Washington, D. C., is chief engineer.

The city commissioners of Montgomery, Ala., will expend $16,500 on the installation of an electric compressor at the water-works plant. Other improvements are contemplated.

The Virginia Railway & Power Company is reported to be planning the erection of an addition to its power plant.

The Roanoke Box Mfg. Company, Weldon, N. C., has been incorporated with $50,000 capital stock to manufacture box shooks. The company is having plans prepared for a plant with a daily capacity of 60,000 ft. The incorporators are G. L. Vincent, W. L. Deal and R. W. Johnston.

The Cordele Ice Company, Cordele, Ga., has had plans prepared for the erection of an additional building for the purpose of installing new machinery to increase its ice capacity to 50 tons a day. The improvements when completed will cost $20,000. H. L. Mize is manager.

Indianapolis

INDIANAPOLIS, IND., December 26, 1911.

The Citizens Gas Company, Indianapolis, will construct additional by-product coke ovens and add other new equipment in order to take care of its growing business. J. D. Forrest is general manager.

The Noblesville Heat, Light & Power Company, Noblesville, Ind., has increased its capital stock from $70,000 to $100,000.

The Summit City Supply Company, Ft. Wayne, Ind., has been incorporated with $25,000 capital stock, to deal in building supplies. The directors are J. R. Kennedy, Henry Wehrenberg, William Westhoff, James Hartzell and Henry Hachmeier.

The Burk Construction Company has been incorporated at Newcastle, Ind., with $10,000 capital stock, to do a road construction business. The directors are J. M. Burk and Howard F. Thomas.

The capital stock of the Advance Stove Works, Evansville, Ind., has been increased from $100,000 to $200,000.

The Elkhart Iron Works, Elkhart, Ind., has been incorporated with $36,000 capital stock, to operate a foundry and do a manufacturing business. The directors are W. H. Holland, E. J. Burnett and C. S. Workinger.

The Indiana Coal & Clay Company has been organized at Greencastle, Ind., with $50,000 capital stock, to do a coal mining business in Owen County. The president is Dr. G. W. Bence and the secretary George Hanns.

At an election at Coatesville, Ind., the vote was in favor of building a municipal electric light system.

The De Tamble Motors Company, Anderson, Ind., is enlarging its plant so as to have a capacity of 10 automobiles a day.

The Brown Brass Mfg. Company, Napanee, Ind., has increased its capital stock from $10,000 to $20,000.

St. Louis

ST. LOUIS, MO., December 26, 1911.

The machine tool market during the week has been unquestionably affected by the holiday period, but the slacking up in actual transactions has none of the earmarks of the dullness of recent months. The inquiries coming in show just as strong tendencies as have existed in the past few weeks, and dealers are very optimistic regarding the prospects following the first of the year after inventories have been taken and everything has been squared away for the new year. The second-hand machinery business is rather quiet, but a considerable amount is moving in the aggregate.

Incorporation papers have been taken out effecting the consolidation of the W. R. Colcord Machinery Company and J. W. Wright & Co., both having completed this week removal to new locations adjoining each other at Nos. 1223 to 1229 North Broadway. The name of the consolidated concern is the Colcord-Wright Machinery & Supply Company, and the incorporators are Walter R. Colcord, president; J. W. Wright, vice-president; Albert Scheu, treasurer, and Julius H. Bentzen, secretary. All the salesmen of both houses will be retained and others added. A branch under the management of W. A. Dailey will be opened in Kansas City, Mo. The new company has a capital stock of $100,000.

Bash & Gray, Joplin, Mo., have been awarded the contract for the complete equipment of the new water and sewer systems and plants accompanying at Las Cruces, N. M. Their bid was $55,753.93 and was $23,589.53 below the highest bid made.

The Moon Motor Car Company, St. Louis, has begun the construction of another story on its factory building and will equip it for almost doubling its capacity through the more effective systematization of work made possible by the new space.

The National Enameling & Stamping Company, Granite City, employing 2000 hands, which had intended to shut down January 1, will continue on full time to meet demands.

The Calhoun Clay Mfg. Company, with $300,000 capital stock, has been organized by W. G. Thomas, Charles E. McEwing, A. T. Givesbeck and W. H. Allen to equip a large plant at Golden Eagle, Ill., for the manufacture of clay products. The main offices will be in St. Louis, in the Fullerton Building.

The abandoned property of the Consumers Brewery of St. Louis, absorbed in a merger, has been sold to Henry Griesedieck, Jr., who will remodel and modernize the mechanical equipment.

The Consolidated Saw Mills Company, St. Louis, has been incorporated with $250,000 capital stock by John C. Crawford, Homer B. Crawford and Charles McDaris, to handle sawmills heretofore operated by a corporation of similar name under Oklahoma laws, and also to extend their milling plants.

The Big Western Mining Company, Joplin, Mo., with $50,000 capital stock, has been incorporated by W. E. West, B. T. Becker and B. F. Dye to install equipment and operate mining property owned by them.

The Daleville Canning Company, Daleville, Ind, has been incorporated with $50,000 capital stock by J. G. Sutton, F. M Boyer and B. E. McDowell to equip a large canning plant.

The Cutalite Machinery Company, with $15,000 capital stock, has been incorporated in St. Louis by M. J. McEneny, W. A. McEneny and William Grafeman, to manufacture machinery.

The East St. Louis Cotton Oil Company, of East St. Louis, Ill., with a capital stock of $250,000, has been authorized to employ its capital in a branch oil plant in St. Louis, Mo.

The Edwards & Wharton Lumber Company, with $10,000 capital stock, has been incorporated at Aledo, Ill., by H. W. Edwards, W. A. Wharton and J. I. Edwards to install a sawmill and planing mill equipment.

The Consumers Pure Ice & Fuel Company has been incorporated with $20,000 capital stock at Rockford, Ill., by G. and M. Ruh and J. G. Siewenie, to equip an ice-manufacturing plant.

The R. L. Hight Mfg. Company, with $20,000 capital stock, has been incorporated at Decatur, Ill, by R. L. Hight, Roy R. Wilson and A. B. Holabird

The Brown McDonald Machinery Company, with $10,000 capital stock, has been incorporated in St. Louis by Charles L. McDonald, Isaac N. Brown and Herman S. Albrecht to manufacture and deal in machinery and supplies.

The Woodson Coal Company, Huntington, Ark., with $24,000 capital stock, has been incorporated by W. M. Pye, G. R. Holbrook, S. Woodson and C. C. Woodson to install mining equipment and open a coal mine.

The Rex Buggy Company, Connorsville, Ind., has increased its capital stock from $100,000 to $150,000 for the purpose of increasing its manufacturing capacity.

The Winter-Langeneckert Folding Box Company, St. Louis, has purchased adjoining real estate to provide for the erection of a one-story addition to its factory at a cost of $15,000.

The Hill Mining Company, Duenweg, Mo., with $28,000 capital stock, has been organized by Isaac Hill, J. Tullington and Frank H. Brown to install mining machinery on land owned by them.

The City Council of Belleville, Ill., is considering means for taking water from the Mississippi for its supply, and is planning to take up the matter of install-

ing a plant to pump and distribute the water so drawn from the river.

The Queen City Electric Company, Sedalia, Mo., has been awarded the contract for installing an electric light system at Lincoln, Mo.

The Argenta Boiler & Iron Works, Little Rock, Ark., has completed the installation of machinery in its new shops, and is about to begin operations. The enterprise is being conducted by J. G. Garden and J. J. Koscielny.

The Union Machine Company, Bartlesville, Okla., will enlarge its foundry in connection with the taking over of a new line of manufacture recently acquired.

The R. M. Fletcher Stave Company, Pine Bluff, Ark., has been incorporated with $15,500 capital stock to manufacture staves, etc. The company has an established plant and is not in need of equipment at this time. The incorporators are R. M. Fletcher, O. Z. Chockley and D. W. Hudspeth.

Texas

AUSTIN, TEXAS, December 23, 1911.

Briefly, it may be stated that the year 1911 has been a very good one for the machinery trade of Texas and the Southwest generally. There has been a noticeable increase in the demand for certain lines of machinery, particularly for irrigating pumping plants and many kinds that enter into manufacturing establishments. For the various smaller articles of machinery there has also been a satisfactory demand. The structural steel business in Texas has increased enormously, due to the erection of the modern type of buildings and for other purposes. Prospects for the coming year are very promising. Splendid rains over the state during the last week or ten days have placed a good season in the ground and created an optimistic feeling on the part of the business element. With the subsiding of political troubles in Mexico it is certain that American machinery manufacturers will find a very large demand for their products in that country.

J. C. Lankford and B. Martin, Terrell, who recently leased the Central Iron Works plant at Temple, will install new machinery and make enlargements.

The Chamber of Commerce of Wichita Falls is organizing an industrial promotion corporation with a capital stock of $80,000. It will have for its purpose the furnishing of free sites for factories and creating a fund to encourage the establishment there of various kinds of industries.

C. W. Post, Battle Creek, Mich., announces that he will erect at Post City, Texas, a textile mill of 10,000 spindles. The initial cost of the factory will be about $400,000, and it will be erected in such a manner as to permit additions of machinery. H. W. Fairbanks, of Dallas, will be superintendent of construction and be in charge of the operation of the mill.

The City Council of Electra will install a waterworks system there and when this work is completed a sewer system will be constructed.

The City Water Commission of Waco has under consideration the installation of a large filtration plant. The commission has employed an expert to furnish plans for the contemplated improvement.

The Commercial Club of Temple is promoting the establishment of a hat factory at that place.

The Sinton Ice & Light Company has been organized at Sinton with a capital stock of $10,000. It will install an ice and electric light plant.

The Commercial Club of Cisco is promoting the development of a natural gas field near there and the laying of a pipe line and distributing system for supplying that town with fuel.

The Pineland Naval Stores Company has been formed at Remlig with a capital stock of $40,000 for the purpose of installing a turpentine and rosin manufacturing plant.

James Stoops, of Dayton, Ohio, contemplates installing a canning factory at Roswell, N. M., at a cost of about $75,000. It will be devoted to canning corn, tomatoes, beets, beans and other products.

The Hydraulic Properties Company, of New York, which has the contract for the reconstruction of the dam across the Colorado River at Austin and is installing a hydroelectric plant, has begun the work of erecting the building for the power house and will soon begin work upon the dam. The city has extended its electric power transmission system to the dam site to provide power for the construction work.

The State Prison Commission has decided to reerect the furniture factory, machine shop, blacksmith shop and repair shop at the state penitentiary at Huntsville, which were recently destroyed by fire. The loss to the state by their destruction was about $150,000. Governor O. B. Colquitt is acting with the prison commissioners in the matter.

The Manhattan Construction Company, Chandler, Okla., has been granted a permit to do business in Texas, with principal offices at Kingsville. It has a capital stock of $50,000.

The Mogollon Power & Mining Company has been formed at Silver City, N. M., with a capital stock of $250,000. Its incorporators are Thomas J. Curran, of Cooney, N. M.; R. P. Barnes and C. C. Royall, of Silver City, N. M.

The Mexico Oil & Refining Company has been formed with headquarters at Gallup, N. M. Its capital stock is $1,000,000. The incorporators are E. R. Vaughan, of Grants, N. M.; W. R. Fleming, of Grants; R. H. Hanna, E. E. Meier, H. F. Stephens and J. H. Vaughan, of Santa Fé, N. M.

E. B. Chapin, of San Antonio, and associates, who are arranging to construct a dam across Devil's River north of Del Rio, Texas, and build a large irrigation system with a view of reclaiming about 125,000 acres of land, have let the contract for the preliminary surveys of the proposed works to C. S. Young Company, San Antonio. In connection with this irrigation system a large hydroelectric plant will be installed.

The Chapala Hydroelectric & Irrigation Company, of Guadalajara, Mexico, has finished the installation of its new hydroelectric plant at Fuente Grande, on the Santiago River, fifteen miles from the former city, at a cost of $1,600,000 gold. The plant has a capacity of 12,000 hp., a large part of which will be transmitted to the Etezatlan and Hostotipaquillo districts in the State of Jalisco. It will also supply power for operating a number of irrigating pumping plants and other industries within a radius of 100 miles.

The Pacific Coast

SAN FRANCISCO, CAL., December 19, 1911.

While transactions of some importance are pending in certain lines, little business is likely to be closed until after the holidays. The machine tool market is especially dull, no new inquiries having come out, while orders recently received are mainly for the class of tools used in small automobile repair shops, etc. Some of the larger shops have been figuring on new equipment, but only in a tentative way, and it is impossible to say when their orders will be placed, though a little business is expected from the gas engine manufacturers early in the coming year.

While considerable general construction work has been in progress throughout the State, contractors' equipment is moving slowly, as the larger concerns are well supplied and the amount of second-hand machinery on the market is increasing. There is more than enough machinery on the ground to take care of all local building operations at present. Preliminary work is being started on several large dams for hydroelectric power development, and some new equipment will probably be required in this connection during the coming year. The extensive road improvements planned by the State are also expected to result in considerable new business. There is a fair demand for mining machinery in Nevada, but the California mining interests are buying very little at present. Pumping equipment of all kinds is in demand, though individual sales are small.

The Oliver Filter Company and the Doak Gas Engine Company are moving their offices from the Sheldon Building to the Hooker & Lent Building at Market and First streets. The Oliver Filter Company has a lot of business in prospect from Mexican mining interests, and has appointed W. W. Merriam as manager of its business in Mexico.

The Bakersfield Water Company, Bakersfield, Cal., is installing two large two-stage turbine pumps with electric motor drive. Auxiliary gasoline engines will also be installed.

The town of Oakdale, Cal., has placed a contract with W. T. Garratt & Co., this city, for all machinery for the municipal water-works.

The city of San José, Cal., is in the market for a rock crusher.

The Corliss Gas Engine Company, Petaluma, Cal., has let a contract for a new building at its shop, and is expected to place orders for some new tools in the near future.

A meeting of stockholders of Payne's Bolt Works, 133 Howard street, this city, will be held January 30

for the purpose of reducing the capital stock from $300,000 to $75,000.

It is reported that a five-stamp mill will be installed shortly at the Midas mine near Grass Valley, Cal.

The Hanford Water Company, Hanford, Cal., is preparing to replace its present pumping plant with one of larger capacity.

Cretsinger Bros. are preparing to install a marine engineering and machine shop on the waterfront of Los Angeles Harbor.

The Oro Electric Corporation proposes to start work on its new hydroelectric plant near Belden, Cal., next April, the work to be completed in about two years. The plant is to have a capacity of 50,000 hp.

The Tucson Iron Works, Tucson, Ariz., has taken a contract for all castings and iron work for a smelter to be erected by the American Smelting & Refining Company.

The completion of the Owens River Aqueduct by the city of Los Angeles will probably bring a large amount of second-hand machinery on the market. The tunnel work on this project is now practically complete, the total amount of tunnels being 42.85 miles.

The Reliance Gas Regulator & Machine Company, Pasadena, Cal., has been incorporated with $100,000 capital stock. The company has just completed a new plant for the manufacture of gas regulators, gas clamps and other gas machinery.

M. H. Bliven, formerly with the American Pipe & Construction Company, Philadelphia, Pa., and R. W. Haight, formerly with the San Diego Hardware Company, San Diego, Cal., have formed a partnership to engage in the general machinery and supply business at San Diego.

Western Canada

WINNIPEG, MAN., December 21, 1911.

This month has been very mild following the cold start the season made in November and there is still considerable work being done in the building line. Some are being finished earlier than expected and others will be well advanced for finishing in the spring. The mild weather has been very favorable for traffic, but there are still complaints of inadequate rolling stock. The unsatisfactory conditions on the railroads this fall is being brought before the government by the business communities, and it is imperative that great improvements be put into effect before another fall season.

The Canadian Dominion Investment Company has bought a site in Winnipeg on which a large modern office building will be erected in the near future.

The Winnipeg Board of Works has indorsed a scheme to add five new wells to the waterworks system.

Tenders will be called on or about January 1 for passenger elevators, lighting, heating, vacuum cleaning appliances, sprinkler system, plumbing, etc., for the Fort Garry Hotel, Winnipeg. Herbert B. Pugh, 927 Union Bank Building, is the architect.

The rural municipality of Assiniboia will build six water tanks of 30,000 gal. each. Frank Ness, Kirkfield Park P. O., Manitoba, is secretary of the municipality.

G. M. Gibbs is head of a Vancouver syndicate that will erect a plant in that city for the manufacture of steel bars.

The Alberta Clay Products Company, Medicine Hat, Alberta, will extend its plant at a cost of $175,000.

The Canadian Pacific Steel Company is contemplating the building of a plant at Vancouver, B. C., to manufacture tin plate.

The new water works and power plant to be installed at Prince Rupert, B. C., will cost $550,000. The ratepayers have already approved the expenditure.

A by-law has been passed at Neepawa, Man., to raise $100,000 for a waterworks system. Chapman & Power, Toronto and Winnipeg, are the engineers.

The city of Port Arthur recently signed an agreement with a firm to be known as the Steel Products Company of Port Arthur whereby the company, which now has a plant at Morrisburg, Ont., and a capital stock of $750,000, will move its plant to Port Arthur and engage in the manufacture of sheets.

The large flour mill, oatmeal mill and elevator of the Saskatchewan Flour Mills Company, Ltd., Moose Jaw, Sask., which were burnt last week, will be rebuilt without delay. The loss was about $500,000, covered by insurance.

Government Purchases

WASHINGTON, D. C., December 26, 1911.

The United States Reclamation Service, Boise, Idaho, will open bids January 10 for furnishing four electric derrick hoists with motor, drum, etc., complete and four stiff-leg derricks, including the necessary fittings.

The Paymaster General, Navy Department, Washington, will open bids January 9, under schedule 4184, class 34, for one bevel band saw; class 35, one automatic horizontal chisel mortiser for delivery to Philadelphia.

The United States Revenue Cutter Service, New York, opened bids December 14 for furnishing one water tube boiler for the revenue cutter Hudson, as follows:

Mosher Water Tube Boiler Company, New York, $4,920, $5,450, $5,270, $5,800, $5,770 and $6,300; Gas Engine & Power Company and Charles L. Seabury & Co., Morris Heights, N. Y., $5,337; Babcock & Wilcox Company, New York, $6,290; Theodore Smith & Sons Company, New York, $4,070, $4,950 and $5,170.

The Bureau of Supplies and Accounts, Navy Department, Washington, opened bids December 19 as follows:

Schedule 4115, class 65, one double surfacer with six rolls—Bidder 23, Berlin Machine Works, Beloit, Wis., $1,432; 36, Chicago Machinery Exchange, Chicago, Ill., $925; 63, J. A. Fay & Egan Company, Cincinnati, Ohio, $1,064; 196, D. D. Whitney & Son, Winchendon, Mass., $1,110, $1,230 and $1,290; 207, American Woodworking Machinery Company, Rochester, N. Y., $1,100.

Class 66, one motor-driven, four-sided outside molder—Bidder 23, Berlin Machine Works, Beloit, Wis., $1,215; 36, Chicago Machinery Exchange, Chicago, Ill., $1,153; 63, J. A. Fay & Egan Company, Cincinnati, Ohio, $1,066.70 and $1,171.20; 131, Newman Machine Company, Greensboro, N. C., $1,185; 166, H. B. Smith Machine Company, Smithville, N. J., $1,222; 207, American Woodworking Machinery Company, Rochester, N. Y., $1,400; 216, Manning, Maxwell & Moore, New York, $1,165.

Schedule 4127, class 91, for two motors and two starting panels—Bidder 1, Allis-Chalmers Company, Baltimore, Md., $1,520.40; 19, Burke Electric Company, Erie, Pa., $1,656.92; 49, Diehl Mfg. Company, Elizabethport, N. J., $1,628.60; 62, Fort Wayne Electric Works, Fort Wayne, Ind.; $1,598; 65, Garwood Electric Company, Philadelphia, Pa., informal; 67, General Electric Company, Schenectady, N. Y., $1,500; 129, National Electrical Supply Company, Washington, D. C., $1,872; 197, Western Electric Company, New York, units; 199, Westinghouse Electric & Mfg. Company, Washington, D. C., $1,882.48.

Trade Publications

Metal Protecting Paint.—Harrison Brothers & Co., Inc., Twenty fifth street and Grays Ferry road. Philadelphia, Pa. Booklet. Devoted to Antoxide pain for iron and steel surfaces. The development of this paint is described with special reference to the three classes of pigments according to their action toward the formation of rust. It is pointed out that even in the light of recent investigations along this line the pigments originally selected for this paint are still used, the only change made being in the proportions of various ingredients.

Welded Pipe.—Central Tube Company, Pittsburgh, Pa. Booklet. Refers to a new line of black and galvanized pipe that is said to be soft, workable and easy to thread. Engravings showing the pipe in process of manufacture are included.

Suction Gas Producers.—Amsler Gas Power Company, Wabash Building, Pittsburgh, Pa. Pamphlet. Treats of the type C suction gas producer for power and fuel. The special features claimed for this producer are high economy, uniform quality of gas, simplicity of construction and safety. The construction of the producer is gone into in considerable detail and the text is supplemented by both half-tone and line engravings. The results of a test on one of these producers are given with a diagram showing the relation existing between the quantity of water delivered into the vaporizer and the gas produced.

Air-Steam Corliss Engine.—The Christie Engine Company, Waterloo, Iowa. Pamphlet. Contains the report of a 5-hr. economy test made on one of these engines together with a description of the Christie-air-steam Corliss engine which operates on the four stroke cycle principle of the gas engine instead of the two-stroke cycle of the steam engine. This description is somewhat extended and is supplemented by half tone engravings.

Presses.—American Can Company, 112 West Adams street, Chicago, Ill. Booklet. Refers to a line of open back inclinable presses manufactured under the Rudolphi & Krummel patents. Following a brief description of the construction of these presses, half-tone engravings are given together with brief specifications of the various sizes of presses built. A complete specification table is given on the last page.

Heating, Forging and Welding Furnaces.—Tate, Jones & Co., Inc., Pittsburgh, Pa. Catalogue. Deals with an entirely redesigned line of forging, welding and heating furnaces employing either oil or gas as fuel. The various types of furnaces include those for tool dressing, rod heating, forging and plate heating as well as a blacksmith's forge. In describing the various furnaces an illustration is given followed by a brief description and a list of the stock sizes in which it is made.

Current Metal Prices.

The following quotations are for small lots, New York. Wholesale prices, at which large lots only can be bought, are given elsewhere in our weekly report.

IRON AND STEEL—

Bar Iron from Store—

Refined iron,
1 to 1½ in. round and square ₤ lb 1.70¢
1½ to 6 in. x ½ to 1 in. ₤ lb 1.80¢
1 to 6 in. x 1/16 to 1/4 in. ₤ lb 1.80¢
Rounds, ½ to 1½ in. also diam. screw ₤ lb 1.80¢
Angles, 3 to 6 in. ₤ lb
3 in. x ¼ in. and larger 1.80¢
2 in. x 1/16 in. and ¼ in. 2.20¢
1 in. x ¼ in. x ½ in. 1.80¢
1 in. x ¼ in. x ½ in. and heavier 1.80¢
1 to 1½ in. x ¼ in. 1.97¢
1 to 1½ in. x ½ in. 2.00¢
2 in. x ¼ in. 2.00¢
2 in. x ½ in. 2.00¢
3 in. x ¼ in. 2.15¢
3 in. x ½ in. 2.15¢
4 in. x ¼ in. 2.30¢
4 in. x ½ in. 2.30¢
Tees, 3 in. 2.25¢
2½ in. 2.30¢
2 in. 2.40¢
1½ to 2 in. x 3/16 in. 2.40¢
1 in. and smaller 2.50¢
Beams 3 in. and larger 1.80¢
Bands, 1½ to 6 in. x ¼ in. 2.00¢
Burden's "H. B. & S." horse shoe iron 2.50¢
Burden's "Best" horse shoe iron 2.15¢
Norway nail rods 3.00¢

Merchant Steel from Store—

per lb

Best refined machinery 1.70¢
Low carbon, for screw stock 2.50@3.00¢
Best cast steel, base price, all shapes, cuts 5¢

Sheets from Store—

Black

	One pass C R	R G
	Soft sheet	Annealed
No. 16	₤ lb 2.45¢	2.85¢
Nos. 18 to 20	₤ lb 2.50¢	2.95¢
Nos. 22 and 24	₤ lb 2.55¢	3.05¢
No. 26	₤ lb 2.70¢	3.15¢
No. 28	₤ lb 2.75¢	3.35¢

Russia, Planished, &c.

Genuine Russia, according to assortment ₤ lb 12 @14½
Patent planished, W Iron & Wire ₤ lb A. 10c; B. 9¢ net

Galvanized

Nos. 12 and 14 ₤ lb 2.75¢
No. 24 ₤ lb 3.10¢
No. 26 ₤ lb 3.30¢
No. 28 ₤ lb 3.60¢

No. 20 and lighter 5/8 in. less wide 25c higher

Genuine Iron Sheets—

Galvanized

Nos. 22 and 24 ₤ lb 5.50¢
No. 26 ₤ lb 6.00¢
No. 28 ₤ lb 7.00¢

Corrugated Roofing—

2½ in. corrugated

	Painted	Galvd
No. 24 ₤ 100 sq ft	$3.75	$4.70
No. 26 ₤ 100 sq ft	3.85	4.90
No. 28 ₤ 100 sq ft	4.00	5.05

Tin Plates—

American Charcoal Plates per box

"A.A.A." quality
IC, 14 x 20 $8.25
IX, 14 x 20 7.00

American Coke Plates
IC, 14 x 20 $5.70
IX, 14 x 20 5.40

American Coke Plates, Bessemer
IC, 14 x 20 $4.20
IX, 14 x 20 5.20

American Terne Plates
IC, 20 x 28 weight 8 lb coating $8.40
IX, 20 x 28 weight 8 lb coating 10.10

Seamless Brass Tubes—

List November 1, 1909. Base price, 18¢

Brass Tubes, Iron Pipe Sizes—

List November 1, 1909. Base price, 18¢

Copper Tubes—

List November 1, 1909. Base price, 21¢

Brazed Brass Tubes—

List February 1, 1911. 20½¢ ₤ lb

High Brass Rods—

List February 1, 1911. 15⅝¢ ₤ lb

Roll and Sheet Brass—

List February 1, 1911. 15⅝¢ ₤ lb

Brass Wire—

List February 1, 1911. 15⅝¢ ₤ lb

Copper Wire—

Base price, Carload lots mill 15½¢

Copper Sheets—

Sheet copper, hot rolled, 16 oz. quantity lots ₤ lb 19 ¢
Sheet copper, cold rolled, 1c ₤ lb advance over hot rolled sheet.
Sheet copper, planished 20 in. wide and under, 1c ₤ square foot.
Sheet copper, planished over 20 in. wide, 2c ₤ square foot.
Planished copper, 1c ₤ square foot more than unfinished.

METALS—

Tin—

Straits pig ₤ lb 47 @48 ¢

Copper—

Lake Ingot ₤ lb 14 ¼ @ 15¼ ¢
Electrolytic ₤ lb 14 ¼ @ 15 ¢
Casting ₤ lb 14 ¼ @ 14¾ ¢

Spelter—

Western ₤ lb 7¼ @ 7¾ ¢

Zinc—

No. 9, base, casks ₤ lb 9¢ Open ₤ lb 9½ ¢

Lead—

American pig ₤ lb 5½ @ 5¾ ¢
Bar ₤ lb 7 @ 7¼ ¢

Solder—

½ & ½ guaranteed ₤ lb 26 @ 27½ ¢
No. 1 ₤ lb 24½ @ 25 ¢
Refined ₤ lb 23 @ 23¾ ¢

Prices of solder indicated by private brand vary according to composition.

Antimony—

Cookson ₤ lb @ 10½ ¢
Hallett @ 10 ¢
Other brands 9@ 9½¢

Bismuth—

Per lb $2.00@$2.25

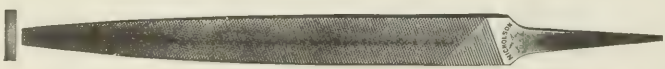
Aluminum—

No. 1 aluminum guaranteed over 99% pure), in ingots for remelting (ton lots) 21¢
Rods and Wire Base price 31c
Sheets Base price 33¢

Old Metals—

Dealers' Purchasing Prices Paid in New York.

Copper, heavy and crucible 12 25
Copper, heavy and wire 12 00
Copper, light and bottoms 11 00
Brass, heavy 8 50
Brass, light 6.50
Heavy machine composition 10 50
Clean brass turnings 8 50
Composition turnings 8 50
Lead, heavy 4 00
Lead, tea 3 75
Zinc, scrap 4.50



Nicholson Files and Rasps

Insure Shop Economy

Every time a mechanic pushes a file across his work he expends a certain amount of time and energy.

Whatever the result may be, the time and energy used on each movement is the same.

A **Nicholson** File will cut a little bit cleaner and deeper than any other file.

Multiply this little extra work by the thousands of movements given every day and you will see that **Nicholson** Files are a big factor in shop economy.

Let us prove it.

NICHOLSON U.S.A. Trade Mark

NICHOLSON FILE CO., Providence, R.I.

BINDING SECT. JUL 2 1980

T
1
I7
v.88

Engin.

Iron age

ENGIN STORAGE

PLEASE DO NOT REMOVE
CARDS OR SLIPS FROM THIS POCKET

UNIVERSITY OF TORONTO LIBRARY